MacUser

1,000

Macintosh Products Reviewed and Rated

**Video Output:**
Turn your Mac into an instant desktop-presentation powerhouse

**Network Backup:**
No-fuss software that makes backing up an overnight success

PLUS REVIEWS OF

* drives
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more!
Remember the first day you got your hands on a Mac?
Remember how excited you felt when you saw all the things it could do?
This may refresh your memory.
Introducing WordPerfect® 2.0.

Every once in a while a new product comes along that sparks the same kind of excitement you may have experienced with your first Macintosh (you stayed up half the night, right?). As we've shown new WordPerfect® 2.0 to Macintosh users around the country, we've seen a very similar reaction. First eyes open wider. Then heads start to nod. Followed by grins that stretch dimple to dimple.

Here are some of the more graphic improvements.

We built a graphics and drawing package right into the program. With WordPerfect 2.0, you don't have to leave your document to incorporate graphics. You can create, edit, size, scale and crop graphic figures just by clicking “graphics” or “draw” on the pull-down menu. The palette includes all of the standard drawing tools, plus Bezier curves, polygons and a free rotation tool.

WordPerfect 2.0 also lets you create text boxes. Inside our text boxes you can change font size and attributes. Then you can drag your text box wherever you want in your document and the rest of your text will wrap around it automatically.

The list of new features could fill a page.
Or up to 24 columns.

By clicking and dragging icons on the new WordPerfect ruler, you can create columns (newspaper or parallel) and then adjust the column settings, align text, set tabs, change line spacing, move margins and do a number of other formatting changes to your document.

Want to add a border to text, paragraph, column, or page? Easy. WordPerfect 2.0 gives you 36 different border styles from which to choose.

Like working with Styles? WordPerfect not only lets you use them, you can also share your styles with other people on your network.

We've also added new features like a Macro Editor, Tables of Authorities, and Line Numbering. And we've made enhancements to Merge, Search and Replace, and Macros.

Of course, what counts is how you feel.

See WordPerfect 2.0 up and running at your dealer. Better yet, buy a copy of WordPerfect 2.0 and load it onto your Mac. But when you try WordPerfect 2.0 for the first time, one word of warning. Don't plan on going to bed early.

For more information, call us at (800) 526-5012.
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AUGUST 1991
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Cover photo by Walt Denson

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Putting Your Mac on TV:
Desktop Video
BY PAUL YI AND THE MACUSER LABS STAFF
The Mac is a great tool for creating information, and video is an ideal way to distribute it. Put your next Mac presentation on videotape — or blend Mac graphics into a videotaped presentation. MacUser Labs explores the video options for business applications by testing six devices that offer everything from simple video output to special-effects wizardry.

Overnight Success: Network Backup
BY VERNON KEENAN, KELLI WISETH, AND THE MACUSER LABS STAFF
Stop begging everyone in the office to back up critical files. Using one of the five network-backup packages tested by MacUser Labs, you can automate the process. Network-backup software lets you set up an unattended central backup-server system.

MiniFinders Buyer’s Guide
What do you call 1,000 Mac products chasing after five mice? MacUser’s MiniFinders, of course. Our biggest buyer’s guide ever has capsule reviews of 1,000 hardware and software products — from reliable hard-disk drives, snazzy color printers, and that big-screen monitor you’ve been eyeing, to powerful spreadsheet programs, intuitive word processors, and a belful of utilities. Whether you’re buying your first Mac or upgrading a $20,000 IIfx-based system, this is the reference you’ll turn to.

Departments

Jon Zilber
The secret recipe for System 8.0

Robert Wiggins
Users of Macintosh spreadsheet programs finally have a choice.

Guy Kawasaki
Guy’s new book objectively reviewed by Guy Kawasaki — really

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MacUser On-Line

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Marketplace
Lotus 1-2-3 for the Macintosh — at last!; Tektronix’s remarkable plain-paper color printer; DeltaGraph Professional, a powerful charting package for science and business; three slick envelope-printing products; and more.

In ten easy steps, you can create customized display type with color blends and other special effects.

Two nifty software utilities — AccessPC and DOS Mounter — let you stick an IBM PC’s 3.5-inch floppy disk into any late-model Mac and have its DOS files appear on your Mac’s desktop.

Network-management programs help you troubleshoot networks by telling you a lot about each Mac’s hardware and software setup.

Stuck on hold? There’s a better way to get instant technical support: Use your modem and an on-line information service to get help from almost 100 software and hardware vendors.

Ah, System 7.0. It’ll make a new Mac user out of you. Especially if you learn this batch of special tricks.

Great spreadsheet design takes more than mastering the features of Excel 3.0 (or WingZ or anything else). Here are the key principles you need to know.

How to position text and graphics vertically in Word, select a bunch of separate cells in Excel quickly, zoom in on parts of documents more easily in QuarkXPress, protect cables from chewing calicoes, and more.

Here’s how to use ResEdit for customizing your software programs, make sure all your Macs print the same file in the same way, figure out when (and how) a Mac’s desktop needs rebuilding, and more.

The ultimate in optical storage — two optical-disc-drive jukeboxes that can swap up to ten discs in and out. The result is a total networkable storage capacity of 6 gigabytes.

A trio of 3-D packages: A fun collection of 3-D clip art, a powerful 3-D-modeling program, and a photo-realistic rendering program.

Small and easy to use and — because it’s an ADB device — it won’t hog the serial ports, but it might lack some abilities you need.

Terrific children’s color painting software, with weird and wonderful painting tools and sound effects that could break your kids of their Nintendo habit — if you ever let them near it.

Two doses of strong medicine for computer viruses that help protect against infection and provide remedies if your disk does get sick.

A masterful and entertaining hypermedia explication of Igor Stravinsky’s landmark ballet score.

A HyperCard primer on merging Macintosh computers with musical instruments.

Battle-strategy simulation where robots do the shooting.

Simply the best software-development environment for building interactive training applications — for veteran multimedia developers, absolute beginners, and everyone in between.

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A HyperCard primer on merging Macintosh computers with musical instruments.

Battle-strategy simulation where robots do the shooting.
"Try this free. You'll be hooked."

"Dollar for dollar, TouchBASE is the most functional piece of Macintosh software I've ever seen."

Guy Kawasaki, Macintosh Evangelist

TouchBASE is the easy-to-use desk accessory that keeps track of all your personal and business contacts. Because it's a real database, it gives you capabilities no other tool can offer.

Use TouchBASE to instantly look up names and numbers, do mailings, keep notes on calls, and make custom phone lists. No matter who you want to be in touch with, TouchBASE makes it easier. You can:

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2. **Find people fast:** search in just about any way you can think of: find people even if you can't remember their names; find groups, companies - you name it.
3. **Keep useful notes:** up to seven searchable pages of useful info for each contact, with time/date stamp.
4. **Import and export data:** to and from other Macintosh applications.
5. **Share if you want:** it works in single-user mode for better personal productivity, or multi-user mode for better office productivity.

**TouchBASE—the bargain of the century!** Just $125 suggested retail. Try the free demo. You'll be hooked in minutes.
Proof that Abaton's color scanner can make anything look attractive.

See for yourself. Everything looks better with Abaton's 24-bit Scan 300/Color scanner. Just ask Slash.

Scanning colorful figures like Slash brings your monitor to life. You can size color pictures and see their relationship to other text and graphics—right on the screen. More than that, you can produce a variety of colorful images. Like stunning comps and presentations from a 300 dpi color printer. Or how about impressive 35mm or overhead slide shows with actual color photos. Even high quality proofs of four-color film for a national ad. Not to mention black-and-white art and photos, which look great with the Scan 300/Color's gray scale, halftone, and line art scanning modes.

And that's not all. We include Adobe Photoshop so you can enhance your original photo and make it more alluring. This powerful image editing software lets you change a natural blond to fuchsia. You can also remove unsightly blemishes from a picture entirely—or make just about any modification you can imagine.

With the Scan 300/Color, everything from your monitor to finished results will look marvelous. Even the price of $1,995* is rather attractive. So if you want to look as good as Slash, call Abaton at 1-800-444-5321 or (415) 683-2226 for the dealer nearest you.

*Price and specifications subject to change without notice. Scan 300/Color, Abaton, the Abaton logo, and "We Make Your Ideas Easier to Publish" are trademarks of Evers Systems, Inc.
Other brand names and product names are trademarks or registered trademarks of their respective companies. In Canada call 1-800-462-3491. OA: 1/1/89. 2/3/89. 3/3/90.

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Since 1985 Ehman has been a leader in providing high quality peripherals to the Macintosh market. Our hard drives, monochrome monitors and removable drives have been a mainstay to the industry, with a name that is well known and highly respected.

Now allow us to introduce the newest member of our family: 20 inches of 8-bit and 24-bit color in high quality, 72 DPI monitors that end users will love, and budget watchers will adore.

The new Ehman 2-page color monitors are as affordable as they are practical. Backed up by a one year warranty and our 30 day money back guarantee, the price tags once again demonstrate Ehman’s commitment to value on the most popular peripherals.

The other members of the family are just as cost conscious. From the lightning fast “highly recommended” 660MB drive (Macworld, July 91)
No Introduction Needed.

"At $899, Ehman’s Two-Page Monochrome display is an excellent buy."

MACWORLD, MAY, 1991

"If you want a full-page display, we recommend the Ehman; it’s rare to find such high quality and low price ($499) in the same monitor."

MACWORLD, MAY, 1991

to our reliable 45MB removable and the popular monochrome monitors, you’ll find our prices among the lowest in the industry, and our commitment to quality and service the highest.

Ehman has always had what you want most: affordable quality. Now with the introduction of our 2-page color monitors we also have the full line of peripherals you need most.
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**About MacUser**

**Land of 1,000 Reviews**

Anyone who reads *MacUser* regularly knows that we like to review products. Even the editors, however, are sometimes taken aback at the sheer scope of the product coverage that has appeared in the magazine during the past six years. Our *MacUser* product database contains vital information on 3,000+ Macintosh products that we follow on an ongoing basis. And it includes summaries of more than 1,000 Mac products that have been reviewed and rated in *MacUser*.

These review summaries appear four times a year in *MacUser* as MiniFinders (named after an early Mac operating-system feature that proved less durable than its namesake). Once a year, they appear as a blockbuster MiniFinders Buyer's Guide, such as the one in this issue. The other three MiniFinders reports are updates that cover important subsets of the database: Hardware, Desktop Publishing, Graphics, and so on.

MiniFinders may be small reviews, but compiling more than 1,000 of them is a big job. The product-listing database on which MiniFinders is based must be updated and revised constantly — often daily — as products are introduced, revised, and discontinued.

**MiniFinders Keeper**

How do we do it? Associate editor Bruce Mewhinney uses Claris' FileMaker Pro to keep tabs on products, because it's easy to use and can be modified on the fly. Getting the MiniFinders out of the database and onto the pages of the magazine was a difficult and time-consuming process until we started using a product called DataShaper, from ElseWare (Seattle, Washington: [206] 547-9623). This inexpensive ($179.95) database-publishing tool lets Bruce smoothly take the information out of the FileMaker Pro database for the art department to pour directly into a PageMaker layout, without a lot of processing.

By themselves, the MiniFinders reports make the *MacUser* product database useful to readers. But the database also feeds our electronic-publishing projects on Zmac, *MacUser*'s on-line service. On Zmac, readers can search for the latest MiniFinders without being constrained by the lead times inherent in magazine publishing. Although the information in this issue was current three months ago, you'll find today's information in Zmac's interactive Buyer's Guide database of 3,000+ products.

For HyperCard users, Zmac also has a MiniFinders stack. Updated quarterly, it's available exclusively on Zmac.

Producing MiniFinders will never be an easy job, for the encouraging reason that the number of products in the Mac marketplace continues to grow. Even more encouraging is that some of the products we're covering are also helping us do the job better.
TYPHOID CAROL.

TODAY SHE PROCESSED THE PAYROLL, POSTED THE MAIL, AND INFECTED EVERY MAC IN THE OFFICE.

Carol didn't mean any harm, she was just doing her job. If only she had SAM. It's the highest rated, best-selling virus protection, detection, and repair program for the Macintosh.

SAM halts viruses before they infect your system and operates invisibly in the background—interrupting you only when a virus is detected. New SAM 3.0 even repairs infected desktop files automatically, no questions asked.

And SAM 3.0 protects you from new viral strains, so you don't have to wait months for new software updates. Just call our 24-hour Virus Newsline for free update instructions. Or download a single update file directly from Symantec.

SAM 3.0 even supports System 7.0. And best of all, it costs only $99.00.

So before another virus makes your life miserable, pick up a copy of SAM 3.0. Call for more information.

1-800-228-4122 Ext. 603-F

SYMANTEC.

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Seven's Deadly Sins

As I look at System 7.0 ("70 Things You Need to Know About System 7.0," June '91, page 96), I think, "Wow, perfection!" But there's always room for improvement. Here's one I'd like to see in System 7.1.

To add any file to the Apple menu in System 7.0, you must add the file (or an alias) to Apple Menu Items in the System Folder. Then you have to open the System Folder if you want to access the file. I'd like to be able to add a file to the Apple menu simply by placing the file icon (or alias) on top of the Apple icon that appears at the top of the menu and then releasing the mouse button.

System 7.0's method of adding files to the Apple menu is much easier than was adding DAs to System 6.x. My idea takes the "convenience factor" one step further.

Brett Rohrig
Huntington Beach, CA

Image Versus Style

Thanks for the review of the two new Apple printers (May '91, page 90). Before I trash my Venerable ImageWriter II (VIW), could you please clear up a few things that the authors left out? How easily do the new machines handle envelopes and peel-off labels? Do they have a draft setting like my VIW's? As a programmer, I routinely print draft-quality copies of code running to 100 pages or more. It takes my VIW an hour or more to do this—i grab some corn chips, switch on the tube, and wait for the printer racket to quit. I extrapolate from your article that the same job with the StyleWriter would take about ten hours. Is this true?

Mary Godwin
Orlando, FL

The StyleWriter's envelope slot makes it easy to insert envelopes, and the straight-through paper path enables the StyleWriter to print envelopes and labels perfectly. In contrast, our testing shows that Image Writers often smear envelopes and chew up labels.

As for speed, one page of our standard Microsoft Word 4.00D test document printed in about two minutes in Best mode and in half that time in Faster mode. An ImageWriter prints swiftly in Draft mode, but that mode omits any graphics and severely limits your choices of font style and size. A StyleWriter in Faster mode, on the other hand, can print everything you see on-screen, just at a lighter density and slightly lower resolution. —PF

Consuming Passion

Your review of Apple's new printers relegates the Image Writer to people who can't bear the slow print times of Apple's StyleWriter.

Dear Mr. Sculley... 

When Apple finally unveiled System 7.0 on May 13, the real news was how the marketing mavens of Cupertino intend to convince customers to switch to it. For instance, the S99 Personal Upgrade Kit includes both the nifty Compatibility Checker and 90 days of free phone support. And free loaders can even hear a 24-hour recorded telephone message that answers the 20 most commonly asked questions about System 7.0 (never mind how Apple knew what those questions would be before it shipped the software). But is all that enough to make users forgo safe System 6.x?

Speak Up:
Do you plan to switch to System 7.0? When? Why?

Send your thoughts to Dear Mr. Sculley, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

In May we asked readers what features Apple should include in a notebook Mac.

Howard Bulloch, of Las Vegas, Nevada, was more than happy to share his wish list: "Size comparable with that of the Sharp PCh220 or Texas Instruments' Travelmate 3000, with a 60- to 80-megabyte hard drive, high-resolution backlit display monitor with a large screen area, external-color-monitor connectivity, and a built-in 1.44-megabyte floppy drive."

Lester H. Hoyt, of Indianapolis, Indiana, likes to think light: "Here's how to get the computer down to a couple of pounds and a thickness of about half an inch:

• Get rid of the hard drive and those lead-acid batteries needed to run it. Instead, put in four 16-megabyte memory chips, for 64 megabytes of storage RAM, powered by readily available 9-volt dry cells or AA cells. They should last for months with no other drain on them.

• Have separate, switchable dry cells to power the screen, which would be the only part requiring real power.

• Include a SCSI port for external storage, the usual ports, and a plug-in external floppy drive with its own dry cells or 110-volt AC power."

Another light-minded reader is John Bradford, of Chicago, Illinois: "Apple should forget about competing with the current crop of DOS notebooks and leapfrog straight to the next generation—which is ably represented by Hewlett-Packard's new 11-ounce 95SLX complete with Lotus 1-2-3 built in to ROM."
or the higher cost of HP's DeskWriter — along with those who need a cheap (in both senses) color printer and those who print multipart forms.

But you forgot to discuss the cost of consumables for these printers. In your November '90 lab report on QuickDraw printers (“Affordable, Laser-Quality QuickDraw Printers,” page 134), you mention that ink cartridges for the HP DeskWriter have a list price of $19.95 and deliver 250 to 300 pages — a cost of 7¢ to 8¢ a page. Toner for the LaserWriter SC lists for $99 and delivers 3,500 pages — a cost of about 3¢ a page. On the other hand, ImageWriter ribbons cost me about $3.50 by mail order and deliver many printed pages — easily 200 — for a cost of 1.75¢ a page or less.

In a setting in which the printers are often running ten hours a day, it has been my experience that an ImageWriter also delivers good printed copy at a low cost. Your review was, I think, a little high-ended. Please keep the rest of us in mind.

Robert J. Yanal
Detroit, MI

But you haven’t factored in the cost of time. A printer that spits out ten times as many pages is well worth the higher cost of consumables to most people — especially if the printer is running nonsstop, as yours is. — JZ

Book Stand
I find it terribly sad to hear Ted Nelson talking about setting up stands to sell information, in Michael Swaine’s column (“Next Year in Xanadu,” June '91, page 49), as though it were a new and revolutionary idea.

The United States has had, ever since Ben Franklin, a long tradition of local “information stands” — the public-library system. Better yet, the information has been provided free to everyone, regardless of money in pocket, and the cost has been borne by the entire community. Unfortunately, public libraries today are in the process of being defunded and shut down across the country.

The carton eaters are stepping in to take advantage of the slow execution of free public access to information. As with so many technology changes, the new techniques can benefit many or few, depending on who controls them, for what purpose, and with what vision. It seems to me that we should be able to provide a decent library system that includes exciting technology such as Xanadu, for the benefit of all, regardless of income or resources.

Jim Davis
Sausalito, CA

More Safe Than Sorry?
Gregory Wasson’s review of Casady & Greene’s A.M.E. (May '91, page 68) was unjust. I admit that the program presents some difficulties. In addition to woes with A.M.E.’s requiring an installer, how about the way A.M.E. makes some communications programs (such as VersaTermPRO and Mathematica’s network portion) freeze out the screen when they’re going through the phone port? And you can’t altogether restrict users’ access to the hard disk while still letting them run applications from it, because some programs (such as MathCAD) insist on writing files in their own folders.

However, A.M.E. is absolutely the only security package that lets you set up a public-access Mac that any person, no matter how inexperienced, can use without any chance of wiping out programs and system files. It also prevents virus contamination and illegal copying of software.

I manage a public Mac that is used regularly by nearly 50 people. Before A.M.E., my life was miserable: I spent countless hours rebuilding the system, which was frequently damaged, accidentally or on purpose. I have used A.M.E. from version 1.0 on, and it has always worked as promised.

Rostislav Serota
Cincinnati, OH

Users with stringent security needs should consider A.M.E., as noted in the review. However, Casady & Greene represented the product to us as a security program for the masses, and it’s not. Most Mac users don’t need it or the restrictions it imposes on their work habits. There are simpler, more forgiving programs out there for the occasional folder or file you want to protect. Even those who have rigorous security needs should first try lower-end programs such as FileGuard or Empower. — GW

LC or Not LC?
I’ve been contemplating purchasing either a Mac LC or a Mac IIx to replace my Plus. After collecting information for a while and being aided greatly by your article “Three Cheers for Three New Macs” (December '90, page 90), I reluctantly...
SORRY, CLARIS.
BUT IT’S DEJA VU
ALL OVER AGAIN.

Another new model year. And Canvas is still miles ahead. Lucky you. With brand new models of both the world's top-ranked drawing programs to choose from. Simultaneously.

And MacDraw® Pro isn't a bad try. In fact, it reminds us of another drawing program we've always had the utmost respect for: Canvas 2.1.

Unfortunately for Claris, our new Canvas 3.0 includes enough major enhancements to leave their latest effort idling somewhere back in the dust. Again.

Let's take a look under the hoods.

Canvas 3.0 gives you more high-end text handling features. Like binding to curves. Slanted margins. Text-wrapping outside — and/or inside — irregular objects, and full kerning & tracking control. Even conversion of PostScript® Type 1 fonts to customizable Bézier outlines.

MacDraw Pro doesn't.

Canvas 3.0 gives you more technical drawing features. Like custom dynamic hatching. Custom parallel lines & curves. Custom dashed lines, curves & borders. Automatic dimension lines, area & perimeter calculations. And a Smart Mouse™ drawing aide.

MacDraw Pro doesn't.

Canvas 3.0 gives you more design/illustration features. Including unparalleled Bézier curve editing power—from multi-point selection & editing to automatic object conversion, combining and blending. Magnetic guidelines. Center line auto tracing of scanned images. And full bitmap editing in 24-bit color.

MacDraw Pro doesn't.

Canvas 3.0 also gives you new built-in translators for important multi-platform formats like CGM, IGES and DXF™. And Open Architecture technology — allowing new tools, effects and translators to be added with ease at any time.

MacDraw Pro doesn't.

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decided to pass on the LC, because it lacks a floppy port, a PMMU, and a math coprocessor and because it has only a 68020 processor. Then I read a New on the Menu piece about 68040-based accelerators (May '91, page 49), and my hopes soared. (The mere thought of an LC blowing past a LSf!) But I still don’t have enough information. Would you please do a review (preferably a lab report) on 68040 accelerators?

Frank McLaughlin
Lennon, MI

To date, we’ve seen only one 68040 accelerator for the LC: the Tokamak, from Fusion Data Systems (Austin, Texas). It draws less than 4 watts, thus fitting within Apple’s stringent power and heat guidelines for LC cards. — JP

Driving a Hard Bargain

In “Life Begins at 40 Megabytes: Small Hard Drives” (April ‘91, Buyer’s Guide page 4), you say, “If you haven’t yet bought your Classic and you know you’ll want a 40-megabyte hard-disk drive, you’re better off buying one built in by Apple — if you can put up with its poky performance.”

OK. Understood. Go with Apple’s internal drive. Cost-effective, not too slow. But then the article says, “...if you’re considering buying a Mac Classic, think seriously about buying one of the drives we recommend instead of opting for the 40-megabyte Conner mechanism that Apple bundles in the $1,499 version of its Mac Plus.”

My friend says the Mac is becoming an application-specific machine and is losing out in the general computing market. He attributes this to Apple’s lack of cooperation with third-party developers.

Apple is also losing out in the engineering market. There is only one good engineering program for the Mac — PSpice — and a few poor ones. Apple won’t help companies with good programs for PCs and workstations port their software to the Mac. All Apple needs to do is fund the porting in return for royalties. I suspect that the payback for this in increased Mac sales would occur in just a few years or less.

Apple is going to be in for a surprise with its engineering-workstation efforts. No one is going to buy a workstation without software.

James Long
Sunnyvale, CA

It is exactly because of its available software that the Mac is the best microcomputer platform for scientists and engineers. I’ve reviewed dozens of scientific and engineering applications in different areas of expertise, and many are unique to the Macintosh. These include MacUser Editors’ Choice Award winners National Instruments’ LabVIEW, for data acquisition and control, and Prescience’s Theorist, an equation solver and animator. Both programs are unequalled on any platform.

In addition, Spyglass Transform, from Spyglass, is peerless for turning numbers

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As for human-factors practitioners, where would the Macintosh’s graphical user interface be without them? Who would even need a programmer but for the teams of professionals who are instrumental in the successful creation of hardware and software products that inspire others?

Judy Hochsztein
Bergenfield, NJ

One for the Road

Your news item on the “new” Mac Portable (New on the Menu, June ’91, page 54) brought a rueful smile to my face. The best Mac portable is a laptop that barely tips the scales at 9 pounds... not 15. And it isn’t made by Apple but by Outbound Systems in Colorado. I bought one a year ago, and I haven’t been disappointed with the choice. The Outbound is my main machine now. It’s well made and intelligently designed, and it stands up to life on the road.

The only way I can be brought back into Apple’s fold is if the company produces a true Mac notebook computer before someone else does. Is Apple equal to the challenge?

Andrew E. Stevenson
Fairfax, VA

Clarifications

In the features chart for “Building a Better Network with EtherTalk-to-LocalTalk Routers” (April ‘91, page 168), the Cayman GatorBox, whose networking security features include configuration protection and resource hiding, was listed as not having these features. The GatorBox’s resource hiding includes zone, printer, and device filtering.

The correct price of Braederbund’s PlayMaker Football game (Quick Clicks, May ’91, page 88) is $49.95.

The “On the Horizon” sidebar in “Easy Hard Copy: Color PostScript Printers” (May ’91, Buyer’s Guide page 50) mentioned that PostScript ability for the Canon Color Laser Copier 500 will soon be available from CAI (Custom Applications, Inc.). In fact, CAI has provided CLC 500 support since the 1990 debut of Freedom of Press Professional for the Macintosh (version 3.0) and has steadily improved it since then with features such as anti-aliassing.

The correct phone number for Wildflower Software, maker of SnapJot (Quick Clicks, June ’91, page 89) is (708) 916-9360.
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MacUser
March 1990

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Publish
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MacUser September 1990

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MACWORLD

If all this weren't enough, both ScanMaker models include the latest image processing software. Enhance, refine and separate your images with the full version of Adobe Photoshop for the Macintosh or PhotoStyler from U-Lead Systems for Windows 3.0.

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Compatibility Checkmate

The Colonel had his secret recipe of seven herbs and spices. The Coca-Cola corporation guards the proprietory formula for its sugar water in a special safe in a locked room, patrolled 24 hours a day by two armed guards named Bubba. And I've got two secret recipes guaranteed to spice up your life.

If you want the secret to my surefire five-alarm Toto-I-don't-think-we're-in-Texas-anymore chili, you'll have to keep watching this space, because this month I'm going to outline the other one. It's the recipe for E-Z No-Bake Instant System 8.0.

Apple's System 7.0 took literally hundreds of man-years; No-Bake 8 takes a couple of hours on the phone with your favorite mail-order-software house and 11 easy steps. System 7.0 gives you some powerful features you can't use until the publishers of your software exploit them in their upgrades; No-Bake 8 gives you features you'll use right off the bat. System 7.0 comes free with every new Mac; No-Bake 8 comes free to every Mac-magazine editor (but you knew there'd be a catch, right?).

We'll get to the recipe in a moment. First, you should know why I decided it was time to become the Julia Child of operating systems.

After two years of delays — excuse me, after 24 months of refining the concept — Apple formally released System 7.0 at its annual Worldwide Developers Conference last May 13, with all the hoopla and fanfare that such an overdue — er, overflowing — product deserves.

Like most of the attendees at the event, I got the System 7.0 box home as fast as I could and started popping floppies in and out of my Mac faster than a toaster on steroids. The first thing I did, of course, was run the Compatibility Checker. The Compatibility Checker is one of the niftiest things Apple's come up with in a long while. It automatically surveys your hard disk, tells you what's wrong with it, and even offers to do some of the housecleaning for you.

My Compatibility Checker told me that I had seven forbidden pieces of software that had to be removed from my System Folder before I could install System 7.0. Which means I have to unlearn seven die-hard habits I've grown accustomed to with those venal INITs — at least until compatible versions come out.

No problem — most of these INITs wouldn't be all that necessary anymore, anyway. Farewell, faithful Suitcase. Bon voyage, Boomerang. Au revoir, After Dark. Toodle-oo, On Cue. CompCheck politely offered to store these in a folder that (like some trunk stored in the attic) it knew I would want to keep on my hard disk but was sure I'd never have occasion to peer into again.

But, so far, things weren't looking too bad. Ol' CC found a few redundant copies of the System file — again, no problem, they're history. Next came a list of about 20 applications that — good news! — were fully compatible with System 7.0. None of them did anything new under System 7.0, mind you, but Apple was pretty sure that running them wouldn't crash my spanking new system.

Then CC decided to play hardball.

The Unfortunate 500

About 50 items needed upgrading to currently available new versions that I hadn't gotten around to getting yet. Another 100 were incompatible in their latest version. And my fair-weather buddy, CC, had never even heard of the remaining 500.

Let's skip over the question about why on earth I'm wasting space on my hard disk with hundreds of apps I'll never use again. (Look, maybe someday Reflex will make a comeback.) Most of those 500 ancient programs have probably been incompatible under the last two or three System releases anyway.

But I still have 50 items to upgrade. Compatibility Checker provides phone numbers for calling all those third-party vendors for upgrades. Which leaves me with a bit of work: 50 phone calls to make, 50 serial numbers to dig up, and 50 purchase orders to request (if the upgrades aren't free), not to mention 50 upgrade fees to part with. Even "nominal" upgrade fees (which can easily be $50 or more these days) are going to add up.

And I have to keep monitoring the situation to know when it starts all over again with the remaining 100 incompetibles.

Pieces of Eight

Apple could have avoided such nightmares by cooking up a new System built on time-tested utilities from some of its faithful third-party software developers. Because Apple didn't, you can do it yourself. All it takes to cook up System 8.0 is the following recipe of 11 not-so-secret ingredients.

Start with DOS Mounter, from Dayna Communications, or AccessPC, from Insignia Solutions (see John Rizzo's "Disks of a Different Color," in this month's Bridges section, for a
review of these two). Either utility makes navigating your way through DOS disks as easy as finding a file on a Mac floppy.

Another pair of utilities can help anyone who's ever been frustrated by the Application Not Found dialog box. First, HandOff II, from Connectix, lets you bypass that annoying box by mapping documents created by an application you don't have so that they'll open with a compatible application you do have. (Among other tips in his Beating the System column this month, Bob LeVitus points out that System 7.0 will do this, but only for text and PICT documents that can be opened by TeachText.) And DataViz's MacLinkPlus/Translators is indispensable for anybody who needs to shuttle documents among any of dozens of applications.

Next, jazz up your system with Articulate Systems' Voice Navigator II to add voice-activated command and control to everything you do. And to dress up the look and feel of the Finder, Dubl-Click's ClickChange gives you dozens of ways to update the appearance and operation of windows, scroll bars, cursors, and more.

If you have a Post-it note taped to your Mac to remind you to “Save often!”, you'll appreciate the functionality of AutoSave II, from Magic Software; you'll never have to think about saving documents again. And to make backing up your files a no-brainer, toss in Magic's Backmatic. (For network-backup alternatives, check out this month's “Overnight Success: Network Backup.”)

If you want to simplify Life With Fonts once and for all, get the Adobe Type On Call CD-ROM (or similar discs from Agfa Compugraphics, Image Club Graphics, NEC, or Monotype). You'll have just about every font you might ever want — you pay to unlocks just the ones you need, whenever you need them.

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You'll have a CD-ROM drive for that font disc, so let's toss in Microsoft's Bookshelf CD-ROM, which puts a library of reference books on call. But because it's a DOS disc, you'll need Insignia Solutions' SoftPC DOS-emulation software to run the disc — and any other DOS software you need.

Finally, realizing that things do occasionally go wrong, we're going to include Farallon's Timbuktu/Remote. Now your network manager or even your Apple dealer — using the same software on his end — can train you or diagnose your Mac and your hard disk from his own desk.

How much is this gourmet System 8.0 feast going to cost? All told, about $2,000 — no small potatoes, but you can get it now, you can get it tested, and you can get just the pieces you want. And it all runs under System 6.x.

Even better, you can tailor the recipe — and the cost — to suit your taste — and budget. You can choose your own substitutions from this month's MiniFinders, a cookbook of 1,000 Mac hardware and software ingredients.

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With System 7, there's a big improvement in big type. Thanks to Apple's TrueType® font technology, you get perfectly smooth letters on the screen, no matter what their size, along with more professional-looking output. And you don't need the Font/DA Mover. To install TrueType fonts, just drag their icons into the System Folder. (Ditto for desk accessories.)

Open an application. Work. Save. Quit. Open another application. Until now, that's how you've probably moved from, say, a word processing program to a spreadsheet. With improved multitasking, you can keep several applications open at once, and choose between them with a mouse click. So you don't have to stop what you're doing to print, search for files, duplicate files, or share data.

Using applications simultaneously can demand lots of memory, but with System 7 you aren't likely to see a not-enough-memory message. Because there's virtual memory.* When you need extra memory, just tell System 7 to use the spare room on your hard disk. Your Macintosh will work without interruption, and so will you.

See what's developing.

System 7 gives developers a far-reaching new set of tools, enabling them to offer applications that do new things for you. For example, to the fame and success of cut and paste, we've added publish and subscribe. Change something in one document, and it can change—automatically—in every document where it appears. Even if the documents are in different applications or on different computers across a network.

System 7 also enables any Macintosh on a network to share documents and applications with any other.

We could go on. But the main point is really this:

System 7 is ready for your Macintosh.

To run System 7, all you need is 2 megabytes of memory and a hard disk. (If you don't have enough memory, you can purchase it from your authorized Apple reseller.)

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Spreadsheet Skirmishes

It's almost as though there were an unwritten law reminiscent of Henry Ford's Model-T philosophy: Macintosh users can buy any spreadsheet program they want, as long as it's Excel.

Although Bill Gates probably didn't mind maintaining that kind of a monopoly on the Mac spreadsheet-program market (at least not until the FTC came calling), it didn't leave Mac users with many options when it came to choosing what's probably the single most important personal-computer application for business.

That's about to change, though, because Mac users are about to witness the spreadsheet shootout of the decade. Two powerful new challengers to the perennial champion are going to debut almost simultaneously. In other words, anyone shopping for a spreadsheet program is going to face some real choices.

We haven't always been so lucky.

Once upon a Recae

When the Mac was introduced in 1984, Microsoft's Bill Gates and Lotus' Mitch Kapor flanked Steve Jobs at the podium. They represented the two most important software-development companies that were working on programs for this new and unusual mouse-based machine.

Microsoft was the first to market with Multiplan, a program that was severely hampered by the Mac's 128K memory limit as well as by the lack of a hard drive. Compared with 1-2-3's features and performance on PCs, Multiplan's abilities came up short. Still, Multiplan did one thing very convincingly: It demonstrated how the mouse and the spreadsheet were made for each other. Multiplan's interface pointed (and clicked) toward the future of spreadsheets.

But Multiplan wasn't 1-2-3. And business users weren't aware that in a few years, they would be lining up to buy Microsoft Windows just so they could point and click at spreadsheeets on PCs too.

Meanwhile, Lotus waited for the arrival of the 512K Mac before it shipped its own contender. But rather than ship a speedy, elegantly efficient 1-2-3 with a terrific Mac interface, Lotus snatched defeat from the jaws of victory with Jazz.

Jazz was a variation of Symphony, Lotus' less popular and less powerful integrated PC product. Jazz included some nice bells and whistles, such as HotViews (which we've had to wait six years to finally see reappear with System 7.0's interapplication communication), but the whole of Jazz was less than the sum of its parts. To fit five applications (spreadsheet, word-processing, charting, communications, and database programs) into 512K of memory (not to mention a maximum of 800K of disk space, including an external floppy drive) at the same time, too many features had to be omitted and too much performance had to be sacrificed, so Jazz struck a discordant note.

Jazz might have managed to hang on long enough for a major revision had Excel not appeared. An independent developer had offered it to Microsoft, which saw that Excel was exactly what Lotus could — and should — have produced: 1-2-3’s feature set with a terrific mouse-driven Mac interface.

Microsoft, which had appeared to be a sitting duck, released Excel even though it was virtually guaranteed to kill the sales of two of its two main Mac products, Multiplan and Chart, which were scarcely a year old.

On the other hand, because Excel seemed to have come out of nowhere, there was no long lead time (or frequent leaks) to warn Lotus of what was coming. In one of the most successful preemptive strikes of all time, Microsoft brought the powerful Excel to market just in time to take Jazz on head-to-head. It was no contest. Excel wiped out Jazz, Multiplan, and Chart in a single blow and established itself as the spreadsheet program to beat.

The release of Excel was a perfect case of having the right product at the right time. Had Excel been delayed by a few months, or had Jazz shipped on time in 1984, Lotus might have built up a strong enough lead to blunt Excel's impact. But the timing was perfect, and Jazz was history.

But that wasn't all. Excel was such a powerful, easy-to-use spreadsheet program that a Mac with Excel became more than a match for a PC with 1-2-3. Microsoft wasn't content just to best Lotus' Mac offering; it also shook its fist at 1-2-3 with its ability to read and write 1-2-3-compatible files.

The Mac became a true business computer in 1985, when the combination of the LaserWriter and Excel made it capable of producing presentations and graphics that PC users could only dream about. Excel became a standard on a computer whose consistent interface discouraged application-level standards.

Savvy businesspeople began buying Macs just to get Excel, just as they used to buy PCs...
just to get 1-2-3. Microsoft also enjoyed some synergies: Excel users were often predisposed to pick Microsoft Word as their word-processing program. Excel and Word for the Mac became best-sellers for years.

To understand why Microsoft enjoys its current 90-percent market share in the Macintosh spreadsheet-program category, simply look at the attempts its competitors have made to counter Excel's success. In 1987 Lotus announced its "intention to announce" 1-2-3 for the Mac. This odd proclamation seemed to be an attempt to slow down the development of Microsoft Excel for the PC. At the same time, Lotus was working furiously on a major rewrite of Jazz, called Modern Jazz. Those who saw it were impressed, but Lotus mysteriously killed the project just before its 1988 release date.

Also in 1988, Ashton-Tate (which had finally seen the GUI light) released Full Impact, a spreadsheet program aimed directly at Excel users. "See why Excel doesn't," proclaimed the ads. Full Impact offered most of Excel's features, along with a superior interface and some innovative presentation aspects, including an integrated drawing environment and extensive formatting capabilities. However, Full Impact was quickly followed in 1989 by the much-ballyhooed WingZ, from Informix, whose long and elaborate promotional campaign (featuring Leonard Nimoy) stole Full Impact's thunder.

WingZ offered Excel-class power and ease of use. But Excel didn't have presentation capabilities per se, and WingZ provided sophisticated charting capabilities and a drawing environment similar to that of Full Impact. For example, WingZ simplified sideways printing, which is popular with spreadsheet users. Otherwise, users could add the ability to shade boxes and annotate text. (Such features were available for 1-2-3 on the PC through add-in utilities from independent vendors.)

Equally important, WingZ featured a revolutionary scripting language that made Excel's macro language seem, well, clunky. This made it much easier to develop turnkey applications — something sophisticated corporate customers wanted. Microsoft got lucky again, however, and long delays in shipping WingZ gave Microsoft an opportunity to give Excel a face-lift in the form of version 2.2 (because Microsoft had cornered most of the existing market, an important part of its strategy was to prevent switching).

The Shooting Starts

Going into 1991, Microsoft faced the same problem with Excel that Lotus faced on the IBM side: How to breathe new life into an aging product. Microsoft wasted no time in launching Excel 3.0, first for Windows and then for the Mac (see the Excel 3.0 review, July '91, page 56).

Excel 3.0 reenergizes and revitalizes an already excellent product. It offers major innovations such as style sheets and outlining, coupled with simpler enhancements such as improved charting and (finally) an icon bar.

The coming months should be interesting for spreadsheet-program users. System 7.0 capabilities were built in to Excel 3.0, and a new version of Word should offer enhanced communication with Excel.

By the time you read this, Microsoft's old nemesis, Lotus, will have announced 1-2-3 for Windows and for the Macintosh. 1-2-3 for the Macintosh is much more than just a port of Lotus' DOS program (see News on the Menu in this issue for a description), but despite some innovative features, it's unlikely to convince large numbers of Excel users to abandon ship. That's not really Lotus' goal, though (especially considering how far Ashton-Tate and Informix got with that strategy). Expect Lotus to go after new Mac purchasers as well as Macintosh users who standardized on 1-2-3 before there was a Macintosh.

Most importantly, no one will ever be able to tell you that you can't order a Mac because it won't run 1-2-3. This fact alone will put more Macs into corporate accounting departments than the evangelizing efforts of 100 Guy Kawasakis ever could.

Hot on 1-2-3's heels will be Claris' Resolve spreadsheet program, which has been in the works ever since Claris licensed some key technology (particularly the revolutionary scripting language I mentioned earlier) and Microsoft Resolve will combine a slick user interface, which will look familiar to users of Claris' other applications, with deep System 7.0 exploitation (for more on Resolve, see New on the Menu, July '91, page 53).

Will Resolve and 1-2-3 make any more of a dent in Excel's market share than did the last two challengers, Full Impact and WingZ? Maybe. With the large number of Macs currently being sold to first-time buyers, there's never been a better time to find out.
"If you have to worry about money, you might as well be poor."

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

"I" was making more money. But I wasn't worrying any less. Until I invested $59.95 in a copy of Quicken.

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

"There are dozens of Macintosh programs on the market...but few are as elegant, comprehensive and eminently easy to use as Quicken."

— William Hartwood, UPI 6/14/89

"Quicken is the best Macintosh tool for helping users manage home budgets or cash flow and do tax record keeping."

— Ken Landis, MacUser 10/31/89
Aldus PageMaker 4.0 goes beyond the paste-board metaphor that made the original PageMaker a smash hit. New features include a blindingly fast Story Editor, extended support for color, the ability to rotate text, a built-in dictionary and spell checker. Files can be up to 9999 pages in length and multiple files can share a common index. You also get much more sophisticated type control with point-sized dependent kerning on any text in increments of .01 point and a condense/expand range of 5% to 250%.

Frame Technology
FrameMaker
FrameMaker is the first software application that lets you simply and elegantly create long, structured, multi-author documents on a Macintosh, without switching back and forth between other word processing and page layout programs. FrameMaker seamlessly integrates word processing, page layout, graphics, math equations and book building functions in one application. This is real workstation publishing software.

FrameMaker .............................................. $795

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The Print Shop makes it amazingly easy to create eye-catching stationery, greeting cards, letterheads, flyers, banners and other personalized communications. The program includes a wide variety of type styles, backgrounds, borders, and symbols. You can even pick up graphics that were created in MacPaint and transport them to your Print Shop designs.

Print Shop .............................................. $34

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Type On Call offers over 800 Adobe Type 1 fonts on a single CD-ROM in a new accessible format. Simply by purchasing access codes over the phone, type users can obtain new fonts from the disk. Type On Call is the quickest and easiest way to buy fonts - once you have the disc, every font is a simple phone call away!

Type On Call .............................................. $47
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- 03435 Pantone Color Book .................. 48

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Adobe Photoshop
- Photoshop 2.0 gives you direct access to a broader spectrum of color editing and production capabilities than many high-end pre-press systems. Now you can easily view and edit your high-resolution CMYK color scans right on-screen without converting to the RGB of your monitor just as you would with an expensive system.

#03139 Photoshop 2.0 ....$499

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- 03942 4 Button Cursor Sd510C .......... 120
- 03943 SP-310 Stylus (Soft) ............... 99
- 03803 SD-311L 12x17 Elec Stat .......... 1,325
- 00087 12x12 Static SUR 421 E .......... 935
- 03801 SD-422L 12 x12 Tablet .......... 875

Microtek ScanMaker 600 ZS
- Introducing the ScanMaker 600ZS. Now you can scan 24-bit color and 256 shades of gray at up to 1850 dpi resolution. It's versatile enough to scan slides in portrait and landscape modes.

#0370 ScanMaker 1850S .....$2299

Microtek 1850 Slide Scan
- Microtek's ScanMaker 1850S is a revolutionary new 35mm slide scanner that's perfect for desktop publishing, presentation graphics and multimedia applications. You can scan 24-bit color and 256 shades of gray at up to 1850 dpi resolution. It's versatile enough to scan slides in portrait and landscape modes.

#00369 ScanMaker 600ZS ....$1599

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- Macromind Director 3.0 is the multimedia presentation and animation tool that helps you communicate with greater impact. In version 3.0 Director is faster and easier for users to get the professional results they want. Movies and presentations sound, look and play better...

#02583 Director 3.0 ....$628

Adobe Photoshop
- $499

Canvas 3.0
- $299

Macromind Director 3.0
- $628

Microtek ScanMaker 600 ZS
- $1599
Small Businesses are

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Four essential business-productivity applications in one special edition: Microsoft Word, Excel, PowerPoint and Mail. Each is an industry standard in its category, whether it is word processing, spreadsheets, desktop presentations, or electronic mail. Used together, they maximize productivity for your entire office.

#02678 Office $519

Microsoft Excel 3.0

$308

Microsoft Excel is the most advanced spreadsheet for the Mac. It combines a spreadsheet with business graphics and data management. It contains presentation tools such as multiple fonts, variable row heights, shading, custom number formats, 68 built-in chart types and more.

#00227 Excel 3.0 $308

TouchBASE

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#03908 TouchBASE $88

Claris Filemaker Pro

$214

FileMaker Pro is the best selling flat file database for the Mac. New graphics tools streamline the generation of reports and layouts. You will appreciate the new data entry aids: check boxes, radio buttons and pop-up menus.

#03478 FileMaker Pro $214

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02238 Microsoft Word 4.0 $244

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00332 4Th D 2.1 Runtime Single User $79
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02648 4Th Dimension 2.1 $488

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- **Aldus Persuasion**
  - Let Aldus Persuasion 2.0 do all the work of developing presentation graphics. Select one of the predefined templates (or create your own), and type your ideas into the outline. Persuasion automatically prepares your slides from the outline. You can use the slide show mode for your presentation or for a self-running demoor create overhead foils.
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**Software Ventures**

**Microphone II 3.0**

*FREE upgrade to version 4.0*

**$214**

Microphone II has earned high praise for its ease of use. Its scripting language makes using electronic mail services an automatic operation. Microphone II now supports the new ZMODEM transfer protocol and can operate modems at any speed from 50 to 57,600 baud. Microphone II sports improvements in the script language and offers more ways to execute scripts. For work with systems in foreign countries it supports character substitution in seven languages under ISO-7 standards, plus user-defined character sets. It also supports large screen monitors and color including color icons and offers VT102 and BT52 emulation.

#01902 Microphone II .... $214

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DoveFax Plus offers the most sought-after fax software features such as: full background operation, pre-scheduled transmissions, customized cover sheets and more! The DoveFax Desktop can be upgraded to the DoveFax Plus with the simple addition of a microphone and software.

