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The Top 50 CD-ROMs
By the editors of MacUser

It’s the Top 50 countdown. Whether you’re looking to learn, looking for fun, or just looking, we’ll tell you which CD-ROMs are worth a look.

Choosing the Right Removable
By John Rizzo

You know that removable storage has the edge over fixed storage in terms of portability, expandability, and security. But which removable technology should you use? Here’s a breakdown of the advantages of five kinds of removable storage: optical, Floptical, SyQuest, Bernoulli, and removable hard drives.

Do-It-Yourself Databases
By Jan Smith

Building a customized database doesn’t have to mean hiring a programmer — at least not with one of these user-friendly programs. MacUser evaluates File Force, FileMaker Pro, Helix Express, My Advanced Database, and Panorama II.

Desktop Video: First Cuts
By Lisa Rudman

Will DTV replace DTP as the next revolution in communications? MacUser Labs examines the current state and the promise of desktop video with hands-on testing of the latest gear from Avid, Digital F/X, RasterOps, and SuperMac.

On the cover: MacUser’s editors looked at hundreds of CD-ROMs before picking the 50 best.

Cover photo by Fred Stimson
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ABOUT MacUser

Smart CD-ROMs

marshall McLuhan was the first to point out that a medium and its messages could easily become confused. Until now, the big news about CD-ROM was still the medium. Content took a back seat. Two years ago, when we looked at CD-ROM titles, we could find only 27 worth writing about.

Today, by contrast, just about every major player in the worlds of communications, computers, and entertainment — including Apple, Microsoft, IBM, Paramount, Sony, and Time-Warner — is investing in title development. Why, you ask? Because "smart TV" — where you interact with what you're watching — is just around the corner, and whoever has content for that audience stands to make lots of money. The first attempts at this new type of programming are represented in the current crop of CD-ROMs.

The Next Generation

In contrast to the slim pickings of two years ago, we had an embarrassment of titles to choose from this time around, with new ones arriving almost every day. Many of them were surprisingly slick, artfully composed CD-ROMs that successfully integrated video, sound, text, and graphics.

So what makes a CD-ROM stand out?

"Obviously, speed, sound, and graphics are important," says assistant editor Amanda Michael, a contributor to this issue's CD-ROM roundup (see "The Top 50 CD-ROMs," page 90). "But the interface is the most important. The navigation tools have to get you where you want to go."

Amanda, who looked at more than 200 CD-ROMs in preparation for this article, has her favorites. "MovieSelect is really cool," she says, "and it was nearly 90 percent accurate in identifying movies I would like to see — but I really loved The San Diego Zoo Presents... The Animals!, which lets you see, hear, and almost touch over 200 animals in a very interactive format."

MacUser editor James Bradbury lobbied for his fave, A Hard Day's Night, as the top CD-ROM. According to Jim, A Hard Day's Night is a technical and artistic tour de force, containing nearly two hours of full-motion video. "Sure, the film window is still pretty small — but what really makes this product work is how the remaining screen space is used for supplementary material, like the original script. The use of photos and other video clips all help to document the context in which the movie was created."

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— Nancy Groth
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Here's a quick comparison. Based on an average of total throughput times for 134 files from 22 graphic and text applications.

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<th>Tektronix Phaser III PXi</th>
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<td>Source: MWA Consulting, Inc., August 1993.</td>
<td><img src="image-url" alt="Graph" /></td>
<td>2.3 times faster than the Tektronix Phaser III PXi</td>
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Two-sided printing for layouts and comps.
The future has to start somewhere.

We predict it will start in very close proximity to Motorola's PowerPC Microprocessors.

Here's why. Personal computers are on the verge of becoming infinitely more useful, more usable, more communicative and more mobile than they are today. A number of advanced technologies—real-time video, wireless networks, voice and handwriting recognition and object-oriented programming, among many others—are ripening, converging and becoming affordable all at once.

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The future of computing is going to be very different. That difference will be powered by PowerPC Microprocessors from Motorola.

PowerPC Microprocessors. Changing the course of computing. For the better.
Poor Claris. Once again, Canvas™ is running circles around MacDraw® Pro. In fact, they are still trying to catch up to Canvas 3 while we've added dozens of new features and enhancements to create Canvas 3.5. Like 3-D extrusions of text and graphics, enveloping of text and graphics, smart lines, fine kerning, fractals, automatic concentric circles and spirals, and a tool loader that allows you to add tools as you work. There's even a versatile pressure-sensitive freehand Bezzer pen tool. And Canvas 3.5 has really outdone itself with new improvements including object blends, binding of text to shapes and curves, Bezier text conversions, and macro windows. Which is just the beginning, because Canvas also includes all the great features of 3.0 like custom parallel lines and curves, our unique SmartMouse™, and more.

Comparing Canvas to the competition is like comparing a superbike to a tricycle. And only Canvas is self-upgrading, allowing you to add new tools, effects and file translators at will. Last but not least, while MacDraw Pro is idling somewhere back in the Dark Ages, Canvas features seamless file sharing with its recently released Windows version. Add it all up, and it's Canvas. For the gives you the ride easy to see that it's time to shift gears to ultimate in value and performance, Canvas of your life. So go ahead and hop on.

NEITHER WOULD WE.
Letters

Are you ready for the Überdisk? David Carroll, of Brighton, Massachusetts, is. "Instead of external megadrives spanning like fungi, why can't Fuji or Maxell simply fold all these entrepreneurs by coming up with 100-megabyte or even 1-gigabyte floppies that work in the existing floppy drives?" he asks. We have to wonder about his comparison of this commonsense approach to the creation of the Volkswagen. Can "Fahrverg floppy" be far behind?

Write to Letters to the Editor, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404, or post your letter on the MacUser Forum of ZiffNet/Mac, our on-line service. All letters become the property of MacUser, and we reserve the right to edit any letters we print. Please include a return address and a daytime phone number.

The Dynamic Duo

Henry Bortman's column "I Don't Want a Duo" (August '93, page 189) doesn't do the PowerBook Duo justice. It gives one man's opinion that his stubby fingers and need for bifocals made the Duo unsuitable for him. For professionals who spend most of their time in the office but also need to be mobile, the Duo is the best product.

I've been the happy user of a Duo 210 for four months. I look all day at Apple's color monitor, not the Duo's black-and-white screen. Then when I push the Eject button on the Duo Dock, I have everything with me — no need to bring along floppies or worry about whether I have the latest version of a file.

David Heyman
via ZiffNet/Mac

I accept that some folks don't like the Duos. However, I expect the technical director of MacUser to at least get his facts straight. Henry Bortman's elaborate scenario of Duo-caused inconvenience is based on an obvious error: "I have to shut down my machine" to attach a floppy adapter and floppy drive? Nope, sleep will do; there's no need to reboot and hence no inconvenient wait for all his nittry extensions to load.

Henry's cost comparison of the Duo 230 and the PowerBook 180 is similarly flawed. He includes no fewer than three separate Duo docks in the cost of a Duo. A MiniDock in each office and a floppy adapter for the road? Come on, Henry, get one MiniDock, and carry it with you. Even with the unnecessary expense of redundant docks, the Duo 230 was cheaper than the PowerBook 180 by "only" $557 — a fair chunk of change to some of us. The $3,500+ price tag of an all-in-one, active-matrix PowerBook 180 is beyond what we're willing to spend for a personal computer.

Duo aren't for everyone, but for some of us, they're just right.

James Huff
Pasadena, CA

In Henry Bortman's attack on the PowerBook Duo, he gives fair treatment to the PowerBook 180 and extols its virtues (excellent screen, all-in-one design, multitude of modem options), but he doesn't give the same fair treatment to the Duo. He ignores the fact that the Duo's AC adapter is small and light and has a connection for a normal computer power cord, whereas the other PowerBooks have bulky, heavy adapters. More important, Henry makes no mention of battery life! Owners of 180s are happy if they can get two hours out of a single NiCadbattery charge. On my Duo, I think something is wrong if I don't get more than three and a half hours.

As far as the modem options are concerned, I agree that the world of the PowerBook Duo leaves a great deal to be desired. I do question your editors' judgment in printing a column lambasting the Apple PowerBook Express Modem in the same issue in which it was a MacUser

Open Folder

It's the little mysteries that make life in the Mac community so interesting, don't you think? For instance, there's the case of the disappearing Mac model. Doreen McMillan, of West Vancouver, British Columbia, wants to know why we don't mention the Mac Ili in the pages of MacUser. Well, Apple decided to sell the Ili in Canada and Europe but not in the United States, so it's a bit off our radar. The good news is that the differences between it and the Iliw, which is sold in the States, are minimal, so anything you read about the Iliw can be applied to the Ili. The bad news is that recent comments about the Iliw have been about its impending demise. Was it Mr. Scully in the library with the candlestick?

Bryan Dahlberg, of Denver, Colorado, uncovered another bit of intrigue in the pages of MacUser. "While perusing 'The Best Connections' in the July issue (page 218), I couldn't help but be captivated by the window behind the dialog box on page 221. Now I can't eat; I can't sleep; I can't even read Dvorak. I must know: Who is Desiree? Why is she on Air Force One? What is she doing with wax in the plusherst seat? The slinky lounging outfit was from where? Whose frame was broodingly handsome? (Can a frame brood?) And finally, what did Desiree continue doing? Flicking? Tickling? Licking? Plucking?" Sorry, Bryan, you'll have to wait for Chapter XIII.

Finally, who would have guessed that the most pressing question in a Mac magazine would not be about PowerPC chips or PowerBook screens but about Gurgling Codfish ("Dear Mr. Scullery, July '93, page 11, and Letters, August '93, page 20)? At last, we have Thomas Seibold to thank for the answer: "A Gurgling Cod is a novelty pitcher shaped like a codfish that's sold in the Boston area. It makes a gurgling sound when rocked and is used by Rush Limbaugh as a sound effect when referring to Democratic Senator Edward Kennedy's car accident at Chappaquiddick." Yikes! Another Rush reference sneaks in!

Got something on your mind? Here's a chance to get it off your chest. Write to Open Folder, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404, All the usual caveats about letters apply.
Why did Sharon Stone's character in Silver just turn on the Duo Dock without showing the machine's capabilities?

SuperMac's large-screen gray-scale displays are alive and kicking the competition, but you wouldn't know it by reading MacUser's July issue. SuperMac was completely overlooked in your article on monochrome and gray-scale displays ("Silver Screens," page 130). To set the record straight, SuperMac has two award-winning gray-scale displays (the SuperMatch Platinum 20 Full-Page Display and Platinum 21 Two-Page Display) and a great monochrome graphics card — all at attractive prices. Please let your readers know that they can turn to SuperMac for the most-competitive products for their applications where a high-quality, large-screen gray-scale display is needed.

Christopher A. Kryzan
General Manager
High-Volume Products
SuperMac Technology, Inc.
Sunnyvale, CA

Hooray for Hollywood

I read the novel Jurassic Park, by Michael Crichton, and loved it. I found the movie to be equally wonderful. I was interested to see that Mac Quadras with SuperMac monitors were used in the control room to run the park and that the camera focused on the company logos. Because Macs were never mentioned in the novel, I wonder what Apple and SuperMac had to do to have the privilege of running Jurassic Park. I'm certain it was well worth it.

Marc LaFountain
Columbia, SC

I recently saw the movie Silver and noticed one of the worst uses of a product I've seen in a long time. Why is it that Sharon Stone's character walked into her office each morning and simply turned on the conspicuous Duo Dock on her desk? Apple must have been so intent on having a product-placement ad that it didn't bother to get the moviemakers to fully show the machine's capabilities. Apple should demand a refund!

Brian E. Hunter
Hanover, NH

We asked Jerry Seinfeld's Classic for the inside scoop on the Mac's inroads into Tinseltown, but it was busy doing lunch at Spago with Demi Moore's PowerBook. — PP

StyleDeskWriter Pro II

I can't let pass your comparison of the Apple StyleWriter II and the Hewlett-Packard DeskWriter (July '93, page 73). I was disappointed to see in the table of contents that the new Apple StyleWriter II "is still no match for the HP DeskWriter." But in reading the review, I discovered that the StyleWriter prints text better than and as fast as the DeskWriter and it's cheaper, too. That's great news for me and a lot of other folks who do not use networks or print gray-scale graphics. I just want to see print quality like that of the ImageWriter's.

In fact it's hard to conceive why someone with a large and expensive system would invest in a smaller and cheaper unit. These folks have the resources to buy laser printers with better gray-scale printing.
MacUser compared accounting packages and judged M.Y.O.B. the best.

So did...

You could systematically compare small business accounting packages on the market. But MacUser and the six other leading computer publications have already done it for you. Every single one declared M.Y.O.B. the best. In fact, M.Y.O.B. has won every comparison of accounting software in the industry over the past 18 months.

It’s easy to see why M.Y.O.B. is the unanimous choice. Everything you need is just a mouse click away. Want to invoice a customer? Just click through the menus and fill in the blanks. The invoice screen looks like an invoice. The check-writing screen looks like a check.

It’s just as easy to record receipts and track expenses and inventory. And even easier to stay in touch with customers and suppliers. Dial right from the Card File with… you guessed it… a click of the mouse.

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This full-featured program generates over 80 customizable reports. You can analyze sales by item, customer, time period and more. And every form you print is customizable, too, so it can look exactly as you want it to, logo and all.

Here’s even better news. Now you can get M.Y.O.B. for just $99.95 (plus $6 shipping and handling). Not only that, you’re free to try M.Y.O.B. for a full 90 days! If you are dissatisfied for any reason, simply return the program to us for a complete refund. This special offer expires 12/31/93, so call today!

Requirements:
Requires Macintosh Plus or better, 2MB RAM or better, a hard drive with approximately 2MB of free space. System 6.0 or later with the font Geneva 10 installed. An Apple ImageWriter or LaserWriter printer is optional. An Apple (or compatible) modem is optional. M.Y.O.B. is a trademark of Teleware, Inc.

All other products mentioned are trademarks of their respective companies.
and faster speed. So why are you evaluating these two printers as if they were the mainstay of every local-area network?

Bill Eppick
Portland, OR

Our discussion of StyleWriter II networking was a must — even though we deemed it detrimental to host-machine performance — because it is a major aspect of the printer’s most important new feature, the GrayShare software. Our main points in judging the StyleWriter II inferior to the DeskWriter were gray-scale quality and speed, hardly obscure criteria to most printer buyers. — SJ

Your StyleWriter II review indicated that buyers of the original printer could use the new software with the original StyleWriter to enhance the printer’s output. I was interested, I called Apple and was told that Apple did not recommend using the new printer software with the original printer.

Earl H. Gibson
Wynnewood, OK

As we were going to press with the StyleWriter II review, Apple informed us that the printer’s new software would work with the old StyleWriter. The company has since changed its mind. Based on our experience with the new-software/old-StyleWriter combination (sometimes it works, sometimes it doesn’t), we think Apple has the right mind-set. — SJ

Aqua­rium Ilv x

I just read Michael Swaine’s August column (“Too Many Macs!” page 37). I prepared a long, sarcastic response, but I changed my mind about sending it. Instead, I’ll offer $100 for any obsolete Mac Ilvx for which he or Andy Ihnatko can find no use other than as a fishbowl. This is a serious offer. If they are so clueless as to believe that Ilvx Macs have no further use, I might as well be the one to take advantage of that foolishness.

Jim Bailey
Acton, MA

I’ve been reading Michael Swaine’s columns in MacUser for years, but his August column has finally inspired a reaction. I take exception to his statements on “obsolete” Macs: “Maybe I should explain why Apple had to institute a policy of accelerating planned obsolescence” and “Although forcing users to upgrade their Macs . . .” Michael: Excuse me? Perhaps you’re referring to my original 128K $2,500 Mac (upgraded to a Plus in 1986), which still runs the vast majority of available software? Do you mean I can throw away the Mac I bought last year because the price of the Quadra 950 has just been cut? The closest I’ve seen to a forced upgrade was the step up to 128K ROMs.

Prices will always go down; power will always go up. To state that existing Macs are obsolete is misleading and perhaps even malicious. The truth is that any Mac bought today will be useful far into the future, running the latest software. Even the PowerPC will not render the existing Mac base obsolete for a long time.

Mark A. Chaffin
via ZiffNet/Mac
Absolutely right. A product can be made obsolete without being any less useful to those who’ve already bought it. Hey, the fishbowl bit was a joke. — MS

Fe ss Up, Andy

Well, now that Andy Ihnatko has thrown the fear of low-cost goods into our hearts (“Dollars and Sense,” August ’93, page 29), why not tell us about all the low-cost stuff he uncovered? He says, “. . . all but three of the models I gave up the ghost after ten hours . . .” Which three? Come on, there was no useful information in this polemic at all, except maybe for the fact that MacProducts is, in its own twisted way, honest. I can think of two reasons why he didn’t name names: It would upset some advertisers, and he was trying to lecture, not to pass along useful info. The first will be denied, but if the second was the reason, then why the heck was the column printed? Isn’t this magazine supposed to give us useful information?

Manuel Veloso
via ZiffNet/Mac
Not to be pushy or anything, but I might gently offer a third reason as to why I didn’t name names: Two of the models that did the big firework are no longer being made. A fourth is that it
Announcing the first personal computers that will send faxes, read you your mail, take phone messages and work with your video camera, VCR and TV.
"Computer, open my word processor."
Now work the most intuitive way - with Apple PlainTalk: AV computers (here, the Macintosh Quada 840AV) can recognize spoken commands - you just speak naturally. We've also included QuickKeys 523 Component software, so you can create your own verbal commands, like "Computer, open my word processor."

"Computer, display Macintosh on TV."
You can play video right on your AV computer monitor for easy presentations to coworkers, clients or a class. You can also plug your AV computer into a TV, if you need a larger display. Or plug into a VCR, and record your work on videotape for distribution.

"Computer, start video."
Just plug a video camera, VCR or laserdisc player into the back of either AV computer. The Fusion recorder software included lets you easily capture video and single-frame snapshots, or record 16-bit stereo sound. You can paste your video directly into presentations, documents or any software that supports QuickTime.

"Computer, play CD."
Add the AppleCD 306a disc drive to either machine, and you can access huge libraries of clip art, sound effects, video clips and more. Or just play your own music CDs while you work.

The Macintosh Centris 660AV and Macintosh Quadra 840AV
You've probably read that telephones, computers, television and other technologies will converge soon. This is where they meet. Introducing the Macintosh Centris 660AV and Macintosh Quadra 840AV personal computers. These two computers offer a suite of communication capabilities called Apple AV Technologies: a telecommunications center, easy video input/output connections, voice recognition and text-to-speech abilities.

For the first time, use a Macintosh to pick up phone messages with a point and click, record video by plugging in a video source, and open a file by saying, "Computer, open." Many of these new functions are sped along by a digital signal processor (this chip flies through data at the rate of 55 MHz in the Macintosh Centris and an even faster 66 MHz in the Macintosh Quadra).

With a 25 MHz 68040 processor and up to 68 MB of RAM, the Macintosh Centris has the horsepower required to breeze through huge spreadsheets and documents. And there's room to add a 500 MB internal hard disk, a CD-ROM or SyQuest drive and a NuBus expansion card.

The new Macintosh Quadra will make publishing, graphic design and other communications professionals salivate. Its 40 MHz 68040 processor and up to 128 MB of RAM make it one of the most powerful Macintosh ever. And it has room for a gigabyte of hard disk storage, four internal storage devices and three NuBus expansion cards.

Best of all, you can get a Macintosh with Apple AV Technologies starting at $2,689. Once again, Apple puts the most amazing kind of power within your reach. The power to be your best.
In fact, they'll do just about a

"Computer, call Michelle Dunn."
With Apple GeoPort, you can turn your Al computer (in this case, the Macintosh Centris 660AV) into a telephone and an answering machine. The hands-free phone lets you do work on-screen while you talk. And both computers have E-V-T-E software, so all you need is a video camera to hold a videoconference across a local area network.

"Computer, read me today's mail."
These computers will actually speak to you, reading aloud your e-mail, documents or spreadsheet numbers. Our new Apple AudioVision Display, with its sensitive microphone and built-in speakers, is the perfect all-in-one monitor for speech capabilities, multimedia presentations and more.

"Computer, fax letter to Steve Wingate."
Forget the fax machine. The optional Apple GeoPort/Telecom Adapter includes fax and modem software—everything you need to send and receive faxes from your desk or use on-line services. And both computers let you try out ExpertFax, an application that converts your faxes into text.

*Manufacturers' Suggested Retail Prices as of 4/13/93. Retail prices may vary. ©1993 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, Macintosh and The power to be your best are registered trademarks of Apple.
seemed to me that my testing of those
modems was hardly scientific; I would
never commit to a blanket “this modem
sucks” statement unless I’d tried many
of the units and found uniform failure.
But the fifth reason is the true one: The
purpose of that section was not to warn
people about modems A, B, and C but to
say that based on my experience and the
experience of others, entry-level modems
as a class have a tendency to develop
problems in harsh conditions. — AI

Stuff This
In response to “Shrink Your Files”
(July ’93, page 242), I don’t think Mark
Simmons is telling the whole story be­
hind Aladdin Systems’ Stufflt and Bill
Goodman’s Compact Pro. He’s correct
that Stufflt Lite often cuts files as much
as 5 percent more than Compact Pro. But
he doesn’t mention that Compact Pro
can routinely compress files more than
25 percent faster than Stufflt or that its
interface is far less cluttered. He doesn’t
mention Aladdin’s irritating habit of
changing Stufflt’s archive format every
few months, which forces users to down­
load a 450K update—a file that’s roughly
four times the download size of Compact
Pro (translating to about $3 more at
CompuServe) and that occupies
more than three times the space on the
user’s hard disk. Compact Pro users, on
the other hand, have not needed to down­
load an upgrade yet.

A compression program is more than
just the resulting file size: When a utility’s
primary function is to create files to send
over a modem, file compatibility and
speed need to be taken into account. Com­
pact Pro has Stufflt beaten on both counts.
Garner Miller
The Macintosh Network BBS
Palm Bay, FL
When choosing a file format for up­
loading and downloading, compression or
decompression speed isn’t relevant.
The overriding concern is how long it
takes to transmit the file (hence the file
size), because you’re paying for that time
(in connect-time charges, phone bills, or
both). It’s true that Compact Pro got its
file format right the first time, but I’m
glad Aladdin dumped its old, inefficient
format. By the way, Stufflt’s format has
changed all of twice, and the last change
was about two years ago. Even so, a user
who needs to get at new-format Stufflt
archives can do so with Aladdin’s free
Stufflt Expander utility, which is a much
smaller download than the 450K
UnStufflt package. We recommend that
all telecom mavens have this utility on
hand for decompressing Compact Pro
archives as well as Stufflt ones. — MS

Game Over, Man
As a recent buyer of a CD-ROM drive,
I have sampled the new generation of
CD-ROM-based entertainment software.
In general, the graphics and video are
nothing less than stunning, the sounds
and music sensational, and the interfaces
intuitive; the vendors have forgotten only
one thing — the games! You would think
that somewhere among the 150 mega­
bytes of data, they could include at least
1 megabyte of gaming. Of the games I
purchased, all were linear, simplistic, and
trite. Are CD-ROMs really the "next gen­
eration" of computer gaming, or are they
a forum for multimedia extravaganzas,
designed to be brainlessly watched and
not played?
Dave Aaronson
Columbus, NJ
Ask, and you shall receive. Take a
look at “The Top 50 CD-ROMs,” in this
issue. — PP

Corrections
In the August story on PowerBook
modems (“Working Away,” page
102), we said that none of the mo­
dems tested fits into the PowerBook
100. This is incorrect. With the ex­
ception of the Applied Engineering
DataLink PB, they all do. Also, con­
trary to the features table on page
116, the APS Modem 14.4 does not have an OCR option.
The phone number for Advanced
Imaging (now called FITS Imaging),
which makes Live Picture software
(Desktop Publishing, August ’93,
page 147), has been changed. For
more information about Live Picture,
call HSC Software, at 310-392-8441.
The phone number listed for Microlytics (Personal Macintosh,
August ’93, page 183) is wrong. The
correct number is 716-248-9150.
In Power Tools (August ’93, page
197), two phone numbers were listed
incorrectly. The phone number for
Digital Eclipse should be 510-547-
6101, and the number for Lincoln
Software should be 617-259-4135.
In “Real NetWare for Macs” (Au­
gust ’93, page 177), we stated that
FileMaker Pro 2.0 supports IPX. The
correct version is FileMaker Pro 2.1.

20 November 1993 MacUser
The sky is the limit with new software from MSA that makes your Macintosh® computer look, feel, and work the way you've always wished it did. Breeze through directory dialogs. Tame tangled INITs. Modify menus to your heart's content. And that's just the beginning.

GO WILD! Annotate your work with digital sticky notes. Place brilliant Notes anywhere. On the desktop, or perhaps hot-linked to a folder. Have them auto-play sounds and QuickTime® movies. Do anything you want. It's your Mac. Go wild.

BE PRODUCTIVE! Complete repetitive tasks with a keystroke. Click buttons, use menus, open documents, launch applications, and copy files. All without ever leaving your keyboard. It's that easy.

SAVE TIME! Copy files in the background, switch printers without ever looking at the Chooser, link your favorite sounds to just about anything, automatically backup your valuable documents, and save your precious time, energy and money.

SAVE MONEY! There's still more, but you get the point. Everything you want. In one intuitive, inexpensive software package -- with no fluff. It's called ALlRight. It's from MSA. And it's available now.

Call 800.366.4622 and we'll show you how to soar.

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Introducing new Ethernet solutions from the only complete Macintosh networking family. As Apple Computer releases more and more Macs, only Asante® is keeping pace with Ethernet® solutions for all of them.

Introducing the MacCon+™ LC III Ethernet adapter for the brand new Macintosh® LC III and Color Classic. It's a high-performance card that plugs into the LC III's 32-bit expansion slot for simple Thin and 10BaseT Ethernet connectivity. This adapter is also backward compatible with earlier models in the LC family, and the Performa 400.

Only Asante has an Ethernet adapter for every Apple.

The MacCon+ LC III is just the latest innovation from the only networking company with an Ethernet solution for every Apple CPU. Asante's family tree includes the FriendlyNet™ line of external adapters that connect Macs with built-in Ethernet, such as the Centris 610, 650, and the Quadra 800, to Thick, Thin and 10BaseT networks. We also offer the new Mini EN/SC, the smallest and lightest SCSI-to-Ethernet adapter in the world. It's the perfect space-saving networking solution for any Macintosh without available expansion slots, and was specifically designed for portable use with the PowerBook line.

So if you have Apples that are ripe for high-speed networking, and you want to get all your Ethernet solutions from a single source, call Asante, the only company capable of networking the entire orchard, at 800.662.9686, extension 202.
I've seen the future, and it's my husband. Until recently, we were your average DIMT (double income, more taxes) couple, trying to get ahead in Silicon Valley. We rolled out of bed, brewed some decaf cappuccino, got dressed (he in a suit and I in whatever wasn't at the dry cleaner), kissed the cats goodbye, and spent the next 30 minutes driving 12 miles to our respective industrial complexes. There, we spent the rest of our day going to meetings; talking on the telephone; going to more meetings; and, of course, banging on our Macs. Well, those days are gone—at least for Jeff.

The future arrived last year, when another company merged with my husband's and he wasn't keen on the new world order. As luck would have it, a small software startup approached him about launching its West Coast sales operations. Being a startup, the company couldn't afford to open an office just for him, and he wasn't willing to move to its Cleveland, Ohio, headquarters—which is why, a few months ago, Jeff set up a couple of Macs and a Sun SPARCstation and began to run the West Coast operations from the back room of our house. (I was initially very skeptical of this plan, but read on.)

How It Works

The company headquarters is Sun- and Mac-based. The Sun SPARCstations are used for engineering development. The Macs handle finance, presentations, marketing, word processing, and whatever else crops up. The Macs and Sun workstations are networked, and they use the Internet for communicating with the remote site (exchanging files with the "California Sun"), customers, and vendors and for the usual e-mail chitchat. Now for the California setup. On one side of Jeff's desk (which faces our backyard and has a decidedly better view than any cubicle I've ever seen) is my old Mac IIX, which has been resuscitated with extra RAM to serve as his office computer and fax machine. Because he spends a lot of time on the road, the company bought him a PowerBook 165 (which, of course, immediately went down in price). He uses it for presentations, communications, and general productivity. Hanging off the other side of the desk is the Sun SPARCstation, which runs the UNIX-based software he's selling. No doubt the advent of PowerPC products will alter this desktop landscape considerably.

The remote setup has worked remarkably well. Now that he's dealt with a few initial challenges—such as getting the Mac IIX to receive faxes, give him access to them when he's on the road, and receive files from SPARCstations—you'd never know that he wasn't sitting right next to his colleagues in Cleveland.

My initial skepticism stemmed from a variety of reasons, most of which were personal, not technological. As someone who travels frequently, I'm used to working remotely, so I wasn't particularly concerned about his ability to communicate with headquarters. I did worry, though, that he might miss the companionship of coworkers. And I have to admit I was also afraid that having him around the house all day meant the place would be a wreck by the time I got home.

None of my fears have been realized. He's incredibly motivated, he's less stressed, and he gets more done. While I'm racing around getting ready for work, he's already read the business section and called the office. He's more productive, because he's not wasting time commuting or attending endless meetings. We save money on dry cleaning and gas. Even the environment benefits. Best of all, when he needs a break, he unloads the dishwasher. I hope he never goes back to work in an office!

The future of business computing may include a view of your own backyard.

Home Alone

At present, Jeff's still an exception; most people who work out of home offices do so only one or two days a week. Estimates I've seen of how many people are choosing to work at home vary from 5 to 7.5 million. (Just over half of them have computers.) All the statistics, though, show that the number is increasing every year, as more companies realize that employee productivity and effectiveness don't disappear as soon as you step outside the company doors.

There's another reason, though, why I expect this trend to continue gathering steam. With a seemingly endless number of workers being jettisoned from corporations (living in Silicon Valley, I know more of them personally than I care to count) and with precious few companies creating new jobs, more people will have to forge their own opportunities. For many, these new opportunities will be based in home offices instead of traditional office parks. The synergy of technology and communications represented by products such as PowerBooks and PDAs is enabling this fundamental shift, and it will change forever our definition of what a workplace is.

And if that means I can come home to a more relaxed spouse and a cleaner house, I'm all for it.
WHAT IS NEWTO
Newton is digital.
Newton is personal.
Newton is as powerful as a computer.
Newton is as simple as a piece of paper.
Newton is a new kind of technology.

Newton will help you communicate.
Newton can send faxes for you.
Newton can send electronic mail for you.
Newton can send messages to another Newton through thin air.

Newton will help you get organized.
Newton can help you make phone calls.
Newton can help manage your schedule.
Newton can help you plan your day.
Newton is always looking for ways to help you out.

Introducing The MessagePad: The First Newton.

Newton can learn your best friend's phone number.
Newton can learn the names of your clients.
Newton learns about you to help you more.

Newton is here today.
Newton will be everywhere tomorrow.

Where is Newton? Call 303-925-3500, ext. 106, to find out where you can try one.
July 22, 1993

Dearest Ellen:

If there is anything better than being loved by you...it is loving you.

And you are so easy to love. You've brought such wonder into my life and have touched my heart with your love.

I just want you to know, my darling, that it feels so good being in love with you and I want to love you for a very long time.

You are a wonderful woman and I love you dearly. If I'm dreaming, please don't wake me up—I don't want this to end.

Monogamously yours.

Your Mac can say a lot about you.

If somebody sat down at your Macintosh and started snooping around your disk, which would embarrass you more?

The details of your love life? Your resume? Your adjusted gross income?

How about the Confidential Employee Evaluation you were working on when the Boss hauled you into his office for a chat?

What? You never thought about this before? Then read on and you'll never have to think about it again.

All you'll have to think about is your password.

That's the key to DiskLock, the painless, yet powerful, System 7 savvy way to keep other people's noses permanently out of both your personal and professional data.

You can password-protect selected files, folders or your entire hard disk. And encrypt everything to U.S. Government DES specs.

You don't even have to be there. DiskLock automatically blanks your screen and secures your system for you—without interrupting applications—whenever you wander off.

When you return, it simply asks you for your password and lets you know if anyone got curious while you were away.

Call us today at 800-666-2904. We'll tell you more about DiskLock.

We'll also tell you all about DiskLock PB, our streamlined PowerBook package that gives you true "sleep" compatibility and impenetrable disk-level security.

So even if they steal your PowerBook, they can't steal your secrets.
Cheap Health Insurance

Lots of companies sell ergonomic products for your Mac, but the best solutions are free.

Mankind's relationship with computers has always been sadomasochistic at best. We alternate cursing at them with pathetic pleading for more of the abuse that only our platinum partners can dish out. It's a sick relationship but a fruitful one. That's because no matter what epithets we scream, the worst a computer can dish out in return is a power cord looping around our legs and pulling us down with it (à la Wile E. Coyote) after we inevitably elect to heave it off a tall building.

But as everyone now knows, computers have had a more sinister and cunning plan all along. If the more lurid news reports can be believed, longtime computer use leads to crippling hand injuries, blindness, and exposure to deadly radiation. Sure, as a result, some of us will receive awesome superpowers, but what if you're not one of the lucky few?

It's prudent to be concerned about the various health risks associated with computer use, but before you spend dough on products that promise to keep you safe, realize that the marketing of this product might be more scientifically devised than the product itself. Believe it or not, almost all effective solutions to potential computer-related health problems are absolutely free.

Hands

Try setting a pencil lengthwise on top of your wrist while your hands are at the keyboard. Does it touch skin from end to end? No? OK, let's all say it together: "repetitive-stress injury." Some of you probably chanted "carpal-tunnel syndrome," but we're talking about the same thing: damage to nerves and tendons in your hands from excessive typing and mousing. At best, an RSI is nothing more than mild tingling or numbness. At worst, an RSI sufferer is saddled by a high degree of pain and impairment correctable only by costly surgery. And because people who make their living with computers are as paranoid as concert pianists about their hands, no end of braces, guards, pads, and other aids have been designed to protect against RSI.

Probably the most ubiquitous anti-RSI aid is the humble wrist rest, which many users slip under or in front of their keyboards. These are fine, unless you use them in the manner demonstrated by many salespeople, with wrists planted on the pad while you type. As you can guess, this only makes the compression problem worse. A wrist rest is a place for you to rest your wrists when you pause in typing, as an alternative to cocking your wrists on the hard edge of a desk or keyboard.

A sexier anti-RSI weapon is the Michael Jackson-type wrist brace, which supports your wrist and hand and makes it difficult to bend them out of straight alignment. Properly designed and used, braces work great. However, many people are making the colossal mistake of going to their local drugstore and buying wrist braces designed for wrist injuries. Many of these have a rigid support which keeps the wrist flexed upward, which is precisely the sort of position you want to avoid; in New York City, I spotted a computer store actually selling such braces specifically for the treatment of RSI.

You're also not necessarily in great shape with a properly designed brace either. Buy one that's too small or strap it on too tightly, and you may actually accelerate nerve and tendon damage. For this and many other reasons, if you suspect that your hands are giving you trouble, it's very important that you see a doctor toot sweet. I know that's what everyone tells you, but this time it's the straight dope. RSI problems that are diagnosed and treated at the early stage can easily be solved with some fairly simple behavior modification or with proper braces your doctor shows you how to use correctly. But if you wait until you wake up one morning to discover that your hands no longer work, you'll be resigned to a date with the knife, a lifetime of pain and impairment, or both.

Above all, rest, rest, rest. The biggest cause of typing-related disorders is the repetition of the same motions over and over again without relief. Every hour, on the hour, take 5, 10, even 20 minutes to do something else and stretch a bit. This and the preceding measures cost absolutely nothing — and they work.

Eyeballs

There's no evidence that staring at a computer monitor causes any permanent damage to the eyes; the American Academy of Ophthalmology itself has given computer screens a clean bill of health. But computer screens can certainly cause eyestrain and temporary vision problems. Most problems can be directly attributed to the lighting around your computer; almost everyone knows that glare and reflections from a computer screen ain't
good, but it’s also important to have subdued, even lighting in the office. Special tinted eyeglasses or antiglare screens can alleviate glare, but removing the source of the glare is far more effective (and infinitely cheaper). Just kill the overhead lights and any intense desk lamps in the room, and if you have to have your computer next to a window, try to jockey things so that the plane of the screen is perpendicular to the window. In general, an underlit room with a simple task lamp for reading papers is your best bet.
If you can’t control the lighting, tints and antiglare screens are better than nothing. Many one-hour eyeglass shops can apply a 15-to-20-percent tint for free, but an antiglare screen is generally more effective. Make sure it’s designed specifically for your screen size, and give a lot of thought to investing in a glass polarizing filter instead of a cheaper cloth screen. Cloth screens have to be cleaned of dust (with uneven success), and many people find they blur the display.

Nothing inspires panic quite like the word radiation, and the knowledge that all CRT-based video monitors leak ELF and VLF radiation is hardly comforting.

And yup, there’s preventive medicine for eyestrain too. Try to focus on distant objects occasionally as you work. This prevents some of the fatigue you suffer when your eye muscles have to hold focus in one spot for a long time. Also consider simply turning your monitor’s brightness down a bit; it’s so simple you might not think of it, but it helps a lot. Oh, and do remember to blink. Dry, painful eyes are usually a side effect of the tendency to blink less while staring at a screen, so keep those orbs moist.

The Big R
I’ve saved the scariest part for last. Nothing inspires panic quite like the word radiation, and the knowledge that all CRT-based video monitors leak ELF and VLF (extremely low frequency and very low frequency) radiation is hardly comforting. Many companies have come out with special radiation-shielding kits that purport to reduce such emissions to “safe” levels, but the chief thing to remember is that no one has any genuine idea of what a safe level of low-frequency radiation is. Numerous studies have been done on the subject, but no real consensus has been reached yet. I don’t want to alarm you unnecessarily, but it should be pointed out that although such shielding does reduce radiation dramatically, any
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Printout shown is a sample file from Quark X-Press 3.0.
promises of safety are conjecture; the only 100-percent safe monitors are the ones based on LCD technology (in other words, buy a PowerBook).

For the most part, there's not much to worry about with monitors manufactured in the past two years. In 1990, the Swedes drafted an exhaustive specification for reduced-radiation monitors, and as compliance is pretty inexpensive, almost all modern monitors are as safe as they can reasonably be. Just ask the manufacturer if a monitor is MPR II-compliant (if they don't know what that is, apologize and ask if it emits less than 250 nT of electromagnetic radiation sampled at a distance of one-half meter). But let's say you have an older monitor; do you still have cause for concern? Well, as a purely practical matter, no; the strength of the radiation decreases in proportion to the square of your distance away from the monitor, so most experts claim that if you stay at least one arm's length away, you're as safe as you're going to be.

Safety is far iffier if you work in a maze of office cubes where your head is only a couple feet away from the back or sides of a coworker's monitor.

Safety is far iffier if you work in a maze of office cubes where your head is only a couple feet away from the back or sides of a coworker’s monitor; on non-MPR II-compliant monitors, radiation emanating from these places is far stronger and as such carries far greater risk.

So Lovely, So Deadly

As in all segments of the marketplace, the freaks and the charlatans are out there. But if you do decide you need to go out and spend some money, make sure you try any health-related product before buying it. Some are uncomfortable, some are cumbersome and don't fit your lifestyle, and some just plain don't work.

In all the cases mentioned here, the healthiest solutions are simply based on eliminating unhealthy habits. Look at me. I've been computing healthily for years without even knowing it. The TV in my office is 20 feet away from my desk, so I'm constantly shifting my focus; I wear black T-shirts and generally work at night, so glare isn't a problem; I sit far back from my monitor; and best of all, I spend enough time pacing the floor, reading comic books, and listening to loud music searching for listings that problems caused by long periods of uninterupted work are dang near impossible. My columns are generally upwards of three weeks late, but hey, this is my health we're talking about.
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AppleScript Adjustments

Now that Apple has delivered AppleScript, its system-level scripting technology, it's time to ask how many lies have been told about it.

Answer: Surprisingly few, although some of the claims need a little adjusting.

Claim: With AppleScript, you just give your Mac a list of things you want it to do and it does everything on your list.

Adjustment: These "lists" are, in fact, scripts, which is to say programs. As you might guess, you can't write programs in AppleScript without expending some serious effort learning the language. Which, unless you're the kind of propellerhead who dialed the phone by using a HyperTalk script, you won't.

Claim: You can create a script simply by turning on the AppleScript recorder and performing a series of actions. AppleScript will save your actions as a script, which will repeat those actions whenever you run it.

Adjustment: That simple picture may work for very simple scripts. In fact, you can record truly humongous sequences of actions and AppleScript will flawlessly record them as syntactically correct scripts. But you can't use recording to create scripts that take different paths depending on circumstances, that repeat actions as many times as needed, or that test and report on conditions. Worse, you can't really count on big scripts to do exactly what you had in mind unless you know something about the language, which is precisely what you thought you were avoiding with this recording business.

Claim: There will be many ways to access scripts without writing or even recording them: through QuicKeys macros, menu items in supporting applications, scripts saved as script apps and distributed through on-line services and user groups, and the propellerhead in the next cubicle.

Adjustment: No adjustment necessary.

Claim: AppleScript will let you drive applications to do things they otherwise couldn't do. Tell your word processor to remove line numbers from certain kinds of documents or italicize all words containing foreign characters such as ä. Tell your graphics program to render a file of complex graphics overnight. Launch your page-layout program every morning, and tell it to check your e-mail in box and use any documents it finds there to produce a morning paper for you.

Adjustment: That is, if you have the new, AppleScript-friendly version of the applications. Many applications already support AppleScript, but many don't and probably some never will. Then there are levels of support: Some applications will be scriptable but not recordable, for example. Read the fine print on the box.

Claim: You can use AppleScript to combine the capabilities of application programs, using a spreadsheet program and a word processor to produce an accurate and attractive invoice, for instance.

Adjustment: Passing lightly over the concept of an attractive invoice, if the probability of one program you want to use being AppleScript-friendly is 1/n, then the probability that two applications are is 1/n^2. And although AppleScript does work over networks, don't plan to use programs remotely unless you know they will be open when you need them, because AppleScript can't launch an application on another machine.

Claim: You can use AppleScript to drive the Finder, with scripts that alert you when e-mail comes in, back up selected folders at preset times, or gather related files into a project folder.

Adjustment: You can do each of those things, because AppleScript comes with system extensions that add specific AppleScript capabilities to the Finder. For example, you can write a script that displays a dialog box because there is a display dialog system extension. But don't assume that whatever the Finder can do can be scripted. The Finder is not (yet) an AppleScript-friendly application. And you won't be creating Finder scripts by recording mouse clicks and menu choices. The Finder is not recordable.

Post Scripts

I believe that AppleScript is really part of a new model of computer use. One aspect of this new model is demand functionality: Instead of trying to anticipate everything you might ever want your word processor to do when you buy it, you add features as you need them. Being able to customize your software to your needs is desirable — but AppleScript can't make it happen unless it gets a bit of assistance from a scriptable Finder: a more object-oriented operating system; and smaller, more focused, scriptable applications.

And scripts. Lots of scripts. Propellerheads, take note.

MacUser November 1993 35
Adobe Wild Type
Add wild fun to anything you create! New Adobe Wild Type is an easy-to-use package of 14 irresistibly zany typefaces. It comes with Adobe Type Manager software to give you smooth, sharp text. The perfect way to add a little humor to home, office or classroom projects and documents. Wild Type is a great gift idea for everyone from students to power users. Adobe #99256

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Monochrome, 600-dpi laser printers are becoming the standard in business printing, and ever since Hewlett-Packard introduced the LaserJet 4M, their prices have been dropping. The two latest entrants, from Texas Instruments and NEC Technologies, push the price down even further, to less than $1,600.

The **microLaser Pro 600** ($1,599), from Texas Instruments (800-336-5236 or 214-995-2111), comes packed with features. An 8-ppm, PostScript Level 2 model, it uses a 20-megahertz IDT RISC processor and comes with 6 megabytes of RAM (expandable to 22 megabytes). LocalTalk and parallel ports are standard, and it can automatically switch between PostScript and PCL 5 on the fly. Ethernet is available as an option, as is a SCSI interface.

For paper handling, the microLaser Pro 600 offers two 250-sheet paper-input trays and an optional 30-envelope input tray. The output tray can hold 250 sheets.

And in case the microLaser Pro 600's processor isn't fast enough for you, Texas Instruments also offers a 40-megahertz RISC accelerator that disengages the on-board processor.

As to durability, Texas Instruments is estimating an unusually long duty cycle: 10,000 pages a month and 15,000 pages per cartridge! The microLaser Pro 600 replaces the 9-ppm microLaser printers in the Texas Instruments printer lineup.