#03514 Fax Plus .......... $395
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  - Pixar Showplace™
  - MacRenderMan™ is a complete picture-making tool. You orchestrate objects, lights and cameras, just like a photographer arranges a studio. It accepts models from any application that outputs RIB files.

  #00030 Showplace ...... $548

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  - The UnMouse does everything a mouse can, only faster, easier and in less space. To move the cursor simply slide your finger over the glass surface. To make a selection, merely press down. The UnMouse also serves as an extended keyboard. With its one million touch points the UnMouse also doubles as a graphics tablet.

  #03412 UnMouse .......... $180

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  - 00193 Monitor FPd Classic .......... 579
  - 03304 Monitor FPd MacI ................ 579

- **E-Machines**
  - 03919 T16-Bit Color Sys Mac II ........ 1995

- **Mass Microsystems**
  - 00180 Quick Image 24 Video Grabber .... 699

- **MegaGraphics**
  - 03923 Rival 19 Mono Mac Se ............ 1,199
  - 03925 Rival 19 Mono Mac SE30 .......... 1,199
  - 03924 Rival 19 Mono Mac II ............ 1,199

- **RasterOps**
  - 03704 RasterOps Clearview GS/30 ....... 1,675
  - 03664 RasterOps 245I .................. 815
  - 03662 RasterOps Clearview/GI/II ...... 1,675
  - 03482 RasterOps Video Expander ....... 525
  - 00035 RasterOps 24S .................. 589
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Please circle 105 on reader service card.
Strap on your moral beepers — it's time for the Mac's greatest evangelist to start Selling the Dream.

The editors of *MacUser* are usually reluctant to let someone write a book review when he or she knows the author well. But I got them to agree — just this once — to let me give it a whirl.

"Why don't you write a book about management?"

"Because I don't know anything about management."

"Then write about something you know."

"I only know evangelism."

"Then write about that."

"OK."

With this auspicious beginning, Guy Kawasaki starts his latest book, *Selling the Dream*, from Harper/Collins. According to Kawasaki, *Selling the Dream* is supposed to "make you into a raging, inexorable thunder lizard of an evangelist." In the preface, he says, "This book is for people who want to make a difference. It is for flames, not embers. It is for people who want to challenge the status quo, the mediocre, or the mundane." So much for underpromising and overdelivering.

The author is eminently qualified (and he doesn't mind telling you so) to write about evangelism. In 1983 he became Apple's second software evangelist. The mission Steve Jobs gave him was to get "the best collection of software in the personal-computer business." Kawasaki's job, along with that of Mike Boich (the first software evangelist and current chairman of Radius), was to cajole, coerce, and seduce software developers into creating Macintosh products. Apparently they were successful, because Macintosh has an outstanding collection of software today (as you can tell by the ratio of ads to editorial in each issue of *MacUser*).

Like many businesspeople-turned-writers, Kawasaki looks back on his past business experiences and tries to bamboozle readers into believing that he knew what he was doing as he was doing it. Then he attempts to refine and reinterpret the lessons he learned in order to make a methodology out of them.

**Evangelism Defined**

Kawasaki begins by defining evangelism as "the process of selling a dream." It means transforming a *vision* — an insight not yet perceived by most people — into a cause. He argues that evangelism is the purest form of selling, because it involves sharing ideas, insights, and hope in contrast to exchanging goods or services for money.

Kawasaki takes his first illustration from the computer industry. He discusses how Macintosh was a vision of improving people's creativity and productivity and how this vision was turned into a cause among Apple employees, software developers, and user-group members. Unlike in his *MacUser* column, where, according to some readers, he often discusses things he doesn't know about, Kawasaki is at home explaining the meaning of Macintosh.

As you would expect, Kawasaki takes a vicious swipe at IBM by pitting the PCjr's demise against the way the Macintosh has flourished, despite its lack of software, expandability, hard drives, and color:

"What accounts for the success of one flawed product (Macintosh) and the failure of another (the PCjr)? First, the PCjr was an intentionally crippled version of a powerful product, the IBM PC. IBM did not want the PCjr to cannibalize PC sales. By contrast, Macintosh was the first step in a new direction and the first step towards fulfilling a powerful dream. Which one would you buy?"

"Another reason for the failure of the PCjr is the way IBM sold it. IBM's status-quo formula was to put their label on it, spend lots of money to advertise it, and ram it down dealers' throats. IBM did not evangelize the PCjr — it sold a computer, but wanting to sell something is not evangelism."

After this diatribe, Kawasaki starts to provide meaningful information about evangelism. He says evangelism is founded on a cause, and causes do five things: embody a vision, make people perform better, generate big effects, catalyze selfless actions, and polarize people. Each of these points is illustrated with an example from either the business or the not-for-profit arenas.

**Records, Birds, Ice Cream**

The use of wide-ranging examples is one of *Selling the Dream*’s strengths. This reviewer expected rehashed Macintosh and Apple examples, but he was relieved to find that Kawasaki was able to break away from the narrow confines of his previous work, *The Macintosh Way*. Organizations profiled include Windham Hill Records, the National Audubon Society, Ben and Jerry's Homemade Ice Cream, the Sierra Club, The Body Shop, and SeniorNet.

If a cause is the foundation of evangelism, then the building blocks are a leader, angels,
evangelists, and enemies. Kawasaki stresses the importance of the leader, who must believe and understand the vision, believe in people, set an inspiring example, and share the cause.

Unfortunately, his discussion of leaders, angels, evangelists, and enemies frequently borders on fiction. He describes what leaders should be, not what they are. One can imagine the naive Kawasaki conjuring up his ideal leader — vision from Steve Jobs, empathy from Bruce Nordstrom, erasing from Jean-Louis Gassée, engineering from Ferdinand Porsche, and so on.

**Tactical Evangelism**

The rest of the book addresses tactical ways to evangelize products, companies, and ideas. This reviewer believes that the tactical material is Kawasaki's most important contribution to the ranks of sales- and marketing literature. He covers tactical topics such as writing business plans, making presentations, and recruiting and training people, along with tips and tricks for each stage of evangelism — sowing, cultivating, and harvesting.

Much of this material will be familiar to business-oriented readers. But Kawasaki performs a great service by boiling down strategies for whole books into chapters. (Perhaps he read a bunch of business books to get his ideas.)

**Sex, Beepers, and PIPs**

Kawasaki ends the book with two risky chapters: One is about evangelizing the opposite sex; the other is about the ethics of evangelism. This reviewer believes that a topic such as evangelizing the opposite sex has no place in a business book. One can only surmise that Kawasaki was short on page count and that his editor forced him to fill the book with such drivel.

Frankly, it's too bad Kawasaki didn't instead fill out the chapter on the ethics of evangelism. He puts forth the preposterous notion that most people wear what he calls a moral beeper. He believes that most people know when they are doing the wrong thing, so he only urges them to listen to that inner voice. To be fair, he does offer a way for people to "calibrate their beepers" so that they all go off at the same time.

Speaking of page count, Kawasaki includes the entire Macintosh Product Introduction Plan (PIP) in an appendix. This takes up about 100 pages of a 320-page book. The PIP, reprinted with Apple's permission, is the plan that the Mac division created in 1983 to introduce the Mac. He cites the PIP as an example of a plan that combines fervor and zeal with business reality. Here is some of the hallucination-induced writing in the PIP:

"... Moreover, IBM will be using it's [sic] successful corporate positioning approach known as FUD to thwart Apple success in the worldwide marketplace. FUD stands for Fear, Uncertainty, and Doubt. These are real competitive forces that can have greater influence on the purchasing decisions than product characteristics. Yet when weighing the competitive strengths of Apple and IBM we win in one key category: PRODUCT SUPERIORITY..."

Although the PIP may be fascinating to Macintosh aficionados and people writing business plans, this reviewer questions increasing the page count with a large appendix.

**Lack of Originality**

Perhaps from force of habit, or because he didn't have fresh ideas, Kawasaki copied much of The Macintosh Way's style — he uses footnotes and exercises in sometimes funny but often distracting ways. This reviewer comes from the old school of writing, which dictates that footnotes are supposed to help readers. In Selling the Dream, the footnotes sometimes entice, sometimes confound. For example, one footnote says: "Most people think that MS-DOS stands for Microsoft Disk Operating System. It really stands for Microsoft Seeks Domination of Society."

And one exercise instructs you to "Pick the best answer. Vision is to cause as
a. BMWs are to yuppies.
b. Shoes are to Imelda Marcos.
c. Love is to marriage.
d. Money is to divorce."

Kawasaki introduces one new concept: rules of thumb. I suspect, however, that he wasn't clever enough to think of this himself but was inspired by Tom Parker's Rules of Thumb book. Here's an example: "People never buy a computer that is more friendly than they are."

Selling the Dream is a useful and entertaining book for people trying to make a product, company, or idea successful. Kawasaki combines interesting examples, vicious humor, and some sparkling insights. The book is not perfect, but it is certainly worth $19.95. And Kawasaki makes $3 per copy.

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*Hardware specifications subject to change without notice. TranScribe, 300, Abaton, and "We make your ideas easier to publish," are trademarks of Ezeen Systems, Inc. Other brand names and product names are trademarks or registered trademarks of their respective companies. In Canada call 1-800-665-1010. Gift schedule PX002752/53071.
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America's Home Video

Nicholas Negroponte is the Marshall McLuhan of the techno-savvy '90s: He understands media. For years, from various podiums around the world, this founder and director of MIT's Media Lab has been predicting the coming marriage of television (video, that is) and computers. As the nuptials draw near, the computer industry is abuzz.

Apple Computer, for example, has recently been abuzz demonstrating to developers its impressive software-only approach to video compression at conferences with multimedia in their names. Other topics get discussed at these conferences, but video is the key to the hope chest of multimedia.

Fortunately, you've read last month's MacUser Lab report on video, so you know all about getting video into and out of the Mac. What you still may wonder about, however, is what this in-and-out's about. What will be the product of this computer/video marriage? When this union is blessed with issue, which parent will it favor?

I predict that the technology of the offspring will resemble computer technology — especially the technology of the Mac — but that its content will look more like video.

This sort of phenotypic prognostication is highly speculative but fun. In this light, I'd like to make the following wild guesses about the kid's character: (1) The computer applications that drive the acceptance of computer video won't be like the applications that have driven past computer innovations; (2) although the new thing will look like video, it will redefine what video looks like — perhaps in the direction of HDTV's high-resolution, wide-screen format; (3) the players in this game won't be the same ones we already know; and (4) our nice, civilized computer industry is going to become a little wild at heart.

I have reason to believe that the applications driving the acceptance of computer video will be entertaining or educational rather than productivity-enhancing and that they will be used at home rather than in the office. I also have reason to believe that the entire focus of innovation and investment in the computer industry may shift in this decade to products designed for home use.

If computer-industry columnists were held accountable for their guesses, several careers would have founders on the rocks of the home market that wasn't (and kept on not being). Unaccountably, they are not, and their hit rate matches that of the IBM marketing executives who regularly leap into the home waters, not noticing that somebody has failed to fill the customer pool. Of IBM's many forays into the home market, the notorious Prodigy service is its most successful to date.

Nevertheless, it may very well be that the home market's time has finally come. One reason is that Apple is spending serious money in ways consistent with these guesses, and Apple doesn't have as much money to waste as IBM. Apple now has a consumer-products division that will, reliable guessers guess, start selling within the year, through consumer-electronics channels and at three-figure prices, machines designed for the home and for home applications.

A good first guess at what such machines will look like is already in the stores. Like a CD player or VCR, Commodore's CDTV sits on a shelf in the living room or media room and is controlled by an infrared remote control. It's more flexible than those other appliances, though. In addition to playing audio CDs, it can also handle CDs with audio plus still images or MIDI and can provide interactive control over CD-ROMs. The CDTV is really a computer in disguise, which becomes obvious if you add the optional keyboard and disk drive.

Expect Apple's home machine to resemble Commodore's; to attach to a TV; to include a built-in CD-ROM drive; and on close examination, to be revealed as a low-end Mac in disguise.

These devices are not yet the new thing that the marriage of TV and the computer portends, but as the standards and technologies for digital video emerge over the coming months, Apple's and Commodore's machines should be positioned well to take advantage of them.

There's another reason to think that home is where the market is: Video is such a greedy medium. It eats a lot of processing power, memory, and storage. If it is to be anything more than a specialty item for affluent computer users, video-ready computer hardware will need the economies of scale of a large customer base. I don't think that the products that deliver that customer base will be produced by the companies listed in this month's MacUser advertiser index.

Entertainment products — TV programs and movies — justify a huge video-based industry whose primary market is the home. Hence my guess that the applications that drive the computer/video connection won't be tools.
I have reason to believe that the focus of innovation and investment in the computer industry may shift in this decade to home products.

for producing better presentations at board meetings but rather entertainment (or to a lesser extent educational) products for the home.

The machines that will run these home products don’t exist yet, so the computer/video marriage won’t be bearing fruit immediately. But if the standards and the technologies come together, the combined market for this sort of home hardware and software may grow faster than any same person can predict.

The reason I think that the new market could be so explosive is because I’ve seen the demos. And although they look like video, these new video applications redefine what video looks like. It’ll be interactive, for one thing, but the key is that it will be digital.

“It’s almost a final decision now that the United States will go to a digital system for HDTV,” says Nick Negroponte, and he sees several consequences of this.

Digital signals can be compressed. So when the phone company puts in its fiber base, you can deliver one hour of video in five seconds to anybody in the United States.” Video will change from something that pours out of a spigot to something we download for viewing at our convenience.

There are better things to do with HDTV’s increased bandwidth than just marginally improving picture quality, Negroponte says. Such as providing depth of information. Say you’re watching a news story. Press the tell-me-more button on your remote control, and you get a background story on the same subject as the news story being shown.

Extra bandwidth can also be used for scalable video. Rather than thinking of TV images in terms of scan lines per picture, think in terms of scan lines per inch, as with a printer. As Negroponte sees it, a video-transmission system that gives us a picture “that can be seen at any resolution and is scan-line-independent, frame-rate-independent, and aspect-ratio-independent has got to be the right way to go, and only digital can do it.”

Beast of Burden

Apple seems to understand the rules and is prepared to play the home game. Other familiar players haven’t anted up yet. Microsoft doesn’t seem to recognize the importance of digital video and may consequently lose big.

For that matter, we may be coming to the end of the era in which hardware and operating-system vendors have much to say about what we use the machines for. Entertainment providers are experienced in delivering video content. They will probably become the primary content providers for this yet-unborn industry. If so, they will be the primary vendors in what will certainly become the dominant segment of that industry.

In fact, movie and entertainment companies are buying into other segments of the industry. They’re buying or investing in or forming strategic alliances with hardware companies. This is arguably not to their advantage, but the entertainment companies may not see it that way. They may see owning the delivery technology as the only way to get a grip on medium madness. Assuming the burden of complexity, as it were.

America’s Digital Home Videos

But if the content will be entertainment (and education) and the content providers entertainment (and education) people, that still doesn’t answer the question of what specific content will make it all pay off.

My guess is sex.

It worked for VCRs: Cheaply and quickly produced X-rated videos gave the new videocassette-rental business the inventory and profit margins it needed to get off the ground. It’s probably helping bring down prices of video cameras, although we’ll have to wait for some Kinsey of the ‘90s to tell us what proportion of home videos are amateur sex videos.

Perhaps the sexual content of the new video will be of more than prurient interest. Interactive sex videos may aid sex therapy, and interactivity may inspire artistic content developers to create a whole new genre of erotic fine art. But I bet that cheaply and quickly produced X-rated products will give the largest economic boost to this new industry. A genre in which production quality and artistic merit appear superfluous can put a lot of product into the pipeline awfully quickly."
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Conspicuous consumption: If the 1.4-megabyte floppy disk has started cramping your style, buck up — the 4-megabyte floppy disk is on the way. TDK announced that its first barium ferrite floppy disks would hit the market in early June. Of course, there aren't any 4-megabyte Mac floppy disk drives yet, and it's a good thing: TDK suggests a list price of $15 per floppy! Buck up indeed.

By Russell Ito

Small packages: The envelope has kept the electric typewriter alive — for now. Envelope printers started out as niche products, but the market has heated up. CoStar ([800] 426-7827) launched things with its LabelWriter (see review, May '90, page 57) and then followed up with the AddressWriter (see New on the Menu, April '91, page 51) for production envelope addressing. Now CoStar has teamed up with Avery ([800] 541-5507) to introduce the LabelWriter's successor. Both companies are distributing the same thermal printer but with different names, software, and prices. CoStar's LabelWriter II ($249.95) and Avery's Personal Label Printer ($279.95) are 137-dpi (compared with the LabelWriter's 72-dpi) units that connect to the computer via the modem port or the printer port. The printers come with a 1-inch print head that can print a standard 1 x 3-inch label in 3.5 seconds. The head is supposed to last through one kilometer's worth of labels. Users can upgrade CoStar's LabelWriter II by replacing the 1-inch print head with a 2.25-inch print head. CoStar also sells the printer as the LabelWriter II Plus; a LabelWriter II configured with the wider head, it costs $399. Both companies bundle addressing software: CoStar, a version of MacEnvelope; Avery, MacLabel Pro. For those who insist on labelless envelopes, Tidemark ([800] 338-8552) has introduced the Address Express printer, a 192-dpi inkjet unit. The printer comes with some slick software that automatically "reads" the address from your letters, places it into a layout you've designed, and prints your envelope — after just one command. At $1,195, the Address Express is intended as a networked device, but unfortunately Tidemark doesn't offer an AppleTalk option: You must connect the Address Express via a network modem or by using a Mac as a "soft server." The typewriter-free office may be just around the corner.

Up to Date . . .

Photoshop, Adobe's image-manipulation package, has seen its first major upgrade. Version 2.0 boasts direct CMYK editing; duotone, tritone, and quadtone editing; and the ability to import Adobe Illustrator files. (415) 961-4400. $895. Retrospect, Dantz Development's archiving utility, is now in version 1.3 and is System 7.0-compatible. The archive size limit is 1 terabyte (1,000 gigabytes). (415) 849-0295. $249. TopDown, Kaetron Software's flowcharting package, is now in version 3.0. Enhancements include more connecting-line choices and automatic symbol resizing to accommodate text. (713) 890-3434. $345.
The PhaserJet PXi is a 300-dpi, plain-paper, color PostScript Level 2 printer that uses a wax-jet technology for printouts as large as tabloid size.

Plain-Paper Color

Most color printers have the same basic problems: They’re expensive; they often require special paper; and their color rendering is usually less than ideal, but Tektronix’s PhaserJet PXi may change that.

The PhaserJet PXi is the first plain-paper color printer that can print on tabloid-sized (up to 12 x 18 inch) paper and costs less than $10,000. A RISC-based 300-dpi unit, the PhaserJet PXi is also one of the first PostScript Level 2 printers.

The unit’s print engine uses a process Tektronix calls “phase change ink-jet technology.” The PhaserJet PXi melts solid wax-based inks and squirts them onto paper (it’s sort of a crayon-jet). The liquid wax cools and bonds to the paper, and the printer fuses the wax to the page by squeezing the print under 3,000 pounds per square inch without heat. This process secures the wax bond and smooths out any bumps.

Designed for networked environments, the PhaserJet PXi has parallel, serial, and AppleTalk ports with automatic switching. Tektronix has also included HPGL emulsion for applications that don’t support PostScript.

The PhaserJet PXi should be available by the time you read this.

Tektronix, Inc., P.O. Box 1000, MS-63-583, Wilsonville, OR 97070; (800) 835-6100. $9,995.

At Long Last Lotus

It’s been a long time coming, but Lotus 1-2-3 is coming to the Mac — really.

Lotus 1-2-3 for Macintosh combines a Mac interface with all the features DOS 1-2-3 users have come to expect. For example, Lotus’s unique 3-D spreadsheet design, which lets users have up to 256 worksheets in a single file or 256 single worksheet files, is supported. The maximum spreadsheet size is 256 columns by 8,192 rows. And as expected, the Mac version is fully compatible with its DOS counterparts. It can also read and write 1-2-3 macros directly, so DOS users who have constructed highly automated 1-2-3 worksheets can run their macros without modification in the Mac version. Users concerned about Excel connectivity can breathe easy, because 1-2-3 can read and write Excel 2.2 files and macros.

But 1-2-3 for the Mac offers more than just its connectivity advantages. It’s the only Mac spreadsheet program that lets users enter and edit data directly in a cell — instead of in the familiar formula bar. Tear-off menus are available, and the formula bar and palettes are floating objects that can be positioned anywhere on-screen.

Lotus 1-2-3’s presentation capabilities include a variety of chart types — including 3-D — plus a drawing layer with graphics tools. There’s also a button tool for creating buttons on the drawing layer that can launch macros. The program also offers custom graph templates.

For power users, 1-2-3 offers Backsolver, an analysis tool for deriving a value for a variable in a formula by working backward from the formula’s result. There’s also DAL support under System 7.0 for access to database programs such as Oracle, Sybase, Ingres, and DB2.

You can expect 1-2-3 for the Macintosh to appear this fall.

Lotus Development Corp., 55 Cambridge Parkway, Cambridge, MA 02142; (617) 577-8500. $495.

DeltaGraph Goes Professional

Moving up the evolutionary ladder, DeltaPoint, developer of the DeltaGraph graphing package, has taken a step toward the scientific and engineering community with DeltaGraph Professional.

System 7.0-friendly, DeltaGraph Professional supports publish-and-subscribe and Apple events. Under System 7.0, it can share data with a program such as Excel 3.0, serving as a specialized charting engine for spreadsheets.

DeltaGraph Professional features
several new chart types, including a range of technical charts (3-D surface, XYZ surface, contour, and ternary) and a variety of business and presentation charts (bubble, picture, and multiple pie). The program also offers text charts, including bullet and organization charts.

The package now includes a slide-show function, complete with sound integration, for presentations, and it also supports graphics libraries. Entire charts — including graphic objects that were drawn and added to the chart, such as company logos — can be saved as libraries, which makes creating consistent charts easier.

Users who don’t need the specialized charts included in DeltaGraph Professional can opt for DeltaGraph 2.0, which offers most of DeltaGraph Professional’s features but without the technical-chart types and slide-show function. Expect to see both programs this summer.

DeltaPoint, Two Harris Court, Suite B-1, Monterey, CA 93940; (408) 648-4000. DeltaGraph Professional, $295; DeltaGraph 2.0, $195.

Rolling Out the Stingray

Ever since the first Kensington TurboMouse, trackballs have been pretty much the same. Almost all of them have a billiard ball set in a large platform. But CoStar has now introduced a radically new trackball design: the Stingray.

The Stingray comes in matte black or platinum, and it has a smaller footprint than most of its competition. It’s not taller than a standard mouse, and the extra-large buttons on either side of the ball make it easy to use regardless of how your hand rests on the unit. The ball is small and light, and the base includes a short integral cord for connecting to a keyboard without any wasted cable. A switch on the bottom of the unit lets you set either of the buttons to click-lock, but this mode seems unneeded in view of the Stingray’s lack of chording options.

CoStar Corp., 22 Bridge Street, Greenwich, CT 06830; (800) 426-7827. $129.

GCC: PostScript for $1,599

If you think buying a PostScript printer will break your budget, think again. GCC Technologies has broken new ground with the latest addition to its BLP line of printers: the BLP Elite.

The BLP Elite has a list price of $1,599, and it features Adobe PostScript. Built on a 300-dpi, 4-ppm engine, the BLP Elite uses a 16.67-megahertz 68000 microprocessor that, according to GCC, makes the BLP’s page-processing speed up to 40 percent faster than that of Apple’s Personal LaserWriter NT, whose list price is $1,000 more. The BLP Elite comes standard with 17 PostScript fonts, 2 megabytes of RAM, and a LocalTalk port.

And for users who bought GCC’s earlier QuickDraw printer, the PLP II, the company is offering a $799 PostScript upgrade that turns the PLP II into a BLP Elite.

GCC Technologies, 580 Winter Street, Waltham, MA 02154; (800) 422-7777. $1,599.

GCC Technology’s BLP Elite costs less than $1,600. Its controller board is less than half the size of Apple’s comparable Personal LaserWriter NT motherboard.
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Authorware Professional

Eddy-Award winner Authorware Professional is a supremely engineered tool for building interactive training applications without programming.

Authorware Professional is an ambitiously conceived and smoothly executed construction set for building interactive training applications without writing code. The $8,000 package develops sophisticated multimedia applications — including the incorporation of sound, video, and animation — from start to finish.

Go with the Flow Line

You construct Authorware applications by stringing together icons that represent various program components. Authorware’s iconic programming system is thoughtfully designed. Authorware uses a flow line (a variation on the flowchart diagram) to construct programs. The idea behind the flow line is simple: You grab icons from a palette, drop them onto the flow line, and then click on the icons to bring up the dialog boxes, tool palettes, and menu choices that let you program each icon to suit your needs. Several subtle design decisions make Authorware’s flow-line approach more than just an electronic flowchart and give it advantages over other iconic approaches. Most importantly, while letting you develop programs of arbitrary complexity, the linear approach virtually guarantees that what you see at any level of the design process is a meaningful chunk of your program. That’s because the flow line is a line rather than a branching flowchart. With Authorware, you can create branches from the line, but branches are indicated rather than drawn out.

Other beneficial constraints include limiting the number of icons that can be attached to flow lines and fixing the size of windows in which flow lines appear. These constraints force modularity onto the design process, a real plus because at any level of the program, you’re viewing the exact amount of detail required to understand that level.

Icon-Driven

Authorware Professional uses fewer than a dozen icon types, most of which determine the nature of the information presented to users: Display icons put text or graphics on-screen, Animation icons move objects, Erase icons remove displayed objects, Movie and Sound icons control the playback of prerecorded movie and sound sequences, Video icons control external videodisc players, and Wait icons interrupt the execution of programs.

Other icon types determine the flow of the program. For example, Interaction icons present options or questions to the user, branch to other icons based on the response, and provide feedback to the users.

Limiting the number of icons is a strategic constraint that actually enhances Authorware’s usability. If you know what functions the program’s few icons represent, you know how to use the product. Once you’ve placed icons onto the flow line, you’re ready to activate them. Click on a Display icon, for example, and the program brings up an empty, resizable presentation window and a palette of drawing tools for creating graphics or blocks of text.

Authorware’s graphics capabilities are rich. They include transparent versus opaque overlay modes, visual effects such as fades and zooms, and 24-bit-color support. Bit maps and PICTs can be imported. Text font, style, size, and color can be set on a character-by-character basis, and margins and justification must be set on a per-object basis, although only two kinds of tabs are supplied.

You can build a simple application just by stringing together Display icons interspersed with several Wait, Erase, and Animation icons. But to make the application interesting, you need to introduce some branching by using the Interaction icon.

The Interaction icon is a right-pointing arrow. When you drop it onto the flow line, you attach other icons to it that supply alternative actions based on user input. You can make interactions available for a specified time only, as when you are presenting a sequence of questions to a student. But Authorware also allows interactions to sit in the background, ready to respond (which is how you might implement a help button, for example).

After you string together eight or ten icons, you have a mildly complicated application. You also have a full flow line, and that’s where the Map icon comes in. Authorware lets you group any sequence of icons and replace them with a labeled Map icon. The Map icon then becomes a module of your program, and clicking on it opens a separate window with its own flow line and icons — a convenient way to modularize an application.

Calculating Design

A Calculation icon provides a window for entering expressions that will be evaluated whenever the application encounters...
the Calculation icon. So, for example, you can set the application to measure subject-matter mastery based on user responses and to display this and other calculated data to users in table, report, or graph form. Although Authorware has no dedicated graphing capabilities, calculated values are available to line and circle functions, making it easy to produce simple graphics based on computed values. And although Authorware is not a database program, there are facilities for building, saving, retrieving, and using an array of data.

You can use your calculations with any of Authorware's 200 system variables or functions and also with any variables, commands, or functions you supply. If you supply functions, they must be in the form of external commands or functions (XCMDs or XFCNs). Here, real programming is required, but fortunately a lot of XCMDs and XFCNs are already written. Most XCMDs and XFCNs written for HyperCard or MacroMind Director, for example, probably work with Authorware Professional.

Using XCMDs and XFCNs is one way to speed up your Authorware program. A better way is careful design. Some features — such as the background option in interactions — will slow your program down if overused, but on a Mac II we found the speed acceptable across a variety of Authorware applications.

As you design programs, you'll want to try them out. Authorware excels here. You can jump quickly from the design phase to the test phase and back again. Or you can test the whole program, a single icon, or any segment of the flow line.

Once your design is complete, you can document the application, using Authorware's ability to create detailed printed reports. And finally, Authorware lets you package applications so that users can run them without the Authorware program.

The program's multimedia capabilities include a sound digitizer; sound-editing software; the ability to import AIFF, PCM, and snd sound formats; and control over playback speed.

Animation capabilities include tools for designing animations, support for layered animations (so one object can pass in front of another), and the ability to import PICS animations.

Video support extends to a large and growing number of videodisc controllers. A productivity library supplied with the package contains sample movies, sounds, and models (subprograms that can be shared among Authorware programs.)

Authorware is a rich development environment that requires four manuals to document it. Fortunately, Authorware, Inc., also provides free hands-on training with the product.

To take full advantage of all of Authorware's features, you should have a minimum system configuration of an SE with 2.5 megabytes or of a Macintosh II with 4 megabytes for development of color applications. However, you can run Authorware on a Macintosh Plus with System 6.0 or later and 1 megabyte of memory.

The Bottom Line
Authorware Professional is a unique and powerful development environment for creating interactive courseware and training applications. By using its icon-based programming techniques, developers can build applications quickly and easily without writing code. Authorware is designed to handle all aspects of multimedia-application development.

Moreover, although other development tools offer object-oriented approaches to programming, none can match Authorware's elegant and well-conceived design. Through its use of constraints and a simple, always visible flow line, Authorware Professional makes the development of even the most complex applications manageable.

— Michael Swaine

Much of the intelligence of an Authorware program resides in the icons. The program shown here controls the photography tutorial illustrated in the "35mm Photography" figure above.

Authorware lets you create various modes of user interaction with your training applications. Here, the user can click on various parts of the camera or make menu selections.

Get Info

Authorware
Professional

Published by: Authorware, Inc.,
8500 Normandale Lake Blvd.,
Suite 1050, Minneapolis, MN
55437; (612) 921-8555.
Version: 1.6.
List Price: $8,000; for educational users, $995.
Pinnacle Micro REO-6500 and PLI Jukebox Junior

For those who've outgrown their hard disk, optical jukeboxes are a high-capacity, cost-effective mass-storage alternative.

You can spend thousands of dollars on a hard-disk drive that stores a gigabyte of data (see "Gigadrives: The 1,000-Megabyte Solution," July '91, page 140). That's bad enough, but when it comes to multiple-gigabyte storage, massive hard drives can't offer a cost-effective solution. Enter the optical jukebox, a storage solution for the desktop that's capacity-intensive, secure, and cost-effective.

Put Another Nickel in the Jukebox
Pinnacle Micro and PLI both offer optical jukeboxes based on hardware from International Data Engineering. At the high end, both vendors offer a 36-gigabyte jukebox, but we looked at the smaller, 6-gigabyte, ten-disc versions: the Pinnacle Micro REO-6500 and the PLI Jukebox Junior. Each device contains a single magneto-optical erasable drive and costs about $13,000. The cost breaks down to roughly $10,000 for the jukebox, $2,000 for the ten optical discs, and $1,000 for the software.

Although optical jukeboxes are slower than hard-disk drives, they're more secure, because they're impervious to the magnetic fields that can harm data on hard disks. Like musical jukeboxes, optical devices find the "records" (erasable optical discs or WORM discs) that contain the requested files, move them to a player (the optical drive), and insert them with either side A or side B up.

Both the Pinnacle and the PLI jukeboxes use at least two SCSI addresses: one for the optical drive and one for the disk changer controller board. You can daisy-chain up to three jukeboxes from one Mac. PLI also offers a version with a built-in hard drive whose disk acts as a cache, but it requires a third SCSI port. The Pinnacle jukebox also has a disk cache, but it uses a portion of your hard drive. In either case, the purpose of the hard-disk cache is to prevent the jukebox from swapping discs every time you open an application.

The jukeboxes have two important features in common. The first is the ability to create spanned volumes where multiple discs appear and act as a single volume on the desktop. The other key feature is the software that arranges the discs within the jukebox.

Pinnacle Micro REO-6500
Version 2.0 of Jukebox Admin, Pinnacle's disk-handling utility, allows you to graphically view and manipulate the inside of the jukebox, modifying the arrangement of discs in their slots. For example, you can insert any jukebox disc into the device's internal drive simply by dragging the disc icon to the drive icon. Similarly, you can swap the position of a disc by dragging the disc icon to a numbered slot or remove a disc from the jukebox by dragging the disc icon to the Export icon.

Although there is only one drive in the jukebox, the REO-6500 lets you mount more than one disc on the desktop. You can mount spanned discs or a single side of a disc by clicking on the appropriate icon(s) in Jukebox Admin and choosing Mount. Mounted jukebox discs all appear on the desktop as if they were in the drive; they're not grayed out.

Spanning discs is also easy and versatile with Jukebox Admin, which lets you combine discs into a single volume of up to 2 gigabytes. You can mix spanned and single discs in the same jukebox, and the Unspan command returns discs to individual volumes.

By keeping track of mounted volumes and their contents with file pointers, the REO-6500's hard-disk cache keeps the jukebox from continually inserting discs into the drive (it takes about 30 seconds to swap discs) as you switch applications. Once a program has been launched, it's stored in the cache the REO-6500 creates on your hard disk. The REO-6500's cache can be from 4 megabytes to 256 megabytes, but the company recommends 40 megabytes. The cache is set up in a control panel, and it's important to make sure the cache is on. Otherwise, the drive will go through every disc each time you open and quit an application (such as AppleShare) that looks at volumes.

The jukebox runs very well once you have an application running (see the "Optical-Jukebox Performance" figure), but the REO-6500 generally requires more disc swaps than the PLI Jukebox. For example, you must wait for a disc to swap the first time you open a volume. More annoying but less frequent is the REO-6500's startup procedure, which inserts every side of every disc into the drive when the Mac is booted. This can take about eight minutes for a ten-disc jukebox connected to a 11c.

PLI Jukebox Junior
An advantage of the PLI Jukebox Junior is that it breaks the Finder's 2-gigabyte limit for mounted volumes; this...
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Maintaining one high-duty printer rather than 30 to 40 desktop printers is a cost advantage. That’s good. But the real advantage comes when the speed, intelligence and flexibility of the new QMS-PS® 2000 changes an office cost advantage into a departmental profit center!

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REVIEWS

The Pinnacle Micro REO-6500 jukebox takes much longer than PLI's Jukebox Junior to load discs into the jukebox, mainly because it uses more disc swaps. It's also slightly slower with a single disc. However, the PLI jukebox slows down considerably when using a spanned volume consisting of several discs. The performance tests were conducted with DiskBasher benchmarks on an 8-megabyte IICl with the control-panel cache set to 256K.

The PLI Jukebox Junior (right) holds ten erasable optical discs, for a total formatted storage capacity of 6 gigabytes. The Jukebox Junior and the Pinnacle Micro REO-6500 (left) use the same jukebox mechanism, from IDE.

In addition, Junior Jukebox Manager can't format single discs in standard, non-spanning format, although you can import preformatted single cartridges. Another inconvenience stems from the modal nature of the software. You can't switch out of it in MultiFinder unless you quit the program.

The Bottom Line
Optical jukeboxes are a viable, cost-effective alternative to hard-disk drives if your storage needs surpass the 1-gigabyte mark. We encountered no problems when using either the PLI or Pinnacle product with an AppleShare file server or on a stand-alone Mac. Overall, with its superior disc-management software and performance, the Pinnacle Micro REO-6500 is the better jukebox, but if you plan to use your hard drive for other tasks while operating the Pinnacle device, dedicate a separate hard drive to the jukebox disk cache for best performance. On the other hand, if you need a single volume that's bigger than 2 gigabytes, the PLI Jukebox Junior will do the job safely. Its built-in hard drive and sensible caching scheme are real pluses, but we look forward to future improvements in the PLI software.

— John Rizzo

Get Info

Pinnacle Micro
REO-6500

Manufactured by: Pinnacle Micro,
15265 Alton Parkway, Irvine, CA
92718; (800) 553-7070 or (714)
727-3300.
Version: 2.0.
List Price: $9,995; software,
cables, power cord, $995; optical
disc, $249.

PLI Jukebox Junior

Manufactured by: PLI, 47421
Bayside Parkway, Fremont, CA
94538; (800) 288-8754 or (415)
657-2211.
Version: 1.0.
List Price: $9,999 (with software,
cables, and power cord); hard
drive and caching software,
$1,999; ten discs, $1,999.
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- Compatible with Macintosh computers, IBM PC’s and other popular systems
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- Model 10 has standard 5 MB RAM expandable to 8 MB RAM
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- External SCSI interface supports up to seven additional hard drives of unlimited size
- HP-GL® emulation software included
Three new software packages play decidedly different roles when it comes to creating and editing 3-D images. Paracomp's SwivelArt is an inexpensive collection of 3-D clip art for casual users. Swivel 3D Professional is the latest and most advanced version of Paracomp's modeling package, and Pixar's MacRenderMan is a powerful rendering package that delivers photo-realistic quality to 3-D objects and scenes.

The process of creating 3-D designs involves two steps. First you create geometric objects with modeling software, and then you render realistic-looking surfaces for the objects, based on their original geometry. SwivelArt and Swivel 3D Professional deal with object geometry, and Swivel 3D Pro supports some rendering, although its rendering capabilities are rudimentary compared with MacRenderMan's.

MacRenderMan is geared for photo-realistic-quality rendering. In general, the package's rendering engine requires that the basic 3-D geometry for objects, surfaces, and lighting positions be predefined by a compatible 3-D-modeling application, such as Swivel 3D Professional.

SwivelArt
SwivelArt is an ideal package to begin with if you're exploring 3-D modeling for the first time. It's a $125 clip-art collection, combined with a read-only version of Swivel 3D. You can't create any new objects, but the package provides nearly 100 excellent 3-D models (text fonts as well as images) that can be scaled, duplicated, rotated, and moved about in a 3-D world.

SwivelArt's selection of premodeled objects is a good fit with business presentations. It includes computers, international icons, and maps. You can export your final art in paint, PICT, PICT2, or EPS formats. SwivelArt also includes a HyperCard stack that produces a Swivel Command File, which you can use to create 3-D text in one of 12 supplied 3-D fonts.

Because the file format and interface are the same as those of its more powerful siblings, Swivel 3D and Swivel 3D Professional, SwivelArt is a good steppingstone to 3-D-modeling packages.

SwivelArt doesn't cost much, but be forewarned that it takes a substantial bite out of your hard disk. The program and art files occupy about 4.5 megabytes of disk space.

In addition, we encountered some errors in converting SwivelArt files to PICT and EPS format that resulted in the appearance of stray lines. Some surface textures also didn't carry over when files were converted to EPS.

Swivel 3D Professional
Swivel 3D Professional is an enhanced version of Paracomp's original 3-D modeling package, Swivel 3D (see review, March '89, page 45). The chief additions to Swivel 3D include support for 24-bit color and expanded export facilities, including a format that MacRenderMan can read.

Swivel 3D Pro also includes eight new adjustable light sources that support color, shadows, and specular reflectance. The package's smooth shader is even faster than the original version's and makes for quick rendering jobs. The new package features enhanced animation capabilities as well, which make it a good choice for...
...So We Decided To Give Them More Of A Good Thing.

Before we developed the QMS-PS® 410 four page-per-minute laser printer, we performed one very important task. We listened to what you wanted. Then we engineered a printer light years ahead of the rest with features that aren't available on other printers at any price.

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How did these printers capture the imagination of an entire industry? The answer is, quite literally, simple! These leading edge printers are so simple to operate they seem to "think for you." Each printer features ESP™ (Emulation Sensing Processor) which allows them to interpret incoming data and automatically choose the appropriate printer language without changing switch settings or sending complicated software commands. And to make things still simpler, the 410, 815 and 825 can receive data simultaneously to LocalTalk®, RS-232C serial and Centronics® parallel interfaces, which makes them the best on the market for mixed computer environments. All this and more is the result of QMS's exclusive ASAP™ III technology (Third Generation Advanced System Architecture for PostScript). And it's this proprietary QMS® technology that wins awards and customers.

True Adobe PostScript Plus HP Emulations

Whether you choose the 410, 815 or 825, you'll enjoy the desktop design flexibility of the latest version of Adobe® PostScript®. This most recent version includes the output enhancement of Adobe Type Manager™ (ATM). All printers come standard with 45 resident typefaces scalable from 4 points upward and fully rotatable. These PostScript printers guarantee compatibility with thousands of useful PostScript applications currently on the market.

For even greater flexibility, these printers feature standard HP LaserJet® Series IIIP emulation to support non-PostScript printing applications. And a variety of options makes the printers easily expandable. HP-GL® emulation cards, HP compatible font cards, memory upgrades and extended paper handling capabilities are all currently available.

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Our Latest PostScript Printer Technology Impressed The Experts...
exporting PICS files to multimedia or video applications.

Despite these valuable additions, however, Swivel 3D Pro has several drawbacks that may prove disappointing to professional designers, particularly those who want to render models in Pixar’s MacRenderMan.

Swivel 3D Pro lacks Bezier splines for creating complex curved surfaces easily. Like the original version of Swivel 3D, Swivel 3D Pro uses a polygon-based system for creating surfaces. In order to achieve a smooth surface, you must use multiple polygons to avoid the faceted look typical of most computer illustrations. Not only is this method cumbersome, but when you do manage to create a smooth surface, the resulting file size is huge.

Furthermore, although Swivel 3D Pro can export files in RIB format, a standard file format developed by Pixar for describing 3-D images and used by MacRenderMan, Paracomp’s implementation of the format is incomplete. For example, Swivel 3D Pro’s RIB format supports only a few of the myriad surface shaders available in MacRenderMan. Granted, you can work around this by using ResEdit or a word processor to edit the RIB file directly, but it would be nice to have this support built in.

In addition, Swivel 3D Pro’s light sources translate only as distant light, so you have no control over the scene’s ambient light. As a result, once you’ve rendered images in MacRenderMan, they look like nighttime scenes. And although shadows are supported in Swivel 3D Pro’s own basic renderer, they disappear when the file is exported to MacRenderMan.

MacRenderMan

For high-quality, photo-realistic rendering of 3-D models, MacRenderMan’s power is unsurpassed. Although you can create primitive objects with MacRenderMan, the program really depends on a full-blown modeling application, such as Swivel 3D Pro, to create object geometry prior to rendering.

The heart of MacRenderMan is a series of math routines called shaders. Shaders come in eight flavors and determine image properties such as surface, light, atmosphere, and projection. The use of various shaders creates a complete scene-description environment. Each shader has a set of parameters that lets you fine-tune the appearance of each image element.

However, MacRenderMan is a programming environment; as such, it lacks a graphical interface. And its power comes without a price. Tweaking all the lighting, surface, and rendering variables can be an extremely time-consuming process, and complex models take quite a while to render. Moreover, big files eat up internal RAM. Fortunately, the program provides controls for either maximizing program performance or cutting down on memory requirements. The control settings are numerous and difficult to decipher, but once you’ve learned how to use them, they’re almost indispensable.

For acceptable display of finished images, MacRenderMan requires a 24-bit system. You’ll also need at least 5 megabytes of RAM and a Mac II-class machine. But MacRenderMan is well worth the investment. Few other programs currently available come close to offering the photo-realistic power of MacRenderMan.

The Bottom Line

For casual users who are looking for an entry-level 3-D product or just an easy way to incorporate 3-D images into a business presentation, SwivelArt’s excellent 3-D clip-art collection is a true bargain.

Swivel 3D Professional is a powerful 3-D modeler noteworthy for its speed and ease of use. Despite its moniker, however, there are several caveats for professional-level users. Some important tools, such as a Bezier tool for curved surfaces, are missing. And users who want to render Swivel 3D Pro models in MacRenderMan will find Swivel 3D Pro’s link to Pixar’s package not as well forged as other elements of the program.

For photo-realistic rendering of objects and scenes, MacRenderMan’s power is hard to beat. Although it requires some degree of programming skill, Pixar’s package lets you render entire scenes in three dimensions by letting you tweak a variety of lighting and surface variables. If professional results are what you’re looking for, MacRenderMan won’t disappoint you.

—Doug Barnard
The QMS-PS 2210 is perfect for a shared printer environment requiring high-quality 11"x17" output. Whether you use Macintosh® computers, IBM®PC's/compatibles or most other mini computers and mainframes, you'll enjoy instant connectivity with AppleTalk®, RS-232 serial and Centronics® parallel interfaces. Should you require non-PostScript printing applications, the 2210 comes standard with HP-GL® and HP® LaserJet® emulations. The 2210 also cuts waiting time with fast page processing made possible by QMS's exclusive ASAP™ (Advanced System Architecture for PostScript) technology and a 68020 microprocessor. That means fast first-page-out performance. Add this to 350 sheet input capacity (600 sheets in the QMS-PS 2220) plus a 20,000 page-per-month duty cycle, and it's easy to see why the QMS-PS 2210 is a true network star!

Expert Service And Support
As a recognized leader in PostScript printer technology, QMS maintains a commitment to customer satisfaction by providing free, responsive technical support. And to keep your QMS printer operating at its peak, QMS National Service offers a variety of service options. Call us today and see how easy it is to put the true PostScript powerhouse to work for you. Or FAX QMS Product Information at (205) 633-4866.
Global Village's send-only fax modem is fast and easy to use but lacks many standard features.

Global Village Communication has added 9,600-bps Group 3 fax-transmission capability to its award-winning 2,400-bps TelePort A300 data modem. The result, the TelePort/Fax 9600, is easy to use, but it doesn't receive faxes and lacks other features that competing fax modems provide.

Minimalist Feature Set

The TelePort/Fax's minimalist feature set is designed for novices who want to send individual faxes quickly and easily. The package also includes several slick innovations, including Chooser bypass, thumbnail previews, smart dialing, and support for MNP (Microcom Networking Protocol) error correction and data compression.

Overall, however, the TelePort/Fax's simplicity comes at the expense of flexibility. More advanced users are sure to be disappointed at the lack of many indispensable features such as gray-scale mode, user-definable coversheets, page preview, scaling, detailed logs, scheduling, group distribution, enveloping, automatic redial, and multiple fax directories with import/export.