The **Silentwriter Model 1097** ($1,499), from NEC Technologies (800-632-4636 or 508-264-8000), is something of a mixed blessing. It's a 10-ppm, 600-dpi PostScript Level 2 printer, but it's not a true 600-dpi model: The engine is actually the same as in the Silentwriter Model 95, so you get a 300-dpi engine that interpolates to 600 dpi.

The Model 1097 uses a 20-megahertz Intel 80960 RISC processor and comes with 4 megabytes of RAM standard (expandable to 9 megabytes). LocalTalk, parallel, and serial ports are standard, and you can add an optional Ethernet interface. The Model 1097 supports PCL 5 and can switch ports and emulations automatically. As with the Model 95, a PostScript fax option is available. A SCSI port is also standard.

For paper handling, the Model 1097 comes with a single 250-sheet input tray and offers an optional 10-envelope input tray. An optional, additional 250-sheet tray is also available.

At 300 dpi, the Model 1097 offers resolution enhancement for both text and graphics; the enhanced 300-dpi output we saw was virtually indistinguishable from the 600-dpi output.

**Up to Date . . .**

**Canvas 3.5**, Deneba's "super" drawing package, is cross-platform-compatible with its Windows counterpart, supports pressure sensitivity, and lets you flow text across multiple columns and text boxes. 305-596-5644. $399. **Redux Deluxe 2.0**, Inline Software's backup utility, offers scheduled back-ups, archiving, and network support. 203-435-4995. $79.95. **CA-Cricket Graph III 1.5**, Computer Associates' graphing package, adds histograms and tables to the program's list of graph types. 516-342-5224. $195.

By Russell Ito
Smart Draw

The smarter your software is, the less you should have to do to get what you want. That was basically the idea behind the original IntelliDraw. Aldus’ smart drawing package, and the latest version has carried that concept even further, with templates, a drag-and-drop interface, and numerous effects.

With IntelliDraw 2.0, you can open any document as a template, so you can quickly assemble a drawing from existing templates. And because you can drag and drop objects across document windows — whether the documents are templates or not — you don’t even have to go through the Clipboard.

IntelliDraw 2.0 includes new collections of templates and clip art, but its art isn’t static. Instead, many of the items have variable properties, so by performing a simple action, such as moving a slider, you can change the art and “dialed in” the desired shape, color, or size.

The effects gallery includes perspective and warping. You can add perspective effects to any object, group of objects, or text — in any orientation — and with warping, you can arbitrarily distort any object, group of objects, or text into different shapes.

Polymorphing, another type of effect, lets you morph one shape into another while maintaining control over the process. For example, you can polymorph a teacup into a teapot and then, by using a simple slider, you can arbitrarily dial in any shape in between. Polymorphing can control shape and color, and one polymorph can control many others, so you can have a single slider that controls many different effects simultaneously.

Aldus Corp., 5120 Shoreham Place, San Diego, CA 92122; 619-558-6000. $199.

Cheap PostScript

The Hewlett-Packard DeskWriter 550C is just about the most affordable color printer you can buy. You get 300-dpi output, but what you don’t get is PostScript — so if you use a PostScript application such as Illustrator, your output looks less than optimal. But now Adobe and HP have teamed up to create a true PostScript product that gives you the DeskWriter 550C with color PostScript for less than $1,000.

HP’s PostScript Software for the HP DeskWriter family is an Adobe PostScript software RIP that lets the 550C print true-PostScript output. Because the 550C doesn’t have a processor or memory, you pay a price on the CPU side: The software requires a 68030- or 68040-based Mac with 8 megabytes of DRAM and 5 megabytes of free disk space.

Hewlett-Packard Co., Direct Marketing Organization, P.O. Box 58059, MS511L-SJ, Santa Clara, CA 95051; 800-752-0900 or 408-725-8900. $249.

EPA Utilities

Energy saving is a big topic these days, and Connectix has brought the issue to the desktop with CDU (Connectix Desktop Utilities), the first package of energy-saving utilities for the desktop.

With CDU installed, you can set your iMac to shut down automatically after a specified period of inactivity. Because this could be a dangerous option in the hands of a not-so-funny practical joker, Connectix lets you password-protect this option. If you don’t want to go the shutdown route, you can just set your monitor to dim automatically after a period of CPU inactivity.

Many of CDU’s other functions are adapted from Connectix’s PowerBook Utilities package. They include file syncing, custom cursors, file security, and Balloon Help removal.

Connectix Corp., 2655 Campus Drive, San Mateo, CA 94403; 800-950-5880 or 415-571-5100. $99.

A Pro’s WalkThrough

Virtus WalkThrough introduced the concept of spatial visualization, letting users easily create 3-D environments and explore them randomly. What was missing was that extra bit of realism that could push things even further; now Virtus has created WalkThrough Pro to fill that gap.

With WalkThrough Pro, you can add texture maps to your objects and still move through an environment in real time. WalkThrough Pro ships with a variety of textures, plus you can use any PICT graphic. You can even apply a QuickTime movie to a surface as a texture. If you do so, the movie plays in a continuous loop for as long as you hold the mouse button down — while you’re moving through a space, the movie plays; when you stop, the movie stops.

Virtus WalkThrough Pro's support for texture maps — and even QuickTime movies as textures — brings realism to your spatial designs without a sacrifice in speed.

**Pro-Level 3-D**

Packages for creating 3-D graphics keep getting more and more sophisticated, and now Strata has stretched its product line with StudioPro, a professional-level 3-D package that offers complete modeling, rendering, and animation environments, including special effects that haven't been seen on the Macintosh before.

The modeler, called 3d Sculptor, is a spline/vertex editor that allows you to easily mold organic shapes, almost as if you were working with clay. The modeler includes a 2-D tool that lets you reshape outlines imported from drawing programs such as Illustrator.

The renderer includes RayPaint, which lets you create rendered images that look as if they were prepared with traditional art media. With RayPaint, your brush strokes follow the geometry of the object, giving you traditional looks in full 3-D. RayPaint's effects include chalk, watercolor, dry brush, and even Seurat- and van Gogh-like treatments.

StudioPro's animation capabilities are extensible, so Strata and other developers can add special-effects extensions to the base program. Some of the included effects — called Explode, Shatter, and Atomize — let you create Lawnmower Man-like effects.


— Russell Ito

Strata's StudioPro offers 3-D graphics professionals visual effects that haven't been seen — or even been possible to create — on the Mac before.

**Powerful Upgrades**

The first PowerPC Macs won't ship until early next year, but Apple and DayStar Digital are already talking about upgrade paths.

By now you may have heard that PowerPC Macs are going to set new standards for personal-computing power. Maybe you've been wondering whether you're going to have to get rid of your current Mac in order to purchase a PowerPC-based one? Or perhaps you aren't sure whether you should buy a new Mac because you don't know whether there will be an easy upgrade path?

Take heart: If you own a 68040-based Mac, you'll be able to upgrade your Mac rather than selling it and buying a new one. Apple has announced that it will provide PowerPC upgrades for the Centris 610 and 660av; the Centris 650, 11vx, Ilv, and Performa 600; and the Quadra 800 and 840av.

If you have Quadras of the 700, 900, or 950 variety, you're still in luck. DayStar Digital (800-962-2077 or 404-967-2077) has announced that it will be making upgrade cards for these three Macs. DayStar Digital will also provide its own upgrades for the same Macs Apple has announced upgrades for, and during 1994, it plans to develop PowerPC upgrades for all color-capable Macs.

Unfortunately, no pricing information for any of these upgrades was available at press time, and all we know about the introduction of the PowerPC Mac is that it's supposed to happen sometime during the first half of 1994. DayStar Digital has announced that its Quadra 700, 900, and 950 upgrades will be available when Apple ships the first PowerPC Macs.

— Stephen Somogyi

Who will upgrade your Mac to PowerPC?

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MacUser November 1993 43
The image you see over there started out attached to the image you see over here. But as it made its way to the printer, the computer it was created on recognized a problem: 11 x 17 pages can't fit on 8½ x 11 paper. And so, out came the electronic scissors.

Now, if you're like a lot of people, you know all about this routine. And you know how it feels to walk into a meeting with a presentation that contains hours of blood, sweat and tears, and a big fat strip of tape going right down the middle of it. Enough said.

Laser printers were built to help put an end to all of that. They can print 11 x 17 pages in a single pass. They come with up to three paper trays, which lets you switch between paper sizes without leaving your desk, so you don't have to pull one paper tray out and replace it with another, only to have your neighbor...
I A PRETTY GOOD IDEA

11 x 17 LASER PRINTER.

repeat the process two minutes later. They hold up to 1,500 sheets of paper. And for people whose design ambitions extend beyond Helvetica

Font Modules, or you can add an internal 60-MB Hard Drive.

All of which print with razor-sharp clarity thanks to the 800 x 400 dpi-high-resolution mode.

Of course, both the COMPAQ PAGEMARQ Laser Printers are fully backed by CompaqCare, our extensive service and support program. Which includes a one-year, on-site limited warranty as well as unlimited toll-free telephone support. All at no additional charge whatsoever.

If you're interested in learning more, just call us at 1-800-345-1518 in either the U.S. or Canada.

We'll show you how to keep big ideas in one piece. At least until your client sees them.

COMPAQ

Bold, PAGEMARQ Printers offer two ways to expand your type library, eliminating the need to continually download from your computer. You can add 1- and 2-MB Programmable

A typographer's dream, these printers can store 1,500 fonts. Of course, not all of us dream about type. In which case, the 35 fonts that come standard are more than adequate.

If you're interested in learning more, just call us at 1-800-345-1518 in either the U.S. or Canada.

We'll show you how to keep big ideas in one piece. At least until your client sees them.

COMPAQ

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QuarkXPress 3.2 launches the latest assault in the page-layout wars with a sophisticated color-management scheme — courtesy of the color-technology masters at EFI (Electronics for Imaging) — that works directly from within the QuarkXPress application. Additional enhancements, including AppleEvents support, a facility that automates file gathering for service-bureau jobs, and a handful of new composition conveniences and design options, add new luster to the already impressive QuarkXPress feature set.

Integrated Color Management
For color management, QuarkXPress 3.2 features the EfiColor XTension. Conveniently integrated into QuarkXPress' own menus and dialog boxes, the EFI color-management package for Adobe Photoshop, QuarkXPress is ahead of rival Aldus PageMaker on this front — PageMaker's support for color management was still on the drawing board at press time.

Overall, the EFI technology works behind the scenes to compensate for the different routes various printers, monitors, and scanners take to color rendering. The new XTension greatly improves color matching among these input and output devices, so that the color output from your desktop color printer, for example, more closely resembles a Matchprint, a calibrated screen display, or even output from an offset press. But QuarkXPress 3.2's color-management system supports only the TIFF and PICT formats; direct support for EPS and DCS isn't available.

In order to test the capabilities of QuarkXPress' new color-management scheme, we imported a scanned color photo saved in TIFF format into QuarkXPress and printed the image — both with and without the EfiColor XTension enabled — on several color printers. We then compared the printouts to a Matchprint generated from the original image. In every case, color produced with the EfiColor XTension enabled was much closer to the Matchprint than color produced without it.

We don't, however, recommend that you zero out your budget for Matchprints quite yet. Although EfiColor allows for more-predictable and -consistent color-image output, it doesn't provide a perfect solution. Nevertheless, it makes color-correction tasks easier and gives you better color information earlier in the design process.

In Profile
Understanding how to use the EfiColor XTension properly takes some effort, largely because the QuarkXPress documentation fails to provide clear, detailed examples. Central to the XTension's use are EfiColor's profiles, which describe the color capabilities of various scanners, monitors, and printers. The profiles come into play as you're importing images and as you're defining colors and printing from within QuarkXPress.

Choosing the right profile (or tagging an image, in EfiColor'speak) is intuitive enough when you create an image on-screen: You simply select your monitor's profile. It's also easy when you import an image directly after scanning: You select your scanner's profile. However, it gets confusing when you try to select the correct profile for an imported image you've color-edited. If your image-editing program doesn't support EfiColor, things can get hairy. The documentation for this aspect of the program isn't comprehensive enough to be much help. Once you've figured out which profile to use, though, tagging an image is easy with QuarkXPress' Get Picture dialog box. You can also simply choose to use the default profile.

Choosing the correct profile for colors defined in QuarkXPress and for output purposes is relatively straightforward. The only complaint we have is about the Page Setup dialog box: EfiColor doesn't always intelligently narrow down your output-profile choices in response to
the type of printer you've selected.

At press time, the number of profiles included with the package was limited, especially for scanners, but EFI promises more soon. The package we reviewed included profiles for 3 desktop color printers, 2 scanners, and 12 monitors as well as press profiles for the Euroscale and SWOP (Specifications for Web Offset Publications) standards. EFI says additional monitor profiles currently under development will be gratis to QuarkXPress 3.2 owners. Additional input- and output-device profiles will cost extra. If a profile for your printer or scanner is not among those included in the package, be prepared to fork out an additional $129 to $529 per profile.

EFI designs each profile to correspond to a device operating under certain conditions that must be met for optimal color matching. Plan to spend some setup time with your printer, for example, making sure you have the right version of the printer driver installed, are using the correct paper and toner, and have selected the specified print settings.

Every output device has its own range, or gamut, of printable colors. When designers create colors on-screen that are unprintable or out of gamut, production people are likely to become frustrated. QuarkXPress' new Gamut Alarm, which is part of the EfiColor XTension, is designed to put an end to that problem. With EfiColor, when you define a new color, you must also select an output device in the Edit Color dialog box. EfiColor compares its gamut with the color you're defining. If you attempt to define an out-of-gamut color, an alarm triangle will appear. To change the color to one that's within the allowable gamut, you use the handy gamut indicator on the adjacent color wheel.

In some cases, you may want to print to a device other than the one whose gamut you specified while defining your colors. Unfortunately, the program lacks a facility that simply checks all QuarkXPress-created colors and then displays out-of-gamut warnings, if needed, when you select your output device.

Color management isn't the only improvement in the latest version of QuarkXPress. If you've ever sent page files to your service bureau only to have them returned or processed incorrectly because you forgot to send all the needed files or list all the fonts you used, you'll welcome the new Collect for Output feature. This facility automatically copies all files required for a job and drops them into the folder of your choice. QuarkXPress also automatically prepares a useful document listing all pertinent file information, including the fonts you used, the required XTensions, and the color plates necessary for each page.

With version 3.2, QuarkXPress joins PageMaker on the scripting bandwagon. QuarkXPress' newly added support for Apple events lets you automate repetitive tasks by writing scripts with AppleScript or UserLand Frontier. A run-time version of Frontier and a handful of sample scripts are included to whet your appetite, but you'll need to purchase your own scripting package if you want to take advantage of this new feature.

A variety of new conveniences helps speed production. The Speed Scrolling feature greets pictures and color blends as you scroll, speeding up redraws considerably as you navigate your documents. This does not, however, make up for QuarkXPress' continued lack of interruptible screen redraw, a handy feature PageMaker added with version 4.2.

Other new conveniences include the ability to specify a color by dragging a swatch from the Colors palette over any item on your document. You can also drag items, groups, or entire pages from document to document. Version 3.2's support for as many as 25 open documents adds to the program's flexibility. In addition, enhanced style-sheet features streamline word processing.

Those who use QuarkXPress on PCs as well as Macs will welcome the new version's expanded cross-platform compatibilities, including font-translation enhancements and full file compatibility between the Mac and Windows versions of the program.

Last but not least, the new design features include five additional blends in the Cool Blends XTension, box skew and flip, and vertical character scaling.

The Bottom Line

New features in QuarkXPress 3.2 significantly up the ante in the page-layout competition. Most notable is the incorporation of the EfiColor color-matching technology, which speeds up color correction and gives page designers more-predictable color results overall.

— Shelley Cryan

QuarkXPress 3.2 offers a handful of new design features, including the ability to flip the contents of text boxes horizontally and vertically (shown here). You can also scale text vertically and skew text boxes and pictures.
Movie Movie
The Movie Movie captures video and audio to QuickTime movies at a bargain price.

The Sigma Designs Movie Movie is the first serious challenger to the SuperMac Video Spigot, previously the low-end tool for turning analog video into QuickTime movies. The Movie Movie includes built-in mono sound-digitizing capabilities, which the VideoSpigot can't provide unless you purchase it bundled with the Macromedia MacRecorder. Furthermore, the Movie Movie's Sony video circuitry enables it to blow the doors off the VideoSpigot/MacRecorder bundle in terms of image quality.

**Learning the Parts**

The Movie Movie is a single NuBus card (small enough to fit in a Centris 610) with both video and audio input. An RCA jack handles composite-video input, and a single phono plug handles 8-bit, 22-kilohertz audio input (compatible with the input you get with the MacRecorder). It is unfortunate that the card lacks an S-video input jack, which would allow slightly higher-quality video input.

The Movie Movie's software includes a basic video-capture application called ScreenEdit plus separate Vdig (video digitizing) components for video and audio. The Vdig components allow you to drive the digitizer from within applications that support QuickTime direct capture, such as Adobe Premiere. ScreenEdit offers basic digitizing controls and is similar to ScreenPlay, the VideoSpigot software. It can display incoming video in typical QuickTime-movie sizes and at full-screen size (in each case with full audio). The controls for incoming audio include an LED-segment VU (volume units) meter (with peak-hold display, a handy feature included in many consumer audio- and videocassette decks) and separate gain and volume controls. Real-time slider controls let you adjust the brightness, contrast, color, and sharpness of incoming video. You can simultaneously preview both video and audio in ScreenEdit, a capability sorely lacking in the VideoSpigot software.

**Screen Tests**

The true test of the Movie Movie is how it compares in capture speed and image quality with its competitor from SuperMac. We tested each card in a Quadra 950 with 32 megabytes of RAM. In addition, we tested the Movie Movie in a stock Mac II with a DayStar 68030 50-megahertz accelerator (with a math coprocessor) and 20 megabytes of RAM.

When we used the Movie Movie's ScreenEdit software to record video footage from a camcorder, the capture rate and speed were excellent. We achieved 18 fps (frames per second) at a 160-x-120-pixel movie size on the DayStar Mac II and 30 fps on the Quadra 950. In contrast, the VideoSpigot provided a maximum capture speed of 18 fps on the Quadra 950 at 160 x 120 pixels (rare of 10 to 12 fps are typical when you use the VideoSpigot with lesser CPUs). Using the Movie Movie to digitize at the larger QuickTime-movie size (320 x 240 pixels) resulted in significantly reduced speeds (10 fps on the Quadra 950) unless we used the Faster capture mode, which let us capture at 18 fps but resulted in a lower-quality image. It's realistic to assume you'll need a higher-end digitizing product, such as the RastrOps Movie Pack system, to make 30 fps, 320-x-240-pixel QuickTime movies.

The Movie Movie clearly bested the VideoSpigot in video quality. The QuickTime movie we produced with the Movie Movie boasted crisp details and good

![ Untitled 0 ](image1)

![ Untitled 1 ](image2)

**Using the Movie Movie's Faster capture mode (left), we were able to capture 320-x-240-pixel movies at 18 fps (the top capture rate we could get for the smaller 160-x-120-pixel movies with the VideoSpigot). The regular capture mode provided higher quality for the same-size image (right) at 10 fps.**
brightness balance. (Of course, the quality of the video source has a large impact on overall digitization quality.) The movie we produced with the VideoSpigot from the same video source was noticeably darker, with more quantization artifacts in areas of smooth shading.

You can also use the Movie Movie to digitize still frames of incoming video at 640 x 480 pixels, and you can set it to preview incoming video at the enlarged size along with the corresponding audio. On the Quadra 950, the video quality and speed (10 fps) are surprisingly good for the size of the picture. An interface-field-interpolation option helps generate a clean still image from a shaky video source, such as a paused VHS deck.

**Sound Check**

Movies recorded with the Movie Movie at 160 x 120 pixels with sound enjoy exceptional video/audio synchronization — much better than you get with any other low-end offering on the Mac (or on the PC, for that matter). However, we encountered some problems with sound amplification.

Although the Movie Movie has software-based gain and volume controls, the range of amplification is much weaker than with the MacRecorder (which has an external analog volume dial). When you're recording sources that have weak audio signals, you need to amplify the signal before it reaches the Movie Movie card. This is a simple matter for audio or MIDI enthusiasts, who can pipe signals through their master mixers before sending them to the Movie Movie, but it's likely to be a headache for those who lack such equipment.

Because the Movie Movie software includes separate Vdigs for audio and video, we thought we might bypass the amplification problem by using the Movie Movie to capture just video and by using a connected MacRecorder system to record audio; unfortunately, this scheme didn't work from within the Movie Movie's ScreenEdit application. Not yet ready to give up, we booted Adobe Premiere and then selected the Movie Movie video Vdig and the MacRecorder audio Vdig. Although this scheme worked, neither the frame rate nor the audio synchronization were up to the quality we got by recording directly from the ScreenEdit software, using the Movie Movie's on-board audio.

**Bother Bother**

Sound amplification wasn't the only problem we had with the Movie Movie's software. ScreenEdit also doesn't let you select sizes that don't conform to the standard 160-x-120- and 320-x-240-pixel QuickTime defaults. For example, you can't record a movie at 240 x 180 pixels, which is the sweet size (the size that gives you the best trade-off between image information and capture rate) for Compact Video, the most popular compression option in QuickTime 1.6. The software should let you numerically specify the exact capture size to work around this limitation, but unfortunately it doesn't.

Also, as with the VideoSpigot software, you can't choose to record sound at any sample rate other than 22 kilohertz, which prevents you from recording sound at a lower sample rate in order to increase the frame-grab rate slightly.

A few small problems impede the installation process. First, the Movie Movie package doesn't include the cables required to hook up the card to a video and/or audio source. These cables don't cost much at your local electronics-supply store, but we think Sigma should consider including them in the box. Also, the Movie Movie's documentation lacks detailed descriptions of the program's capabilities and explanations of the various QuickTime compression schemes (although this information is available elsewhere, first-time QuickTime users would find it very helpful if it were included here). Finally, we were unable to use the video and audio Vdigs from within Premiere, because the Movie Movie Vdigs loaded before the QuickTime extension at startup. Although we were able to use an extension manager to change the extension-loading order (loading QuickTime before the Vdigs), the documentation doesn't warn you of this possibility, let alone tell you how to work around it.

**The Bottom Line**

If you've been looking for an easy way to get low-end QuickTime into your Macintosh, look no further than the Movie Movie. Its still-frame-grab feature doesn't replace more-professional (and more-expensive) alternatives, but its overall capture capabilities beat those of the SuperMac VideoSpigot in both image quality and audio/video synchronization, at a lower price. As long as you can make do with 160-x-120-pixel QuickTime movies, you'll get the elusive, affordable 30 fps you've always dreamed about.

— David Biedny
The Apple Portable StyleWriter and the MOBILEWriterPS

Apple and Mannesmann Tally each hit the road with a portable printer tailored for PowerBook owners.

If you thought the GCC WriteMove II was the only portable printer in town designed for PowerBook owners, think again. Mannesmann Tally recently introduced the $999 MOBILEWriterPS, an impressive portable PostScript printer that doubles as a desktop printer. A less expensive alternative to the MOBILEWriterPS is the new Apple Portable StyleWriter, a redesign that packs the original StyleWriter into a smaller and lighter case.

MOBILEWriterPS

The MOBILEWriterPS is the first portable 300-dpi PostScript printer designed exclusively with PowerBook owners in mind. It's color-coordinated, it's almost the same size as the PowerBook, and it weighs just a little more than 8 pounds. Although not as convenient to carry as the lighter-weight QuickDraw-based Apple Portable StyleWriter, it offers more features and versatility. The best news is that the MOBILEWriterPS is so well designed that it can serve as your desktop printer as well as your on-the-road companion.

At the heart of the MOBILEWriterPS is a 16-megahertz 68000 processor and 2 megabytes of RAM, which means that this printer is not only portable but also fast. At a very swift 6 pages per minute, the MOBILEWriterPS' speed either equals or surpasses that of many desktop laser printers.

The print quality of both graphics and text outclasses that of inkjet printers, even though the latter offer slightly higher resolution (360 dpi compared to the MOBILEWriterPS' 300 dpi). The advantage stems from the MOBILEWriterPS' thermal-wax ribbon, which produces crisp output with a smooth, waxy finish that doesn't wrinkle the paper. On the whole, graphic output is good — just what you would expect from a PostScript printer. Text quality, however, can't quite match that of a laser printer. Expect some minor breaks and jaggedness in the type.

The one disadvantage of the thermal-wax ribbon is its cost — ribbons come bundled in 5-packs priced at $75. One ribbon is good for about 150 pages, which means you get at best 750 pages per pack. That's expensive relative to the 3,000 to 5,000 pages you get from a similarly priced toner cartridge for a laser printer. The printer's battery is good for about 150 pages before you have to recharge it — that's more than twice the number of pages you get from the StyleWriter's battery.

Because the MOBILEWriterPS is essentially a PostScript LaserWriter, you don't need a special printer driver. You simply connect your Mac to the printer with the supplied 8-pin DIN cable and select the standard Apple LaserWriter driver in the Chooser. For those planning to print documents from Aldus PageMaker or FreeHand, the package includes the special Aldus PPD (PostScript Printer Description).

Although it's nice to be up and running with the MOBILEWriterPS without having to install any special software, several other aspects of the setup process are a bit awkward and confusing. The process of installing the ribbon and extending the paper feed, for example, is not as easy as it should be and is not explained well in the manual. Moreover, the printer's many knobs, levers, and buttons are packed into a tiny
space, making it hard to push, pull, and slide everything into place.

The MOBILEWriterPS comes with both a standard AppleTalk port and a parallel port — good news for the many PC users who are attracted to the PowerBook. You can also set up the MOBILEWriterPS as a network printer on an AppleTalk network. The printer supports automatic switching between PostScript and HP-PCL 4 (LaserJet II) emulations. The printer’s Level 1 PostScript is a Microsoft clone of the Adobe original, but we encountered no compatibility problems during our testing.

The MOBILEWriterPS handles standard paper sizes (letter, legal, A4, and B5), transparencies, #10 business envelopes, and labels. It also boasts a built-in 80-sheet paper feeder, which the Portable StyleWriter doesn’t have. Because the MOBILEWriterPS doesn’t use ink cartridges, there’s no smearing, so you can handle and stack pages as they emerge from the printer.

**Apple Portable StyleWriter**

The $439 Apple Portable StyleWriter is essentially a variation of the original StyleWriter designed to accommodate a sheet feeder and a battery pack. It’s a 360-dpi thermal inkjet QuickDraw printer that’s approximately the same size as a PowerBook 170 and weighs a mere 4.5 pounds.

Installing the driver software and optional 39 TrueType fonts is a snap. The software requires System 7 or later. The package includes the SpoolMaster utility for background-printing support, an interface cable, a power adapter, one ink cartridge, and the battery.

Like the MOBILEWriterPS, the Portable StyleWriter handles standard paper sizes, transparencies, #10 business envelopes, and labels. Unless you purchase the optional $85 50-sheet automatic sheet feeder, you must feed the paper into the printer one sheet at a time. This works fine for small print jobs on the road, but it rules out the option of using the Portable StyleWriter as a desktop printer. The battery is rated at 60 pages per charge. Replacement ink cartridges cost $19; each cartridge is rated to last for about 500 pages.

Although it’s unfair to compare the Portable StyleWriter with desktop printers, there are speed and output issues to consider. Because the printer relies on your Macintosh to do the print processing, its speed depends on the power of your Mac’s CPU. Even a powerful CPU, though, can’t make the Portable StyleWriter print faster than its advertised 1.5 pages per minute.

Text prints faster than graphics, but the Portable StyleWriter is simply not designed for producing graphics-intensive pages. The output quality of both text and graphics is acceptable at 360 dpi, but given the nature of inkjet printing, it’s never going to match the crispness of laser output. Text, in particular, looks fuzzy. You can also expect some dimpling of the paper, especially when you are printing pages that contain large graphics.

The Portable StyleWriter is a solid offering for PowerBook owners who don’t require the PostScript support and speed of the MOBILEWriterPS, but similarly priced alternatives to the Apple printer are worth considering. The most attractive is the $599 GCC WriteMove II portable printer. It produces sharper text and graphics output, and its diminutive Cracker Jack-box size makes the Portable StyleWriter look bloated. If you’re truly looking for portability, you can’t beat the GCC printer. However, the WriteMove II has one drawback — feeding it paper can be tricky.

The Canon Bubble Jet family (especially the BJ-10EX) also offers an alternative. The drawback is that you must purchase a separate printer driver (the $149 PowerPrint package, from GDT Softworks, for example), which can swallow the price advantage offered by the heavily discounted Canon models.

**The Bottom Line**

If you’re looking for high-quality printing, speed, and portability in one package, the Mannesmann Tally MOBILEWriterPS is an excellent buy, especially when you consider that it can serve as a desktop printer as well as a traveling companion. It offers the most versatility and power of any portable printer currently available for the Mac. If you need a printer that’s easier on the budget and you’re willing to sacrifice speed and output quality, the Apple Portable StyleWriter is worth a look. But the GCC WriteMove II, although slightly slower than the Portable StyleWriter, offers higher-quality output.

— Gregory Watson
The Nikon Coolscan is a mighty little wonder of a slide scanner that boasts high-quality scans at a price lower than that of many competing slide scanners.

First, it’s so small and draws so little power that Nikon makes an internal unit that mounts inside any Mac equipped with a bay for a 5.25-inch half-height drive. For this review, however, we tested the external model, which is also compact. In fact, at 12 x 6 x 2 inches, it’s by far the smallest slide scanner we’ve seen. It’s also easy to use — the Coolscan is as plug-and-play as any Mac SCSI device.

The scanner’s software is equally straightforward. In addition to Nikon Scanner 4.0, a Photoshop-compatible plug-in that works with a variety of applications (EPI’s Cachet and Fractal Design’s ColorStudio, to name a couple), Nikon includes a basic scanning application called Coolscan Control. This application lets you scan images, save them in PICT or TIFF format, and view them at various levels of magnification; for actual scanner control, it uses the Nikon Scanner plug-in.

Mounted slides pop straight into the scanner, and the Coolscan comes with a filmstrip holder for loading unmounted film, either positive or negative. Filmstrip length is limited to an entirely reasonable six frames.

The plug-in software’s controls are largely self-explanatory, but comprehensive interactive help is readily available. You first choose the appropriate film type — color positive, color negative, black-and-white positive, black-and-white negative — from the Film Type pop-up menu and then click on Preview for a quick preview scan. The software automatically decides the exposure settings for the image. Using the preview image, you set the cropping rectangle and adjust the exposure settings. The plug-in also lets you set the output size (height and width) and resolution.

The last setting, Pitch, is particular to Nikon. It’s basically a measure of the resolution — a value of 1 scans at the full resolution of the scanner, and higher numbers scan at progressively lower resolutions.

The plug-in’s main dialog box lets you enter numerical values for brightness and contrast as well as for red, green, and blue exposures. These controls act on the analog data from the CCD (charge-coupled device) and are best used for making major corrections. Fine-tuning controls are available with the software’s gamma-curve editor, which lets you adjust the overall gamma curve as well as individual curves for red, green, and blue. You can also set a black point and a white point and view a histogram of the image. For repetitive scanning of the same film type, you can save and load custom gamma settings.

The Coolscan is also noteworthy for offering a real focus control, a feature sadly lacking on many transparency scanners. You adjust the Coolscan’s focus with a thumbwheel located on the device itself.

The Coolscan is fairly speedy. A preview scan takes about a minute and a half. A low-resolution 72-dpi scan that results in a 1.5-megabyte file takes about two and a half minutes. A full-resolution 24-megabyte scan takes about twelve and a half minutes. We were particularly impressed with the results we obtained from scanning negatives — the Coolscan is the first scanner we’ve seen in its price range that produces acceptable results.

The Bottom Line
The Nikon Coolscan is an impressive slide scanner that compares favorably with scanners costing considerably more. It’s easy enough for novices to use yet powerful enough for professionals. The Coolscan’s documentation is clear and informative and offers a particularly valuable section on handling film. In short, the Coolscan is hot news.

— Bruce Fraser
PAINTING & IMAGE EDITING

BrushStrokes

BrushStrokes jockeys for a top slot in the low-cost paint-program arena.

The most recent entry to the budget-color-paint-program category more than holds its own against the competition. BrushStrokes is a 32-bit program that features an elegantly designed interface, a wide assortment of feature-rich tools, and surprising image-processing power — all for an affordable $139.

No Brush-off

The BrushStrokes interface is intuitive and easy to use and provides lots of helpful feedback. Floating palettes let you customize brushes, patterns, and colors. Many of the program’s dialog boxes allow you to experiment with brush settings. Preview windows let you view the effects of filters before you apply them. You can configure the Tools palette to display icons that represent currently selected foreground, background, and line colors, so you know at a glance what the results of using a particular tool will be.

Similarly, when you select a brush, the cursor shows you exactly what that brush will do when you apply it. If you’ve chosen a large square brush to apply a dark-red foreground color, for example, the cursor becomes a dark-red square. This helpful feedback takes a lot of the guesswork out of painting. Other plusses are five levels of undo and the program’s ability to interrupt screen redraws as you make menu selections.

BrushStrokes’ ability to dither color on 8-bit displays means you can work with millions of colors instead of just 256. You can work at resolutions as high as 600 dpi and open and save files in PICT, TIFF, or StartupScreen format.

BrushStrokes works with several Photoshop plug-ins, which means if your scanner uses a plug-in, you can scan images from within BrushStrokes. You can also use third-party plug-ins, such as Aldus Gallery Effects, to create special effects.

In addition to all the basic tools you expect in a paint program, BrushStrokes has a variety of impressive extras. The brush tool works in 13 modes. You can opt to smear the color you’re painting on, for example, and lighten or darken colors with your brush stroke. You can also have the paintbrush or the spray can cycle through a range of colors as you paint. If you’re using System 7, you can even set BrushStrokes to automatically anti-alias edges, smoothing out jaggy lines as you create shapes and lines.

The package includes nine special plug-in tools, including a magic wand; a rubber stamp; and the Snappy tool, which lets you quickly make small rectangular selections for copying into the customizable Brush or Pattern palettes. The Impressionist tool, which uses repeating patterns to create images reminiscent of Seurat or Monet paintings, is particularly impressive.

Most tools have multiple variations, so you’ll want to spend some time configuring them to your specifications. Once you’ve configured them, though, you can save them to the Tool Settings palette. When you click on a setting, that setting is instantly restored. You can even copy and paste your tools among open documents.

BrushStrokes boasts an impressive array of controls for selecting and masking image areas. You can get the effect of layering a paint document by creating slips, areas of color you can exclude from image-area selections. You can turn selections into masks as well as mask out specific colors.

To set masking and slip colors, you select colors from the Pickup Colors palette, using the eyedropper tool. Although somewhat confusing at first, the palette makes it easy for you to quickly modify selections on the fly without constantly returning to selection tools. A wealth of options is available for modifying selections. You can rotate, flip, stretch, distort, and even apply perspective to your selections. The program also provides 14 Photoshop-like image-enhancing filters, including mosaic, emboss, colorize, brightness/contrast, and Gaussian blurs.

In addition to supporting custom pattern fills, BrushStrokes lets you define and apply a wide variety of multicolored gradient fills, either directional or shaped to fit the selection.

BrushStrokes requires at least 2 megabytes of RAM and runs on any Mac that supports Color QuickDraw.

The Bottom Line

BrushStrokes offers an impressive array of features at a budget price. The program’s well-designed interface lets you get your hands on its power quickly and intuitively, and its flexibility encourages experimentation. We highly recommend it.

— Eric Taub
Two new driver-level compression utilities aim to double the size of your hard disk automatically. Stacker for Macintosh, from the veteran PC-compression-software company Stac Electronics, and eDisk, from Alysis Software, each offer a more feature-rich route to expanded disk space than the first driver-level compressor for the Mac, Golden Triangle’s TimesTwo. Of the three, Stacker gains the edge with its simplicity and ease of use.

Unlike TimesTwo — a stand-alone disk formatter that installs its own custom drive on your hard disk — eDisk and Stacker each patch your existing disk’s drive with compression routines. That means if your existing driver features partitioning and universal support for a full range of media, you’ll get the same functionality with your expanded disk (one exception is driver-level password security).

Installation
Installing Stacker is a study in simplicity. You first perform a complete backup (to satisfy Murphy’s Law) and check the data structures on your disk with a utility such as Apple’s Disk First Aid; then you install Stacker by clicking on a single button and selecting the disk you want to expand. The Stacker application patches the disk driver and compresses all of the disk’s existing files. When you quit Stacker, your disk is capable of storing twice as much data.

By contrast, eDisk’s installation needs improvement. In our tests, the installation application didn’t recognize the Apple and Drive7 drivers on our disks and even displayed some ominous “Unknown driver” warnings. Despite this unsettling experience, however, the installation proceeded without a hitch.

One especially frustrating aspect of the eDisk installation is that it erases all the existing data on the disk you choose to expand. Alysis says this is merely a safety precaution — if users know that all of their data will be destroyed, they will be certain to perform a backup before installing eDisk — but we found it disconcerting to have to start from scratch with an empty disk.

Once you’ve installed the utility, you have the option of tweaking several settings for optimal performance. But this procedure can be frustrating — if you don’t get the settings just right (you have to know what you’re doing), performance can be abysmal. Chances are you’ll have to twiddle with the settings to some extent anyway. For example, an automatic optimization feature in eDisk’s initial release prevented our PowerBook 100 from entering Sleep mode until we turned the feature off.

Once fully in place, however, both Stacker and eDisk operate transparently and require no further tweaking.

Operation
Disks expanded with eDisk and Stacker function more or less as you’d expect. However, each utility has problems with removable cartridges. If you don’t install special auto-mounting system extensions (included with the software), you’ll be able to mount expanded cartridges at startup only. In addition, both Alysis and Stac advise you to avoid using virtual memory on expanded disks. Alysis warns of system crashes; Stac merely mentions that using virtual memory on an expanded disk slows data access considerably.

The one serious incompatibility we experienced is Stacker’s aversion to accelerator cards. According to Stac, bug fixes should be available by the time this review appears.

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TurboStar $474.99

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**Focus Ethernet**

**Mac II (NuBus) Series Product Features**

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<thead>
<tr>
<th>Model</th>
<th>Description</th>
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<tr>
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<tr>
<td>EtherLAN II-T</td>
<td>Thick, 10BaseT, 16K</td>
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<td>EtherLAN A1-II</td>
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<td>EtherLAN A1</td>
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<td>EtherLAN MS SE/30</td>
<td>Pass Thru Slot, 10BaseT, 16K</td>
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All EtherLAN boards for Mac IIsi can be upgraded with FPU.

**Mac SE, A1**

<table>
<thead>
<tr>
<th>Model</th>
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<tr>
<td>EtherLAN SE</td>
<td>Thick, Thin, 10BaseT, 64K</td>
<td>$169.99</td>
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</table>

Only $99.99 EtherLAN LC 10BaseT

Only $139.99 3-in-1 NuBus Card

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EtherLAN HUB/8 $199.99

**AN Cards**

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<thead>
<tr>
<th>Mac LC, LC II, LC III</th>
<th>EtherLAN LC</th>
<th>EtherLAN LC-T</th>
<th>EtherLAN LC/FPU</th>
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**Ethernet Board Upgrades**

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<th>FPU/Ilsi (20MHz)</th>
<th>Math Coprocessor Upgrade*</th>
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<td>$290</td>
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<tr>
<td>Farallon EtherMac II-C</td>
<td>$249</td>
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**Absolutely The Best Value**

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<tr>
<th>NuBus, Thick, 10BaseT</th>
<th>Controller Chip</th>
<th>RAM</th>
<th>Data Bus</th>
<th>Surface Mount</th>
<th>Fuse</th>
<th>Apple Register</th>
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<th>Diagnostic Software</th>
<th>General</th>
<th>30-Day Money-Back Guarantee</th>
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<td>Lifetime</td>
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<td>No</td>
<td>No</td>
<td>Lifetime</td>
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</tbody>
</table>

\*All Ilsi and LC boards include an FPU socket; just plug them in!

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Both the EtherLAN SC and SC-T connect to your Mac via a DB-25 SCSI cable. For Mac PowerBooks, HDI SCSI cables are available. The EtherLAN SC has thick (AUI) and thin (BNC) connectors, while the SC-T has thick and 10BaseT (RJ-45) connectors. Get the high-speed benefits of Ethernet today, and save a slot! 5.5"Wx1.5"Hx7.5"D

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Accelerators

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<th>Model</th>
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Accelerator prices subject to change. * Memory not included.

80 Nanos And Faster Focus SIMMs are high density dynamic RAM memory modules that deliver maximum power and speed to your system. All SIMMs are 80 nanoseconds and faster, built using state-of-the-art surface mount technology. Need additional specs? Call Focus Technical Support.

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---

**Focus Removable Drives**

<table>
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<th>Drive Type</th>
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**Focus Duet and Combo Drives**

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**44MB, 88MB, and 105MB Cartridges**

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<td>$289.99</td>
</tr>
<tr>
<td>105MB Formatted Cartridge 3-Pack</td>
<td>$175.99</td>
</tr>
</tbody>
</table>

All drives available in black or platinum.
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Our Duet drives give you maximum data flexibility, allowing direct transfer of files between two cartridges. Duet drives come in 44MB, 88MB, and 105MB versions; the 88MB model will also read (but not write to) 44MB cartridges. Use the 88C Duet for transferring data between 44MB and 88MB cartridges.

$400 worth of software with every purchase of a Focus storage subsystem!

The Best Value

<table>
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<td>Warranty</td>
<td>3 years</td>
<td>3 years</td>
<td>1 year on drives</td>
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different users work with different data on different systems, comparing the read/write speed of the two utilities can be difficult. Our tests, performed on both a PowerBook 100 and an LC III, timed file copying as well as the launching and closing of the System file and various application and document files. Initially, it appeared that Stacker was almost 50 percent faster than eDisk. This result was due to the less-than-optimal default settings of the initial eDisk release. However, once we'd adjusted the settings to closing of the on different systems, comparing the read/difficult.

Stacker's such as working with large database files, speed was almost equal to Stacker's.

eDisk exclusively to store highly compressible at reading data, and each product offered a slight speed advantage over TimesTwo 1.03.

When we looked at the overall impact of the two utilities on a Mac's speed, we found that for disk-intensive operations, such as working with large database files, speed can decrease by as much as 40 percent. You're unlikely to notice much difference for most day-to-day operations, however.

In our final point of comparison — compression ratio — eDisk was slightly better at squeezing files than Stacker. On a disk of sample data, eDisk consistently reported ratios of 1.8:1, compared with Stacker's 1.7:1. This is not a spectacular advantage, but it was duplicated consistently across a wide variety of sample data.

eDisk gives you a choice of compression ratios. Aylesis recommends the 2:1 setting for most users who store a mix of file types. However, if you use your disk exclusively to store highly compressible files (EPS graphics and database files, for example), you may want to opt for a compression ratio of 3:1 or 4:1 rather than 2:1.

Data Safety
Speed and compression ratios aside, the most serious concerns regarding driver-level compression utilities have to do with data safety. If an expanded disk is nearly full, for example, and a compression utility signals to an application that there's more space available than there really is (1 megabyte of expanded space for 500K of physical space, for example), what will happen if the application tries to write more data to the disk than the driver can compress and squeeze onto it?

In order to prevent this problem from occurring, both utilities become more and more conservative in reporting the amount of free disk space available. When the disk is nearly full, the utility starts to report the actual amount of physical free space left rather than the expanded free space. Both manuals point out the potential problem (eDisk's better than Stacker's), and as long as you keep a small percentage of your disks empty (good advice even for normal disks), the risk is small.

An even bigger concern is compatibility of compressed low-level data with data-recovery programs such as Symantec's Norton Utilities or Central Point's MacTools. We inflicted numerous crashes on expanded disks and found that data recovery was not a problem with either compression utility. It simply involved running the installer application and the utility's own low-level diagnostic and recovery routines and then running a disk-recovery program.

However, there is one caveat: The consensus among disk-recovery specialists is that an expanded disk is generally immune to their lowest-level recovery procedures; in rare instances, a profoundly damaged expanded disk may be beyond the reach of even a commercial disk-recovery company.

The Bottom Line
If you have a temporary need for more disk space or if you simply can't afford a higher-capacity hard drive, a driver-level compression utility is a worthy solution. However, none of the three packages currently available — eDisk, Stacker for Macintosh, and TimesTwo — is completely flawless. Hard-drive speed is somewhat compromised, and there's a slight risk of losing low-level data that may be crucial to some disk-recovery operations.

Of the three products, Stacker wins for the present. It's quick and simple. With a couple of interface improvements and a less cumbersome installation process, eDisk could be in the same class. And for those who consider the highest compression ratio to be their most important criterion, eDisk has the advantage. But competition in the driver-level compression arena continues to get hotter; as we went to press, Golden Triangle was hard at work on a new release of TimesTwo.