Most external modems attach to one of the Mac's two serial ports. The TelePort/Fax modem, however, is an ADB (Apple Desktop Bus) device. As such, it requires a Mac SE or later. It can be placed anywhere along the ADB chain between the Mac keyboard and mouse, so the TelePort/Fax leaves both serial ports free for other devices.

The TelePort/Fax software emulates a serial connection, and its function key eliminates the need for an A/B box for switching between devices. With its pass-through connector, the TelePort/Fax doesn't hog the ADB port into which it is plugged. And because the modem draws its power from the ADB line, there's no requirement for a bulky external power supply.

The TelePort/Fax software comprises a control panel, a printer driver, and an application. The control panel lets you specify which serial port to emulate, provides a way to examine the modem/handset status, and enables options such as MNP protocols, speaker sounds, and menu status. It also provides support for Apple's Communications Toolbox, a standard communications interface that will be used by many telecommunications programs under System 6.x and System 7.0. The TelePort/Fax application sends fax files that have been previously saved to disk and merges fax files created by disparate applications.

To send a fax with the TelePort/Fax, you first select the TelePort printer driver as the output device. Most fax modems force you to execute this task by using the Chooser DA, a bothersome procedure if you often alternate between the fax modem and your normal printer. With the TelePort/Fax, however, you can bypass the Chooser altogether. Just hold down the Option key when you click on the File menu to temporarily select the fax modem. And that's not the only thoughtful feature that makes the TelePort/Fax easy to use. Whenever the TelePort/Fax is selected, the Print command in most applications' File menu is renamed Fax.

Using the TelePort/Fax modem is easy, but simplicity comes at the expense of flexibility. The package doesn't include fax-receive capabilities, nor does it provide page preview or scaling.

Thumbnail Pages

Sending a fax is as easy as choosing Fax from the File menu, entering the recipient's name and fax number in the Teleport/Fax window, dragging the recipient's icon to the Destinations area, and clicking on the Send button. You must wait a short while as the TelePort converts your document to fax format. As it does so, it displays a small thumbnail image of each page, mimicking the output of a traditional fax machine — a very nice touch.

After the document has been converted to Group 3 fax format, the modem initiates the actual transmission in the background, so you can continue with your work. You can hear simulated dial tones emanating from the Mac's internal speaker, although there is no way to monitor the result of the call (dial tone, ringing, busy signal, and recorded message) without eavesdropping on a handset plugged in to the modem. Fortunately, once the modems start exchanging data, the TelePort breaks the handset connection, thereby preventing data corruption from extraneous noises.

Small icons at the right of the menu bar indicate basic fax-transmission information on such functions as dialing, connecting, and sending. Unfortunately, the TelePort/Fax software doesn't go beyond the basics to display other useful information such as the telephone number dialed, the rate of transmission, or detailed error messages.

During data communication, you can request a technical-status display that imitates the standard indicator lights on conventional modems. We wish such an option were available for fax transmissions.

To see how the performance of the TelePort/Fax stacks up against that of the competition, we put it through the same series of rigorous benchmark tests we used in our recent MacUser Labs report on send/receive fax modems (see "Fast, Full-Featured Fax Modems," May '91, page 104). The TelePort/Fax tied the top-ranked Abaton InterFax 24/96 and the Dove DoveFax in speed of fax creation and in duration of call, respectively.

Our one-page Word test letter transmitted without a blemish. For best text results, Global Village recommends outline fonts with ATM or TrueType, which we used. The composite PageMaker document transmitted equally impressively. The TelePort/Fax converted grayscale TIFF portions of the image into high-contrast halftone dithers, but everything else looked fine, with no geometrical
LEAN, MEAN, POSTSCRIPT MACHINE.

Finally, the first affordable PostScript® printer designed specifically for Macintosh® users. It's from GCC Technologies®, and it's called the BLP Elite™. A printer so advanced that it offers exactly the features you're looking for, at a price you've never seen before. Just $1599.

That's a full $1000 less than Apple's $2599 Personal LaserWriter® NT. But that doesn't mean the BLP Elite has less to offer. In fact, the BLP Elite is packed with more features you want, like true Adobe® PostScript and built-in AppleTalk® for sharing over a network. There's also edge-to-edge printing for super-sized spreadsheets and banners, and a straight-through paper path for printing wrinkle-free envelopes and labels.

The new BLP Elite is a faster printer, too.

In fact, with its 16.67 MHz processor, it's one of the fastest 4 ppm (page-per-minute) PostScript printers you can buy. About 40% faster than Apple's Personal LaserWriter NT.

But what makes the BLP Elite a more sophisticated, more affordable printing machine is its breakthrough technology, engineered at GCC.

At the heart of the BLP Elite is the most compact, cost-effective PostScript controller board ever designed - half the size of the Apple Personal NT's, with one-third the number of chips. A compact controller means two things: fewer components and lower manufacturing costs, which translates to exceptional product reliability and a significant cost savings for you.

800-422-7777 for the BLP Elite.

The new BLP Elite PostScript printer is available from your Authorized GCC Dealer or directly from GCC. Call 800-422-7777 for the name of the dealer nearest you or to place your order directly with us. Either way, you'll find it's painless to go lean and mean with the new BLP Elite.

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Betsy Mill put it all in perspective when she wrote to us, “I love [Microsoft] Excel as much as my microwave oven but no love is perfect.”

Well, Betsy, get a load of this. We think new Microsoft Excel version 3.0 is the closest thing to perfection ever seen in a spreadsheet for the Mac. For one good reason.

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Use outlining features to collapse...
version 3.0. The result response course.

Take a look at the new Toolbar. In one step, you can now access style sheets, outlining features, Autotext, formatting options, drawing tools, charts of all kinds and macros. Go to town.

or expand worksheets without having to create multiple files.

As for charting, we took our cue from Paul Woods, who began his letter with the salutation, "Charts, charts, charts!" Hey, Paul – check out the picture and caption for the full scoop.

Did we mention that you can consolidate up to 255 worksheets at a time, regardless of format?

Or the Goal Seek feature, which lets you put in the total you want and works backwards from there to fill in the variable you need?

Or the fact that this is the first System 7.0 application available?

Plus, you can update to version 3.0 for $129. If you acquired your current version of Microsoft Excel on or after 12/7/90, the upgrade is only $50: Call (800) 541-1261, Department Q82, to find out more.

By the way, Bryan Larson: we said hi to Bill for you. He sends his regards.

Microsoft
Making it all make sense
Although Global Village's speedy TelePort/Fax 9600 modem attaches to the Apple Desktop Bus, it emulates a standard serial connection, so most applications should be able to use it without difficulty.

distortions at all. Although we appreciate the exact size reproduction, the ability to scale documents is sorely lacking.

For transmitting data, the modem is especially robust. It's Hayes-compatible, with MNP Class 4 error-correction and Class 5 data-compression technology for error-free data communication, up to an effective rate of 4,800 bps. Of course, you must be connected to another MNP-capable modem for these features to come into play. We had no trouble accessing America Online, AppleLink, and CompuServe, using the standard configurations of several telecommunications programs. For new users, the TelePort/Fax modem comes with FreeTerm, a basic application for accessing on-line services.

The Bottom Line
Current owners of TelePort data modems can and should upgrade to Global Village's send-only fax software. The upgrade is a steal at only $60. However, if you're new to the fax-modem market, the top-ranked DoveFax from Dove Computer may be a better choice than the current incarnation of the TelePort/Fax 9600. Even though the DoveFax costs about $100 more, it offers ease of use and a host of useful features that make it worth the extra money, particularly if you want to receive faxes through your modem.

A major upgrade that addresses many of the TelePort/Fax's shortcomings should be available at about the time this review appears. The new package is slated to include page preview, scaling, detailed logs, and perhaps even group distribution. Such enhancements should make it more attractive to users who demand functionality as well as ease of use.

— Owen W. Linzmayer

The HP ScanJet Plus scanner provides 8-bit photographic-quality scanning.

That means 256 shades of gray. For the richest, most-detailed images your Mac can muster. With the ScanJet Plus, the great results come easy. At the click of your mouse, you can get negative or mirror images, as well as scaling in 1% increments. From 4-200%. And to make things even easier, this desktop scanner has an automatic exposure feature.

If you want the hottest-looking output from your Mac, you've got it with the ScanJet Plus. Call 1-800-752-0900, Ext. 2378 for your authorized HP dealer.

For all its amenities, ease of use, good image quality, and low price, Publish recommends the HP ScanJet Plus as their "Best Buy."
Kid Pix is a new painting program that even the youngest child can master, although once their parents have discovered it, kids may have a hard time getting a turn.

Kid Pix is a new color painting program created just for kids. But you don’t have to be a kid to enjoy it. As the wildest, craziest mix of unique painting tools and zany sound effects you can find anywhere for the Mac, Kid Pix stole the show during Apple CEO John Sculley’s keynote address at last January’s Macworld Expo.

Kid Pix is so easy to use that even a young child can master it. The entire work space is visible at all times. There are no scroll bars, and all the program’s tools are accessible from the main screen. You won’t find any cluttered tool palettes or overlapping document windows.

The drawing and painting tools are easy to use, as is the Color palette. Each tool has a unique sound associated with it that you hear when you use the tool. The Kid Pix paint bucket, for example, makes a splashing noise. The basic freehand-drawing tool is the wacky pencil, which makes a scratchy sound as you draw it across the screen. You can select different line thicknesses and patterns from the palette at the bottom of the screen.

got it made in the shades.
CoStar's new ergonomically designed trackball beats the competition hands down.

A few years ago trackballs were a big idea. They provided more speed and precision than a mouse and took up less desk space. Unfortunately, over time they also felt big. And heavy. And uncomfortable.

Well, now there's a smaller, much more comfortable idea, The Stingray™ ergonomic trackball from CoStar.

The Stingray was carefully designed to work with the human hand. It’s low profile offers a natural position, reducing strain on the hand, wrist, and forearm. The ball is 75% smaller and lighter. And the jumbo size buttons mean that no matter where your hand rests on the Stingray, it’s resting on a button.

So, if you'd like all the advantages of a trackball with all the comfort of a mouse, give us a call. When you compare the Stingray to the pointing device you’re now using we think you’ll agree, there's just no competition.

Stingray retails for $129. Existing trackball owners can upgrade to Stingray direct from CoStar for $49 (expires 9/30/91). For more information or the dealer nearest you, call 800-4-COSTAR. For information by fax, 24-hours a day, call 800-388-4888.

See us at Macworld Expo, Bayside #710
Several tools are unique to Kid Pix. When you select the wacky brush, the stamp, the electric mixer, or the eraser, the palette at the bottom of the screen changes to show variations of the selected tool.

**Leaky Pens, Bubbly Paint**

The wacky brush applies paint to the drawing. All the wacky-brush variations in the palette perform this task differently. One acts like a leaky pen, leaving ink that collects and soaks into the drawing surface. Another leaves bubbles in its wake. Yet another creates a variety of bare-branched tree shapes (you must supply the leaves) that spring up wherever you use it. You can avail yourself of more variations by holding down the Option key while you select the brush type you want.

The stamp lets you apply small pictures to the painting, accompanied by the sound of a rubber stamp hitting paper. More than 100 pictures come with Kid Pix, and you can easily create your own with the built-in stamp editor.

The electric-mixer tool operates like the wacky brush, in that it has many different variations. The mixer affects the entire painting, emptying all filled areas or creating snowflakes over an image, for example.

Because sound is an integral part of Kid Pix, even the text tool comes with audio effects. Each time you choose a letter, you hear it spoken in one of many children’s voices. You can hear Spanish-speaking voices in addition to English-speaking ones.

Kid Pix lets you record sound with each document, using either Farallon’s MacRecorder, which requires System 6.0.7 or later, or the built-in microphone of the newer Macs. If a Kid Pix document contains a sound, you’ll hear it when the document is opened.

For those who are concerned about turning their Macintosh over to small children, Broderbund has wisely provided a Small Kids mode, which makes the full menu bar disappear. That way, children can’t inadvertently launch DAs or switch applications.

**The Bottom Line**

Kid Pix is a wonderful program. Children can grasp the straightforward interface quickly, the sounds are a riot, and the program sneaks in a good complement of learning with the fun. There’s plenty of entertainment for adults too. Kid Pix comes with enough tools, patterns, colors, and innovative sound effects to keep kids — as well as the most jaded of Macintosh users — occupied for hours.

— Stephan Somogyi

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**Get Info**

**Kid Pix**

Published by: Broderbund Software, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3200.

Version: 1.0.

List Price: $49.95.

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"With Truevision NuVista+ and VideoScript," we produce broadcast commercials straight from a Macintosh."

Now you can script and produce professional videos on your Macintosh using VideoScript software with any Truevision NuVista+ graphics engine. With VideoScript, you create a series of 'events' by defining duration and speed for transitions between graphics and video. The VideoScript interface lets you quickly master the basic transitions, yet allows access to more sophisticated effects for truly dazzling video productions.

Special effects for live video include capture, strobe and posterization. There are 28 transitions (wipes, pushes, reveals and blends) with selectable borders and border colors. And unlike other programs, these transitions all run at 16 bits/pixel for the highest quality real-time effects available on a Macintosh.

Truevision is well known in the broadcast industry for providing the highest quality video output. With VideoScript, you can make the most of the advanced features of the Truevision NuVista+. Improve the quality of your video output by using this powerful combination in your next production.
SAM and Virex

Two programs deliver strong medicine for preventing and curing computer viruses.

You’ll know when your Mac contracts a computer virus. If you don’t nip the infection in the bud, you can easily face a cranky computer that generates printing problems, suffers from system crashes and data loss, and may even damage your media.

Diagnosis and Cure
Fortunately, professional diagnosis and cure are available in the form of two virus-prevention programs: Microcom’s Virex and SAM (Symantec Anti-Virus for Macintosh). Both are now available in their third iterations, sporting improved interfaces and up-to-date detection and eradication capabilities. You’re well advised to add one of these virus-prevention utilities to your standard Macintosh survival tool kit.

At first glance, the only difference between the two applications appears to be cosmetic — for instance, Virex displays icons at the top of the screen and mounted disks at the bottom, and SAM does the opposite. The programs differ also in some of the options and methods they employ to perform their tasks.

Both Virex and SAM use an INIT to detect viruses and application software to destroy them and repair damaged files. The Virex and SAM INITs offer several options for automatically scanning for and detecting viruses: on startup, on shutdown, and when floppy disks are inserted or removable cartridges are mounted. You can also use a key code to cancel scans in both programs, or you can lock the scans in place so they can’t be changed. Network and MIS managers can use passwords to prevent users from modifying any of these options.

Virex uses a pop-up menu that lets you set these INIT options in a control panel, but SAM provides a set of buttons in a control panel that are cleaner and easier to use.

In addition to doing scans, both programs’ INITs constantly monitor your system for events indicating possible infections. SAM breaks these events into 14 categories that range from innocent operations, such as copying an application to disk, to more-foreboding actions, such as an attempt to add code resources to a file. At its most advanced level of use, SAM lets you turn these 14 categories on and off as needed. This is useful to programmers who want to add code to an application while still maintaining some protection.

Virus Alert
If either Virex’s or SAM’s INIT detects something suspicious in an operation, it will alert you with a dialog box that asks

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As you add new Macs to the network, they too can contribute to the Virtual Server. A unique time-slice mechanism means DataClub operates in the background of users’ Macs without interrupting the work they are doing.

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REVIEWS

Symantec's hot line and bulletin board issue updates for detecting new viruses, and you add them via SAM's Add Virus Definition (Resource) dialog box.

For further protection against undocumented virus strains, Virex also includes a Record/Scan option that builds a historical reference point for files, including details such as modification dates, file sizes, and a record of added code resources. If a new and unknown virus infects the file, Record/Scan will improve Virex's chances of detecting it.

SAM includes options for scanning in a dozen or more different ways, such as by file, folder, or volume. And a feature called Inoculation adds code to an application or INIT. The code acts as a kind of barrier to the files. Any undocumented viruses that manage to get by SAM's periodic scans first change the barrier code, alerting users to a virus attack.

SAM's INIT weighs in at a hefty 180K of memory, and the slimmer Virex is half that size. Fortunately for those who are concerned about conserving memory, SAM includes a scaled-down INIT called SAM Intercept Junior. This "lite" version of SAM scans inserted floppies and monitors the desktop.

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Company office. Great company. For more power where power counts, there's the $2,644* microLaser PS35 with 35 scalable fonts. MacUser calls it "The clear winner in the personal printer category....It gives you more bang for the buck and outperforms all its competitors in most performance tests."‡

Shared office. Shared printer. Now here's the right match for one Mac or many. In fact, the 16 ppm microLaser XL is a natural fit for an AppleTalk® network. And like its slightly smaller cousin, this workhorse printer offers you either 17 or 35 scalable fonts, priced at...
A virus checker is only as good as its ability to detect new virus strains. Each program builds intelligence for tracking new symptoms, but the best protection comes in the form of the updates both publishers provide.

In fact, the hassle of providing constant updates for the latest strains has driven some companies out of the virus-detection business. But Microcom and Symantec continue to supply upgrades by mail to users whenever a new strain is discovered. You enter the supplied information into the programs' virus-definitions files, and the packages are programmed to detect the new virus.

In addition to notifying users by mail, Symantec provides a toll-free number and a bulletin board for update information. MIS managers will appreciate a new feature in SAM that allows networked users to access a single virus-definitions file on the network server. That means there's only one file to update when new viruses appear.

SAM 3.0 is System 7.0-ready, with balloon help, the ability to scan DAs at launch, and support for Apple events (so you can scan for viruses by dragging files over the SAM icon).

Virex 3.2 supplies an installer that places the INIT and the application in your System Folder automatically, an easy solution that will be a boon to novice users. It is also currently the only program that combats an unconventional HyperCard virus that originated in Europe. Virex's System 7.0 support, however, is now limited to balloon help.

The Bottom Line
There's no question that viruses are running rampant throughout universities, high schools, and big corporations. Copy shops too are a breeding ground for viruses in the DTP world. Unless you keep your Mac in a hermetically sealed environment, virus protection is a must.

When it comes to choosing between Virex and SAM, we give SAM the edge in features and usability, although both of these programs provide solid virus protection and damage control.

— Ben Templin

If you want to learn more about viruses, check out the Virus Encyclopedia Stack. It's available on Zmac. — Ed.

Get Info

**SAM**

*Published by: Symantec, 10201 Torre Avenue, Cupertino, CA 95014; (408) 253-9600.*

*Version: 3.0.*

*List Price: $99.*

**Virex**

*Published by: Microcom, Inc., P.O. Box 51489, Durham, NC 27717; (919) 490-1277.*

*Version: 3.2.*

*List Price: $99.95.*

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To the best of our knowledge, the products and their corresponding versions preceded by the symbol ☐ are compatible with System 7.0. This information is based on data gathered prior to press time from individual manufacturers and other validated sources. For additional information concerning product compatibility with specific features of System 7.0, please ask your salesperson at the time of your order.

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Apple's System 7

![Image of software applications]

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★ Microsoft ... 30 day MBG
2878 PowerPoint 2.01D ... 245.
★ Monotype Impprints ... 30 day MBG
2878 Monotype Imprints—TrueType ea. ... 22.
★ Multi-Ad Services
8767 Multi-Ad Creator 2.5 ... 455.
★ PANTONE
7466 Process Color Imaging Guide ... 48.
★ Paracomp ... 30 day MBG
5028 ModelShop 2.0 ... 559.
7728 SwivelArt 1.0 ... 581.
7441 Swivel 3D Professional 1.0 ... 435.
8957 Swivel Pro/MacRenderMan Bundle 899.
★ Quark
7612 QuarkXPress 3.0 ... 519.
★ SpringBoard ... 30 day MBG
3530 Certificate Maker 2.0 ... 22.
★ Strategic Mapping
6518 Atlas/MapMaker 4.5 ... 369.
★ SuperMac Tech. ... 60 day MBG
3360 PixelPaint 2.1 ... 149.
5625 PixelPaint Pro 2.0 ... 499.
★ Tactic Software ... 30 day MBG
8251 Icon It! 2 ... 44.
8252 MagicTypist or 8249 Art Fonts ... ea. ... 49.
8263 Art Clips 1.49 ... 8261 Art Clips 2 ... 49.
8248 Font Share 2.2 ... 129.
★ 3D Graphics
3942 Images with Impact: Graphics ... 49.
4583 Images with Impact: Business ... 64.
6379 Accents & Borders ... 64.
★ Timeworks ... 30 day MBG
7115 Publish It! Easy 2.01 ... 139.
6301 ColorStudio 1.5 ... 599.
★ Trendsoft ... 60 day MBG
4780 @Database ... 72.
7835 Tempo II Plus 2.03 ... 105.
★ Ventura Software
8962 Ventura Publisher 3.0 ... Full line available. EPS or Bitmap ... call
9867 GraphMaster 1.1 ... 499.
★ Wildflower ... 30 day MBG
6512 SnapJet 3.01 ... 31.
★ Zedcor ... 60 day MBG
8966 DesktPaint & DesktDraw 3.03 ... 225.
★ T/Maker ... 30 day MBG
7526 CanOpener 1.1 ... 62.
★ AdvancedSoftware ... 30 day MBG
8051 Intouch 1.1 ... 39.
9966 Intouch Server (3-Pack) ... 112.
★ MicroFrontier ... 30 day MBG
7835 Tempo II Plus 2.03 ... 105.
7441 Swivel 3D Professional 1.0 ... 435.
8957 Swivel Pro/MacRenderMan Bundle 899.
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<td>FolderBolt 1.01</td>
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<td>The NightWatch 1.03</td>
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<td>FolderBolt/NightWatch Bundle</td>
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<td>MacSafe II 2.0</td>
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<tr>
<td>Kiwi Software 60 day MBG</td>
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<td>KiwiEnvelopes! 3.1.1</td>
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<td>KiwiFinder Extension 1.02</td>
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<td>SuperGlue II 2.0</td>
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<td>Pi llar 2.0</td>
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<td>Disk 2.0</td>
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<td>Symantec 30 day MBG</td>
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<td>Symantec AntiVirus for Mac (SAM)</td>
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<td>Symantec Utilities for Mac (SUM II)</td>
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<td>Norton Utilities for the Mac 1.1</td>
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<tr>
<td>THINK Pascal or 3420 THINK C 165</td>
<td>$94</td>
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</table>

Kent Marsh Ltd. 30 day MBG: A winning team! The perfect combination of hard disk and folder security. Rigorous yet elegant simple. Full or read-only protection with a click of the mouse. And much more! $99.
<table>
<thead>
<tr>
<th>Company Name</th>
<th>Product Name</th>
<th>Description</th>
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<tbody>
<tr>
<td>Davidson &amp; Associates</td>
<td>Math Blaster 1.0 (CP)</td>
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<td>Algebra-Blaster Plus 1.0</td>
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<td>EARTHQUEST</td>
<td>EARTHQUEST 2.0</td>
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<td>Pipe Dreams 1.0</td>
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<td>Earl Weaver Baseball</td>
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<td>Darwin's Dilemma 1.0.1</td>
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<td>Flight Simulator 1.02 (CP)</td>
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<td>Freesoft</td>
<td>White Knight</td>
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<td>Muriarity Revenge 1.03 (CP)</td>
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<td>Word Quest 1.0</td>
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<td>Vocabulary Trainer Levels 1 &amp; II (French, Italian, Spanish, German, Russian, Hebrew, Japanese)</td>
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<td>Personal Training System</td>
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<td>HyperGlot</td>
<td>Architecture—Use Design Your Own Home</td>
<td>Design Your Own Home, Architecture—Use Design Your Own Home, Architecture to modify or design the home of your dreams! Includes a library of architectural objects and sample floor plans</td>
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<td>KanjiMaster—Beginner (Japanese)</td>
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<td>Reader Rabbit 3.0 (CP) (ages 4-7)</td>
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<td>Talking Math Rabbit 2.3 (ages 4-7)</td>
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<td>*Leister Productions</td>
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<td>Reunion 2.0</td>
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**Global Village** 30 day MBG

**Sir-Tech Software**

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Description</th>
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<tbody>
<tr>
<td>Bane of the Cosmic Forge</td>
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<tr>
<td>Wizardry II: Knight of Diamonds (CP)</td>
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**Software Toolworks**

<table>
<thead>
<tr>
<th>Product Name</th>
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<tr>
<td>Mavis Beacon Typing 1.3 (CP)</td>
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<tr>
<td>Spectrum Holobyte</td>
<td>30 day MBG</td>
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<tr>
<td>Tetris 1.1, 6112 Welltris 1.1 or 8180 Faces 1.0</td>
<td>ea. 22.</td>
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<tr>
<td>Falcon 2.2.1 or 8181 Vette 1.0</td>
<td>ea. 33.</td>
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<td>Spinnaker</td>
<td>30 day MBG</td>
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<tr>
<td>Sargon IV 1.03</td>
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<td>Sargon IV 1.03</td>
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<tr>
<td>LSAT Prep for the Mac</td>
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<tr>
<td>Mummy’s The Word 1.0 (gardening)</td>
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<tr>
<td>Mummy’s The Word Plus (color)</td>
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**FTL/Software Heaven**

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<th>Description</th>
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<td>*Great Wave</td>
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<td>*NumberMaze (B&amp;W)</td>
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<td>*NumberMaze (Color)</td>
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<td>*NumberMaze Decimals &amp; Fractions</td>
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**Abaton** 30 day MBG

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<td>*Analyst</td>
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<td>*DCE</td>
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<td>*DX</td>
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<td>*HyperTerm</td>
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<td>*Java</td>
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<td>*NetPath</td>
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<td>*Telnet</td>
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**StudyWare**

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<td>ACT, GMAT, GRE, or SAT Prep</td>
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<td>LSAT Prep for the Mac</td>
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<td>Mummy’s The Word 1.0 (gardening)</td>
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**HyperGlot** 30 day MBG

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<th>Product Name</th>
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<tr>
<td>White Knight</td>
<td>10 award winning communications program that supports XMODEM, YMODEM, ZMODEM, Kermit, and CompServe Error Correcting protocols. Includes Olytro 1.0 and a free subscription to CEnie $85.</td>
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<tr>
<td>Mummy’s The Word Plus (color)</td>
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</table>
So we show you

**DeltaPoint ... 60 day MBG**
1546 Taste 1.03 with UltraPoint 1.03—A great value. Combine the latest in word processing and document layout and design with power and ease of use in a flexible and expandable paint program. $79.

**Insignia Solutions**
7557 Access PC 1.1
7058 SoftPC-AT/EGA Module 1.4
9726 SoftPC 2.0 (Classic, LC, SE, Port.)
4089 SoftPC 1.3

**Intel Corporation**
5119 2400EX Modem
6420 2400EX MNP Modem
8193 9600EX Modem (w/QuickLink II)

**Int'l Business Software ... 30 day MBG**
8581 DataClub 8581 (3) $199, 8580 (10) $399
5631 Rapport 1.3.4
5792 Drive 360 or 7500 Drive 1200, ea. $29
5632 2 Drive 2.4 (32"") (incl. FastBack II) $325

**Microsoft ... 30 day MBG**
7459 CarbonCopy Mac (single)
1556 CarbonCopy Mac (unlimited)
8027 MacModem V3.2

**Microsoft ... 30 day MBG**
9444 Microsoft Mail 3.0 (1-5 users)
3000 TurboNet ST (DIN-8) 30, 6751 (12) $279
6272 NuvoLink SC $389

**Microcom ... 30 day MBG**
7 CarbonCopy Mac 2.0—A best value in remote control. Direct another Mac's screen, keyboard, & mouse from anywhere. Single user for remote access (2 copies req.); unlimited users for networks. 7459 (single) $59, 1556 (unlimited) $179.

**Practical Peripherals ... 30 day MBG**
3102 2400 Baud External Modem
8994 2400 V.42 bis Modem
7934 PM9600SA Modem 1.26
9849 SmartPack 9600

**Prometheus ... 30 day MBG**
3850 2400 Mini for Mac
8349 Maxfax
8709 2400M Plus
8738 9600M Plus
8950 ProModem Ultra

**Shiva ... 30 day MBG**
3444 NetSerial 3.3
1190 NetBridge or TeleBridge, ea. $409
3443 NetModem V2400 3.3
6917 NetModem V32 (V.42 & V.42 bis) $1169
6519 EtherGate 1.50.1 $1299
8189 FastPack

**Silk/TOPS**
4188 TOPS Teleconnector (DIN-8)
3720 TOPS Flashcard
6264 TOPS Network 3.1 (August '91) $187

**Software Ventures ... 30 day MBG**
3455 MicroPhone II 3.0

**Solutions, Inc. ... 60 day MBG**
6720 FAXGATE Plus 3.0 (June '91) $239

**Symmetry ... 30 day MBG**
9969 EasyShare 1.2

**Synergy ... 30 day MBG**
6618 VersaTerm 4.5
6619 PRO 3.5 $173.

**Traveling Software ... 60 day MBG**
3729 LapLink Mac III Connectivity Pac $93.

**Zoom Telephonics ... 30 day MBG**
1168 MX2400R Modem (w/QuickLink II) $89.
1176 MX2400S Modem (w/StandFax 9600) $105
1179 V42bis Modem (w/MacPack) $169.

**INPUT/OUTPUT**

<table>
<thead>
<tr>
<th>MONITORS, KEYBOARDS, MICE, PRINTERS &amp; SCANNERS</th>
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<tr>
<td>Abaton ... 30 day MBG</td>
</tr>
<tr>
<td>7432 Scan 300/3GS (reg. Scan Kit) $999</td>
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</tbody>
</table>
| Includes free ProPoint ($79 value).
| 1405 Scan 300/Color $149.
| 1406 Int. Kit for 300/Color w/Photoshop $479.
| 1537 LaserScript LX $1729.
| Advanced Gravis ... 30 day MBG |
| 9963 Gravis Mouse Stick $59.
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| 9771 StyleWriter & Ink Cartridge $559.
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| 9799 Cache-In $199.
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| 8124 Typoset $479.
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| CH Products ... 30 day MBG |
| 7344 Killorner's ADB $75.
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| 9834 DS-3000 Color Scanner $769.
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You never cease to amaze me. Since I live in a big city with lots of computer stores, I figured I could get a toner cartridge easily. One store had just sold their last one. Another had them for $20 more than your price. Should I fight the rush hour traffic and spend $20 on a parking lot? Or call a cab? Or pay $12 for a local delivery service?

Instead, I called you folks. You said I would get it the next morning. At 9:05 (before some of the stores are even open), the Airborne delivery arrived. Was I one happy customer! It was more convenient (and cheaper!) to order the toner cartridge from you 3,000 miles away than to get it 3 miles away in downtown San Francisco.

Will wonders never cease?

Shoshanah Dubiner
President, The Interactive Muse
San Francisco, CA

"Should I fight the rush hour traffic?"

MacConnection

Just for the record, all the ads in this series feature photographs of real live MacConnection customers and the real live letters they wrote us. Really!
Just look for the 7.

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6624 16 MHz Mercury 030 (for Mac Plus) 519.
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8708 25 MHz Gemini 030 1179.
7514 33 MHz Gemini II 030 1375.
6371 40 MHz Gemini II 030 1499.
20 - 40 MHz Gemini Classic call 68882 Math Coprocessors.

★ Kensington... 30 day MBG
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4973 Power Tree 20. $27.
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★ Curtis Manufacturing... 30 day MBG
8046 MVP Mouse... 80.
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9977 MacTilt (for Mac SE or SE/30) 68.
9978 MacTilt (for Mac Classic) 68.
★ Goldstein & Blair... 30 day MBG
8198 "What Do I Do Now" Book... 9.
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4015 Mac SE & Ext. Kybd. Carry Case... 79.
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6148 3½" DS/DD Disks 3 Pak (30)... 29.
3298 3½" HD Disks 1.44 Meg (10)... 18.
6375 3½" HD Disks 3 Pak (40)... 49.
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★ MacConnection... 60 day MBG
6692 44 Meg Removable Cartridge... 74.
9728 44 Meg Removable Cartridge... 69.

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Cutting Edge Hard Drives are fast and reliable with access times as low as 23 milliseconds and a near time between failure rating of up to 30,000 hours. An outstanding combination of reliability and low price... see line listing.

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2793 3½" HD Disks 1.44 Meg (10) 21.
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3943 DC2000 40 Mb Data Cartridge 19.

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what you are gettin'.

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
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<tbody>
<tr>
<td>Datadesk</td>
<td>$129</td>
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<td>Mac101E</td>
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<tr>
<td>Switchboard Modular Trackball</td>
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<td>Switchboard (modular keyboard)</td>
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<td>Everex</td>
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<td>Silhouette Trackball</td>
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<td>Dove Computer</td>
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<td>Marathon Racer 030 Plus or SE ea. 599</td>
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<td>Hitachi</td>
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<td>14&quot; Color Monitor (with Mac II adaptor)</td>
<td>$599</td>
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<td>Kensington</td>
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<td>Turbo Mouse 5.0 (Plus or ADB) ea. 107</td>
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<td>Kraft Systems</td>
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<td>KM30 ADB Joystick</td>
<td>$42</td>
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Abaton                              | 30 day MBG |
| 1537 LaserScan LX-6 page/minute, 300 dpi laser printer. PostScript and HP LaserJet II emulation, comes with 2.5 Mb installed, also includes AppleTalk, Centronics parallel and 2 RS-232 serial ports | $1729  |

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MegaGraphics                        |        |
| 16" B-bit System for SE/30, II .. ea.2595|        |
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| 19" B-bit System for SE/30, II .. ea.4295|        |
| 19" G/S System for SE/30, II .. ea.1895|        |

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| A3 Mouse                             | $85    |

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| Pacific Page XL (incl. accelerator) 979|        |

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| TheComplete PC                      | $32    |

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| 3.5 Mac 800K Drive                  | $195   |

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| Includes free instructional video tape. |          |
| 1 Meg SIMMs (80ns)                  | $57    |
| 2 Meg SIMMs Set (80ns)              | $99    |
| 2 Meg SIMM for Ile                    | $149  |
| 1 Meg SIMMs for Ile (set of 4)      | $225   |

CD Technology                        |        |
| Porta Drive HD (200 Mb)              | $1395  |

DayStar Digital                      | 30 day MBG |
| SCSI PowerCard (4 Mb Installed) .. 949|        |
| 25 MHz PowerCard 030 (II/III) ea.1095|        |
| 40 MHz PowerCard 030 (II/III) ea.1895|        |

Dove Computer                        |        |
| Iomega                               |        |
| Xcode iili-128 Cache Card            | $239   |
| Xcode for SE/30 (640 x 480)         | $329   |

Peripheral Land, Inc. (PLI)          |        |
| PLI TurboFloppy 1.4                  | $309   |
| PLI SuperFloppy                      | $429   |
| PLI Sony 40 Turbo Ext. Drive         | $439   |
| PLI Infinity 40 Turbo                | $739   |
| PLI Infinity 88 Turbo                | $1259  |
| PLI 105 Meg Ext. Drive               | $699   |
| PLI 200 Meg Ext. Drive               | $1179  |
| PLI 40 Meg Removable Twin            | $1259  |

Quantum                              |        |
| 40 Meg & 105 Meg Internal Drives    |        |

Sigma Designs                        |        |
| DoubleUp                             | $159   |

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*Cutting Edge ... 30 day MBG

*Sophisticated Circuits ... 30 day MBG

*MicroSpeed ... 30 day MBG

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*Nutmeg Systems ... 30 day MBG

*Orange Micro ... 30 day MBG

*What you are gettin'
American Heritage Electronic Dictionary

The American Heritage Electronic Dictionary (AHED) is a reference and writing tool based on the office edition of the American Heritage Dictionary. The package is a real-world example of hypertext that beats thumbing through conventional dictionaries. Its interface is somewhat clumsy, however, and the program doesn't integrate well with other applications.

The AHED contains complete dictionary entries for more than 116,000 words and incorporates the Roget's II Electronic Thesaurus, which provides 500,000 synonyms for more than 42,000 words.

The AHED package comprises four 800K disks. The contents are compressed as a segmented DiskDoubler file, so you must first join and expand the segments. You place the ten resulting files (3 megabytes on disk) in your System Folder.

Although this method of installation is not exactly difficult, it would be nice if the program automated the process and reduced the number of resulting files.

Once installed, the AHED is available as a DA. When you select it, an AHED menu appears at the right of the application's menu bar. To activate the program, you select Choose Dictionary from the AHED menu, type a word in the text field, and click on Lookup. The DA searches the dictionary files for the appropriate definitions and displays them almost instantaneously. Just as with a printed dictionary, you get hyphenation points, pronunciation, parts of speech, inflections, etymology, and usage notes in addition to the definition. The thesaurus works in a similar fashion.

You can double-click on almost any word in the dictionary or thesaurus to look up its definitions or synonyms. The DA keeps track of your last 16 inquiries, and you can backtrack via a pop-up menu. You can have up to 15 windows open simultaneously.

If you're trying to look up a word that's spelled incorrectly or isn't in the dictionary, the program suggests alternatives based on phonetic and typographic-correction algorithms. You can search the dictionary by using wildcards that represent single or multiple characters — a real boon to crossword-puzzle fanatics and poets in search of just the right word. Additionally, the Anagram feature finds words that have the same characters arranged in different order.

SearchText is a powerful AHED feature that finds words based on definition, vague meaning, or related concept. For example, using Boolean expressions, a search for the words gold and coin returned the words doubletloon, eagle, guinea, and sovereign.

The AHED has on-line help and is backed by toll-free technical support. The product is bundled with a helpful writers' guide and comes with a 60-day money-back guarantee.

Unfortunately, the AHED's clumsy interface doesn't win any points for convenience. Most importantly, the program doesn't integrate well with other applications. For example, AHED doesn't automatically default to a word on the Clipboard and there are no hot keys for invoking features. Another complaint is that you can't cut and paste definitions into your documents.

But these shortcomings aside, we found the AHED to be a useful reference tool that is truly superior to a printed dictionary for Mac users.

Houghton Mifflin, 1 Memorial Drive, Cambridge, MA 02142; (800) 633-4514 or (617) 252-3000. Version 1.0, $89.95.

— Owen W. Linzmayer

The Rite of Spring

With the release of The Rite of Spring, The Voyager Company has raised CD-ROM technology to a higher plateau. The Rite is the latest entry in Voyager's CD Companion series, a CD-ROM and HyperCard-based exploration of classical music. Beethoven's Ninth was an impressive first in the series, but The Rite of Spring represents a significant reassessment of how CD-ROM programs should work.

Stravinsky's The Rite of Spring has always been a mystery to all but the most educated of music scholars. Voyager's product, which features a rip-roaring performance by Charles Dutoit and the Montreal Symphony, finally unlocks many of the work's musical mysteries and lays them bare for music aficionados and first-time listeners alike.

The accessibility of Voyager's product is due, in large part, to the written and aural contributions of author and National Public Radio personality Robert Winter. It is Winter's gift of lucidity that makes The Rite such a joy to use.

The Rite program consists of eight sections: The Pocket Guide provides a single-screen overview of the entire piece, enabling users to hear any individual section instantaneously by clicking on it. Stravinsky's Orchestra and Stravinsky's World influence the listener on the composer's method of writing and explain how he used orchestral forces in unusual ways. The Rite as Dance describes the balletic aspect of the work.

In the Rite Listening section, the music really comes alive. This section clarifies the stylistic, rhythmic, structural, and harmonic elements that make The Rite of Spring sound as modern today as it did when it was first performed 78 years ago.

The Close Reading section analyzes the piece in real time. At any time during the playing of the piece, you can pause and refer to linked cards in either the Rite as Dance or Rite Listening stacks or in a stack called A Closer Look, whose cards contain written score samples. You can choose to play either the orchestral version of the sample or an instrumental solo. (Hundreds of fragments of The Rite played by individual instruments are also on the CD-ROM.)

And finally there is The Rite Game, which draws on all the information presented in the package using new HyperCard 2.0 routines.

A help feature on the order of System 7.0's balloon help is available at all times in the program, and pop-up captions appear when the cursor passes over certain items. A Glossary function is also available. When turned on, the function outlines words that have Glossary entries. If you click on an underlined word, you get a definition and, in some cases, an audio example. There are also scanned drawings on every card, complete with captions, and title cards even contain animation routines.

Although it's black-and-white, the stack itself has real style, thanks in part to the use of Adobe's Frutiger font, which is included and must be installed first. The Retrace and Find functions are also well designed.

If you love music or just want to see what first-rate HyperCard programming is all about, get The Rite of Spring. It's the
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The Book of MIDI

If you’re a longtime reader of MacUser, you’ve probably noticed that the acronym MIDI (musical-instrument digital interface) appears frequently. If, like 99 percent of the public at large, you still don’t know MIDI from XCMD, worry not: Help is at hand. Opcode Systems’ The Book of MIDI is a HyperCard primer that promises to enlighten even the most digitally dysfunctional.

The Book of MIDI was designed to be useful to MIDI novices as well as to MIDiphiles. The stack covers all the basics of MIDI, from the creation of the specification in 1983, to descriptions of MIDI studio setups and MIDI hardware and software, to the intimate details of MIDI messages.

You can operate the stack on two levels. If you’re a novice, we recommend that you explore the first level, where the basics are described in a nonthreatening way. If you’re past the elementary stage or are interested in specific details and subjects, you’ll want to explore the second, more technical, level.

Especially useful is the tour of potentially confusing MIDI setups. Sure, you understand that Box A is supposed to make a sound, Box B is designed to amplify the sound, and Box C is responsible for telling Box A which sound to play. Fine. Meanwhile, you’ve got 34 cables, all of which seem to have different connectors, clutched in your sweaty hands. How does this stuff hook together? Open the Book of MIDI, and go directly to Chapter 2, Setting Up Your MIDI Studio. Follow the steps, and your MIDI setup is done in no time.

For more-experienced MIDI users, the chapter detailing MIDI messages is also welcome. And let’s face it — even MIDI pros need a reminder of common MIDI hexadecimal and binary codes. The MIDI-implementation-chart walk-through is also quite good.

So what’s not to like? Although The Book of MIDI is a fine reference source as well as a darn good HyperCard stack (the scripting alone may be worth the price), it’s marred by too many plugs for Opcode products. Opcode goes so far as to include minidemos of its MIDIplay and EZ Vision products. Enough already.

But this annoyance aside, The Book of MIDI is a good starting point for MIDI beginners. And even experienced MIDI users can benefit from the Book as a reference for common MIDI messages and code. When you’re ready for more advanced information, you can take a look at The Book’s bibliography, which lists some of the best sources of information available on MIDI. Perhaps if enough Macintosh users become MIDI-literate,
Sure, you're into computers, but how do you get your dog, or your house, or your company into one? A Canon Still Video Imaging Kit may provide your answer.

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PUTTING YOUR MAC ON TV: Desktop Video

Make your Mac a TV star! We test six ways to put a TV studio onto your desktop — and discover a surprising top performer.

Want to be the next Ted Turner? Maybe your Mac can help. But does the Mac have the power to make desktop broadcasting as ubiquitous as desktop publishing? This month MacUser Labs dissects six top Mac desktop-video products and discovers that CNN is safe — for now.

Although Mac desktop video can’t deliver broadcast-quality television, it’s more than adequate for most business and educational uses. You can, for example, easily record any Mac presentation and take a videocassette along on sales trips instead of lugging your Mac. What’s more, because you can easily make multiple copies — complete with stirring music and authoritative narration — you can mail your presentation to clients in cities you don’t get around to visiting. Some of the products we tested also let you mix video with Mac-generated graphics, so your company’s training videos can include the smiling face of your orientation specialist — complete with her name on the screen, just as on the nightly news — along with screen recordings of the Mac software she’s demonstrating.

The Mac is a great tool for creating information, and video is an ideal medium for its distribution. Desktop video — often called DTV — brings the two together. Last month we looked at one aspect — displaying broadcast, videotape, or videodisc images on your Mac’s screen (see “The Mac/TV Connection: Desktop Video,” July ’91, page 124). This month we look at DTV from the opposite angle — putting your Mac’s display onto a TV screen or onto videotape.
A Toast to the Toaster

Although we found that no Mac DTV product is yet ready for prime time, we did discover a non-Mac video product that is: the NewTek Video Toaster. The Toaster comes in two flavors: the original card, which turns a Commodore Amiga 2000 or 2500 computer into a desktop-video-production studio, and a new stand-alone Video Toaster computer based on an Amiga motherboard. Both offer the same impressive list of features.

The Video Toaster takes NTSC video input from different sources, overlays graphics, manipulates the combination with any one of many special effects, and then outputs broadcast-quality video. No Mac product comes close to the Toaster’s quality and versatility — and certainly not to its price: The card retails for $1,595, and the Toaster computer costs $3,995.

Mac developers are working on ways to integrate the NewTek Video Toaster with Mac applications.

The first essential piece of DTV hardware is a NuBus card or external box that converts Mac video into television video. We found six products for the Mac that accomplish this task and compared them with the reigning champion of DTV, the NewTek Video Toaster — a card that turns the much-maligned Commodore Amiga into a surprisingly powerful studio-in-a-box (see the “A Toast to the Toaster” sidebar).

Three of the Mac-based products — the Generation Systems TV Board, the Generation Systems TV Box, and the RasterOps Video Expander — simply turn a Mac’s video signal into a TV signal. The remaining three — the MassMicrosystems ColorSpace III and FX (two NuBus cards that work together), the RasterOps ProVideo 32, and the Truevision NuVista+ — also offer special effects: They take a TV signal, overlay and blend Mac graphics with it, and output the result to a TV or a VCR. For video production, you need additional equipment such as videotape recorders, hardware to control the VTRs, and software (see the “Mac Video Production” sidebar).

After we had installed all six video-output products in a NuBus-equipped Mac — not an easy chore in some cases — we put them through an exhaustive set of MacUser Labs video benchmarks. We discovered that the big differences among them were not in the quality of their video output — none even approached broadcast quality — but rather in how easy they were to use, how powerful was the software that each vendor supplied, and how much help their manuals offered.

Not Ready for Prime Time

If you want to show your Mac-produced video on NBC, you’ll have to go to a video service bureau that specializes in Mac-video-to-TV-video conversion. A service bureau uses industrial-strength video equipment called encoders and time-base correctors to bring your tape up to the tight voltage and timing specifications that define a broadcast-quality signal.

The U.S. TV standard signal — also used in Canada, Japan, and South America — is called an NTSC (National Television Standards Committee) signal and includes 525 interlaced lines of video per frame at 30 fps (frames per second). An interlaced frame is made up of two separate but overlapping fields, with each field containing alternating lines of the image. Each field is displayed at 60 hertz; that is, it’s drawn and redrawn 60 times per second. Because two interlaced fields are required to make up one image, the image is completely redrawn 30 times per second.

Mac video, on the other hand, uses nonscrambled, single-field video running at 67 to 82 fps to create an image that’s crisper and more flicker-free than NTSC can achieve.

All six DTV products we evaluated convert Mac video into NTSC video. The three products that can produce overlays and effects can also convert NTSC video into Mac video, manipulate the Mac video image, and then convert it back into NTSC video. They do all conversion in real time, so anything you can do on your Mac can be merged with a video input and captured on videotape.

NTSC video comes in three popular flavors (see Figure I). The most common is composite — a one-channel signal used by most consumer-
level video equipment. Another widespread version, of intermediate quality, is S-video, used in semipro equipment such as Super-VHS and Hi-8 cameras and recording and playback decks. The highest-quality NTSC-video signal is a three-channel component signal called an RGB signal, which is used in professional video gear.

Because of its popularity, we chose to test the quality of each Mac DTV product's composite NTSC signal. A Tektronix VM700 TV-signal analyzer showed us that none of the products achieved NTSC-level quality, although the Truevision NuVista+ came closest (see Figure 2). The NewTek Video Toaster, on the other hand, easily met NTSC specifications.

An NTSC RGB signal is of higher quality than any composite signal, but an RGB signal can't be played on consumer-level VCRs. RGB signals can be converted into single-channel composite signals through a process called encoding, but this conversion may introduce noise and timing errors unless you use a professional — and expensive — encoder. For the best DTV quality, find a video service bureau that can do the job.

The Truevision NuVista+, Mass Microsystems ColorSpace III and FX, RasterOps ProVideo, and RasterOps Video Expander output three-channel RGB signals in addition to composite video. The Generations Systems TV Board and TV Box output only composite signals. The RasterOps ProVideo 32 and Video Expander and the Truevision NuVista+ also output S-video signals. The Video Toaster outputs only composite signals, but they're of broadcast quality, so there's no need for an RGB output.

**Mac In-House Videos**

Although a Mac-produced video will never be good enough to air on MTV, don't be disappointed: There are plenty of ways DTV can streamline and enliven your business presentations, train and inform your employees and clients, and add titles and graphics to your current video collection — once you've figured out how to install and use the product of your choice. And, as is often true with a technology that has not yet fully matured, the more powerful the DTV product, the harder it is to master.

The three products that simply put your Mac's display onto a TV screen or videotape are all easy to set up and run. The Generation Systems TV Box and the RasterOps Video Expander work with Apple display cards. The Video Expander also works with RasterOps display cards that drive a 13-inch AppleColor High-Resolution RGB Monitor. Neither work with Mac internal video from the Iic, Iis, or LC. Both are external boxes, and both support 24-bit-color cards. To install them, you simply plug the video cable from the Macintosh video card into the boxes.

The TV Box has a connection for a video cable to an Apple monitor. A switch on the front of the TV Box lets you select the TV or the computer monitor as the active screen; the nonactive display — the TV or the Mac monitor — goes blank. The

---

**Figure 1: The Three Types of NTSC Video**

**Composite:** The one-channel composite signal is the most common video signal. Composite cables use either an RCA or a BNC connector.

**S-video:** The two-channel S-video signal is used in Super-VHS and Hi-8 VCRs and cameras. S-video cables use a four-pin connector that looks identical to a Mac ADB connector.

**RGB:** The least common signal, three-channel RGB, is used in professional video equipment. A component cable has four BNC connectors: one each for the red, blue, green, and sync channels.
Mac Video Production

To produce desktop video with your Mac, you need more than a NuBus card or an external box that converts Mac video into TV video. For starters, you need (1) a videotape recorder (VTR), a videocassette recorder (VGR), or a videodisc player and (2) a camera or a camcorder. You also need device controllers and software to integrate your DTV production. Our recent "MacUser Multimedia Encyclopedia" (February '91, page 105) gives a complete overview of all the necessary pieces — but there are some recent developments worth noting.

Sony's new Vbox ($249.95) controls most Sony consumer-quality cameras, camcorders, VCRs, and even TVs. About the size of an external floppy drive, the Vbox connects to a Mac through the printer port or the modem port. One Vbox can control 1 device, but a chain of 7 Vboxes can be connected to each port — letting one Mac simultaneously control up to 14 devices. As soon as developers write the appropriate software, you'll be able to zoom in with a camcorder, pause and record with a VCR, and raise or lower the volume on a TV, all under Macintosh control. Sony Corp., Sony Drive, Park Ridge, NJ 07656; (201) 930-6432.

The Vbox offers control of consumer-quality cameras and VCRs, but consumer video equipment is notoriously imprecise. For accurate frame-by-frame control, you need professional VTRs and more-powerful controllers. You also need what's called SMPTE time code — a way of indexing frames of video with numbers so that you can accurately edit video or record Mac animations frame by frame.

MacUser's February Multimedia Encyclopedia listed several frame-accurate device controllers from Advanced Digital Imaging, Diaquest, and Videomedia. Another source is ARTI (Advanced Remote Technologies, Inc.), which sells external boxes called ARMs that control professional VTRs. All the products generate SMPTE time code and support frame-accurate VTRs. ARTI, 307 Orchard City Drive, Suite 204, Campbell, CA 95008; (408) 374-9044.

Digital FX offers an integrated video for the recording VTR (output). You need a lot of additional video equipment to use the Mac for frame-accurate editing, recording animations frame by frame, and producing video effects such as chroma keying and character generation.
The Video FIX retails for $9,995, with A/B-the final tape from the original videotapes-
complete with fades and wipes — and PICS—an audio for storage on your Mac’s hard disk.

Although the Video FIX 1.0 digitized only the first and last key frames of an analog-video segment, the new version uses compression to digitize full-motion video and audio for storage on your Mac’s hard disk. The quality of the digital video is good enough to print to videotape. You can use an edit decision list — a list of edit points — created from your digital edits to assemble the final tape from the original videotapes. The Video FIX retails for $9,995, with A/B-roll and PICS-animation support as options at $3,000 and $1,000, respectively. Digital F/X, 755 Ravendale Drive, Mountain View, CA 94043; (415) 961-2800.

For the ultimate in Mac digital-video production, choose the Avid Media Composer Series. The original Avid 1 Media Composer was the first system to offer full digital editing, but its 8-bit dithered Mac video image wasn’t professional. The new Composer Series products use JPEG (Joint Photographic Expert Group) compression to digitize full-motion video in full color.

The Avid Media Composers are Mac video workstations, complete with a Mac IIx, Truevision NuVista+, compression board containing the C-Cube CLC-550 chip, Videomedia device controllers, sound-digitizing boards, and plenty of magnetic storage. Avid software integrates all the elements. With it you can perform digital editing, prepare edit decision lists, create titles, print to videotape, and layer and mix multiple tracks of digital sound. Seven models are available in the Avid Media Composer Series, starting at $24,500 and topping out at $69,500; the high-end models have higher-quality digitizing and additional digital-audio features. Avid Technology, Inc., 3 Burlington Woods, Burlington, MA 01803; (617) 221-6789.

RasterOps Video Expander, on the other hand, doesn’t have an output for an Apple 13-inch monitor. Once the video cable has been plugged in to the box, you have no choice of TV or Mac-monitor display. The TV takes over. To return to the Mac monitor, you have to disconnect the box and reconnect the cable from the display card back to the Apple monitor — a real nuisance if you need to switch back and forth frequently.

When you’re using the TV screen as the display, neither box can display the menu bar or any icons on the edges of the Mac screen, because the NTSC video frame isn’t big enough for the full frame — 640 x 480 pixels — of an Apple 13-inch monitor. Neither box offers the solution used by the Generation Systems TV Board and the three effects cards: an under scan output mode, which compresses the NTSC image so that it can fit the entire Mac desktop, menus and all, onto a TV screen. The resolution of the under scan video mode varies with the other products, but all manage to show the entire desktop.

The TV Box outputs a single video signal — composite — whereas the Video Expander outputs each of the three most-popular types: composite video, S-video, and RGB. The Video Expander also has inputs for an external signal that allow it to be genlocked — electronically synchronized — with other video devices. Without genlocking, a TV image rolls or shows interference patterns when mixing video signals from different sources.

The other DTV products — the Generation Systems TV Board and the three effects and overlay cards — all fit into the NuBus. Installation of the TV Board is simplicity itself — just plug it in to a NuBus slot, and you’ve got instant composite NTSC video available from the RCA-style connector on the rear of the card. The TV Board supports up to 8 bits, and because it acts like any other 8-bit Mac display card, it shows up in the Apple Monitor control panel. The only difference is that instead of showing Mac video on a 13-inch Apple RGB monitor, the TV Board shows it on a TV.

The three effects and overlay systems — the RasterOps ProVideo 32 card, the Mass Microsystems ColorSpace cards, and the Truevision NuVista+ card — provide both interlaced NTSC-video and noninterlaced Mac-video output. Like the TV Board, the three cards show up in the Apple Monitor control panel. You can connect their NTSC output to a VCR and record it. If your television or VCR has a video-pass-through feature, you can record and view at the same time. The three video-out cards are also Mac-video-display systems that can run a 13-inch AppleColor High-Resolution RGB Monitor. You can’t, however, see the video on an Apple monitor and a TV at the same time. You set the active mode — either Mac video or TV video — with a software driver for the NuVista+ and through the Monitor control panel for the ColorSpace cards and the ProVideo 32.

If your video experience amounts to connecting a TV to a VCR, much of the struggle of using an effects and overlay card will be plugging everything in. The RasterOps ProVideo and Truevision NuVista+ make your chore easy, because they are single NuBus cards. The Mass Microsystems ColorSpace product comprises two separate NuBus cards: the ColorSpace III, a stand-alone 8-bit-video card, and the ColorSpace FX, which provides NTSC conversion and special effects.

The two ColorSpace cards, introduced in 1989, were the first Mac video-effects cards. Unfortunately, their manuals (the same user guide and reference manual are used for each card) are still labeled ‘preliminary’ on the front cover — and it gets worse when you open them. For example, there are references to figures that are ‘to be drawn’ — omissions that are inexusable in light of how difficult both ColorSpace cards are to install.

For example, when you connect the two ColorSpace cards by using the supplied cable, it’s difficult to ascertain whether you’ve installed the
**Figure 2: Not Ready for Prime Time**

<table>
<thead>
<tr>
<th>Overall Image Quality</th>
<th>Broadcast Quality</th>
<th>Image Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Truevision NuVista+</strong></td>
<td><strong>Mass Microsystems ColorSpace II/FX</strong></td>
<td><strong>RasterOps Video Expander</strong></td>
</tr>
<tr>
<td><strong>Mass Microsystems ColorSpace II/FX</strong></td>
<td><strong>RasterOps ProVideo 32</strong></td>
<td><strong>Generation Systems TV Box</strong></td>
</tr>
<tr>
<td><strong>Generation Systems TV Board</strong></td>
<td><strong>NewTek Video Toaster</strong></td>
<td><strong>Note</strong></td>
</tr>
</tbody>
</table>

![Image Quality Comparison Table]

**Overall Image Quality:**
Overall image quality is a combination of how closely each DTV product approached broadcast-quality signal specifications and how accurately it converted the Mac's digital color signals into NTSC signals. We compared each product with the Commodore Amiga-based NewTek Video Toaster — a DTV product that easily outperformed the best Mac card, the Truevision NuVista+.

**Broadcast Quality:**
We weighted nine NTSC-signal-quality specifications to create an index that defines an acceptable broadcast-quality signal according to industry standards. On our index, a 100-percent signal is a perfect broadcast signal and a 90-percent signal is acceptable. None of the Mac products comes close to matching the NTSC's tight voltage and timing requirements. The NewTek Video Toaster, however, shows that you can get broadcast-quality video from an inexpensive desktop computer.

**Image Accuracy:**
We created a file containing a set of industry-standard colors — called SMPTE color bars — to see how far the colors shifted during their conversion from Mac video to NTSC video. We created an image-accuracy index by combining the measurements of various image elements such as color accuracy and brightness and measuring how far each product deviated from this ideal. Of the Mac products, the NuVista+ was the most accurate. The Generation Systems TV Box, on the other hand, showed colors that were grossly shifted from the Mac-video colors. The NewTek Video Toaster shows how little error a broadcast-quality DTV product adds to the conversion.

**Note:**
The best Mac DTV product — the Truevision NuVista+ — is a distant second to the Commodore Amiga-based Video Toaster in tests of image quality.

**Performance factor:**
- **2**
- **4**
- **6**
- **8**
- **25**%
- **50**%
- **75**%
- **100**%
- **1**
- **2**
- **3**
- **4**

**Broadcast quality range:**
- **Broadcast quality signal with very accurate colors.**
- **The TV Box may be inexpensive, but it produces poor colors.**
- **The Video Toaster outputs a broadcast-quality signal with very accurate colors.**

---

Cable's five-pin connectors in the right orientation. Also, none of the ports — two on the FX and three on the Ili — is labeled. After much thumbing through the "preliminary" manual, we discovered that all three RCA connectors on the Ili card are NTSC inputs and that the ColorSpace software lets you select which is active. Mass Microsystems should be crowing about this powerful feature — with it you can monitor three active video sources — rather than burying it in its obscure manual.

Mass Microsystems told us that it has no plans to update the ColorSpace manuals, however. Although the ColorSpace cards were the first on the scene, they now seem poised for early retirement. They have been drastically reduced in price, down to $2,495 from their original list price of $5,798.

One of the two manuals shipped with the RasterOps ProVideo 32 is also labeled "preliminary," but the ProVideo 32 is a single NuBus card and installation in the Mac is straightforward. The connecting cables are labeled "input" and "output" — very helpful when you're fiddling around behind your Mac to attach them. You receive no help from the manual about how to set up video devices such as VCRs, videodiscs, and camcorders, however.

Owners of the Truevision NuVista+ will find that its two helpful manuals ease installation and use. The setup manual shows step-by-step illustrated instructions on how to install the card and on how to connect various video devices. We congratulate Truevision for making the process clear and straightforward — both novice users and the most experienced videophiles.
will appreciate the help. The thick user manual includes a tutorial and many pages of in-depth explanation of software features and capabilities.

The NuVista+ comes in three memory configurations, with increasing prices for more memory. You can have 1, 2, or 4 megabytes and can upgrade the memory at any time. More memory gives you a greater range of resolutions at full color. The NuVista+ can be set for NTSC- and Mac-video modes at a range of resolutions, including full 640-x-480-pixel and underscan 512-x-400-pixel modes — the underscan mode allows all of the Mac’s desktop to appear on a TV screen. The 1-megabyte version can output 24-bit color only in the underscan mode, whereas the full 4-megabyte version can output full-color video in any mode. The 1-megabyte version also has limited overlay and capture capabilities on the Mac. We used a 2-megabyte version and found its abilities to be more than sufficient.

Software and Features

The Generation Systems TV Box and TV Board and the RasterOps ProVideo 32 have only limited software. They simply provide TV output of the Mac’s screen — it’s up to you to figure out what to do next. You can videotape presentations, animations, educational software — or just the mouse scurrying across your screen.

The Mass Microsystems ColorSpace, RasterOps ProVideo 32, and Truevision NuVista+, on the other hand, offer powerful features that need software to make it all happen. One important feature all three products share is the ability to overlay — or combine — video with Mac graphics (see Figure 3). You can blend TV video and Mac graphics, controlling the transparency of each. Each card also provides chroma keying: You use the cursor to select a color in a Mac graphic, and video appears instead of that color. This lets you place text over live video and record the result: You simply create a Mac graphic with text on a solid background color and select
Apple's QuickTime

In last month's "The Mac/TV Connection: Desktop Video" (page 124), we mentioned that a new Apple System-software extension called QuickTime would help digital video become a reality. We're now willing to make an even bolder prediction: QuickTime will do for multimedia what 32-bit QuickDraw has done for color and desktop publishing. With QuickTime's help, the Mac will become the premier multimedia computer of the '90s — and beyond.

QuickTime is Apple's architecture for handling "dynamic media" — digital video and audio — and external devices such as digitizing cards and video devices. It's the first extension to System 7.0 software and is also backward-compatible with System 6.x. QuickTime manages the playing of digital movies and the compression of still images, animations, and digital video. It also defines a new file format called MOVIE, the first significant format to come from Apple since PICT. MOVIE is a format for animation and digital video that can also have tracks of digital audio and external hooks such as MIDI. You can cut, copy, and paste a MOVIE document as you can with any other Mac file format. The MOVIE format also contains a tempo map that takes its timing from the Macintosh's internal crystal clock. With QuickTime's help, MOVIE files can play at the same speed on a Mac and a Classic. MOVIE is designed as a cross-platform format so it may become an industry-standard way of communicating digital multimedia information.

Apple has used some elements of QuickTime to revamp the PICT format, adding extensions for compression and preview. The new PICT format can save a 4K or 5K thumbnail of an image that an application can easily call for previewing without having to lead the entire image into memory. This can save substantial time, because a full-page 24-bit-color image can be as large as 20 megabytes.

Compression is one of QuickTime's most radical advances. QuickTime includes three schemes: The Photo Compressor puts the industry-standard JPEG (Joint Photographic Expert Group) compression algorithm inside Apple System software, allowing PICT files to be saved in JPEG format. The Animation Compressor squeezes PICS animation files — a series of linked PICT files. The Video Compressor uses a proprietary algorithm to compress live analog video as it's converted into digital form. Providing compression in System software means that every Mac can have access to digital video, although Maccs with monochrome displays will have severely limited image quality. For those who want the faster and better-quality compression offered by a NuBus card, QuickTime can sense any installed third-party hardware compression system and switch to it.

QuickTime should be available by the end of the year, and products are already in the works to take advantage of it. For example, SuperMac's VideoSpigot ($499) is a board for the Mac IIfi and LC that uses QuickTime's Video Compressor to capture and play back full-motion video and audio in a small window. With a camcorder and the VideoSpigot, you can record directly to your hard disk. The VideoSpigot uses the IIfi's and the LC's built-in internal video. The VideoSpigot Pro ($1,899), for the IIfi, is a video- and audio-digitizing card and an accelerator/color-graphics card. The VideoSpigot Pro drives large screens in 8-bit color and small screens in 24-bit color, all accelerated.

SuperMac also plans to bundle with both boards a powerful editing program called ReelTime, which lets you edit digital video and audio, mix Mac graphics, and add transitions such as wipes and dissolves. You can save ReelTime creations in the MOVIE format, and word processors, spreadsheet programs, and database programs can play your MOVIE documents on any Mac running QuickTime. SuperMac, 485 Potrero Avenue, Sunnyvale, CA 94086; (408) 245-2202.

The Truevision NuVista+ can also accomplish the reverse: chroma keying Mac graphics onto a specific video color. This is a common technique, used for creating the familiar illusion of a TV forecaster in front of a weather map. The forecaster is actually standing in front of a blue screen, and a weather graphic is displayed instead of the blue background color. It is also the technique used in films such as Star Wars: All those careening spaceships were shot in front of a blue screen, and the background of stars and planets was added later.

The RasterOps ProVideo 32 ships with the simplest software, a single DA called SFX, which provides blends, overlays, and chroma keys. You can run a Mac application and still have access to the card's features through the DA, but the DA alone lacks the power to do anything beyond simple overlays and blends. RasterOps is working on hooks to HyperCard and MacroMind Director — in the form of XCMDs and XOBJs, small pieces of code that allow HyperCard and Director, respectively, to control hardware devices. For the present, however, you are limited to just the DA.

The Mass Microsystems ColorSpace III and FX come with the application MacTV, which provides a live-video window in full or quarter size; a DA that digitizes single frames of video; and a DA that controls the overlay of Mac graphics and video. This software only touches the surface of the power of the hardware, however.

Two demo stacks in HyperCard and SuperCard better illustrate the range of possible effects — multiple video windows and animation of a video window, to name just a couple — but these are only demo stacks. Mass
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Microsystems does provide HyperCard XCMDs with a reference manual, but none of the software is helpful for average users who want to use the card out of the box without learning to program.

The Truevision NuVista+ comes closest to delivering a complete video solution. Five control panels control input, the blending of Mac graphics and video, and chroma keys. The Capture application gives users a quick and easy way of digitizing single video frames. The manual is tremendously helpful: It provides examples, a complete and thorough description of the software, and a tutorial on how to use the software. In addition to providing you with ways of using the card directly through the bundled software, Truevision also provides hooks to HyperCard via XCMDs and MacroMind Director via XOBJs.

We looked at a beta version of new Truevision software called VideoScript that will make the NuVista+ even easier to use. VideoScript is an authoring application that lets you use simple point-and-click methods to create video presentations. You can create sequences of scenes with live video and Mac graphics and perform 28 transitions, including wipes and dissolves, between the two. The retail price is high — $495 — but VideoScript is the easiest way to create professional video effects that we've seen any Mac video product offer.

**Color Tests**

As mentioned before, we first measured each product's video-signal output and compared it with NTSC specifications. The results were disappointing: None of the Mac products came close to meeting NTSC specs — but the inexpensive NewTek Video Toaster in a Commodore Amiga placed well within the composite NTSC ballpark.

We also used Adobe Photoshop to create a set of SMPTE color bars — an industry-standard set of colors used to calibrate TVs — and output the file through each product's composite NTSC output. We used a Tektronix VM700 to measure the luminance and chrominance values in the resulting NTSC signal and then computed the difference between the output and the original Mac file in terms of color accuracy and brightness.

The Truevision NuVista+ produced the most-accurate images, followed by the Mass Microsystems ColorSpace H/IX combo (see Figure 2). Both systems were able to closely match the Mac video's colors when translating them to NTSC. The Generation Systems TV Board also did well, but it transmits only 8-bit color (or gray scale), compared with the 24-bit color provided by the other cards. (Noise and errors are reduced when fewer bits per pixel are translated from Mac to NTSC video.) The worst performer was the Generation Systems TV Box, which showed a great deviation between the colors on the Mac screen and those that appeared on the attached TV.

**Desktop-Video Revolution**

It's easy to put your Mac on TV or videotape with DTV. Although the television signal produced by the six Mac DTV products doesn't approach broadcast quality, it's more than good enough for producing videos for in-house training or for mailing sales presentations to clients.

The products we tested for this report prove that the video hardware is here, and it will be only a matter of time before all the pieces start coming together. The NewTek Video Toaster proves that true broadcast quality can be achieved on the desktop, and there's no reason why Mac-based hardware can't match Video Toaster quality. When combined with the Mac's superior software interface, a Mac DTV product may someday roast the Toaster.

Paul Yi is a MacUser associate editor. He would like to acknowledge the invaluable assistance of Pete Nehl of Varift Video, San Francisco, in researching and testing for this report.
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To find out more call 1-800-NEC-INFO.
### Table 1: Features of Desktop-Video-Out Products

<table>
<thead>
<tr>
<th>Video</th>
<th>Generation Systems TV Board</th>
<th>Generation Systems TV Box</th>
<th>Mass Microsystems ColorSpace III/FX</th>
<th>RasterOps ProVideo 32</th>
</tr>
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<tbody>
<tr>
<td>List price</td>
<td>$395</td>
<td>$395</td>
<td>$2,495</td>
<td>$1,995</td>
</tr>
<tr>
<td>Street price</td>
<td>$395</td>
<td>$395</td>
<td>$1,995</td>
<td>$1,750</td>
</tr>
<tr>
<td>Cons</td>
<td>Outputs only 8-bit color or gray scale. No software.</td>
<td>Poor image accuracy. No software.</td>
<td>Incomplete manuals.</td>
<td>DA lacks power. No external hooks.</td>
</tr>
<tr>
<td>Hardware config</td>
<td>NuBus card</td>
<td>external box</td>
<td>two NuBus cards</td>
<td>NuBus card</td>
</tr>
<tr>
<td>Cables</td>
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<td>yes</td>
<td>no*</td>
<td>yes</td>
</tr>
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<td>Mat-video-card input</td>
<td>15-pin Mac RGB</td>
<td>NA</td>
<td>NA</td>
</tr>
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<td>composite</td>
<td>composite, S-video</td>
<td></td>
</tr>
<tr>
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<td>none</td>
<td>24-bit; 640 x 480</td>
<td>none</td>
</tr>
<tr>
<td>File-save formats</td>
<td>none</td>
<td>none</td>
<td>PICT</td>
<td>none</td>
</tr>
<tr>
<td>Video out</td>
<td>Mac RGB output (no. of bits; resolution)</td>
<td>none</td>
<td>none</td>
<td>8-bit; 640 x 480</td>
</tr>
<tr>
<td>NTSC-video output</td>
<td>composite (8 bits)</td>
<td>composite</td>
<td>composite, RGB</td>
<td>composite, RGB, S-video</td>
</tr>
<tr>
<td>Special effects</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Software</td>
<td>none</td>
<td>TV Box</td>
<td>ColorSpace</td>
<td>none</td>
</tr>
<tr>
<td>INITs and control panels</td>
<td>none</td>
<td>none</td>
<td>Desktop Video, NTSC Digitizer, MacTV</td>
<td>SFX DA</td>
</tr>
<tr>
<td>Applications</td>
<td>none</td>
<td>none</td>
<td>NTSC Digitizer, MacTV</td>
<td></td>
</tr>
<tr>
<td>HyperCard XCMDs</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Macromind Director XOBJs</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Technical support</td>
<td>toll-free, unlimited</td>
<td>toll-free, unlimited</td>
<td>toll-free, unlimited</td>
<td>unlimited</td>
</tr>
<tr>
<td>Warranty</td>
<td>1 year</td>
<td>1 year</td>
<td>1 year</td>
<td>1 year</td>
</tr>
<tr>
<td>Company</td>
<td>Generation Systems</td>
<td>Generation Systems</td>
<td>Mass Microsystems</td>
<td>RasterOps</td>
</tr>
<tr>
<td></td>
<td>1185-C Bordeaux Dr. Sunnyvale, CA 94089</td>
<td>1185-C Bordeaux Dr. Sunnyvale, CA 94089</td>
<td>810 W. Maude Ave. Sunnyvale, CA 94086</td>
<td>2500 Walsh Ave. Santa Clara, CA 95051</td>
</tr>
<tr>
<td></td>
<td>(408) 734-2100</td>
<td>(408) 734-2100</td>
<td>(800) 522-7979</td>
<td>(408) 562-4200</td>
</tr>
</tbody>
</table>

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Please circle 368 on reader service card.
## Table 1: Features of Desktop-Video-Out Products, continued

<table>
<thead>
<tr>
<th></th>
<th>RasterOps Truevision NuVista+</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>List price</strong></td>
<td>$695</td>
</tr>
<tr>
<td><strong>Street price</strong></td>
<td>$575</td>
</tr>
<tr>
<td><strong>Pros</strong></td>
<td>Easy to use. Three types of NTSC outputs. Genlockable.</td>
</tr>
<tr>
<td><strong>Cons</strong></td>
<td>No Mac-monitor output. Menu bars lost on TV screen.</td>
</tr>
<tr>
<td><strong>Hardware configuration</strong></td>
<td>external box NuBus card</td>
</tr>
<tr>
<td><strong>Cables</strong></td>
<td>yes</td>
</tr>
<tr>
<td><strong>Video In</strong></td>
<td>15-pin Mac RGB</td>
</tr>
<tr>
<td><strong>NTSC-video input</strong></td>
<td>composite, RGB, S-video</td>
</tr>
<tr>
<td><strong>Video digitizing</strong></td>
<td>(no. of bits; resolution) 8-, 16-, 32-bit; resizable</td>
</tr>
<tr>
<td><strong>File-save formats</strong></td>
<td>none PICT, TGA</td>
</tr>
<tr>
<td><strong>Video out</strong></td>
<td>none</td>
</tr>
<tr>
<td><strong>Mac RGB output</strong></td>
<td>(no. of bits; resolution) 8-, 16-, 32-bit</td>
</tr>
<tr>
<td><strong>NTSC-video output</strong></td>
<td>composite, RGB, S-video</td>
</tr>
<tr>
<td><strong>Special effects</strong></td>
<td>no yes</td>
</tr>
<tr>
<td><strong>Software</strong></td>
<td>Blending, ChromaKey, CloseUp, MasterKeys, VID/O</td>
</tr>
<tr>
<td><strong>Applications</strong></td>
<td>Capture</td>
</tr>
<tr>
<td><strong>HyperCard XCMDs</strong></td>
<td>no yes</td>
</tr>
<tr>
<td><strong>MacroMind Director XOBJs</strong></td>
<td>no yes</td>
</tr>
<tr>
<td><strong>Technical support</strong></td>
<td>unlimited toll-free, unlimited</td>
</tr>
<tr>
<td><strong>Warranty</strong></td>
<td>1 year</td>
</tr>
</tbody>
</table>

### Table 1 Criteria

- **List price** — The list price is the vendor’s suggested retail price.
- **Street price** — The street price is a typical actual price charged by dealers or mail-order companies during April 1991.
- **Hardware configuration** — A description of the physical configuration of the product.
- **Cables** — Does the vendor provide cables for hooking up external boxes and video sources such as VCRs, camcorders, or videodisc players?
- **Mac-video-card input** — The video connections for the external boxes.
- **NTSC-video input** — A list of the types of NTSC-video signals the cards can accept.
- **Video digitizing (no. of bits; resolution)** — The color depth and the resolution of the digitized video that the cards produce.
- **File-save formats** — The file formats in which single digitized frames can be saved.
- **Mac RGB output (no. of bits; resolution)** — The color depth and the resolution that the cards support.
- **NTSC-video output** — The types of NTSC video signals that can be output.
- **Special effects** — Does the product offer special effects such as blending and chroma keying?
- **INITs and control panels** — The startup software bundled with the product.
- **Applications** — The bundled applications.
- **HyperCard XCMDs** — Does the product offer XCMDs — external hooks that let you control the hardware from HyperCard?
- **MacroMind Director XOBJs** — Does the product offer XOBJs — external hooks that let you control the hardware from MacroMind Director?
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You’ve got better things to do after-hours than back up your network. We test five ways your Mac can work the night shift—so you don’t have to.

BY VERNON KEENAN, KELLI WISETH, AND THE MACUSER LABS STAFF

There’s nothing very exciting about backing up. That is, until that adrenaline-filled moment when you realize that last quarter’s balance sheet has mysteriously vanished from your hard disk. Despite such hair-raising lessons—and hours or days of reconstructive surgery—getting your accounting department to back up routinely is still a problem. And the problem only gets larger as more Macs join your network.

But thanks to recent software and hardware advances, network backup—storing copies of files from every Mac on a network onto one central device—has just become a lot easier. Network-backup software now lets Mac clients use a single Mac as a backup server, or storage depot. And the best news is that the software automates the backup process: You can schedule backups for whenever you like—you don’t have to be there while the chore is being done.
Media Overview

To back up all the files scattered throughout a network of Macs, you need a lot of storage capacity. And that’s just what you get with DAT — digital audiotape — a recent transplant from the high-end-audio world. DAT drives make network backup easy to manage because they provide high storage capacity (1.3 gigabytes) in a small (less than 2 x 3 x .25 inches) cassette at a fairly inexpensive price: At less than $25 a cassette, DAT storage costs less than 2 cents per megabyte. And with compression — available with Retrospect Remote, QTBackup, and Nightshift — that 1.3 gigabytes rises to 2.6 gigabytes today and is expected to increase to 5 gigabytes in the future.

The only media that approach the capacity of DAT are erasable optical discs and 8-millimeter tape, neither of which can match DAT’s capacity:price ratio. For example, erasable optical discs can hold up to 1 gigabyte of data, but $200 per disc cartridge is a little steep for a backup budget — and the random-access capability of optical storage is a backup luxury, not a necessity.

An 8-millimeter tape cassette can hold as much as 2.2 gigabytes of data but costs about $60.

As a point of comparison, floppy disks weigh in at about 70 cents per megabyte. And swapping the 800+ floppies it’ll take you to back up a 1-gigabyte file server will wear out your floppy drive as well as your elbow.

— Stephen Satchell

Figure 1: Network-Backup Speed

Overall Time

<table>
<thead>
<tr>
<th>Software</th>
<th>Time factor</th>
<th>Overall Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retrospect Remote</td>
<td>1</td>
<td>Fast and feature-packed.</td>
</tr>
<tr>
<td>Nightshift</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>QTBackup/QTShare</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MacBack</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>NetStream</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Because all the Macs on a network — including AppleShare file servers — are backed up onto one Mac’s storage device, that device must be able to hold lots of data. Enter the DAT (digital audiotape) drive, a recent transplant from the audio-equipment world, which is now being bundled with network-backup software. A 120-minute DAT cassette can store vast amounts of data — up to 1.3 gigabytes (1.300 megabytes). Some network-backup software also offers a compression option that can cram 2.6 gigabytes onto the same DAT cassette. As new compression schemes are developed and tape length increases, the amount of data that can be stored on a DAT cassette will continue to rise.

Note that PCPC should now be shipping a completely revamped version of NetStream that promises to have much better performance than the version we used for these tests.

Complete Backup:

We timed how long it took to back up 30 megabytes of test files from the client Mac to the backup server. If you need to back up 20 Macs on EtherTalk with 30 megabytes of data each, NetStream will take about 6 hours — Nightshift can do the same job while you’re at lunch. If those same 20 Macs are on LocalTalk, NetStream will take more than 14 hours to finish the backup; Nightshift will take only 9 hours.
But if you’re backing up 20 Macs equipped with 105-megabyte hard drives, even 2.6 gigabytes will fill quickly if you back up all their files (do a complete backup) all the time. Fortunately, backup software lets you save media — and time — by making incremental backups of your files — that is, backing up only new or changed files once you have a complete backup on tape. Gone are the days — or nights — of feeding fresh floppies or other media into a hungry drive (see the “Media Overview” sidebar).

However, capacious, a DAT drive is useless without backup software. To help you choose the right backup software for your network, MacUser Labs tested five network-backup applications bundled with DAT drives. We repeat the process by manually selecting the files from incremental backups — in our case, three separate versions. It’s up to you to restore the incremental backups in the right order — if you don’t, you’ll overwrite a newer version of a file with an older version.

Incremental Restore:
We timed how long it took to restore a file from an incremental backup session. Finding a single file on a tape taxes the software’s cataloging and indexing capabilities. Note that NetStream and Nightshift can’t restore directly to a client Mac across the network. To test these two packages, we restored to an AppleShare server mounted on the backup server’s desktop.

Figure 2: When backing up over the network with the MacBack Client application, users have complete control over file selection and backup scheduling — although the MacBack Server application must also be running on the backup server. Fortunately, MacBack runs under MultiFinder, so the MacBack Server application can always be running in the background.

<table>
<thead>
<tr>
<th>Incremental Backup</th>
<th>Complete Restore</th>
<th>Incremental Restore</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Better</strong></td>
<td><strong>Worse</strong></td>
<td><strong>Better</strong></td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
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<td>6</td>
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<td>40</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>50</td>
</tr>
</tbody>
</table>

**Incremental Backup:**
After editing a series of files, we performed a series of incremental backups — setting the backup software to back up just those files that had changed. Incremental backups can be added to a DAT cassette only after a complete backup — only then can the software know which files have been changed.

**Complete Restore:**
Restoring an entire hard disk is easy with Retrospect Remote and NetStream — both keep track of file versions for the complete backup and all subsequent incremental backups on the tape. With QTShare and MacBack, you must first restore the complete backup and then repeat the process by manually selecting the files from incremental backups — in our case, three separate versions. It’s up to you to restore the incremental backups in the right order — if you don’t, you’ll overwrite a newer version of a file with an older version.

**Incremental Restore:**
We timed how long it took to restore a file from an incremental-backup session. Finding a single file on a tape taxes the software’s cataloging and indexing capabilities. Note that NetStream and Nightshift can’t restore directly to a client Mac across the network. To test these two packages, we restored to an AppleShare server mounted on the backup server’s desktop.
Network-Backup Software

Four Backup Rules

Using unattended network-backup software is fast and easy, but without systematically applied procedures, it's hardly foolproof. We recommend that you abide by the following four basic rules, regardless of which network-backup package you pick:

1. **Establish a regular backup routine.** Inform all network users of their respective role in the process — and stick to the schedule. This rule sounds simple, but it's often overlooked. Only regular, frequent backups will give your network the protection it needs.

2. **Establish a generational backup system.** Backing up onto a series of alternating tapes has long been part of backup systems in the mainframe and minicomputer world. The generational backup system, also called the grandparent/parent/child rotation scheme, is one such plan that is easy to follow and ensures that three versions of your data safely live on tape. Here’s how it works: Say you decide you want a weekly full backup of your ten-Mac network. At the end of week 1, make a complete backup, using a fresh new DAT cassette; label the cassette; and place it in the proverbial clean, dry place — preferably a cement-lined or otherwise fireproof file drawer. At the end of week 2, make another complete backup, also using a clean fresh DAT cassette. And likewise for week 3. These three tapes represent three generations of your network's data and can be thought of as grandparent, parent, and child.

At the end of week 4, get out the oldest backup DAT cassette — the grandparent — and use that tape for your backup. Do the same each succeeding week, taking the oldest backup cassette and using it for the current week. Perform more-frequent incremental backups in a similar fashion.

3. **Store a second copy off-site.** Plan for potential catastrophic physical disasters. Think Biblical: fire, flood, earthquake. Taking a second copy of your backups off-site is added protection. If you must keep the second copy on-site, be sure to keep it in a locked, cement-lined file drawer or vault for safekeeping.

And speaking of Biblical catastrophes, let's not forget the plague — your data's mortality rate can rise quickly when under siege from a computer virus. Keep an eye out for symptoms of infection, and have a copy of Disinfectant at the ready.

Incidentally, Retrospect Remote lets you automatically make that second copy at the same time you make the first, so there's really no reason for not doing so if you're using that software.

4. **Archive dormant files.** Make a list of files that are at the core of your business or that you need to keep track of for audit purposes. For example, say you are a tax accountant with monthly clients and annual tax clients. When tax season is over, you can archive the annual client data — that is, back up just the files relating to annual clients and remove those files from your hard disks and file servers. Such archives should be well labeled and cross-referenced to a paper index. When the IRS comes calling, you'll be able to find all 1989 supporting schedules for Ralph's PC Consulting Business, restore the files, and confidently face the auditor — although your client may try to hide in your cement-lined file drawer.

— Kelli Wiseth

To test network-backup speed, we created a three-Mac network — a client, a backup server, and an AppleShare file server — in the MacUser NetworkShop. Our client Mac contained 30 megabytes of files tucked into folders, to represent a typical Mac hard-disk drive. We timed a complete backup and then modified a series of three files, performing an incremental backup in each instance. We also timed how long each package took to restore a single file and to restore the complete backup. Speed differences among the software packages point out, among other things, how well — or how poorly — the software's scatalog system works (how well the software keeps track of all the files on the tape).

But speed isn't the only factor to consider when you choose software. We also evaluated how easy each application is to install and use; odds are pretty good that if it's a pain to use the software, the backup chore won't get done. And we looked at advanced features such as password protection, scripting capabilities, and other tools that help manage network data. Retrospect Remote, for example, lets you archive files — define and remove dormant, or inactive, files from the source in a single step after backing up to tape for permanent storage (see the "Four Backup Rules" sidebar).

Quick and Easy Setup

Any Mac on your network, except for an AppleShare server, can provide backup service for your network. Typically, network administrators assume the role of backup administrator and use their own Mac as the backup server. Simply plug the DAT drive into the Mac's SCSI port, and drag the backup-server software onto the hard disk. Next, install the client version of the backup software onto each Mac on the network you want to back up.

Client software usually consists only of the ADSP (Apple Data Stream Protocol) INIT and other INITs or control panels (see the "ADSP and System

looked at ADIC's MacBack 2.0, PCPC's NetStream 2.0.4, TTI's Nightshift 1.5, Tecmar's QTBackup with QTSparse Share 1.0, and Dantz's Retrospect Remote 1.2. Except for Retrospect Remote, these network-backup applications were designed by DAT-drive vendors to work with their hardware. Prices, including the drives, range from $2,995 to $5,393. Retrospect Remote ($449 for ten clients) is software that works with a variety of storage media and is bundled with hardware from several vendors. Dantz recommended EMAC's Metro DAT/Retrospect Remote bundle for our tests, because the Metro DAT is representative of many DAT drives sold without vendor-developed backup software.
work together to create a connection between the two that ensures reliable data transfer. Through this connection, the contents of the client hard disk “stream” to the backup server — and hence to the DAT drive connected to the backup-server Mac.

But that data won’t stream anywhere if you don’t finish setting up the software. For example, the MacBack Server application uses the Nightshift Client into each client’s System Folder, and reboot. Installing QTShare is also simple — you just copy the QTShare INIT/control panel, along with ADSP, into the System Folder of each client Mac and the backup-server Mac. In addition, the backup-server Mac needs a copy of the QTBackup application.

Retrospect Remote’s installation is a bit more time-consuming, because of copy protection: After copying the Remote INIT and ADSP to each client Mac’s System Folder, the backup administrator must enter a code (from the Remote Activator Code List, which comes with Retrospect Remote) on the backup server for each client Mac. The backup administrator can also enter a password for each user.

With the software installed, nodes named, activator codes entered, and passwords established, you’re ready to back up some networked Macs.

**Freedom of Choice**

Although these network-backup applications all rely on a central Mac as backup server — and a person, the backup administrator, to manage the MacBack Server application to enter the Chooser names of all users so they can access the backup server. With NetStream, not only must the administrator name the backup server but all users must also name their machines — a step that could have been avoided had PCPC chosen to use each Mac’s Chooser name for identification.

On the other hand, setting up Nightshift is a snap. Simply copy ADSP and Nightshift Client into each client’s System Folder, and reboot. Installing QTShare is also simple — you just

---

**ADSP and System 7.0**

Part of the setup process for most of the network-backup products we tested includes copying ADSP (AppleTalk Data Stream Protocol) into the System Folder of the backup-server and client Macs.

Why?

ADSP is the newest member of the AppleTalk family of network protocols from Apple. It provides a standard method for transferring large volumes of information over an AppleTalk network by creating an “information pipe” between two Macs. This pipe ensures more-reliable data delivery — so it’s natural that most network-backup software uses ADSP to send data between a client and a backup-server Mac.

ADSP is now built into System 7.0, but in the old days — such as when we tested the network-backup software for this report — the ADSP INIT had to be dropped into System Folders of all Macs. Only NetStream doesn’t use ADSP for network communication, but that’s about to change too.

— Stephan Somogyi
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process—the amount of participation required by users and backup administrator at backup time varies among the applications (see the “How It Works: Network Backup” sidebar).

If you’re a network administrator responsible for the integrity of network data—and possibly maintaining an electronic audit trail—you should choose backup software that gives you maximum control over the backup, archiving, and retrieval of that data. On the other hand, if users are responsible for their own backup, a client-directed approach may work better.

MacBack, for example, leaves the bulk of backup tasks to network clients (see Figure 2). Users log on to the backup server, select files, and schedule a backup time. Unfortunately, such a scheme is inconvenient to use during business hours—if a user wants to back up a 5- or 10-megabyte 24-bit-color graphics file before going to lunch, the backup administrator must launch the application on the backup-server Mac before backup can occur. Although the backup administrator can schedule a backup for a particular user, that client Mac won’t find out until its user logs on to the server. And on top of the inconvenience of tying up both Macs—and both user and administrator—MacBack doesn’t let you get back to your regular work very quickly. Even over EtherTalk, MacBack took almost 14 minutes to back up our 30-megabyte test folder (see Figure 1).

Backup with NetStream is a 50-50 proposition, with users and backup administrator alike having specific roles in the backup process. NetStream clients create an RBS (Remote Backup Set)—a list of the files and volumes to be backed up—and the backup administrator creates a schedule for scooping up these RBSs over the network (see Figure 3). Unfortunately, there’s no way to back up immediately: Both backup-server Mac and client Mac must not be running any application—including their respective NetStream applications—for backup to occur. When the scheduled time arrives, both client and
backup server must be in the Finder; only then do the User and Administrator versions of the software automatically launch. The backup then runs its course, and both applications automatically quit. NetStream was clearly designed to be used overnight — set everything up, and then walk away.

Such a scheme might sound OK in theory, but you need a lot more flexibility in an active network environment than you get with the current version of NetStream — you may want to back up on the spot, for example, rather than at some time in the future. In addition, the documentation and the interface are confusing and there are many ways to stray in the program and do things wrong — and the software doesn’t prompt or otherwise warn you. For example, we created an RBS on our client but had neglected to name that Mac during the NetStream setup. NetStream doesn’t use the Chooser name, so when we tried to schedule backup of that RBS, our backup server couldn’t find our nameless client — alas, our RBS was for nought. And not only was NetStream the most difficult to set up and use but it was also the slowest overall — even over EtherTalk, backing up 30 megabytes’ worth of files took close to 20 minutes.

By the time you read this, however, PCPC will be shipping a completely revamped version of NetStream that should be faster, have more features, and sport an improved interface (see the “On the Horizon” sidebar).

Backing up with Nightshift is an exceptionally simple affair, initiated and controlled only by the backup administrator. The Nightshift application searches the network for all Nightshift client Macs and displays a scrollable list from which to select volumes to back up (see Figure 4).

But there’s a price for such simplicity: Nightshift is the most limited of the five programs we tested. You can choose between a complete backup and an incremental backup, and although you can choose to exclude applications from the backup, you can’t selectively back up a particular file...
Network-Backup Software

Find — and Restore — Files Fast

Once you've gotten your files selected and calendars or scripts established, your backup process becomes type, such as all Excel worksheets or all TIFF files, as you can with Retrospect Remote and QTBackup.

On the other hand, Nightshift is a speed demon — it took a little more than 6 minutes to completely back up 30 megabytes — less than half the time of NetStream, MacBack, and QTBackup.

QTShare and Retrospect Remote also place the burden of network backup on the backup administrator. A QTShare backup session is executed from the backup server; QTBackup lets you create a script that specifies which client volumes and files you want to back up. The scripting process simply records your selections to a file you can name and modify: You don't need to know any scripting language.

QTBackup's appropriately named PowerTag feature (see Figure 5) lets you make sophisticated file selections — such as backing up all files created by Excel after January 1, 1990. You can also schedule scripts to run at a specific date and time. At the scheduled time, the QTBackup application automatically launches on the backup-server Mac and executes the script; the client doesn't have to do anything.