Stay tuned.
— Andy Ihnatko

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**CIRCLE 126 ON READER SERVICE CARD.**
Colorsqueeze and PicturePress

PicturePress bests Colorsqueeze with a richer feature set for image compression.

In a prepress environment, few things tax storage devices and network transmission more than color-image files do. To ease the handling of these huge files—a single full-page image scanned for reproduction at 150 lines per inch and color-separated for printing may be larger than 30 megabytes—professionals can invest in one of two image-compression utilities. Kodak's $179 Colorsqueeze is solid, but its features pale in comparison to the flexibility and power offered by Storm Technologies' $199 PicturePress.

Seeing Is Believing
Colorsqueeze and PicturePress can compress scanned images to a fraction of their original size. Because some image data gets lost in the process, many users consider this lossy compression to be a disadvantage. It's not. Each utility works by discarding only data that's relatively unimportant to the eye. With this technique, the utilities can compress images to a 10th or even a 15th of their original size without any visible loss of image quality. Some images hold up well even at compression ratios of 30.1 or higher.

PicturePress makes use of the JPEG (Joint Photographic Experts Group) compression algorithm, an international standard that's been incorporated into technologies as diverse as Apple's QuickTime and Adobe's PostScript Level 2. Colorsqueeze uses a similar algorithm but creates proprietary KIC files that can't be read by JPEG-aware applications. Colorsqueeze can, however, save files in compressed PICT format by using the JPEG algorithm built in to QuickTime. That means any application that can read PICT files should also be able to open and decompress these files, providing QuickTime is installed on the same system.

To ease the distribution of image files, each utility also offers free programs that decompress compressed images, making it possible to send compressed images to users who don't have the original utility. The differences between Colorsqueeze and PicturePress boil down to four considerations: speed, image quality at a given compression ratio, convenience, and supported file formats.

For speed, PicturePress has the clear advantage, especially for large files. With software-only compression, PicturePress is more than twice as fast as Colorsqueeze. Factor in hardware acceleration, and it's even faster: Although PicturePress' maker no longer sells an accelerator card, SuperMac's ThunderStorm and Thunder II cards and DayStar Digital's Charger card automatically accelerate Storm's JPEG compression by two to five times. An additional benefit of hardware acceleration is that the resulting compressed files are somewhat smaller than their software-compressed counterparts. That's because the accelerator cards can handle the math involved with greater precision.

Evaluating the image quality of files compressed by the two utilities is quite a

Will the original uncompressed image please stand up? Both Colorsqueeze and PicturePress compress images to a fraction of their original size by "losing" some of the image data. However, it's virtually impossible to distinguish a compressed image from its original (the image on the right is a 784K PicturePress-compressed image, the image on the left is the 768K Colorsqueeze version, and the middle one is the 24.5-megabyte original).
Colorsqueeze offers three fixed compression settings: Normal (best quality, lowest compression ratio), Medium, and High (lowest quality, highest compression ratio). PicturePress, in contrast, offers almost unlimited control over image compression: A slider control lets you set the compression level from 1 to 100.

When we used PicturePress settings that produced file sizes similar to those of Colorsqueeze, we could detect no difference between the decompressed images until we enlarged them to at least four times their actual size. At that magnification, we could see slight differences but couldn’t say unequivocally that one image looked better than the other.

We also did a synthetic comparison, comparing compressed and then decompressed files with their originals by subtracting them in Photoshop. In these tests, the Colorsqueeze files changed slightly more than the PicturePress files, but we lend more weight to the visual results for our final judgment of image quality.

We did find a clear quality difference between PicturePress’ JPEG-compressed files and the JPEG-compressed PICT files created by Colorsqueeze acting in concert with QuickTime. PicturePress’ JPEG compression resulted in less color shifting and fewer visual artifacts than did QuickTime’s.

One significant advantage of PicturePress over Colorsqueeze is that it offers much more flexibility and convenience. Besides the stand-alone PicturePress application, Storm includes a Photoshop plug-in that lets you compress and decompress images directly from within Photoshop. Colorsqueeze, on the other hand, works only with images opened from within the utility itself.

Another PicturePress productivity advantage is that it is Apple-events aware and it includes a run-time version of the UserLand Frontier scripting tool. A pre-built Frontier script lets you drag files into a folder for automatic drag-and-drop compression. Compressed files are automatically stored in a second folder, and the originals are moved to a third folder after compression — a handy feature.

PicturePress and Colorsqueeze also differ in the file formats they support. Colorsqueeze supports the Kodak Photo CD format, whereas PicturePress does not. However, Colorsqueeze uses its native KIC compression only on 24-bit RGB color images. To compress grayscale images, Colorsqueeze uses QuickTime compression, and it can’t compress CMYK images at all.

PicturePress provides broader support. It compresses RGB, CMYK, and grayscale images either from within the application or from within Photoshop, using the plug-in. It saves files in JPEG format or as JPEG-compressed PICT files. A system extension, QuickPress, substitutes Storm’s JPEG for Apple’s whenever the QuickTime PICT format is used, so any application can take advantage of PicturePress’ superior speed and image quality.

With its Photoshop plug-in module, PicturePress can also save JPEG images as EPS files, with or without a preview. You can use the EPS/JPEG format with any application that supports EPS files, but you can print the files only on PostScript Level 2 output devices. The time savings gained by printing EPS/JPEG files to a Level 2 color printer are substantial — printing is three to five times faster than printing the same image uncompressed.

The Bottom Line

Both Colorsqueeze and PicturePress offer a viable means of shrinking unwieldy image files without compromising image quality. Colorsqueeze is straightforward to use but slow. Moreover, it lacks the flexibility PicturePress offers. PicturePress is a complete JPEG system powerful enough for professional users and simple enough for novices. The addition of the Frontier run-time module and script turns batch compression of images into a drag-and-drop operation, and the Photoshop plug-in enables Storm’s JPEG compression to be applied to almost every image format known to the Macintosh. For demanding users, the availability of hardware acceleration makes PicturePress an even better choice, for a cost that’s only slightly higher.

— Bruce Fraser
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CIRCLE 117 ON READER SERVICE CARD.
PrecisionColor Pro from Radius is the fastest 24-bit color graphics card available. Not in one category, not in just a few functions, but in overall performance.

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Get the PrecisionColor Pro and PhotoBooster combo. And start screaming with your Mac.

© 1993 Radius Inc. Radius, the Radius logo and all Radius product names are trademarks of Radius Inc. Other brand and product names are trademarks of their respective holders. *Based on QuickDraw acceleration tests using Hydra Benchmark v.2.1.
If you're looking for a bargain-priced alternative to Farallon's Timbuktu remote-control software, you may want to check out Datawatch's ScreenLink. It lacks many Timbuktu features, and it doesn't support screen sharing among Macs and PCs. But for those who don't require Timbuktu's power and cross-platform capabilities, ScreenLink can provide basic remote-control features at a fraction of the cost of Timbuktu.

**Host Meets Guest**

ScreenLink operates as a DA that lets you control one Mac (the host) from another (the guest) over a network or over phone lines with modems. The program initially presents you with a dialog box that lets you select the machine you want to control, the method of connection (serial or AppleTalk), and the connection port (modem or printer). Once you're connected to a host machine, you can view a bit-mapped representation of its screen, control its operations remotely, and even exchange files.

ScreenLink displays the host's desktop in a resizable, movable window with a heavy black border. The window provides full Finder access to the host Mac. ScreenLink doesn't support color — in general, if the host display is in color, ScreenLink substitutes white for light colors and black for dark.

You can set access privileges for host as well as guest machines with ScreenLink's Security Preferences dialog box. A case-sensitive password is required.
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We didn’t just change the shape of Ethernet. We changed the ground rules.

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Stop reading this ad and start reading our free white paper. Simply call us today. We guarantee you’ve never seen anything like EtherWave. In any way, shape or form.

EtherWave part numbers: Mac NuBus card: PN8991TP; Mac LC card: PN892TP; Mac LC card w/FPU: PN892TPF; Mac/PowerBook adapter: PN894; printer adapter: PN891; Newton adapter: PN844; All transceiver: PN801; AAU transceiver: PN802; PC ISA card: PN801TP. For customer service, call (510) 814-5000. Or contact us on America Online or AppleLink ID: Farallon. CompuServe ID: 75410, 2702. Internet ID: Farallon@farallon.com. All trademarks are property of their owners. Farallon Computing, Inc. ©1993

CIRCLE 148 ON READER SERVICE CARD.
Ever wonder why you had to buy one compression program to automatically free up disk space and another to let you shrink files on demand? Ever suspect it was because somebody wanted to bill you twice?

How cynical of you.

Fortunately, Now Compress combines both functions in one rather amazing package. It can double the size of your hard drive by compressing your data smaller than AutoDoubler®, DiskDoublertm or any other product. Additionally, it creates tiny archives that drastically reduce the time it takes to transfer files throughout a network.

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for accessing these preferences. ScreenLink allows several levels of guest access to host machines — view-only privileges, control of the host's operations, file transfer from the guest to the host, and file transfer from the host to the guest. You can create a different set of controls for each guest and view, modify, and delete them from a scrolling selection window.

The Security Preferences dialog box provides other controls as well. It lets you set a host to become active at startup. You can protect host-system folders from modification by guests and enable a dialog box that lets the host user control guest access. In addition, the CallBack feature enables the host to verify calls from guests. To do so, the host breaks a remote-modem connection as soon as it’s established and dials back the guest, verifying that the guest is at the preset number for that user name. ScreenLink also lets you use the bundled Virex extension software to scan files as they’re transferred between host and guests.

ScreenLink’s security controls are adequate, but they don’t offer a fine level of control over host access. You can’t, for example, allow guests to view and copy host files but restrict them from modifying the files. In short, ScreenLink’s access permissions are no substitute for the better controls you get with file sharing under System 7 or with a network operating system such as AppleShare.

In theory, you can have an unlimited number of guests connected to a single host simultaneously, although only one guest at a time can control the host. When one guest relinquishes control, another can take over. This makes ScreenLink a good choice for training and classroom laboratory situations in which users need to view the instructor’s screen from connected Macs.
Without training, thousands of dollars already spent on computers and software is needlessly wasted.

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the transfer to the proper location. In order to help speed file transfers over LocalTalk or modem connections, ScreenLink provides a file-compression option. Compressed files are automatically decompressed by ScreenLink as they are received.

ScreenLink's primary competitor is Farallon's Timbuktu 5.0. Timbuktu's longer history on the Mac and its many revisions make it a better overall product than ScreenLink. A Windows version of Timbuktu lets a Mac control a PC and vice versa, so Timbuktu is the better choice for mixed Mac/PC environments. In addition, Timbuktu supports color, provides snappier screen response, and displays menu-bar status icons that keep you informed about who is doing what to your host machine.

However, Timbuktu is also more expensive than ScreenLink. For $299, you can purchase a version of ScreenLink that covers all the Macs on a single AppleTalk zone. Timbuktu, on the other hand, is priced according to the number of licensed users — 2 for $299, 10 for $999, 30 for $1,999, and 100 for $5,500 — substantially costlier. ScreenLink comes with the Virex antiviral extension.

**The Bottom Line**

For those who need remote-control and screen-sharing software, ScreenLink is a solid product that's easy on the budget. It's not as full-featured or as slickly implemented as rival Timbuktu. ScreenLink lacks Timbuktu's color support, fine-tuned controls over host access, and cross-platform features. But ScreenLink gets the job done at a price that can't be beat, making it ideal for classroom labs.

— Don Crabbe

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**Stufflt Deluxe**

We couldn't agree more. The coolest thing about Stufflt Deluxe is the more you Stuff, the more disk space you have.

Enjoy more disk space. Programs today take up enormous amounts of disk space. That's why file compression has become so popular. And no one compresses tighter or faster than the Eddy award-winning Stufflt Deluxe. Cool.

Talk less, say more. Stuff a file before sending it over a modem or network and it will take a fraction of the usual time to get there. And now, Stuffing is as easy as adding ".sit" to an item in the Finder. Presto! An archive. Cool.

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MacUser Editors' Choice Award for Best Compression Software.
Announcing everything you'd expect in workgroup servers from Apple.

The new Apple Workgroup Servers 60 and 80 were designed not just to meet your expectations. They will undoubtedly exceed them.

Now, people can work together better using servers that are as easy to install and use as a Macintosh personal computer.

Both high-performance servers allow departments and workgroups to collaborate and share files easily. So people spend a lot more time using information and a lot less time looking for it.

The Workgroup Server 60 is ideal for classroom and small-business settings. Installation is as easy as plugging it in and turning it on. And built-in networking means it fits into any office environment with a minimum of effort.

The Workgroup Server 80 is all this and more — more power and more performance for more people. An optional built-in DAT 4mm tape backup drive allows you to store gigabytes of information. It also comes with Dantz Retrospect Remote automated backup software to ensure that all your data is protected.

Both models arrive with System 7.1 and new AppleShare 4.0 software pre-installed. Providing greater performance, ease and reliability than ever before. While products such as Farallon PhoneNET PC let MS-DOS and Windows users easily connect to any Apple server.

For still larger groups of people, we offer you the Apple Workgroup Server 95. Built around our performance-tuned UNIX-based system software, A/UX 3.0.1. And optimized to deliver stable, dependable file, print and database services.

No matter how many people you need to bring together, Apple provides a way to make it easier for them to share their ideas and information.

But then again, what else would you expect?
And a few things you wouldn't.

Introducing the Apple Workgroup Server 60, a complete solution including file-server software for under $3000.

Introducing the Apple Workgroup Server 80, a complete solution including file-server software for under $5500.

Clearly, the Apple Workgroup Servers 60 and 80 were built to meet the demands of every workgroup size. What you may not have realized is how well they fit into every workgroup budget. Because the simple fact is that all this power and flexibility come with remarkably affordable price tags. Unlike comparably priced servers, Apple servers begin as complete systems. So you avoid the hidden cost of adding extra features we make standard, such as file-server software and memory, as well as Ethernet and SCSI ports.

At under $3000, the Workgroup Server 60 is designed for small groups with even smaller budgets. The Workgroup Server 80, at under $5500, makes an equally attractive solution for larger groups. And because they're so easy to use and manage, they demand much less attention from network supervisors. In fact, an independent study showed that Apple servers deliver dramatic savings in the categories of support and training!

Of course, your budget isn't the only thing we support at Apple. The AppleAssurance program provides free 24-hour, 7-day-a-week phone assistance to help you set up and start using your server. As well as on-site service options to keep it running at peak performance for a lifetime.

For more information and the name of your authorized Apple reseller, call 1-800-776-2333.

With Apple Workgroup Servers, it's never been easier to give people the power to work together. With the power you expect from Apple, the power to be your best.
Launching Pads.

**DrawingBoard III**
12 x 12, 12 x 18, 18 x 24
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**CalComp's New Graphics Tablets.**

Creativity and productivity can rocket to new highs with CalComp's new graphics tablets. They offer the latest features — such as pressure-sensitive pens and cordless cursors — all at very down-to-earth prices.

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These tablets measure about 1/8" thick, weigh less than a pound and start at $395 for a 6 X 9 tablet with pressure pen. They're available for IBM PC and compatibles and Macintosh and include these key features:

- 6 x 9, 12 x 12 or 12 x 18 inch sizes
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- Pressure-sensitive pen standard with 6 x 9, optional with others
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All tablets provide multiple output formats and are available with Apple Desktop Bus™ (ADB), ADI®, Microsoft® Windows® and Mouse emulation drivers.

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CIRCLE 40 ON READER SERVICE CARD.
QUICK CLICKS

On The Road

The main strength of the PowerBook is also one of its problems: You can work almost anywhere, without being plugged in to anything. So what happens when you want to print or fax something? You can make yourself a to-do list and print or fax the items later. You can even use background printing to spool print files to disk until you’re near a printer — but then you still have to check that to-do list. Or you can use Palomar’s On The Road to automate the process.

With On The Road’s deferred printing and faxing, you work as if you were connected to a printer and a phone line; that is, you choose your Print or Fax command when your document is ready. But instead of a Print or Send button in the dialog box, you get a Defer button. Clicking on it spoools the document to disk for On The Road to handle later.

Any time your PowerBook starts up or wakes up, On The Road does its best to find out where you are. It looks at network connections, printer names, mounted AppleShare volumes, and external monitors — plus it uses previous information and experience. If the right printer is available, it prints the spooled documents; if a phone line’s attached, it faxes the waiting items. If On The Road can’t figure out where you are, it asks you. You can store as many named locations as you want — “At home,” “At work,” “Dialed up to work,” and so on — where each location corresponds to a distinct set of connected devices.

When you spool your print documents, On The Road looks for the printer you’ve specified in the Chooser. You can defer printing to your office printer, one at a client’s office, and one at a client’s office, and the correct documents get printed at each location. You can also force a spooled document to print to a current printer at any time, as long as it uses the same printer driver as the one you sent it to originally.

On The Road stays in your menu bar, signaling its actions (ascertaining a location, looking for a phone line, and checking for a printer) by changing its icon. Its menu lets you turn deferred printing and faxing on and off and lets you set AppleTalk to load at startup. As a bonus, it turns AppleTalk on and off automatically, based on your network connection.

In all, On The Road takes a simple idea and turns it into an elegant, handy utility for PowerBook users.

- Sharon Zardetto Aker

MACphotographer

Imagine a teaching camera that can develop an entire roll of film (well, virtual film) on the spot and critique your technique as well. That’s the idea behind MACphotographer, a camera-simulation software package from Kodak that also includes a database of photography-related information.

Photo Workshop, the main application in MACphotographer, puts the viewfinder of a virtual 35mm camera on your screen, with a simulated-reality scene, such as moving boats, visible in the center. Surrounding this scene are a variety of camera controls, from basic (camera position, film speed, aperture) to more advanced (depth of field, metering, flash, exposure compensation, bracketing, and so on), depending on the level of expertise you choose.

At the advanced level, you can select from a long list of lenses, including powerful zooms and telephoto (although in some scenes, your creativity is limited by a narrower choice). To help you make selections, there’s a Help/Reference option, which provides access to a wide range of topics, although some are cursory in their treatment of a subject.

Unfortunately, the scenes provided for photographing — especially the action scenes — are low-resolution images, so they don’t look very realistic (QuickTime movies or a separate disk with images would be an improvement). Once you’ve taken your pictures (by clicking in the scene or pressing the space bar), MACphotographer “develops” them quickly and displays them in an album-page format.

The commentary provided for each photo is more helpful than the visual image, giving the poor image quality. You can choose a basic or in-depth commentary, but we found the basic commentary (of focusing, shutter speed, and so on) more to the point. The in-depth review uses broad definitions that can be confusing, and it plugs Kodak film relentlessly — did we mention that you can load only Kodak film in your virtual camera?

The Kodak Database included in MACphotographer is also Kodak-centric, but it’s a good resource for any photographer. The Kodak Database includes information on film and exposure that used to be available only in professional-photography books.

Despite its low-resolution images and Kodak plugs, MACphotographer is a helpful and instructive product for beginning and intermediate photographers who want to know more about what their cameras can do. Although it’s no substitute for real camera time, it teaches how thinking before you trip the shutter can save you time and money afterward — a lesson many pros learn the hard way.


— Peter Alan Gould

CLImate

If the Mac’s friendly desktop can’t keep you from sometimes longing for the efficiency of a CLI (command-line interface) such as that of DOS or UNIX, Orchard Software’s CLImate might be just the utility for you. Then again, it might not. Although CLImate offers a CLI and a scripting language, there are many things it can’t do or doesn’t do well.

CLImate provides a CLI that works alongside the Finder’s graphical user interface. You use an English-like language to list directories, copy and delete files, run applications, format floppy disks, and so on. In addition to a basic set of commands that parallel Finder operations, CLImate includes a scripting language that’s a subset of the venerable programming language BASIC. CLImate’s BASIC dialect supports moderately advanced features such as loops, conditionals, and subroutines, but it requires line numbers — a clunky approach.

To make CLImate run under System

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QUICK CLICKS

6.0.5 and later, Orchard chose not to support System 7's Apple events or any form of IAC (interapplication communication); CL!mate is unlike such scripting environments as UserLand's Frontier or Apple's own AppleScript in this respect. Whereas the latter systems' strengths lie in linking disparate applications through IAC, CL!mate can script only the Finder's file-manipulation functions.

For scripting Finder operations, CL!mate works well, but its interface has limitations. CL!mate lacks an easy means of reentering previous commands — a feature of UNIX, Amiga, and even DOS shells; instead, it requires a select/copy/paste/edit cycle. Also, although CL!mate's EXEC command can run any application, you can't specify that a particular document be opened. Nor is it possible to quit running applications or interact with them (except applications, such as Stufflt Expander, that you can influence by placing files in specific directories), because CL!mate doesn't support IAC.

CL!mate can be useful if you want a CLI to facilitate or automate simple file-manipulation tasks such as copying groups of files. For more-complex system scripting, though, you'll have more success with Frontier or AppleScript.

Orchard Software, Inc., P.O. Box 380814, Cambridge, MA 02238; 617-876-4608. Version 1.0.2. $59.95.

— Jeffrey Sullivan

Out of This World

Ready for a fantastic trip to another dimension? As its name implies, MacPlay's Out of This World can take you there. It's an action adventure game that's guaranteed to keep you glued to your Mac for hours.

In a nuclear experiment gone wrong, you find yourself transported through time and space to another dimension — a place where ferocious beasts and armed aliens are out for your blood. Your only ally is a friendly alien who helps you get out of tough spots from time to time.

This game requires a perfect balance of arcade-style hand/eye coordination (timing your jumps, firing at enemies, deflecting their hits) and problem-solving abilities — your surroundings are much like a maze, and the obvious ways of getting to the next level seldom work. Fortunately, the keyboard controls are simple; you can also use an Advanced Gravis MouseStick for maneuvering. If you happen to die during the course of the game (and you will — many times), you get a four-letter pass code that lets you return to life at the location of your demise instead of starting over.

The animation in Out of This World is first-rate. The program uses polygonal (vector-based) graphics, which provide smooth, fluid animation although not a lot of fine detail (which is no great loss, given the pace at which the game travels). For optimum speed, you can match your Mac’s horsepower to one of four...
possible window sizes for the game — the smaller the window, the faster the animation. A continuous soundtrack provides plenty of brooding atmosphere and entertaining sound effects. The game’s best feature, though, is how it pulls you in: It reaches out and grabs you, and it won’t let go.

MacPlay, 17922 Fitch Avenue, Irvine, CA 92714; 714-553-3530. Version 1.0. $59.95.

— Tony A. Bojorquez

**OffLine**

OffLine is a nifty little utility that keeps track of what’s where on floppy disks. The interface could use a little fine-tuning, but even in its current form, OffLine is a workable way to track your off-line storage.

OffLine makes catalogs of the files and folders on floppy disks. You can create as many catalogs as you want — one for the backups of your financial records, one for your font disks, and so on. All you have to do is feed the disks in, one after the other. In seconds, OffLine reads the contents into the catalog and spits the disk out, ready for the next. Get Info comments attached to any of the files are preserved — and files in StuffIt, Compact Pro, DiskDoubler, and AppleLink formats are logged according to the items inside the compressed file.

OffLine could use a little interface polishing. Browsing isn’t straightforward, because the files in the catalog aren’t listed in the main window; you have to double-click on a disk name to open a separate dialog box. Also, you have to set export preferences in a separate dialog box instead of through pop-up menus in the Export dialog box, and the main window disappears when the Export dialog box opens. But these are minor annoyances, not major problems.

You can search for a file in either of two modes: Basic, in which you give all or part of the filename and can specify the application that created the file, or Advanced, in which the search criteria can also include the file’s label, its creator code, and the file type. The search speed isn’t blinding, but it’s respectable: about 10 seconds to select 22 matches in a 1,400-item catalog.

OffLine includes some helpful touches: It checks whether the disk you’re inserting is already cataloged and, if so, updates its information instead of duplicating it; it lets you append files with brief comments that are stored only in the catalog and are unrelated to the Get Info comments; it exports catalog information in text files; and it prints disk labels with file information on them.

OffLine could use a little refining and a few more features — such as internal printing of catalog lists, so you don’t have to export the information to print it — but it’s still a useful utility.


— Sharon Zarletto Aker
THE TOP 50 CD-ROMs
With hundreds to choose from, how can you tell which CD-ROMs are worth the bucks? Here are the 50 best we've seen to date. By THE EDITORS OF MACUSER

How do you start an information explosion? Begin by introducing QuickTime, a new data format that makes it easy to distribute movies and animations. Go on to bundle CD-ROM drives with Apple Performas. And for good measure, make CD-ROM drives (yes, even Apple’s) significantly faster and cheaper.

All those things happened in the past couple of years, and suddenly you can’t turn around without bumping into a new CD-ROM about anything from dinosaurs to the Beatles. Two years ago, when MacUser last surveyed the offerings for CD-ROM-drive owners (“Silver Platters That Matter,” June ’91, page 170), we could find only two-dozen discs worth mentioning. Now, after sifting through hundreds of available titles, we’ve had to limit ourselves to selecting only the top 50 as potential additions to your collection. And new titles are being introduced every week.

As before, we’ve largely excluded discs that merely use CD-ROM as a delivery medium for software. Thus, you won’t find The Microsoft Office (a best-selling collection of Microsoft business applications) or consolidated image collections such as 3G Graphics’ excellent Images with Impact! (although we did slip in a couple of image-based discs that have special cataloging features). Also missing are collections of QuickTime movie clips — which wouldn’t be possible without the capacity (as much as 650 megabytes) of CD-ROMs. Finally, we haven’t included collections of shareware, freeware, and public-domain-software libraries — such as the ones offered by BMUG (510-549-2684), the Boston Computer Society (617-252-0600), and Pacific Hitech (801-278-2042) — even though they’re among the best bargains.

What you will find are CD-ROM titles that range from the educational to the eclectic to the electrifying. Whether you’re looking for something to encourage your child to read, to teach you a new language, or simply to satisfy your own curiosity about interactive media, these CD-ROMs will make it happen.
A Hard Day’s Night

1. A Hard Day’s Night
The Voyager Company; $39.95.

Beatles fans and movie fans in general will flip over A Hard Day’s Night, which manages to pack the entire 1964 film, its screenplay, and lots of extra goodies on one CD-ROM. You can watch the Fab Four’s film debut with your left eye while your right eye follows along with the screenplay, seeing what dialogue and scenes were cut and what was ad-libbed. This disc shows just how good CD-ROM can be — and it’s a great movie too!

2. The San Diego Zoo Presents . . . The Animals!
The Software Toolworks; $99.95.

You’ll find it hard to believe the wealth of QuickTime movies, photos, animal sounds, stories, and well-written information The Software Toolworks has stuffed into The San Diego Zoo Presents . . . The Animals! This multimedia tour of the San Diego Zoo explores the lives and habitats of more than 200 animals, depicted in 1,300 photos and an hour of video clips. The software safari is lucidly explained in 2,500 carefully cross-referenced pages and presented in a polished package of handsome graphics.

3. How Computers Work
Time-Warner Interactive Group; $79.99.

Based on the Time-Life books How Things Work and Understanding Computers, How Computers Work is an easy-to-follow interactive guide to what’s under your computer’s hood. With its on-line textbook, a time line showing high points in the development of the computer, a peek at future trends, and activities ranging from knowledge tests to a programming exercise, this is an entertaining and educational tool for curious adults and teenagers.

4. Criterion Goes to the Movies
The Voyager Company; $24.95.

At first glance, Criterion Goes to the Movies looks like a promotional catalog for the Criterion Collection of video laser-discs. But because that collection includes 150 of the best movies ever, this CD-ROM full of Quick­Time clips becomes a joy for any movie fan. Click on Five Easy...
CD-ROM Top 50

Pieces, and watch Jack Nicholson tell a waitress to hold some chicken between her knees. High-quality stills of all major cast members and a short essay are standard issue for each of the films on the disc.

5. Small Blue Planet
Now What Software; $159.

Map lovers and would-be astronauts will thrill to the wealth of maps and satellite images in Small Blue Planet, an interactive electronic atlas. Navigate among a world political map (complete with statistics and historical information for each country), global and U.S. relief maps, and a gallery of breathtaking satellite images ranging from major cities to glaciers and canyons. You also get The Chronosphere, which correlates times and dates with the patterns of night and day across the globe.

6. Living Books
Bröderbund Software; $59.95 each.

If you have kids, drop whatever you’re doing, pick up your phone, and order Just Grandma and Me and Arthur’s Teacher Trouble, the first two discs in Bröderbund’s animated, interactive Living Books series. If you don’t have kids, buy Grandma and Arthur anyway, if only to see just how elegant and entertaining multimedia can be. Both multilingual discs, based on popular children’s books, lead you through witty, whimsical worlds where — at the click of a mouse — starfish dance, cookies sing doo-wop, and the shy kid beats the class brain in the annual school spelling bee.

7. Word Tales
Time-Warner Interactive Group; $59.99.

New readers (from four to seven years old) will love Word Tales, a collection of games featuring an animated character called Milo, who teaches children the sounds of letters and how they combine to form words. In the first part of the game, children match the correct initial letter to a word; when that’s done, an animated scene appears containing several items that begin with that letter. But it’s not all work — there’s also an arcade game kids can play as a reward as they successfully complete each Word Tale.

8. Lunicus
Educorp Computer Services; $99.

The king of CD-ROM adventure games is Lunicus. Other games may have prettier graphics and
more-cohesive story lines, but Lunicus succeeds because it moves you through a 3-D environment quickly. Speaking with realistic “cyberpuppet” characters can give you important clues, but game players who crave an old-fashioned shoot-'em-up won't be disappointed. From gunfights with alien robots to tank battles on city streets, Lunicus delivers the ammo.

9. Stravinsky: The Rite of Spring
The Voyager Company; $99.95.

How many classical-music premières start riots? The Rite of Spring did. Years later it was still inspiring everyone from Charlie Parker to Walt Disney. Now Stravinsky: The Rite of Spring is a brilliant CD-ROM. Stravinsky’s score is still a more subversive piece of music than anything you’re likely to hear from pseudocyberpunk Billy Idol, and UCLA professor Robert Winter (see #38, Beethoven: Symphony No. 9) uses the Mac to make the piece’s notoriously complex structure accessible to anyone. The performance by Charles Dutoit and the Montreal Symphony is electrifying too.

10. Dinosaurs!
Sony Electronic Publishing; $79.

It’s difficult to imagine a CD-ROM subject with more kid appeal than Dinosaurs! Maybe a disc that contained a complete set of X-Men trading cards? Although this might seem a little tame after seeing Spielberg’s velociraptors stalk the silver screen, it contains a lot more real information about the creatures themselves. Unfortunately, the only animated QuickTime dinosaurs on hand are elderly paleontologists.

11. Iron Helix
Spectrum HoloByte; $99.95.

Futuristic 3-D adventure games are becoming common on CD-ROM, but Iron Helix isn't like the rest. Sure, it's got an engrossing plot and great graphics (with slow response times to match), but in Iron Helix, you control a defenseless robot space probe. There’s no shooting in this game: If you’re going to save an innocent planet from destruction, you’re going to have to rely on your wits alone.

12. The Madness of Roland
HyperBole Studios; $59.95.

The Madness of Roland is based on medieval legend and it looks like an illuminated manuscript, but the strategy of this multimedia novel is purely modern. You move among five sometimes conflicting points of view, branching off into layers of witty or poetic commentary and startling QuickTime movies.

13. 21st Century Media PhotoDisc Series
21st Century Media; $299; starter kit, $69.

21st Century Media PhotoDisc Series is a seven-volume (and counting) series that steers clear of clichés while offering images ranging from people at work and play to wildlife and the environment to world commerce and tourism. Its innovative image-cataloging software makes finding files a snap.
14. Baseball's Greatest Hits
The Voyager Company; $79.95.

If you want to hear Ty Cobb giving base-stealing advice, watch Bobby Thomson’s miracle in ’51, or play the most arcane baseball-trivia game ever devised, get Baseball’s Greatest Hits. This fan pleaser captures baseball’s most memorable moments in a wealth of QuickTime movies, play-by-play recordings, photographs, interviews, and period writings.

15. Poetry in Motion
The Voyager Company; $29.95.

Some poems are meant for the page and the solitary reader, but others beg to be performed. Poetry in Motion contains QuickTime movies of 24 poets (Allen Ginsberg, Ntozake Shange, and others) in performance and interviews next to the texts of their poems. The performances add a surprising extra dimension to your reading experience.

16. Funny: the Movie in QuickTime

Funny: the Movie in QuickTime doesn’t have the greatest picture quality, but it more than makes up for that with its material: QuickTime clips of about 100 funny stories, anecdotes, and one-liners. And since Funny’s interface lets you sort by categories, you can even choose to see only jokes told by people with red hair or a strange accent — no kidding.

17. Musical Instruments
Microsoft; $79.95.

Musical Instruments is a stylish encyclopedia of more than 200 instruments and styles of music. By clicking on the instruments, you can hear what they sound like. The engine is remarkably fast, the graphics are of good quality, and the CD-ROM offers an intuitive, easily navigable interface.

18. So I’ve Heard
The Voyager Company; $24.95 per volume.

If you don’t know a lot about “highbrow” music, the So I’ve Heard series of CD-ROMs written by music critic Alan Rich will painlessly educate you both to the joys of the classics and to which versions of classic works you should buy when you hit the CD store.

19. MovieSelect
Paramount Interactive; $59.95.

MovieSelect can end frustration over what to rent at the video store. All you have to do is enter three favorite movies, and the program generates a list of recommended rentals based on your tastes. You can search by actor, director, or title.

20. All My Hummingbirds Have Alibis
The Voyager Company; $39.95.

Inspired by Max Ernst’s collage novels, All My Hummingbirds Have Alibis provides a taste of
Creepy Crawlies

how multimedia will change and challenge artistic expression in the future. With its combination of Ernst’s mystical artwork, Morton Subotnick’s music, and informative commentaries, this is a fascinating disc to explore.

21. Mozart String Quartet
The Voyager Company; $59.95.

Can CD-ROMs provide an experience equivalent to chamber music? The best way to find out may be to try Mozart String Quartet, Voyager’s treatment of one of Amadeus’ most sublime works (K. 145). For serious multimedia mavens, this one is also available with an accompanying laser disc performance.

22. Creepy Crawlies
Sony Electronic Publishing; $69.

If you like bugs, slugs, and things that live in rugs, you’ll love Creepy Crawlies. This CD-ROM encyclopedia contains facts and QuickTime movies about more than 70 of the strangest creatures alive. A guaranteed kid pleaser.

23. The Journeyman Project
Presto Studios; $99.95.

The Journeyman Project is so pretty and interesting, it’s easy to forget you’re playing a game. While moving through your drab life in an incredibly realistic world, you’re suddenly called on to travel back in time and prevent the future from being altered. You have time to admire the attractive graphics, though — game play goes slowly.

24. Dictionary of the Living World
Compton’s New Media; $149.95.

From abaxial to zygote — with 2,600 stops in between — the Dictionary of the Living World defines, explains, and illustrates life on earth. Movies, animations, and photos combine with narration and text to explore biological processes, habitats, and animal life — the QuickTime movie of two adorable baby emperor penguins is alone worth the price of admission.

25. The Orchestra: The Instruments Revealed
Time-Warner Interactive Group; $79.98.

Featuring Benjamin Britten’s The Young Person’s Guide to the Orchestra (in a performance conducted by the composer), The Orchestra: The Instruments Revealed is a wonderful introduction to the instruments of the symphony orchestra. Audio examples, exercises, and analyses are entertainingly presented.
26. The Enduring Vision
D. C. Heath; $44.95.

An interactive textbook covering American history from the 1700s to the mid-1900s, The Enduring Vision contains the same information you’d find in a conventional textbook but also includes sound samples from historic speeches, QuickTime movies of historical events, and extensive original source documents.

27. Space Shuttle
The Software Toolworks; $49.95.

It’s the ultimate in efficiency: On a single 4.75-inch CD-ROM, Space Shuttle squeezes a multi-billion-dollar space program, a six-month astronaut-training course, and a detailed report on each shuttle flight — including dozens of QuickTime scenes depicting space walks, blasts offs, and landings.

28. Alice: An Interactive Museum
East West Communications; $99.

Finding your way through the gorgeously rendered 3-D Alice: An Interactive Museum is a surreal, sometimes maddening adventure. Your mouse clicks animate objects and paintings (some sexually explicit, be warned), open doors, and uncaps bottles of Perrier labeled “Drink Me” or “Don’t Drink Me.”

29. Cosmic Osmo and the Worlds Beyond the Mackerel
Cyan; $59.95.

Cosmic Osmo and the Worlds Beyond the Mackerel transports you to some truly weird places. Climb aboard the Cosmic Osmo plane (which is equipped with the ultimate weapon: a cotton-swab shooter), and travel to planets where dinosaur skeletons play horns and cupboards open to warp-zone hallways that take you to other planets where... well, see for yourself.

30. Aesop’s Fables
Discis Knowledge Research; $29.95.

Discis pioneered the CD-ROM-stories-for-kids concept, and Aesop’s Fables is an example of why its titles are among the best. The illustrations are excellent, and each fable’s accompanying music is well chosen. Kids can have the fables read to them or can read them themselves.

31. Hell Cab

Hell Cab is yet another entry in the multimedia adventure-game genre — this time you’re at the mercy of a devilish cab driver who’s out for more than just your fare. The ride is hip and stylish but, like the real thing, not particularly fast.
32. **Exotic Japan**

The Voyager Company; $99.95.

If you want to learn about Japanese culture, traditions, and language but can't swing the plane fare just yet, pick up a copy of *Exotic Japan*. This disc is more than just a travel guide or language program; it helps you understand Japanese society.

33. **Think and Talk**

HyperGlot Software; $199.

Each *Think and Talk* package is a seven-CD-ROM set that promises to teach you to speak and write Spanish, French, German, or Italian. Complete vocabulary lists, conjugation tables, and pronunciation are included.

34. **Rock Rap 'n' Roll**

Paramount Interactive; $79.99.

Kids under ten will love the unusual *Rodney's Wonder Window*, which contains silly QuickTime-movie antics and cartoonlike action. Kids can't make their own movies, but the

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**Aesop's Fables**

The Country Mouse was amazed at the riches of a town kitchen and the thought of her poor country house filled her with shame.
graphics and concepts may inspire them to create their own "wonder windows," using programs such as Bruderbund's KidPix.

37. Schubert Trout Quintet
The Voyager Company; $59.95.

The CD-ROM format often seems to best lend itself to program music such as the famous Trout Quintet. The disc Schubert Trout Quintet offers a fascinating analysis of the structure of the quintet as well as information about Schubert the man and the composer.

38. Beethoven: Symphony No. 9
The Voyager Company; $79.95.

Beethoven: Symphony No. 9 was the first CD-ROM Guide to the Classics, and it still holds up well, largely because of the contagious enthusiasm of its author, Robert Winter. No wonder Microsoft licensed this program as a showcase for Windows.

39. Strauss: Three Tone Poems
The Voyager Company; $59.95.

Strauss: Three Tone Poems takes three of Richard Strauss' tone poems — Don Juan, Till Eulenspiegel, and Death and Transfiguration — and gives them Voyager's usual high-class(ical) treatment. It's in black-and-white only, but its beautiful art-nouveau graphics put many color programs to shame.

40. A Silly Noisy House
The Voyager Company; $59.95.

A Silly Noisy House is an engaging CD-ROM for the under-five set that lets kids navigate through a magical house inhabited by a family of teddy bears. A click of the mouse sends household objects cavorting across the screen to the sound of familiar nursery rhymes and songs.

41. Spaceship Warlock
Reactor; $95.

The first of the high-concept graphical CD-ROM adventure games, Spaceship Warlock still sports impressively slick graphics — but be prepared to spend a fair amount of time waiting around.

42. The Mayo Clinic Family Health Book — Interactive Edition
Interactive Ventures; $99.95.

Hypochondriacs will thrive on The Mayo Clinic Family Health Book — Interactive Edition. It contains hundreds of illustrations, video clips, and animated segments showing medical procedures and parts of the body.

43. I Photograph to Remember
The Voyager Company; $39.95.

I Photograph to Remember is a series of almost 100 haunting black-and-white photographs that testify to the strength of photographer Pedro Meyer's family relationships. In a choice of
English or Spanish. Meyer's spoken narrative movingly conveys his feelings toward his parents as they confront terminal illness.

44. The Oregon Trail
MECC; $69.95.

The Oregon Trail puts you into the shoes of a pioneer traveling from Missouri to the Willamette Valley. You have to decide what to pack, when to go, the pace of your journey, and what to do in an emergency. Each decision affects the outcome of your journey, so be careful!

45. AgfaType CD-ROM 4.0
Agfa Division, Miles; $99 (starter set).

Unlockable CD-ROMs have been slow to take off, but the AgfaType CD-ROM 4.0 font collection may convert skeptics. Not only does it give you instant phone access to high-quality fonts from Agfa, Adobe, and the Font Bureau but you also get an interactive type tutorial, an extensive glossary, and 12 megabytes of graphics-related shareware.

46. Whales and Dolphins
REMedia; $59.95.

Whales and Dolphins is the second in a series of beautiful interactive zoo discs from REMedia (the first one was about butterflies). Simple animations and QuickTime movies supplement chapters on the creatures' life cycle, body plan, and ecology.

47. From Alice to Ocean
Addison-Wesley Publishing; $48.95.

Fill your screen with Rick Smolan's color photos of the Australian outback as From Alice to Ocean tells the story of Robyn Davidson's camel trek across the desert. A map lets you jump to any portion of the journey, and buttons take you to historical and cultural topics. Perfect for didgeridoo fans.

48. Beauty and the Beast
New Media Schoolhouse; $69.

Beauty and the Beast offers an interactive version of the favorite tale, with animated illustrations and definitions of difficult words. The program can be slow at times, but the illustrations are good.

49. Victor Vector & Yondo: The Vampire's Coffin
Sanctuary Woods Multimeda; $59.95.


50. Sightlines
DiscMore Productions; $125.

Sightlines is an encyclopedia of visual images that spans 4,000 years. The interface is somewhat clunky and the images are fuzzy at full size, but the sheer amount of information makes this two-CD-ROM set a valuable research tool.

Beauty and the Beast

"I spent my time tending and expanding the gardens, and in reading. Over time, I did change, and came to see the world in quite a different way than I had before. I knew that I had changed inside, but I also knew that no one would ever be able to see past my appearance to end the curse."

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La Cie PocketDrive

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• Easy to move drive without disturbing SCSI chain.
• Smallest drive chassis.
• U.S. and world-wide universal AC adapters available.
• Award-winning industrial design.
• Silverlining hard disk management software with auto drive spin-down.
• Macworld "Editor's Choice" and World Class Awards.

Theirs

• Internal termination does not meet SCSI specifications.
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MacWeek, May 1993

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<table>
<thead>
<tr>
<th>Size</th>
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<th>External</th>
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<tr>
<td>128MB Cartridge</td>
<td>$45</td>
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</tbody>
</table>

It's hard to beat the safety record of optical drives. La Cie's Cirrus optical uses cartridges the same size as 3.5" floppies, but stores almost 160 times more. They deliver speed and reliability in our award-winning Cirrus chassis. And that's not all; each drive includes award-winning Silverlining ($149 free value, Bobker's Dozen) and one free cartridge ($45 value).

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### DAT & Tape Drives

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### SyQuest Drives

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</tr>
<tr>
<td>88MB Cartridge</td>
<td>$99</td>
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</tbody>
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**CIRCLE 47 ON READER SERVICE CARD.**
Choosing the Right REMOVABLE

If optical, Floptical, SyQuest, and Bernoulli sound more like storybook characters than storage technologies, we can help.

BY JOHN RIZZO

Removable storage can be such a pain. It’s tough enough making heads or tails out of all the vendors’ claims when you buy a hard drive, but trying to make sense of magnetic, magneto-optical, and Floptical technologies can make buying a removable-storage device downright scary.

To make the buying process less of an ordeal and to ensure that you end up with the...
best storage device possible, you've got to know why you're buying it. If you're considering removable storage, chances are you need portability, expandable capacity, security, or some combination of these three.

It also helps to know what the various removable technologies are. For starters, there are drives that store data on cartridges that contain magnetic disks like those in most hard drives. The most popular magnetic-removable-cartridge devices for Macs are probably those that are based on mechanisms made by SyQuest. They use two types of 5.25-inch cartridges — ones that can hold 44 megabytes and others that can hold 88 megabytes (the 88c mechanism can also read and write 44-megabyte cartridges) — and a new 3.5-inch, 105-megabyte cartridge.
Removable-Storage Systems

Iomega makes a family of magnetic-cartridge drives called Bernoulli drives, which use 5.25-inch cartridges that come in 90-megabyte and 150-megabyte varieties. You can also get 105, 65, and 35 cartridges that can be used in the MultiDisk 150 drive.

Also available are various removable-hard-drive systems that consist of a docking station for modules containing hard-drive mechanisms.