Retrospect Remote (see Figure 6) also has many sophisticated file-selection and scripting features. As you select the drives and files to back up, Retrospect Remote saves your steps in a default script called Backup. The next time you begin a backup session, your settings will already be selected — although you can modify them if you wish. Retrospect Remote also lets you create and name other scripts, so you can build a library of sophisticated backup procedures. You can use Retrospect Remote's Calendar feature to completely automate backup. As long as the client Mac and backup-server Mac are on, the Auto Launch feature will start Retrospect Remote and perform the backup.

As we wrapped up our testing, Apple pulled the wraps off System 7.0. And following quickly on the heels of this release came upgrades to most of the packages we've tested.

Dantz began shipping a System 7.0-compatible version of Retrospect Remote in April. All registered Retrospect Remote users can upgrade to version 1.3 for free. And with an eye toward the future, when compression will enable even more data to be jammed onto tape, Dantz has increased the upper limit of an archive — a cataloged series of backup sessions — from 2 gigabytes to a whopping 1 terabyte — 1,000 gigabytes (although the hardware to support such capacity doesn't exist). Dantz Development Corp., 1400 Shattuck Avenue, Suite 1, Berkeley, CA 94709; (415) 849-0293.

Nightshift should also be shipping a System 7.0-compatible version — QTBackup 3.0 ($149) and QTShare 1.1 ($249/unlimited users) — by the time you read this. QTShare is an INIT/control panel that lets QTBackup work with clients over a network. Dantz's software is compatible with its complete line of tape and optical drives. QTBackup also supports backup of Novell NetWare 2.15 (and later) file servers and maintains the file-server security features. Dantz Development Corp., 1400 Shattuck Avenue, Suite 1, Berkeley, CA 94709; (415) 849-0293.

PCPC, 4710 Eisenhower Blvd., Building A-4, Tampa, FL 33634; (813) 884-3092.

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PCPC, 4710 Eisenhower Blvd., Building A-4, Tampa, FL 33634; (813) 884-3092.

Nightshift will soon be sold separately ($495/unlimited users). Nightshift works with TT's complete line of 4-millimeter and 8-millimeter tape drives; this unbundling will let drives from other vendors take advantage of its speed. TT, 6225 Cochran Road, Solon, OH 44139; (216) 349-0600.

TITNightshift will soon be sold separately ($495/unlimited users). Nightshift works with TT's complete line of 4-millimeter and 8-millimeter tape drives; this unbundling will let drives from other vendors take advantage of its speed. TT, 6225 Cochran Road, Solon, OH 44139; (216) 349-0600.

Darryl Chan

On the Horizon

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— Darryl Chan

Figure 5: QTBackup's PowerTag feature gives you a host of file-selection options, including selecting for a particular text string. Each Tag Set can be saved and scheduled to occur regularly, if desired.

Figure 6: Retrospect Remote gives the network-backup administrator complete control over file selection. All your selections are stored in the default Backup script, which you can edit, copy, rename — or simply use again by choosing Backup from the Action menu.
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Mirroring is a registered trademark of Apple Computer.

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Table 1 Criteria

<table>
<thead>
<tr>
<th>Software (list/price)</th>
<th>The list price is the manufacturer's suggested retail price. The street price is an average actual price charged by dealers around the U.S. in April 1991.</th>
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<tr>
<td>Software/hardware bundle (list/price)</td>
<td>The list price is the suggested retail price for the package, including software, as bundled by the hardware vendor. The street price is an average actual price charged by dealers around the U.S. in April 1991.</td>
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<tr>
<td>DAT drive tested</td>
<td>The model of DAT drive bundled with the software.</td>
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<tr>
<td>Other devices supported</td>
<td>Other kinds of storage hardware with which the software can be used.</td>
</tr>
<tr>
<td>Client application</td>
<td>The name of the software application or INIT installed on the client Mac.</td>
</tr>
<tr>
<td>Backup server application</td>
<td>The name and version number of the application tested.</td>
</tr>
<tr>
<td>Network transport INIT</td>
<td>What INIT does the application rely on for assured data delivery?</td>
</tr>
<tr>
<td>Archive</td>
<td>Does the software have an option for removing files from the source after backing up for permanent storage?</td>
</tr>
<tr>
<td>Auto-launch</td>
<td>Can the application launch on its own when a backup is scheduled to occur?</td>
</tr>
<tr>
<td>Auto-shutdown</td>
<td>Can the backup application shut down on its own when the backup has been completed?</td>
</tr>
<tr>
<td>Back up client floppy</td>
<td>Can diskette and other volumes mounted on the client desktop be backed up?</td>
</tr>
<tr>
<td>Client cancell backup</td>
<td>Can the client cancel the backup?</td>
</tr>
<tr>
<td>Client-controlled scheduling</td>
<td>Can the client set the backup schedule?</td>
</tr>
<tr>
<td>Excludable files</td>
<td>Can clients place a special character in front of filenames to prevent backup of certain files?</td>
</tr>
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<td>Parent password</td>
<td>Is access to a client's backup files password-protected?</td>
</tr>
<tr>
<td>Selectable files</td>
<td>Can the client select files for backup?</td>
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<td>Cumulative-log file</td>
<td>Is all backup history stored in one convenient log file?</td>
</tr>
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<td>Daily-log file</td>
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<tr>
<td>Encrypted backup</td>
<td>Does the backup have password protection?</td>
</tr>
<tr>
<td>File compression</td>
<td>Does the software provide file compression, which can double the storage capacity from 1.3 gigabytes to 2.6 gigabytes per DAT cassette?</td>
</tr>
<tr>
<td>Network data encryption</td>
<td>Is data encoded as it travels across a network?</td>
</tr>
<tr>
<td>Restore to AppleShare volume</td>
<td>Can files be restored to the AppleShare file server?</td>
</tr>
<tr>
<td>Restore to client over network</td>
<td>Can files be restored directly to the client Mac from which they originated?</td>
</tr>
<tr>
<td>Scheduled backups</td>
<td>Does the software let you schedule backups for unattended times in the future?</td>
</tr>
<tr>
<td>Scripting</td>
<td>Can you create automated routines for various kinds of backups?</td>
</tr>
<tr>
<td>Server password</td>
<td>Is access to the backup-server application password-protected?</td>
</tr>
<tr>
<td>Write-verify</td>
<td>Does the backup-server application confirm that data has been correctly written to the tape?</td>
</tr>
</tbody>
</table>

pretty routine. The excitement begins when you need to restore.

The dreaded moment has arrived: You need to recover a single file or the contents of an entire hard disk because of mechanical failure, virus, or other calamity. Are you going to have a stroke — or a stroke of luck? MacBack, Retrospect Remote, and QTBackup provide the most immediate relief to a panicked client, because they let you pick and choose files from the backup server and bring them right back to a client hard disk over the network. NetStream and Nightshift, on the other hand, can restore only locally — to the Mac that has the DAT connected to it.

Restoring files with MacBack can be a hassle, because it requires some coordination between the backup administrator and the client. Both Macs need to be running their respective applications, but the client retrieves the files from the tape loaded at the backup server. Such a scheme is good for workgroups in which users are responsible for their own files. However, you also need some time: MacBack was the slowest overall in both our complete- and incremental-restore tests.

Unfortunately, you can't restore files to a client Mac over the network with either NetStream or Nightshift. Both applications can, however, restore to a volume — such as an AppleShare file server — mounted on the backup server's desktop. You then have to copy the files from the AppleShare server to the client — all in all, not the slickest implementation.

Despite this limitation, Nightshift was the fastest in the incremental-restore tests, taking about 30 seconds to restore a 1-megabyte file. Nightshift was able to completely restore all 30 megabytes of our test files in a little more than 11 minutes. If network users back up their files each day to an AppleShare file server, then you may not even need to back up — or restore — to clients at all, and Nightshift's inability to do either may not be a problem.

Restoring files with QTBackup across a network requires coordination between client and backup administrator. Unlike with MacBack, which lets the client select the files to retrieve, the backup administrator uses QTBackup at the backup server to select files and send them back across the network to a QTShare client. This scheme works well for backup administrators who have complete control over a workgroup's data.

Likewise, Retrospect Remote can put files back onto a client's hard disk across the network quickly and easily. Retrospect Remote's sophisticated cataloging system keeps track of all versions of all files you've backed up. When you specify a file to restore by name, Retrospect Remote prompts you with the name of the DAT cassette that holds the most recent version of that file.

AppleShare-Server Backup

Backing up AppleShare file servers poses special problems, because of the security measures built in to the AppleShare file-server system. AppleShare users must be registered on the server, given a password, and placed in one or more user groups; to access the file server, users log on to the server with their user name and password. AppleShare keeps track of this information in a password-protected Users & Groups file, and the
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The Bottom Line

Network-backup software automates the monumental task of backing up all the files on a network. It should be easy to use and fast, and retrieving important files should be just a few mouse clicks away. If you’re looking for a fast backup system that can help you effectively manage the backup process, we recommend Retrospect Remote 1.2 ($449/ten clients), from Dantz. It provides many powerful file-selection features, supports a wide variety of media — DAT cassettes, diskettes, SyQuest cartridges, WORM discs, hard disks, and tape cassettes — and quickly restores the files you need, over the network. Retrospect Remote has some features that aren’t available in other packages, such as the ability to make backups on two different media during the same backup session. It also provides password-protection, encryption, and scripting capabilities.

If you don’t need sophisticated file selection, try TTI’s Nightshift 1.5 ($495). It’s fast, but it doesn’t provide as many features as the other packages. It lets you do full or incremental backups and you can select certain file types not to back up, but you can’t select just a particular group of files to back up and you can’t restore over the network to a client. But Nightshift is a speed demon, and it’s exceptionally easy to use — you can digest the entire manual in less than an hour.

Ideally, we’d like to see Nightshift’s ease of use combined with Retrospect Remote’s powerful feature set. Now that would be worth writing about — maybe in the middle of the night, while you’re backing up.

Our top network-backup picks: Dantz’s Retrospect Remote 1.2 (right) is a full-featured time-saver, whereas TTI’s Nightshift 1.5 (left) is lean and mean.
You can't afford to have your data turn up missing, so get Fastback II.

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Back up your data before it's too late!
## Table 1: Features of Network-Backup Software

<table>
<thead>
<tr>
<th>Features</th>
<th>MacBack 2.0</th>
<th>NetStream 2.0.4</th>
<th>Nightshift 1.5</th>
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<td>Archive</td>
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<td>Client-controlled scheduling</td>
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<td>Server password</td>
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</tr>
<tr>
<td>Write-verify</td>
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<table>
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<tr>
<th>Price</th>
<th>Network-Backup Software (list/street)</th>
<th>MacBack 2.0</th>
<th>NetStream 2.0.4</th>
<th>Nightshift 1.5</th>
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<tr>
<td></td>
<td>Software/hardware bundle (list/street)</td>
<td>NA</td>
<td>$499 (10 clients)/NA</td>
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<td>$4,995/$3,745</td>
<td>$3,479</td>
<td>$2,995/NA</td>
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</table>

**Pros**
- Can restore to clients over the network. Client-controlled file selection.
- Good file-selection features for restore.
- Second-fastest. Easiest to install and use.

**Cons**
- Requires both client and backup-server applications to be running. Slow.
- Clumsy interface. Cannot restore directly to clients over the network.
- Limited file selection for backup. No scripting.

**Hardware**
- DAT drive tested: ADIC MacBack DAT
- Other devices supported: Various tape drives

**Software**
- Client application: MacBack Client 2.0
- Backup-server application: MacBack Server 2.2

**Network transport INIT**
- ADSP
- Master INIT, User INIT

**Company**
- Advanced Digital Information Corp.
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  Redmond, WA 98052
  (206) 881-8004
- PCPC
  4710 Eisenhower Blvd.
  Bldg. A-4
  Tampa, FL 33634
  (813) 884-3092
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Table 1: Features of Network-Backup Software, continued

<table>
<thead>
<tr>
<th>Feature</th>
<th>QTBbackup with QTSshare 1.0</th>
<th>Retrospect Remote 1.2</th>
</tr>
</thead>
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<td>Price</td>
<td>QTSshare, $249/$195 (10 clients)*</td>
<td>$449/$280 (10 clients)</td>
</tr>
<tr>
<td></td>
<td>$5,393/$4,050</td>
<td>$2,995/$1,965</td>
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<tr>
<td>Pros</td>
<td>Excellent documentation. Powerful scripting. Moderately easy to use.</td>
<td>Overall fastest. Restores files quickly to clients over the network.</td>
</tr>
<tr>
<td>Cons</td>
<td>Slow. Doesn't automatically restore incremental backups in correct order.</td>
<td>Must register all users. Confusing documentation.</td>
</tr>
<tr>
<td>Hardware</td>
<td>Tecmar DATaVault</td>
<td>EMAC Metro DAT</td>
</tr>
<tr>
<td>Other devices supported</td>
<td>all Tecmar tape drives</td>
<td>cartridge, tape, hard drive, WORM</td>
</tr>
<tr>
<td>Software</td>
<td>QTSshare 1.0</td>
<td>Remote INIT</td>
</tr>
<tr>
<td>Client application</td>
<td>QTBBackup 2.04</td>
<td>Retrospect INIT</td>
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<tr>
<td>Backup-server application</td>
<td>ADSP</td>
<td>ADSP</td>
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<tr>
<td>Network transport INIT</td>
<td>ADSP</td>
<td>ADSP</td>
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<td>Features</td>
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<td>Auto-launch</td>
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<td>Auto-shutdown</td>
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<td>Back up client floppies</td>
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<td>Client cancel backup</td>
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<td>Client-controlled scheduling</td>
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<td>Client-excludable files</td>
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<td>Client-selectable files</td>
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<td>Cumulative-log file</td>
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<td>Network data encryption</td>
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<td>Restore to AppleShare volume</td>
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<td>Restore to client over network</td>
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<td>Write-verify</td>
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<tr>
<td>Company</td>
<td>Tecmar</td>
<td>Dantz Development Corp.</td>
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<tr>
<td></td>
<td>6225 Cochran Rd.</td>
<td>1400 Shattuck Ave., Ste. 1</td>
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<td></td>
<td>Solon, OH 44139</td>
<td>Berkeley, CA 94709</td>
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<tr>
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<td>(216) 349-0600</td>
<td>(415) 849-0293</td>
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*Also requires parent application, QTBbackup ($149/$116).

1Bundle available from EMAC, 49431 Milmont Drive, Fremont, CA 94538; (800) 821-0806, ext. 2222.
THE QUICKOR LABS STORY

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How to Master 20 Popular Macintosh Programs Without Ever Reading The Manuals

Macintosh Programs Can Be Learned in a Few Hours With the Right Training

Over the past four years I've been associated with over 50,000 people attempting to learn the Macintosh computer. I've watched as each person wages their own personal, private battle to master the computer and the most popular Macintosh programs.

I've seen their frustration, have empathized with their confusion, and understood their computer fears. I've talked to workers who have had new computers and new programs simply dropped on their desk with the directive to, "learn this." I've listened to people who have struggled night after night trying to read and understand a computer manual. Can you imagine trying to understand and master 4th Dimension from the manual?

You would be surprised at the number of people who have confided with me the fact that they've given up trying to learn some of the programs. They put the box on the shelf and write the expenditure off as a bad investment.

Hard Earned Money Wasted
Can you imagine how much money has been wasted on programs and computers that are sitting abandoned? Right now think of the people working on Macs in your office. Do they really understand the computer? Do they know what to do when it goes down? How many programs are each of your people using? Have they really mastered the programs they're using? Do they know the short-cuts and valuable techniques that will save you time, money, and increase your professionalism?

An Excellent, Low Cost Training Answer
Four years ago I founded MacAcademy. My purpose was to create a training organization that provided training similar in nature to the Macintosh itself - simple, easy to use, and effective.

Now, four years later the concept has proven to be a great success. Right now people are benefiting from MacAcademy training in over 100 cities in the U.S., in Canada, Great Britain, Australia, Japan, Hong Kong, and 22 additional countries throughout the world.

MacAcademy training is successful for one reason - it works!

The Video Answer
Two years ago we introduced the MacAcademy Video Training Library. This library now includes over 45 different titles. Each video is 2 hours long and offers clear, concise, effective training for the Macintosh and over 20 popular programs. In many cases you can purchase up to 6 hours of training for one program.

MacAcademy has resisted the temptation to follow competitive training programs who have recently implemented large price increases. Our videos started out at $49 each and are still only $49. The best training in the business for less than $50. This low cost training alternative has proven to be the Macintosh training choice of over 10,000 companies.

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The MacAcademy reputation is excellent. Our guarantee is simple: If you're not happy we'll give your money back. No hassles or problems.

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Here is a current list of MacAcademy Video training tapes now available. To order, simply send check, credit card information, or purchase order to MacAcademy Videos Dept. MU791 477 S. Nova Rd. Ormond Beach, FL 32174 or call the numbers listed below. Now is the time to start training. Thank you for allowing MacAcademy to help you in that effort.

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A HyperCard stack of the entire MiniFinder database is usually available on Zmac, our CompuServe on-line service. You can also obtain the full-length product reviews from the back-issue libraries of Zmac.

Product prices, hardware specifications, software features, and vendor addresses change quickly. To update the MiniFinders database of reviewed products, send written notification to MiniFinders, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

COMMUNICATIONS

AlisaTalk can be downloaded from CompuServe. It is a complete talk program that lets you have conversations in real-time, to the speed of modem links. Requires System 6.0.3 or later. The price is $39.95, with a one-time $6.00 fee for purchasing the program. AlisaTalk is available for Mac users with 80386 processors and compatibility with Apple's TalkTalk or TalkTalk, TTYTalk, Apple Talk, and Internet-based communications programs.

MacTopS Network Bundle

MacTopS is file-server software designed for use with client-server computer platforms. Slow and expensive for large networks but supports communication with DOS compatible and UNIX machines. Files and subdirectories are accessed transparently as if they are Mac folders. MacTopS handles file transfer between platforms. Print spooling and InBox E-mail software are bundled. MacTopS requires System 7 or later, no site license available. Apple Software Licensing, 20525 Marianna Ave., Cupertino, CA 95014. (800) 974-4667. (Oct '88)

NetWare for Macintosh

NetWare for Macintosh lets Mac users connect to NetWare servers. It is a full-featured product that allows Mac users to access file systems on other platforms, provides file and printer sharing, and supports remote login and printing. Requires System 7.5 or later. The price is $299 per node, with no site license available. Apple Software Licensing, 20525 Marianna Ave., Cupertino, CA 95014. (800) 974-4667. (Oct '88)

MacWorkStation

MacWorkStation is a development environment for Mac users. It provides a comprehensive suite of tools for creating and editing documents, spreadsheets, and presentations. Requires System 6.0.3 or later. The price is $1,995, with a $2,000 price for version 2.0. Apple Software Licensing, 20525 Marianna Ave., Cupertino, CA 95014. (800) 974-4667. (Oct '88)

MacLinkPlus/Translator

MacLinkPlus/Translator offers a translation capability between Mac and PC applications. Requires System 6.0.3 or later. The price is $195, with a $199 version. Apple Software Licensing, 20525 Marianna Ave., Cupertino, CA 95014. (800) 974-4667. (Sept '90)

Oracle for Macintosh

Oracle for Macintosh is a database management system designed for use with Macintosh computers. Requires System 7.5 or later. The price is $1,995, with version 2.0 free with license agreements. Requires MacPlus or later. Oracle Corp., 2680B Corp. Blvd., Redwood City, CA 94065. (800) 526-5463 or (800) 453-1267. (June '91)

PacerShare 4: A file server for networked Macs, PacerShare is the fastest VAX server we tested. Extends functionality at a high price. Maximum simultaneous users: 250. Supports Ethernet but not LocalTalk. Requires VAX, 10 users, $2,100; 20 users, $3,750. PacerShare, 9540 South Bell Ave., Ste. 402, La Jolla, CA 92037. (619) 454-0565. (June '91)

Pathwork for Macintosh: Pathworks, a file server for networked Macs, provides self-installng, extensive VAX connectivity. Slow for AFP file sharing and crashed when 20 clients were connected, but the number of simultaneous users is theoretically unlimited. Bundled with Mail for Macintosh, MacTerminal 3.0, and MacTCP, Supports Ethernet but not LocalTalk. Can't be administered from a Mac. Requires VAX. $295 per user. Digital Equipment Corp., 146 Main St., Maynard, MA 01754. (508)493-5111. (June '91)

pcMACETERM 2: pcMACETERM 2 lets your Mac take full advantage of your VAX from the Mac keyboard. Allows DOS files to be printed through the Mac. Version 1.1 reviewed. Version 3.1 shipping. Requires Mac Plus or later with System 6.0.3 or later and printer, IBM PC or later, and DOS 2.0 or later with at least 256K of RAM. $179 for pcMACETERM 2 and $395 for pcMACETERM/Network. Dynamic Microprocessor Associates (DMA), 176 E. Jericho Turnpike, Huntington, NY 11743. (516) 462-4040. (Jan '89)

QuickShare 2: QuickShare 2 (formerly sold by Compatibile Systems) connects your Mac to a PC via SCSI, enabling the Mac to access files on a PC or a network. File-transfer speeds are adequate for general and graphical translation. Version 2.0 reviewed. Requires DOS 3.0 or later, $695. SeeColor Corp., 34004 16th Ave. S., Federal Way, WA 98003. (206) 874-9080. (Oct '89)

SeqeLink 4: An API (application-programming interface), SeqeLink provides a faster alternative to Apple's DAL but is difficult to use. Server using SeqeLink-supported systems include VAX/VMS and SCO UNIX/XENIX. Supported database-managed systems include Ingres, Oracle, Rdb/VMS, Sybase, and Interbase. Client operating systems supported include the Mac OS, Windows 3.0, OS/2, and Windows NT. For use, $695; servers, $4,950. Pentacross, Inc., One Perkins Way, 621 N.W. 53rd St., #340, Boca Raton, FL 33437. (800) 275-7565 or (407) 997-6687. (Jan '91)

Software Bridge for the Macintosh: Software Bridge is a collection of file translators for PC-to-Mac file conversion. Used with the AFE program, Software Bridge provides translators for three Mac word-processing formats (Word, WordPerfect, and MacWrite) and more than 20 DOS formats. It has no translation options for graphics and spreadsheet files. Mac version does a good job of converting PC text files while retaining the original formatting. Version 1.0 reviewed. Mac Plus or later. $129. Systems Compatibility, Inc., 401 N. Wahash, Ste. 600, Chicago, IL 60611. (312) 329-0700. (Mar '91)

SQL/Net for Macintosh: Benchmark is an API (application-programming interface) for client/server database access. Server operating systems include VAX/VMS and VMS as well as VAX/VMS, UNIX, and OS/2. Intended for use with Oracle databases but offers support for DB2, SQL/DS, and RMA via SQL/Connect gateway. SQL/Net handles most networking protocols and client operating systems. Version 1.2 shipping. $299 per user. Oracle database for Mac, $695; servers, $920 – $13,000. Oracle Corp., 500 Oracle Pkwy., Redwood Shores, CA 94065. (650) 345-1239 or (415) 306-7000. (Jan '91)

StarGROUP Server for Macintosh: StarGROUP Server, a file server for networked Macs, provides file sharing for Mac, DOS, and UNIX clients. Slow for AFP file sharing and cannot administer from Mac. Maximum number of simultaneous users is 120. Requires 80386-based PC and StarGROUP LAN Manager software. 8 users, $795; unlimited users, $1,295. AT&T Computer Systems, 100 State St., Morristown, NJ 07960. (800) 247-1212. (June '91)

SunTOPS: SunTOPS is file-server software designed to work with the Sun SPARCStation with Macs using MacTCP and with DOS machines using DOSXTOPS. Slow and expensive for larger networks. Supports Ethernet/AppleTalk but not LocalTalk. Can handle an unlimited number of simultaneous users. Requires Sun SPARCStation. On floppy, $1,295; on tape, $1,395. Stikta Corp. (formerly TOPS), 930 Marina Village Pkwy., Alameda, CA 94501. (800) 443-5677 or (415) 769-9660. (June '91)

Networking

3Com EtherLink/SE: This EtherLink/SE offers a very fast SE client, server, and raw file sharing performance but is cellar raw performance among SCS1 adapters. Easy to use. Requires Mac SE or later. $495. 3Com, 6165 Kifer Rd., Santa Clara, CA 95052. (408) 638-3266 or (408) 562-6400. (Jun '90)

Adaptec Dodom: This Ethernet interface has poor file transfer performance but excellent raw performance among SCS1 adapters. Easy to use. Requires Mac SE or later. $495. Adaptec, 691 Milpitas Blvd., Milpitas, CA 95035. (408) 945-2518. (Jun '90)

Apple EtherTalk NB Card: Pricky, but excellent in file transfer tests. Requires Mac SE. Good raw performance. Requires Mac SE. $595. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (408) 776-2333 or (408) 996-1010. (Apr '91)

AppleShare: AppleShare is file-server software from Apple. Fast and easy to configure and administer. Let's network users protect files from other users at the folder level. No support for VAX clients. Maximum number of simultaneous users is 50. Allows setup and administration from Mac, choice of LocalTalk or Ethernet connection, and AppleShare/PC support. Version 2.0 shipping. Requires a dedicated Mac and a hard disk drive. $799; AppleShare Print Server 2.0, $299; Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (408) 776-2333 or (408) 996-1010. (June '91)

AppleTalk Internet Router: This software router is the fastest we tested. Can create a large internet with EtherTalk and TokenTalk. Doesn't support dial-up connections. Available for AppleTalk Phase 2, mixed Phase 1 and Phase 2, and token-ring networks. Cabling can be thick coaxial, thin coaxial, or twisted-pair. Design depends heavily on locating a knowledgeable, cooperative, authorized Apple dealer. Version 2.0 reviewed. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Apr '91)

Apt Communications

ComTalk: This EtherTalk/LocalTalk router is a speed demon, available in the widest variety of configurations and prices. APT Communications, 9607 Dr. Perry Rd., Ijamsville, MD 21754. (301) 831-182. (Apr '91)

Asante MacCon+ SEE: This Ethernet device in an SEE/30 is a very fast AppleTalk Phase 1 server. Fast raw performance. Requires Mac SE/30. $379. Asante Technologies, Inc., 404 Tasman Dr., Sunnyvale, CA 94089. (800) 662-9868 or (408) 752-8388. (Jun '90)

Asante MacCon+ SEE: This inexpensive Ethernet device provides very good performance as an SE client. Requires Mac SE. $379. Asante Technologies, Inc., 404 Tasman Dr., Sunnyvale, CA 94089. (800) 662-9868 or (408) 752-8388. (Jun '90)

Asante MacCon+ SEE: This inexpensive Ethernet device provides very good performance and a competitive price. Skimpy manual, not for novices. Requires NuBus-capable Mac. $379. Asante Technologies, Inc., 404 Tasman Dr., Sunnyvale, CA 94089. (800) 662-9868 or (408) 752-8388. (Jun '90)

Aspects: Winner of our 1990 Editors' Choice Award for best工作组 product, Aspects is the first real "groupware" product for the Mac. As with allusion databases, Aspects provides several users with simultaneous access to multiple documents (limited by available RAM). Word-processing, drawing, and spreadsheet work is supported, but there are no database or spreadsheet modes, outline, or color support. Operates on LocalTalk, or in many cases, on networked workstations such as AppleTalk, or can use 2,400-bps modems. Version 1.0 reviewed. Per user, $299; 5 users, $500.
FlashLink II

This NuBus card has average performance. Good software. Requires NuBus-capable Mac, $494. EMC (Everex Systems), 48431 Milford Dr., Fremont, CA 94538, (800) 821-0806 or (415) 498-1111, (Jun '90)

MacUser Aug 1991 Minifinders 137
System 6.0.3 or later. $199.95; 5 users, $399.95; 10 users, $599.95; 50 users, $2,999; CE Software Inc., P.O. Box 65580, West Des Moines, IA 50265. (800) 237-7638 or (512) 224-1955. (July '90)

Racial InterLab MacConnect 

Very fast NuBus card. Lacks diagnostic software. Requires NuBus-capable Mac. $495. Racial InterLab, 1550 Swan Rd., Lexington, MA 01718. (800) 256-8255 or (508) 263-9929. (Jun '90)

Send Express 

Sound card is DA-DINT combination that sends files or Clipboard contents in the background, with or without MultiFinder. Extremely smooth background operation compensates for sluggish performance. User interface is too complex for those who need to transfer files frequently. Version 1.0. $199.95; 50 users, $3,999.95; 100 users, $9,999.95. (May '91)

MicroPhone II 

MicroPhone II is the leader among high-end telecommunications programs, with more options and features than its competitors. Virtually all protocols and modem drivers are supported, and many features can be heavily customized or automated. Program complexity and size are a very big interface. You can be smarter if you 're interested in network connections. Version 2.0 reviewed. $229. Technology Concepts, Inc., 1159 Trinton Dr., Foster City, CA 94404. (415) 349-0900. (Mar '90)

MicroPhone III 

MicroPhone III is a leader among high-end telecommunications programs, with more options and features than its competitors. Virtually all protocols and modem drivers are supported, and many features can be heavily customized or automated. Program complexity and size are a very big interface. You can be smarter if you 're interested in network connections. Version 2.0 reviewed. $229. Technology Concepts, Inc., 1159 Trinton Dr., Foster City, CA 94404. (415) 349-0900. (Mar '90)

Remote Wakeup 

Remote Wakeup is a slick hardware/software combination that allows you to turn an AppleTalk-capable Mac on from any modem and that also shuts down the Mac after a specified period of inactivity. Uses a special modem cable that plugs into the modem serial port and the modem itself. DataVox's Autotalk is an INIT. Version 1.0 reviewed. $49.95. Farallon Computing, Inc., 2000 Powell St., Ste. 600, Emeryville, CA 94608. (415) 595-9000. (Aug '90)

Smartcom II 

Smartcom II balances power and ease of use. It's capable of unlimited operation and has a powerful command language. It has the fastest screen updating available, which can work at 9,600 bps. The full screen buffer can easily be archived. Version 3.0 reviewed. $329. Shipping. Requires Mac 512k or later. $149. Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348. (404) 441-1617. (Jan '89) * '89 Ed

VersaTerm PRO 

VersaTerm PRO is the first telecommunications package that uses the Apple Communications Toolbox's add-on modules. Its performance in includes a serial module and supports Xmodem, Ymodem, and Kermit transfers. It doesn't have an extended command or scripting language. Version 4.0 reviewed. $295. Synergy Software, 2457 Perkmoun Ave., Reading, PA 19606. (800) 876-8376 or (215) 775-9226. (Dec '90)

White Knight

White Knight is the new name for Red Ryder (1987 Eddy winner). Although this component is still a weak point in a telecommunications program, it is now more powerful, the interface has taken a step backward. The manual is new and much improved. Software extensions called RCMDs (similar to HyperCard XCMDs) are now supported. Contains a lot for a low price. Version 1.1.0 reviewed. $35. Version 1.1.0 reviewed. Requires Mac Plus or later. $139. FreeSoft Co., 150 Hickory Dr., Beaver Falls, PA 15010. (857) 456-2700. (May '90) * '87 Eddy

ZTerm

ZTerm is a good, cheap telecommunications program. Rich features. Interface is intuitive. Xmodem, Ymodem, and Zmodem transfers are possible. Has simple macro ability, capture buffer, keyboard buffering, and dial set-ups. Excellent performance. Easy to use if you have other telecommunications experiences. Version 1.0 reviewed. Requires Mac Plus or later, a modem, and a cables. Shareware: downloadable, $30; ondisk, $40. Dave Alverson, 5653 Crump Creek Dr., Mason, OH 45040. (Sept '90)

Databases

4D Calc

4D Calc is a spreadsheet module that works with the 4D Dimension database. Although 4D
Calc can’t replace a full-featured spreadsheet program. Its ‘hot’ links to 4D database files quickly update shared information. The ability to exchange data as SYLK files between Excel and 4D is adequate, but may be replaced by values (ACIUS’s documentation and sample databases are helpful here). 4D Calc offers a more powerful design potential for 4D programmers contemplating more sophisticated uses of this module. Version 1.0 reviewed.

Requirements: 4th Dimension 2.1.1 or later, $295. ACIUS, 10351 Bubb Rd., Cupertino, CA 95014. (408) 252-4444. (June ’91)

4D Compiler !!!!!! This developer tool lets 4th Dimension speed up many user-specified procedures, rather than interpreting code into machine language as is copy-protected, asking for an original disk at launch and occasionally thereafter. Despite this nuisance, 4D Compiler is indispensable for serious programming. Version 1.0 reviewed. Requires 4th Dimension 2.1.1 or later, $295. ACIUS, 10351 Bubb Rd., Cupertino, CA 95014. (408) 252-4444. (Jan ’91)

4D Write !!!!!! 4D Write is a word-processing module that works with 4th Dimension. Although you can’t replace a full-blown word-processing program with 4D Write, it has basic features such as formatting, ruler bars, and the capability to handle simple graphics. Lacks a spelling checker and style sheets. 4D Write sometimes has difficulty opening large text files, and translation of imported RTF (rich text format) documents is not good, although you can specify RTF when saving documents. Version 1.0 reviewed. Requires 4th Dimension 2.1.1 or later, $295. ACIUS, 10351 Bubb Rd., Cupertino, CA 95014. (408) 252-4444. (June ’91)

4D XREF is a specialized analytical tool that every 4D developer will cherish. It’s simply a module that lists and cross-references all the different variables, procedures, commands, externals, structure elements, and layouts you have used in a 4D database. The entire XREF file can be saved as a text file for use in other applications. Listings provided (including Layouts and Structure) allow for clear, graphically intuitive analyses of procedures, layout dimensions, and structure maps. Version 1.0 reviewed. Requires 4th Dimension 2.1.1 or later, $200. ACIUS, 10351 Bubb Rd., Cupertino, CA 95014. (408) 252-4444. (June ’91)

4D Write is a word-processing module that works with 4th Dimension. Although you can’t replace a full-blown word-processing program with 4D Write, it has basic features such as formatting, ruler bars, and the capability to handle simple graphics. Lacks a spelling checker and style sheets. 4D Write sometimes has difficulty opening large text files, and translation of imported RTF (rich text format) documents is not good, although you can specify RTF when saving documents. Version 1.0 reviewed. Requires 4th Dimension 2.1.1 or later, $295. ACIUS, 10351 Bubb Rd., Cupertino, CA 95014. (408) 252-4444. (June ’91)

4th Dimension is a versatile relational-database manager that can create powerful stand-alone applications. Has a Pascal-like pro-
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Hermes & Tribute Fonts

Hermes & Tribute Fonts are specially designed fonts that come in sizes up to 120 points. Optimized for the ImageWriter LQ, the ImageWriter LaserWriter. Requires a PostScript laser printer.

$29.95. Miles & Miles, 704 N. Water St., Ellensburg, WA 98926. (800) 992-5280. (Sept '89)

KeyCap Fonts

KeyCap Fonts contains three typefaces designed specifically for writing computer documentation. Version 1.0 reviewed. Version 1.1 shipping, $149.95. Publiflex Software International, 2830 Ninth St., Berkeley, CA 94710. (800) 255-3242 or (415) 644-2116. (June '89)

FontStudio

FontStudio provides a fully integrated environment for typographic work. If you're in the market for a PostScript font editing system, look no farther. FontStudio might prove to be irresistibly attractive because of its ability to store character parts in a flexible, excellent bit-map editor, and its strong kerning-pairs interface. Its most significant failing is its lack of automatic hinting. Version 1.0 reviewed. Version 1.01 shipping. Requires Mac Plus or later. $299, 405 Eisenhower Dr., Princeton, NJ 08540. (800) 343-8973 or (210) 845-6100. (Sept '90)

Formulator

Formulator is a mathematical application that incorporates a rudimentary word processor as well as an equation writer. It comes with a helpful HyperCard demonstration stack, and the section on importing equations into a word-processing program is very clear. Version 1.1 shipping. Requires Mac Plus or later. $399.95. ICOM Simulations, Inc., 648 S. Wheeler Rd., Wheeling, IL 60090. (708) 520-4440. (July '90)

MacType Sampler

The MacType Sampler is a classic art director's typebook that has samples of all PostScript laser fonts. The material is arranged by font type but, alas, resolution is poor. The printed version of Type Sampler is the more valuable part of this package. MacType Sampler, $575; one year of printed updates, $80. MacType, 326-D N. Stonehurst Ave., Rockville, MD 20852. (800) 344-8335 or (415) 961-4400. (May '90)
TypeStyler is a type-customization program that lets you manipulate regular type to create display type. It supports 8-bit color and monochrome, and lets you define up to 127 different color separations. Its performance is excellent except on low-end Macs where it might be unacceptably slow. Includes ten fonts, Version 1.0 reviewed, Version 1.5 shipping. Requires Mac Plus or later, $199.95. Broderbund Software, Inc., 1797 Corporate Center Dr., CA 94030, (415) 492-3200. (May ’90) ★ 90 Eddy

World Class FontType
World Class FontType is a bit-mapped screen font that comes with three useful utilities, all the Mac the Knife fonts, and a list more. Eight separate volumes are available, $89.95 per volume. Dubl-Click Software, Inc., 9316 Deering Ave., Chatsworth, CA 91311, (818) 700-9525. (Dec ’89)

World Class Laser Type
World Class Laser Type is a six-volume collection of PostScript fonts that are an attractive alternative to TypeStyler. Each volume is on two 80K disks and includes screen fonts and Type 3 PostScript printer fonts. An excellent value. BigCaps, version 3.2; FontCharter, version 2.2 reviewed. Requires PostScript printer, $89.95 per volume. Dubl-Click Software, Inc., 9316 Deering Ave., Chatsworth, CA 91311, (818) 700-9525. (Dec ’89)

Page Layout

CopyFlow
CopyFlow is a QuarkXPress XTension that allows batch importing or exporting. Adds its own menu to QuarkXPress. CopyFlow automates placement whenever you’ve completed your revisions. Works well and can be a real time saver. Version 2.0 reviewed. Requires QuarkXPress 3.0 or later. $331.11 (woodstock). Informed Designer
Informed Designer is a complex and comprehensive forms-design program primarily for high-end corporations. Its $30,000-weapon spelling checker works well and quickly. Powerful cross-referencing. Poor table formatting. Imports standard Mac graphics as well as DOS, EPS, and other faster fonts. Version 2.5 shipping. Requires SE/30 or Mac II, System 6.0.3 or later, a 40-megabyte hard disk drive, 4 megabytes of RAM, PostScript printer, and a large-screen monitor. $995. Frame Technology, 1010 Kincon Cir., San Jose, CA 95134, (408) 433-6200. (Dec ’90)

FrameMaker
FrameMaker is a powerful publishing program for long-document publishing. Provides extensive power for creating paragraph formats. Its $30,000-weapon spelling checker works well and quickly. Powerful cross-referencing. Poor table formatting. Imports standard Mac graphics as well as DOS, EPS, and other faster fonts. Version 2.5 shipping. Requires SE/30 or Mac II, System 6.0.3 or later, a 40-megabyte hard disk drive, 4 megabytes of RAM, PostScript printer, and a large-screen monitor. $995. Frame Technology, 1010 Kincon Cir., San Jose, CA 95134, (408) 433-6200. (Dec ’90)

Informed Designer
Informed Designer is a complex and comprehensive forms-design program primarily for high-end corporations. Its $30,000-weapon spelling checker works well and quickly. Powerful cross-referencing. Poor table formatting. Imports standard Mac graphics as well as DOS, EPS, and other faster fonts. Version 2.5 shipping. Requires SE/30 or Mac II, System 6.0.3 or later, a 40-megabyte hard disk drive, 4 megabytes of RAM, PostScript printer, and a large-screen monitor. $995. Frame Technology, 1010 Kincon Cir., San Jose, CA 95134, (408) 433-6200. (Dec ’90)

Interleaf Publisher
Interleaf Publisher is a speedy multiuser layout system for producing large, complicated documents. This version has an improved user interface, but it suffers from poor font management.