Magneto-optical-cartridge drives, commonly known as optical drives, come in a variety of types too. The larger drives store data on 5.25-inch cartridges that can hold 650 megabytes, 1 gigabyte, or 1.3 gigabytes. Smaller drives use 3.5-inch cartridges that can store 128, 230, or 256 megabytes each.

Finally, we have Floptical drives. These megafloppy drives use magnetic technology to store data and optical technology to locate it. A Floptical cartridge, which looks like a floppy disk, stores 21 megabytes.

Confused yet? See the “Reading, 'Riting, and Removability: How the Technologies Differ” sidebar for a quick rundown on the major removable-storage technologies. Remember, at least ten companies sell drives based on each of these technologies (see Table 2). Whatever your reason for buying a removable-media drive, cost is a major consideration.

What Will You Pay?
Suppose you need 650 megabytes of storage. That would take one 5.25-inch magneto-optical cartridge costing $90; or three 3.5-inch, 256-megabyte cartridges costing $150; or five 3.5-inch, 128-megabyte cartridges costing $225. On the magnetic side, it would take six 105-megabyte SyQuest cartridges costing $450; or eight 88-megabyte SyQuest cartridges costing $800; or fifteen 44-megabyte cartridges costing $950; or thirty-one Floptical cartridges costing $715.

Looking at these costs, you might ask why anyone would buy a SyQuest, Bernoulli, or Floptical drive. Well, there are two reasons. First, although optical cartridges are cheaper, optical drives cost a lot more than SyQuest or Bernoulli drives — it’s the old, “Do I buy the expensive razor with the cheap blades or the cheap razor with the expensive

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Reading, 'Riting, and Removability: How the Technologies Differ

**Magneto-Optical**
Magneto-optical drives use a laser beam to write data to and read it from a plastic disc. During a write or erase pass, the laser heats a spot on the disc to about 302 degrees Fahrenheit. The heated material retains the magnetic polarity of a magnet on the opposite side of the disc. During the erase pass, the magnet changes the entire sector to a uniform polarity. During the write pass, the magnet switches polarity to record data.

**SyQuest**
A SyQuest drive is, in essence, a hard drive that has a removable disk. A hard-plastic cartridge contains a highly polished aluminum disk plated with a magnetically sensitive metal alloy. When the cartridge is inserted into a drive, the disk's metal hub is held and rotated by a magnetized spindle. The magnetic read/write heads move close to the disk's surface while reading data from or writing data to the disk.
blades?” The second reason is that you might never need as much as 650 megabytes of storage. For example, you might just use two cartridges that you swap with a service bureau and might never exceed 88 megabytes per transaction.

To get a handle on which technology is right for you, let’s take a closer look at why you need a removable-storage device in the first place.

**Take It Away**

The need for portability is probably the single biggest reason for buying a removable-storage device. Swapping data with colleagues or sending documents to service bureaus for printing requires reliable, capacious storage. The first thing to look for if you plan to ship your data anywhere is a device that uses rugged, inexpensive cartridges. It doesn’t matter how fast a drive is if the cartridges it uses are dead on arrival when you send them away. It’s also a serious problem if each cartridge costs a day’s salary. Finally, you need to be sure there’s a compatible drive at the destination.

Optical storage technology is the most rugged, because the medium is impervious to magnetic fields. We examined the ruggedness of various sample cartridges by conducting controlled drops onto different surfaces and by mailing them across the country and back. In these tests, all the cartridges survived except for the 105-megabyte SyQuest ones.

Be aware that simply opening the aperture of a magnetic cartridge and placing a greasy finger on the medium or breathing on it can be enough to render the cartridge and its data useless. In the case of an optical cartridge, you can remove fingerprints by wiping the disc with a clean cloth in a straight line from the hub to the outer edge.

We also subjected the cartridges to extremes of temperature and humidity. Only the Bernoulli cartridges failed, becoming unusable after an hour at 185 degrees Fahrenheit and 45-percent humidity.

As for compatibility, just about every service bureau has a SyQuest drive of some kind, but many are adding optical drives at their customers’ request. Before you buy, check with your local bureau to see what it’s using.

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**Bernoulli**

An Iomega Bernoulli drive uses a cartridge that contains two flexible plastic disks coated with a magnetically sensitive metal alloy. As the disks spin, air moves outward over them, passing between the disk surface and the drive’s read/write heads. The reduced air pressure causes the disks to come almost into contact with the heads. This process is called the Bernoulli effect.

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**Floptical**

A Floptical drive — as its name suggests — uses a hybrid of magnetic-floppy-disk and optical technologies. A Floptical cartridge contains a disk that has concentric positioning tracks through which the light of a laser can pass. The laser light is used to position the read/write heads over the concentric magnetic tracks.

— John Rizzo

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Removable-Storage Systems

I Need My Space
From time to time, we’ve all wished our hard disk would never fill up, but it usually does. To get around this, the obvious answer is to move older, less frequently used data off your hard disk. But where can you put it? If you need a place to put files you can’t accommodate on your hard disk, a removable-storage system can really help you out.

Your first considerations should be: How long you expect to need the data you’re archiving, how big the files are, and how much data you expect to move from your hard disk in the future. Notice we didn’t mention drive speed. If all you need is more storage space to free up room on your hard disk, the speed of a storage device should not top your list of considerations. In fact, speed is seldom the best reason for buying a removable-storage device. A hard drive is almost always faster than a removable-storage device, so you

Figure 1: Economies of Scale

When total storage exceeds 700 megabytes, a 128-megabyte, 3.5-inch drive is the most economical.

Table 1: Pros and Cons of Removable-Storage Systems

| Technology        | Pros                                      | Cons                                                          | Ideal Users                                                                 |
|-------------------|--------------------------------------------|                                                              |                                                                             |
| Bernoulli         | • Moderately fast drives.                  | • Cartridges vulnerable to magnetic fields.                   | • This is a handy solution for users who need to perform short-term personal backups. |
| Floptical          | • Inexpensive drives.                      | • Limited range of cartridge capacities.                     | • This is the most versatile and cost-effective solution for users who need to transport, archive, or back up large amounts of data. |
| Magneto-optical   | • Inexpensive cartridges.                  | • Expensive drives.                                          | • Users who must secure their data but don’t need to take it far from their Macs will find this technology worth the investment. |
|                   | • Rugged cartridges.                       | • Drives slower than magnetic equivalents.                   |                                                                             |
|                   | • Large range of cartridge capacities.     |                                                              |                                                                             |
|                   | • Cartridges impervious to magnetic fields. |                                                              |                                                                             |
| Removable hard drive | • Fast drives.                           | • Expensive drives.                                          | • Users who must secure their data but don’t need to send cartridges over long distances will find this technology worth the investment. |
|                   | • Large range of cartridge capacities.     | • Bulky and heavy drives.                                   |                                                                             |
|                   |                                             | • Mechanisms vulnerable to magnetic fields.                   |                                                                             |
| SyQuest           | • Widely used.                             | • Cartridges vulnerable to dust, impact, and magnetic fields. | • Users who must secure their data but don’t need to send cartridges over long distances will find this technology worth the investment. |
|                   | • Fast drives.                             | • Moderate cost per megabyte.                                |                                                                             |
|                   | • Inexpensive drives.                      | • Expensive cartridges.                                     |                                                                             |

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|                   | • Cartridges impervious to magnetic fields. |                                                              |                                                                             |
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|                   | • Fast drives.                             | • Moderate cost per megabyte.                                |                                                                             |
|                   | • Inexpensive drives.                      | • Expensive cartridges.                                     |                                                                             |
Figure 1: When choosing a removable-cartridge drive, first estimate the total amount of storage space you plan to fill over the life of the drive. If you need only a few hundred megabytes of space, a low-cost magnetic drive based on SyQuest or Bernoulli technology may be your best bet. If your needs are greater, however, choose an optical drive. Even a high-end optical drive that uses 5.25-inch cartridges can save you money in the multimegabyte range. (Our cost projections are based on average drive and cartridge prices during July 1993; your mileage may differ, of course.)

should work with your hard drive whenever possible.

When you archive data, you will be using either the Finder or a utility such as DiskTop to move old data between your Macintosh’s hard disk and a removable-storage medium. You probably will not have to do this often — a few times each day at most. What is really important is that the archive medium has a long life span so your data is safe, in case you need to archive data for a long time.

Generally, optical cartridges offer the greatest longevity and data security. Magnetic media such as SyQuest, Bernoulli, or Floptical cartridges or hard drives are vulnerable to magnetic fields; A strong magnet placed near a magnetic medium can be enough to wipe it clean.

Remember, if you plan to store gigabytes of data, work out the cost of the cartridges you’ll need. And if you intend to archive huge files, the drives that use lower-capacity media are obviously out of the question.

Figure 2: We combined the results of two tests to arrive at an overall speed rating. First, we used DiskFit Pro to back up an 18-megabyte file from the Quantum LPS 80 internal drive mechanism to each removable-storage medium. Then, using the Finder, we copied an 18-megabyte file from the internal disk to each removable-storage medium.
Removable-Storage Systems

See Figure 1 for a cost-per-megabyte comparison of various drives and cartridges.

Is It Safe?

Of course, everyone wants data security, but some people need data security, because it's part of their job. If your company works on sensitive government contracts, for instance, you may be required to lock up your data whenever you leave your desk. If so, you need thoroughly reliable removable storage, because what you store isn't just some files you want to trade with colleagues — it's everything, even your startup volume. If the removable-storage drive you're considering must be your startup drive too, drive speed is a critical consideration. Although you can start up your Mac with a drive based on any of the removable-storage technologies, things will go much faster if you use a hard drive.

We ran some speed tests on drives that use the various removable-storage technologies and found that the removable hard drive was the fastest; the drive based on the SyQuest 105 mechanism was a close second. The fastest optical drive we tested was based on the new MaxOptix Tahiti III mechanism in its 1-gigabyte mode.

If security is your primary concern, you probably won't care about cartridge cost or ruggedness, because the leastnest your cartridges will travel is from your desk to a vault every night. A removable hard drive is probably your best bet in this case. But if expandability also fits into your buying equation, a drive based on the SyQuest 105 mechanism would be an even better choice: The cost per megabyte of a removable hard drive is much higher than that of one based on the SyQuest 105.

Is It Mac-like?

Once you've got a good handle on what your needs really are, it's time to make sure the technologies you're considering are Mac-like. A removable-storage device should work like a floppy drive: When you put a cartridge into the drive, it should mount automatically; when you drag its icon to the Trash, the drive should spit the cartridge out. Simple, right?

Unfortunately, it's never quite that simple.

To eject a SyQuest cartridge, for instance, you must first press a button on the drive; the disk spins down, and you then push a lever to eject the cartridge. With 5.25-inch-cartridge drives, it is possible to push the eject lever while the disk is still spinning down, which can damage both the drive and the cartridge. This is not a problem with the 3.5-inch-cartridge SyQuest mechanism.

To eject a Bernoulli cartridge, you drag its icon to the Trash, wait for a light to stop flickering, and then pull out the cartridge.

Removable hard drives differ in behavior. Most hard-drive volumes mount automatically like a floppy disk, and the La Cie ExpressDrive removable hard drive ejects mechanisms like a floppy drive ejects floppy disks. But you dismount some removable hard drives, such as the MountainGate Increment and Mega Drive Mercury, by pulling the mechanisms out of the docking station. This method can be a real problem: It's possible to remove a mechanism before it has ambient noise except that emitted by the Mac Iici to which the drive was attached.

Although it wasn't possible to test cartridge shelf life (who has 15 years?), we did run some durability tests. We used Bernoulli cartridges from Iomega, SyQuest cartridges from SyQuest, Floptical cartridges from 3M, magneto-optical cartridges from Verbatim, and Tahiti magneto-optical cartridges from MaxOptix. Each cartridge contained a 14-megabyte Adobe Photoshop file. After each test, we checked the file to see if it was still usable.

First, we conducted heat and humidity tests. We stored the cartridges in a humidity-controlled environmental chamber at 45-percent humidity for an hour at 150 degrees Fahrenheit and again at 185 degrees. Then we subjected the cartridges to an hour at 73 degrees Fahrenheit and 95-percent humidity. We also stored them at freezing temperatures for an hour.

To see how well the cartridges traveled, we packed each one in the protective covering it shipped with and placed it inside a box with packing material. We mailed the boxes to our New York office, and our colleagues mailed them back to us in California. Again, we examined the data on all the cartridges to see if it had survived the trip.

-Fred DeLisio and Kristina DeNico
had a chance to spin down.

Optical and Floptical drives act just like floppy drives: You drag a cartridge’s icon to the Trash, and the drive spits out the cartridge.

Let’s suppose you’ve decided you need the ruggedness and capacity of a 1.3-gigabyte optical cartridge or perhaps capacity of a 105-megabyte SyQuest cartridge and the speed of its drive. What if you just can’t afford the cost of the appropriate system? Don’t give up hope — driver-level compressors such as Stacker for Macintosh, from Stac Electronics, or TimesTwo, from Golden Triangle, can significantly bump up the capacity of optical and SyQuest cartridges.

For instance, 256-megabyte, 3.5-inch optical cartridges are not as widely available as the 128-megabyte variety, so swapping these cartridges with others can be a problem. If you use one of these compression products with a standard 128-megabyte cartridge, though, you’ll get greater storage capacity — and the cartridge should work with any other 128-megabyte optical drive.

**The Bottom Line**

As you can see, when it comes to removable storage, no one technology fits all. Being aware of why you need removable storage and knowing the capacity you expect to need over the next year or two will help you immensely if you’re trying to make a buying decision. And don’t let anyone force the fastest drive down your throat — for most purposes, speed should be way down on your list of priorities.

If portability is what you seek, you need a technology that offers cheap and robust cartridges: magneto-optical technology. If you don’t expect to consume more than a gigabyte or two, a 3.5-inch optical drive will probably be just fine. If you think you’ll go over 2 gigabytes, look for a 5.25-inch drive.

If you need expandable capacity, focus your attention on those technologies that offer rugged media and a capacity that matches your expected needs. Again, optical devices seem to have the edge over magnetic-based ones in terms of durability. But if you plan to store your cartridges in a controlled and secure place, magnetic-based devices such as SyQuest, Bernoulli, and Floptical drives will do just fine. If you expect to accumulate more than 2 gigabytes of data for storage over the next couple of years, 5.25-inch optical drives are your best bet.

Finally, if you need a removable-storage device because you must lock up your data at night, you need one that’s as fast as possible, because you’ll be using it just like a hard drive. For this situation, a removable hard drive is your best choice, although an expensive one — you might want to check out the cost of a standard external hard drive that you can lock up at the end of the day. Standard external hard drives are almost always cheaper than the removable variety. If security is a concern and you also want to swap data with colleagues, drives based on the MaxOptix Tahiti III or the SyQuest 105 are your next-best bet.


---

**Trends**

Since the first reels of magnetic tape were strapped to mainframes 40 years ago, computer storage has continued to get bigger, faster, and cheaper while coming in smaller packages. We’ll see the same pattern with removable storage for your Mac in the next few years.

- **SyQuest will exploit hard-drive innovations.** To see where SyQuest is going, you have only to look at where hard drives are now. Soon, 3.5-inch and 5.25-inch SyQuest cartridges will be able to hold even more data — 3.5-inch cartridges will more than double in capacity to well over 210 megabytes. Increased capacity will also improve data-transfer rates, because data on a disk will be more densely packed.

- **SyQuest will make postagel-stamp-sized cartridges.** SyQuest is in the process of developing a 1.8-inch-cartridge mechanism based on PCMCIA, the tiny port standard now used in PC laptops and Apple’s Newton MessagePad. Unlike with other PCMCIA drives, the removable portion of the SyQuest version will be the disk only, not the heads, so cartridges should be less expensive than those for other PCMCIA drives.

- **A standards war is coming for 3.5-inch optical drives.** During the next few months, two competing standards for increased-capacity 3.5-inch optical cartridges will emerge — 230-megabyte and 256-megabyte. The drives that use the new cartridges will still be able to read from and write to current cartridges. The denser media will also bring drive-speed enhancements, as will improved caching, as in the new Sony SMO-E301F mechanism.

- **5.25-inch optical cartridges will hold more data.** The 1.3-gigabyte capacity will become the high-end standard as more vendors move to the MaxOptix Tahiti III and the new Sony EDM-1300 mechanisms. These mechanisms are compatible with each other and with other 1.3-gigabyte mechanisms that will come to market during the next few months. A 2.6-gigabyte cartridge is also in the works.

- **Sony will introduce a small, inexpensive, removable-storage device in late 1994.** MD Data, based on Sony’s consumer-audio Mini Disk technology, will employ a 2.5-inch, 140-megabyte cartridge similar to the Floptical and will be slower than today’s magneto-optical-storage devices. An MD Data drive can accept read-only, rewritable, and partially rewritable media, the latter of which contains prerecorded sections that can’t be erased.

- **Blue-light speculums will appear in 1995.** The light emitted from blue lasers consists of much shorter wavelengths than those of today’s red lasers. The use of blue lasers in magneto-optical drives will result in narrower tracks and denser data on each track of a disc, thereby increasing the capacity of magneto-optical cartridges by three to five times that of today’s. Expect to see blue lasers used in magneto-optical drives in less than two years.

— John Rizzo
Removable-Storage Systems

Table 2: Who Sells What

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<th>Vendor</th>
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<th>SyQuest 105</th>
<th>Bernoulli</th>
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Accelerate SCSI into the fast lane.

This is how you get ahead at the office. Especially if you’ve got a network file server. Or do professional-level color prepress. Or any other kind of disk-intensive work.

You simply get the SCSI JackHammer™—a RISC-based, 40 MHz NuBus® SCSI-2 accelerator board that elevates the performance of any standard Macintosh® SCSI-1 drive to unheard-of speeds. Even on a Quadra®. What’s more, there’s a path to exploit not only today’s Fast SCSI-2 drives, but the Wide SCSI-2 drives that are now available.

How fast is fast? FileMaker® saves in a third the time it takes on the current fastest hardware. Photoshop® rotates 40% faster. And 4th Dimension® exports twice as quickly. DAT backups 50% faster.

The JackHammer achieves these blazing speeds by freeing the CPU from having to oversee the drive’s I/O operations. Which means that your Mac can focus its CPU power on what it does best: processing. Not only that, the SCSI JackHammer gives you all this at a very affordable price—and one that’s even more affordable when you purchase it with an FWB drive.

Presenting the

SCSI JackHammer NuBus Accelerator Board

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## Removable-Storage Systems

### Table 2: Who Sells What, continued

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Imagine the reaction to our new PostScript Level 2 printer.

No matter what the competition says about our DEClaser™ II52, you'll swear by it. Call 1-800-DECINFO, ext. 848 to place your order or get the name of your local distributor.

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CIRCLE 39 ON READER SERVICE CARD.
Removable-Storage Systems

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CIRCLE 136 ON READER SERVICE CARD.
### Table 2: Who Sells What, continued

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These productions were converted to Windows using Director Player:
- Lotus 1-2-3 Demo
- Microsoft Project Demo
- Macromedia Showcase
- Adobe Photoshop Demo
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MACROMEDIA TOOLS TO POWER YOUR IDEAS.
Building a custom database doesn't have to mean hiring a programmer - not with one of these five database programs.

BY JAN SMITH

The most often used database program on the Mac, some say, is actually a spreadsheet program — Excel. Never mind that it isn't designed to let you easily move fields around, perform complex searches and sorts, and build custom reports and data-entry forms. It's familiar, and using it is easier than trying to create a custom database in some expensive, bound-to-be-complicated database program, right?

Not anymore. Today, even low-cost database programs offer powerful data-handling features in easy-to-use formats. The makers of these programs claim that even novices can create an attractive, functioning database within hours, without programming.

To find out how much database power can be packed into a product that nonprogrammers can set up and use, we reviewed five database programs targeted at such users. Unlike high-end products such as ACI US' 4th Dimension and Blyth Software's Omnis Seven, these programs don't include sophisticated features such as extensive programming languages, code compilers, and run-time modules for distributing finished applications. Instead, they are devised to make designing a database system as easy as selecting items from a menu.

There's a price difference too. High-end packages can cost upwards of $800. Four of the programs we tested — File Force, FileMaker Pro, Helix Express, and Panorama II — are priced at half that. And My Advanced Database lists at just $59.95.
Employee Database

Employee ID # JO 27707 B357

Last Name: JOHNSON
First Name: DAVID
Social Security #: 022-36-88
Address:
Department:
Photo ID:
Database Programs

The Contenders

Because we chose products based on target audience rather than on whether the databases were flat-file or relational, we ended up with two relational- and three flat-file-database programs. Flat-file traditionally means each database holds one category of data — such as People or Companies — and can't be linked to other databases, as opposed to the relational approach of linking many single-category data files to form a database. However, two of the flat-file products we looked at, FileMaker Pro and Panorama II, have the pseudorelational ability to look up information in other databases.

Here's a quick introduction to the five products:

File Force. File Force, from ACI US, is the most substantial program we looked at. It's a subset of ACI US' 4th Dimension, created by removing the programming language and the runtime modules, and it retains the look and feel of its ancestor (as well as 4D's relational abilities).

FileMaker Pro. Long dominant among Mac flat-file-database programs (and a player in the Windows arena as well), FileMaker Pro, from Claris, has a simple, streamlined interface that reflects its developers' intent to keep the product from moving into the high-end relational-database market. Still, it's powerful enough to be the basis of simple commercial applications.

Helix Express. A lower-priced successor to Double Helix, this program from Helix Technologies has a radically different approach from the other programs we looked at. Its unique terminology and icon-based interface are intended to make its relational capabilities accessible to a wide range of users.

My Advanced Database. My Advanced Database, from My Software Company, is inexpensive and flatly flat-file, but it has a surprisingly extensive feature set.

Panorama II. ProVUE's Panorama II is designed for efficiency rather than good looks. It uses a table layout to get you going quickly, and its RAM-based approach is designed for fast searches and sorts.

The Tests

To put these programs through their paces, we invented a small consulting firm called Sullivan Engineering and built and used three simple databases — employee, customer, and invoice — for it. We evaluated how easy it was to do these basic tasks in each program:

- Define data files.
- Define database relationships.
- Create entry forms and reports.
- Access and maintain data.

Two of the flat-file products are pseudorelational — they can look up information in other databases.

In addition to evaluating ease of use, we looked at a sampling of performance issues, such as sort speed and file size.

Field Trials

The first task in setting up any database is defining the fields you want it to contain — for example, our employee database contained fields for employee ID, first and last name, hire date, birth date, and so on. You also need to define what type of data goes in each field (such as text, numeric, date, or picture) and specify whether you want the database to automatically calculate, supply, or format the values.

Same Goal, Different Path. File Force, FileMaker Pro, and My Advanced Database all offer similar and easy-to-understand ways to set up fields: You type in a sequence of field names, specifying each field's properties by selecting from options in menus or field-description dialog boxes.

Panorama II, on the other hand, opens each new database in a columnar format, with letters in place of the field names across the top; you replace each letter with a name when you define the rest of the field's properties. Although the columnar format offers a preset layout that makes it easy to quickly enter some data (one row per record) and print simple reports, we found using it a slightly awkward method for field definition. If you want more than ten fields, you need to add columns — and Panorama II's default is to insert the field before the last one you added rather than at the end.

The icon-based Helix Express has a radically different method of defining fields, one we found unintuitive. To get to the appropriate window for defining fields, you must define a relation (Helix's name for a data file), by dragging a relation icon into Helix's main window. You double-click on this icon to open a relation window, into which you drag field icons and name them, opening three dialog boxes to set the field's type, format, and validation properties. To complicate matters, some fields are represented by the abacus (calculation) icon instead of the field icon and the relation window can also hold icons that represent templates (forms designers), views (actual forms), indexes, and queries — with no graphical clues besides icons to help you make sense of all this.

Easing Data Entry. Most of these programs offered all the options we needed for easing or customizing data entry in particular fields. Each program provided ways to create masks, or formatting specifications (so that telephone numbers, for example, are automatically formatted with parentheses and a hyphen), set up pick lists
(so users can choose from several predefined values for a specific field), and create calculated fields.

File Force and Panorama II provide several ready-made input masks, but FileMaker Pro and Helix Express require you to create masks by hand. My Advanced Database includes only one mask, for telephone numbers, but it has an interesting extra feature: it provides a link to the program’s auto-dialing feature.

In addition to its input masks, Panorama II offers easy pick lists and a lookup function called Clairvoyance that’s unique among these programs. When Clairvoyance is turned on for a field, the program searches the database for previous entries that match the string of characters you’re entering and completes the entry for you. Clairvoyance can be convenient if you have only a few choices, such as cities or part names, or if you want to ensure data consistency, such as always having a company spelled the same way. If you accidentally enter values you don’t want, you can turn the feature off.

Creating calculated fields in these programs is generally straightforward — you compose a formula by selecting fields and operators (from basic math to complex statistical functions) from a menu of choices. Helix Express uses an unusual iconic approach once again, but here it works fairly well. You create the calculated field (represented by an abacus icon) by dragging fields, values, and/or other formula icons into the holes (called black boxes) in preset calculation tiles. Although at first it’s a bit confusing, the tiles do make it easy to see the relationships within formulas.

Helix Express is the only program that lets you attach a document (actually a pointer to a document), such as a spreadsheet, to a record and then launch the appropriate application to view the document.

FileMaker Pro and Panorama II also support some special attachments. FileMaker Pro supports sound and QuickTime movie files as well as pictures (which all the programs except My Advanced Database also support). Panorama II uses a Flash Art Scrapbook to store pictures and lets you play back sound files from within a macro.

**Relating Data**

Setting up our invoice database was a process that varied widely from program to program, because it involved using the relational or semirelational capabilities available in all the programs except My Advanced Database. We used relational capabilities, if they were available, to handle two aspects of our invoice database: multiple product orders per invoice and lookups of information from the employee and customer databases.

**One Invoice, Many Orders.** In creating our invoice database, we wanted each invoice record to have room for order information (quantity, part number, description, unit price, and total price) that could be repeated so we could record the purchase of several different items on one invoice — even though an invoice would often include only one purchased item.

In a relational-database program, such as File Force and Helix Express, this situation is handled by having the order-information records exist in a separate data file.
related to the invoice data file. Each invoice can then include any number of orders, and there's no wasted space. However, you need to set up an orders file and link it to the invoice file.

Flat-file-database programs, in contrast, require that the order-information fields be repeated in the invoice database; you determine how many repetitions are enough and how much space you're willing to risk wasting. My Advanced Database provides no special help for creating repeating fields, but the other two flat-file database programs automate the process to some degree. Panorama II creates new fields, such as Qty1, Qty2, Price1, Price2, and so forth. FileMaker Pro simply repeats and displays each field as many times as you like.

**Looking It Up.** Because we already had a database of customer information, we wanted our invoice database to be able to look up information such as customer addresses, so we wouldn't have to enter this information on each invoice. We included a company-ID field in both databases to provide a means for linking the files.

Such lookups are standard in relational-database programs, such as File Force and Helix Express. With these database programs, you're not limited to looking up data from other data files — you can also modify data in other files or even merge information from multiple data files. But these capabilities require a more complex design process than with flat-file-database programs. Both File Force and Helix Express require that all the data files to be linked be created as part of the same database — so you need to plan ahead when you set things up.

File Force uses scripts for setting up links and lets you create scripts with words (see Figure 1a) or flowcharts. Unfortunately, the scripting language is complex and the documentation isn't helpful in clarifying the syntax for nonprogrammers. We'd rather the program placed each function's syntax and name in the scripting window.

Helix Express again uses an icon-based approach — a Lookup calculation tile into which you drag the fields and data files (relations) for the lookup (see Figure 1b). The process takes concentration, because you start with the last hole in the tile and then move to the first, and it's easy to get confused about which relation you're using. The program's documentation does include models to help you, however.

Although the databases in the remaining three programs are not relational, FileMaker Pro and Panorama II each let you look up data in one database and use it in another (My Advanced Database has no lookup capabilities). For most simple database needs, such as with our invoice database, such lookups between separate databases are adequate. FileMaker Pro and Panorama II each use a simple, fill-in-the-blank dialog box to keep you from getting confused when creating a lookup (see Figure 1c). You specify the fields on which to base the link and which data to copy from one database into the other.

**Creating Forms and Reports**

After setting up the fields, you need to create layouts, or views, of the data. Usually that means at least one on-screen input form, with one record per screen, plus...
multiple layouts for viewing and printing the data.

**Flexible Forms.** My Advanced Database is the only one of these programs that doesn’t let you do much to customize input forms. It simply puts the fields you’ve entered in the center of the screen, leaving you little flexibility about how they’re arranged, and it doesn’t let you add buttons, custom menus, pictures, or macros.

Each of the other four programs includes a grid or template form, similar to that of a drawing program, on which you place the fields you want to use. Besides icons for adding fields, the programs include drawing functions, so you can add lines, boxes, colors, and graphics to your forms. We found Panorama II’s mechanisms for placing, sizing, and moving fields and graphic objects to be the most difficult of the bunch — even just lining objects up was tough.

All the programs except My Advanced Database let you add pictures and buttons. Helix Express and File Force also allow custom menus, and FileMaker Pro and Panorama II let you add macros to a macro menu — for example, you might create a macro for a frequent complex search. Panorama II has a macro recorder, but FileMaker Pro requires simple scripting. File Force and Helix Express also require scripting to create macros.

Overall, FileMaker Pro offers the best balance of efficiency and elegance for designing your own forms; placing and moving objects on its layout forms is easy, and the results tend to look better than in Helix Express or Panorama II. File Force offers an extensive design palette and a gorgeous selection of preformatted layout templates, but the templates are so sophisticated that they’re hard to customize.

The **Output Outlook.** Getting the data out of databases in these programs is surprisingly straightforward. Most of the programs offer label templates (usually by Avery-label number), simple lists, and envelopes.

Designing your own output form is a matter of placing the fields you want on a blank form. The tools and options are similar to those for designing input forms, with additional options for adding headers, footers, and page numbers. As with input forms, My Advanced Database doesn’t let you customize the format for reports.

Summaries and totals may require creating a separate field, as in FileMaker Pro and Helix Express, or simply selecting an item on a menu, as in File Force, My Advanced Database, and Panorama II.

All five programs export records to a separate text file for later import into a word processor for mail-merge. However, it’s generally easier to create each letter as a separate layout and then select and print the letters within the database program.

There are other output options as well. Panorama II offers cross tabs, charts, and graphs as standard reports; we found it the most useful program for reporting numbers, although File Force includes a graph editor that produces especially good-looking graphs. My Advanced Database makes it easy to print address data and other information in standard organizer formats.

**Putting It to Work**

To test the day-to-day workability of these programs, we checked how fast they sort records, how efficiently they use disk space, how easily they let you import data, and whether they let many users access one database.

**The Sorted Details.** To check sorting speed, we imported a 1,000-record tab-delimited file into the company database in each program and set up an index (an internal table built to position records in a particular order) on the 10-digit company-ID code. We mixed the records and timed a sort three times, shutting down the

![All the programs except My Advanced Database provide a template with drawing tools for creating custom input forms and reports, but FileMaker Pro’s is especially easy to use.](image-url)
Database Programs

system after each test to remove the records from RAM. We found that the time required for sorting varied widely within the programs (see Figure 3). Panorama II and Helix Express were relatively fast, and File Force and FileMaker Pro were somewhat slower. My Advanced Database was downright poky.

One reason for Panorama II’s speed is that the program is RAM-based, unlike the other programs. Because the active database is stored in RAM, you get faster access to data and less battery drainage if you’re using it on a PowerBook. However, you risk data loss if you lose power before you’ve saved your changes (or before the program has, if you’ve turned on the autosave feature).

Fluctuating File Sizes. We also found that database size varied widely. The 1,000-record database we imported from Excel actually became slightly smaller in Panorama II, but it expanded to more than three times its initial size in FileMaker Pro and more than twice its initial size in the other programs. If file space is tight — especially if you expect to take your database program on the road in a PowerBook — you’d be much better off with Panorama II than with FileMaker Pro.

Matters of Import. Importing data was easy with all the programs, although most require that the fields in the import file be organized in the same order as those in the destination database. FileMaker Pro wins kudos for letting you match fields in the import file and the database before you import the file.

Multiple-User Matters. If you’re planning to create a database that multiple users will access, you won’t want My Advanced Database; it’s strictly a single-user program. FileMaker Pro is the clear choice in multplatform environments, because users can share data with FileMaker Pro for Windows — and by the time you read this, FileMaker Pro 2.1, which adds Novell NetWare support, should be available. File Force, Helix Express, and Panorama II are Mac-only, but they support multiple users on Mac-based client/server networks with password-controlled access.

Deciding on a Database Program

In choosing from among these programs, you can’t escape a trade-off between abilities and ease of use. My Advanced Database supports its developers’ claim that you can build a simple database in five minutes, but the database will be limited in what it can do, and it won’t have sharp-looking forms. It’s a good, bargain-priced choice for creating quick-and-easy address books, index-card files, and other simple systems. But its lack of lookup abilities makes it easy for businesses to outgrow.

File Force and Helix Express, on the other hand, are true relational-database programs and thus the most flexible and powerful in this group — but they require more planning of your database structure and have a steeper learning curve than the other programs.

If relational capabilities (being able to change values in one data file from another, for example) are important to you, you’d do well to look at File Force. Its slick-looking layout templates and wealth of design controls let you create attractive, customized applications you may well find worth the effort. Although Helix Express is theoretically easier to use, because of its icon-based approach, we often found it more difficult — the icons are nonintuitive, and the terminology is confusing. However, if you want to attach documents to database records, Helix Express is the only way to go.

Our preference for do-it-yourselfers was for the mid-spectrum programs. FileMaker Pro and Panorama II each offer enough pseudorelational abilities (lookups and repeating fields) to handle moderately complex small-business applications as well as personal uses. And they’re clearly designed for nonprogrammers, providing fast and easy access to standard database functions.

Which to buy? FileMaker Pro has the edge in looks and ease of use, and it’s strong for multplatform use. If you’re concerned with numerical reporting features or if you want a fast and compact RAM-based database program for your PowerBook, go with Panorama II.

Jan Smith is a Boston-based writer and an associate editor for ZiffNet.
### Table 1: Database-Program Buying Basics

<table>
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<th></th>
<th>File Force</th>
<th>FileMaker Pro</th>
<th>Helix Express</th>
<th>My Advanced Database</th>
<th>Panorama II</th>
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<td>4.1</td>
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<tr>
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<td>1.2</td>
<td>2.0.3</td>
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<td>1.2</td>
<td>2.0.3</td>
<td>1.0.1</td>
<td>4.1</td>
<td>2.1</td>
</tr>
</tbody>
</table>

#### List price
- File Force: $395
- FileMaker Pro: $399
- Helix Express: $439
- My Advanced Database: $599.95
- Panorama II: $395

#### Pros

#### Cons
- File Force: Layout templates are hard to adjust. Complex. Poorly documented scripting.
- FileMaker Pro: Large file size. Unusual interface. Documentation is difficult to navigate.
- My Advanced Database: Time-consuming layout design.

#### Setup
- Ease of defining fields
  - File Force: 1
  - FileMaker Pro: 2
  - Helix Express: 1
  - My Advanced Database: 1
  - Panorama II: 1
- Extensiveness of entry options (pick lists, masking, calculated fields)
  - File Force: 2
  - FileMaker Pro: 2
  - Helix Express: 2
  - My Advanced Database: 2
  - Panorama II: 2
- Variety of attachments supported (pictures, sounds, movies, documents)
  - File Force: 2
  - FileMaker Pro: 2
  - Helix Express: 2
  - My Advanced Database: 2
  - Panorama II: 2
- Ease of creating repeating fields or subrecords
  - File Force: 2
  - FileMaker Pro: 2
  - Helix Express: 2
  - My Advanced Database: NA
  - Panorama II: 2
- Ease of creating lookups
  - File Force: 2
  - FileMaker Pro: 2
  - Helix Express: 2
  - My Advanced Database: NA
  - Panorama II: 2

#### Forms and reports
- Variety and quality of supplied templates
  - File Force: 2
  - FileMaker Pro: 2
  - Helix Express: 2
  - My Advanced Database: 2
  - Panorama II: 2
- Ease of creating custom layouts
  - File Force: 2
  - FileMaker Pro: 2
  - Helix Express: 2
  - My Advanced Database: NA
  - Panorama II: 2
- Extensiveness of design tools
  - File Force: 2
  - FileMaker Pro: 2
  - Helix Express: 2
  - My Advanced Database: NA
  - Panorama II: 2
- Availability of special report options (labels, cross-tabs, graphs, organizers)
  - File Force: 2
  - FileMaker Pro: 2
  - Helix Express: 2
  - My Advanced Database: NA
  - Panorama II: 2

#### Daily use
- Sorting speed
  - File Force: 2
  - FileMaker Pro: 2
  - Helix Express: 2
  - My Advanced Database: 2
  - Panorama II: 2
- Compactness of files
  - File Force: 2
  - FileMaker Pro: 2
  - Helix Express: 2
  - My Advanced Database: 2
  - Panorama II: 2
- Ease of importing data
  - File Force: 2
  - FileMaker Pro: 2
  - Helix Express: 2
  - My Advanced Database: 2
  - Panorama II: 2
- Extensiveness of multiuser capabilities
  - File Force: 2
  - FileMaker Pro: 2
  - Helix Express: 2
  - My Advanced Database: NA
  - Panorama II: 2

#### Documentation and support
- Helpfulness of documentation
  - File Force: 2
  - FileMaker Pro: 2
  - Helix Express: 2
  - My Advanced Database: 2
  - Panorama II: 2
- Availability of tech support
  - File Force: 2
  - FileMaker Pro: 2
  - Helix Express: 2
  - My Advanced Database: 2
  - Panorama II: 2

#### Company
- File Force: ACI US, Inc. 10351 Bubb Rd. Cupertino, CA 95014 408-252-4444 408-252-4829 (fax)
- FileMaker Pro: Claris Corp. 5201 Patrick Henry Dr. Santa Clara, CA 95052 408-727-8227
- My Advanced Database: My Software Company 1259 El Camino Real Suite 167 Monte Park, CA 94025 415-473-3600
- Panorama II: ProVUE Development 15190 Transistor Ln. Huntington Beach, CA 92649 714-992-6199
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   (415) 765-7670 FAX
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   (800) 615-1611
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   (312) 642-8975 FAX
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    (503) 223-3036 MODEM
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    (801) 456-9596 MODEM
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    (503) 284-3714
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Are you ready for desktop video? Or more important, is it ready for you?

BY LISA RUDMAN

When desktop publishing first appeared in 1985, some people dismissed it as a high-end, niche technology: Those color scanners, monitors, and printers — and all that complicated page-layout software — were just expensive toys for a handful of well-heeled designers. Desktop publishing (or, as it was soon called, DTP) wasn’t relevant to average business Mac users, right?

Wrong. DTP has become an ongoing revolution that brings document production of all kinds out of the service bureau and into your office, where it’s cheaper and easier to control. Now, a similar revolution promises to change the way you produce videos. It’s called desktop video (DTV). Everyone from multimedia authors in marketing-department cubicles to professional video editors in half-million-dollar editing suites has something to gain.

To help you understand how DTV can change your world, we’ve provided overviews of both the traditional video-production process and the brave new way (see Figure 1). We’ve also provided a glossary (see the “Videospeak” sidebar) of some common video jargon.
Desktop Video Systems

DTV requires an investment in hardware as well as software, and vendors are lining up to provide integrated packages to get you started. To help demystify the new crop of digital, or desktop, video-editing systems, MacUser Labs tested five of the leading contenders. Although they differ in their overall mission, all these products compress and digitize video footage from videotape; let you edit those digitized clips in a random-access, or nonlinear, fashion; and then let you export the finished piece back to videotape.

Rooted in the old off-line/on-line paradigm, the Digital F/X Video F/X Plus ($15,995 list) lets you control video decks as you would in a traditional analog on-line editing suite. The Video F/X Plus has a disk-assisted mode with which you can digitize and edit clips in a small window on the Mac for previsualization.

The Avid Media Composer 400S ($9,995 list) is the entry-level member of a family of products aimed at video professionals. The Media Composer 400S can export an EDL (Edit Decision List) to a floppy disk as well as let you produce low-resolution, full-screen presentations on your Mac that you can export to tape. Other products in the Media Composer family offer a variety of features and resolutions.

Of particular interest to multimedia media producers are the RasterOps Editing Aces Suite ($3,899 list) and the SuperMac DigitalFilm Deluxe ($5,995 list), each of which can digitize, compress, and edit video clips on the Mac and then allow you to export your presentation to tape or create an EDL for use in a traditional on-line suite.

The Avid Media Suite Pro ($9,995 list) also allows you to edit clips on the Macintosh, play them back at full-screen resolution, and export them to tape at about home-videotape quality.

Whichever product you choose, the cost of the desktop-video package is small compared with the cost of the computer system you’ll need to run it (see Figure 2).

The Torture Test

We tested these products the way you’d actually use them. We assembled a team of video and multimedia producers to use each product to create a five-minute piece. Pacific Video Resources, a San Francisco...
Figure 1: Old School/New School

The Old Way

Create low-quality dubs (copies) of your original source tapes or window dubs (copies with time-code numbers inserted in window on footage). View and edit dubs on a cuts-only off-line edit system to create a rough cut for approval (a), or to export an EDL file to disk if your system can export EDL or handwrite your edits if it can’t (b).

At on-line, use the EDL to reedit the piece, using your original source tapes (and lots of expensive video equipment), to create a polished piece, including transitions, effects, graphics, and so on.

The New Way

View and digitize selections of footage onto hard disk. Edit clips — adding wipes, dissolves, effects, and graphics — to create a highly developed rough cut, an EDL, or a final master of your piece and distribution copies directly from your hard disk.

Bay Area postproduction facility, supplied scripts and S-VHS copies of BetacamSP originals. Our piece had more than 80 elements, including transitions, effects, music, animations, graphics, and text (see the “How We Tested DTV Systems” sidebar).

Ease of installation means different things to different people. Mac users have come to expect plug-and-play installation, whereas folks from the video world are more used to piles of cables, external boxes, and VCRs. Overall, we found the installation of these products straightforward, although what each product consists of varies dramatically.

The SuperMac DigitalFilm Deluxe, with its NuBus-card/daughter-card arrangement, was the easiest to install. An external breakout box — with audio and video connectors and an encoder for exporting your edited piece to tape — connects via cable to the NuBus card, once you’ve installed the card in your Mac. The DigitalFilm Deluxe includes Adobe Premiere 2.01 editing software and Premiere’s built-in tutorial.

The RasterOps Editing Aces Suite has a similar NuBus-card/daughter-card arrangement, but it’s more modular: The daughtercard is designed to work with several other RasterOps digitizing cards and is available separately. The Editing Aces Suite consists of a MediaTime card; a MoviePak daughtercard; a breakout box for connecting VCRs; a separate encoder; Adobe Premiere 2.01; and Media Grabber, RasterOps’ own digitizing software.

The Avid Media Suite Pro was easy to install, even though it includes a compression/digitizing-board set, an AudioMedia II card for sound, and an ATTO Silicon Express SCSI-2 card for connecting hard drives. It also includes its own editing software, a HyperCard tutorial, and a helpful training video. The setup guide is useful, but the main user guide is not very thorough.

The documentation for the Avid Media Composer 400S is much better. The extensive manual provides clear warnings and hints, especially pertaining to digitizing and storage, and important points are highlighted and easy to find. Installation is straightforward as well, considering the product’s many cables and NuBus cards.

The Digital F/X Video F/X Plus, with its video connectors and cables, will seem familiar to video editors. In addition to installing a digitizing card in your Mac, you install as many as 12 cables to connect three VCRs; your Mac; and the Video F/X Plus’ external box, which contains video and audio switchers. Clear documentation and helpful tutorial tapes are provided. Video F/X Plus’ manual is clearly written, but it needs some updating. The product comes with editing software; TypeStyler, a type-modification application; and TextureSynth, a nifty texture-creation application.
Desktop Video Systems

Figure 2: When $20,000 Equals $80,000

Nonlinear DTV System

Professional VCR (S-VHS editing recorder/player): $6,000
The quality of your source material is crucial, so you'll want as high-end a VCR as you can afford. Using one deck instead of the three you'd need for traditional analog editing saves money. There's also less wear and tear on the VCR, because you use it only to play footage into the Mac and record your edited piece, instead of searching, pausing, and shutting as you would with linear editing.

Audio speakers: $400 for two
We highly recommend portable, self-amplified stereo speakers for audio editing.

Backup system: $1,500
Of course, you'll want to back up your hard disks as a safety measure. But backup systems also provide a method of archiving video elements your hard disk alone can't accommodate.

Figure 2: System configurations and specifications vary, but you can expect to pay $20,000 to $35,000 for a nonlinear DTV Mac system. It sounds like a lot until you consider the cost—$80,000 to $100,000—of a traditional linear A/B Roll editing suite.

Grab It, Make It Small

To bring video into your Mac, you must convert the signal from analog to digital and squeeze the resulting data down to a size the Mac can handle. Each of the products we looked at captures only 30 of the 60 fields of video displayed each second. Some of the products also capture only smaller video windows, and therefore less data, even though they can display at full screen size.

There are obvious trade-offs between file size and quality, and the best products give you a variety of compression settings. This variety lets you choose a setting based on whether you're creating a draft or final version of your piece or on how you will distribute it—on CD-ROM or on tape.

The RasterOps Editing Aces Suite offers compression ratios from 5:1 to 120:1; the SuperMac DigitalFilm Deluxe offers only ratios from 25:1 to 50:1. Using the Least compression setting, a one-minute, 320-x-240-pixel clip captured with the Editing Aces Suite occupied 11 megabytes; with the DigitalFilm Deluxe it occupied 16 megabytes.

Avid's Media Composer family gives you five compression/resolution choices. The model 400S offers only the two lowest-quality settings, which are fine for rough cutting and generating an EDL. At the lowest-quality setting, our one-minute clip occupied about 21 megabytes.

The Digital F/X Video F/X Plus digitizes at one extremely low resolution. We expected a clip captured with it to occupy the least disk space, but our one minute of digitized video filled approximately 23 megabytes.

The Avid Media Suite Pro offers only one, high-quality compression setting, which consumed 68 megabytes per minute.

Talkies Too

In QuickTime, audio is not compressed, so it can comprise a large part of the data stream when you're digitizing. The result is that including high-quality audio can have a serious impact on the quality of the video portion. QuickTime makes room for audio data by dropping video frames if necessary. Additionally, the higher the sound quality, the more hard-disk space you need:

One minute of 8-bit, 22-kilohertz sound occupies about 1,328K in mono and 2,640K in stereo; one minute of 16-bit, 44-kilohertz sound...
occupies approximately 5,232K in mono and 10,448K in stereo.

The RasterOps Editing Aces Suite supports low-resolution 8-bit audio as well as 16-bit CD-quality stereo sound. Unless you have Apple's new Sound Manager 3.0 and QuickTime 1.6, however, your Mac can play back only mono sound with QuickTime movies and 8-bit stereo otherwise. Both Avid products we tested avoid this snag entirely by piping sound through the AudioMedia II card. The Avid Media Suite Pro, however, digitizes only at the highest-quality level, consuming lots of disk space. The SuperMac DigitalFilm Deluxe also offers stereo sound but of a lower quality.

**Order from Chaos**

Nonlinear editing is great, but only if you know where your clips are. All the products we tested let you name a digitized clip as you save it, but each product handles logging — organizing, sorting, and recording comments — differently.

Adobe Premiere 2.01, the editing application used by both the RasterOps Editing Aces Suite and the SuperMac DigitalFilm Deluxe, has only basic logging functions. As each clip is digitized, it’s represented in the project window as a thumbnail image of the clip’s first frame. Premiere automatically lists essential information, including the clip’s duration and screen dimensions.

The Video F/X Plus editing software lets you export your log to a third-party database program, but that is no match for the built-in customizable logging and sort/sift retrieval features of Avid’s editing software.

**Putting It All Together**

After you’ve digitized and organized your clips, it’s time to edit them. Editing consists of trimming...
Desktop Video Systems

clips to the length you want, putting them in order, applying transitions (dissolves, wipes, effects) between them, and adding graphics or text.

The *time line*, or *construction window*, is the assembly point for your piece: You drag and drop your clips and other elements into it. All the editing software except Digital F/X’s for the Video F/X Plus — which uses a hierarchical, or “stacked,” time line (see Figure 3) — uses a ribbon or track-style time line (see Figures 4, 5, and 6). With a track-style time line, you place video clips in a video track and audio elements in a separate audio track. With a hierarchical time line, you can place elements anywhere within the time line and the elements have identifiers (for video, audio, graphics, and so on).

With the hierarchical viewing style, elements you’ve overwritten are still displayed but they’re grayed out, although you can easily move them to the active layer if you change your mind. Although it offers flexibility, we think this method can be confusing for complex projects. More disturbing was the frequency with which the Video F/X Plus editing software crashed on our test systems — a two-year-old product ought to be more stable.

Adobe Premiere uses Macintosh-standard dragging and dropping for placing and arranging clips in its time line (see Figure 4). However, we preferred the speedy time-line navigation, helpful customizable keyboard shortcuts, and simpler and more powerful interfaces of Avid’s software.

The editing software in all the products we tested provided various time-line *ripple* functions, letting you remove a section from the middle of a sequence and close the resulting gap — something you just can’t do with tape. Trimming clips is also important, and although Premiere’s click-and-drag trimming method is very Mac-like, the Avid software’s highly visual Trim mode wowed us with its functionality.

Figure 3: Video F/X Plus Software Interface

Time lines are an area of personal preference, so we suggest you take any of these interfaces for a serious test drive. We thought the Video F/X Plus software’s time line was cluttered, and changes in clip position created confusion. One advantage of this hierarchical arrangement is that you can create layers of video-clip choices.

Figure 4: Adobe Premiere Interface

The Adobe Premiere 2.01 interface used by the SuperMac DigitalFilm Deluxe and the RasterOps Editing Aces Suite is big, bold, and the most Mac-like in the way clips are manipulated in the time line, or construction window. It has superior graphics and effects tools plus flexible audio controls. By the time you read this, Premiere 3.0 will have made a good thing even better.
The Media Composer software, version 4.5, that comes with the Avid Media Composer software interface has a more spacious media because it has separate windows for source clips and recorded clips.

**Powerful Transitions**

One of the advantages of DTV over traditional off-line editing is that you can perform transitions, such as wipes, where you once could only afford to do cuts. The Digital F/X Video F/X Plus performed impressively smooth dissolves and wipes when it was constructing transitions on actual videotapes, but only crude approximations of the transitions appeared on the Mac screen.

The Media Composer software performed smooth digital dissolves, but it doesn’t offer wipes or effects. You can add Avid’s Pre-Visualization package #1, which contains 34 wipes plus motion control, for an extra $4,500.

Adobe Premiere graphically displays numerous dissolve, wipe, and effect options as animated icons in an effects window. Unfortunately, Premiere is slow in allowing you to preview its transitions.

The Media Suite Pro editing software (see Figure 5) offers fewer effects but previews them more quickly than Premiere does.

DTV systems should let you include graphics, titles, and animations within presentations. Adobe Premiere 2.01 has extensive graphics capabilities, including sophisticated Photoshop filters. With the Media Suite Pro software, graphics creation is limited to a built-in titler, but you can import PICT files and PICS animations. It doesn’t have the graphics/effects bells and whistles Premiere does, but it provides fast and flexible titles; offers smooth effects; and supports imported graphics and animations with little of the aliasing, tearing, or other artifacts common in the rest of the products.

The Video F/X Plus software includes a rudimentary graphics-creation feature, but it can import PICT, PICT2, EPS, or EPS Text formats and it has good analog graphics and title quality. The Media Composer software has no native graphics capabilities, and as with that of the Video F/X Plus, you’re expected...
Desktop Video Systems

to create your graphics in another application and import them.

Once you’ve completed your project, you’ll want to distribute it. Currently, using videotape is the most economical way to do this. The Digital F/X Video F/X Plus has no trouble making a good tape, because it’s designed to make a master tape by assembling your source tapes.

For the remaining products, you must export your finished piece through a digital-to-analog encoder to put it on tape. We played all the tapes for a jury of video and computer professionals to see which video systems had produced the best results. Both the RasterOps Editing Aces Suite and the SuperMac DigitalFilm Deluxe had produced noticeably jerky motion from time to time — more frequently in the case of the DigitalFilm Deluxe.

The jerkiness could be attributable to QuickTime itself. QuickTime moves data in small chunks, much as the Finder does. It’s more difficult to push through lots of little data chunks than is fewer larger chunks. The SuperMac DigitalFilm Deluxe tries to get around this problem by creating its own export plug-in for Premiere, which bypasses QuickTime for playback. Both Avid systems bypass QuickTime as well. Our jury felt that the Avid Media Suite Pro produced the best overall video and audio quality.

Decisions, Decisions

Even as DTV features and video-output quality continue to improve, EDLs give you the option of easily reediting from your original tapes.

Premiere’s EDLs performed well, except for a few glitches, such as incorrect descriptions of transitions. The Video F/X Plus software supports more EDL formats than Premiere does and it did well on the transitions, but it didn’t list some fade-ups/fade-downs. The Media Composer software’s EDL performed well. The Media Suite Pro software we tested couldn’t export an EDL; however, we found that the software’s project file could be read by the Media Composer software to create an EDL. (Version 2.0 of the Media Suite Pro software, which began shipping after we completed our testing, can export EDLs.)

Get the Job Done

The future of DTV lies in fully digital desktop video systems. If you’re a video professional about to replace your old analog off-line system, you should seriously consider the DTV realm. But be clear about what you need a product to do, in view of the way you’re currently working. Because of storage constraints and costs, these products are currently best suited for short pieces. If you’re a multimedia author wanting to take advantage of the power of video, consider the total cost of DTV, including a Quadra, lots of RAM, storage, and a backup system.

Table 1 Criteria

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<thead>
<tr>
<th>Criteria</th>
<th>Description</th>
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</thead>
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<tr>
<td>List price</td>
<td>The vendor’s suggested retail price.</td>
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<td>Street price</td>
<td>The average selling price through mail order or at dealers surveyed across the U.S. in June 1993.</td>
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<td>Control protocols</td>
<td>The protocols the editing application supports to control video recorders.</td>
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<td>SMPTE-time-code capture</td>
<td>Does the editing system have a means of reading in time code from your source tapes?</td>
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<td>QuickTime in/out</td>
<td>Can you import and export QuickTime?</td>
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<td>Image-quality control</td>
<td>The image variables you can alter.</td>
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<tr>
<td>Graphics handling</td>
<td>The file formats the editing software supports.</td>
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<td>EDL-export support</td>
<td>Does the video-editing application allow you to create and export an Edit Decision List?</td>
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<tr>
<td>Transitions/effects</td>
<td>The total number of transitions and effects the editing application offers.</td>
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<td>Preview transitions/effects</td>
<td>Does the editing software let you preview your transitions and effects?</td>
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<td>Highest audio resolution</td>
<td>The highest-quality audio supported, given in terms of bit depth and sample rate.</td>
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<td>Number of audio tracks</td>
<td>The number of audio tracks the editing application provides.</td>
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<td>Audio controls</td>
<td>The audio variables you can adjust from within the editing application.</td>
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<tr>
<td>Digital scrubbing</td>
<td>Does the editing system let you read back and forth over small portions of video and audio to locate precise editing points?</td>
</tr>
<tr>
<td>Configuration</td>
<td>The vendor’s recommended system configuration.</td>
</tr>
</tbody>
</table>

Lisa Rudman is a video producer/editor in Oakland, California. Her company, Activision, specializes in videos for businesses and nonprofit groups and is catching the DTV wave. Julian Steinberg is a San Francisco-based multimedia developer. Jeffrey K. Mistead, a MacUser project leader, managed the testing for this report.

The Bottom Line

Given all the “betaness” of many of the products we tested for this report and their generally disappointing video-output quality, we suggest you wait before diving into this new field. Better image quality, more-stable software, and probably lower prices will quickly make the batch of products tested here obsolete.

On the other hand, multimedia authors who can afford these products with the computer systems they require should consider the RasterOps Editing Aces Suite ($3,899 list, $3,615 street). Its variable compression settings and the quality of its playback to screen, along with the bundled Adobe Premiere 2.01’s great graphics and effects, make it a powerful multimedia tool.

If you’re a professional video editor who can’t wait for the next generation of products, your best bet is the Avid Media Suite Pro ($9,995 list, $9,500 street). Its superior editing software, speed, and image quality were the best of the bunch. And with the EDL support and 60-frame-per-second capture added in its most recent release, Media Suite Pro has just become even better.
<table>
<thead>
<tr>
<th>Feature</th>
<th>Avid Media Composer 400S</th>
<th>Avid Media Suite Pro</th>
<th>Digital F/X Video FX Plus</th>
<th>RasterOps Editing Aces Suite</th>
<th>SuperMac Digital Film Deluxe</th>
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<td>List price</td>
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<td>$9,995</td>
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<td>Pros</td>
<td>Excellent EDL support.</td>
<td>Excellent editing</td>
<td>Highest-quality video</td>
<td>Inexpensive. High-quality</td>
<td>Good software bundle.</td>
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<td></td>
<td>Best editing software.</td>
<td>software. Fast.</td>
<td>output. Excellent EDL</td>
<td>audio. Good editing</td>
<td>Good editing software.</td>
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<td></td>
<td></td>
<td>Good output to tape.</td>
<td>support.</td>
<td>software.</td>
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<td>Cons</td>
<td>Expensive upgrade</td>
<td>No EDL support.</td>
<td>Poor digital video.</td>
<td>Took a couple of card</td>
<td>Requires Quadra 950, disk</td>
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<td>required for effects</td>
<td>Only one compression</td>
<td>Compatibility problems.</td>
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<td>No time code in.</td>
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<td>508-851-0418 (fax)</td>
<td>508-851-0418 (fax)</td>
<td>415-949-6711 (fax)</td>
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*Version 2.0 of the Media Suite Pro software, now shipping, can export EDLs.

* Depends on attached VTRs.

MacUser Bottom Line pick
They put a big red crayon in your hand.

Now what? Aa Bb Cc Dd Ee Ff. Again and again. Is it K or X? May I go to the bathroom, please? Reeeecess!

But slowly letters became words, words became sentences, sentences became paragraphs, and paragraphs became a report on Gems of the World. C+.

Later, you tried $10 words. Sometimes they worked. Sometimes you were accused of malapropism. Mala-what? But somehow after four years of English Comp and a million term papers, you finally got it.

And nothing can keep your writing more articulate and concise than the new WordPerfect® Mac 3.0. Twenty-seven innovations make it the most comprehensive, most Macompatible® word processor anywhere. Class dismissed.
The most complete hand scanning system you can find in a box. Or a store. Or in town. Or in the world for that matter.

Quickly scan text and images into your computer with the OmniScan 256 grayscale scanner. OmniScan produces true 8-bit grayscale at 400 dpi and features advanced illumination technology and solid tracking for the most accurate scanning.

Scan directly into any application with OmniPage Direct. Direct employs Caere's AnyPage technology to provide the most accurate OCR possible. Font sizes, styles, and formats are no problem for OmniScan Direct's OCR.

Image Assistant GS makes grayscale image editing and enhancement a snap. The "Assist Mode" displays sample image variations right on your computer screen. All you have to do is choose the one that works best for you. And to help you add your own personal touch to images, Image Assistant GS features a complete set of editing tools and features.

With OmniScan, you can send, receive, OCR, and compress faxes right from your computer using Caere's FaxMaster technology. All you need is a fax modem. OmniScan does the rest.

Caere's full integration of grayscale scanning, OCR, image editing, and fax capabilities make OmniScan the most complete hand scanning solution found anywhere. Now that you have discovered it, here's how to locate the dealer nearest you:

1-800-535-SCAN.

Featured at these resellers:

[Logos for Micro Center, Mac Warehouse, Computer City, and Caere]

Caere and OmniScan are registered trademarks of Caere Corporation. The Caere logo, OmniPage Direct, AnyPage, Image Assistant, and FaxMaster are trademarks of Caere Corporation. © 1993. All rights reserved.

CIRCLE 120 ON READER SERVICE CARD.
Child's play: Composing 3-D scenes can be time-consuming — creating objects, placing them in tableaux, adjusting light sources and shadows — when it could be as easy as arranging a dollhouse or a diorama. Pixar’s Showplace lets you do just that: You assemble predesigned 3-D models into scenes, apply textures and effects, and then render them into compositions. Showplace 2.0 is more flexible than its predecessor. It supports DXF (AutoCAD) models in addition to those in its own RIB (RenderMan) format, and it sports a plug-in interface for creating adjustable models — such as staircases, windows with blinds, and 3-D type — directly within Showplace. You can edit Pixar’s Looks library of textures and surfaces with Glimpse, a bundled application that also lets you create new Looks from TIFF or PICT files. 510-236-4000. $695 ($495 on CD-ROM). ¥ To add the illusion of 3-D without the hassle, try LetterGraphics, a collection of EPS letters from NOV A Cube. Once placed in your page layout or illustration, these beveled letters can be scaled, skewed, or otherwise transformed. Useful for presentations too, the letters are sold as separate alphabets for $39.95 each ($29.95 for uppercase only), and you can select from 22 styles in 12 colors with silver or gold beveled edges. To be honest, you can always change colors in your illustration program, and if you work in gray scale, it doesn’t matter which color you choose. 800-728-5052 or 302-655-4486.

Express, oh: Feeling uninspired? What you need is some spunky dingbats, such as the Acme collections, from FontHaus. The AcmeAnimals and AcmeServices fonts are digitized versions of Akemi Aoki’s cut-paper illustrations. Acme-Expressions may become the ’90s equivalent of the smiley face. Have a nice day. 800-942-9110 or 203-367-1993. $49 each.

By Pamela Pfiffner

Framed: Adding nice borders to layouts can be an effective design strategy (just ask magazine designer Roger Black), but the borders that come with Aldus PageMaker and QuarkXPress can get pretty boring. Importing clip-art borders is always an alternative, but isn’t there an easier way? Funny you should ask. FRÆMZ Proportional Borders, from ShadeTree Marketing, is a set of 101 borders for QuarkXPress, where it lives in the XPress Preferences file, or PageMaker, where it’s accessible as an Addition. Try bouncing your text off the trampoline frame. 800-678-8848 or 602-279-3713. $99. ¥ For a different approach, you should check out BorderFonts, from General Glyphics. This set of 20 border designs loads as fonts, but what makes the designs easier to use than other type ornaments is that frame pieces are found in the same grid of keys, which means you don’t have to run all over the keyboard (with numerous trips to Key Caps) to locate the left corner, for example. Use straight pieces as rules too. 800-854-4061 or 214-350-0952. $79.

By Pamela Pfiffner
You'd Be AMAZED At What Goes Into a UMAX UC1260 Scanner.

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CIRCLE 93 ON READER SERVICE CARD.
Scanning the Globe

Does canned clip art look too flat?
For a new dimension in graphics, try scanning the objects around you.

By Janet Ashford

Flatbed scanners, like photocopy machines before them, were designed to scan flat, paper originals. But in offices and studios across the country, it wasn't long before people started playing around by putting objects (including parts of their bodies) on the machines' glass platens to create highly personal images. Compared with photocopiers, where hard-copy output must be pasted into a publication, experimenting with scanners can be especially rewarding, because you can incorporate scanned three-dimensional objects into your publication as illustrations, sometimes even in place of photographs.

Applying colors and special effects in a paint or image-editing program further transforms mundane objects into works of art. Use the scans as color or gray-scale images. Convert scans to line art, posterizations, and duotones, and crop and silhouette them. Combine them with other images, or use them as textural backgrounds or as initial caps.

Why try scanning real-world objects? Compared with using prepackaged clip art, it's available, it's unique, and it's cheap. All it takes is a scanner and some imagination. The possibilities are as endless as the array of objects you find around you.

As the figures that follow show, everyday objects take on new dimensions when they're scanned and enhanced in an image-editing application. A wide variety of materials lend themselves to scanning.

How to Scan

Scanning three-dimensional objects requires more care than scanning flat art. Follow these tips when putting objects on your scanner:

- Consider the thickness of the object. Your scanner is designed to reflect light from a flat surface, and the parts of thick objects farthest away from the glass will be out of focus. This can result in an interesting effect, but if a sharply focused look is your goal, then be sure to work with thinner items.
- Beefy objects also prevent the scanner lid from closing. This doesn't affect the scan quality per se, but the open lid allows in too much light. The result is a dark background for your object. You can remove the background in an image-editing application, or you can construct a temporary lid by setting a piece of white cardboard raised on shims on the platen.
- Three-dimensional objects cast shadows, but the shadows that result from the scanner's light source as it moves up the glass are not the same as those cast by a directional light. To get more-realistic-looking shadows, add them in an image-editing application. Two programs, Studio/32, from Electronic Arts, and PixelPaint Professional, now sold by Pixel Resources after a stint with SuperMac Technology, offer automatic drop-shadow functions, mainly for use with type, but the results are solid-toned and fairly harsh. Adobe Photoshop's masking functions create softer-looking shadows.
Keeping spherical or cylindrical objects stationary on the scanner glass can be challenging. To prevent items from rolling off the scanner bed, place small strips of art board around the edges. You can incorporate this frame into your design or edit it out later in an image-editing application.

Even if you're planning to use the image in gray scale, scanning it in full color and then converting it may be a good idea. The method used for converting color to gray scale in an image-editing program such as Adobe Photoshop may be better than that built in to your scanner.

Don't forget the oft-repeated scanning-resolution formula. To keep the file a

Theme and Variations

Plant materials are especially good subjects for scanning, because they tend to be thin and have wonderful variety and texture. After scanning some silk flowers at 266 dpi, I opened the file in Adobe Photoshop and boosted the color saturation and the contrast to about 25 percent, to deepen the color (a).

For a line-art variation (b), I converted a detail of the flower scan to gray scale and then applied the Photocopy filter from Aldus Gallery Effects, Volume 2.

For a different effect, try Photoshop's posterization controls, which convert gray-scale or brightness values to a specified number, remapping the pixels to the closest set value. For example, when you set Posterize (under Map, on the Image menu) to four levels and apply it to a 256-level gray-scale image, it produces black, white, and two shades of gray (c). But a three-level Posterize applied to a color image results in more colors than the specified number (d), because colors of different hues can have the same saturation and thus the same gray-scale value. Another option is to add color to the posterized gray-scale flower: I painted out unwanted background with white, converted the image to RGB mode, and used the Levels command (under Adjust, on the Image menu) to add purple (e).

To create a PostScript version of the image to be used in a greeting card (f), I first softened the gray-scale posterization by applying Photoshop's Blur filter several times and painting out some of the smaller details to reduce the number of control points. I then auto-traced it in Adobe Streamline and colorized it in Aldus FreeHand.
size of your scanned-image manageable, scan the object at a resolution 1.5 to 2 times the anticipated printed line screen, which is typically 133 to 150 lines per inch for magazine work, and scan at the actual size at which the image will be used. (If you scan a 2-inch object at 266 dpi and then enlarge it to 4 inches in a page layout, the effective resolution will drop to 133 dpi). For example, *MacUser* is printed at 133 lines per inch, so we scanned the objects at a resolution of 266 dpi at 100-percent size. To resize some of the larger images to their anticipated final size, we used Adobe Photoshop’s Image dialog box to change the image size without changing the resolution.

* From Marbles to Hexagons
  Scanned foods make interesting stand-alone illustrations and background textures, but you have to be careful. I placed yellow popped corn on the scanner glass; scanned it (a); and then opened the scan in PixelPaint Professional, where I applied the Emboss filter with the foreground color set to a yellowish beige. This filter applies a raised, three-dimensional look, which in this case produced a texture similar to rough plaster (b).

- From Popcorn to Stucco
  Scanned foods make interesting stand-alone illustrations and background textures, but you have to be careful. I placed yellow popped corn on the scanner glass; scanned it (a); and then opened the scan in PixelPaint Professional, where I applied the Emboss filter with the foreground color set to a yellowish beige. This filter applies a raised, three-dimensional look, which in this case produced a texture similar to rough plaster (b).

- Creating a Marbled Texture
  Textured papers produce elegant patterns when scanned, but surprisingly good results come from household materials such as crumpled aluminum foil. Its shiny surface reflects the scanner’s red, green, and blue light sources, resulting in a bright, hard-edged pattern of the three colors plus black and white (a). For a marbledized effect, I first decreased the contrast to make the colors more pastel and then twice applied Photoshop’s Ripple filter (under Distort, on the Image menu). I cropped the image to its upper right quadrant, saved it as a TIF, and then imported it into FreeHand to create a traditional book cover (b).
When you scan real-world objects, cleanup involves more than just touching up the image. Depending on what you’re scanning, it also means literally cleaning up the scanner. Scanners weren’t designed for liquids or other products that can damage sensitive electronic circuitry, so scan at your own risk.


Creating an Initial Cap
You’ve probably seen books or posters of “found alphabets” — things such as tools, artists’ supplies, natural objects, even the patterns on butterflies’ wings — that follow the shapes of letters of the alphabet. Scans of such objects can make effective initial caps for an article that lacks other illustration, especially if the objects tie in to the subject matter.

Another idea is to mask a scan of objects into a letter shape. To make a decorative initial cap for a matchbox design, for example, I scanned kitchen matches and opened the scan in Photoshop, where I increased the canvas size and rotated it to a horizontal format (a). I imported the scan into FreeHand, where I typed an M in Helvetica Black, stretched it to fit over the scan, converted it to outlines, and then pasted the scan into the letterform. Additional type and a background completed the matchbox design (b).

Found Mandalas
Photoshop filters can transform scans of everyday objects into something much more interesting, such as these mandalas. The result is a striking example of the interplay between art and life. Mandalas are symbols of wholeness and are used as focal points for meditation in the East; they also occur frequently in nature and in the ornamentation of everyday objects around the world. I looked around the house for examples of mandalas — circular designs that are divided, usually, into four (or sometimes three, six, or eight) segments. I unearthed the following (top row, from left to right): an acorn squash, a pinecone, a doll’s Mexican hat, and a basket lid.

After scanning and cropping these, I transformed each raw scan into an illustration by applying filters from Aldus Gallery Effects: Classic Art, Volume 2. I used the following filters (bottom row): Accented Edges (acorn squash), NotePaper (pinecone, with the foreground and background colors set to red and purple), Stamp (Mexican hat, with the white areas filled with color), and Bas Relief (basket lid, with the foreground color set to purple).
MicroNet's Raven-800. Disk Array Power For The Quadra 800/840av.

MicroNet is the first to bring disk array power to the Quadra 800/840av. Using a pair of fast spindle disk drives, the Raven-800 transfers up to 6.2 MB/sec of sustained data with average access as fast as 4 ms.

Disk arrays can improve performance up to 400 percent over standard drives. Combine MicroNet's Raven-800 disk array with the speed of the Quadra 800/840av and you have an unbeatable system for audio recording, full rate digital video, and graphics applications such as PhotoShop.

Cost effective two drive disk arrays are available in capacities of 1030 to 5560 MBytes and are expandable to more than 38 GBytes. MicroNet offers Raven upgrade kits for existing MicroNet or factory installed Apple 500 or 1000 MByte drives.

Built on award winning technology, the Raven-800 takes full advantage of Apple's existing hardware. One drive connects to the native SCSI port of the Quadra, and one connects to a MicroNet NuPORT-III, SCSI-2 host adapter. Together, these two drives create a fast, parallel, 16-Bit data path.

MicroNet offers a family of internal data storage systems for the Quadra 800/840av. Included are SyQuest removable systems, rewritable optical drives, and DAT backup systems. We back you with our 24-hour tech support and Over-Night-Exchange service.

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CIRCLE 114 ON READER SERVICE CARD.
It's a wild world, and here's how it was created. Original pencil sketch of the Mandrill is scanned for use as a template. Sketch is now traced with Pen tool. Two shapes that compose ear are constructed with Divide Fill tool. Mane is built with three tools: Star filter creates a basic jagged shape; Scribble filter randomizes star points; and Twirl filter alters star point angles. To create eyes, three colors are selected and placed in circular gradient. Multicolor gradient generates this medley of tones with less banding. Pathfinder tool is used in headline to isolate and create shapes occurring where areas intersect, permitting them to be colored separately. Clicking on placed images can automatically launch Adobe Photoshop and its powerful tools. Paint Style Box (not shown) allows quick and easy selection of commonly used colors. This entire ad was created in Adobe Illustrator 5.0. Illustration by Ron Chan.

Forgive us if we howl a bit, but Adobe Illustrator 5.0 software has so much grace and power, it's hard to call it an upgrade. A new interface helps you manipulate tools with greater freedom, ease and precision. Adobe Illustrator 5.0 is the first drawing application that gives you Plug-in filters to expand your options. Powerful new Pathfinder technology provides precise control of intersecting areas or overlapping objects. Other surprises include Unlimited Layers, Edit in Preview, Multiple Undos, and a Pressure Sensitive Pen tool to create stylized paths and calligraphic effects. More discoveries await you in Adobe Illustrator 5.0. Remember, it's a jungle out there, and here's what you need to prevail. Call 1-800-833-6687, Dept. L, Ext. 1101 for information and your nearest Adobe Authorized Reseller. If you can dream it, you can do it.
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No wonder MacWeek recently downgraded Persuasion to a three-star rating, while ranking us first in the category. And why the editors at Publish Magazine said, “Its outstanding power, versatility, and simplicity make it an excellent buy.”

Astound sells for just $399, and with our special limited time competitive upgrade, you can switch today from any current presentation product for only $99†.

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Either way, call us for all the details at 1-800-465-3375. Then see for yourself where Persuasion ends and Astound begins.

†Recently, MacUser gave Astound 4½ mice, out-ranking Persuasion.

GOLD DISK

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Circle 45 on reader service card.
Cool Packaging in a Hurry

Creating innovative packaging is fast and easy when you use digital tools such as Adobe Photoshop, Aldus FreeHand, QuarkXPress, and a Leaf Systems digital camera.

By Janet Ashford

It's smart to use digital design tools to produce packaging for digital design tools. Not only does the work go faster but also the medium truly becomes the message. Such was the case for packaging created by Imprimatur Designs for a set of seven Scitex XTensions, tools that aid design and production with QuarkXPress. Scitex America asked the company, based in Cambridge, Massachusetts, for a turnaround of just seven weeks, so Imprimatur decided to design the packaging by using the products themselves along with other state-of-the-art hardware and software.

Michael J. Sullivan, founder and creative director of Imprimatur (now Haywood & Sullivan), designed the package—a colorful envelope that could be folded into a desktop disk holder. The package designs and type were produced in Aldus FreeHand and incorporated photo montages created by Schlowsky Photography, of Weston, Massachusetts. Bob Schlowsky used a Leaf Systems digital camera to record still-life shots directly to disk. While the photo shoot was still in session, Lois Schlowsky edited the images with Adobe Photoshop on a Quadra 900 and with HiRes QFX on a 486 PC, exchanging files in Targa format. Sullivan and the Schlowskys worked together during the shoot and got the images they needed into digital format in three days, instead of the seven to ten days required in a conventional photo shoot with film processing and image scanning.

While Lois Schlowsky continued to refine the photo montages, the team at Imprimatur worked in Aldus FreeHand to complete the package designs, create disk labels, design covers for the manuals, and draw instructions for folding the package into a disk holder. They used QuarkXPress to lay out the 52-page manuals, using some of the Scitex XTensions, including Grids & Guides, Fractions, Image Tools, and Document Reports. Color files were proofed on an Iris inkjet printer, and final color-separated film was output through a Scitex Dolev imagesetter. Having started on October 21, the team finished the packages by January 4, proving that talented artists and designers using digital technology can create sophisticated products in a hurry.


Imprimatur's design for the Scitex XTensions packaging incorporates an origami paper-folding approach. Printed on card-weight paper, the packages have top and bottom flaps that fold down to form sleeves that hold the disk and manual inside. Slots and cutouts make it possible to fold and stack the packages into a disk caddy. The small package size (about 5 x 5 1/2 inches), folding construction, and use of recycled paper (Federal Mill's Envirocote for the cover and St. Laurence's 60# Multifeel recycled for text stock) were intended to minimize environmental impact. The photo montages were created by Bob and Lois Schlowsky, who used a digital camera and digital image editing.
**1 Designing the Package**

Michael J. Sullivan sketches out a packaging concept that includes sections for holding a manual, a floppy disk, and a registration card. After approval by Scitex, Sullivan and colleague Mark Field render the final package design in FreeHand (a). For type, they use Gill Sans and Esprit in black and white on solid backgrounds, choosing a different Pantone color for each package (in this case, it’s PMS 556). A curved shape, shown here in pink, serves as a path for clipping the imported photomontage TIFF. The designers also use FreeHand to create a die-cut guide that indicates the position and shape of the main flaps, slots, and cutouts (b). The guide is given to the printer, along with color-separated film.

**2 Creating Photo Montages**

Sullivan brainstorm with the Schlowskys about the photographic approach he wants to take, focusing on still-life elements that relate to the purpose of each Scitex XTension. Some images originate as 35mm slides that are scanned on a LeafScan 45 film scanner. Others are purely digital: During a one-day shoot, Bob Schlowsky uses a Leaf Systems digital camera connected to a Mac to record the images directly to a hard disk. The images are immediately viewed on-screen and edited by Lois Schlowsky and Sullivan, providing instant feedback for the photographer.
3 Adapting the Montage
To ensure visual cohesion, the same images created for the external packaging appear on the accompanying manuals. For the Image Tools manual, for example, the package-cover image is imported twice into the FreeHand layout and pasted into curved shapes on the front and back, shown here in pink (a), so that the rest of the image is masked off. The manual cover repeats the curves and the four slot elements of the package cover, but here the slot shapes are filled with gradations in tints of the package color (b).

4 Designing the Manuals
The software manuals, which fit inside the packages, are designed in QuarkXPress, and some of the Scitex XTensions they describe are used. This spread from the Scitex Image Tools manual demonstrates how blends are created with the XTension's Blends tool.

5 Drawing an Instruction Sheet
Explaining how to put together this origami-like design is challenging, so Sullivan and Field again turn to FreeHand to create a diagram that shows how to fold a single package into a disk holder and how to stack and fold several packages together. Created in black-and-white, the diagram is printed across the inside of the manual cover.

6 Finishing the Project
The finished photo montages are saved in Photoshop as EPS files in DCS (desktop color separation) format. This approach separates each image into four-color, CMYK layers, producing four separate color-separation documents plus a PICT screen-image document for each file. The photo montages are proofed on a Kodak XL7700, and Iris proofs are used for the FreeHand documents. The QuarkXPress files are trapped and then color-separated to film on a Scitex Dolev imagesetter, and Matchprints are used for final color proofs before printing.
The Best Way To Get To Your Printer On Ethernet Is Now Way Better.

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   A single EtherPrint now connects two printers or other LocalTalk devices. That's double the device support for the same low retail price of $499. EtherPrint Plus connects up to four devices for just $599, which makes EtherPrint very well connected.

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   All Ethernet cable types are supported, from thick and thin to 10BASE-T. But only EtherPrint offers the option of all three connectors on one model. And with our auto-sensing technology, there are no switch settings to change when you switch cable types.

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CIRCLE 133 ON READER SERVICE CARD.
**Desktop printing:** Sonic Systems' new Print Juggler is the evolutionary link between printing as we know it and QuickDraw GX. With this $49 software installed on your Mac, you can create desktop icons for printers that display whether a printer is busy, so you can **scope out a free printer** before you drag 'n print. 408-736-1900.

**Breaking the print barrier:** Moving up to Ethernet doesn't mean you have to say goodbye to your old printers and other LocalTalk devices. Compatible Systems (303-444-9532) recently upgraded the still-$695 EtherWrite, its Ethernet-to-LocalTalk converter, to version 2.0. The new hardware lets you connect as many as six LocalTalk devices to an Ethernet network via 10BASE-T, thicknet, or thinnet wiring. Plus: flash-upgradable firmware and management software that gives you detailed bandwidth statistics.

**maximum modem moxie:** Face it, most Macs have wimpy serial hardware — their tiny serial-port buffers just weren't made to handle the volume of incoming data that a high-speed modem can deliver. Fortunately, version 1.5 of the Apple Modem Tool (used by the Macintosh Communications Toolbox) provides a fix for this problem: software MNP. This error-correction software is able to **deal with mangled data** as it arrives — so it makes sense to have it in your Mac, where it can guard against serial-port data loss. The new Apple Modem Tool will be available free, most likely through on-line services. While you're beefing up your Communications Toolbox, how 'bout some **fast-file-transfer** tools to support Zmodem, X/Ymodem, and Kermit? You can get a basic set of three tools supporting these protocols for $69.95 from Seaquest Software (503-531-0252) or buy extra-fast versions (reportedly) from Aladdin Systems (408-761-6200) as part of SITcomm, the company's new $120 communications package.

**Caffeinated routing:** So you want a faster FastPath? Version 9.2 of Shiva's K-STAR management software ($199) includes TunnelTalk (the former Dr. Pepper, for those who follow code names), an alternative to Apple's AURP, for routing AppleTalk through TCP/IP with minimal traffic overhead. K-STAR 9.2 also provides improved device monitoring and SNMP management, zone and device filtering, and more. 617-270-8300.

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*By Stephan Somogyi*
Step 1: Load Now Up-to-Date 2.0, the software that lets you schedule events, set reminders, manage To Do lists, print calendars and keep your associates informed, allowing you to become disgustingly organized.

Step 2: Notice how incredibly easy Now Up-to-Date is to use. Totally customizable. 100% non-fascist. Just click on a date, enter your info, hang, you’re done.

Step 3: Think to yourself, “Wow, calendar software that’s actually faster and easier than the old pen and appointment book approach. Amazing.”

Step 4: If you are on a network, share events from your calendar with the other folks on your network. In return, they’ll no doubt share meeting dates and whatnot with you. Not on a network? No sweat, Now Up-to-Date still works fine all by itself.


Step 6: Pick up Now Up-to-Date 2.0. Or, for more info, call us at 1-800-237-3611.

Step 7: Quit goofing around reading software ads and get back to work. You’ve got a lot of stuff to do.
MOBILE CONNECTIVITY

Ethernet for PowerBooks

Your office is on Ethernet, but your work's on a PowerBook. Can a SCSI Ethernet adapter give you the speedy, no-hassle network connection you need?

By Kelli Wiseth

Only one obstacle is keeping you from using your PowerBook all the time: it has no built-in Ethernet capability.

If you had a PowerBook Duo, you could add an Ethernet card to your Duo Dock or get a dock with built-in Ethernet capability, such as E-Machines' portable EtherDock. But you don't have a Duo. And your office has evolved beyond LocalTalk, the only type of network your PowerBook is built to access (because Apple didn't include its handy AUI Ethernet connector, as it did in the Quadra and recent printers). So, much as you love your PowerBook and hate transferring work to and synchronizing files with your desktop machine, you're stuck in the two-machine trap if you want to connect to the network at work. And if you're a mobile network manager wanting to connect your PowerBook to lots of Ethernet networks, you're stuck lusting after the PCMCIA Ethernet cards some of your PC counterparts are toting around with their laptops.

But wait — there is an alternative, the same one available to slotless desktop Macs such as the Classic: a SCSI Ethernet adapter, which is a small hardware device that directs Ethernet packets into and out of the PowerBook through the SCSI port. It doesn't provide throughput as fast as you'd get from a NuBus or PDS (processor-direct slot) Ethernet card — understandably, because the SCSI bus wasn't designed to handle network traffic — and it's not as easy to carry as a PCMCIA card, but it's faster than any alternative PowerBook network connection, such as going through an Ethernet-to-LocalTalk converter or router.

To help you decide which PowerBook SCSI Ethernet adapter best meets your needs, we looked at the data-transfer speed, convenience, and portability of the 10BASE-T versions of eight such products: the Asante EN/SC-PB, Asante Mini EN/SC-T, Cabletron EA412, Compatible Ether+, Dayna Dayna-PORT SCSI/Link-T PB, Farallon EtherMac SCSI/PB 10BASE-T, Focus EtherLAN SC-T, and Technology Works (TechWorks) Ethernet SC-T. Some of these products are versions of others (Dayna licenses its design to Farallon, and Compatible Systems licenses its design to Focus Enhancements and Technology Works), but you will still find differences among these products in terms of pricing, support, and included cables and connectors.

Speed Similarities

As Figure 1 shows, data-transfer speed isn't a major differentiating factor among these products — this is not too surprising, given that many of the products are licensed from competing companies or use the same Ethernet controller. We copied files and folders of various sizes between a PowerBook 180 and a Quadra 950 and measured how long it took each product to transfer packets between the server and the PowerBook. With the exception of the Cabletron EA412,
At a Glance

- Asante Mini EN/SC-T
- DaymaPORT SCS/Link-T PB
- Farallon EtherMac SCSI/PB 10BASE-T
- Asante EN/SC-PB
- Cablerton EA412
- Compatible Ether+
- Focus EtherLAN SC-T
- TechWorks Ethernet SC-T

MacUser Bottom Line pick

which transferred data more slowly than the other products (most notably when reading a 5-megabyte file, which took twice as long), times for these products were close. Asante's products were generally the fastest at transferring data, most likely because of Asante's custom-designed SCSI interface — it's optimized to reduce much of the overhead that results from the SCSI specification being designed for mass-storage devices rather than for network use.

Even the Cablerton EA412, however, was much faster than the alternatives we tested — it took about half as long overall as copying the files via an Ethernet-to-LocalTalk converter or router. In other words, if you want to connect your PowerBook to an Ethernet network, using a SCSI Ethernet adapter is the speediest way to go.

Daisy-Chain Dilemmas

Of course, if you've spent time connecting SCSI devices, you may be less worried about speed than about another notorious aspect of SCSI: daisy-chaining. How easily can these products coexist on a SCSI chain with other devices such as an external hard drive or a CD-ROM drive? And does the PowerBook's unusual SCSI port (HDI-30 instead of

**Figure 1: Comparing Copy Speed**

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<thead>
<tr>
<th>5-MB-File Copy</th>
<th>1-MB-Folder Copy</th>
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<td>NuBus Ethernet</td>
<td>SLOWER</td>
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<td>Asante Mini EN/SC-T</td>
<td>Read time</td>
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<tr>
<td>Asante EN/SC-PB</td>
<td>Write time</td>
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<tr>
<td>Farallon EtherMac SCSI/PB*</td>
<td>Read time</td>
</tr>
<tr>
<td>DaymaPORT SCS/Link-T PB</td>
<td>Write time</td>
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<td>Cayman GatorBox</td>
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</table>

*10BASE-T version

Figure 1: Slower than a NuBus Ethernet card but faster than any viable alternative for hooking your PowerBook to Ethernet — that's the word on SCSI Ethernet adapters, which route packets into the PowerBook via the SCSI bus.

ZD Labs' test network consisted of a Quadra 950 server running AppleShare 3.01, connected via an Asante FriendlyNet adapter to an Asante hub; we connected a PowerBook 100 to the hub by using the SCSI adapter being tested. To show optimal throughput unimpeded by the overhead associated with keeping track of many filenames, we copied a single 5-megabyte Photoshop file between the server and the PowerBook. To show the effect of significant filename overhead, we then copied a 1-megabyte folder containing hundreds of files.

In all four of the processes we timed — read and write times for the 5-megabyte file and the 1-megabyte folder — we saw close results for all the adapters except Cablerton's. Still, with the adapters, the processes didn't take much longer than with a NuBus Ethernet card (in the 1-megabyte read test, with most of the adapters, they took even slightly less time!), and the adapters gave much better times than those we saw when we left the PowerBooks on LocalTalk and connected to the Ethernet network via a router or an Ethernet-to-LocalTalk converter.
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Figure 2: Asanté not only includes both types of SCSI cables (for regular Macs and for PowerBooks) with its Mini EN/SC-T, but it also provides two DB-25 connectors on the non-PowerBook end of its CDU SCSI cable. This cable allows the Mini EN/SC-T, which has only one SCSI port, to be the first device in your PowerBook's SCSI chain and to have a second device daisy-chained to it.

DB-25 present any extra cabling hassles?

The Dayna and Farallon products are configured to provide you with optimal SCSI flexibility. These devices have two SCSI ports apiece and allow you to enable and disable termination easily with external switches, so you can fit them anywhere in the SCSI chain without much problem. Asanté's EN/SC-PB, the predecessor to the company's lightweight Mini EN/SC-T, also has two SCSI ports, along with an auto-terminating feature that figures out whether termination should be applied; however, this feature doesn't work with the PowerBook, so you need to put the device either at the beginning or the end of a PowerBook's SCSI chain.

In the less-flexible-but-even-more-ingenious category are the Asanté Mini EN/SC-T and the Cabletron EA412; each is a single-SCSI-port adapter, but the companies offer a cable/adapter that gives you an extra port (and that lets you choose whether you want the extra weight). Asanté's HDI-30-to-DB-25/DB-25 cable (see Figure 2), which ships with the Mini EN/SC-T, lets you put the SCSI Ethernet adapter first in your chain and daisy-chain a second device from it; a switch lets you enable or disable termination. Cabletron's extra-port adapter is a block containing three SCSI ports that mounts on the EA412, so one of the three SCSI ports connects to the PowerBook, leaving you two — unfortunately, you have to pay $45 extra for it. You can enable or disable termination easily with this product also, by selecting from two sets of SCSI-ID numbers (one for terminating, one for unterminating).