Version 3.5 reviewed, Version 3.6 shipping. Requires Mac II series with 5 MB of RAM and a hard-disk drive, $995; upgrade, $99. Interleaf, Inc., Prospect Place, 9 Hills Ave., Walhalla, NY 10480. (800) 456-5323 or (617) 290-0710. (Apr ’89)

Layouts
Layouts is a five-disc set of PageMaker templates. The business-document templates are excellent. The superb manual has suggestions covering printing tips, versions for QuarkXPress and ReadySet. Go! are also available. Requires Mac Plus or later and PageMaker. $149.95 for each version. Postcraft International, Inc., 27181 Avenue Hopkins, Ste. 6, Valencia, CA 91355, (805) 257-1797, (May ’90)

Multi-Ad Creator
Multi-Ad Creator is a powerful tool that lets you create high-quality single-page ads. It is easy to use but is nearly foolproof (but it lacks a good-taste feature). Every kind of graphic file and most wordprocessor files can be imported. If you create ads and don’t need an all-page-layout layout program, get Multi-Ad Creator, Version 2.5 shipping. Requires Mac Plus or later with 2 MB of RAM and a hard-disk drive (Mac II series is recommended). $995. Multi-Ad Services, Inc., 1720 W. Dettweller Dr., Peoria, IL 61615, (800) 447-1996 (309) 692-1530. (Jan ’90)

PageMaker
PageMaker 4.0 is a major upgrade of Aldus’ popular page-layout application. It adds 75 new features without complicating the program. Thenew version’s range of improvements is impressive. PageMaker is accessible and significantly improved in its word-processing, typography, graphics, links management, long-document processing, color, and table-processing capabilities. Requires Mac Plus or later and a hard-disk drive. $795; upgrade, $150. Aldus Corp., 411 First Ave., Seattle, WA 98104, (800) 333-2538 or (206) 628-2330. (Sept ’90) ★ 85, 98 Eddy

PDQ! (Page Designs Quick!)
PDQ! (Page Designs Quick!) and PDQ! 5 (Page Designs Quick! 5) are PageMaker templates designed exclusively for newsletter and newspaper publishing. The two sets contain 60 three-column, 50 four-column, and 225 tabloid-sized, five-column layouts. The quality is excellent, but art is lacking. You can modify all layout objects from within PageMaker. Version 1.0 shipping. Requires PageMaker 3.0 or later. PDQ!, $89.95; PDQ! 5, $159.95. PAR Publishing, 6355 Topanga Canyon Blvd., Ste. 307, Woodland Hills, CA 91367, (818) 340-8165, (Aug ’90)

Personal Press
Personal Press is a budget page-layout program. Lots of good features. Has style-sheet support, good TIFF-halftone controls, and spot-color cutouts. AutoCreate feature simplifies design and production of book jackets. Extensive features let you use powerful enough for basic DTP projects. Needs ample memory and disk space. Editing in 100-percent view only. Screen refresh occasionally slow. Can have only one document open at a time. Version 1.0 reviewed, Revision 1.1 shipping. Requires Mac Plus or later and 2 MB of RAM, System 6.0.3 or later, and a hard-disk drive. $299. Aldus Corp., 411 First Ave., Seattle, WA 98104, (800) 333-2538 or (206) 628-2320. (July ’91)

Publish It
Publish It! is a moderately priced page-layout package designed for users with basic page-layout requirements. Includes word-processing and simple drawing and painting tools. Uses a frame metaphor. Can rotate text. Limited color support. Very powerful. Version 1.2 shipping. Requires Mac Plus or later and hard disk and System 6.0.3 or later recommended. $495. Frame Technology, 444 Lake Cook Rd., Deerfield, IL 60015, (800) 353-9497 or (708) 559-1300, (Dec ’89)

Publish It! and Publish It! Plus
Publish It! is a budget DTP application with loads of features (including some missing in high-end programs). Menus and dialog boxes are underused and are very easy to use. Good typographical controls. Easy text and graphic importation. Includes service-bureau checklist, slide show feature for presentations, and mail-merge module. Lacks real style sheets. Documents limited to 100 pages. Can’t turn off toolbars. Version 2.0 reviewed. Requires Mac Plus or later and System 6.0.3 or later. $249.95. Timeworks, Inc., 444 Lake Cook Rd., Deerfield, IL 60015, (800) 353-9497 or (708) 559-1300. (July ’91) ★ 90 Eddy

QuarkStyle
QuarkStyle is a simple program that has a collection of 72 templates for “instant” desktop publishing. The templates, which range from business cards to newsletters, let you concentrate on a page’s overall appearance rather than its details. Version 1.0 reviewed. Version 1.01 shipping. Requires Mac Plus or later and hard disk drive. Design Idea, 300 S. Jackson, Ste. 100, Denver, CO 80229, (800) 356-9363 or (303) 524-2211, (Feb ’89)

QuarkXPress
QuarkXPress 3.0 has wonderful new features, and the interface has been greatly simplified. It lets you use QuarkXPress retrofit master pages directly in your document. The program lets you drag objects completely off a page and see the place outside a page as a pasteboard. You can also re-
tate any object or group in increments as fine as .001 degree. As many as seven documents can be open simultaneously. Version 3.0 requires 2 MB of RAM and a hard disk drive. $795. Quark, Inc., 300 S. Jackson St., Ste. 100, Denver, CO 80209. (800) 356-9363 or (303) 834-2211. (Nov '90) ★★ ★ Edy

RagTime ★★★★
RagTime combines word-processing, page-layout, graphics, and spreadsheet capabilities. It has a wide array of charts, hyphenation dictionaries in 14 languages, and an integral word processor that can check spelling in 8 languages. Linked spreadsheets within the same or other documents update automatically. Offers 80 functions, and you can add external functions for importing data from SQL databases. It also has page-layout functions such as page breaks, text around frames and to adjust color and tint. Its number-crunching capabilities are minimal. Version 3.1 shipping. Requires Mac Plus or later, 2 MB of RAM, System 6.0.2 or later, and a hard disk drive. $599. RagTime USA, Inc., 702 Marshall St., Ste. 322, Redwood City, CA 94063. (800) 875-9632 or (415) 780-1800. (Jun '90)

RagTime Classic★★★★
RagTime Classic, a simplified version of RagTime, is a budget page-layout program. Includes spreadsheet module and control over TIFF halftones. Lacks style sheets or layout rules. Very limited text-editing capabilities — only ASCII, Word 1.0, and MacWrite 5.0. Copy protection using system disk. Confusing, incomplete documentation but toll-free support. Version 2.1 reviewed. Requires Mac Plus or later and System 5.0 or later (hard disk drive required). $195. RagTime USA, Inc., 702 Marshall St., Ste. 322, Redwood City, CA 94063. (800) 875-9632 or (415) 780-1800. (July '91)

Ready.Set.Go!★★★★
Ready.Set.Go! is a low-budget DTP program. Elegant interface. Good style sheets, typographical controls, gray-scale halftone control, and spot color. Provides thumbnails views of publications. Stores font-name information within documents, which avoids font-ID conflicts. Easy to use. Limited graphic tools. Version 4.5a reviewed. Requires Mac Plus or later and a hard disk drive. $259. Letratext USA, Inc., 40 Eisenhower Dr., Paramus, NJ 07653. (800) 343-8973 or (201) 845-6100. (July '91) ★★ ★★ Edy

SmartForm Designer★★★★
SmartForm Designer is a full-featured forms-design manager. Includes SmartForm Assistant for filling-in forms when design is complete. This easy-to-use design environment can import color graphics. Version 1.1 reviewed. Version 1.1v1 shipping. Requires Mac Plus or later, $399. Claris Corp., P.O. Box 120, Sunnyvale, CA 94088. (800) 544-8554 or (408) 727-8227. (Jan '90)

Springboard Publisher II★★★★
Springboard Publisher II is a low-cost, very basic, limited-function desktop publishing program. Version 1.0 reviewed. Requires Mac Plus or later, System 6.0.3 or later, and a hard disk drive. $395; upgrade for existing users, $50. Symphony Corp., 10201 Tower Ave., Cupertino, CA 95014. (800) 411-7234 or (408) 253-9600. (Oct '90) ★★ ★★ Edy

Persuasion★★★★
Persuasion is the premier desktop-top presentation program. Template andoutlining capabilities are much improved, and slide transitions are handled well. Version 2.0 reviewed. Requires Mac Plus or later, System 6.0.3 or later, and a hard disk drive. $95. Aldus Corp., 411 First Ave., Seattle, WA 98104. (206) 628-2320 or (415) 628-7800. (Apr '90) ★★ ★★ Edy

PowerPoint★★★★
PowerPoint is an easy-to-use desktop presentation tool. Good color schemes. Can send presentations to Geographics to produce color 35mm slides. Version 2.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later, System 6.0.3 or later (hard disk drive recommended). $395. Microsoft Corp., One Microsoft Way, Redmond, WA 98052. (800) 426-9400 or (206) 882-8800. (Aug '89) ★★ ★★ Edy

Visual Business No. 5★★★★
Visual Business No. 5 is a port of a DOS charting and presentation package. Excellent charting capabilities. Includes the Macintosh version, which is difficult to learn and use than Persuasion or PowerPoint. Can't store an entire presentation. Output Manager is included for slide printing. Includes four LaserWriter fonts. Not a good choice unless you specifically need one of its features. The redesigned program GraphMaster will replace Visual Business No. 5. Version 1.02 shipping. Requires Mac II and System 6.0.3 or later; 2 MB of RAM needed on a hard drive. $295. Visual Business Systems, 380 Interstate N. Pkwy., Ste. 190, Atlanta, GA 30339. (404) 962-6025. (Oct '89)

Presentation★★★★

Course Builder★★★★
Course Builder creates stand-alone educational applications. This easy-to-learn dedicated program provides language blocks and arrows, Graphics, animation, and sound can be integrated. Poor documentation. Version 2.0 reviewed. Requires Mac Plus or later, 2 MB of RAM and a hard disk drive. $1,495. TeleRobotics International, 7325 Oak Ridge Hwy., Ste. 104, Knoxville, TN 37921. (615) 690-5600. (Oct '87)

Interactive Physics★★★★
Interactive Physics is the best physics-teaching tool — short of a laboratory — you can buy. Students set up and run experiments, using a drawing environment to draw strings, springs and strings; and then watch the animated results on-screen. There are limits to the number of masses and connectors, but that doesn't detract from the overall program. Excellent manual. Version 1.2 shipping. Requires Mac Plus or later and System 6.0.3 or later (hard disk drive required). $249. Knowledge Revolution, 497 Vermont St., San Francisco, CA 94107. (800) 766-6615 or (415) 553-8153. (Apr '90) ★★ ★★ Edy

KidsMath★★★★
KidsMath is a set of eight educational applications for ages 3 to 8. The quality ranges from adequate to superb. Doesn't support color or large monitors. Version 1.1 shipping. Requires Mac II or later, 1 MB of RAM, and a hard disk drive. $535. Scotts Valley Dr., Ste. E, Scotts Valley, CA 95066. (408) 438-1990. (May '90)

Macography Workshop★★★★
Macography Workshop is a seven-disk program that teaches basic camera and darkroom techniques. Anchev simulations and hypertext make learning black-and-white photography easy. Designed for both self-instruction and classroom use. Requires Mac Plus or later. $79.95. Joe Ciagla. 2036 Spruce St., Philadelphia, PA 19103. (215) 985-1539. (Sept '90)

Mavis Beacon Teaches Typing★★★★
Mavis Beacon Teaches Typing! has more features than a Selectric. Lots of diagnostics concerning type. Requires Mac Plus or later. Version 1.1 reviewed. Version 1.3 shipping. Requires Mac II or later. $49.95. Software Toolworks, Inc., 1385 Charleston Rd., P.O. Box 34, Mountain View, CA 94042. (415) 963-0600 or (800) 922-8221 or (650) 673-0172. (May '91) ★★★★★

Computer Associates International, Inc., 1240 McKay Dr., San Jose, CA 95131. (800) 531-2526 or (408) 432-1727. (Dec '88)

MORE★★★★
MORE's outline scan be instantly transformed into presentations. Dozens of templates are provided, and users can also design their own. There is wide choice of customizable labeling schemes. Slide-making tools are formidable. Version 1.0 reviewed. Requires Mac Plus or later, System 6.0.3 or later, and a hard disk drive. $395; upgrade for existing users, $50. Sympohym Corp., 10201 Tower Ave., Cupertino, CA 95014. (800) 411-7234 or (408) 253-9600. (Oct '90) ★★ ★★ Edy

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MIKE RATINGS★★★★

MICROSOFT CO., 10201 Torrey Pines Rd., La Jolla, CA 92038. (619) 673-0172. (May '91) ★★★★★

MICROSOFT CO., 10201 Torrey Pines Rd., La Jolla, CA 92038. (619) 673-0172. (May '91) ★★★★★
MICE RATINGS

NumberMaze makes practicing basic math skills a game. Children ages 5 through 12 can work their way through various maze problems by solving math word problems in counting, addition, subtraction, multiplication, and division. Can select problem types and difficulty. Games can be customized with familiar names and additional levels. Based on five major math-textbook series for grades 1 through 6. Version 1.0 shipping. Requires Mac 512K or later; color-capable Mac for color version. $49.95; NumberMaze Color, $69.95. Great Wave Software, Inc., 17 Paul Dr., Ste. E, Scotts Valley, CA 95066. (408) 438-1990, (Dec ’89) ★ ’88 Eddy

Physics

Physics is a capable, intelligent, well-designed aid. Covers topics from vectors to thermodynamics to the nature of light. Animated experiments let you try out concepts. Version 1.2 shipping. Requires Mac Plus or later. $89.95. Broderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903. (800) 521-6263 or (415) 492-3200. (Jan ’88)

The Playroom

The Playroom is a highly entertaining and educational program that teaches basic concepts, such as spelling, telling time, and counting. The child is centered around a brightly colored screen that changes in size and shape. The computer provides a variety of learning experiences. Version 1.0 shipping. $49.95. Broderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903. (800) 521-6263 or (415) 492-3200. (Jan ’88)

Point of View

Point of View is a dynamic history program that makes exploring American history interesting and fun. Comes with more than 2,000 pages of documents, hundreds of graphs, and 140 census tables, with tools for searching, accessing, and displaying the data. Contains many typographical errors and does not cite source quotations for any of its documents. Version 1.0 shipping. Requires Mac Plus or later; 3-megabyte hard disk drive recommended. $199.95. Scholastic Software, 730 Broadway, New York, NY 10003. (800) 541-5513 or (212) 505-3000. (Nov ’90)

Reader Rabbit

Reader Rabbit teaches four- to eight-year-olds how to read, with four elegant games that build on one another. A future version will improve the problem of incompatibilities with recent Mac OS versions. Version 2.0 reviewed. Version 2.2 shipping. Requires Mac Plus or later; $29.95. Reader Rabbit Software, Inc., 17 Paul Dr., San Rafael, CA 94903. (800) 832-2235 or (415) 715-0230. (June ’88)

Tyrrell’s is a tutorial that is both practical and flashy. Users can interrupt functions and move easily amongst them. Use of Return and space bar are assumed but never explained. Version 1.0 reviewed. Requires Mac 512K or later; color-capable Mac for color version. $49.95; NumberMaze Color, $69.95. Great Wave Software, Inc., 17 Paul Dr., San Rafael, CA 94903. (800) 521-6263 or (415) 492-3200. (Nov ’88)

Tyrrell Instrutor Encore

Tyrrell’s is a Mac typewriter, that — unlike many others on the market — recognizes that it’s being used on a computer rather than a typewriter. Although the program is easy to control and offers good performance, it has some strange bugs. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later; $29.95. Individual Software, Inc., 125 Shoreway Rd., Ste. 3000, San Carlos, CA 94070. (800) 331-3713 or (415) 995-8855. (Nov ’88)

Voyager, the Interactive Desktop Planetarium

Voyager, the Interactive Desktop Planetarium, lets you view the sky as a star chart, as a celestial sphere, or as seen from anywhere in the universe. Includes an extensive database of more than 2,500 objects. Version 1.0 reviewed. Version 1.2 shipping. Requires Mac Plus or later and System 6.0.3 or later; $124.50. Voyager, Inc., 830 William St., Ste. 200, San Leandro, CA 94577. (415) 352-7328. (Sept ’89)

Where in Time Is Carmen Sandiego?

Where in Time Is Carmen Sandiego? is the fourth in the popular Carmen Sandiego series. The previous releases use intriguing stories and characters to teach geography to young Macintosh users, but this package adds the element of time travel (sounds better than “history” and is much more fun). The story revolves around a time machine that Carmen and her gang are using to steal treasures from the past. The Acme Detective Agency has issued you a Chronoskimmer time-travel device, but only your ability to solve the puzzles can save the day! Version 1.0 reviewed. $49.95. Broderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903. (800) 521-6263 or (415) 492-3200. (Apr ’91)

Entertainment

Armor Alley

More than an exercise in blowing up helicopters and airplanes, Armor Alley requires a solid understanding of military strategy, planning, and the value of human life. You are rewarded for economic lives rather than for ending them needlessly. The game offers ten levels of difficulty and lets you play against the computer or via modem against another computer or PC. There’s also a multiplayer mode for AppleTalk networks (each player must have a copy of the game). Armor Alley gives your brain a workout instead of letting you rely merely on hand-eye coordination. Version 1.0 reviewed. $49.95. Three-Sixty Pacific, 2-105 S. Bascom Ave., Ste. 380, Campbell, CA 95008. (408) 776-2187. (Feb ’91)

Balance of the Planet

Balance of the Planet is similar to the classic game Balance of Power but with the object of securing global environmental survival. It’s difficult to win, but eventually you should be able to get positive scores, and your awareness of environmental issues will be greatly enhanced. Players can set the basic bias of the game, ranging from pronuclear industrialism to extreme “green.” Version 1.0 reviewed. $49.95 Aclerode, 142 S. Winchester Blvd., Ste. 200, San Jose, CA 95128. (800) 245-7744 or (408) 245-7744. (Aug ’90)

Bomber

Bomber is a great HyperCard-based simulation. You attack Germany during WWII flying a B-17. Great sound (you probably can’t see the megabytes of sound database). Headphones are provided so you don’t disturb others. Version 2.0 shipping. Requires HyperCard 2.0 (included) and a hard disk drive. Version 1.0 reviewed. $49.95. Voyager, Inc., 830 William St., Mountain Road, Sharon, CT 06069. (203) 364-0063. (Feb ’90)

Chessmaster 2000

Chessmaster 2000 is a challenging chess program that can appeal to novices as well as experts. You can view the board from 2-D or 3-D perspectives and also turn it over for a better look. Play is smooth and easy, and the program responds vocally. You may get tired of hearing “Getcha,” though. Version 1.0 reviewed. Version 1.02 shipping. Requires Mac Plus or later; $44.95. Software Toolworks, 60 Leveroni Ct., Novato, CA 94947. (800) 231-3088 or (415) 883-3000. (July ’87)

Cribbage King/Gin King

Cribbage King/Gin King is an electronic version of the popular card games. Both have seven skill levels and can challenge even the best players. Superb graphics but lack color support. Simple play mechanics. Helpful tutorial. Excellent manuals offer strategic advice as well as game history. Version 1.2 reviewed. Requires Mac Plus or later; $39.95. Electronic Arts, 1820 Gateway Dr., Redwood City, CA 94062. (415) 452-4525 or (415) 571-7717. (Sept ’90)

Crystal Quest

Crystal Quest combines all the good elements of nearly every video game ever made. Move a piece around to gobble up points and crystals. Shoot the monsters, fight with them, and try to get them before they get you. Excellent sound effects. In color on the Mac II. Version 2.2x shipping. Requires Mac Plus or later; $49.95 with Critic Editor, $79.95. Casady & Greene, Inc., 22734 Portola Dr., Salinas, CA 93938. (800) 359-4920 or (408) 484-9228. (Apr ’88) ★ ’88 Eddy

Dark Castle

Dark Castle is an outstanding achievement in action games, integrating some of the best ideas of animation and graphics. You need better-than-average hand/eye coordination, but it’s worth the effort. Version 1.0 reviewed. Version 1.1 shipping. Requires Mac Plus or later; $49.95. Aldus Corp., 411 First Ave. S., Seattle, WA 98106. (206) 628-2320. (Apr ’87) ★ ’87 Eddy

Darwin’s Dilemma

Darwin’s Dilemma provides intriguing, deceptively simple entertainment. You manage a game piece called Darwin, which moves other icons to combine them within an invisible grid. These icons include animals such as amoebas and paramecia, and your progress in managing recombinant life forms lets you graduate to jellyfish, octopuses, and crabs. A trick called telewarping lets you accelerate the evolutionary process, and if you’re willing to lose points you can also teleport your icon across the board. Version 1.0 reviewed. Version 1.01 reviewed. $49.95. Infine Design, 5 W. Mountain Road, Sharon, CT 06069. (203) 364-0063. (Mar ’91)

Falcon

Falcon simulates an F-16 fighter jet dogfighting with gut-tightening, sweat-making realism. Take on MiGs and dodge SAMs. Can be played via modem against other players. Version 1.0 reviewed. Version 2.21 shipping. Requires Mac Plus or later; $59.95. Spectrum HoloByte, 2061 Challenger Dr., Alameda, CA 94501. (415) 522-3358 or (415) 522-0107. (May ’88)

Ferrari Grand Prix

Ferrari Grand Prix is an exciting racing-car simulation game, providing a high degree of realism. A beginners’ course and four other courses are built into the program. You can also design custom courses and backgrounds. 

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Dataproducts introduces the first 9 ppm animal of its kind with the powerful graphic capabilities of Adobe's PostScript® Level 2 software. And the LZR 960 is the first laser printer to combine Level 2 with a RISC-based controller for speed and agility. The LZR 960 delivers it all in one high performance package. The bottom line: you can print more complex pages in less time. And that's just for starters.

Besides incorporating an entirely new generation of PostScript page description language, our newest laser printer interfaces easily with Macintosh® and IBM PC®/compatible platforms. It also features an HP® LaserJet® Series II emulation to handle non-PostScript language applications.

Now that you know what our LZR 960 does, you'll want to know how. Its PostScript Level 2 software lets you produce sophisticated graphics and output from font-intensive applications significantly faster than with standard PostScript printers. You'll be able to generate and manipulate forms much more quickly by saving them for overlay instead of building them again for each page. And PostScript Level 2 is compatible with earlier versions so there's no need to replace existing application software drivers.

Beyond software compatibility is system compatibility, and here's where the LZR 960 takes the lead again. Apple® and IBM-compatible users can be connected simultaneously through AppleTalk*/LocalTalk/RS-422, RS-232 and Centronics® parallel interface ports. And because the LZR 960 handles port polling so gracefully, printer sharing is easy.

This kind of performance calls for a superior paper handling system, and that's exactly what has been designed into the LZR 960.
LZR 960™ and still look this good.

It handles letter, legal, A4, B5, statement, executive, envelopes, labels and transparencies with perfect agility, and delivers a maximum 500 sheet capability. An optional cassette feeder allows two different paper sizes to be accessed at once. And an optional high-capacity envelope feeder holds up to 40 business envelopes.

All these paper handling accessories can be operator-installed in seconds without any tools.

What's even more remarkable is that a laser printer can pack this much performance into a footprint of just 1.3 square feet. All told, the LZR 960 sprints past other PostScript laser printers. Call 1-800-624-8999 extension 584 for the name of your nearest dealer.

Dataproducts. The high performance printer people™

Please circle 85 on reader service card.
MINIFINDERS August 1991 MacUser

SECONDARY TEXT

MINIFINDERS

Version 1.0 reviewed. Version 1.0 shipped. Requires Mac Plus or later. $59.95. Bullseye Software, P.O. Box 7900, Incline Village, NV 89450. (702) 265-2298. (July '87)

Halls of Montezuma

Halls of Montezuma is a classic move-the-units war game adapted from the famous U.S. Marine board game. Color and black-and-white versions for all scenarios, with good performance and play. You can create your own scenarios. Requires Mac Plus or later. $44.95. Strategic Studies Group, Inc., 1747 Orleans Ct., Walnut Creek, CA 94598. (415) 952-4119. (Apr '90)

Pipe Dream

Pipe Dream is an addictive game that demands a nearly perfect mixture of strategy and speed. You must build a pipeline fast enough to prevent the stuff in the line from running out — that's it. It has 36 levels of play. Its copy-protection scheme requires you to use an included decoding plug. Version 1.2 shipping. Requires Mac Plus or later. $24.95. Lucasfilm Ltd., Games Division, P.O. Box 10307, San Francisco, CA 94102. (800) 782-7927 or (415) 721-3333. (May '90)

PlayMaker Football

You won't find a better combination of football and computer game than PlayMaker Football. More of a coaching simulation than a play simulation, this game gives priority to strategy over simulation. Requires Mac Plus or later. $49.95. Casady & Greene, Inc., 17 Paul Dr., San Rafael, CA 94903. (800) 521-6263 or (415) 492-3200. (May '91)

Shadowgate

Shadowgate is an adventure game where you, as the seed of prophecy, must save the world from the evil warlock. Great graphics, sound, and adventure. Version 1.0 reviewed. $49.95. Software Toolworks, 60 Leveroni Ct., Novato, CA 94949. (800) 231-3088 or (415) 883-3000. (Dec '87)

Shanghai

Shanghai is a wonderful strategy game that has gorgeous color, good sound, and intelligent AI. It tells you when no more moves are possible. Version 2.0 reviewed. $29.95. Activation (Mediagenic), 3885 Bollman Dr., Menlo Park, CA 94025. (415) 329-0800. (Jun '90) * 86 Eddy

SimCity

SimCity is an animated game that's also a city-planning simulator. You can work on any one of eight scenarios included in the package. Evaluation window gives you instant feedback on your efforts. Optional Terrain Editor program lets you build cities from the ground up. Version 1.0 reviewed. Viewed. Version 1.2 shipping. Requires Mac Plus or later. $49.95. SimCity Supreme (color version includes Terrain Editor), $79.95. Maxis Software, Two Theatre Square, Ste. 230, Orinda, CA 94662. (800) 336-2947 or (415) 254-9700. (June '89) * 89 Eddy

SimEarth

In SimEarth, you are the Supreme Being who guides an Earth-like planet's many species from evolution to civilization and finally to Exodus toward the distant galaxies before the Sun destroys it. Difficult to learn and has some bugs. Version 1.0 reviewed. Requires Mac Plus or later. $69.95. Maxis Software, Two Theatre Square, Ste. 230, Orinda, CA 94662. (800) 336-2947 or (415) 254-9700. (July '91)

Sky Shadow

Sky Shadow is a must for anyone who appreciates fast action and has a sense of humor. It features a funky flying machine that ker-chunks its way across a comic book-like landscape. Novel graphics, smooth scrolling, and quirky sound is everything in Sky Shadow. Version 1.02 reviewed. Version 1.09 shipping. $49.95. Casady & Greene, Inc., 22734 Portola Dr., Salinas, CA 93908. (800) 359-4990 or (408) 494-9228. (Oct '90)

Star Fleet I: The War Begins!

Star Fleet I: The War Begins! is a 3-D animated adventure in which you play a janitor in a dicey situation. The goal is to get off your ship before it begins to explode and destroy your system. Requires Mac Plus or later. $49.95. Sierra On-Line, Inc., P.O. Box 485, Coarsegold, CA 93614. (800) 326-6554 or (209) 693-4686. (Sept '87)

Space Quest

Space Quest IV: Thecrystallized cruiser is an addictive game in which you try to get your ship off the station before it explodes.Requires Mac Plus or later. $69.95. Maxis Software, Two Theatre Square, Ste. 230, Orinda, CA 94662. (415) 329-0800. (Dec '89)

SimCity

The Mac version significantly improves on the classic Milton-Bradley board game in many ways. The object of the game is to capture your opponent's headquarter (symbolized by the enemy flag) before the enemy captures yours. Each side deploys an army of 12 officers (valued according to their rank), 1 spy, 6 bombs, and 1 flag. The Mac's presentation of Starfleet closely resembles the board-game version's basic grid. The copy-protection scheme requires you to use a cardboard code wheel prior to play. Version 1.0 reviewed. $49.95. Accolade, 550 S. Winchell Blvd., Ste. 200, San Jose, CA 95128. (800) 245-7744 or (408) 985-1700. (May '91)

Synchronicity

Synchronicity, based on the I Ching, can be used as a stress-reduction or decision-making tool. Beautiful artwork and sounds. Even if you aren't versed in Oriental 108 shipping. Requires Mac Plus or later. Mac II series or LC for color version. $39.95; color version, $79.95. Visionary Software, Inc., P.O. Box 69447, Portland, OR 97201. (800) 877-1832 or (503) 246-5260. (Mar '90)

Welltris

Welltris is an arcade game that is a type of a sequel to Tetris. Moving shapes in 3-D. Has musical accompaniment, options to preview shapes, and color-black-and-white versions. Not a GA. Copied version. Version 1.0 reviewed. Version 1.1 shipping. Requires Mac Plus or later. $39.95. Spectrum Holobyte, 2061 Chal­ lengeringly, CA 94010. (415) 522-3584 or (512) 522-1017. (Oct '90)

FINANCIAL MANAGEMENT

Business

A4

A4 is based on 4th dimension, the relational database manager, and thus has 4D's power and draw­ backs. It offers general ledger, accounts-payable, and accounts-receivable modules. Users who are familiar with 4D can customize it easily. Excellent multiuser capabilities. Good for large firms. Requires Mac Plus or later. $2,500. Softtek Design, Inc., P.O. Box 2100, Telluride, CO 81435. (303) 727-7500. (May '89)

Accountant, Inc.


ACCPAC Bedford Simply Accounting

ACCPAC Bedford Simply Accounting has six ledgers and eight journals to handle the needs of small- to medium-sized businesses. Better Mac interface than most. Payroll-tax labels can't be modified, forcing you to subscribe to Bedford's yearly update service. Version 1.03 reviewed. Version 1.2 shipping. Requires Mac Plus or later with System 6.0.3 or later. $199; updates $100 per year or $75 per year if begun at time of registration. Computer Associates International, Inc., 1240 McKay Dr., San Jose, CA 95131. (408) 531-5326 or (408) 244-2197. (Sept '90)

aOnce

aOnce is an integrated accounting package with general ledger, accounts-payable, account

**Payroll****

Payroll is a module designed to work with MultiLedger or CheckLedger version 2.05 or later. $295. CheckMark Software, Inc., 1520 E. Mulberry, Ste. 200, Fort Collins, CO 80524, (800) 444-9922 or (303) 484-3541. (May '90)

**Plains & Simple****

Plains & Simple is an excellent one-write accounting system that offers full general-ledger, accounts-receivable, accounts-payable, and reporting modules. Has three-to-six digit account numbers, 14 predefined account categories, a full audit trail, and multiple checking accounts. Provides more than 20 comprehensive reports and has all the companies. It defaults to accrual-based accounting. Version 1.05 reviewed. Version 1.06 shipping. Requires Mac Plus or later. $199.95. Plains & Simple, Inc., 1520 E. Mulberry, Ste. 200, Fort Collins, CO 80524, (800) 444-9922 or (303) 484-3541. (May '90)

**Rags to Riches****

Rags to Riches has been around since 1984 and is still excellent. There are separate integrated accounts-receivable, accounts-payable, inventory, and professional-billing modules. The program is based on the Omnis 3 database system. Version 1.0 reviewed. Version 2.06 shipping. Requires Mac Plus or later. $199.95. Rags to Riches, Inc., 920 E. 2nd St., Lafayette, CA 94549. (800) 434-1471 or (925) 281-0550. (May '90) at 87 Eddy

**SBT Database Accounting**

The Sales and Marketing Forecasting Toolkit is an Excel-based productivity package. The 18 worksheets, 8 charts, and 1 macro sheet let you create graphs visually, and then copy down to suitable tables. Lacks transaction journal and customer credit limits.
MIFINDERS

the FoxBase+ engine. Very fast. Has 16 integrated modules. Can support up to 99 companies with as many as 999 departments each. Three different types of budgets can be generated and tracked. Holds 24-month customer and 36-month item histories. Requires Mac Plus or later, $695 per module, Sunsoft Corp. Software Technology, One Harbor Dr., Sausalito, CA 94965. (415) 331-9900. (May '90)

Service Industry Accounting


Brown-Wag Publishing, 130D Knowles Dr., Los Gatos, CA 95030. (408) 378-3838. (May '90)

TimeMinder

TimeMinder is an application for adding a DA for recording data. Each client's time slips are stored in separate files, which is a drawback. Batch entry is easy, however. The package's interface needs layout isn't WYSIWYG, making reporting unnecessarily difficult. Version 2.1 reviewed. Reviews Mac Plus or later (hard-disk drive recommended). $299. Axtro Software, P.O. Box 5359, Grand Forks, ND 58206. (800) 426-0854 or (701) 746-6801. (Apr '90)

Timeslips

Timeslips III is for professionals who bill by the hour. It works as a MultiFinder-compatible application adding a DA for recording data. Also comes as DA for entering data. Batch entry is easy, and most descriptions are legible. Features excellent documentation and online help, which compensates for the difficulty of learning the setup procedure. Timeslips can be useful, but some users may experience system incompatibilities. Version 2.0 reviewed. Version 2.01 shipping. Requires Mac Plus or later (hard-disk drive recommended). $299.50; 5-user version, $699.50. Timeslips Corp., 239 Western Ave., Essex, MA 01929. (617) 388-3114 or (508) 768-6100. (Feb '91) ★ 86 Eddy

WOD Fund Accounting

WOD Fund Accounting is a true multiuser system designed to meet the unique needs of government and nonprofit agencies. Contains general ledger, payroll, purchase orders, accounts payable, and accounts receivable modules. Can handle multiple-fund accounting and multiple-year-adjustments. Meets most federal reporting requirements. Requires Mac Plus or later.

$4,995. Farallon Computing (Kansas office), 1321 Wakatusa Dr., Ste. 1010, Lawrence, KS 66049. (800) 843-8101 or (913) 843-8101. (May '90)

PERFORMANCE

CheckFree

CheckFree is electronic-bill-paying software that works. Version 1.5 reviewed. Requires Mac Plus or later, System 6.1 or later, and Hayes-compatible modem (hard-disk drive recommended). $339.95; service costs $9.95 per month for up to 20 payments. $30 for each additional payment. CheckFree Corp., 720 Grandview Dr., Westerville, OH 43081. (800) 882-5280 or (614) 899-7500. (Aug '90)

CheckWriter II

CheckWriter II is a personal-accounting package that uses your checkbook as a ledger. This version offers good functionality at a reasonable price. Features include an overdraft warning that prevents overspending in a specific category, a transfer command that shifts funds between accounts, an endorsement base, drawing tools for designing checks, a Quicken file converter, good reporting options, and an updating function for recurring transactions. Print checks on laser printers or ImageWriters. Version 3.1 reviewed. $299. Axtro Software, P.O. Box 5359, Grand Forks, ND 58206. (800) 426-0854 or (701) 746-6801. (Apr '91)

MacTix

MacTix is a personal-tax form tool for preparing federal and certain state tax forms. Intuitive and easy to use (with all separate forms automatically interlinked for accurate recalculation), it's consistently the best in its class. Accepts data from the leading personal-finance programs. Good built-in help. Prints IRS-accepted forms and LaserWriters. Requires Mac Plus or later, $339.95; state form packages, $199.95. TurboTax for the Macintosh

TurboTax is an excellent tool for preparing federal and certain state tax forms, but this first Mac incarnation hasn't outgrown its PC origins. It makes extensive use of interactive worksheets, instead of accepting data directly into its tax forms. Separate forms and fields can be interlinked for automatic recalculation. Accepts data from the leading personal-finance programs. Excellent built-in help. Prints IRS forms on LaserWriters and ImageWriters. Requires Mac Plus or later, state-tax-form sets also available. Version 1.0 reviewed. $89; frame Tax forms, $49 each. Chipsoft, Inc., P.O. Box 857080, San Diego, CA 92185. (800) 755-8829 or (619) 587-4030. (Oct '90)

Wall Street Investor

Wall Street Investor (formerly Market Pro) helps spot stock market trends, using technical analysis. Downloads information from an electronic service. Good charting. Version 2.1 reviewed. Version 3.02 shipping. Requires Mac Plus or later and a hard disk drive; telecommunications use required. $499.95 each. EDS/StarView, Inc., 1721 Pacific Ave., Ste.100, Oakland, CA 94603. (800) 385-5000. (Apr '91) ★ 86 '89 Eddy

MacMoney

MacMoney is a full-featured financial manager that produces a wide and useful variety of reports and graphs. Version 3.0 reviewed. Version 3.5 shipping. Requires Mac Plus or later, $119.95. Survivor Software Ltd., 11222 La Cienega Blvd., Ste. 420, Inglewood, CA 90304. (213) 338-0155. (July '89) ★ '86 Eddy

Managing Your Money

Managing Your Money is Andrew Tobias' respected and well-supported personal-financial-manager program. Long list of features. It can print checks and keep detailed accounts. An excellent choice for users with moderately complex financial needs. Version 2.0 reviewed. Version 4.0 shipping. Requires Mac Plus or later, System 6.3 or later, and a hard-disk drive. $119. Meca Software, Inc., P.O. Box 907, Westport, CT 06881. (203) 222-9150. (Apr '90)

Quicken

Quicken is the best tool for home budgets, cash-flow management, and tax-record keeping. Mimics your checkbook, so tracking your finances is easy and intuitive. Provides detailed reports supporting tax deductions and sources of income for Schedules A, B, C, D, and E; and Canadian tax forms. Version 1.6 reviewed. Version 2.0 reviewed. Requires Mac Plus or later. $59.95. Intuit, Inc., P.O. Box 3014, Menlo Park, CA 94026. (800) 624-8742 or (415) 322-6372. (Dec '89) ★ 88 Eddy

Tobias' respected and well-supplied Color Bits is a dream come true. It's still not the ultimate icon-manufacturing machine, but it lets you quickly draw a new icon or add color or revisions to an existing one. And it doesn't require RestEdit. Available on some BBSs and on-line services. Shareware, $10. Ben Haller. (Oct '90)

Dir-Acta-By

Dir-Acta-By displays to you an overview of the contents of a directory. Takes a picture of files and folders on your main disk to store in outline form. You can read files within any of the Acta DAs/applications or with other outlining programs. Impressive array of displays and directory view options. Shareware. Free. David Dunham. (Oct '90)

Klondike

Klondike is a version of solitaire that uses video-game-like scoring to create a super, totally addictive game. Simple to play — nearly impossible to stop playing. Version 3.3 reviewed. Version 4.0 reviewed. Requires Mac Plus or later, $10. Unison Software, Inc., 675 Almanor Ave., Sunnyvale, CA 94086. (408) 245-3000. (Dec '87)

MIDI Companion

MIDI Companion is a MIDI tool that lets you patch MIDI signals, sounds, and channels through the DA that has a slick feel and is easy to use. Features include curly (smart) quotes, a Find function that works well, and the option to set the typeface and size for the whole document but not for individual words. Designed for dot-matrix printers, it prints very well on laser printers too. Version 1.6 reviewed. Version 1.61 shipping. Shareware, $12. Maitrey Design, P.O. Box 1480, Goleta, CA 93016. (805) 966-7775. (Oct '90)

FREEWARE & SHAREWARE

ASCII Chart DA

ASCII Chart DA shows all 256 characters for a font. Fonts can be easily changed with the Font menu. Can display characters at 72 points. Quickly finds hidden characters, keystrokes, and hex equivalents. Doesn't print. Version 3.2 shipping. Free on many BBSs and on-line services. Jon Wind. (Oct '90)

Blesser

Blesser allows you to switch between your system Folder configurations on your hard disk without conflicts during startup. Prevents access to the Set Startup defaults from your system's startup switches. Requires Mac Plus or later, System 6.3 or later. $35. Shareware, $10. Ben Haller. (Oct '90)

Color Bits

Compared with previous generations of icon-drawing utilities, Color Bits is a dream come true. It's still not the ultimate icon-manufacturing machine, but it lets you quickly draw a new icon or add color or revisions to an existing one. And it doesn't require RestEdit. Available on some BBSs and on-line services. Shareware, $10. Ben Haller. (Oct '90)
Sound Manager Package 1

Sound Manager Package is a group of well-implemented sound-file manipulators and players. It's the best, most versatile utility set available for sound (as opposed to music) aficionados. Many useful and amusing sounds are included on disk. Version 1.40 shipping. Requires System 4.1 later. Ste. A. Southwick, 15801 Chase Hill Blvd., Ste. 109, San Antonio, TX 78256. (512) 709-2199.

SuperClock 1

SuperClock is a superb on-screen time indicator or clock. Is able to work properly in every environment and has excellent timer and alarm functions. Version 3.9 shipping. Requires System 4.1 or later. Free. Steve Christensen, CompuServe 76174.1712, AppleLink STEVEC. (Nov '90).

Graphics & Design

Capture

Capture is a reliable screen-capture utility. It can capture full or partial screens either to the Clipboard or to a PICT file. Supports 8-bit and 32-bit color. Capture may have to be renamed on your Mac to avoid INIT conflicts. Version 1.65 shipping. Requires System 6.0.3 or later. S.129.95. Mainstay, 5311-B Berry Ave., Agoura Hills, CA 91301. (818) 991-6540. (Jan '90)

ColorStudio

Although decidedly more complex and difficult to learn than Adobe's Photoshop, ColorStudio offers an unbeatable set of tools for professional-quality color manipulation and high-end output. For electronic prepress work, desktop publishing, computer-generated graphics, or other artwork, must look their best, ColorStudio lets you control color calibration, film separations, f-stop settings, and a wide range of image-editing tools. The Shapes Annex package (new bundled with ColorStudio) adds an editable PostScript drawing program. Version 3.0 shipping. Requires Mac Plus or later and System 6.0.3 or later. $995. Letraset USA, Inc., 40 Eisenhower Dr., Paramus, NJ 07653. (800) 343-8973 or (201) 884-2300. (June '90)

Digital Darkroom

If you don't need the color capabilities of more-expensive photo-manipulation programs, then Digital Darkroom is for you. Strictly for black-and-white or high-resolution gray-scale images, this program does everything required for professional photo processing. Uncluttered interface and a wide variety of painting and selection tools. Can colorize images. Version 2.0 reviewed. Requires Mac Plus or later with at least 4 MB of RAM and a hard disk drive or SE/30 or II series with gray-scale or color-video card. Free. Aldus Corp., 375 MicroFrontier, 7650 Hickman Rd., Des Moines, IA 50322. (800) 388-8109 or (515) 270-8109. (July '90)

Flexigraphs

Flexigraphs lets you start with basic charts that you can modify in a staggering variety of ways. The main interface is elegant but cluttered, so you add attractive details and modify certain parts of charts while locking other areas down. Version 2.0 reviewed. Requires Mac Plus or later. $149. TreeSLar, Inc., 116 Memory Ln., Campbell, CA 95008. (408) 371-8343. (Apr '90)

Image Analyst

Image Analyst is an image-processing program that lets you identify and analyze any element of an image. No programming is necessary. Measurements and statistics can be automatically or interactively generated from TIFF or PICT files or from captured video images. Manual is well illustrated but poorly written. Easy to learn. Version 7.1 shipping. $2,000. Automatic, 1000 Tech Park Dr., Billerica, MA 01821. (508) 667-7900. (July '90)

Image Grabber

Image Grabber is a D/1 screen-capture program. Can capture pull-down menus and convert 8- and 24-bit color-screen to 2-bit black-and-white files, saving huge amounts of memory. It has realtime, hardware delay modes and captures in the MacPaint and PICT formats. Version 2.0 reviewed. Requires Mac Plus or later and System 6.0.3 or later. $90. Image Designs, Inc., 8100 Olds Rd., Bellevue, WA 98007. (206) 861-6062. (May '90)

ImageStudio

ImageStudio puts a complete black-and-white or gray-scale photo-retouching lab onto the Mac desktop. Editable brushes let you modify digitized images in 256 gray levels. If you never worked with color images, ImageStudio is all you need for professional photo manipulation. Version 1.0 reviewed. Version 1.7 shipping. Requires Mac Plus or later and a hard-disk drive; gray-scale work requires 8-bit-video card and a moveable monitor. Letraset USA, Inc., 40 Eisenhower Dr., Paramus, NJ 07653. (800) 343-8973 or (201) 845-6100. (Oct '89)

LANDesign

LANDesign is a versatile land-surveying program that simulates the way surveyors worked before computers. Mac software. All standard geometric principles are supported, and all objects can be named with character identifiers and labels. This intelligent program is easy to use. Version 1.1 reviewed. Version 1.1 shipping. Requires Mac Plus or later (hard-disk drive recommended). $595. Compass Engineering, Inc., McCabe Crescent, Thornhill, Ontario L4J 2S6, Canada. (416) 738-4601. (Sept '89)

MultiClip 2.0

MultiClip 2.0 is a much improved version of an already great product. It lets you have as many Clipboards as your hard disk allows, making many graphics page-layout applications easier to use. The new features make it easier to find an image quickly. Version 2.0 reviewed. Requires Mac Plus or later. $129. Olduvai Corp., 7520 Reel Rd., Ste. A, Southbury, CT 06488. (203) 372-0750. (Nov '89)

PhotoMac

PhotoMac is a color-retouching tool for PICT and TIFF photo-manipulation. Displays and edits in 8-bit monochrome or 8- or 24-bit color. Performs color separations, but process requires substantial disk space. Version 1.0 reviewed. Version 1.5 shipping. Requires Mac II with 2 MB of RAM, a color monitor, an 8-bit-binarycard, a high-disk drive, $795. Data Translation, 100 Locke Dr., Marlboro, MA 01752. (508) 481-3700. (July '89) * $88 Eddy

Picture Shop

Picture Shop is a 32-bit photo-retouching program combining powerful image-editing capabilities with an unassuming interface. Easy to use. Flexible file-conversion options can import and export images from popular graphics file formats for Mac and DOS machines. Has 22 pictorial options and 5 third-party filters. Version 1.0 reviewed. Requires Mac II series, 2 MB of RAM, a hard-disk drive, and a color monitor. $895. Adobe Systems, 555 Charleston Rd., P.O. Box 7900, Mountain View, CA 94039. (800) 344-8335 or (415) 961-4400. (Oct '90) * $90 Eddy

Picturebook

Picturebook is a great Snapshop replacement. It catalogs your Scrapbook and lets you resize and/or crop anything that can be copied to the Clipboard. Powerful and has an excellent interface. Version 3.1 reviewed. Version 3.2a shipping. Requires Mac Plus or later (hard-disk drive recommended). $99.95. Loop Software, P.O. Box 1249, 704 University Dr., Menlo Park, CA 94025. (800) 285-7631 or (415) 324-7636. (Sept '89)

Screenshot

Screenshot is a simple, powerful screen-capture utility. It can precisely capture and save the contents of screen items, with extraneous pixels surrounding the captured image. You can convert color images to black-and-white on the fly and even change the size at the time of capture. You can leave the Screenshot window open to capture multiple images without repeatedly pressing the "Command-C" key. Images can be printed or saved immediately in bit-mapped paint, PICT, 24-bit color, Clipboard, or MacPaint Screen formats. Version 1.1 reviewed. $59.95. Baseline Publishing, 1770 Mortiah Woods Blvd., Ste. 14, Dallas, TX 75226. (817) 822-6767 or (901) 682-9676. (Mar '91)

Smart Art

Smart Art is a nifty PostScript utility disguised as a DA. It lets you save special effects with text and graphics and lets you import EPS files into any program. Has 15 text effects, Version 1.0.1 shipping. Requires Mac Plus or later, System 6.0.3 or later, and a PostScript laser printer. $149. Adobe Systems, 1583 Charleston Rd., P.O. Box 7900, Mountain View, CA 94039. (800) 344-8335 or (415) 961-4400. (Oct '89)

Smart Art II, III, and IV

Smart Art II, III, and IV are the second, third, and fourth volumes of Smart Art. Each volume includes an export facility and a much-improved DA that permits direct printing. Volume II includes graphic elements; volumes III and IV contain text effects. Version 1.0.2 shipping. Requires Mac Plus or later, System 6.0.3 or later, and a PostScript laser printer. $149 per volume. Adobe Systems, 1583 Charleston Rd., P.O. Box 7900,
<table>
<thead>
<tr>
<th>MINIFINDERS</th>
<th>Mountain View, CA 94039. (800) 345-9355 or (415)961-4400. (Jan '90)</th>
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</thead>
<tbody>
<tr>
<td>SmartScrap and The Clipper</td>
<td>SmartScrap and The Clipper are two powerful DA utilities for graphics work. SmartScrap is a major enhancement to the standard Scrapbook DA. The Clipper provides a transparent Clipboard window that lets you resize or crop a graphic in the area in which it will be pasted. Version 2.01 shipping. Requires Mac Plus or later and System 5.0.3 or later. $89.95. Solutions, Inc., P.O. Box 783, Williston, VT 05495. (802) 866-9223. (4/87) * 87 Eddy</td>
</tr>
<tr>
<td>SnapShot 1.1b</td>
<td>SnapShot is a DA/INIT utility that lets you capture full or partial screens. Differs from similar products in that the captured window remains on-screen within a real window, which you can use as you work. All or part of a screen, window, dialog box, or menu can be captured as a color or a black-and-white image. Supports PICT or paint formats. There is no way to scale or crop captured images or to save them as startup screens, but these features are available in other painting applications. Version 3.0 reviewed. $59.95. Wildfire Software, 211 W171 Cornet Rd., Lombard, IL 60148. (708) 916-9360. (June '91)</td>
</tr>
<tr>
<td>Streamline</td>
<td>Streamline is a dedicated PostScript auto-trace package. Can quickly produce nearly print-ready traces with little tweaking. Retains original scanned images' bit depth and size values. Final touch-ups must be completed in Illustrator or a similar program. Continuous-tone photos aren't worked well. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later and System 4 or later (2 MB of RAM recommended). $195. Adobe Systems, 1585 Charleston Rd., P.O. Box 7900, Mountain View, CA 94039. (800) 344-8335 or (415) 961-4400. (Nov '89)</td>
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<tr>
<td>Virtus WalkThrough</td>
<td>Virtus WalkThrough is a powerful modeling and visualization package that makes virtual reality available to ordinary desktop Macs. Provides two views of an imaginary building or other object: 2-D Design, which lets you create and precisely customize a model; and 3-D Walk View, which offers a real-time, rendered color perspective through which you navigate in any direction. Lacks interactive capabilities needed for serious CAD. Compact data files. Version 1.0.3 reviewed. Requires Mac Plus or later with 2 MB of RAM (hard-disk drive recommended). $895. Virtus Corp., 117 Edinburgh St., Ste. 204, Cary, NC 27511. (919) 467-9700. July '91) * 90 Eddy</td>
</tr>
</tbody>
</table>

**Note:**
- **CAD Aperture 3.3:** Aperture combines a CAD program with a database manager. Some of its numerous features are difficult to access, but generally the package is very useful. The database application is a decent flat-file manager, and the drawing portion of the package has color support, infinite zoom, and libraries as well as many other powerful tools. Version 1.0 reviewed. Version 1.0 shipping. Requires Mac Plus or later (Mac SE/30 or II series with 2 MB of RAM recommended). $795. Aperture Technologies, Inc., 84 W. Park Place, Stamford, CT 06901. (800) 342-9022 or (203) 975-7587. (Apr '90) * 90 Eddy |
- **Ashlar Velum 1.0:** Velum is an entirely new type of CAD package with AI elements. The cursor can inform you about its exact position (midpoint, end point, etc.) and so on. The program's tools include a library of resizable parametric shapes. Performance is good if you have a fast Mac and lots of RAM (at least 4 megabytes). Can import and export DXF files but not IGES files. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later and System 4 or later with 2 MB of RAM (4 MB recommended). $995. Ashlar, Inc., 1200 Oakmead Pkwy., Ste. 218, Sunnyvale, CA 94086. (408) 489-7486-1800. (May '90) * 90 Eddy |
- **Blueprint 2.0:** Blueprint is a 2-D CAD program with features that, as the name suggests, are particularly useful for architectural drafting. Its control over colors and patterns is excellent. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later. $295. Graphsoft, Inc., 8370 Coun Ave., Ste. 202, Ellicott City, MD 21043. (301) 461-9488. (July '90) |
- **Clippak 1.4.2:** Clippak is a CAD program that produces simple building floor plans and elevations. Its built-in parts libraries and many sample plans (that come from four separately available libraries) provide a wealth of drawing program. Version 2.6 shipping. Requires Mac Plus or later. $99.95; additional design libraries, $295.95 each. Abramdata Ltd., P.O. Box 2440, Eugene, OR 97402. (800) 451-4871 or (503) 342-3030. (May '90) |
- **DynaPerspective 3.0.2:** DynaPerspective was reviewed in earlier versions of this 3-D CAD program. Necessary drafting capabilities have now been added, its rendering tweaked, and its animations made faster and smaller. You can use up to 16 drafting layers. DynaPerspective's limitation is its method for measuring relative distances. It is a powerful, versatile tool and a great value. Version 2.0 reviewed. Version 2.02 shipping. Requires Mac II and at least 4 MB of RAM and 8- or 24-bit video card (hard-disk drive recommended). $995. Dynaware USA, Inc., 950 Tower Ln., Ste. 1150, Foster City, CA 94404. (800) 445-3962 or (415) 349-5700. (Dec '90) * 90 Eddy |
- **MiniCAD 3.0:** With a fast and logical interface, MiniCAD 3.0 has a Pascal-like macro language, an internal database, 2-D as well as 3-D graphics, a linked spreadsheet, and a low cost. But it may have the best 3-D capabilities among low-cost CAD programs. Good documentation. Graphsoft's tech support is helpful. A HyperCard tutorial stack is sold separately. Version 3.0 reviewed. Requires Mac Plus or later with 2 MB of RAM, System 6.0, and 8- or 24-bit video card (hard-disk drive recommended). $595. Graphsoft, Inc., 8370 Coun Ave., Ste. 202, Ellicott City, MD 21043. (301) 461-9488. (Apr '91) * 90 Eddy |
- **ModelShop 1.1:** ModelShop is a powerful 3-D modeling package. It needs many navigational and editing improvements to match its powerful feature set, however. Procedures not only differ from what you expect but often require too many steps. Version 1.1 shipping. Requires Mac Plus or later and a hard-disk drive. $595. Paracomp, Inc., 1725 Montgomery St., San Francisco, CA 94111. (415) 956-4091. (Apr '90) |
- **StrataCAD 3.0:** StrataCAD 3.0 brings mainframe rendering power to the Mac. You need a lot of RAM and a lot of patience. It's a modeling and visualization tool that can create photo-realistic 3-D images. Rendering can take hours, but it can also be done in the background so you can do other work. Conspicuously lacks precision options. Five libraries are available. Version 1.4.2 shipping. Requires Mac II series with FPU and hard disk and at least 2 MB of RAM. $495; libraries, $139 each. Strata, Inc., 2 W. St. George Blvd., Ancestor So., UT 84770. (800) 678-7282 or (801) 628-5218. (May '90) |