Least flexible are the Compatible Ether+, Focus EtherLAN SC-T, and TechWorks Ethernet SC-T. Each one is internally terminated and cannot be unterminated, so it must either be the last device in the chain or the only device. If your SCSI chain already contains another such device — one with a single SCSI port, forever terminated — you won't be able to add one of these adapters to your SCSI chain.

Compatible and Focus are also among the least obliging vendors — along with Cabletron — as far as providing the appropriate SCSI cables. You need to order the PowerBook SCSI cable separately from these vendors, for about $25.
Tips for Ethernet on the Go

Whether you're traveling from network to network with your PowerBook or just leaving your adapter on your desk so you can connect whenever you're there, these tips will help you keep your SCSI Ethernet connection hassle-free:

- **Don't connect without warning.** Get clearance from the network administrator before adding your PowerBook as a new node on any Ethernet network. Knowing that you're on the network will help your administrator troubleshoot any potential problems.

- **Power down all SCSI devices.** Before adding a SCSI Ethernet adapter to your PowerBook's SCSI chain, remove the adapter from the chain, or changing any SCSI-ID numbers, make sure the adapter is off. Power to all other devices in the chain — hard drives, CD-ROM drives, and so on — should also be off.

- **Turn on the SCSI Ethernet adapter first.** Before turning on your PowerBook, be sure to turn on the SCSI Ethernet adapter first. When the PowerBook starts up, the SCSI Manager looks to see what's connected on the SCSI bus. If the PowerBook is turned on first, it may not see the SCSI adapter.

- **Check your connection.** Use the diagnostic software that comes with your adapter to check the integrity of the network connection and of the hardware itself before harassing your network administrator about not being able to connect.

- **Let sleeping PowerBooks lie.** Before making any changes to the SCSI connection, don't just put your PowerBook to sleep — shut it down. When the PowerBook is in Sleep mode, it still draws a minimal amount of power. Disrupting a sleeping PowerBook's SCSI bus — by yanking it from its SCSI Ethernet adapter to run to a meeting, for example — can cause problems: When you reconnect and wake up the PowerBook, shared disks may not auto-remount when they should or your PowerBook may hang.

- **Carry the diagnostic software with you.** Even if you hate statistics, consider copying the diagnostics and any other troubleshooting software that comes with the adapter into a folder on your PowerBook's hard disk. Then if you have a problem when you're connected at another site, at least you'll have some troubleshooting tools besides the LEDs.

from Compatible and Focus and $45 from Cabletron. In contrast, the other vendors provide the PowerBook cable free if you specify you want the PowerBook version of the product. Only Asante goes even further, providing PowerBook as well as regular Mac cables with its Mini EN/SC-T.

**Portability a Plus**

In addition to speed and SCSI issues, we looked at how portable these products are. If you're going to keep the adapter on your desk and use it just to connect to the office network, portability may not matter to you. However, network administrators and other folks who tramp from site to site with PowerBook in tow need an adapter that weighs little and fits easily into a purse or a pocket.

For portability, the Asante Mini EN/SC-T is the best choice. It has the smallest footprint — just slightly larger than a cassette case — and weighs the least overall: The adapter, the power supply, and the SCSI cable weigh about 1.5 pounds. The least portable products are those from Compatible, Focus, and TechWorks; at 3.5 pounds apiece, each is fully 2 pounds more than the Asante Mini EN/SC-T.

**Lots of Connections**

If you're going to be traveling to a variety of sites and want to be ready for any type of Ethernet cabling, you should get an adapter with connectors for all three common types — UTP (unshielded twisted pair), thinnet, and thicknet — or at least for UTP and thinnet cable.

Because we tested the 10BASE-T versions of these products, each of the adapters we looked at had at least one RJ-45 connector (for UTP); some also had a BNC connector (for thinnet) or an AUI connector (for an external transceiver for thicknet). With the exception of Parallon, all the vendors offer multiconnector versions of their adapters. However, only Asante and Dayna provide all three types of connectors on one device — Asante with its EN/SC-PB and Dayna with a three-connector version of its adapter that costs the same as Asante's ($499).

Having more than one connector onboard isn't enough, though; you should also be able to select the appropriate
MOBILE CONNECTIVITY

connector with a mouse click or the flip of a switch. Better still, do nothing and get an adapter that auto-senses which connector has a cable attached.

The multiconnector version of the Cabletron EA412 automatically selects the connector that has a cable attached, but you can also disable this auto-sense feature by selecting a connector through a cable-type control panel — so you can leave two networks connected to your PowerBook and easily switch between them. The Asané Mini EN/SC-T and the Dayna multiconnector adapter are also auto-sensing but don’t have the override ability. The Asané EN/SC-PB’s external switch lets you easily switch from one cable type to another.

Least convenient is the selection scheme used in the Compatible, Focus, and TechWorks adapters, which are set at the factory for the type of Ethernet you specify. To change the cable type, you have to open the adapter, locate the jumper pins, and use needle-nose pliers to remove the jumper. This isn’t impossible, but it’s far from convenient.

Finally, keep in mind that many large networks were installed prior to the final 10BASE-T specification and may not support the link-integrity feature of the final spec. Check with your network administrator about this; if your network doesn’t support link integrity, it won’t know how to respond to the packets the adapter sends out to test the integrity of its link to the network. The Asané Mini EN/SC-T is the only adapter that lets you disable link integrity and avoid flooding a pre-10BASE-T network with packets it doesn’t know how to handle.

**Drivin’ Software**

Once you’ve made all the physical connections — you simply select the appropriate SCSI ID and connect the adapter to your PowerBook (via the SCSI cable) and the network (via the appropriate connector) — there’s still one more step: You need to install the driver software, which replaces a small piece of the AppleTalk stack so that traffic can be routed through the SCSI port.

Installing the driver is easy: Just boot your PowerBook from the installation floppy disk, and click on OK in each

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<thead>
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<th>Control Panel</th>
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<td><strong>PCname:</strong> Accounting Dept</td>
</tr>
<tr>
<td><strong>Location:</strong> San Francisco Office, 3rd Floor</td>
</tr>
<tr>
<td><strong>Owner:</strong> Raymond and Ali Martinez</td>
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<td><strong>Comment:</strong> Alternate location: Beach Office</td>
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<td><strong>MMAC Port:</strong> 00</td>
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<td><strong>MMAC Board:</strong> 00</td>
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<tr>
<td><strong>IP Add:</strong> 0.0.0.0</td>
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</table>

Figure 3: We found Cabletron’s software the most useful overall. The diagnostic software is easy for users to comprehend, and the management software is especially informative. Cabletron’s was the only one of the adapters we tested that includes an SNMP control panel. It allows network administrators to access information on the adapter-connected PowerBook from any SNMP-compliant network-management package.
dialog box until the process completes — a matter of a few minutes. Then open the Network control panel and select the EtherTalk Alternate icon to choose the Ethernet network.

After installation is complete, it's a good idea to run through the vendor's diagnostics program before attempting to use any network services, such as AppleShare servers. The diagnostic software confirms that the adapter hardware itself is good and also checks the integrity of the network connection.

All the vendors of the products reviewed here provide some level of diagnostics. Compatible, Focus, and TechWorks — each of which uses Compatible's Manager+ software with the company's own name on it — provide a good deal of information, such as SCSI and network-related error statistics. The Dayna and Farallon packages have pass/fail tests for the hardware and software and a test for the network connection. Asanté's Troubleshooter software has a single easy-to-understand dialog box providing access to five tests, with pass/fail information about hardware components and network connections in simple language; it also lets network administrators gather network-activity statistics.

Cabletron stands out, however, in its complete package of diagnostics, control panels, and extensions for users; it also includes SNMP (Simple Network Management Protocol) management for network administrators. The diagnostic utility displays information in a straightforward fashion, and you can use one screen to check all components and the network connection. In addition to providing diagnostics, Cabletron gives users an extension that displays network-activity statistics as well as a control panel for overriding the auto-sense cable-selection feature.

For network administrators, Cabletron's SNMP control panel (see Figure 3) enables long-distance troubleshooting through any SNMP-compliant management software, including Cabletron's Remote LANView, a Windows-based application. You set up information about your PowerBook in the Management control panel; the administrator, using an SNMP-compliant management program, can then see this node from elsewhere on the network. If you're managing a large, multiplatform network, being able to identify the name and location of a problem workstation is a boon.

Adapter Advice

If you want Ethernet connectivity for your PowerBook, you'll need a SCSI adapter. The question is, which one?

If you want portability, the Asanté Mini EN/SC-T is your best choice. This 6-ounce adapter is about the size of a cassette box and is just as portable. It has a BNC connector for thinnet and an RJ-45 connector for UTP Ethernet connections, and it automatically chooses the appropriate one when you plug in the cable. Although the Mini EN/SC-T has just one SCSI port, Asanté's clever cable lets you daisy-chain a second SCSI device. The Mini EN/SC-T also provides the fastest data transfer in our tests, and it's the only adapter we looked at that lets you disable link integrity to avoid creating traffic problems on old, pre-10BASE-T UTP networks.

If portability is less important to you than the convenience of having an adapter that can fit anywhere in a SCSI chain, go with one from Dayna or Farallon. The DaynaPORT SCSI/Link-T PB is flexible in its network adaptability as well as in its SCSI-chain placement; it's available in a three-connector model (for UTP, thinnet, and thicknet) that costs no more than the other three-connector adapter, the Asanté EN/SC-PB. The Farallon EtherMac SCSI/UTP 10BASE-T is available with only one connector (for UTP or thinnet), but it comes with Farallon's outstanding lifetime warranty and has the second-lowest price of all the adapters we looked at.

Finally, look for competition to drive adapter sizes and weights down and to drive prices down as well. At press time, Dayna was planning to introduce a more portable adapter sometime around November, and MacNet (408-954-8888) had just entered the competition with a $329 adapter, less expensive than all but the Focus adapter in this roundup.

Of course, we hope that competition from PC-laptop vendors will eventually force Apple to provide PowerBooks with truly convenient Ethernet capability: a PCMCIA slot that lets you pop in a credit-card-sized Ethernet card whenever you need to connect. Hey, if they can do it for the Newton . . .

Kelli Wiseth, a former MacUser senior editor, heads NetResults, a network-consulting company based in the San Francisco Bay Area. Jessica Beyer, a project leader at ZD Labs, managed the testing for this story.

continues
## Table 1: Which Way to the Ethernet?

<table>
<thead>
<tr>
<th></th>
<th>Asante EN/SC-PB</th>
<th>Asante EN/SC-T</th>
<th>Cabletron EA412</th>
<th>Compatible Ether+</th>
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<tbody>
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<td><strong>List price</strong></td>
<td>$499</td>
<td>$369</td>
<td>$525</td>
<td>$495</td>
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<tr>
<td><strong>Pros</strong></td>
<td>Connectors for all cable types. Fastest throughput.</td>
<td>Smallest footprint.</td>
<td>SNMP management.</td>
<td>Connectors for thinnet and twisted-pair cable.</td>
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<td><strong>Cons</strong></td>
<td>Can't fit in middle of SCSI chain.</td>
<td>Can't fit in middle of SCSI chain.</td>
<td>Most expensive. Slowest throughput. Bulky. Doesn't include SCSI cable.</td>
<td>Large footprint. Heaviest. Must be last or only SCSI device. Doesn't include SCSI cable. Inconvenient cable-type selection.</td>
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<td>303-444-9595 (fax)</td>
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Circle 55 on reader service card.
<table>
<thead>
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<th>Dayna</th>
<th>Farallon</th>
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</tbody>
</table>


**Table 1: Which Way to the Ethernet? continued**
Junkbond dealers? Drug lords? Savings and Loan presidents?

Nope, they're computer hackers. And judging by their physical appearance, you wouldn't think you'd need any protection from them. But you do. Or should we say, your computer does.

And to keep these criminally minded people from infecting your files, floppies and various software programs, you need SAM 3.5 anti-virus software.

You see, SAM will constantly monitor for 14 suspicious viral activities. Which is more than any other anti-virus program on the market. And it's the only program that will scan compressed files in System 6.0 and 7.0.

So basically, if your Mac has a virus, SAM will detect it, get rid of it and repair the file. And if your Mac is virus-free, SAM will help to make sure it stays that way. Because it monitors your Mac transparently, working behind the scenes, and only interrupting when a virus is found.

What's more, SAM is simple to install on a Macintosh networking system, as well as a single-user Mac. All you need to do is load the program disk, double-click on the Installer Icon and let SAM handle the rest.

For the most anti-viral protection, pick up SAM 3.5 at your local retailer. It's the most popular anti-virus program in the world, and will keep you from ever having to deal with this ugly crime. Or these ugly criminals.
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Wouldn't it be great if you could run Windows, DOS and NetWare programs on your Macintosh?

CIRCLE 154 on reader service card.
Lotus Notes: Who Needs It?

Before you buy into the hype, you'd better find out what Notes can — and can't — do.

By John Rizzo

In the children's story The Lorax, Dr. Seuss describes a product called a thneed, the thing that everyone needs. The selling point of a thneed is that anyone can use it to do just about anything. Not surprisingly, thneeds do very well in the marketplace.

You may have heard similar descriptions of Lotus Notes, the cross-platform work-flow and communications system/database-development environment for PCs and (with version 3.0) Macs, from Lotus Development (617-577-8500). The people who categorize Notes as a multiplatform thneed tend to be idealistic types — MIS coordinators, PC-magazine editors, and the like. You get a more mixed reaction when you talk to Notes users and developers.

Notes certainly has some useful capabilities, but the hype surrounding the product has created unrealistic expectations. There are also problems with Notes' Mac client software in terms of performance and interface: Basically, it lacks both. Any decision to implement Notes needs to be thought out carefully beforehand, and alternatives — and there are alternatives — should be considered.

What NotesDoes

Notes has three basic functions: work-flow management, database capabilities, and communications. It's at its most powerful when it's used to develop work-flow applications such as those for travel authorization, purchase approval, customer tracking, and ongoing project management. These systems normally are built with multiple shared databases that reside on the Notes server and are accessed through the Notes client software. The databases usually contain documents, which multiple users can access through outlinelike lists.

The shared databases all reside on PC servers running IBM's OS/2 (you can also have a Windows Notes server, but Macs can access only the OS/2 version). The Notes server provides a good deal of data reliability, in that users don't actually access identical documents: Notes replicates each document for each user and again for each server. Whenever anyone edits a document, a new version is created. A database is usually set so that users see the newest version of a document but can retrieve old versions.

The third aspect of Notes consists of rudimentary e-mail, a conferencing system, and an electronic bulletin board (a handy feature for people buried in e-mail, because it lets them choose just those threads they want to read). You can use Lotus' cc:Mail, which is superior to Notes' primitive, built-in
Notes is not a product you can use straight out of the box — the Mac client software alone comes on 19 floppy disks.

What Notes Doesn't Do

Notes Mac client software is glacially slow (I know of at least one company that is using PCs for selected Mac users rather than have them run Notes on their Macs). The remote link is so slow, in fact, that it makes AppleTalk Remote Access look superfast.

In addition, the interface seems designed to keep you from getting work done. A confusing array of 25 foreign-looking icons surrounds the Workspace window, which is a kind of Notes Finder. And the Workspace window itself contains icons of databases. Unlike with the Mac's Finder, you can't list the icons by name, so the Workspace window takes up most of your screen. That's not the end of it either, because Notes soon clutter your screen with other windows, which you often need to open to get to your data.

All this is to give you the illusion that Notes has a graphical interface, but it's only an illusion. The database-form creator contains no drawing tools — you can't even put boxes around fields, although the fields can contain graphics. You can add a check box, but you can't see it while you're in design mode.

Mac users will also find unexpected behavior in the simplest things. Hitting the Delete key can close windows; you can select text in situations where you can't act on it; and you can open the same document twice, but the windows aren't numbered — the duplicate windows have exactly the same name. Mac users will need to learn a new vocabulary, too, such as "launching a file" instead of "opening a file." This non-Macness even extends to Notes' manuals: There isn't a single screen shot of a Mac anywhere in the documentation, which uses illustrations of Windows machines instead.

A First-Class Alternative

First Class, from SoftArc (416-299-4723), is one alternative to Notes. Like Notes, First Class uses the same interface in its Mac and Windows versions, and although there is a learning curve — First Class retains some of the UNIXlike remnants of the e-mail/bulletin-board system from which it evolved — the interface uses graphics in a more intelligent manner than Notes. The First Class server software also runs on Macs, and SoftArc is planning server software for other platforms. Version 2.5 of First Class lets you create work-flow, database, and communications systems, as does Notes, but the two programs' strengths and weaknesses lie in different areas.

In the work-flow area, Notes is more flexible and has more built in to it for creating work-flow applications. Although First Class doesn't contain databases, it lets you create forms that interface with external databases.

The First Class Desktop, equivalent to the Notes workspace window, is where you access databases. Like in Notes, a database is represented by an icon: double-clicking on the icon brings up a form. Unlike Notes, First Class lets you view databases by name, date, and size, the same way you view files in the Finder. Although you can use First Class to create work-flow applications, the product is better at providing more-traditional database access. Because First Class can access mainframe-based SQL databases through Apple's DAL (Data Access Language), it's more suitable than Notes for high-transaction applications.

First Class really outshines Notes as a group-communications system for e-mail, conferencing, and bulletin-board
functions. Its remote e-mail is fast and full-featured, and new directory services allow you to send a message across the country without having to know the exact spelling of the intended recipient’s name. Directory synchronization is automatic, and you can also set up systems to send mail over several servers. In contrast to the Notes bulletin board, which you have to build yourself, the First Class bulletin board is built-in and feature-rich.

Developing a System

Notes is not a product you can use straight out of the box — the Mac client software alone comes on 19 floppy disks. One Notes developer estimates that it takes about 500 person-hours to set up 100 users. The cost of software, development, and training can easily run from $50,000 to more than a million dollars for a typical Notes installation.

Notes is a flexible development environment, but it also provides a way to reinvent your company’s work-flow processes. If you hire a developer to create your company’s Notes system, make sure he or she knows as much as possible about your business and how it’s run. Notes developers also recommend that you implement Notes in stages, according to a well-thought-out strategy. Anyone taking up Notes is going to run into a steep learning curve, so get your users accustomed to tracking information in a public manner and install databases in stages, so as not to overwhelm them.

First Class, on the other hand, can be up and running quickly. Of course, you will need substantial development work if you don’t already have SQL databases to connect to. Even so, with First Class software costing $395 for 5 network users or 10 dial-up users (versus $495 per client for Notes), a First Class system should end up costing substantially less than its Lotus competitor.

It’s too bad that neither Notes nor First Class yet supports AOCE or AppleScript; potentially, such support would completely integrate work-flow, database, and communications systems with everything users do on the Mac. AOCE represents the future of Mac workgroup computing, but it’s only just started shipping, so I suppose we can cut Lotus and SoftArc some slack — for now.

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“I DON’T NEED (tick) YOUR DATA (tick) PROTECTION SOFTWARE (tick). I’VE HAD MY MAC (tick) FOR YEARS AND (tick) IT HASN’T CRASHED (tick) YET.”

Not to alarm you or anything. But if a lot of wishful thinking is all that’s standing between you and a Mac meltdown, you may want to check out a more proven method of protection.

We suggest the Norton Utilities for Macintosh v2.0. It both prevents data loss and gives you the most effective data recovery features available. In other words, it’s like giving your computer its own personal bomb squad.

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To learn more, dial FAST FAX 1-800-554-4403 and select option 1, document 411. (For information on easy network installation, choose option 1, document 481.) Better yet, pick up Norton Utilities at your local dealer for about $149.

You should probably do it today, though. Before your luck runs out.
Work smarter: It had to happen — utilities for desktop Macs that offer the power-saving features available in PowerBook utilities. Connectix’s CDU (Connectix Desktop Utilities) reduces your Mac’s energy consumption by as much as 50 percent by dimming your screen or shutting the Mac down when it’s not in use. (Dimming the screen also cuts down on your exposure to electromagnetic emissions.) CDU does other things too, such as letting you set file-sharing status, sound, and color depth from a special menu and customize the desktop color and look. 800-950-5880 or 415-571-5100. $99. * There are diagnostic programs for hard drives, so why not for floppy ones? MicroMat (maker of MacEKG) has filled the void with DriveTech, a diagnostic-testing and maintenance program for 3.5-inch floppy-disk drives. The DriveTech package also includes a head-cleaning kit for routine maintenance. 415-898-6227. $59. * Sneak Preview, from Logical Solutions, lets you instantly preview any document — graphics, text, even QuickTime movies — from the Finder. 612-659-2495. $129.95.

Dynamic Duos: Here’s a quick way to get files on and off your Duo or hook your Duo up to a CD-ROM drive: The Lapis SCSI Dock, a $199 docking unit, gives you a SCSI and an ADB port so you can easily connect to any Mac. The Duo’s hard disk appears in the Finder of the Mac it’s connected to. 510-748-1600. * Recycle old PowerBook hard drives with the ETC Purple Bullet, a $99 NuBus card that supports 2.5-inch drives that can be used in most Macs as well as in Duo Docks (the $15 ETC Purple Bullet Expander enables the card to accommodate 3.5-inch low-profile drives too). You can get the Purple Bullet as a kit or preconfigured with an 80-, 120-, or 213-megabyte hard drive. Included is ETC’s Disk Tools 4.0 software, which lets you link several drives so they appear as one. 800-876-4382 or 813-884-2863.

Power prints: One of my all-time favorite computer publications is Flash magazine. Compiled by the staff of Black Lightning, a toner-cartridge manufacturer in Vermont, Flash is a compendium of laser-printing lore. Now Peachpit Press has published the best of Flash in The Underground Guide to Laser Printers. For $12, you get tips, techniques, advice, and more. 800-283-9444 or 510-548-4393. * The CoStar LabelWriter II’s software has had a face-lift in version 2.0. Not only does it print POSTNET postal bar codes but it also now prints in the background. You can use the new software with CoStar’s AddressWriter and Address Express label printers too. $249.95. 800-426-7827 or 203-661-9700.

By Victoria von Biel
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All of a sudden, it’s gone, and you’re overwhelmed with amazement, disbelief, fear, anger, self-pity, regret, and probably a little guilt. A hard-disk crash is never easy to deal with.

But the situation demands a cool head. In most cases, permanent damage or data loss has not happened yet and the steps you take after the crash will determine how big a problem you really have. Play your cards right, and you could be happily working again in just a few minutes. Make the wrong move, and you’ll spend days and dollars having your drive repaired, re-creating lost data, reinstalling backup data and software, and being generally miserable.

The most common sign of a hard-disk crash is the question-mark-inside-a-floppy-disk icon that appears instead of the happy-Mac icon during startup. This might show up when you first turn on your Mac or, more commonly, after some type of system error or crash has forced you to manually restart your computer. If you have another startup device, such as an external hard drive or a removable-cartridge drive with a System Folder, you might find that your Mac starts up fine but one of your hard disks or cartridges fails to appear (mount) on the desktop.

Alternatively, your Mac might crash repeatedly during startup, crash every time a particular hard disk tries to mount, or display a dialog box asking whether you want to initialize the disk.

First Things First

Dozens of things can cause a hard-disk crash, and many of them have little or nothing to do with the hard drive itself. So the best strategy is to move cautiously, investigating and eliminating possible causes one by one. Start with simple fixes, such as those described in step 1, that won’t make your problem worse. Before you start, have the following tools near your Mac:

- A floppy disk containing the System and Finder files.
- The Disk Tools disk, which came with your Mac’s system software.
- A copy of SCSProbe or another SCSI-device-mounting utility.
- The formatting software that came with your hard drive or a universal formatting utility such as Drive7, from Casa Blanca Works.
- Data-recovery and disk-repair utilities such as Symantec’s Norton Utilities, Central Point Software’s MacTools, or Fifth Generation’s Public Utilities.
- A complete, up-to-date backup of the important data on your hard disk.

Even though the ultimate goal of hard-disk recovery is to make the hard drive safe and usable again, your first goal should be to recover any data on the disk that has not already been backed up. The first time your crashed hard disk re-appears, copy any files that haven’t been backed up onto
another hard or floppy disk. Once you’re sure your data is safe, you can try to fix the drive.

1. The Simple Fix

There are several simple steps you should try first (in this order):

• Shut down the Mac and all connected devices, wait one to three minutes, and then restart.
• If the disk crashes during restart, hold down the Shift key during startup to disable all extensions (System 7 only).
• Start up from the Disk Tools disk, and run Disk First Aid.
• Start up from your emergency floppy, and launch SCSI-Probe. If it can see the disk but not mount it, the drive on the disk is bad. Update the driver, using your formatting utility.

2. Stronger Medicine

If none of the simple-fix methods get your drive back on its feet, at least you know you have a real problem. The next step is to use a SCSI-formating utility to make contact with your disk and then a disk-recovery tool to try to repair the software.

• Start up from your emergency floppy disk (it should also include your hard-disk formatting utility). Run the formatter, and see if it recognizes your hard disk at the drive’s SCSI address. Formatting utilities can often see disks that don’t mount and that other utilities can’t see. Some formatting utilities mount the disk automatically; others provide specific mount commands. Use the utility’s driver-update or test commands to try to fix the problem.

The ultimate goal of hard-disk recovery is to make the hard drive safe and usable again, but your first goal should be to recover any data that has not already been backed up.

3. Last-Ditch Efforts

By now it’s clear that you don’t have just a problem, you have a crisis — the magnitude of which depends on when you last backed up your data.

• Disconnect the drive from your Mac, and connect it to another Mac. This isn’t simple if you have an internal drive, but it’s worth trying. Do all the above steps on the new machine.

• If your drive contains data you cannot afford to lose, send it to a data-recovery service. These firms will probably retrieve your data — they have remarkable success rates — and will usually repair your drive too. Such rescue work isn’t cheap, usually costing from $125 to $350, but that’s far less expensive than re-creating megabytes of lost work. Turnaround times vary from 24 hours to 5 days. Services include DriveSavers (415-883-4232), Data Recovery/Disk Repair (415-306-1100), Ontrack (800-752-7557 or 714-263-9245), and Computer Shoppe (619-384-4500).

• Use a formatting utility to initialize
the disk (do not reformat it), and then attempt to recover the data with a disk-repair utility. This is life on the edge, but when it works, it works flawlessly. Most of these programs have a better chance of recovering data if they were installed before the crash, but you can use them even if they weren’t.

4. Regaining Your Confidence

Once you’ve recovered data and resurrected your drive, you may be wary of ever trusting your drive again. This is not misplaced fear. To make sure you’ve fixed your drive, take the following steps:

• Run Disk First Aid and your data-recovery program again, making sure both give the drive a clean bill of health.
• Make a complete backup of the disk. Keep two backup sets, and store one of them off-site.
• Use the disk-testing tools of your formatting software to run read, write, and seek tests. Most can run in unattended mode and test overnight to give the drive a complete workout.
• Using your formatting software, update your disk’s driver.
• Use a set of high-quality (the thicker, the better), matching SCSI cables. Most of us use a mixed bag of cheap cables that came with our drives and other SCSI devices. A new set of cables can prevent some headaches.
• Rid yourself of unnecessary or suspect system extensions.

5. Throwing In the Towel

If there doesn’t seem to be a way to get your data back and you have a recent backup or don’t need to send the drive out to a data-recovery service, you can usually reformat the disk. If your preferred formatter doesn’t work, try a few others. Usually, once one utility has formatted and initialized the disk, all other formatters work fine.

If none of your formatting software can see or reformat the disk, then the drive should be returned, if it’s under warranty, or replaced. Because most hard drives have warranties ranging from one to five years, there’s a good chance the drive is still under warranty. If you can’t get satisfaction from the dealer who sold it to you, contact the drive’s manufacturer directly.

And if it hasn’t already occurred to you, go back up your data. Now.

Craig Danuloff is the author of The System 7 Book.

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[Expires 1/30/94]
Did you know Apple fixes some PowerBook flaws for free?
It does — but only if you know what to ask for.

By Sharon Zardetto Aker

I s the PowerBook screen too small for you? Too bad. What did you expect from a computer that fits inside a briefcase? Need a mouse instead of a trackball? So, plug one in. You'll get no sympathy from me if you whine about design decisions that are inherent in the PowerBook’s compact size.

But design flaws — well, that's another matter. You'll get not only sympathy but you may also get a free fix — even if your warranty period is up, in some cases. But who ya gonna call? You can try your Apple dealer (a species on the endangered list), or you can call Apple SOS, at 800-767-2775 (in the U.S. only). Apple SOS provides shipping both ways and has a short turnaround time. If you have a problem, ask these folks if they can fix it; if it's one of the problems listed here, ask if they'll fix it free, even if your warranty is up.

First, a note about PowerBook serial numbers. The first two characters indicate the manufacturing facility: F1 or F2 for Fremont, California, and CK for Cork, Ireland, for instance. The next digit is for the year: 1 is 1991 and so on. The next two digits are for the week of the year: 05 is the fifth week of the year — the end of January and beginning of February. The rest of the numbers identify your individual PowerBook.

**Fabulous Free Fixes**

- An active-matrix screen with even a single stuck pixel — one that can't turn off, so it's always black — qualifies for a replacement. However, you need five voids (permanently white spots) to qualify for a similar replacement. Rumor has it that two voids within an inch of each other may also get you a replacement if you're insistent enough.

- Screens on early PowerBook 140s and 145s had the disconcerting habit of flicking on and off, due to an internal cabling problem. If your screen problem straightens out when you squeeze the right side of the screen's frame, the cable is probably the culprit. The fix is a simple shim, already built in to models with serial numbers F2208xxx or higher, CK121xxx or higher, or any that start with FC.

- The original PowerBook 140 and 170 models often had problems reading floppy disks, giving you the "This is not a Macintosh disk" dialog box or read and write errors. Turning off the backlight often temporarily alleviated the problem, for the very good reason that inadequate shielding on the backlight converter had caused the problem in the first place. Later models (PowerBook 140s with serial numbers F2150xxx and higher and PowerBook 170s with serial numbers CK205xxx and higher) were built with adequate shielding. In the spring of 1992, a floppy drive that corrected the problem was phased in as well; models with the new drive are 4/40 140s with serial number F2211xxx and higher, 4/80 140s with serial number F2212xxx and higher, and 170s with serial numbers FC213xxx or CK213xxx and higher.

If you don't have one of the factory-fixed models and you're having trouble with your floppy drive, you can either have the shielding fixed or have the revised drive installed. Go for the revised drive if you have any say in the matter.
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PowerBook Secrets: Get the Right Cable

There's lots of confusion between the two SCSI cables Apple sells for the PowerBooks. Each cable has the special HDI-30 SCSI connector, but that's the extent of their similarity. The HDI-30 System Cable (Apple part #M2538) is 18 inches long, is light gray, and has a 50-pin male connector; the square HDI-30 end is missing one pin. This cable is used to attach external SCSI devices to your PowerBook. The HDI-30 SCSI Adapter Cable (Apple part #M2530) is 10 inches long, is dark gray, and has a 50-pin female connector; the square end has all 30 pins. Using this cable in conjunction with a standard SCSI cable and a pass-through terminator puts your PowerBook into SCSI-disk mode so it can act as an external hard drive for another Mac. It's that 30th pin that tells the PowerBook to go into SCSI-disk mode rather than just boot up normally.

APS (800-645-5401 or 816-483-6100) has two terrific solutions to the cable confusion. Its 2-inch SCSI Boy has an HDI-30 connector on one end and a 25-pin connector on the other, effectively giving the back of your PowerBook the same SCSI-port configuration as the back of a desktop Mac. Another product, called the SCSI Kit, has a switch that lets it work as either a SCSI cable or a SCSI-disk adapter. And they're cheaper than either of Apple's cables.

— Rich Wolson
Color-PowerBook Batteries Die Young

ZD Labs test results show the life per charge of a color-PowerBook battery is only 40 percent that of a battery for a noncolor model, which means 165c and 180c users can expect their batteries to typically last less than an hour and a half per charge. (ZD Labs used Apple's 2.8-amp battery to test battery-charge life in the noncolor 180 and the color 165c and 180c; the labs also tested the 180c with Apple's new 2.9-amp battery, now shipping in all models.) What causes the power drain? The main culprit is the fluorescent tube that backlights the screen. Noncolor PowerBooks have just one power-hungry bulb; color PowerBooks have two.

With their painfully short battery life and high price, color PowerBooks are probably best suited only for those who must have color on the go. If you don't fall into that category, you still have some colorful options: All PowerBooks from the 160 up have a video-out port that yields 256 colors and supports external displays as large as 16 inches.

— Blake Roberts

<table>
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<tr>
<th>PowerBook 180c</th>
<th>Battery life in hours</th>
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<tr>
<td>with 2.8-amp battery</td>
<td>0.5</td>
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<tr>
<td>with 2.9-amp battery</td>
<td>1.0</td>
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<tr>
<td>PowerBook 165c</td>
<td>2.0</td>
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<tr>
<td>with 2.8-amp battery</td>
<td>2.5</td>
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the machine still double-booted on startup, although Power to Go doesn’t reset it for anything.

I tried removing CPU, using its own installer, but the PowerBook still double-booted. I deinstalled Power to Go, but that didn’t work. In desperation, I launched ResEdit and did something I really shouldn’t have done: I deleted the #2 boot resource and restarted. My PowerBook went berserk. It restarted itself over and over and over again until I put it out of its misery by shutting it off. I finally reinstalled a clean system.

Lots of experimenting and terrific help from both companies pinned down the chain of events. CPU had installed a #2 resource different from the normal one in the system. And Power to Go’s Airport module appends resource #2 and renames it. CPU’s deinstall looked at #2; said, “Well, that’s not mine”; and left it alone. Power to Go’s removal process did nothing about the resource, because it’s altered but not at installation but only by the Airport module and that depends solely on the module’s setting at shutdown. Even if I had managed to remove the Power to Go resource information, the reboot code from CPU would have remained forever.

Altering the System file without even telling you is a major sin. What if you have system problems unrelated to your PowerBook utilities and you have to re-install your system? When certain options in your utility package stop working because they’re missing from the System file, how in the world can you ever figure out what’s gone wrong?

To Connectix’s credit, its deinstall procedure removes its boot resource from the System file under normal circumstances and the manual does mention (in passing) that you should use the Remove function if you’re taking CPU out. But the manual doesn’t mention that CPU is missing with your System file, and it should. Power to Go’s manual doesn’t mention the System-file alteration, nor does it say that you should turn off the Airport module before removing the utility, to clean up your System file.

Both companies insist that altering the System file is the best and only way for their products to work; both also admit their manuals should contain more-complex information. Let’s hope that if they stick with the first philosophy, they’ll also follow up on the second.

Sharon Zardetto Aker and Rich Wolfson cowrote the second edition of PowerBook Companion. Blake Roberts is a former Apple engineer.

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MacUser November 1993 197
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How to Buy

Backup Software

- Make sure the software package you buy supports your storage medium. Some programs might not work with tape, and others don’t work with SyQuest or optical-disc cartridges. If you’re planning to mix media, either now or as your storage needs grow, make sure the software you buy can support different media.

- Ease of use is important, because backups and restores are complex, multistep processes. The program you buy should have helpful documentation and an interface that makes sense to you. Because different backup programs can have very different interfaces, try to test-drive the program — either by using a friend’s or a user group’s copy or by calling the company to see if it has a demo version. And keep in mind who will be using the software — if your office mates aren’t comfortable with the interface, they may avoid backing up their data.

- Because performing backups over a network slows network speed to a crawl, most people back up at night. Although the need to run backups while everyone’s out of the office has made scripting abilities standard in backup packages, the quality of those abilities differs from package to package. Make sure the package you buy gives you the amount of control you need, whether that’s setting the system to back up every day or choosing to back up just a few specific folders on specific computers at specific intervals.

- If you must back up while people in the office are still working, make sure the software you buy can work in the background, letting you do two things at once. But be warned: The Mac running the backup, the network you’re backing up on (if you’re backing up more than one Mac), and the Mac whose hard disk is being backed up will all take a performance hit.

- After you’ve bought your software, back up your files often. To decide how often you should back up, take a look at what kind of work you’re doing. If you write 40 or 50 short documents every day, you’ll want to back up frequently so those files aren’t lost. If you work on just a few files over a long period (working with Photoshop, for instance), you might be able to back up less often. The files that you rarely (if ever) alter, such as applications, don’t need to be backed up very often, because they take up a lot of space and don’t change from week to week. Just be sure that you do have backup copies of your applications somewhere safe. And no matter what, back up your data regularly.

- If you’re worried about data security — whether you’re afraid that people will steal your backup tapes or spy over your network while a backup is in progress — check to see if the package you’re planning to buy will allow you to add password protection or data encryption to your backups.

- To make your data as secure as possible, consider doing generational backups: Back up on two or more cartridges, for example, and rotate the backups. With three tape cartridges, you can perform a backup on a new tape on each of three days. On the fourth day, write over the first tape. When you need to restore data, use the most recent version. If that tape is defective, you’ll have two previous versions to fall back on.

- Be sure to store your backups off-site. That way, if something catastrophic happens to your workplace, the backups won’t be lost along with the original data (see “The Best Backup Strategies,” October ’91, page 206).

- If you haven’t chosen a piece of hardware for backing up your files, consider how much space you’re going to need and how fast you need the system to be. Tape drives allow you lots of storage space and are fast. If you aren’t planning to back up large amounts of data (for example, if you’re backing up only a personal Mac) and don’t care much about speed, you might be able to get by with optical-disc or SyQuest cartridges as your storage medium.

- For more information, see “Building a Data Safety Net,” September ’93, page 208.

By Jason Snell
Proxima® brings the power of your computer to the meeting room.

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The Macintosh LC II and its Performa equivalents have 4 megabytes of RAM on the logic board plus two 30-pin SIMM slots. By adding two 4-megabyte SIMMs — about $160 each at press time from sources such as Chip Merchant (800-426-6375 or 619-268-4774) and Technology Works (800-928-3148 or 512-794-8533) — you can upgrade to 10 megabytes of RAM (the maximum amount of RAM these machines can access without an LC III upgrade).

Replace the 256K VRAM SIMM in your Performa 405 or LC II 4/40 with a 512K SIMM (already present in the Performa 400 and LC II 4/80) to see more colors. You can buy VRAM from the same sources you turn to for RAM (about $30 to $50 for a 512K SIMM). Apple sells a VRAM kit as well, but it costs $159.

The Macintosh LC II and its Performa equivalents are in fact exactly the same computer — they just have different monikers for marketing reasons (the Performa 405 is a minor variation). All three machines are powered by a 16-megahertz 68030 microprocessor that is certainly powerful enough to accommodate most everyday home, school, and business tasks.

Sophisticated DTP, graphics, and video users are likely to find the processing speed sluggish, however. Accelerators that double or even triple your processor’s speed are easy to obtain and install, but you should start by looking at Apple’s LC III upgrade.

By Tom Petaccia
logic-board upgrade. For $599, you get a complete logic-board and case swap—one of Apple’s best bargains ever. The result is a 25-megahertz 68030 LC III, with 4 megabytes of RAM on the logic board and larger-monitor support (32,768 colors on 12- to 14-inch monitors, 256 on 16-inch monitors) via additional VRAM. Unlike with an accelerator, you still have your PDS (processor-direct slot) free for a video card or other options. If you go for the upgrade, you’ll lose any RAM installed in your SIMM slots (because the LC III has a single 72-pin SIMM slot that doesn’t accept the old RAM), but you’ll be better off in the long run; the new SIMM slot can accept a SIMM with a capacity as large as 32 megabytes, giving you 36 megabytes of RAM. This way, you can break the ridiculous 10-megabyte barrier these machines now carry even with third-party accelerators.

A Performa’s 80-megabyte internal hard drive is enough for most everyday

**With room for just one PDS card, you may need to choose between a faster computer and a bigger screen. We recommend going faster; bigger isn’t all it’s cracked up to be.**

users. However, it never hurts to have additional storage—especially if you have an LC II with a 40-megabyte drive instead of the 80-megabyte model. Adding an external device is easier, but you’ll save 25 percent or more of the cost by installing a 3.5-inch, low-power, one-third-height internal SCSI drive—you can do it yourself in about 15 minutes with a Phillips-head screwdriver.

Want a bigger screen too? To go larger than a 14-inch monitor (16-inch if you get the LC III logic-board upgrade), you’ll need to buy a video card. PDS video cards are available by mail order for about $400 (8-bit) to $600 (24-bit) from companies such as Radius (800-227-2795 or 408-434-1010). Often, such cards are also bundled with monitors.

Remember, though, that these machines have room for only one PDS card; you may have to choose between a faster computer and a bigger screen (or an Apple IIe emulation card, for that matter). We recommend going faster. Bigger isn’t all it’s cracked up to be—especially if the cost of the monitor means you’re spending more as well.

If you really want bigger, the street price of a brand-new, faster Centris 610 is about $2,000, and it’s capable of supporting a color monitor as large as 21 inches on VRAM alone.
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RAM: 8MB, expandable to 128MB on the motherboard. HARD DRIVE: 425MB SCSI.

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Nobody ever said you had to live in Cupertino to be a Macintosh expert. Know-It-alls are everywhere, from Manhattan to Malibu — even in Waldport, Oregon, where we found our own Mac guru, Philip Russell. Each month Phil shares his own tips plus the best from 70-odd Macintosh-user group (MUG) magazines. But Phil can’t do it alone. To all those whose undocumented Mac tip MacUser prints, we pay $25, and the Reader Tip of the Month earns $100.

Send your tip, together with your name, address, and phone number, to Tip Sheet, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

You can also contribute tips electronically via ZiffNet/Mac, the on-line service for MacUser. Send them to Gregory Wasson at 72511.36. Be sure to include your full name and mailing address along with the text of the tip.

By Philip Russell

Reader tips compiled by Gregory Wasson

■ Extra-long column titles in Excel 4.0 can either be word-wrapped to occupy more depth or rotated so they’re vertical. To do either, select the cell you’re going to work on. Then select Alignment, on the Format menu, and either check Wrap Text or click on the rotated-text picture you prefer. Note: You can’t do both to the same cell.
■ Pictures that are pasted into Word 5 are formatted like paragraphs. To keep text from remaining in the picture paragraph, press Return before and after the picture to isolate it.
■ In order to prevent a button in HyperCard from doing something destructive (deleting a button or a field, for example), be sure you script an Ask dialog box to confirm the action. Why? Because HyperCard often has a hard time restoring deleted items.
■ Federal Express and UPS don’t ship to APO addresses, so if you have friends overseas in the military who want to buy software, have the mail-order company send it to you and then ship it yourself. All it costs you is the postage. (Thanks, Washington Apple P’s newsletter.)
■ If a keyboard command equivalent in an application no longer works, check to see whether you have created a QuicKeys shortcut that uses the same keystroke and interferes with the application’s built-in keyboard commands. Change whichever keystroke you use least.
■ For longer PowerBook battery life on the road, use the Geneva font, which is built in to the ROMs of all Macs and requires no additional memory. If you need another font, you can switch later.
■ Fast page turning in PageMaker 4 is just a keystroke away. Command-Tab moves you forward one page. To go backward, add the Shift key. This works even before the screen redraws.
■ And did you know that repeatedly pressing the Tab key with the Command key held down moves you forward several pages without showing the intervening pages?
■ Need to know how many times a certain word occurs in your document? Any word processor with a Change or Replace command can help. Just type the word in the Find box, tab to the Change To box, and type the word again. Be sure the entries are identical. The Mac will now find and report the number of occurrences without changing the word in question.

Reader Tips

Rendering Programs
Here is a tip for people who use a graphics-rendering program. If you don’t use your Mac when it is rendering an image, turn your screen saver off, because it can slow down the time it takes to process the image. If you’re concerned about burn-in, turn the monitor off or dim it.

Mark Bradley
Orangevale, CA

Tip of the Month: ClarisWorks 2.0

Here’s an easy way in ClarisWorks to change text into a graphic, letting you create special effects for logos and headlines.

Within a ClarisWorks draw document, type the text you want to change. Next, save the document as a PICT file, open a new word-processing document, and insert the graphic file. To resize and distort the text’s shape, select the text and stretch it in any direction. This technique lets you create special effects such as ultracondensed text.

Steve Yuroff
West Chicago, IL

(You can do the same thing with your stand-alone word processor, even if it doesn’t offer a drawing environment. All you need is the shareware package Print2Pict. Make sure Print2Pict is the current selection in the Chooser and that it is set to save as a PICT file. Use the custom paper sizes to trim the excess white space from the document, so that the graphic image you create won’t be as large as the default page (8.5 x 11 inches for most users) and include lots of unnecessary white space. Finally, import or place the PICT file into another document. You’ll be able to distort it by resizing.

The Print2Pict shareware package is available through various on-line services. On ZiffNet/Mac, you’ll find it listed as file PSPICT.CPT in Library 4 (Extensions) of the Download & Support Forum (GO ZMC:DOWNTCH). — Ed)
Here's an easy way to redefine a style in Word 5.1: Choose Commands from the Tools menu. In the dialog box's scrolling list, select Redefine Style From Selection. Click on the Add button in the Menu or Keys section to add this command to a menu or a key, and go ahead and redefine your style.

Michael C. Miller
Watertown, MA

**System 7 Finder**

In a hurry to get to some of your folders? Create a folder on the Mac's desktop called Quick System, and store aliases of such folders as Apple Menu Items, Extensions, Control Panels, Startup Items, and Fonts. Now when you need to access these folders, you can avoid the long wait of opening the System Folder by opening just the folder you need.

Chris Parrish
Norman, OK

**Clipboard**

To show the Clipboard in System 7, even in programs that don't offer the Show Clipboard command, put an alias of Clipboard (located in the System Folder) into the Apple Menu Items folder.

Steve Huey
Tampa, FL

**QuarkXPress 3.1**

To rotate a line at a specific angle in QuarkXPress 3.1, first draw a straight line (press the Shift key and click on the straight-line tool). Then draw a text box underneath the line. Once both the line and box are drawn, select both objects with the mover tool. Now an angle can be assigned to the line and the box with the Item menu's Modify command. (If you select Modify with just the line selected, there is no option for entering an angle.) When you're finished, delete the empty text box. The line you drew now appears at the desired angle.

Al Gilson
Elmira, ON
Canada

**Apple StyleWriter**

If you need to print a thin line with an Apple StyleWriter, you can do so simply by drawing a hairline at the equivalent of one pixel in a drawing program and then copying and pasting it into a word-processing document. You will get a line that's at least one point (1/18 inch) thick. Another option for printing a hairline is to use an em-dash (Option-Shift-Hyphen) created with a TrueType or PostScript font and then adjust the point size to get the thickness you want.

Gene Poncelet
Clearfield, UT

**Excel 4.0**

Excel doesn't show the keyboard shortcut for Save As in the File menu, but it exists. Just press Command-Shift-S.

Neil Schulman and David Bowing
Oak Ridge, TN

**System 7 Aliases**

You can use Apple's resource editor ResEdit (available from user groups and online services) to automatically remove the alias suffix when creating new aliases. First, make a copy of your Finder. Open the copy with ResEdit, and then open the STR # resource and STR # ID 20500. Change string #1 from alias to whatever you wish. Save the changes to the Finder. Start up from a different disk, and swap the modified Finder for the old version.

Gregory Tetrault
Omaha, NE
via ZiffNet/Mac

**HP LaserJet 4M and Word**

If you have a Hewlett-Packard LaserJet 4M, the printer driver will not allow you to specify a particular paper cassette as your default tray. However, in many programs, the printer marks your file. This means whatever tray you select when you print a file is automatically selected when you print it again.

In order to take advantage of this feature with Microsoft Word 5, use the New command, type any character, and issue the Print command. When the Print dialog box opens, select as your default tray the paper source you want to keep and print the page. Next, select Page Setup from the File menu, click on Use as Default, and save the file. From now on, whenever you use the new document, your default paper source will be selected.

Ron Garrison
Denver, CO

**System 7 Trash**

Here's a quick way to have easy access to your Trash while keeping the Trash icon in its default location: Just make an alias of the Trash icon and position it close to your hard disk icon. You'll be able to trash files to the alias, but only the real Trash icon will bulge.

Murray M. Tuckerman
Winchendon Springs, MA

**Word 5.1**

Microsoft Word 5.1 has a drag-and-drop feature that lets you quickly drag a selection to a new location without going through the usual cut-and-paste routine.

If you don't want to delete the selection from its original location, hold down the Option key while you're performing the drag-and-drop procedure. This will copy the selection to the desired destination without deleting the original.

Ben Balsev
Toronto, ON
Canada

**System 7 Finder**

In theory, it is impossible to position an icon partly off the desktop, which means you can't save desktop space by having just the top of a folder or file showing along the bottom edge of your screen. But there is a way to trick the Finder into letting you do just that:

Drag the icon into a folder that is set to View by Small Icon. Now drag it back out onto the desktop, and bring it as close as possible to the bottom edge of the screen. Release, and as the icon pops into regular Icon view, you'll see that only the top of it is exposed. This trick works only for positioning icons along the left or bottom edge of the screen.

Joe Holmes
Brooklyn, NY
via ZiffNet/Mac

206 November 1993 MacUser
When you purchase the under $1,000 Microtek ScanMaker® II for the Macintosh, you already get Adobe Photoshop 2.5 LE.

And when you purchase the $1699 ScanMaker® IIXE for the Macintosh, you get the full version of Adobe Photoshop 2.5.

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HELP FOLDER

Questions, anyone? Here's where to get answers from the experts. Bob LeVitus and Andy Ihnatko are the authors of the best-selling Dr. Macintosh's Guide to the On-Line Universe. Andy Ihnatko is also a longstanding activist with BCS-Mac. They're ready to answer your questions about everything Macintosh. Write to Help Folder, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Don't want to wait for an answer? Post your question on ZiffNet/Mac, MacUser's on-line service, and get a reply from Bob (76004,2076), Andy (72511,204), or one of the other MacUser experts. See the masthead in this issue for instructions on how to sign up.

By Bob LeVitus and Andy Ihnatko

Bob: Last July (Help Folder, page 237) Barbara Freedman asked if it was possible to change the name of an open file. We said no, but it turns out that's not entirely correct. Many applications don't let you, including Word and WriteNow, which asks you to save the file under a different name after you've changed its name in the Finder. But other programs, including ClarisWorks and PageMaker, allow you to change the name of an open file to your heart's content and continue working. Then there are programs such as Photoshop, Painter, Canvas, Nisus, and Excel, which allow you to change the name of an open file in the Finder; they then automatically create a new file under the old name the next time you save, leaving you with two files instead of one.

Safe Sleeping and X-Raying

Q. I am confused about two aspects of my PowerBook:
First, when is it all right to use the Sleep mode? The Apple manuals say to use Shut Down when transporting PowerBooks, yet the article "Traveling Companions: PowerBook Utilities," (May '93, page 90) suggests putting the PowerBook into Sleep mode when going through airport security.

And second, what is the deal with airport X-ray scanners? Is it safe for my PowerBook to go through them or not?

John D. Roberts
Alameda, CA

Bob: Apple is concerned that if you bump your PowerBook and the bumping moves a key on the keyboard just enough to awaken it from its sleep and your hard disk spins up and you jar your PowerBook just the wrong way while the disk is spinning, you might damage the hard disk. That scenario is possible but, in my experience, unlikely. My PowerBook has slept on planes, trains, automobiles, and even a boat, and nothing remotely like that has ever happened.

I don't provide potentially dangerous advice cavalierly, so I checked two authoritative sources: Richard Wolfson and Sharon Zardetto Aker's excellent second edition of The PowerBook Companion (Reading, Massachussets: Addison-Wesley, 1992) and Andy Gore and Mitch Ratcliffe's equally excellent PowerBook: The Digital Nomad's Guide (New York: Random House, 1993). They seem to agree with me. Wolfson and Aker call Apple's advice "extremely conservative"; Gore and Ratcliffe are more assertive, calling the potential danger "one of the great myths in the PowerBook user community."

As far as X-ray machines go, both of these books agree that there's little danger to your PowerBook, although putting it through one of these machines does pose a definite danger to floppy disks. X rays aren't the problem — they won't harm your PowerBook or your floppy disks, as we've said in this column several times in the past. The real danger is from the electromagnetic field (EMF) emitted by the magnets in the conveyor belt's motor. Again, most PowerBook users I know put their PowerBooks through the X-ray machine, and I've never

* ... But Were Afraid to Ask *

Got a simple question? I mean a really, deeply stupid question you don't want to ask anyone you know? If so, you've come to the right place, so send it on in. To protect your anonymity, we'll say it was sent in by a recipient of a MacArthur genius grant.

Q. You won't get a simpler question than this: I've lost my lid's user manual and need a new one. You wouldn't think this was a big problem, but it's stymied my local Apple dealer, who claims Apple doesn't sell manuals by themselves.

James Randi
The Spirit Plane

Andy: Your friendly local Apple dealer is full of beans. Any dealer can special-order replacement manuals for all current Apple equipment. If your Mac is hopelessly out-of-date, give the Apple Catalog people a call at 800-795-1000 (in the U.S. only). Among the Apple T-shirts, Apple golf umbrellas, Apple sailboards, and other such computing essentials, you'll also find manuals for just about everything Apple has sold since Reagan took office.

If the equipment is really ancient, however, your only course will be to check out flea markets and classified ads. I'm sort of in the same situation myself. For years, I've been looking for a copy of The Red Book, the manual for the first Apple, written by Woz himself. Any leads on this morsel would be keenly appreciated: You can contact me via MacUser, 850 Tower Lane, 18th Floor, Foster City, CA 94404 or at my CompuServe address (72511,204).
heard of a problem. You can limit the amount of EMF your PowerBook is exposed to by placing it in the center of the conveyor belt and as close to the scanner-tunnel entrance as possible.

The metal detector you walk through is more likely to cause problems than the X-ray machine, because most metal detectors use a strong electromagnetic field to detect metal. So if you decide not to send your PowerBook through the X-ray machine, for Pete’s sake, don’t carry it through the metal detector either. Pass it around the metal detector, and ask the security person to hand-check it. Metal detectors are even more perilous to your floppies, so have them hand-checked as well. For extra protection, I carry my floppies in a lead-shielded disk wallet.

Mojo Memory

Q. Every chart I’ve seen swears the Quadra 700 cannot use 2-megabyte SIMMs to get a full 12 megabytes of RAM (4 megabytes on the motherboard plus four 2-megabyte SIMMs). However, I have a friend with a Quadra 700 who swears he has 12 megabytes with such a configuration on his machine. I haven’t seen it, but how can this be?

William Henry

Houston, TX

Bob: “Wild” Bill Ross, my liveware consultant at Technology Works (which makes RAM upgrades), confirms that 2-megabyte SIMMs don’t work “reliably” in a Quadra 700. He wouldn’t sell ’em to you. If I were you, I wouldn’t try it.

Andy: Speaking of Technology Works, to solve future memory questions, give them a call at 800-395-0726 or 512-794-8533 and ask for the free Macintosh Memory Configurations Chart and Calendar (see Figure 1).

Complete and informative, it not only tells you how much memory your Macintosh can use but also covers up water stains in the wallpaper very nicely.

The Mac Unplugged

Q. We all know the rule about not plugging in or unplugging devices while the Macintosh is on, but I’ve never met a technician who seemed to pay any attention to this rule, particularly while “rerearranging” an AppleTalk network. Just how dangerous is this?

Eric F. Fiedler
via ZiffNet/Mac

Bob: Thou shalt not do what technicians do (unless, of course, you have AppleCare service contracts for all the products you’re doing it to). Technicians are a breed apart — they have a large pile of spare parts at their disposal, so if they try a component, they reach into the pile and replace it. You, on the other hand, would have to take your damaged equipment to a dealer, whose mission in life is to charge you an arm and a leg to replace it. Even though you’ll get away with it 999 times out of 1,000, that one time will cost you, and probably a lot. Is it worth it?

Andy: I want all of you to close your eyes for a moment and imagine that I’m removing the propeller beanie denoting my status as an Authority and am now donning the brown-felt fedora of Just Plain Andy. Just Plain Andy says that as long as you’re not monkeying with the SCSI cable (which delivers mucho current and is in a sensitive location) or an ADB connector, you’re almost certainly not taking any serious risks. You’d have to be a loser of the caliber of George Costanza to do any damage by unplugging a monitor cable. A modem or printer cable, even when there’s no activity therein, presents a little more danger. Just be sure to unplug by the book — firmly grasp the connector, and then pull straight out.

Now I’m putting my beanie back on. Most of the time, the marginal savings in time and effort aren’t worth the serious loss in time and dough you’ll suffer if something goes wrong. So the bottom line is, it’s up to you.

Cursors, Foiled Again

Q. I’ve always wondered but never asked: Why does the cursor jump around when I print something?

Steve Shmerler
Encino, CA

Bob: The reason for the herky-jerky cursor is print spooling, also known as background printing. Although your Macintosh allows you to get back to work after you’ve sent a job to the printer, it’s processing that print job in the background, which inevitably degrades the performance of whatever you’re doing in the foreground. And that’s why the cursor twitches. A couple of things will minimize (but not eliminate) the jumpiness of the cursor. First, if you’re still using System 6, background printing will be somewhat smoother under MultiFinder. (You might have to increase the size of your system heap with a utility such as BootMan or HeapFixer if you’re printing large documents.) If you find the quaking cursor bothersome enough, you might try SuperLaserSpool, a print spooler that seems to have less impact on foreground performance than the system...

Figure 1: If you don’t know how much RAM or what kind of SIMMs your Mac can use, you’re not alone — it’s a subject fraught with confusion. One easy reference is a free wall calendar from memory vendor Technology Works.
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software’s built-in spoiling.

Andy: I’d like to take this opportunity to say that I almost never, ever use print spooling. The performance hit is a big pain in the neck. Besides, when your Macintosh is tied up in a printing job, you have a perfect mandate to go off for a few minutes. This is quite cleansing for the soul, and it also helps prevent side effects, when your Macintosh is spooling. The performance hit is long hours when the machine is on without a cover.

But the key here is not to get too excited about dust. Dust doesn’t do much damage unless it’s thick and has been there a long time.

Besides, it adds a lot of atmosphere to the office, if I may say so.

Bob: I use a can of compressed air to blow the dust off my circuit boards every so often. But unlike the vacuum idea even better.

The next time my Macintosh is in pieces on the floor, I’m going to try sucking the crud into my vacuum cleaner instead of blowing it onto my black sweatshirt.

Is there any way to dust the interior of my Macintosh without damaging its components?

A. B. Thompson
Lexington, KY

Andy: Oh, the dust stories I could tell you. Unfortunately, the only one that’s actually relevant is the story of the early Macintosh IIE, where Apple made the wonderful decision to design the system fan to blow right into the hard drive to help cool the sucker off.

The fan also served to blow all of an office’s ambient dust straight into the mechanism, causing several atomic breakdowns and waves of disgruntled owners marching on into Cupertino.

If I happen to have a lid open and see something akin to the laptop surface therein, I just don my antistatic wrist strap (very important, in this case) and vacuum the interior, using the vacuum cleaner’s brush attachment.

Of course, I unplug the Mac first.

But you’re right—Apple is the first party implied in this phrase. But I’ve never been able to figure out who the heck the “second party” is.

Norman Kehr
Chicago, IL

Bob: Sorry, Norman, but that’s not quite BWATA material. I’ve often wondered myself who that mysterious “second party” is. I asked around, and the consensus is that the second party is you, the user.

And you’re right—Apple is the first party.)

Party of the First Part

Q: The answer to this question is probably so obvious that I’d prefer being referred to as some obscure Mesopotamian potentate’s charioteer. For years I’ve been reading the phrase “third-party vendor” or “third-party supplier.” Presumably Apple is the “first party” implied in this phrase. But I’ve never been able to figure out who the heck the “second party” is.

Norman Kehr
Chicago, IL

Bob: Sorry, Norman, but that’s not quite BWATA material. I’ve often wondered myself who that mysterious “second party” is. I asked around, and the consensus is that the second party is you, the user.

And you’re right—Apple is the first party.)

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Meet the Internet

For an eye-catching, interactive introduction to the Internet, check out A Cruise of the Internet (CRUISE.SIT, Library 7), a multimedia tutorial produced by Merit Network. The presentation discusses many Internet services and gives examples of how to use them. It also lists more than a dozen Internet treasures, which offer information on everything from NASA to cooking.

To find out how to get onto the Internet, check out the Nixpub List (NIXPUB.SIT, Library 7) and the PDIAL List (PDIAL.SIT, Library 7), both of which list vendors that offer Internet access. More and more commercial sites are hooking up directly to the Internet as well, and free Internet access is available to college students and staff and most academic and government employees.

Once you're connected, you'll find Brendan P. Kehoe's Zen & the Art of the Internet indispensable reading. Available in plaintext or printable-PostScript form (ZINTXT.SIT and ZINTPS.SIT, respectively, Library 7), Zen & the Art of the Internet surveys the Internet's history, structure, and customs. This file also covers the basic Internet services in detail. It's worth reading for the etiquette tips alone.

Internet Services

There are several ways to connect to the Internet, and most of them require you to deal with the cryptic command-line interface of a UNIX mainframe. Shareware authors and public-spirited system administrators have created applications that put a Mac front end onto the various Internet services, but many of these require special software such as Apple's TCP/IP Connection for Macintosh (formerly MacTCP); you can get details and technical advice in the Download & Support Forum.

One of the chief virtues of the Internet is that it allows you to send mail not only to any Internet site but also to many networks and bulletin boards and most on-line services. To put a Macintosh interface on the Internet mail you send, download Eudora 1.3 (EUDORA.SEA, Library 1). For information on how to send mail back and forth between the Internet and other services, take a look at the Inter-Network Mail Guide (INMAIL.SIT, Library 7).

The Internet also provides a vast collection of downloadable files and documents, stored at countless Internet sites around the world. If you know where you're going, the shareware application Fetch 2.1 (FETCH.SEA, Library 1) lets you browse a site in a Mac-like fashion. If you know what you want but not where to get it, you can use Internet's Gopher service to retrieve information and download files. The freeware TurboGopher 1.0.6b5 (TURGOP.SEA, Library 1) makes Gopher fast, friendly Mac client.

By Mark Simmons
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• 4 Resolutions: 640 x 480 to 1152 x 870

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"beats the 4M hands down"

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NewGen Turbo PS/600p
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Dataproducts LZR 965
600 dpi, PostScript Level II, -35 fonts, 9ppm

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  - PLI 1GB Turbo External HardDrive: $1,479
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<tr>
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<tr>
<td>Entry Level Windows Solution</td>
<td>Affordable PostScript® Solutions</td>
<td>Affordable PostScript Solutions</td>
<td>PostScript for the Power User</td>
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<td>17 scalable fonts</td>
<td>35 scalable fonts</td>
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<td><strong>NOW $669</strong></td>
<td><strong>NOW $765</strong></td>
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All printers come with a 1 year limited warranty. AppleTalk® kits available for Mac users for an additional $50.00.

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<tr>
<th>USA FLEX</th>
<th>PCs COMPLEAT</th>
<th>CDW</th>
<th>TOTAL CHOICE</th>
<th>USA FLEX</th>
<th>PCs COMPLEAT</th>
<th>CDW</th>
<th>TOTAL CHOICE</th>
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<td>1-800-884-4CDW</td>
<td>1-800-888-3702</td>
<td>1-800-888-3702</td>
<td>INSIGHT</td>
<td>1-800-888-3702</td>
<td>1-800-888-3702</td>
<td>1-800-888-3702</td>
<td>THIRD WAVE</td>
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Introducing the all-in-one storage solution. The new Fujitsu DynaMO™. It's the highest performance, external, plug-and-play optical drive for PCs and Macs.

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Buy now and we'll give you ACTION! 2.5 Special Edition Multimedia Presentation Software, a $495 value absolutely FREE. ACTION! – the leading presentation software package from Macromedia – is the perfect compliment to your DynaMO drive. Use ACTION! to create and deliver multimedia presentations with graphics, video, animation and sound.

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The savings stack up. To add 128MB of storage, you have to buy:

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<th>Size</th>
<th>Price</th>
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<tr>
<td>88 Floppies</td>
<td>$114</td>
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<tr>
<td>6 Floppies</td>
<td>$122</td>
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<tr>
<td>1.4 Bernoulli</td>
<td>$194</td>
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<td>2.9 Symmet</td>
<td>$200</td>
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<td>1 Fujitsu</td>
<td>$45</td>
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Plus, 128MB cartridges cost only $45, which means you can dramatically increase storage for less than half a buck per megabyte. Or, take advantage of our special offer. Five 128MB cartridges including 109MB of FREE clip art are only $199 — with the purchase of a Fujitsu DynaMO drive. That's over 600MB for 31 cents a megabyte!

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Five pack of 128MB cartridges with 109MB of FREE clip art............ $199

The Fujitsu Magneto Optical Drive. Rewritable storage complete with FREE ACTION! multimedia presentation software, 128MB cartridge and cabling.

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$3,497.  

$48.  
CD-ROM ToolKit  
If you work with multimedia, clip art, reference works, or databases, CD-ROM ToolKit will improve their performance and your productivity. This utility replaces your CD-ROM drive's original software, transparently speeding up CD-ROM operations up to 1000 percent. This specialized software works in the background to accelerate all CD-ROM drives, even the faster multi-speed devices. It also improves compatibility and allows you to play audio CDs. There are no boards, cables, or cards to install. The program transparently caches CD-ROM information to your hard disk so mounting, folder opening, seeking, and searches happen instantly. Minimum requirements: Mac Plus, 1MB RAM, System 6.0.2, 3.2 CD-ROM drive.

$2,344.  
ACCU RA 144+ FAX 144  
Looking for a high-performance data and fax modem for your Mac? The ACCURA 144 + FAX 144 is a cost-efficient V.32bis/14,400 bps data communications and Group 3/14,400 bps fax modem. It supports standard 14,400-300 bps data transmission and provides 14,400-2400 Group 3 send and receive fax capability. High-performance V.42/V.42bis, MNP 5 error-control, and data compression protect your data and improve accuracy. Throughput is up to 57,600 bps using V.42bis data compression. Best of all, you'll be up and running fast with Smartcom data and fax software FREE ($128 value)! Minimum requirements: Mac Plus, 1MB RAM.

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QuickFLIX  
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High-powered drawing tools help you create and quickly refine the accurate graphics you need every day - at a price you can afford. Even if you don't draw, Smart Templates give you a head start. Use IntelliDraw for technical drawing, business or engineering, graphics, diagramming, drafting, space planning, and more. Minimum requirements: Mac Plus, 2MB RAM, System 6.0.5, hard disk.

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Minimum requirements: SE/30, 8MB RAM, System 6.0, 6MB hard drive space.

Inspria Solutions
5025 SoftPC Professional

$185.

Virex 4.0

Virex 4.0 is the ultimate weapon against the threat of Macintosh computer viruses. The application detects and repairs files infected by all known Macintosh viruses. The Record/Scan feature lets you identify previously unknown viruses. The Virex INIT program continuously monitors the computer to prevent future infections, and Virex is the only anti-virus product with an INIT that performs instant repairs.

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.2.

Data Watch
5234 Virex 4.0

$59.

Crystal Crazy

This sequel to Crystal Quest has more crystals to collect, pool balls to sink, puzzles to complete, and fragile ornaments to smash. Accomplish these entirely pointless tasks while avoiding eggs that hatch into space bunnies and much more. You'll be appalled at how much time you'll waste on this game - but you'll love every minute of it.


Casady & Greene
5956 Crystal Crazy

$36.

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33 Fonts Total!

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Get 33 fantastic, artistic fonts with this bundle. Your documents will stand out from the crowd when you use these original, award-winning, attention-grabbing display font designs that clearly turn heads and make people pause. These fonts are fully compatible with ATM and System 6 or 7. Art Fonts received the "Most Distinctive Font" award from MacUser.

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6984 Art Fonts & Cool Fonts Bundle

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Catch incompatibilities and problems affecting your Mac with this bundle available only from Mac's Place. Help! is great technical support. It not only analyzes systems and highlights potential problems, but it also suggests possible solutions to those problems. Help! collects information about your system configuration, compares it with a set of rules in its built-in knowledge base, displays the results on your screen, and lets you print out the report. And you can perform over 150 comprehensive hardware diagnostics with Peace of Mind. It provides a complete diagnostic test suite and a real hardware workload. Peace of Mind is ideal for testing your RAM, SCSI bus & disks, video processors, modem, mouse, floppy drive, clock, ROM, graphics cards, and more.

Minimum requirements: Mac Plus, 2MB RAM, System 6.0.5, a hard drive.

Tekniques/Pointek Systems Corporation
6557/6558 Help! & Peace of Mind Bundle

$449.

TVATOR PRO

TVATOR PRO turns any Mac or PC into a powerful multimedia presentation system. TVATOR PRO is a small lightweight, portable device that converts analog RGB/VGA to NTSC signals for flicker free color output on big screen TV, RGB video, LCD projectors, and RGB/SVGA monitors. Includes cables, power adapter, utility disk, TV brightness controller, and user's manual.

Minimum requirements: LC II, LC IIc, LC III, Mac II, Mac Plus, 68000, 68030, PowerBook 160, 165c, 180, 190c; TV with Composite Video or S-Video input.

Antec
6093 TVATOR Pro

$31.

Shanghai II, The Dragon's Eye

Snap off matching pairs 'til you run out of tiles, run out of moves, or run out of time in Shanghai. And this version of the captivating strategy game gets even better. Dragon's Eye is a special challenge for superior Shanghai players. It's more against move, as one player seeks to complete the Dragon formation, the other to dismantle it. Play the computer or a friend.

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.5.

Addison-Wesley
4342 Shanghai II, The Dragon's Eye

$36.

Spaceway 2000

Test your intergalactic combatt driving skill! Spaceway 2000 is a high-speed, alien-infested freeway. Watch out for Wall Creepers who crawl along the edge of the highway and fire at you, and Blockers who force your movements like bad mimes and keep you from passing. Use laser cannons, automatic shields, smart bombs, and more to battle your way through.

Minimum requirements: Mac Plus (LC recommended), 2MB RAM, System 6.0.5, hard drive, 4MB RAM for color.

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Minimum requirements: Any color Mac, 1.5MB RAM, System 6.0.7.

MacPlay 6847 Star Trek: 25th Anniversary

$78.

Cash Ledger 2.0

This easy-to-use cash-based accounting program for managing personal and small business finances lets you record checks and deposits, reconcile bank accounts, keep track of vendors, create financial reports, and more. Pop-up lists make data entry fast and simple. Create recurring entries to save you from redundant typing. Each time you enter a transaction.

Minimum requirements: Any Mac with 1MB RAM, System 4.2, hard disk recommended.

Checkmark 1333 Cash Ledger 2.0

$78.

FLOWERscape

Plan your spring garden now with FLOWERscape! View its growth in color, as it would appear in any month of the year. Through its easy-to-use interface, FLOWERscape helps you choose what to grow and where to grow it. Just enter soil, sun, and geographic information, and the program recommends suitable plants. Includes FREE pH test strips. Minimum requirements: Any Mac with a 256-color monitor and a 1MB hard drive.

Vanguard 6791 FLOWERscape-Mac (pictured) 6702 FLOWERscape-Windows

$49.

Wacom 12" x 12" Tablet & Kai's Power Tools

Get the fabulous filter effects of Kai's Power Tools by HSC FREE with Wacom's new 12" x 12" tablet. This serial tablet has a square foot of working area, enough for serious computer artists to create masterpieces on their Macs. Wacom is the technology leader in graphics tablets and cordless, batteryless, pressure-sensitive pens. The 12" x 12" tablets offer you the most precise, delicate, real-time control possible over your graphic Tablet accepts 120 levels of pressure. A menu strip adds flexibility by allowing you to define functions and macros. This tablet includes a transparent protective overlay and enhanced control panel features.

Minimum requirements: Mac Plus.

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Minimum requirements: Mac Plus, 1MB RAM, System 6.0.3.

Smart Label Printer Pro

Produce fast, high-resolution, laser-quality output on multiple label sizes. The Smart Label Printer Pro prints at twice the resolution of other label printers. Using Seiko Instruments’ latest and most advanced thermal print engine, the Pro can print text, POSTNET, bar codes, even photo-like graphics from digital images. Print labels for envelopes, file folders, ID badges, diabetics, binders, and more. The Smart Label Printer Pro comes complete and ready-to-use with printer, software, printer cable, power supply, and a roll of labels. Complete set-up takes only minutes. It’s quick and quiet, printing labels as fast as six seconds.

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Smart Label Printer Pro

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Get Action FREE with purchase of the Mac DisplayLink.

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Mac DisplayLink w/Action

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How to Order:
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- For orders in WA: 425-883-8321
- For orders in Canada: Call 206-883-8321
- Call 1-800-817-0009 for International orders
- Fax 1-800-817-0009
- Write Mac’s Place, Inc.

Minimum requirements: Mac DisplayLink – Mac II with Apple 8.2.4 or compatible video card.

CVLink – IC, Performa, Centura, Live, Quicksilver, Powerbook.

Display Tech, Inc.
6875 Mac DisplayLink w/Action
6877 CVLink scan converter w/Action $559.

$158.

Lapis SCSI Dock

The Lapis SCSI Dock is the only way to add a SCSI port and an ADB port for under $175. Connect your Powerbook. Dock directly to any Mac and operate in SCSI Disk Mode so that the Mac’s hard disk appears on the Finder of the other Mac. You have fast access to information and file transfers. And the SCSI Dock weighs only five ounces, so it’s a perfect portable solution. You can also connect your Mac to any SCSI device like a CD-ROM drive, second hard drive, or scanner. And the ADB port allows you to hook up a desktop mouse, trackball, keyboard, or tablet. Add flexibility to your Mac in the affordable way.

Minimum requirements: Powerbook Duo 210 or 230.

Lapis 6849 Lapis SCSI Dock

$278.

ScreenLink Twin-Pak & SupraFAXModem 144PB

This is the perfect bundle for the telecommuter. With the ScreenLink Twin Pak you can easily access your office Mac from home, and your home Mac from the office. Just dial into your modem, and you’ve got complete control of your Mac. The ScreenLink to check your email, send files, listen to your voice mail, or perform any other work on your remote Mac. The 144PB gives you the 14,400 bps fax and data communications on a line that fits in your Powerbook. Wake Up mode turns your Powerbook on when the modem receives a call and, when combined with the included fax software, can send scheduled faxes when rates are lowest.

Minimum requirements: Mac Plus, 1MB RAM, System 7.1.4M or more. Works with all major fax software. SupraFAXModem 144PB Bundle

08099/5575 ScreenLink & SupraFAXModem 144PB Bundle

The ☢ symbol indicates a manufacturer’s Money Back Guarantee.
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**Third Wave Optical**
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- 256MB Optical: $149.00
- 650MB Optical: $214.00
- 128MB Cartridge: $38.00
- 256MB Cartridge: $88.00
- 650MB Cartridge: $99.00

### Macintosh Systems

**Optical Drives**
- Quadra 950 B/0: 3448.00
- Quadra 840av 8/230: 3038.00
- Quadra 840av 8/550: 4775.00
- Quadra 950 100 CD: 4978.00
- Quadra 840 8/1000: 5478.00
- PowerBook 180c 4/160: 3389.00
- PowerBook 230 4/120: 2049.00
- Centris 610av 8/230 C9: 2599.00

### Mac Memory

**Macintosh SIMMs**
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- 4 MB SIMM: Call
- 8 MB SIMM: Call
- 16 MB SIMM: Call
- Quadra LC & Centris 72pin SIMM
  - 4 MB SIMM: Call
  - 8 MB SIMM: Call
  - 16 MB SIMM: Call
- PowerBook SIMM
  - 8 MB for 210/230: Call
  - 8 MB for 140, 170: Call
  - 8 MB for 180/190: Call
  - 8 MB for 165: Call

### Display Systems

- Radius Color Pivot LE: 399.00
- AudioVision: 508.00
- E-Machines T-18 II: 1198.00
- SuperMac 20TXL: 2575.00
- Radius 2KXP Pro: 479.00
- Paintboard: 775.00
- Thunder II: 3475.00

### Accelerators

- Daystar
  - 50MHz Powercache w/86882: 720.00
  - 40MHz Turbo 040: 1589.00
  - 8040 LCH 25MHz: 755.00
- Dilino
  - Dilino 50MHz w/86882: 713.00

### DAT Drives

- 2.5 GB Sony Drive w/Tape: 1049.00
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**Airbourne’s External Drive**

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**Reference Bundle**

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**Children’s Games Bundle**

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**Clip Media & Fonts Bundle**

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<td>Publish It 2.0 with Clip Art Fonts • Color It!</td>
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**Scanner Models**

- **Model**: UMAX
- **Price**: $398
- **Description**: Includes free software

**Software**

- **Adobe Illustrator 5.0**: $369
- **Adobe Photoshop 2.5** (free with UMAX Scanners): $549
- **Adobe Premiere**: $429
- **Frame Maker**: $519
- **Quark Xpress 3.2**: $598

**DayStar Digital**

- **Model**: 33 MHZ Powercache
- **Without FPU**: $358
- **With FPU**: $438

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- **All units come with Microphone LT & STF FAX Software**
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  - 96/48 SR Fax w/ 2400 BPS Modern: $99
- **Faxmodem PKT Portable**
  - 96/48 SR Fax w/ 2400 BPS Modern: $109
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  - V42 bis/MNP5/2400 BPS, 96/48 SR Fax: $129
- **Faxmodem VFX V.32**
  - V.32 bis, 14.4 data & fax, V.42 bis/MNP5: $258

**Video**

- **Model**: 1x8
  - 70 NS Call: $33
  - 80 NS Call: $36
  - 24x8 Call: $50
  - 70 NS Call: $33
  - 80 NS Call: $36
  - 24x8 Call: $50

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**Hard Drives**

- **Conner**
  - 3.5” Disk Drives (2 year Warranty)
  - 85 mb LPS: $178
  - 120 mb LPS: $208
  - 240 mb LPS: $288
  - 540 mb: $728

- **Quantum**
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  - 85 mb LPS: $174
  - 120 mb LPS: $198
  - 240 mb LPS: $278
  - 525 mb: $648

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  - 1.0 Gig: $948
  - 1.2 Gig: $1098

**Seagate**

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- 1.9 Giga Baracuda: $1798
- 2.4 Giga Baracuda: $2348

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- **Fujitsu**
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ColorBlaster PB

Enhance your PowerBook with 16bit color presentations and graphics, using monitors up to 16" or 8bit color up to 21". The ColorBlaster PB is a video expansion card which includes a 6MB RAM upgrade. Available for the PowerBook 140, 145, 145B, and 170.

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JetInc is the most economical way to refill your ink jet printers. It provides over 50% savings, while also incorporating recycled materials that are environmentally conscious. DGR now has the Refill Unit to make it easy to do it yourself.

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- 10 MB PowerBook 160/160 CALL

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- Toshiba XM3401 $599
- NEC MultiSpin 74.1 $548
- Apple CD320 w/5 CDs $399
- Pioneer DRM-604x $1249

**Storage Systems**

All MacCenter storage products include FSB Hard Disk and DLI internal. For more information call us.

**Puma® Optical Drives**

- Puma 259 CALL
- Puma 128 $899

**Eagle® SyQuest Drives**

- Eagle 44 $399
- Eagle 88c $499
- Eagle 105 $699

**Cobra® DAT Drives**

- Includes 90 ft tape & Retrospect
- Cobra Turbo DAT (9.0 GB) $1499
- Cobra DAT II (2.0 GB) $1299

**Falcon® Hard Drives**

- Micropolis 1.2 GB $1259
- Fujitsu 1.2 GB $1199
- Toshiba 1.0 GB $1099
- Quantum 60-120 $299
- Quantum 60-160 $399
- Toshiba 213 (PowerBook) $459

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- Supra Fax Modem 414.4/4.4 $429
- Twincom PowerTwain 14.4/4.4 $429
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**CD ROMs**

- Toshiba XM3401 $599
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- Quantum 60-120 $299
- Quantum 60-160 $399
- Toshiba 213 (PowerBook) $459

We stock all Micropolis, Fujitsu, & Toshiba drives.
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**Sigma**
- Sigma ErgoView 17: multimode 17" Sony
  - Add 24-bit accel. color card $799
  - $1149

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- UMax UC 630LE: 600 dpi, 24-bit color with Photoshop LE
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  - $899

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- Mac Centris 610: 4MB RAM/80MB HD
  - $299
  - Call

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- Scanners
- Printers
- Drives & Storage
- Modems

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- E-Machines Futura SX: 24-bit card: 399
- E-Machines NEW Ultima LX: Call

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<table>
<thead>
<tr>
<th>Model Number</th>
<th>Formatted Capacity</th>
<th>Effective Drive Size</th>
<th>Special</th>
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<tbody>
<tr>
<td>DT-2105</td>
<td>560 Megas</td>
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<tr>
<td>DT-1624</td>
<td>670 Megas</td>
<td>4.6 ms</td>
<td>5.25 FH</td>
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<tr>
<td>DT-2108</td>
<td>700 Megas</td>
<td>3.9 ms</td>
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<tr>
<td>DT-2112</td>
<td>1050 Megas</td>
<td>3.9 ms</td>
<td></td>
</tr>
<tr>
<td>DT-1528</td>
<td>1340 Megas</td>
<td>4.1 ms</td>
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<tr>
<td>DT-1908</td>
<td>1400 Megas</td>
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<td>DT-1548</td>
<td>1750 Megas</td>
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<td>DT-1924</td>
<td>2000 Megas</td>
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<td>5.25 FH</td>
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<td>DT-1936</td>
<td>3000 Megas</td>
<td>3.9 ms</td>
<td>5.25 FH</td>
</tr>
</tbody>
</table>

Call for rates on higher amounts. Underwriting requirements may vary by state. Void where prohibited.

Sure it's Insured?
Most computers are not insured. And ordinary policies may exclude or limit the coverage you need. Do you have the ready cash to replace stolen or damaged equipment? You will if you have SAFEWARE's® comprehensive COMPUTEROWNERS™ coverage. It provides full replacement of hardware, media and purchased software for just pennies a day! Your protection includes theft, fire, accidental damage, and more. Even costly power surges are covered. Just select your system value and premium from the table below. Use the coupon or call for immediate coverage or more information.

<table>
<thead>
<tr>
<th>Amount of Insurance</th>
<th>Annual Premium</th>
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<tr>
<td>$2,000</td>
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<td>$5,000</td>
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<tr>
<td>$8,000</td>
<td>$149</td>
</tr>
<tr>
<td>$11,000</td>
<td>$199</td>
</tr>
</tbody>
</table>

Call for rates on higher amounts. Underwriting requirements may vary by state. Void where prohibited.

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The highest-quality 300 dpi color PostScript®-language compatible 8½"x11" printer for under $4,000.

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An unprecedented low-cost, high quality color printer!

What does the Prism have over other printers?

The NuDesign Prism Prints twice as fast as other color printers at 1/3 the price!

- Thermal Transfer printing
- Print high-quality Color output at a low cost per page.
- Proofing quality output
- Brighter, richer, more vibrant colors than other color printing technologies.

NuDesign Prism Color Printer $998

Here are some of the things you can do with this great printer!

- Stunning business presentations
- Coffee mug imprints
- Color proofing
- T-Shirt transfers
- Create vibrant charts and graphs
- Re-print crisp, clear color photos
- Plaques
- Cap imprints
- Even temporary tattoos!

Actual Prism output using the photo realistic upgrade

.....Introducing the Photo-Realistic Upgrade.

Dye-sublimation on the Prism? The photo realistic upgrade kit gives you incredible true dye-sub output on your Prism printer!

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## Storage Options

### Optical Drives from Nu Design

All Our Optical Drives include one free cartridge

<table>
<thead>
<tr>
<th>Model Type</th>
<th>Capacity</th>
<th>Access Time</th>
<th>Warranty</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>128 MB 3.5&quot; Series II</td>
<td>128 MB</td>
<td>Fast 32ms access, PWB Software</td>
<td>3yr warranty</td>
<td>$858</td>
</tr>
<tr>
<td>128 MB 3.5&quot; Series V</td>
<td>128 MB</td>
<td>Fast 32ms access, PWB Software</td>
<td>1yr warranty</td>
<td>$988</td>
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<tr>
<td>128 MB 3.5&quot; Series VII</td>
<td>128 MB</td>
<td>Fast 30ms access, PWB Software</td>
<td>3yr warranty</td>
<td>$978</td>
</tr>
<tr>
<td>128 MB 3.5&quot; Fujitsu Dynamo</td>
<td>128 MB</td>
<td>Fast 17ms access, PWB Software</td>
<td>3yr warranty</td>
<td>$998</td>
</tr>
<tr>
<td>256 MB 3.5&quot; Series X</td>
<td>256 MB</td>
<td>Fast 20ms access, x/128mb compatible</td>
<td>3yr warranty</td>
<td>$1448</td>
</tr>
<tr>
<td>600 MB Hyperspace 5.25&quot;</td>
<td>600 MB</td>
<td>Fast 20ms access, 1MB sec Trans</td>
<td>3yr warranty</td>
<td>$2598</td>
</tr>
</tbody>
</table>

### DAT Drives from Nu Design

All Our DAT Drives include one free 90m Tape

<table>
<thead>
<tr>
<th>Model Type</th>
<th>Capacity</th>
<th>Access Time</th>
<th>Warranty</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>NuDesign 2.1 Gig</td>
<td>2.1 Gig</td>
<td>Fast 17ms access, with Retrospect</td>
<td>3yr warranty</td>
<td>$998</td>
</tr>
<tr>
<td>NuDesign 5.0 Gig</td>
<td>5.0 Gig</td>
<td>Fast 17ms access, with Retrospect</td>
<td>3yr warranty</td>
<td>$1398</td>
</tr>
</tbody>
</table>

### NuDesign Key Points

- Thermal Transfer printing
- Print high-quality Color output at a low cost per page.
- Brighter, richer, more vibrant colors than other color printing technologies.
- Proofing quality output

### NuDesign Color Printer

- Price: $998

### DAT Drives

**NuDesign DAT Drives**

- NuDesign 2.1 Gig | $998
- NuDesign 5.0 Gig | $1398

### Fujitsu Drives

**Internal**

<table>
<thead>
<tr>
<th>Model Type</th>
<th>Capacity</th>
<th>Access Time</th>
<th>Warranty</th>
<th>Price</th>
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<tr>
<td>520 MB 3.5&quot;</td>
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<td>Fast 12ms</td>
<td>3yr warranty</td>
<td>$698</td>
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<tr>
<td>1.1 Gig 3.5&quot;</td>
<td>1.1 Gig</td>
<td>Fast 10ms</td>
<td>3yr warranty</td>
<td>$1998</td>
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<tr>
<td>2.4 Gig 5.25&quot;</td>
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**External**

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### Conner Drives

**Internal**

<table>
<thead>
<tr>
<th>Model Type</th>
<th>Capacity</th>
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<td>C 170 MB 3.5&quot; LPS</td>
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<td>Fast 3ms</td>
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<td>$228</td>
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<td>C 212 MB 3.5&quot; LPS</td>
<td>212 MB</td>
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<td>$298</td>
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<td>C 540 MB 3.5&quot; LPS</td>
<td>540 MB</td>
<td>Fast 3ms</td>
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<td>$698</td>
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**External**

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<th>Model Type</th>
<th>Capacity</th>
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<th>Warranty</th>
<th>Price</th>
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### Seagate Drives

**Internal**

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<td>2.4 Gig</td>
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<td>5yr warranty</td>
<td>$2198</td>
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<td>2.4 Gig</td>
<td>Fast 5ms</td>
<td>5yr warranty</td>
<td>$2398</td>
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<td>5yr warranty</td>
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<td>1.6 Gig Elite 5.25&quot;</td>
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**External**

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<th>Model Type</th>
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### Syquest Removable Drives

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<td>44 MB</td>
<td>Fast 5ms</td>
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<td>88C MB Removable</td>
<td>88C MB</td>
<td>Fast 5ms</td>
<td>2yr warranty</td>
<td>$508</td>
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</tbody>
</table>

---

**NuDesign**

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No fee for Visa or Mastercard, Amex accepted, COD, Telecheck Approved, C.O.D., Check, or Money Order. All new drives, preformatted with latest stable system software. Factory warranty, bracket, cables and software included. 30 Day Money Back Guarantee. Call toll free (8:30-5:00) 800-759-2133

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- NuDesign 5.0 Gig $1398

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**DAT Drives from Nu Design**

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- 2.1 Gig | $1048
- 5.0 Gig | $1458

---

**Technical Support**

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or Fax us at: 312-664-9784

Hours: 8:30 - 8:00 CST, Saturdays 10:00 - 4:00

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---

**Retrospect**

- Backup software included

---

**NuDesign Color Printer**

- Price: $998

---

**NuDesign Key Points**

- Thermal Transfer printing
- Print high-quality Color output at a low cost per page.
- Brighter, richer, more vibrant colors than other color printing technologies.
- Proofing quality output

---

800-621-8469

or Fax us at: 312-664-9784

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  Automatic Document Feeder ............................................428
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## CD ROM SELECTIONS

Purchase any four CDs from this list to get the APS T 3401 CD ROM drive for the unbelievable price of $499.