**ClipArt:** ClipArt is a sophisticated photo-graphics package that does not show any of its DOS roots. Excellent element manipulation and full-pilot supporter. Library user interface is extremely crowded. Version 3.0 shipping. Requires Mac Plus or later. $2,395. Computervision (Personal CAD/CAM Business Unit). 100 Crosby Dr., Bedford, MA 01730. (800) 488-7228 or (617) 275-1800. (July '88) * 90 Eddy |

**Clipped Art:** Clipped Art is a sophisticated photo-graphics package that does not show any of its DOS roots. Excellent element manipulation and full-pilot supporter. Library user interface is extremely crowded. Version 3.0 shipping. Requires Mac Plus or later. $2,395. Computervision (Personal CAD/CAM Business Unit). 100 Crosby Dr., Bedford, MA 01730. (800) 488-7228 or (617) 275-1800. (July '88) * 90 Eddy |

**Click & Clip:** The Click & Clip packages are graphics with seasonal themes.
The ClickArt series consists of Textures that provide more than 400 images. Each medium package is available on floppy disk and on CD-ROM. Comes with a well-designed catalog of images. Twenty volumes are available. Version 1.0 reviewed. Version 1.0 shipped. Requires a program that reads EPS files. CD-ROM, $79.95; single volume (disk), $99.95; two volumes (disk), $149.95. Image Club Graphics, Inc. 1902 Eleventh St. S.E., Ste. 5 Calgary, Alberta T2G 3E2, Canada. (800) 661-9410 or (403) 262-8008. (Aug '88)

Images with Impact
Images with Impact has three collections of superb, imaginative art. The 610-piece Deluxe package contains 175 images of people, equipment, and office scenes. Graphics & Symbolic covers several topics and drawing styles. Accents & Borders, winner of an Eddy Award, contains 270 design elements, including borders, frames, ornamental and mortise; registered users receive a bonus disk of color artwork. Images are opaque, and most are strategically subgrouped for reusing/edging. Excellent manual. Business package, $129.95; Graphics, $79.95; Accents & Borders, $129.95; 3G Graphics, 1140 N.E. 124th St., Ste. 6155, Kirkland, WA 98034, (408) 456-0234 or (206) 367-9321. (Nov '90) * * 90 Eddy

ArtWare Graphics Pak
The ArtWare Graphics Pak is a large collection of clip art with unique qualities. Overall, the most elegant. Other packages are available. Version 1.0 shipping. Requires a program that reads EPS files and a PostScript printer. $149.95. ArtWare Systems, Inc., 6512 Six Forks Rd., Ste. 302A, Raleigh, NC 27615. (800) 722-3764 or (919) 870-8910. (Sept '89)

Totem Graphics
Totem Graphics provides 13 volumes of PostScript images in 24-bit color. Color blends and fine details look superb even when printed in black-and-white. The 13 categories emphasize animals and plants, but also include holidays, food, sports, hardware, and people. Images are available in four formats and are fully editable. Requires Mac Plus or later and a hard-disk drive; requires Mac II series for color images. $39.95 per category; $99.95 for CD-ROM with all categories. Totem Graphics, 5190A Capitol Blvd., Tumwater, WA 98501. (206) 352-1851. (Oct '90)

MacGraphic
MacGraphic is a whimsical collection of MacPaint images, ideal for children's publications, newsletters, fliers, and invitations. The 400 original illustrations include holidays, food, sports, borders and ornaments, animals, plants, and suns. Excellent manual. Requires Mac Plus or later and graphics program compatible with MacPaint format, files. $49.95 each. DreamMaker Software, 7415 Foothill Blvd., Tujunga, CA 91042, (800) 876-5665 or (818) 340-7057. (Nov '90)

CloneArt
CloneArt is a collection of bit-mapped clip art on 13 thematic disks. Most pictures are full-page, and unfortunately, reproduction quality suffers when they are reduced. Version 3.0 reviewed. Thirteen-disk set, $225. GoldMind Publishing, 4984 Tula Ave., Riverside, CA 92505, (714) 687-3815. (Feb '89)

Metro ImageBase Electronic Art
Metro ImageBase Electronic Art is a series of TIFF and EPS clip art from the grandparent of the clip art industry. The traditional-looking images are huge, so have a large hard-drive handy. There are 18 volumes. Requires Mac Plus or later. $145 per volume. Metro ImageBase, Inc., 1892 Foothill Blvd., Ste. 210, Tarzana, CA 91356, (800) 525-1552 or (818) 477-1997. (Aug '89)

Professional Photography Collection, Volume 1
This CD-ROM contains 100 color TIFF images. Each image comes in three formats: 24-bit high-resolution color, 24-bit low-resolution color, and 8-bit black-and-white. Strikingly clear, high-quality images. Includes printed catalog and a liberal rights policy. Excellent bay. Requires Mac II series, a color monitor, and a CD-ROM drive. $149.95; membership, $199.95. Personal Computer, 1240 McKay Dr., San Jose, CA 95131. (800) 331-5326 or (408) 432-1727. (May '87)

Canvas
Canvas 2.0 is a rich drawing/painting program that features full Bezier curves; the cutting and joining of polygons; skewing, perspective, and distortion capabilities; auto-dimensioning; area and perimeter calculation; auto-tracing of bit maps; and full color support. Creates and edits high-resolution bit maps to 2,540 dpi. Slightly less powerful than DA version available. Version 2.0 reviewed. Version 3.0 shipped. Requires Mac Plus or later and System 7.0.2. Deneba Software, 3205 N.W. 74th Ave., Miami, FL 33122. (800) 622-6827 or (305) 594-6965. (Apr '89) * 90 Eddy

Mice Ratings

MacUser August 1991 | MiniFinders 151
MINIFINDERS

Color MacCheese

Color MacCheese is an inexpensive color painting program that is designed for artistic fun, not as a professional tool. It has two noncustomizable palettes, resolution up to 72 dpi, and there are no rulers. Only one document can be opened at a time. But for casual painters who want to get work immediately, Color MacCheese is perfect. Version 1.05 reviewed. $99. Delta Tao Software, Inc., 760 Harvard Ave., Sunnyvale, CA 94087. (800) 827-3510 or (408) 750-3936. (Mar '91)

The Comic Strip Factory

The Comic Strip Factory is an assembly program for creating comic strips. Includes a database of parts for various characters as well as backgrounds for panels. Good at editing in balloons. Can import other images and change colors. Requires Mac Plus or later. $152. MiniFinders, P.O. Box 246, New Shore Ln., Prior Lake, MN 55372. (612) 445-8860. (Dec '87)

DeskPaint and DeskDraw

DeskPaint and DeskDraw are reasonably full-featured painting and drawing programs in DA format. You can calibrate vertical and horizontal rulers in inches, millimeters, picas, or points/pixels. Printer resolution can reach 4,000 dpi. DeskPaint has image-manipulation functions to satisfy any user except professional electronic artists. Version 3.03 reviewed. Requires a color display system, 2 MB of RAM, and a hard-disk drive. $199.50. Zedcor, 4500 E. Speedway, #22, Tucson, AZ 85712. (602) 881-8101. (Mar '91)

DeskDraw Tools

DeskDraw Tools is a simple three-D tool for use with MacDraw II. Sizer does exact scaling and dimensioning, calculates enclosed areas, and creates a drawing. Adjacency brings together any two selected objects. Tools adds a handy menu that lets you clip or reshape lines and build fillets. Can be awkward to use. Version 1.1 reviewed. Requires Mac Plus or later and MacDraw II 1.0 or 1.1 or 1.2. $99.95. Paracom, Inc., 1725 Montgomery St., San Francisco, CA 94111. (415) 956-4019. (July '90)

Easy Color Paint

Easy Color Paint is a low-cost, basic 8-bit (256-color) paint program. Can print to color printers, five color palettes as well as monochrome palettes. Each palette has 38 patterns, and one is totally user-definable. Poor manual. Offers good performance for casual use. Version 1.0 reviewed. Version 1.1 reviewed. $79. Creative Software, 55 Clinton Ave., New Providence, NJ 07974. (800) 367-6899 or (201) 696-3116. (Sept '90)

FreeHand

FreeHand 3.0 is a professional PostScript illustration package. Includes auto-trace, 100 levels of blend command, powerful Blend command. Version 3.0 improves text manipulation but relies on dialog box for input. Fast FreeHand comes with freehand tool palettes (Colors, Layers, and Styles). Can edit in preview mode. Allows Pantone, spot, or CMYK process colors. Displays, separates, and prints 32-bit color TIFF images and generates color EPS files compatible with OPI (Open Prepress Interface) system. Slow learning curve but now has streamlined, easy-to-navigate interface. Version 3.0 reviewed. Requires Mac Plus or later and at least 2 MB of RAM. $595. Aldus Corp., 411 First Ave., S. Seattle, WA 98104. (800) 333-2538 or (602) 268-6230. (July '90)

Illustrator

Illustrator is a professional-level color PostScript graphics program from the people who defined the PostScript language. Its powerful, compact toolbox has many drawing tools that did earlier versions. Its new charting functions let you import spreadsheet data as text, which are automatically converted into complex, easily customized charts (changes to imported numerical data also update the chart). Uses a freehand drawing mode or bit-mapped templates for detailed artwork. Version 3.0 reviewed. Requires Mac Plus or later. $595. Adobe Systems, 1585 Charleston Rd., P.O. Box 7900, Mountain View, CA 94039. (800) 344-8335 or (415) 961-4400. (Feb '91) * 88 Eddy

MacCalligraphy

MacCalligraphy simulates brush painting. User-designed Seals and Touches enable you to design a signature tool and the style of brush you use. Takes some getting used to. Package includes a wooden box stores disks and documentation. Version 1.0 reviewed. Version 2.01 shipping, $149.50. Qualitas Trading Co., 6907 Norfolk Rd., Berkeley, CA 94705. (415) 848-8080, (Feb '88) * 88 Eddy

MacDraft

MacDraft is an object-oriented drawing program that offers a rich set of features for a moderate price. Object rotation is precise, and it accesses the full spectrum of 16.7 million colors. It is particularly appropriate for high-school or college-level introductory CAD classes or for small architectural/ construction contracting businesses. Version 2.0 reviewed. Version 2.1 shipping. Requires Mac Plus or later, System 6.0 or later, and a hard-disk drive. $79.95. Innovative Design, Inc. (IDD), 2280-A Bates Ave., Concord, CA 94520. (415) 680-6618. (Oct '90)

MacDraw II

MacDraw II updates the venerable, popular object-oriented drawing program. Adds dithered and color patterns in its own commands, but uses the same color in PICT II format. Version 1.0 reviewed. Version 1.1 shipped. Requires Mac Plus or later, System 6.0 or later, and a HyperCard text layer. $85. Eddy

MacPaint

MacPaint has lost its shine after all these years. Supports multiple windows, design templates, and a magic eraser for corrections. It lacks free-rotation and distortion. Version 2.0 reviewed. Requires Mac Plus or later. $125. Claris Corp., 5201 Patrick Henry Dr., Santa Clara, CA 95052. (800) 544-8554 or (408) 727-8227, (Nov ‘88) * 88 Eddy

MacPaint II

MacPaint doesn’t rival its high-performance precursors, but it is a workable painting environment, multiewindow capability, some interesting special effects, and a lower price. Version 3.0 reviewed. Requires Mac Plus or later. $54.50. Aldus Corp., 411 First Ave., Seattle, WA 98104. (408) 727-8227. (July ‘88) * 85, ‘87 Eddy

Photo Paint

Photo Paint includes feature s such as plug-in tools, auto-trace, Bezier curves, and a HyperCard playback utility. Can render objects as a 3-D scene with lights and shadows. Supports 3-D scene construction, but it does offer its usual effects include magnification, rotation/resizing/stretching; transparency; and the “magic wand,” which selects only certain parts of an image within a certain range. Despite its power, Studio/32 is exceptionally easy to use. Version 1.0 reviewed. Requires 24-bit-color display, 5 MB of RAM, and a hard-disk drive. $30.95. Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. (800) 245-4525 or (415) 571-7171. (Mar ‘90) * 80 Eddy

Super 3D

Super 3D is an update of an excellent 3-D object-oriented drawing program. Powerful features are easy to use. Three solid-rendering modes. Can export a scene as object-oriented 2-D snapshot in PICT or EPS. Version 2.0 reviewed. Requires Mac Plus or later, System 6.0 or later, and a hard-disk drive; requires Mac II series or later for color work. $495. Aldus Corp., 411 First Ave., Seattle, WA 98104. (800) 333-2535 or (206) 628-2320. (Mar ‘90)

SuperPaint

SuperPaint 2.0 is a combination drawing/graphics/designing package that includes features such as plug-in tools, auto-trace, Bezier curves, support for resolutions exceeding 300 dpi, and eight-color support. Adds a HyperCard playback utility, particularly fast. Version 2.0 reviewed. Requires Mac Plus or later. $199. Aldus Corp., 411 First Ave., Seattle, WA 98104. (800) 333-2535 or (206) 628-2320. (July ‘89)

Swivel 3D

Swivel 3.0 is a program for shaded solids in full color. Casts true shadows onto other objects and can project color graphics onto solids. Objects can
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Tape Cart: Bernoulli B33C 4MB ............... 57804 $95
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You already know that CD-ROM gives you access to huge amounts of information, and now Chinon CD-ROM drives let you access all that information without breaking the bank. This Chinon drive is reasonably priced and will also play pure audio compact disks. Comes complete with Adobe Type On Call — a CD that includes Adobe Type Manager and two type families — FREE! Type On Call is the most automatic, affordable way to select the Adobe typefaces you need — anytime you need them.

**Chinon CD-ROM drive with Adobe Type On Call**

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**Adobe Type On Call**

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### COMMUNICATIONS

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### THE GRAPHIC ARTS

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You can double the effective storage capacity of hard disks (and diskettes) with Double-Up with DiskDoubler from Sigma Designs. This NuBus card compresses and decompresses graphics, data and application files fast. Double-Up with DiskDoubler (256MB)...

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### Fast and Versatile Scanner

The Logitech ScanMan 32 is a convenient hand-held scanner that creates 32 shades of gray offers resolution options from 72dpi to 400dpi. Connects directly to any SCSI port.

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MINIFINDERS

be linked as jointed and sliding mechanisms that can be manipulated without the need for cutting or drilling. It can tween-animate objects or fly your view through a scene, saving frames for playback. Super-objects are supported, including color and texture. Experienced artists may also find it useful. It's a solid packaging suite with all the basic tools plus a variety of specialized tools, which have a somewhat quirky interface. Version 1.0 reviewed. Requires Mac II or LC with color monitors; $199. Denese Software, 3305 N.W. 74th Ave., Miami, FL 33122, (800) 622-6827 or (305) 594-0695. (Sept '90)

UltraPaint

UltraPaint is an 8-bit-color, graphics program best suited for those new to computer graphics and color, but experienced artists may also find it useful. It's a solid packaging tool with all the basic tools plus a variety of specialized tools, which have a somewhat quirky interface. This portable computer is designed for Macintosh, and uses the Macintosh program. The program also includes a powerful graphical equation editor and a matrix editor that supports windowing. Programs and variables are stored by name in a directory. The calculator uses sound output, a real-time clock with alarms, and includes a screen as well as RAM and ROM expansion. The Serial Interface Kit adds considerable power but could use improvement. $395. Hewlett-Packard 48SX. 100 N.E. Circle Blvd., Coralville, Iowa 52241, (800) 752-7360 or (501) 752-7736. (Mar '91)

Personal Terminal

The Personal Terminal is a Macintosh terminal-emulation program that doesn't help in setting up the modem for full data compression or transmitting data. Requires Mac Plus or later. $339. Anchor Automation, Inc., 20675 Bahama St., Chatsworth, CA 91311. (818) 598-6000. (Jan '91)

Applied Engineering DataLink Express

This 2,400-bps modem's slow performance is partly due to MNP 5 compression, and the built-in Terminal 1.5 software doesn't help in setting up data compression or error correction. The modem comes with its own hardware-handshaking cable, necessary for data-flow control. $249; with fax, $349. Applied Engineering, 3210 Bell Lake Rd., Scottsdale, AZ 85251. (602) 241-6060, (Jan '91)

Computer Friends LightFax 9624

The LightFax 9624 is a fax modem capable of either 2,400-bps data transmission or 9,600-bps facsimile transmission. Fax mode allows sending as well as receiving. The inexpensive LightFax 9624 features voice-call detection and has good print times. But this fax modem isn't particularly fast, churning out a simple PageMaker test document, it has long regain control times, and suffers from a clumsy software interface. No Preview mode. The documentation is almost as bad as an average manual for DOS software. $549; networkable version, $799. Computer Friends, Inc., 14250 N.W. Science Park Dr., Portland, OR 97229. (800) 547-3303 or (503) 626-2291. (May '91)

Computer Friends Lightspeed 2400E

The price/performance of this 2,400-bps modem makes it a best buy. If you buy one, make sure the right cable — the CBL-124 — is included. Fax modem allows sending as well as receiving. The InterFax 2400E incorporates automatic data/fax switching, polling support, activity reports, good print times, and good regain control times. Error correction is MNP Class 4, and data compression is MNP Class 5. Lacks features such as user-definable cover pages, a Preview mode, and scaling. Off-hook times are long, which can cause higher phone charges, but creating a fax is faster. Requires Mac II or later. (June '91)

Cypress Research FaxPro

The FaxPro is a fax modem capable of either 2,400-bps data transmission or 9,600-bps facsimile transmission. Fax mode allows sending as well as receiving. The FaxPro is a fax modem capable of either 2,400-bps data transmission or 9,600-bps facsimile transmission. Fax mode allows sending as well as receiving. The FaxPro incorporates activity reports and turns in good times for printing, except for FaxPro + Hook. A Preview mode and an Exact Scale Option are provided, but there's no graphics-conversion feature and there may be some software incompatibilities. Requires Mac II or later. (March '91)

Mice Ratings

Mice are inidexed as jointed and sliding mechanisms that can be manipulated without the need for cutting or drilling. They can tween-animate objects or fly your view through a scene, saving frames for playback. Super-objects are supported, including color and texture. Experienced artists may also find it useful. It's a solid packaging suite with all the basic tools plus a variety of specialized tools, which have a somewhat quirky interface. Version 1.0 reviewed. Requires Mac II or LC with color monitors; $199. Denese Software, 3305 N.W. 74th Ave., Miami, FL 33122, (800) 622-6827 or (305) 594-0695. (Sept '90)

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The V-series Smartmodem 9600 is one of the fastest modems available. For high-speeds, you need a special cable and software that supports the V.42 and X.25 protocols. Requires Mac 512Ke or later, Mac-to-modem cable, and communications software. $999; with Smartcomm II for the Mac, and HayesConnect software, $1,049. Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348. (404) 441-1617. (Jan '89)

HyperDialer

This 2,400-bps modem delivers average performance. Its software requires manual setup for data compression and error correction. Before buying, double-check to see that it includes the right cable for hardware flow control. The modem has a five-year warranty. $369, Intel Corp., 5200 N. Elam Young Pkwy., Hillsboro, OR 97124. (503) 338-3373 or (503) 682-6800. (Jan '90)

Orchid OrchidFax

The OrchidFax is a fast modem capable of either 2,400-bps data transmission or 9,600-bps facsimile transmission. Fax mode allows sending as well as receiving. The OrchidFax can send Mac files at 9,600 bps to other OrchidFax modems or an AppleFax and has fast-receive control timers along with LQ fonts and a two-year warranty. However, these capabilities aren't enough when you consider the cost. It's not the fastest modem available, but it's as good as any 2,400-bps modem. Requires Mac SE or later. $225. Global Village Communication, 1204 O'Brien Dr., Menlo Park, CA 94025. (415) 325-0700. (Jan '91) *'90 Eddy

Hayes V-series Smartmodem

This modem showed outstanding performance in our tests. Its V.42bis compression lets it operate twice as fast as modems with the alternative MNP 5. In some instances, its data-compression schemes let it approach 9,600-bps throughput. Software is easy to use and intuitive. $649; bundled with Smartcomm II and Hayes Connect, $699. Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348. (404) 441-1617. (Jan '89)

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This V-series Smartmodem 9600 is one of the fastest modems available. For high-speeds, you need a special cable and software that supports the V.42 and X.25 protocols. Requires Mac 512Ke or later, Mac-to-modem cable, and communications software. $999; with Smartcomm II for the Mac, and HayesConnect software, $1,049. Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348. (404) 441-1617. (Jan '89)

Apple MicroTV

The MicroTV is a NuBus board that puts a small (128-x-108 pixel) video or broadcast image on your Macintosh. Performance depends on screen resolution. Requires Mac II with Macintosh 9424 and 8-24 cc cards. Its 69-dpi screen resolution gives a slightly larger-than-WYSIWYG image. Very reliable. Requires video card (optional with Mac LC, IICi, and IIfi), $999. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (408) 776-2333 or (408) 776-4300. (Apr '90)

AppleColor High-Resolution RGB Monitor

The AppleColor High-Resolution RGB Monitor is standard among 13-inch monitors. It's very bright, with no built-in glare protection. Can support 24-bit color when used with the Macintosh 9424 and 8-24 cc cards. Its 69-dpi screen resolution gives a slightly larger-than-WYSIWYG image. Very reliable. Requires video card (optional with Mac LC, IICi, and IIfi), $999. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (408) 776-2333 or (408) 776-4300. (Apr '90)

The Big Picture

This 17-inch monochrome display has a greenish high-persistence phosphor. Screen sharpness is uneven. Good but not ideal. Response is uneven, and there is slight ghosting. Requires Mac 512Ke or later. $1,650. E-Machines, Inc., 93055 S.W. Gemini Dr., Beaverton, OR 97005. (503) 344-7274 or (503) 646-6699. (Apr '90)

CalComp DrawingCard ChromaVision

This 21-color monochrome display plays all A4 pages. Screen coloration is uneven. No bundled software. Accelerated QuickPlus video was planned for mid-1991 release. Requires Mac II series, 8-bit ChromaVision Plus, $5,995; 24-bit ChromaVision Plus, $6,995; color matching, $1,695. CalComp, 2411 W. La Palma Ave., Anaheim, CA 92801. (714) 225-6477 or (800) 327-4660. (Apr '90)
The ColorSpace II/DFX is a 24-bit video display that can be used with a Mac. The FV board converts TV signals so they can be displayed on the Mac. Offers sophisticated special effects. The Ill lets you mix live video with computer graphics. Includes Digitizer DA to grab frames for export; also has VideoAuthor tool kit for HyperCard authoring. Requires Mac II series and appropriate cable. Ill and ColorSpace FX bundle, $2,495. Mass Micro- systems, 802 Broadway, Sunnyvale, CA 94086. (800) 522-7979 or (408) 522-1200. (Mar '90)

**Cutting Edge Full Page Display**

The Cutting Edge Full Page Display has a 15-inch-diagonal monochrome screen with average image quality. The screen geometry is good, and nuisance factors are minimal. Videocards are available for the SE, SE/30, and Mac II series. Comes with a tilted/swivel stand, $899. Canon, 4359 S. Red Willow Rd., Evanston, WY 82930. (307) 789-0582. (Feb '91)

**DTI SpeedView**

The SpeedView is a full-page display that can show an entire actual-size tabloid page. Designed for professional publishers who need large screen acreage. Image quality is impressive and is competitive with smaller 15-inch displays. Comes with monochrome or gray-scale card plus tilt/swivel stand, $945. DTI, 1087 S. Red Willow Rd., Evanston, WY 82930. (307) 789-0582. (Feb '91)

**E-Machines ColorPage T16/S**

The ColorPage T16/S is consistently rated the best and brightest 8-bit-color monitor by MacUser Labs. The monitor is a razor-sharp Sony Trinitron, and the videocard is an AT compatible 8-bit with Mac II family. With 8-bit card, $995. E-Machines, Inc., 9305 S.W. Gemini Dr., Beaverton, OR 97005. (503) 646-3447 or (503) 646-6699. (May '91)

**E-Machines TX/24**

This 24-bit-color display system combines the E-Machines TX monitor with a 24-bit videocard. Delivers very good overall performance. The 16-inch-diagonal screen size is large enough for most professional applications. This monitor provides a non-WYSIWYG, 8-bit display that allows plenty of information at somewhat-reduced scale — good for CAD and freehand drawing but not for WYSIWYG desktop publishing. Excellent convergence and software. Requires Mac SE/30 or II series with NuBus adapter. $4,495. E-Machines, Inc., 9305 S.W. Gemini Dr., Beaverton, OR 97005. (503) 646-3447 or (503) 646-6699. (May '91)

**E-Machines TX Full Page Display**

Considering its price, the E-Machines TX Full Page Display is a real bargain. It has a warm-color phosphor and bright screen. It has good software with inverse-video capability. Card difficult to install. Screen resolution is 80 dpi. Requires Mac Plus or SE, $1,495. Genius Technologies, 755 Mass St., Hastings, MN 55033. (800) 328-9254 or (612) 473-2237. (Apr '90)

**MacTel Index Portrait**

The MacTel Index Portrait has a 15-inch-diagonal monochrome display with average image quality, but adequate brightness and color that's not too bright or too dull. Comes with a tilt/swivel stand. $625. MacTel Technology, 3007 N. Lamar Blvd., Austin, TX 78751. (512) 451-2600. (Feb '91)

**MagicView**

This 15-inch monochrome monitor is not very sharp but has good color. Focus is excellent. Requires 8-bit card for Mac II family. Comes with a tilt/swivel stand. $5,995. E-Machines, Inc., 9305 S.W. Gemini Dr., Beaverton, OR 97005. (503) 646-6699. (May '91)

**MagicGraphics 2002**

This 24-bit-color display system combines a Sony Trinitron monitor with a 24-bit videocard. This high-quality, high-resolution system delivers good overall performance. The 16-inch-diagonal screen size is adequate for most professional applications. The videocard is not WYSIWYG, because of the condensed 88-dpi pixel density, but it lets you see a lot of your layout or artwork on a screen. Sharpness, focus, brightness, and color quality are excellent. Requires Mac II series. $6,795. MagicGraphics, 439 Calle San Pablo, Camarillo, CA 93012. (805) 487-6342 or (805) 484-3799. (May '91)

**Megagraphics 2000**

This 19-inch color monitor is bright and fairly sharp. Excellent color quality and software. Hardware capabilities include pan and zoom (with 24-bit card only). Requires SE or Mac II series. $8,995. Model 280. Requires Mac SE or II series. $5,995. Generation Systems, Inc., 1185 C Bordeau Dr., Sunnyvale, CA 94089. (512) 451-2600 or (408) 734-2100. (May '90)

**Lapis DisplayServer II-DPD**

The DisplayServer II-DPD is a monochrome NuBus videocard that lets a Mac II run PC-compatible VGA monitors. The card has occasional problems with some Mac programs, and it is cost-effective with a small monitor. Users on a budget, however, can save hundreds of dollars by using this card with a recycled big VGA monitor — it produces a crisp, jitter-free image. Requires Mac II series. $249. Lapis Technologies, 1210 Marina Villas Pkwy., Ste. 100, Alameda, CA 94501. (415) 748-1600. (Nov '90)

**MacGenius**

This 19-inch monochrome monitor has a warm-color phosphor, and bright screen. It has good software with inverse-video capability. Card difficult to install. Screen resolution is 80 dpi. Requires Mac Plus or SE, $1,495. Genius Technologies, 755 Mass St., Hastings, MN 55033. (800) 328-9254 or (612) 473-2237. (Apr '90)

**Mirror PixelView**

This unique full-page display system is capable of displaying any Mac application, with a choice of either 24- or 256-color display. Comes with a screen saver and large-cursor option and useful feature set. Requires Mac II series.
This 24-bit-color display system combines a Sony Trinitron monitor with a 24-bit-video card. A high-quality, affordable combination, this system delivers good overall performance. The 19-inch-diagonal screen size is large enough for nearly all professional applications. Sharpness, focus, and color quality are excellent, but geometry is slightly off. Good software. Requires Mac II series.

PCPC II 10" Color Display

This 24-bit-color display system combines a Sony Trinitron monitor with a 24-bit-video card. A high-quality, affordable combination, this system delivers good overall performance. The 18-inch-diagonal screen size is large enough for most professional applications, but the 8-dpi pixel density produces an image that may appear too condensed. Sharpness, focus, and color quality are excellent. Includes Stepping Out II software. Requires Mac II series. $3,495. PCPC (Personal Computer Peripherals Corp.), 4710 Eisenhower Blvd., Bldg. A4, Tampa, FL 33634. (800) 622-2888 or (813) 884-3092. (Apr '90)

PCPC II 19" Mono Display

This 19-inch monochrome monitor is bright and has good-quality focus. Geometry is fair. Phosphor is clean with a yellowish hue in the center. Includes Stepping Out II. Screen resolution is 72 dpi. Requires Mac Plus, SE, SE/30, or Mac II series. $1,699. Nutmeg Systems, 28 South Ave., New Canaan, CT 06840. (203) 966-3226. (Apr '90)

PCPC II 10" Color Display

This 24-bit-color display system combines a Sony Trinitron monitor with a 24-bit-video card. A high-quality, affordable combination, this system delivers good overall performance. The 16-inch-diagonal screen size is large enough for most professional applications, but the 8-dpi pixel density produces an image that may appear too condensed. Sharpness, focus, and color quality are excellent. Includes Stepping Out II software. Requires Mac II series. $3,495. PCPC (Personal Computer Peripherals Corp.), 4710 Eisenhower Blvd., Bldg. A4, Tampa, FL 33634. (800) 622-2888 or (813) 884-3092. (Apr '90)

PCPC II 19" Color Display System

This 21-inch color monitor has a sharp-screen image. Eight-bit color is excellent, but gray linearity is poor. Noticeable flicker. Includes Stepping Out II software. Requires Mac II series. $5,995 with 8-bit card. PCPC (Personal Computer Peripherals Corp.), 4710 Eisenhower Blvd., Bldg. A4, Tampa, FL 33634. (800) 622-2888 or (813) 884-3092. (May '91)

PCPC II 21" Color Graphics System

This 21-inch color monitor has a sharp-screen image. Eight-bit color is excellent, but gray linearity is poor. Noticeable flicker. Includes Stepping Out II software. Requires Mac II series. $5,995 with 8-bit card. PCPC (Personal Computer Peripherals Corp.), 4710 Eisenhower Blvd., Bldg. A4, Tampa, FL 33634. (800) 622-2888 or (813) 884-3092. (May '91)

PCPC Shadowgraph

This 24-bit-color display system combines a Sega Trinitron monitor with a 24-bit-video card. This high-priced combination delivers good overall performance. The 20-inch-diagonal screen size is large enough for nearly all professional applications. Sharpness, focus, and color quality are excellent. Requires Mac II series. $7,490. Moniterm, 5740 Green Circle Dr., Minnetonka, MN 55343. (800) 933-5740 or (612) 935-4151. (May '91)

PCPC MultiView II

This overall performance of this 15-inch-diagonal monochrome monitor was below average in our lab tests. Screen geometry and focus are poor. Price is high considering the quality. Comes with a tiltswivel stand. With board for SE or SE/30, $545; with board for Mac II series, $995; with OCLI anti-glare treatment, $75. Princeton Publishing Labs., Inc., 19 Wall St., Princeton, NJ 08540. (908) 241-1153. (Feb '91)

Radius Full Page Display

This 24-inch monochrome monitor is bright and has good monochrome quality. This system delivers good overall performance. The 20-inch-diagonal screen size is large enough for nearly all professional applications. Sharpness, focus, and color quality are excellent. The Radiu s Full Page Display is a bright monochrome monitor, with screen resolution slightly below that of true WYSIWYG. It is capable of 256 shades of gray. A slight flicker is perceptible. Requires Mac Plus or later. $895; SE/30, or LC. Monitor only, $1,995 (for Macs with built-in video); optional video card, $795; 2-bit card for LC, $395; 8-bit upgrade kit, $400. Radius, Inc., 1710 Fortune Dr., San Jose, CA 95131. (800) 227-2795 or (408) 434-1010. (June '91)

Radius Pivot for Built-in Video

The Radius Pivot for Built-in Video is an impressive 15-inch-diagonal full-page display. Has excellent focus and maximum usable brightness. Has the ability to rotate 90 degrees between portrait and landscape orientations. Comes with a tiltswivel stand. Video card requires Mac II series, SE/30, or LC. Monitor only, $1,995 (for Macs with built-in video); optional video card, $795; 2-bit card for LC, $395; 8-bit upgrade kit, $400. Radius, Inc., 1710 Fortune Dr., San Jose, CA 95131. (800) 227-2795 or (408) 434-1010. (Apr '90) $895 Radius Pivot for Built-in Video

The ColorBoard 264 is a low-cost video board with 32-bit capability and good performance. One of the cheapest ways to get 16.7 million colors on your Mac. Requires Mac II series or SE/30, System 6.0.3 or later, and 32-bit QuickDraw.NuBus version, $575; SE/30 version, $895. RasterOps, 2500 Walsh Ave., Santa Clara, CA 95051. (800) 227-2656 or (408) 562-4200. (Apr '90)

Rasters ColorBoard 364

The ColorBoard 364 is a dual-purpose NuBus board—a digitizing and display board as well as a 24-bit display card for the Apple 13-inch monitor. Good but limited software. Handles both video input and output. Digitizes video input with good image quality (8- or 24-bit). Video-in options include composite and S-video input, with adjustable sync and a resilient 940-x-480-pixel, 24-bit window. Requires Mac II series. $1,295. RasterOps, 2500 Walsh Ave., Santa Clara, CA 95051. (800) 227-2656 or (408) 562-4200. (Feb '90)
nice software bundle. Requires Mac Plus or later. $1,595. Abaton (Everex Systems), 48431 Milmont Dr., Fremont, CA 94538. (800) 444-5221 or (415) 683-2226. (Sept ‘90)

**Agfa Focus S800GS**

This Focus S800GS is a 400-dpi, 6-bit gray-scale scanner that simulates resolutions of up to 800 dpi. It has superior resolution and good halftone quality. Professional-quality software has extensive editing features and printing options. Users requiring 8-bit (256-gray) resolution will need Agfa’s new Focus II S800GSE. Requires Mac Plus or later and NC View software. $3,995; NC View software, $495. Agfa Compugraphic, 200 Ballardave St., Wilmington, MA 01887. (800) 227-2780 or (508) 658-5600. (May ‘91)

**SuperMac (Hitachi) 21”**

This high-quality color display system combines a Hitachi monitor with a Spectrum/24 PDQ 24-bit-video card. It delivers excellent color quality, and the 21-inch-diagonal screen size is large enough for nearly all professional applications. The WYSIWYG display has 77-dpi pixel density. Few external controls are provided to manage screen-image characteristics. Requires Mac II series, $7,199; SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94086. (408) 245-2202. (May ‘91)

**SuperMac (Hitachi) 19”**

This high-quality color display system combines a Hitachi monitor with a Spectrum/24 PDQ 24-bit-video card. It delivers excellent color quality, and the 19-inch-diagonal screen size is large enough for nearly all professional applications. The WYSIWYG display has 77-dpi pixel density. Few external controls are provided to manage screen-image characteristics. Requires Mac II series, $7,199; SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94086. (408) 245-2202. (May ‘91)

**Agfa Focus II S800GSE**

This 8-bit gray-scale-only flatbed scanner has high resolution and intuitive software. Also has excellent professional software. Requires Mac Plus or later and NC View software, $5,495; NC View software, $495. Agfa Compugraphic, 200 Ballardave St., Wilmington, MA 01887. (800) 227-2780 or (508) 658-5600. (Sept ‘90)

**Apple Scanner**

The Apple Scanner is not a state-of-the-art unit but is adequate for scanner neophytes. The 4-bit (16 gray level) scanner comes with AppleScan software and HyperScan, written by Bill Atkinson. Requires System 6.0.3 or later, appropriate SCSI cables, and a hard-disk drive. $1,799. Apple Computer, Inc., 20525 Mariani Pkwy., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Sept ‘90)

**Asher Engineering quadLynX Trackball**

The quadLynX Trackball has an encased trackball. Small size makes it easy to control. Requires some wrist movement to access the buttons. Comes in both ADB and non-ADB versions. Requires Mac 512K or later, $99.95. Asher Engineering, 15115 Ramona Blvd., Baldwin Park, CA 91706. (800) 321-5969 or (818) 962-4063. (Oct ’89)

**Barneyscan CIS 315**

This slide scanner is easy to set up and has short scan times. Excellent software. Difficult manual focus. Image preview is in gray scale, not color. Unit requires regular calibration. Requires Mac II series for color work. $4,495. Barneyscan Corp., 1125 Atlantic Ave., Alameda, CA 94501. (415) 521-3388. (Sept ‘90)

**CalComp DrawingBoard 230A**

The CalComp 230A is a full-featured drawing board that lets you resize and reposition the drawing area. Six different input devices (pens and packs) and several software packages are available. AE Template Manager lets you set up your own templates. Requires Mac SE or II series. $4,950 to $2,995, depending on size. CalComp, Inc., 660 Maple Ave., Torrance, CA 90503 (213) 533-0274. (Sept ‘90)

**Complete PC Half-Page Scanner/400**

This half-sized scanner has very good resolution. True 400-dpi scans. Excellent OCR. Requires Mac Plus or later. $3,999. Complete PC, 1983 Concourse Dr., San Jose, CA 95131. (800) 634-5558 or (408) 434-0145. (Sept ‘90)

**Felix**

The Felix is a 5.75-inch-square fixed-base mouse replacement. Space saver but awkward for lefties. Has a button on top of the pointer handle for mouse clicks. Has drawing setting for precise absolute movement. Software provides useful tools. Mac Plus and ADB versions available. Requires Mac II or later. $169. ALTRA Technology, 1200 Skyline Dr., Laramie, WY 82070. (800) 726-6153 or (307) 745-7538. (Aug ’91)

**FreeWheel Pointer**

The FreeWheel Pointer uses a pointer to determine the user’s head position by bouncing infrared light off a small, lightweight mirror on the user’s forehead. Has compact receiver unit and push switch (can be mounted wherever convenient). Measures finger and hand movements while using a spreadsheet. Standard keyboard arrangement is located on-screen. Requires Mac Plus or later, $1,395. ADB adapter, $150. FastTrack, Inc., 1016 and II series, $150. Pointer Systems, Inc., One Mill St., Burlington, VT 05401. (800) 537-1562 or (802) 868-3260. (Oct ’89)

**GTCO Maclntroller ADB**

The Machlntroller compares favorably with other tablets in terms of mouse emulation and drawing but lacks some software features. No built-in capability for using or creating overlay templates. Provides developer stacks for HyperTalk and Pascal. Active area sized and resized through control panel. Requires Mac SE, CE, or II series. GTCO, Inc., 15115 Hamada Dr., Commerce, CA 90042. (800) 635-6610 or (213) 857-3277. (Oct ’89)

**HeadMaster**

The HeadMaster was designed for users who have little or no use of their hands. It uses ultrasound signals emitted from a headset to...
determine the position of the user’s head. Has a pufftube for the mouse button, or triple-clicking. $99.95. Ad- versary Software, Inc., 9330 Eton Ave., MicroSpeed, Inc., 680 Knox St., Torrance, CA 90401. (415) 656-1117. (Oct ’89)

MouseTouch sticky

The MouseTouch is a joystick with programmable settings. Buttons can be assigned to the programmable actions, and has a joystick function such as move, up, down, left, right, or triple-clicking. $99.95. Adversary Software, Inc., 9330 Eton Ave., MicroSpeed, Inc., 680 Knox St., Torrance, CA 90401. (415) 656-1117. (Oct ’89)

MicroSpeed MacTRAC

The MacTRAC has three buttons with a Sailock and a Mac TRAC trackball, located above the trackball. Each button can be assigned to the programmable actions, and has a joystick function such as move, up, down, left, right, or triple-clicking. $99.95. Adversary Software, Inc., 9330 Eton Ave., MicroSpeed, Inc., 680 Knox St., Torrance, CA 90401. (415) 656-1117. (Oct ’89)

MicroTouch

Mac ‘N Touch is a touch screen that is useful for applications that require a lot of pointing and clicking. Doesn’t require a Mac or a Macintosh. $959. MicroTouch Systems, Inc., 55 Jonspin Rd., Wilmington, MA 01887. (508) 693-9633. (Oct ’89)

Mac-101


Mac-105 ADB Extended Keyboard

The Mac-105 ADB Extended Keyboard is a good alternative to Apple’s Extended Keyboard, with a larger Return key, larger and more-marbled keys, and a more-precise feel and response. Requires Mac SE or later. $1,195. MicroTouch Systems, Inc., 55 Jonspin Rd., Wilmington, MA 01887. (508) 693-9633. (Oct ’89)

Macho IV Plus

Macho IV Plus has buttons on either side and one atop the joystick. $999.95. MicroTouch Systems, Inc., 55 Jonspin Rd., Wilmington, MA 01887. (508) 693-9633. (Oct ’89)

McIntyre

McIntyre combines two products: a joystick (or people who can’t use their hands) and a WordWriter software. The LipStick joystick is held in the mouth, and clicking requires pressing a button on the top of the trackball. A joystick can be mounted on a gooseneck stand. An image of the joystick appears on-screen so users can select letters and carry out most keyboard functions. Extremely sensitive. WordWriter software, $100. LipStick joystick, $95. McIntyre Technology, 22809 Shagbark, Birmingham, MI 48010. (313) 645-5090. (Oct ’89)

Mice Ratings

Mice are rated in three categories: Standard, Low-Profile, and Specialized. Each category is further divided into three subcategories: Basic, Advanced, and Professional. The ratings are based on a five-point scale, with 1 being the lowest and 5 being the highest.

 McMaster

The McMaster is a mouse with a high-resolution sensor and a comfortable shape. $50. McMaster Micro Instruments, 3007 E. Chambers St., Phoenix, AZ 85004. (602) 276-5533. (Oct ’89)

Kurma

The Kurma is a mouse with a two-button design and a comfortable shape. $39.95. Kurma Corp., 3007 E. Chambers St., Phoenix, AZ 85004. (602) 445-8782 or (602) 276-5533. (Oct ’89)

Logitech ScanMan

The Logitech ScanMan is a low-profile mouse with a high-resolution sensor. $50. Logitech, 6505 Kaiser Dr., Fremont, CA 94555. (415) 795-8500. (Sept ’90)

Howtek Scanner

This 300 dpi flatbed scanner is fast and easy to use. Excellent, intuitive software. Requires Mac Plus or later. $2,195. Howtek, 21 Park Ave., Hudson, NH 03051. (603) 882-5000. (Dec ’89)

Kensington Microfiche Turbo Mouse ADB

The Turbo Mouse ADB trackball lets you reverse mousing and lock buttons for left-handed people. Has a chording feature for user-specific keyboard-command-equivalent functions. Requires Mac SE or later, $169.95. Turbo Mouse Plus version (same price) for earlier Macs. Kensington Microfiche Ltd., 251 Park Ave. S., New York, NY 10010. (800) 535-4242 or (212) 475-5200. (Oct ’89)

Kurma IS/ADB

The IS/ADB tablet comes in three sizes, each with pointing devices, including multibutton pucks and multibutton styli. Operates in either absolute or relative movement and clicking. $495 to $995. Kurma Corp., 3007 E. Chambers St., Phoenix, AZ 85004. (602) 445-8782 or (602) 276-5533. (Oct ’89)

Kurma ROM

The IS/ADB tablet with Penworks software lets you use a corded or cordless pen or mouse and a high-resolution display for precise graphics input. Minor bugs with some applications and DAs. Key stroke macro can be launched from the keyboard to simulate certain actions. Requires Mac Plus or later, $545 to $995. Kurma Corp., 3007 E. Chambers St., Phoenix, AZ 85004. (602) 445-8782 or (602) 276-5533. (Oct ’89)

Logitech ScanMan Model 32

This hand-held scanner has poor dither. Scans at up to 400 dpi. Removable internal termination is in SCSI box. Requires Mac SE or later. $499. Logitech, 6505 Kaiser Dr., Fremont, CA 94555. (415) 795-8500. (Sept ’90)

Mac ‘N Touch

Mac ‘N Touch is a touch screen that is useful for applications that require a lot of pointing and clicking. Doesn’t require a Mac or a Macintosh. $959. Logitech, 6505 Kaiser Dr., Fremont, CA 94555. (415) 795-8500. (Sept ’90)

MicroTouch

Mac ‘N Touch is a touch screen that is useful for applications that require a lot of pointing and clicking. Doesn’t require a Mac or a Macintosh. $959. Logitech, 6505 Kaiser Dr., Fremont, CA 94555. (415) 795-8500. (Sept ’90)
The ThunderScan was the original Mac scanner. It still does the job, albeit slowly. Can scan only three things at a time: a cursor keypad, a numeric keypad, and a QWERTY alphanumeric keypad. Can be configured via DIP switches to run with Macs or PCs. Many customizable settings.