### Model

<table>
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<th>CD ROM</th>
<th>Price</th>
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<td>APS P 215</td>
<td>$299</td>
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### POWERBOOK ACCESSORIES

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### POWERBOOK DRIVES

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### TAPE DRIVES

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### THE ADVANTAGE

- CD ROM BUNDLE
  - APS T 3401: $549
  - APS P 215: $299
- POWERBOOK DRIVES
  - APS GRS 80: $249
  - APS GO 120: 319
  - APS GRS 160: 349
  - APS T 213: 549
  - APS T 340: 849
- MAGNETO OPTICAL
  - APS 128MB MO: $919
- DAT
  - APS DAT: $949
  - APS Turbo DAT: $1249
  - APS Hyper DAT: $1649
- SYQUEST
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  - APS SQ 5110c: 44/88
  - APS SQ 3105: 105MB
- TAPE DRIVES
  - APS T 155 MB Tape Backup: $479
  - APS T 600 MB Tape Backup: $649

### APPLIED TECHNOLOGIES

- Support
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- Every Drive Tested and Retested
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## CD ROM BUNDLE

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- APS P 215: $299

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- APS SQ 5110c: 44/88
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<td>NEC MicroLaser Plus 17-Font Adobe PostScript and 1.5MB memory</td>
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<td>Scanners</td>
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<td>ESPON Scanners 24-bit &quot;TruePass&quot; scanning capable of 16.6 million colors</td>
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<td>ES-600C SCSi</td>
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<td>ES-800C</td>
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<td>Interface Kit</td>
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<td>Epson Lingo Color, Hand held scanner, 400dpi, 262,144 colors, includes s/w bundle</td>
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<td>Order Today!</td>
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LOOK FOR THIS SIGN
WHEN YOU NEED INFORMATION...
FAST!

In today's competitive marketplace, smart buyers look for that extra edge when purchasing Macintosh computer products. One sure way to get the information edge is to use the MacUser Reader Service Fax Card. It's the quick and easy way to get detailed product information mailed directly from the manufacturer, free of charge.

Our new fax format speeds response time and is designed to be user friendly. To request Macintosh product information by fax, just follow these three simple steps:

- **CHECK OFF** answers to six research questions
- **CIRCLE** the numbers on the card that correspond with the advertisements or articles featuring the products you're considering purchasing
- **FAX** your request to (609) 461-5921

Don't take a chance with your next product purchase. Get the MacUser information edge and feel confident about making an informed buying decision.
If you find any of products listed here or in our catalog advertised for less in this magazine, we'll meet or beat that price!
- The Lowest Prices
- The Widest Selection
- Over 2,500 Items in Stock
- Expert Mac Advisors
- Money Back Guarantees
- Overnight Delivery Only $3
- Easy Methods of Payment
- Corp., Govt. & Educational Accounts
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- International Dealers & Distributors

NEW LOWER PRICE

**$258**

**HAYES... THE RIGHT CONNECTION**

**ACCURA 144 + FAX 144**
Cost effective V.32/32.400 bps data and Group 3/4/1400 bps Fax modem. V.42B, MNP 5, plus 56000-300 bps data. Free SMARTMac Modem software and Macintosh modem cable.
Item # HAY34

**ACCURA 96 + Fax 96 (New lower price)** $228
Item # HAY33

**ACCURA 2400** Item # HAY32 $88

**Optima 144 + Fax 144** Item # HAY36 $488

**Pockets edition excl.)**

**Smartcom II 3.4 for Mac** Item # HAY10 $82

**HayesConnect 3.0** Item # HAY23 $75

**UMAX UC1260 COLOR SCANNER**

The UMAX UC1260 scanner is built to provide users with 24-bit rich resolution color images. This 24-bit color scanner can recognize over 18 million colors. It has a built-in hardware gamma correction to match the original colors with outstanding quality. In addition, the UMAX offers 8-bit gray-scale, 1-bit halftone and 1-bit line art modes to speed up scanning time.

Item # UMAX18

**UC400** Item # UMAX14 $1,248

**UC600 (New lower price)** Item # UMAX10 $988

**OFOTO 2.0**

OFOto Version 2.0 sets a new standard for ease of use and accuracy when scanning line drawings, art and images — color, grayscale, and black and white. High-fidelity scans with the click of one button. Out-of-focus or under and over-exposed problem originals are no longer a problem. Ofo can even fix photographs that have been taken with the wrong film. Don't 'correct' your scan; get it right the first time with OFOTO version 2.0!

**$17/2 October McAllister**

**FAXPRO II 14.4 V.2.2 HI-SPEED MULTIUSER**

FaxPro II 14.4 is a complete hardware and software package which includes a 14,000 bps fax modem. FaxPro II software lets networked users share one or more fax modems to send and receive faxes from their desktop. FaxPro II's sophisticated features include the ability to store frequently faxed files. Includes 100 different fonts and bitmaps. FaxPro II software only $29

**Item # CP18**

**PhonePro item # CP18**

**PhonePro software only $27**

**NEW VERSION!**

**MACACADEMY**

America's Most Popular Mac Workshops
Now on Video!

MacAcademy has a unique Video Training Library that eliminates reading through huge instruction manuals. Each video features a top trainer to teach the program from start to finish. Cut your learning curve by 70%. Most top programs featured on video. See the technique on the screen, replay, fast-forward. Excellent learning sources for companies, schools, individuals and clubs. Winner 1992 MACWORLD Word Class Award.

**HAYES CONNECT III**

**$39**

**AFTER DARK BUNDLE**

Now get two great programs — After Dark and More After Dark for twice the variety. After Dark is the ultimate screen saver collection with over 30 displays including Flying Toasters and Fish! Features sound, password protection, logo and message displays. More After Dark includes 25 new displays: Monkey Man, Tunnel Geospot, and Crazy Kittens.

**Item # BRR15-B0**

**After Dark 2.0** Item # BRR11-B02 $29

**Star Trek The Screen Saver** Item # BRR17 $35

**NEW Disney Col. Screen Saver** Item # BRR17B $28

**More After Dark** Item # BRR18-B0 $29

**TAMARACK COLOR SCANNERS**

Will Change the Way You Do Business
The 1200C is high resolution image capture (1200 dpi) — the latest requirement in high technology desktop publishing. All models offer exceptional color accuracy combined with outstanding speed and reliability. Option: transparency adapter gives you added versatility — scanning transparent documents to a file (8.5 x 11") in seconds. Item # TAM10

**6000C (600 dpi)** Item # TAM12 $1028

**8000C (600 dpi)** Item # TAM11 $1198

We take care of you!
PERIPHERALS

**WACOM**

12" x 8" Graphics Tablet $295

12" x 12" Electronic Tablet $995

**PLI**

105MB 3.5" Square/14 MS Drive $649

128MB Optical, 30WS Drive $1069

864MB/44MB Square Drive $555

**UMAX**

UC 1260 $1895

1200 DPI Color Scanner/PhotoShop 2.5, Tycoon Plus OK Kit's PowerTools

UC 840 $1339

800 DPI Color Scanner with PhotoShop 2.5 & TypeFand OCR Software

**NEW!** Prometheon Ultimate Modem (14.4 Data/Fax & VoiceMail) $345

SERVERLESS 14.4 BPS FAX & DATA over the Network!

PRINTERS

**HEWLETT PACKARD**

660B (600 DPI Bit-Scan) $3895

660P (600 DPI) 2MB RAM $1995

880P (800 DPI) $1995

**NEW!** HP 4ML $1075

PostScript Level 2, RISC, Resolution Enhancer, 48MB, Energy Saving Features, Tiny Small Size

**COLOR DeskWriter 550C**

DeskWriter $625

DeskWriter $345

GCC BLP Elite 4 Laser Printer $995

GCC Select 600 (600 DPI Tabloid) Laser Printer $3895

**MAC SYSTEMS**

**NEW! AV MAC SYSTEMS!**

**UMAC**

880P (800 DPI) 1.2Gigabyte Hard Drive, CD ROM Drive (40MHz), Video Recognition, Speech Generation, Video In and Out, Stereo, 16-bit Sound, Windows 95 (BSP C6)

SONY 17" Trinitron Monitor

New 400 DPI Laser Printer

Apple PostScript 2.5

Apple Adobe/PDF, Adobe Photoshop 2.5

Apple SoftPart Table & Cables

**NEWTON**

Newton Communications System

Message/Phone/Fax

Newton Communications System Pro

Message/Phone/Fax, Mac to Newton Traliner K...

Newton Message Pad

**NEW! POWER BOOKS**

PowerBook 180c EXECUTIVE PACKAGE $159 p/m

• PowerBook 180c/8/160
• WriteAbove Portable Printer
• Global Village PowerPad Gold
• Targus Leather Case
• ABC Deluxe PowerBook

PowerBook 145B 4/40 $1350

**THE TRAVELLER PACKAGE**

PowerBook 165 (233MHz) 4/160

PowerBook 144 BPS FaxModem

PowerBook Case

ABC Deluxe PowerBook

$2379/951

**NOW AVAILABLE**

SONY 1720 17" Trinitron Color Monitor ...

SONY 1430 14" Trinitron Color Monitor ...

**SPECIALIZED SYSTEM BUNDLES**

Complete Systems for the Following:

• DESKTOP PUBLISHING • DESKTOP VIDEO
• GRAPHIC ARTIST • SCREENWRITING

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fax: 1 (310) 325-4073

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We offer you the best overall value, customer service, technical support, and financing options.

During our 8 years in business, we've become America's one-stop source for Macintosh solutions. Why have we been so successful when dozens of others have failed? The answer is SERVICE, SERVICE, SERVICE. We believe in building relationships and making sure you get the best solutions you possibly can...that's why we're America's largest Mac mail order reseller.

Real Fronencher
President

CUSTOMER SERVICE

When you order from us, you get computer experts, not clerks! All of our salespeople are trained in Apple's intensive program, as well as our own. On average, they have three years of Mac experience. They're ready to help you (with a smile!) both before and after the sale.

TECH SUPPORT

Our tech team is well trained, well informed, and well known for their ability to solve customers' problems with a minimum of inconvenience to the customer. We have the best tech support team in the business. Call them toll-free at 1-800-364-MACS. Please have your customer number ready.

GUARANTEE

Our famous guarantee: if you don't like it, we'll buy it back. If you're not 100% satisfied, call for your RMA number and return the product within 30 days of the ship date. We'll cheerfully refund your purchase price. Guarantee applies to all hardware except leases, PowerBooks, consumables, and special-order items.

BUSINESS LEASING*

1. True Lease (10% buy-out option)
2. Installment Lease ($1 buy-out option)
3. Speed Lease...90- or 180-day terms, with buy-out/upgrade to other leases
4. 20/20 Lease...10% security deposit, 20 equal payments, 10% buy-out
5. 90-day Deferred Lease...no payment for 90 days; 1st and last payment in advance

*All leases are subject to credit approval. All lease payments in our ads are based on the "True Lease" program at 48 months. Prices, lease prices, and rates are subject to change without notice. NOTE: Minimum lease payment is $50 per month.

Your one-stop source

HARDWARE THAT FITS

RasterOps
Sweet 16

$1,099

Lease: 30/mo.

RealTech
15"

$449

Grayscale

Lease: $1/mo.

SuperMac

$1,599

20" Plus

Lease: $44/mo.

SuperMac 21" Mono/Grayscale

SuperMatch 20" Multi-Mode XL

SuperMac 20" Plus

SuperMac 17" Trinitron

SuperMac Video Cards

Spectrum/24 PDQ Plus

Spectrum/8 NuBus

Spectrum/24 Series IV

Video Spinout

Video Spinout & Sound

Thunder 24

Thunderlight

* 24-bit captures up to 30 frames/second

SUPERMAC

 pans

Sonic

$1,199

17" 1730

Lease: $33/mo.

Daystar

Digital

NEW Turbo 040 Accelerators

Get the maximum in 68040 acceleration and 100% compatibility. For Mac Iici and Iib; includes math chip. 25 MHz Turbo 040

33 MHz Turbo 040

FastCache Turbo 040

40MHz Turbo 040 w/FastCache

Universal PowerCache Accelerators

Math chip included. Supports 16 platforms.

33 MHz Accelerator

40 MHz Accelerator

50 MHz Accelerator

PowerCache Adapter

Photoshop Accelerator

Includes PicturePress 2.5, Charger Plug-ins, and Kodak Photo CD access with clip art images.

Charger

$639

ACCELERATORS

UMAX

UC 630, UC 840 & UC 1260

600, 800, or 1200 dpi color scanners with 51 brightness and contrast levels. Scans flat art in an 8-1/2 x 14" viewing area. Includes full version of Adobe Photoshop. Transparency Option allows scanning of flat art, transparencies, and slides in a 6 x 9" viewing area.

UC 630 Color Scanner

UC 630 Color Transparency Option

UC 840 Color Scanner

UC 840 Color Transparency Option

UC 1260 Color Scanner

$1,199

$1,699

$1,299

$1,299

$1,879

$1,595

RealTech Scan 800

800 dpi color scanner with 200 brightness and contrast levels. Scans flat art in an 8-1/2 x 11-3/4" viewing area. Optional Adobe Photoshop: $200. Includes ScanMatch color calibration software. Transparency Option allows scanning of flat art, transparencies, and slides in an 8-1/2 x 11-3/4" viewing area.

RealTech Scan 800

RealTech Scan 800

$1,699

$1,299

$1,879

$1,595

Lease: $44/mo.

SCANNERS
We specialize in special savings on custom-tailored systems.

LC III, 4 MB of RAM, 80 MB hard drive, RealTech 15" Full Page Display, and Apple standard keyboard...$1799

Centris 610, 4 MB of RAM, 80 MB hard drive, Magnavox 14" color monitor, and KeyTronic MacPro Plus extended keyboard...$2029

Centris 650, 8 MB of RAM, 230 MB hard drive, Sony 2036s Trinitron color monitor, RasterOps Paintboard Li video card, built-in Ethernet, and KeyTronic MacPro Plus extended keyboard...$5819

Centris 660 AV (with CD), 8 MB of RAM, 230 MB hard drive, Apple AudioVision 14" color monitor, and KeyTronic MacPro Plus extended keyboard...$3667

Centris 8400 AV (with CD), 8 MB of RAM, 230 MB hard drive, Apple AudioVision 14" color monitor, and KeyTronic MacPro Plus extended keyboard...$5267

Quada 950, 8 MB of RAM, 540 MB hard drive, Sony 2036s Trinitron color monitor, RasterOps Paintboard Li video card, and KeyTronic MacPro Plus extended keyboard...$6979

Quada 800, 8 MB of RAM, 230 MB hard drive, Sony 2036s Trinitron color monitor, RasterOps Paintboard Li video card, and KeyTronic MacPro Plus extended keyboard...$6736

We install your card...install your memory...and test all components together before shipping your custom-configured system.

$1,889

Lease: $51/mo.

PowerBook Duo 230, 8 MB of RAM, 80 MB hard drive, 33 MHz 68030 microprocessor...$1889

POWERBOOKS

PowerBook Duo 210 4/80...$1599
PowerBook 160 4/80...$1999
PowerBook 165c 4/80...$2999
PowerBook 180 4/80...$3999

PowerBook Portable Docks

Designed for presentations. Connects the PB Duo to almost any type of video screen. The ideal travel clock.

PowerLink Presenter (8-bit)...$499

Connects to Ethernet networks, color displays, external SCSI devices, etc.

PowerLink DeskNet (8-bit)...$659
1. We offer the highest quality name-brand mechanisms available; fully tested and burned in.

2. Shielded 40 watt power supply (65 watts for FH drives) provides an additional margin of safety from electrical interference, keeping your data free of corruption.

3. External fuse keeps fuse replacement simple.

4. Power cable plug-in

5. Two switched outlets provide power to additional peripherals, allowing 1-step system power-up.

6. Easy-to-use pushbutton SCSI ID selector switch

7. Two 50-pin SCSI connectors for simple configuration...

...no need to buy extra attachments.

---

**REMOVABLES**

**REALTECH MAGNETO-OPTICAL**

- 128 MB Epson Drive w/1 disk (29 ms access time)...........................................$999
- 1 yr. warranty) ..........1.0 G B cap acity; 35 ms access time; 1 yr. warranty)...............$399

**REALTECH TAPE BACKUP**

Includes Retrospect 2.0 backup software.

TEAC 155 MB Drive..................$499
- TEAC 600 MB Drive..................$699

**REALTECH DAT**

- DDS-DC Drive (2-8 GB capacity; 1 yr. warranty; includes Retrospect 2.0 backup software)......$1399

The RealTech DAT Drive uses industry-standard DDS-DC compression on a 90-meter tape. Depending on your data, storage capacities may vary from 2 to 8 GB.

**SYQUEST**

- 44 MB Drive (External)..........$389
- 88c Drive (External)..........$549

Internal SyQuest drives are available. Call for current pricing.

*Includes one disk or tape

---

**HARDWARE THAT FITS**

**Maxtor®**

**MICROPOLIS**

Name-brand mechanisms in the highest-quality enclosure available

Prices are constantly changing. We'll always give you the best price...just call us for current pricing.

<table>
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<th>Form factor**</th>
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1. Transfer rate (or throughput) depends on your Mac CPU and system configuration. For more information, ask your Hardware That Fits sales partner.

2. Form Factor: Low Profile (LP) = 3.5

3. Full Height (FH) = 5.25

4. Power cable plug-in

5. Two switched outlets provide power to additional peripherals, allowing 1-step system power-up.

6. Easy-to-use pushbutton SCSI ID selector switch

7. Two 50-pin SCSI connectors for simple configuration...

...no need to buy extra attachments.

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**REMOVABLE MEDIA**

<table>
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<th>Model number</th>
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<td>128 MB Optical Diskette</td>
<td>$49</td>
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<td>5-pack of Optical Diskettes</td>
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<td>652 MB M-O Cartridge</td>
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<td>1.0 GB ZCAV M-O Cartridge</td>
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<td>155 MB TEAC Tape</td>
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<td>600 MB TEAC Tape</td>
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<td>60-meter DAT Tape</td>
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<td>90-meter DAT Tape</td>
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<td>44 MB Syquest Cartridge</td>
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<td>88 MB Syquest Cartridge</td>
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</table>

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Hours: 8 am-7 pm Central Standard Time

39 DAY MONEY BACK GUARANTEE on all hardware except for Macs. To arrange for return, call your Hardware That Fits store or 1-800-364-USER. We pay for return. Please pack carefully. Reconditioning required. 39-day money-back guarantee is void if machine is not reconditioned. Return authorization number required. We're not responsible for damaged machines. All prices subject to change without notice. Hardware That Fits is located at 401 S. Frazier in Comer, GA 30629.
## MARKETPLACE

The cost-effective buying arena that provides sellers of Macintosh compatible products 3 advertising options: Premier, Classified and BusinessCard to meet their specific advertising goals, reaching 410,000 Macintosh Business Buyers. All sections are set up by product category and offer reader service.

### HARDWARE
- Accelerator Boards
- Bar Coding
- CD-ROM
- Communications
- Computer Systems
- Data Acquisition
- Disk Drives
- Diskettes
- General Input Devices
- Memory Upgrades
- Networking Peripherals
- Power Book Supplies
- Power Supplies
- Printers
- Scanners
- Security
tape Drives
- Used Equipment

### SOFTWARE
- Accounting
- Back Up Systems
- Bar Coding
- Business
- Business Time Management
- CAD/CAM
- CD-ROM
- Communications/Networking
- Desktop Publishing
- Educational
- Emulation
- Engineering
- Entertainment/Games
- Financial
- Fonts
- Foreign Languages
- Genealogy
- General Government
- Graphics
- Health
- Language Tools
- Legal
- Lottery
- Medical/Dental
- Music/WIDI
- Networking
- Personal Management
- Programming Tools
- Public Domain
- Real Estate

### CLASSIFIED
Flexible-format display advertising that offers diverse sizes plus two and three color options. Section meets dynamic advertising needs for all Macintosh products and services.

### BUSINESS CARD
A forum for innovative, unique, low-cost and hard-to-find Macintosh hardware, software, and miscellaneous products and services.

### PRODUCT CATEGORIES

<table>
<thead>
<tr>
<th>HARDWARE</th>
<th>PREMIER</th>
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<th>BUSINESS CARD</th>
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BAR CODE READERS

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• 1 or 2 scanners per reader
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• Complete with Steel Stand $39

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• 64K or 256K Memory
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• Complete 64K Unit with Stand $279

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NEC 496 $789
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Personal LV NT - $799.00
Personal LV LS - $499.00
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EMAC 2400B Data/Fax (send + receive)
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Hiyges 2400B Int. - $25.00
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Syquest Carts - $62.00
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Classic II 6400 - $489.00
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Apple 12" RGB - $299.00
Apple 12" Mono - $150.00
Apple 5 Bit Video Card - $65.00
Apple One Scanner - $499.00
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<table>
<thead>
<tr>
<th>QUADRA</th>
<th>CENTRIX</th>
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<td>800 16/500</td>
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<td>$6297</td>
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<td>1000 8/5200 CD</td>
<td>$8000</td>
<td>$6597</td>
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</table>

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800-825-4237.
Source: MacUser 1992 Study of Microcomputer Product Ownership and Buying Plans

MacUser November 1993 281
# DISK DRIVES

## Pacific Mac

**800-546-4622**

24 Hr Fax 714-447-6723

### AMEX*DISCOVER*MC*VISA

<table>
<thead>
<tr>
<th>QUANTUM</th>
<th>Intern</th>
<th>Extern</th>
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<tr>
<td>160 MB 2.5&quot;</td>
<td>17ms</td>
<td>280/-</td>
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<tr>
<td>85 MB 3.5&quot;</td>
<td>17ms</td>
<td>169/-</td>
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<tr>
<td>127 MB 3.5&quot;</td>
<td>17ms</td>
<td>190/-</td>
</tr>
<tr>
<td>170 MB 3.5&quot;</td>
<td>17ms</td>
<td>195/-</td>
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<tr>
<td>240 MB 3.5&quot;</td>
<td>10ms</td>
<td>249/-</td>
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<td>525 MB 3.5&quot;</td>
<td>10ms</td>
<td>630/-</td>
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<td>700 MB 3.5&quot;</td>
<td>10ms</td>
<td>795/-</td>
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<tr>
<td>1.0 MB 3.5&quot;</td>
<td>10ms</td>
<td>940/-</td>
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<tr>
<td>1.2 MB 3.5&quot;</td>
<td>10ms</td>
<td>1060/-</td>
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TWO YEAR WARRANTY!

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<tr>
<th>FUJITSU</th>
<th>Intern</th>
<th>Extern</th>
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<tr>
<td>520 MB 3.5&quot;</td>
<td>9ms</td>
<td>665/-</td>
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<tr>
<td>1.2 GB 3.5&quot;</td>
<td>8.5ms</td>
<td>905/-</td>
</tr>
<tr>
<td>2.1 GB 5.25&quot;</td>
<td>11ms</td>
<td>1835/-</td>
</tr>
<tr>
<td>2.4 GB 5.25&quot;</td>
<td>11ms</td>
<td>1825/-</td>
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FIVE YEAR WARRANTY!

<table>
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<tr>
<th>MAXTOR</th>
<th>Intern</th>
<th>Extern</th>
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<tbody>
<tr>
<td>120 MB 3.5&quot;</td>
<td>15ms</td>
<td>185/-</td>
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<tr>
<td>213 MB 3.5&quot;</td>
<td>15ms</td>
<td>259/-</td>
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<tr>
<td>540 MB 3.5&quot;</td>
<td>8.5ms</td>
<td>780/-</td>
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<tr>
<td>1.2 GB 3.5&quot;</td>
<td>8.5ms</td>
<td>1150/-</td>
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<td>1.7 GB 5.25&quot;</td>
<td>13ms</td>
<td>1185/-</td>
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FIVE YEAR WARRANTY!

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<th>SEAGATE</th>
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<tr>
<td>1.2 GB 5.25&quot;</td>
<td>10.5ms</td>
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<td>2.4 GB 5.25&quot;</td>
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<td>2.4 GB 5.25&quot;</td>
<td>8ms</td>
<td>2240/-</td>
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<td>2.4 GB 5.25&quot;</td>
<td>15ms</td>
<td>1689/-</td>
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<td>2.4 GB 5.25&quot;</td>
<td>12.9ms</td>
<td>1515/-</td>
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<td>11.5ms</td>
<td>1399/-</td>
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<tr>
<td>2.4 GB 5.25&quot;</td>
<td>11ms</td>
<td>1709/-</td>
</tr>
<tr>
<td>3.4 GB 5.25&quot;</td>
<td>11ms</td>
<td>1850/-</td>
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FIVE YEAR WARRANTY!

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<tr>
<th>MICROPOLIS</th>
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<tr>
<td>1.2 GB 1.12&quot;</td>
<td>3.5&quot;</td>
<td>10ms</td>
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<tr>
<td>2.0 GB 2.12&quot;</td>
<td>3.5&quot;</td>
<td>10ms</td>
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FIVE YEAR WARRANTY!

<table>
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<tr>
<th>SYQUEST</th>
<th>Intern</th>
<th>Extern</th>
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<tbody>
<tr>
<td>44 MB 5.25&quot;</td>
<td>45ms</td>
<td>345/-</td>
</tr>
<tr>
<td>88 MB 5.25&quot;</td>
<td>45ms</td>
<td>439/-</td>
</tr>
<tr>
<td>165 MB 5.25&quot;</td>
<td>45ms</td>
<td>485/-</td>
</tr>
<tr>
<td>165 MB 5.25&quot;</td>
<td>45ms</td>
<td>615/-</td>
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All Syquest drives include Cartridge and Software

### FAX MODEMS

<table>
<thead>
<tr>
<th>FAX MODEMS</th>
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<tr>
<td>SLUPE FAX MODEM V.32bis S/R Fax 14.4 Stand-Alone</td>
<td>239/-</td>
</tr>
<tr>
<td>V.32bis S/R Fax 14.4 w/Software</td>
<td>288/-</td>
</tr>
<tr>
<td>V.42bis S/R Fax 14.6 w/Software</td>
<td>238/-</td>
</tr>
<tr>
<td>V.32bis S/R Fax 14.4 for PB Internal</td>
<td>298/-</td>
</tr>
<tr>
<td>V.32bis S/R Fax 14.4 for PB/Voice</td>
<td>394/-</td>
</tr>
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| PSI         | 174/-234/- |
| COStoration One/Two | 354/-424/- |
| COStoration Four/Five | 104/-224/- |
| PowerModem One/Two | 314/-374/- |

| US ROBOTICS | 238/- |
| Mac & Fax Sportster 14.4 S/R Fax | |

GLOBAL VILLAGE

| PowerPort Bronze/Silver/Gold | 164/-318/-368/ |
| TelePort Bronze/Silver/Gold | 174/-318/-374/ |

### RASTEROPS

<table>
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<tr>
<th>RASTEROPS</th>
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<tr>
<td>208500 20&quot; Monochrome Color</td>
<td>290/-</td>
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<tr>
<td>207500 20&quot; Multiscan Trin.</td>
<td>290/-</td>
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<tr>
<td>2020C Multiscan Color</td>
<td>290/-</td>
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<tr>
<td>2400TV/2400XQ</td>
<td>290/-</td>
</tr>
<tr>
<td>2420/242X</td>
<td>290/-</td>
</tr>
<tr>
<td>2420LTV/2440TV</td>
<td>290/-</td>
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### SUPERMAC

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<tr>
<td>Super/Match 17&quot; Multimode</td>
<td>998/-</td>
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<tr>
<td>Super/Match 17&quot; Color Monitor</td>
<td>1048/-</td>
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<tr>
<td>Super/Match 21&quot; Page Color</td>
<td>2375/-</td>
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<tr>
<td>Thunderbird 2 Deluxe</td>
<td>825/-</td>
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<td>Thunderbird 9 Card</td>
<td>395/-</td>
</tr>
<tr>
<td>Spectrum/24 Series IV</td>
<td>775/-</td>
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<tr>
<td>Spectrum/24 PDQ Plus</td>
<td>1434/-</td>
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<td>Spectrum/B24 PDQ si</td>
<td>745/-</td>
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### RADIUS

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<td>IntelColor Display 20</td>
<td>2585/-</td>
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<tr>
<td>PrecisionColor Pro 20X Card</td>
<td>2075/-</td>
</tr>
<tr>
<td>PrecisionColor 24X/32X Cards</td>
<td>1475/1484</td>
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<tr>
<td>PrecisionColor 24X/32X Cards</td>
<td>489/-</td>
</tr>
<tr>
<td>PrecisionColor 35&quot; Pivot 15&quot; Mon</td>
<td>925/-</td>
</tr>
<tr>
<td>VideoVision Studio (and more)</td>
<td>3685/-</td>
</tr>
<tr>
<td>Rocket 25/32/35/39/41</td>
<td>965/1445/-</td>
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### MICROTEK

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<tr>
<th>MICROTEK</th>
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<tr>
<td>ScanMaker II/IXE</td>
<td>875/-1155/-</td>
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<tr>
<td>ScanMaker 1ST</td>
<td>1375/-</td>
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<tr>
<td>Automatic Document Feeder</td>
<td>465/-</td>
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### CD ROM DRIVES

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<th>CD ROM DRIVES</th>
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<tr>
<td>TOSHIBA XM3401B External</td>
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<tr>
<td>TOSHIBA XM3301B External</td>
<td>455/-</td>
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<tr>
<td>TECIX DM3024 External</td>
<td>425/-</td>
</tr>
<tr>
<td>CHINON 435 External</td>
<td>398/-</td>
</tr>
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</table>

Choose from following bundles: ADD

BUNDLE A (Choose any 5 titles for $89/-)
- 1. Cartoon Idioms
- 2. Graphic Textures
- 3. Lucas Game Pack II
- 4. Media Clips: Wild Places
- 9. Multimedia Audition Mammals
- 10. Publish It Vol. 1
- 11. NME Dessen Stern
- 12. Sherlock Holmes Consulting detective

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- 1. Time Table of History, Science & Innovation
- 3. Family Doctor
- 4. Multimedia CIA/KGB World Fact Book
- 5. Media Clips: Jokes & Props
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- 9. Animals of the San Diego Zoo

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#### PowerBook Memory for the 165C & 180C

<table>
<thead>
<tr>
<th>Memory Type</th>
<th>Capacity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>4mb memory module</td>
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<tr>
<td>8mb memory module</td>
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<tr>
<td>16mb memory module</td>
<td>$429</td>
<td></td>
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<tr>
<td>32mb memory module</td>
<td>$489</td>
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#### Syquest Cartridges

<table>
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<tr>
<td>44MB</td>
<td>$62</td>
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<tr>
<td>88MB</td>
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#### Memory Direct Removable Drives

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<td>$359</td>
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<tr>
<td>Memory Direct 44mb Internal</td>
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<td>Memory Direct 88mb External</td>
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<td>Memory Direct 88c External</td>
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<td>Memory Direct 88c Internal</td>
<td>88c</td>
<td>$569</td>
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*Your Memory Direct 88c will read and write, but not format, 44 mb cartridges.*

#### Daystar Digital

<table>
<thead>
<tr>
<th>Device</th>
<th>Price</th>
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<tbody>
<tr>
<td>Power Codec 25</td>
<td>$389</td>
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<td>Power Codec 40</td>
<td>$469</td>
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<td>Power Codec 50</td>
<td>$719</td>
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<td>25 Mux Turbo 040</td>
<td>$419</td>
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<td>33 Mux Turbo 040</td>
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<tr>
<td>Universal FDCache</td>
<td>$169</td>
</tr>
<tr>
<td>ComboCache with math chip</td>
<td>$219</td>
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<tr>
<td>Equalizer IC with math chip</td>
<td>$179</td>
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<tr>
<td>Charger</td>
<td>$269</td>
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<tr>
<td>100v</td>
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#### Local Village

<table>
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<tr>
<th>Model</th>
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<tr>
<td>PSI</td>
<td>$399</td>
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<tr>
<td>PSI PowerModem</td>
<td>$439</td>
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<tr>
<td>PSI PowerModem</td>
<td>$599</td>
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<td>PSI PowerModem</td>
<td>$829</td>
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<tr>
<td>PSI PowerModem</td>
<td>$1059</td>
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#### NEC CD-ROMs

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>NEC CD Express (CD-25)</td>
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<tr>
<td>NEC MultiSpin (CD-36)</td>
<td>$305</td>
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#### SuperMAC

<table>
<thead>
<tr>
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<tr>
<td>Hard Drives</td>
<td>$855</td>
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<tr>
<td>PowerBooks</td>
<td>$855</td>
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#### Memory Upgrades

<table>
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<td>UMAX Scanners</td>
<td>$855</td>
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<tr>
<td>External Drive Housing</td>
<td>$855</td>
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#### Classifieds

<table>
<thead>
<tr>
<th>Name</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>NEC CD-ROMS</td>
<td>$855</td>
</tr>
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</table>

---

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- Fax: (714) 847-5043
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- *CALL PowerBook 140, 170 - 4MB/6MB
- CALL PowerBook - 160, 180 - 4MB/10MB
- CALL PowerBook - 165C - 4MB/6MB
- CALL PowerBook - 165C - 8MB/10MB
- CALL PowerBook Duo 210, 230 - 4MB/8MB
- CALL PowerBook 9600/2400 Fax/Modem
- CALL PowerBook 14400/14400 Fax/Modem
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- CALL Quadra’s/LS III,Centris VRAM - 256KB
- CALL LC,LC II,IIvi,IIvix VRAM - 512KB
- CALL Classic II,LC III - 16/20MHZ FPU

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<table>
<thead>
<tr>
<th>Capacity</th>
<th>Speed</th>
<th>RPM</th>
<th>Brand</th>
<th>Warranty</th>
<th>Internal</th>
<th>External</th>
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<tbody>
<tr>
<td>170MB</td>
<td>17ms</td>
<td>3600</td>
<td>Quantum</td>
<td>2 Years</td>
<td>$195</td>
<td>$255</td>
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<tr>
<td>240MB</td>
<td>16ms</td>
<td>4300</td>
<td>Quantum</td>
<td>2 Years</td>
<td>$239</td>
<td>$305</td>
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<tr>
<td>340MB</td>
<td>15ms</td>
<td>3600</td>
<td>Maxtor</td>
<td>2 Years</td>
<td>$339</td>
<td>$409</td>
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<tr>
<td>340MB</td>
<td>13ms</td>
<td>4011</td>
<td>Conner</td>
<td>2 Years</td>
<td>$369</td>
<td>$429</td>
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<tr>
<td>520MB</td>
<td>12ms</td>
<td>4400</td>
<td>Fujitsu</td>
<td>5 Years</td>
<td>$639</td>
<td>$699</td>
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<tr>
<td>525MB</td>
<td>10ms</td>
<td>4500</td>
<td>Quantum</td>
<td>5 Years</td>
<td>$569</td>
<td>$649</td>
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<tr>
<td>540MB</td>
<td>10ms</td>
<td>5400</td>
<td>Conner</td>
<td>2 Years</td>
<td>$619</td>
<td>$679</td>
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<tr>
<td>560MB</td>
<td>10ms</td>
<td>5400</td>
<td>Micropolis</td>
<td>3 Years</td>
<td>$759</td>
<td>$829</td>
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<tr>
<td>700MB</td>
<td>10ms</td>
<td>5400</td>
<td>Quantum</td>
<td>5 Years</td>
<td>$749</td>
<td>$809</td>
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<tr>
<td>1050MB</td>
<td>10ms</td>
<td>5400</td>
<td>Quantum</td>
<td>5 Years</td>
<td>$879</td>
<td>$939</td>
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<td>1050MB</td>
<td>10ms</td>
<td>5400</td>
<td>Micropolis</td>
<td>5 Years</td>
<td>$909</td>
<td>$979</td>
</tr>
<tr>
<td>1080MB</td>
<td>9.5ms</td>
<td>5400</td>
<td>Fujitsu</td>
<td>5 Years</td>
<td>$909</td>
<td>$979</td>
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<tr>
<td>1100MB</td>
<td>10.5ms</td>
<td>5400</td>
<td>Hewlett Packard</td>
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<td>$909</td>
<td>$979</td>
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<td>1225MB</td>
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<td>5400</td>
<td>Quantum</td>
<td>5 Years</td>
<td>$979</td>
<td>$1049</td>
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<tr>
<td>1230MB</td>
<td>8.5ms</td>
<td>6300</td>
<td>Maxtor</td>
<td>3 Years</td>
<td>$1129</td>
<td>$1229</td>
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<td>1370MB</td>
<td>10ms</td>
<td>5400</td>
<td>Conner</td>
<td>2 Years</td>
<td>$969</td>
<td>$1059</td>
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<tr>
<td>1600MB</td>
<td>9.7ms</td>
<td>5400</td>
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<td>1570MB</td>
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<td>2060MB</td>
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<td>Micropolis</td>
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<td>$1859</td>
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<tr>
<td>3020MB</td>
<td>11ms</td>
<td>5400</td>
<td>Micropolis</td>
<td>5 Years</td>
<td>$2199</td>
<td>$2299</td>
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**Syquest Drives**

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<thead>
<tr>
<th>Capacity</th>
<th>Model</th>
<th>Speed</th>
<th>Internal</th>
<th>External</th>
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<tbody>
<tr>
<td>44mb</td>
<td>SG555</td>
<td>20ms</td>
<td>$345</td>
<td>$375</td>
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<tr>
<td>44/88MB</td>
<td>SG5110C</td>
<td>20ms</td>
<td>$469</td>
<td>$485 Sales</td>
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<tr>
<td>105MB</td>
<td>SQ3105</td>
<td>14.5ms</td>
<td>$609</td>
<td>$629 Sales</td>
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<tr>
<td>Media 1/5</td>
<td>44MB/53</td>
<td>$435</td>
<td>$455</td>
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<tr>
<td>88MB/56</td>
<td>$449</td>
<td>$465</td>
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<tr>
<td>520MB</td>
<td>3020MB</td>
<td>$1759</td>
<td>$1859</td>
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**CD-ROM Drives**

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<th>Brand</th>
<th>Speed</th>
<th>Transfer</th>
<th>Type</th>
<th>Internal</th>
<th>External</th>
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<tbody>
<tr>
<td>Teac</td>
<td>260ms</td>
<td>335KB/sec</td>
<td>Single Disk</td>
<td>$379</td>
<td>$419</td>
</tr>
<tr>
<td>Pioneer</td>
<td>270ms</td>
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<td></td>
<td>N/A</td>
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**Tape Drives**

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<th>Brand</th>
<th>Speed</th>
<th>Internal</th>
<th>External</th>
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<tbody>
<tr>
<td>250MB</td>
<td>QIC 190</td>
<td>Archive</td>
<td>7MB/min</td>
<td>$479</td>
<td>$499</td>
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<tr>
<td>25ig</td>
<td>DAT</td>
<td>Archive</td>
<td>1MB/min</td>
<td>$969</td>
<td>$989</td>
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<tr>
<td>25ig</td>
<td>DAT</td>
<td>Hewlett Packard</td>
<td>12MB/min</td>
<td>$999</td>
<td>$1019</td>
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<tr>
<td>8-9ig</td>
<td>DAT</td>
<td>Archive</td>
<td>8MB/min</td>
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<td>$1229</td>
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<td>8-9ig</td>
<td>DAT</td>
<td>Hewlett Packard</td>
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<td>$1199</td>
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<td>Tapes 1/5</td>
<td>DC6250 $29 / $120</td>
<td>90 Meter DAT $17 / $75</td>
<td>DAT Cleaning Tape $19</td>
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**Optical Drives**

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<th>Brand</th>
<th>Feature</th>
<th>Internal</th>
<th>External</th>
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<td>20MB</td>
<td>65ms</td>
<td>Insite</td>
<td>Floptical</td>
<td>$319</td>
<td>$349</td>
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<tr>
<td>650MB</td>
<td>27ms</td>
<td>Hewlett Packard</td>
<td>MultiFunction</td>
<td>$2179</td>
<td>$2279</td>
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<tr>
<td>1.3Gig</td>
<td>19ms</td>
<td>Maxtor Tahiti III</td>
<td>MultiFunction</td>
<td>$2999</td>
<td>$3099</td>
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<tr>
<td>1.3Gig</td>
<td>19ms</td>
<td>Media</td>
<td>1 Gig</td>
<td>$189</td>
<td>$199</td>
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<tr>
<td>20Meg</td>
<td>20Meg</td>
<td>128Meg (Verbatim)</td>
<td>$23 / $95</td>
<td>$33 / $173</td>
<td>$49 / $245</td>
</tr>
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</table>

**Fujitsu**

128MB Rewritable Optical

**Only $939**

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Brand</th>
<th>Features</th>
<th>Internal</th>
<th>External</th>
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<td>345MB</td>
<td>14ms</td>
<td>64KB Buffer</td>
<td>$339</td>
<td>$409</td>
</tr>
<tr>
<td>3600rpm</td>
<td>2 Year Warranty</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

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<td>CD Tech DM5024-$439</td>
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<tr>
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<td>1697 Clippin v.1</td>
<td>$79.95</td>
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<tr>
<td>1919 Clippin v.2</td>
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<tr>
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<td>$79.95</td>
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<td>2079 Loops</td>
<td>$79.95</td>
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<tr>
<td>2080 Faces Plus</td>
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<tr>
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<tr>
<td>1681 Design Toolkit</td>
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<tr>
<td>50048 Best of People in Business</td>
<td>$49.95</td>
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<tr>
<td>1297 Creative Backgrounds and Textures Hi Res</td>
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<tr>
<td>144 Professional Photography Collection Hi Res</td>
<td>$99.95</td>
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<td>50067 Donatelli v.1 &amp; 2 High Res</td>
<td>$99.95</td>
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<tr>
<td>50068 Donatelli v.1 &amp; 2 High Res</td>
<td>$99.95</td>
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<td>50069 Donatelli v.1 &amp; 2 High Res</td>
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MacUser November 1993 299
Last August, I meandered over to the Boston Macworld Expo to find out what was new in the world of Macintosh computing. I'd say it was pretty ordinary as such shows go — with one important exception.

First, to answer the perennial trade-show question, what was hot? For one thing, video-editing products, both hardware and software, seemed to be everywhere. And one company, LaserMaster, had an inkjet printer called the DisplayMaker that produced huge Kodachrome-quality posters and transparencies. Unfortunately, its $20,000 price tag makes the DisplayMaker suitable only for service bureaus and big agencies.

Not surprisingly, I also saw better games than ever before and plenty of cool peripherals. Lots of people were talking about Live Picture, a new imaging application that uses "revolutionary" FITS technology. So revolutionary the product will cost only $3,500! Maybe they can work out a deal to bundle a Mac with each copy.

In other words, it was a typical show, with the usual mixture of hype and hoopla. What wasn't typical was the gloomy mood of the Mac community. You see, right before this show opened, Apple's stock took one of its periodic nosedives. All of a sudden, people with short memories seemed ready to write the company off. One well-known writer actually said to me, "Gee, it has the feeling of the end. You can sense that this is the end of the road for the Mac."

Mac Bashers

It was a former publisher of PC Magazine, of all people, who asked me why so many people were bashing the Mac and Apple. I replied that ever since the late '70s, analysts have been convinced that Apple would never turn the next corner. When Apple was a half-billion dollar company, the experts said it was curtains. Then they said Apple could never make it past the billion-dollar stage. Then Apple was going under when it made $2 billion. The company was sinking fast at $3 billion. Down for the count at $4 billion. You get the idea.

I went on to say that Apple will go through a transition period as it migrates from the 68000 family of processors to the PowerPC chip that it developed jointly with IBM and Motorola. This process may take a couple of years, and it might temporarily slow Mac sales as people hold off buying while they wait for what is clearly a radically superior technology. Long-term, though, things couldn't be rosier for Apple. "Well, why is everyone bashing the Mac so fiercely?" was the response, "Do they want to kill their own preferred platform? It makes no sense!" No kidding. Because I'm paid to complain, I hadn't until then noticed how loud the bitching and moaning had become in the Mac community. It was unusual, for sure.

I thought about this for a long time in an effort to make some sense of it. Perhaps it's a natural psychological reaction. Maybe we're going through predeath grieving and will continue to be morose until the 68000-based Mac is no longer in production and we can have a true, celebratory New Orleans-style wake for old Betsy. Until then, we'll worry incessantly about the future. About whether the transition to PowerPC will work. And even about whether Apple Computer will survive at all.

Newton in Town

The one technology the show did seem excited about was the Newton. People waited in long lines on the show floor for the privilege of buying one. Of course, by the next day, all you heard were complaints about Newtons crashing and rumors that Apple was already set to recall the first-shipment units for ROM fixes.

Hold on — wasn't this supposed to be a Mac show? What was the Newton even doing there? The Newton's not a Mac. Apple did release some real Macs at the show (the Quadra 840av and the Centris 660av), and they are actually pretty cool boxes. Why weren't there lines around the block to buy those? No wonder people were in a bad mood. It's as if their beloved Mac was being snubbed.

The Newton is the hot new thing of the present, and the PowerPC is the hot new thing of the future — the chip that will "save" the Mac. But wait, now the Mac needs saving?

Then again, it may have been Boston's 95-degree heat and 95-percent humidity that caused all the grumbling. Let's give it a year and see what happens before we all jump to conclusions.

Bottom line: The Mac ain't dead yet. Don't forget, the PowerPC is a Mac. Besides, if Apple went under, what would I have left to complain about?
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