ThunderScan Plus

The ThunderScan Plus is the original Mac scanner. It does the job, albeit slowly. Can scan only three materials that can be fed through a printer. Excellent software. Can scan up to 32 x 32 dpi. Scanned images are bit-mapped but can also be saved as PostScript files. Version 1.05 shipping.

Output Devices

Abacon LaserScript

The LaserScript is a low-cost personal laser printer. It uses a PostScript-class laser engine, has 35 built-in LaserScript fonts. Consumables setup is complex, because the toner, developer, and drum units are separate. $2,995.

Travel TZ-3

This scanner has a resolution of 900-dpi. Has the ability to re-scan one line per millimeter, with superior halftone output and the ability to handle large documents. Univariate illumination at 300-dpi. Can output only if 600-dpi. Requires Mac Plus or later with at least 2 MB RAM. Requires Mac Plus or later with at least 2 MB of RAM.

Umax UG80

This 300-dpi flatbed scanner has excellent resolution and gray scale. Convenient and easy to maintain. Requires Mac Plus or later with at least 2 MB of RAM; gray scale requires II series with a 24-bit-video card.

Varityper 1200

High-resolution, 400-dpi, expensive scanner with excellent OCR capabilities. Powerful software comes with Mac II. Requires Mac II with at least 8 MB of RAM. $2,599. Varityper, 11 Mt. Pleasant Ave., East Hanover, NJ 07936. (201) 887-8000. (Sept '90)

Wacom SD-510C Cordless

Digitizer

The SD-510C Cordless Digitizer is light and thin. Uses a pressure-sensitive stylus requiring no cord or battery. Tablet connects to the modem port. Sensing accuracy is 6 x 9 inches (roughly 10 x 13 inches overall). Resolution is 770 lines per inch with high accuracy. Much more responsive than a mouse. When not in use, makes an excellent mouse pad. Includes Pressure Paint program and choice of stylus or cursor. Requires Mac Plus or later. $695.

CoStar LabelWriter

The LabelWriter is a small serial printer that thermally prints individual labels. Labels can include bar codes but can’t mix text and graphics. The interface needs some work. A timesaving device.

Combustion LaserWriter INTX

This PostScript laser printer prints complex graphics files slowly but is very easy to set up. The toner and drum come in a single sealed cartridge. The Personal LaserWriter NT uses a Canon laser engine, has 37 built-in fonts, and has a 200-sheet paper tray. A PIF chip gives this printer a speed advantage.

Diconix M150 Plus

The Diconix M150 Plus printer is a tiny inkjet printer. Runs on batteries or AC and fits easily in a briefcase. Does not offer PostScript but comes with AT. Requires Mac Plus or later. $699. Diconix Technologies, Inc., 580 Winter St., Waltham, MA 02154. (800) 422-7777 or (617) 890-0880. (May '91)

GCCC Business LaserPrinter II

This PostScript laser printer is one of the first laser printers for text and graphics. The interface needs some work. A timesaving device.

Hewlett-Packard ColorPro

Graphics Plotter

The ColorPro Graphics Plotter is an eight-page Adobe PostScript printer. Requires third-party software to drive it. Fonts are limited to a few Adobe fonts.
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*Pricing in this ad based on 60 month FMV.

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New!

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<td>Sigma L*View MultiMode 19&quot;</td>
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<td>Sampo Color 14&quot; RGB</td>
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<td>RasterOps 8LC System</td>
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<td>Micron 8-bit Video Card (Mac 11, SE/30)</td>
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<td>RasterOps ColorBoard 24S (Mac II)</td>
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<td>MegaGraphics Rival 19&quot; Mono. w/card</td>
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<td>1 Megabyte Upgrade (Mac Classic)</td>
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Monitors & Video Cards

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<td>Apple High Resolution 13&quot; RGB</td>
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Connectivity

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<td>Farallon PhoneNET Connector (DIN-8)</td>
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<td>Farallon PhoneNET Repeater</td>
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<td>Farallon Timbuktu</td>
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Modems

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<td>DoxFax + Modem</td>
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<td>Zoom 2400 Baud w/cable &amp; software</td>
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<td>Zoom V.42bis w/cable &amp; software</td>
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<td>Zoom 2400 External w/9600 Send Fax</td>
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<tr>
<td>Microcom MacModem w/Carbon Copy</td>
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Microtech Hard Drives

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Removable Cartridge Drives

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<td>Apple ImageWriter II w/cable</td>
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<td>Apple Personal LaserWriter LS</td>
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<td>HP DeskWriter w/cable</td>
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<td>Kodak Diconix M150 + w/ATM &amp; cable</td>
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<td>NEC SilentWriter 2 Model 90 w/cable</td>
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<td>TI microLaser PS 35 w/AppleTalk</td>
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Printers

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<tr>
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<td>Apple Personal LaserWriter LS</td>
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MIDI/Music Hardware & Software

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<td>MIDI F0402 (professional notation)</td>
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<td>Music Prose V2.0 (notation)</td>
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<td>Digidesign MacProts</td>
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<td>AudioMedea</td>
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<td>DECK</td>
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Mark of the Unicorn Performer V3.6 | $356 |

Mark of the Unicorn Performer V3.6-IBM Time Piece (MIDI/SMpte Interface) | $356 |

Mark of the Unicorn Performer V3.6-IBM Time Piece Bundle | $719 |

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The XL7700 establishes a new standard for color printing. By using dye sublimation, the printer blends colors between adjacent pixels to generate realistic images. The printer requires expensive dye ink, $250 per 200 sheets for envelopes or extra bins. Can receive data simultaneously through three active ports: serial, parallel, and LocalTalk. $6,995. Kyocera Electronics, Inc., 1321 Harbor Bay Pkwy., Alameda, CA 94501. (800) 334-6056 or (415) 748-6680. (Oct '90)

**Konica S340-10 Color**

This sublimal-dye-transfer printer creates excellent proofs. Superb print quality. Color range is limited, but the gradients are excellent. Would have received 4.5 if Mac interface had been included. $3,995. Mitsubishi Electronics, Inc., 9910 Fox St., Torrance, CA 90402. (213) 217-5732. (May '90)

**NEC Colormate PS Model 80**

Offering true PostScript, the Colormate PS Model 80 was the fastest thermal-wax-transfer color printer we tested for our May '91 lab report. Standard RAM configuration is 8 MB. Halftoning is poor, but overall image quality and color registration are good. The optional hard drive stores printer fonts and helps boost performance. $8,995; optional 20 MB hard drive, $9,995. NEC Technologies, Inc., 1414 Main St., Boxborough, MA 01719. (800) 632-4636 or (617) 264-8000. (May '91)

**Oce OctColor**

This PostScript, the OctColor is a fast, compact thermal-wax-transfer color printer. Standard RAM configuration is 5 MB, upgradable to 8 MB. Halftoning is poor, but overall image quality is good. A SCSI port is included for use with third-party hard drives. Best quality when printing black type, $8,990. Oce Graphics, Inc., 85 Ravendale Dr., Mountain View, CA 94039. (800) 545-5445 or (415) 964-7900. (May '91)

**QMS ColorScript 100 Model 10**

The ColorScript 100 Model 10 is the first four-color thermal-wax-transfer PostScript printer. Fast and simple to install and use. Excellent typographic capability. Standard RAM configuration is 5 MB, upgradable to 8 MB. A SCSI port is included for use with third-party hard drives. Imprint quality was not as good when compared to our lab test of this year's machines. $9,895. QMS, Inc., One Magnum Pass, Mobile, AL 36618. (800) 523-2696 or (205) 633-4300. (May '91) *89 Eddy

**QMS PS 410**

The QMS PS 410 is a personal Adobe PostScript printer. Although its engine makes it somewhat slow for printing plain text, its speed is superior for processor-intensive applications such as printing complex graphics. It keeps all three data ports "live" at all times and features the ability to change emulations on the fly, without user intervention. A good choice for small offices with Macs and PCs. $2,795. QMS, Inc., One Magnum Pass, Mobile, AL 36618. (800) 523-2696 or (205) 653-4300 (May '91) *90 Eddy

**QMS PS 810**

The QMS PS 810 is an eight-page-a-minute 300-dpi PostScript laser printer that competes with the LaserWriter IINT. Comes with 2 megabytes of RAM, upgradeable to 3 megabytes. $3,995. QMS, Inc., One Magnum Pass, Mobile, AL 36618. (800) 523-2696 or (205) 633-4300. (July '88)

**QMS PS 810 turbo**

This PostScript laser printer is faster than Apple's LaserWriter IINTX, and provides the same SCSI interface for a hard drive that stores printer fonts. $5,495. QMS, Inc., One Magnum Pass, Mobile, AL 36618. (800) 523-2696 or (205) 633-4300. (Oct '90)

**QMS PS 820 turbo**

The QMS PS 820 turbo is a PostScript printer that substitutes for the LaserWriter IINTX, producing equivalent output more quickly and at a slightly reduced quality. Has two paper trays, each for 200 sheets. Uses a Canon TX engine. Hard-disk drive can be attached for fonts. $6,495. QMS, Inc., One Magnum Pass, Mobile, AL 36618. (800) 523-2696 or (205) 633-4300. (May '90)

**Qume CrystalPrint Express**

The bargain-priced CrystalPrint Express is the fastest PostScript-clone printer available. Based on a Weitek RISC microprocessor, this compact machine offers industrial-strength, high-capacity networking. Its 300-dpi output quality is good. The printer lacks the ability to read Adobe Type 1 PostScript fonts, but its hinting; this is less of a problem if horizontal resolution is increased to 600 dpi (which requires the 6 MB configuration). There's no SCSI port to allow attachment of a hard-disk drive for storing type fonts. Two 250-sheet paper trays are standard. With 3 MB of RAM, $5,390; with 6 MB of RAM, $6,590. Qume Corp., 500 Yosemitie Dr., Milpitas, CA 95035. (800) 223-2479 or (408) 942-4000. (May '90)

**Qume CrystalPrint Publisher**

The CrystalPrint Publisher was the first 300-dpi PostScript-clone printer. Based on a RISC microprocessor, it's faster and cheaper than the LaserWriter IINT. Output quality is excellent, but it can't handle Adobe fonts. Lacks manual feed or envelope capabilities. Requires Mac Plus or later. $3,995. Qume Corp., 500 Yosemite Dr., Milpitas, CA 95035. (800) 223-2479 or (408) 942-4000. (Sept '89) *88 Eddy

**Seiko ColorPoint Color PS Model 4**

Using PostScript emulation, the compact, low-priced Seiko ColorPoint PS Model 4 was the slowest thermal-wax-transfer color printer we tested for our May '91 lab report. Standard RAM configuration is 6 MB, upgradable to 34 MB. Overall image quality is good, and it has the largest scalable usable print area on letter-sized paper. Has SCSI port for use with third-party hard drives. Built-in fonts are from Bigscreen. 90-day warranty, $5,995. Seiko Instruments USA, Inc., 1130 Ringwood Ct., San Jose, CA 95131. (408) 922-5900. (May '91)

**Seiko Instruments CH-5504**

This thermal-wax-transfer printer has good color range but poor line resolution on transparencies. Continues to lead in the available print area. Includes Adobe Type Manager, Plus Pack, and TypeAlign. $7,000. Seiko Instruments, Inc., 15500 N. Noyes St., San Jose, CA 95131. (408) 922-5900. (May '90)

**Seiko Smart Label Printer**

The Smart Label Printer is a small serial printer that thermally prints labels one at a time. Labels can
include bar codes but can't mix text and graphics. The interface needs some work. Requires Mac Plus or later. $249.95. Seiko Instruments USA, Inc., 1130 Ringwood Ave., White Plains, NY 10604. (914) 997-4999. (May '90)

Sharp JX-730 Color Ink Jet

This inkjet printer is slow, with mediocre print quality. Color range is good. Takes hand-fed paper only. Does not print transparencies. Annoying noise and vibration. Sharp Electronics, Sharp Plaza, Mahwah, NJ 07430. (215) 529-8200. (May '90)

Shinko CHC-345

This thermal-wax-transfer printer has excellent image quality but is slow, with poor line resolution on transparencies. Limited color range. $6,000. Mitsubishi Inter­national Data Handling and Intelligent Corp., 1130 Ringwood Ave., White Plains, NY 10604. (914) 997-4999. (May '90)

Tektronix 4693DX Color Image Printer

The Tektronix 4693DX Color Image Printer is a 300-dpi printer that produces bit-mapped images. Colors look smooth and rich. Uses bit-mapped fonts; most type has noticeable jaggies. Optional connection to four Macs. Requires Mac Driver Kit (8-MB configuration recommended). 8-MB configuration, $8,995; Mac Driver Kit, $295. Tektronix, Inc., P.O. Box 100, MS#63-630, Wilsonville, OR 97070. (503) 635-8000. (Aug '90)

Tektronix ColorQuick

The ColorQuick is an inkjet QuickDraw printer with 216-dpi quality. Produces vivid colors and has excellent color range. It's fast and offers hand, roll, and cut-sheet paper feeds. Requires Mac interface kit, $2,345; Mac interface kit, $2,755. TBC P.O. Box 1000, MS#63-630, Wilsonville, OR 97070. (800) 835-6100. (May '90)

Tektronix Instruments microLaser PS35

This microLaser PS35 is a compact, easy-to-use, personal PostScript printer that outputs six pages per minute. It uses a Sharp laser engine, has 35-built-in Adobe fonts, and has a 250-sheet paper tray. Its high speed is due to efficient laser engine, smart interface allocation of printer memory. Modular design simplifies upgrades. Excellent on-board help and diagnostics. A good choice when desk space is at a premium. $2,849. Texas Instruments, Inc., P.O. Box 20220, Austin, TX 78761. (800) 520-1500. (Mar '91)

Varilayer VT80FPP

This 600-dpi PostScript laser printer provides camera-ready output when less-than-Linotronic quality will do. Produces excellent image quality. $16,995. Varilayer, 11 Mt. Pleasant Ave., East Hanover, NJ 07936. (201) 887-8000. (Oct '90)

WriteMove

The WriteMove is one of the smallest, lightest Mac printers. It's an inkjet unit that produces resolutions up to 192 dpi. Runs off expensive rechargeable batteries or AC. Weighs 3 pounds. Comes with a good selection of Bitstream fonts. Printing quality varies, depending on printer resolution and ink used. Driver version 1.0 reviewed. Version 1.3 shipping. Requires Mac Plus or later and a hard-disk Drive. S.R. Print Technologies, Inc., 580 Winter St., Waltham, MA 02154. (800) 422-7777 or (617) 890-0880. (Apr '89)

- PERFORMANCE ENHANCERS -

Axx DoubleTime-16

This accelerator offers a modest RAM increase via a 16-MB memory expansion card. Designed for tight budget. Requires Mac SE. With FPU, $359; with FPU, $854. Axx, Kippen Post, 585 Main St., Waltham, MA 02154. (800) 232-1269 or (617) 890-4402. (Aug '90)

Apple Macintosh IIC Logic Board Upgrade

This option offers a significant performance booster over the IICx but requires 80-nanosecond or faster RAM SIMMs. Requires Mac IICx. $2,399. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Aug '90)

Apple Macintosh IIX Logic Board Upgrade

Apple's motherboard replacement boasts a 40-MHz CPU and performs other add-ons at reasonable cost. SRAM cache and fast DMA SCSI. Special IIX RAM required (minimum 4 MB). This unit offers Macs the capability of handling all-around best performance for Mac II and IIx owners. Requires Mac II or 4 MB of DRAM. $4,999. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Aug '90)

Apple Macintosh SE/30 Logic Board Upgrade

This option offers color QuickDraw and stereo sound features. Capability for 8 MB of RAM distinguishes it from other SE-accelerator options. Requires Mac SE (FDHD upgrade and System 6.0.3 software recommended). $1,699; FDHD upgrade, $449. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Aug '90)

DayStar 25MHz PowerCard

This accelerator is a speedy upgrade for the Mac II, IIx, or IICx. Good price and performance. Requires Mac II, IIx, or IICX. Irix requires CPU socket upgrade for soldered-in CPUs. Without FPU, $1,699; with FPU, $1,999. Irix CPU socket upgrade, $49. DayStar Digital, Inc., 5556 Atlanta Hwy., Flowery Branch, GA 30542. (800) 962-2077 or (404) 967-2077. (Aug '90)

DayStar 40MHz PowerCard

This accelerator is a speedy upgrade for the Mac II, IIx, or IICX. Good price and performance. Requires Mac II, IIx, or IICx. Irix requires CPU socket upgrade for soldered-in CPUs. Without FPU, $1,699; with FPU, $1,999. Irix CPU socket upgrade, $49. DayStar Digital, Inc., 5556 Atlanta Hwy., Flowery Branch, GA 30542. (800) 962-2077 or (404) 967-2077. (Aug '90)

DayStar FastCache IICX

The FastCache IICX is a full-height cache card that fits into the IICX's processor-direct slot. The cache card has 64K of 25-nanosecond static RAM that increases the IICX's overall performance by approximately 30 percent. This speed boost is an economical, easy upgrade requiring no software. No control panel software is provided to allow cache disabling, if any. Requires Mac IICX. $259. Dove Computer Corp., 1200 N. 23rd St., Milwaukee, WI 53233. (800) 622-7627 or (919) 763-7918. (Aug '90)

Ircache Card 32

This accelerator offers a modest increase in performance over the IICX but requires 80-nanosecond static RAM that increases the IICX's overall performance by approximately 30 percent. This speed boost is an economical, easy upgrade requiring no software. No control panel software is provided to allow cache disabling, if any. Requires Mac IICX. $259. Dove Computer Corp., 1200 N. 23rd St., Milwaukee, WI 53233. (800) 622-7627 or (919) 763-7918. (Aug '90)

MacProducts PowerCard

This accelerator has the same basic design as the Novy Quick30/Plus-33MHz. Limited SCSI throughput (upgrade planned). Supports Macs are 128K, 512K, 256K, Plus, SE, and Classic. Without FPU, $799; with FPU, $999. MacProducts USA, Inc., 830 Fisherman Way, Austin, TX 78759. (800) 622-3475 or (512) 343-9441. (Aug '90)

Micron Xcedic IICX

This Xcedic IICX is a full-height cache card that fits into the IICX's processor-direct slot. The cache card has 128K of 25-nanosecond static RAM that increases the IICX's overall performance by approximately 30 percent. This speed boost is an economical, easy upgrade requiring no software. No control panel software is provided to allow cache disabling, if any. Requires Mac IICX. $259. Micron Technology, Inc., 2805 E. Columbia Rd., Boise, ID 83706. (800) 642-7661 or (208) 368-3800. (June '91)

Newer Technology MacSElcerator

This SE accelerator offers good performance and 25-nanosecond static RAM. Without FPU, $295; with FPU, $550. Newer Technology, 1171 S. Rock Rd., Wichita, KS
This accelerator gives Mac 512Ke, 168 MiniFinders 2Ke, and SE owners Iicci computing power. Limited SCSI throughput, 25-MHz plus, or SE. With 16-MHz FPU,$1,294; without FPU, $1,195. Novy Systems, 1862 Fern Palm Dr., Edgewood, WA 98024. (425) 427-2358. (Aug '90)

Orchid MacSprint II 2Ke
This accelerator is a good buy. Simple upgrade offers moderate performance increase for little money. There's a control panel that disables cache for incompatible software. Version 2.1 shipping. Requires Mac 128K, 256K, or 512K. Orchid Technology, 4536 Northport Loop W., Fremont, CA 94538. (800) 767-2443 or (415) 683-0582. (Aug '90)

Radius Accelerator 16 SE 2Ke
The Radius Accelerator 16 SE is a speedy upgrade requiring no software. Version 2.1 shipping. Requires Mac SE. Radius Computer, Inc., 1710 Fortune Dr., San Jose, CA 95131. (800) 626-6347 or (408) 434-1010. (Aug '90)

Radius Accelerator 25 SE 2Ke
The Radius Accelerator 25 SE has a 68828 FPU for fast number crunching. Easy configuration via control panel or startup dialog box. Requires Mac SE. $1,295. Radius, Inc., 1710 Fortune Dr., San Jose, CA 95131. (800) 227-2795 or (408) 434-1010. (Aug '90)

Radius QuickCAD Graphics Engine 2Ke
The QuickCAD Graphics Engine is a NuBus card that increases the Mac's screen-redraw speed. Uses a 10-MHz RISC chip. Accesses integer display lists directly from AutoCAD 10 and VersaCAD 2.2. Benefits best realized with Radius QuickCAD, VersaCAD, and other software. shipping. Requires Mac II series. $1,495. Radius, Inc., 1710 Fortune Dr., San Jose, CA 95131. (800) 227-2795 or (408) 434-1010. (Aug '90)

Siicone S10300 2Ke
This accelerator is a speedy upgrade for the Mac II or IIX. Retains older CPU to allow downfall to native unaccelerated mode. INIT provides enabled proper floppy operation. Requires Mac II or IIX. Without FPU, $1,799; with FPU, $2,999. Siicone Sales and Engineering, 1072 Saratoga-Sunnyvale Rd., Bldg. A, Suite 443, San Jose, CA 95129. (408) 534-1742. (Aug '90)

Siicone S10350 2Ke
This accelerator is very fast. Extensive INIT, enables proper floppy operation. Requires Mac II or IIX. Without FPU, $2,499; with FPU, $2,999. Siicone Sales and Engineering, 1072 Saratoga-Sunnyvale Rd., Bldg. A, Suite 443, San Jose, CA 95129. (408) 534-1742. (Aug '90)

Siicone S10400 2Ke
This accelerator is very fast. Extensive INIT, enables proper floppy operation. Requires Mac II or IIX. Without FPU, $2,499; with FPU, $2,999. Siicone Sales and Engineering, 1072 Saratoga-Sunnyvale Rd., Bldg. A, Suite 443, San Jose, CA 95129. (408) 534-1742. (Aug '90)

Siicone S10500 2Ke
This accelerator is very fast. Extensive INIT, enables proper floppy operation. Requires Mac II or IIX. Without FPU, $2,499; with FPU, $2,999. Siicone Sales and Engineering, 1072 Saratoga-Sunnyvale Rd., Bldg. A, Suite 443, San Jose, CA 95129. (408) 534-1742. (Aug '90)
for this SyQuest drive, which comes with rudimentary documentation but little else. This drive’s SCSI ID is changed via external DIP switches. It comes with a cartridge that has a capacity of 44 MB, $485. ClubMac, 7 Musicik, Irvine, CA 92718, (800) 258-2622 or (714) 794-4940. (Feb ’91)

CMS Enhancements
MacStack SD45RM $$$
This SyQuest removable-cartridge drive comes with excellent documentation and has an auto-

switch power supply. The cartridge has a capacity of about 44 MB. The extended warranty is optional. This drive’s SCSI ID can be changed via external DIP switches. SyQuest technology offers speed and compatibility with an industry standard, $999. Extended warranty, $119 a year. CMS Enhancements, 2722 Michelson Dr., Irvine, CA 92715. (714) 242-2300. (Feb ’91)

CMS PD1000S $$
The CMS PD1000S is a 1-gigabyte expensive hard-disk drive with an actual capacity of 886 MB. Has an average seek time of 6 milliseconds. Based on the Micropolis 1598-15 mechanism. Provides good performance with the CMS Utility 6.0.1. SCSI driver, SCS-

I termination is external, and SCS-ID selection is via an external switch. Bundled with Sym-

matace Utilities for the Macintosh, $7.199. CMS Enhancements, 2722 Michelson Dr., Irvine, CA 92715. (714) 222-6000. (July ’91)

CMS Platinum 40 MB $$$
This CMS Platinum 40 MB is a 40- MB external SCSI hard-disk drive based on the slow, older (but reliable) Conner 3040A mechanism. For the price, this drive has poor performance and a stark design, but it includes an automatic powering mechanism for use with North American or European voltages. Good software is hand-

led, including SUM II. SCSI termination is internal, which makes daisy-chaining SCSI devices difficult, $919. CMS Enhancements, 2722 Michelson Dr., Irvine, CA 92715. (714) 222-6000. (Apr ’91)

CMS Platinum Series PD 300 $$$
The CMS Platinum Series PD 300 is a hard-disk drive with a capacity of 291 MB. It has slow seek times and low throughput. Good software, Requires Mac Plus or later, $3,299. CMS Enhancements, 2722 Michelson Dr., Irvine, CA 92715. (714) 222-6000. (Dec ’90)

Corel 50 MB Removable $$
Because it uses the new Ricoh magnetic-disk-cartridge technology, this drive offers a potentially more durable cartridge design than the older, established (and incompatible) SyQuest technology. This drive also offers speed and compatibility with an industry standard. It comes with a car-

tridge that has a capacity of about 44 MB, $1,295. Corel Systems, 1600 Carling Ave., #190, Ottawa, Ontario KIZ 8R7, Canada. (613) 729-2805. (Feb ’91)

Cranel 330MB $$$
This Cranel 330MB is a hard drive with an actual capacity of 321 MB. Average seek times and throughput. Large case, Good customer support. Requires Mac Plus or later, $2,350. Cranel, Inc., 510 E. Wilson Bridge Rd., Wor-

thington, OH 43085. (800) 243-3475 or (614) 433-0045. (Dec ’90)

Cube Floppy $$$
This Cube Floppy is a compact 3.5- inch floppy drive that can be used with NeXT computers. Can ini-

Cutting Edge 40 MB $$$
The Cutting Edge 40 MB is a 40-

MB external SCSI hard-disk drive based on the fast, reliable Quan-

tum 4040S mechanism. Performance is average. Two extra AC plugs are provided and SCSI-ID selection is external, but the drive uses internal SCSI termination (a clear plastic window lets you view the setting but doesn’t provide convenient access). The fan opening under the case is relatively exposed. $799. Cutting Edge, 97 S. Red Willow Rd., Evanston, WY 82930. (307) 789-0582. (Apr ’91)

Cutting Edge 44 MB Removable $$$
This SyQuest removable-cartridge drive is well built and has dual-

fase protection and two switched AC plugs, but it is relatively expensive for a SyQuest drive. SyQuest technology offers speed and compatibility with an industry standard. It comes with a car-

tridge that has a capacity of about 44 MB, $1,139. Cutting Edge, 97 S. Red Willow Rd., Evanston, WY 82930. (307) 789-0582. (Feb ’91)

Data Enhancements ProCase PS1045-PM $$
This SyQuest removable-cartridge drive comes with powerful soft-

ware, supports A/UX partitioning, and has good performance. The SCSI-ID number appears in the drive’s desktop icon. It comes with a cartridge that has a capacity of about 44 MB. SyQuest technology offers speed and compatibility with an industry standard. $599. Data Enhancements, 51328 Via Colinas, #102, Westlake Village, CA 91362. (818) 879-2700. (Feb ’91)

Data Enhancements ProDisc PD1040 $$$
The ProDisc PD1040 (formerly called the Heart HD 1040) is a fast zero-footprint 40- MB hard-disk drive. Features include a two-year warranty, a thumb-wheel switch for SCSI-ID selection, and a special-

matic hard parking. Requires Mac Plus or later. $749. Data Enhancements, Inc., 31328 Via Colinas, #102, Westlake Village, CA 91362. (818) 879-2700. (Feb ’90)

Data Enhancements ProSystem PS1350 $$$
The Data Enhancements Pro-

System PS1350 is a 330- MB hard-
disk drive. Average seek times. Low throughput rate. Requires Mac Plus or later. $3,189. Data Enhancements, Inc., 31328 Via Colinas, #102, Westlake Village, CA 91362. (818) 879-2700. (Dec ’90)

DaynaFile II $$$
The DaynaFile II is a drive that lets Macs read 3.5- and 5.25-inch DOS floppy disks. The software is a MacPlus or later. This drive comes from Data Enhancements ProDisc and has a SCSI-connected, special-

matics hard parking. Requires Mac Plus or later. $3,189. Data Enhancements, Inc., 31328 Via Colinas, #102, Westlake Village, CA 91362. (818) 879-2700. (Dec ’90)

DaynaFile Pro for NeXT $$$
The DaynaFile II is a floppy
drive for the original NeXT computer. The 5.25-inch drive exchanges files between a NeXT and a Mac and two SCSI-equipped DOS machines, and is compatible with the NeXT system. Comes with two applications, one that accesses DOS disks (but does not format them) and one that reads and writes Mac-formatted floppies. Can’t read or write Mac disks. Requires NeXT computer. 5.25-inch drive, $750; 3.5-inch drive, $850; both, $1,105. Dayton Communications, Inc., 50 S. Main St., Salt Lake City, UT 84144. (801) 531-6060. (Oct ’89) ★87 Eddy

Deltaca DS400 $$$
The Delta DS400 is a 40- MB external SCSI hard-disk drive based on the fast, reliable Quan-

tum 4040S mechanism. The drive is inexpensive, has a low profile, and has external SCSI-ID selection and SCSI termination. Unfortunately, little software is provided, and the SCSI IDs permitted include illegal numbers 7 through 9. Our test unit’s fan rattled when the power-supply encased distorting pressure, $449. Delta Systems, 1701 Junction Ct., Ste. 302B, San Jose, CA
The Delta IC Server is a hard drive with an actual capacity of 990 MB. Has an average seek time of 15 milliseconds. The Motorica 1598-15 mechanism. Provides good performance with the Delta 201 SCSI hard drive. Fast internal transfer rate and SCSI termination uses an external plug. No bundled software. $3,199. Delta Systems, 1701 Junction Ct., Ste. 302B, San Jose, CA 95112. (800) 745-1240 or (408) 441-1240. (July '91)

Delta Systems OptiServer 600 1111

The Delta Systems OptiServer 600 is a hard drive with software that maps out bad sectors and reads/writes the drive. Extremely quiet. Few software utilities. Requires Mac Plus or later. $3,499. Delta Systems, 1701 Junction Ct., Ste. 302B, San Jose, CA 95112. (800) 745-1240 or (408) 441-1240. (Dec '90)

Erman 160 MB 8


Erman HD 40 1111

The Erman HD 40 is a 40-MB external SCSI hard drive. The fast, reliable Quantum P40S mechanism. Good performance. External SCSI ID selection but internal SCSI termination. The fan running under the case is relatively exposed. This drive has an attractive price and sports two extra AC plugs to power other devices. $429. Erman Engineering, Inc., 97 S. Red Willow Rd., Evanston, WY 82930. (800) 378-1666 or (307) 789-3830. (Apr '91)

Erman HD 60 1111

The Erman HD 60 is a 60-MB external SCSI hard drive. The fast, reliable Quantum P40S mechanism. Good performance. External SCSI ID selection but internal SCSI termination. The fan running under the case is relatively exposed. This drive has an attractive price and sports two extra AC plugs to power other devices. $549. Erman Engineering, Inc., 97 S. Red Willow Rd., Evanston, WY 82930. (800) 378-1666 or (307) 789-3830. (Apr '91)

DPI 44 MB Removable 1111

The vertically mounted DPI 44 Removable is a SyQuest removable-carryable drive with a sturdy metal case. Its diode-regulated fan assures cool operation. Comes with a cartridge that has a capacity of about 44 MB. SyQuest technology offers speed and compatibility with an industry standard $570. DPI, 40 Corn Ave., Milpitas, CA 95035. (800) 825-1850 or (408) 945-1850. (Feb '91)

Erman 45 MB Removable 1111

This SyQuest removable-carryable drive is well built, is reasonably priced, and offers good performance. It comes with a cartridge that has a capacity of about 44 MB. SyQuest technology offers speed and compatibility with an industry standard. $569. DPI, 40 Corn Ave., Milpitas, CA 95035. (800) 825-1850 or (408) 945-1850. (Feb '91)

FastBack Tape 1111

The FastBack Tape package includes an FB120 tape drive (128-MB capacity), FastBack II 2.10, manuals for both, a SCSI-termi

FWD Hammer 1000 1111

The FWD Hammer 1000 is a 1-gigabyte hard-disk drive with an actual capacity of 428 MB. High throughput rate. Average seek times. Includes embedded 3.5 MB floppy, with good data performance. $3,699. FWD, Inc., 2040 Polk St., Ste. 215, San Francisco, CA 94109. (415) 474-8055. (Dec '91)

FWD Hammer 600S 1111

The Sony-based FWD Hammer Disk 600S erasable optical drive is very fast. Software overrides copy protection. Has a auto-eject on dismount or shutdown. Requires Mac Plus or later. $2,499. FWD, Inc., 2040 Polk St., Ste. 215, San Francisco, CA 94109. (415) 474-8055. (May '91)

FWD PocketJet 1500 1111

The well-designed FWD PocketJet 1500 is a 50-MB external SCSI hard drive based on the fast, reliable Quantum LPS25 mechanism. This was the overall fastest drive in our April '91 lab report. Its compact construction doesn't skimp on desirable features. SCSI-ID selection and SCSI termination are external, the case is durable, power-on and drive-activity indicator lights are provided, and bundled software is excellent. Current formatting software allows accidental reformating of startup drive. $849. FWD, Inc., 2040 Polk St., Ste. 215, San Francisco, CA 94109. (415) 474-8055. (Apr '91)

GCC UltraDrive 30 1111


GCC UltraDrive 450S 1111

The well-designed GCC UltraDrive 450S is a 40-MB external SCSI hard-disk drive based on the fast, reliable Quantum P40S mechanism. Average performance. Good software is provided, including SUM II and 3.5 MB of shareware. This drive boasts solid construction, and both power-on and disk-activity status lights are clearly visible. SCSI-ID selection and SCSI termination are external. $679. GCC Technologies, Inc., 580 Winter St., Waltham, MA 02154. (800) 422-7777 or (617) 890-0880. (Apr '91)

GCC UltraDrive 430S 1111

The GCC UltraDrive 430S is a hard-disk drive with an actual capacity of 428 MB. High throughput rate. Average seek times. Includes embedded 3.5 MB floppy, with good data performance. $3,699. GCC Technologies, Inc., 580 Winter St., Waltham, MA 02154. (800) 422-7777 or (617) 890-0880. (Apr '91)

Hard Drives International Hard Drive 410 1111

An inexpensive CD-ROM drive with good performance. No preamp audio output and limited volume control. The SCSI-ID selection that's done via DIP switches or jumpers is clumsy. Exceeds the system's hard drive performance. $699. Hard Drives International, 1912 W. Fourth St., Tempe, AZ 85281. (800) 767-3475 or (602) 967-4999. (Dec '90)

Hard Drives International POWERDrive 320 1111

The HDI POWERDrive 320 is an inexpensive hard-disk drive with an actual capacity of 330 MB. Average seek times and throughput. Requires Mac Plus or later. $1,449. Hard Drives International, 1912 W. Fourth St., Tempe, AZ 85281. (800) 767-3475 or (602) 967-4999. (Dec '90)

Hard Drives International POWERDrive 44 Removable 1111

This SyQuest removable-carryable drive has a sturdy metal case and comes with good software, toll-free tech support, and a cartridge. The version we tested lacked shielding on SCSI connectors. It comes with a cartridge that has a capacity of about 44 MB. SyQuest technology offers speed and compatibility with an industry standard. $499; each additional cartridge. $79. Hard Drives International, 1912 W. Fourth St., Tempe, AZ 85281. (800) 767-3475 or (602) 967-4999. (Feb '91)

Hard Drives International POWERDrive 1050EMC 1111

The PopDrive 1050EMC is a 1-gigabyte hard-disk drive with an actual capacity of 990 MB. Has an average seek time of 15 milliseconds. Based on the Micropolis 1598-15 mechanism. Provides good performance with the Disk Manager Mac 2.23 SCSI driver. Software provides user-selectable-initalizer, partitioning, and password-protection functions. SCSI-ID selection is via external jumpering. $2,699. Hard Drives International, 1912 W. Fourth St., Tempe, AZ 85281. (800) 767-3475 or (602) 967-4999. (July '91)

IRS Pro 200 1111

The Pro 20 is a compact 20-MB hard-disk drive. Operation is very
quiet, because there's no fan, so it also runs cool. Nice feature: The door has lots of software included. Two-year warranty. Requires Mac Plus or later. $495. IDS Systems, Inc., 2107 N. First St., Ste. 280 (Koll Bayshore Bldg.), San Jose, CA 95131. (800) 733-0078 or (408) 752-2952. (Feb '90)

**IDS Wip 40MB** $495

The IDS Wip 40MB is a 40-GB external SCSI hard-disk drive. The drive profile has two extra CP3040 mechanisms. The drive is a compact, lightweight and has external SCSI-ID selection. Unfortunately, SCSI termination is internal, and only one SCSI port is provided; and the drive takes power from the Mac's floppy-drive port, which is not advisable for long-term use. Requires Mac Plus or later. $595. IDS Systems, Inc., 2107 N. First St., Ste. 280 (Koll Bayshore Bldg.), San Jose, CA 95131. (800) 733-0078 or (408) 752-2952. (Dec '90)

**Jasmine DirectDrive 40 2.795**

The low-priced DirectDrive 40 is a 40-GB external SCSI hard-disk drive based on the reliable Fujitsu M26115 mechanism. Has excellent documentation. The low-priced DirectDrive 40 uses AC plugs and a power supply that auto-switches between North American and European voltages. SCSI-ID selection is external, but SCSI-IDI selection is internal. SCSI-IDI selection switch allows "illegal" numbers 7 through 9. Good software is provided, including a slim 10 MB of shareware. $369. Jasmine Technologies, 1225 Elko Dr., Sunnyvale, CA 94089. (800) 347-3228 or (408) 435-2000. (Feb '90)

**Kennet Drive 2.4** $169.95

The Drive 2.4 is a connector/drive combination when used with the Roland port connector attached to the external hard drive port. BAS, Plus or SE. DOS 3.5-inch disks can be inserted into the Mac's internal drive and read through AFE. Supports Mac- and PC-formatting conventions, and can be used to control all drive default formats. Not compatible with Mac IIx or Power Mac. Requires Mac Plus or later. $295. Rapport, $295. Kentec Technologies, 120A Albright Way, Los Gatos, CA 95030. (800) 552-1232 or (408) 426-2866. (Feb '90)

**La Cie 1000 MB ZFP Plus** $995

The La Cie 1000 MB ZFP Plus is a 1-gigabyte hard-disk drive with an actual capacity of 988 MB. Has an average seek time of 15 milliseconds. Based on the Seagate ST41200NM mechanism. Provides good performance with the Mac. Price is moderate, considering that this compact drive qualifies as a true portable. Performance is average. Internal SCSI termination is difficult to disable, but if the drive takes power from the Mac's floppy-drive port, this is not advisable for long-term use. Requires Mac Plus or later. $595. La Cie Ltd., 19552 S. 90th Ct., Tualatin, OR 97062. (800) 999-0143 or (503) 691-6771. (July '91)

**La Cie 45 MB Removable** $295

This SyQuest removable-cartridge drive is solidly built and has an auto-switching power supply. The drive is bundled with Norton Utilities for the Mac and Silverlining formatting software. This drive comes with a cartridge that has a capacity of about 44 MB. SyQuest technology offers speed and compatibility with an industry standard. $799. Liberty Systems, 122 Saratoga Ave., #16, Santa Clara, CA 95050. (408) 983-1127. (Apr '91)

**Macavance Protractive 40 5.2795**

The well-designed Macavance Protractive 40 is a 40-GB external SCSI hard-disk drive based on the fast, reliable Quantum 40P40 mechanism. With a low price, solid construction and an auto-switching power supply, this drive has a chunky shoebox shape that lacks a zero feet footprint to fit under a Mac Classic, and it can't be vertically oriented. Average performance. External SCSI-ID selection and SCSI termination. $455. Macavance, 12303 Technology Blvd., Austin, TX 78727. (800) 888-6221 or (512) 331-0446. (Apr '91)

**MacLand 40MB** $2,795

The MacLand 40MB is a 40-GB external SCSI hard-disk drive based on the fast, reliable Quantum 40P40 mechanism. Has an average seek time of 15 milliseconds. Based on the Seagate ST41200NM mechanism. Provides good performance with the Disk Manager Mac 2.23 SCSI driver. Software provides backup and password-protection features. SCSI-ID selection is via external button, and SCSI termination uses an external plug. Includes 10 MB of shareware. $2,795. MacProducts USA, Inc., 8303 Mopac Expwy., Ste. 218, Austin, TX 78759. (800) 622-3475 or (512) 343-9441. (July '91)

**MacProducts Magic 40MB** $2,595

The Magic 40MB is a 40-GB external SCSI hard-disk drive based on the fast, reliable Quantum 40P40 mechanism. The test unit had unshielded plastic SCSI connectors and relied on software to select SCSI-ID selection switches. An external SCSI-ID selection switch isn't a problem in a single setup but is potentially hazardous.
to data if you swap among multiple hard drives. Good software and a 1 MB of public-domain and shareware software. SCSI ID is software-controlled. Requires Mac Plus or later. $389. MacProducts USA, Inc., 8303 Mopac Expwy., Ste. 218, Austin, TX 78759. (800) 622-3475 or (512) 343-9441. (Apr '91)

**MacProducts MagicDrive 105**

The MagicDrive 105 is reasonably priced and fast. This zero-footprint unit comes with approximately 10 MB of public-domain and shareware software. SCSI ID is software-controlled. Runs warm. Requires Mac Plus or later. $419. MacProducts USA, Inc., 8303 Mopac Expwy., Ste. 218, Austin, TX 78759. (800) 622-3475 or (512) 343-9441. (Feb '90)

**MacProducts Magic 45**

Although not the fastest SyQuest removable-cartridge drive, this self-contained product has complete hardware features. Excellent software includes BackMatic and AutoSave II for backup. Drive supports A/UX partitions and comes with a cartridge that has a capacity of about 44 MB. $499. Cartridge, $69. MacProducts USA, Inc., 8303 Mopac Expwy., Ste. 218, Austin, TX 78759. (800) 622-3475 or (512) 343-9441. (Feb '90)

**MacTel HD Index Gigabyte**

This MacTel HD Index Gigabyte has an actual capacity of 988 MB. Average seek time is 15 milliseconds. Based on the Seagate ST41200NM mechanism. Gives good performance with the HD Chaffeur 1.3 SCSI driver. Software has partitioning, password-protection, backup, and data-encryption capabilities. SCSI-ID selection is via external button, and SCSI termination is via external plug. Includes 20 MB of shareware. $2,999. MacTel Technology, 3007 N. Lamar Blvd., Austin, TX 78758. (800) 950-8411 or (512) 451-2600. (July '91)

**MacTel Index 40MB**

The MacTel Index 40MB is a 40-GB hard drive and software. This drive is based on the fast reliable Quantum P40 mechanism. The price is attractive, construction is solid, and the drive has a low profile. Performance is average. The two SCRs and outlets are handy but aren't equipped with switches. SCSI-ID selection is external, and SCSI termination is internal. Good support from MacTel. $439. MacTel Technology, 3007 N. Lamar Blvd., Austin, TX 78758. (800) 950-8411 or (512) 451-2600. (Apr '91)

**MacTown DataStor DS40**

The DataStor DS40 is a 40-GB external SCSI hard-disk drive based on the slow, reliable Conner CP3040 mechanism. This drive has internal SCSI termination, and the external SCSI-ID switch allows "illegal" ID numbers 7 through 9. Low price is this product's redeeming virtue. $339. MacTown, 4657 MacArthur Ln., Boulder, CO 80303. (800) 338-4273. (Apr '91)

**MicroNet MR45**

This SyQuest removable-cartridge drive has rudimentary document-management software but no password protection. Comes with a cartridge that has a 44-GB capacity. SyQuest technology offers speed and compatibility with an industry standard. Cartridge, $569. MacTown, 4657 MacArthur Lm., Boulder, CO 80303. (800) 338-4273. (Feb '91)

**MicroNet MS-404**

The MicroNet MS-404 is a hard-disk drive with an actual capacity of 423 MB. Custom-designed case is excellently crafted. Average seek times and high throughput rate. No bundled software except for a proprietary installation utility. Requires Mac Plus or later. $3,795. MicroNet Technology, Inc., 20 Mason, Irvine, CA 92718. (714) 837-6033. (Dec '90)

**MicroNet MS30**


**MicroNet MS62**


**MicroNet SV-1000NP**


**Microtech CD-ROM**

This CD-ROM drive is well built and offers good performance. It has no preamp output, and volume control is limited. SCSI-ID selection is done via push button. Excellent performance. $809. Microtech International, Inc., 158 Commerce St., East Haven, CT 06512. (800) 626-4276 or (203) 468-6223. (June '91)

**Microtech Europa 40**

The elegant Microtech Europa 40 is a 40-GB external SCSI hard-disk drive based on the fast, reliable Quantum P40 mechanism. Average performance. SCSI-ID selection is external, but SCSI termination is internal. Good value for moderate price. Trade-in plan gives up to $70 off for new Microtech drives. Five-year warranty. $569 list. Microtech International, Inc., 158 Commerce St., East Haven, CT 06512. (800) 626-4276 or (203) 468-6223. (Apr '91)

**Microtech MicroKCN N1000**

**MINIFINDERS**

**MICE RATINGS**

The Microtech N320 is a compact hard-disk drive with an actual capacity of 770 MB, 3.5 MB/second seek times and throughput rate. Good software and support. Requires Mac Plus or later. $2,299. Microtech International, Inc., 158 Commerce St., East Haven, CT 06512, (800) 626-4276 or (203) 468-6223, (Dec '90)

**Microtech Nova 40 1**

The Nova 40 is an excellent zero-footprint, 40-MB hard-drive disk. It has a sturdy case, a five-year warranty, and automatic termination. Internal termination. Requires Mac Plus or later. $649. Microtech International, Inc., 158 Commerce St., East Haven, CT 06512, (800) 626-4276 or (203) 468-6223, (Dec '90)

**Microtech OR650**

The Microtech OR650 is an erasable optical drive with slow performance. Good for storing and transporting large files, Ricoh 30-MB hard drives may also offer better dust resistance. Doesn't match Syquest drives' speed, however. If you want to be an early adopter of this promising technology, the R50 is a good choice among Ricoh mechanisms. It comes with a cartridge and excellent utilities and formatting software. $1,299. Microtech International, Inc., 158 Commerce St., East Haven, CT 06512, (800) 626-4276 or (203) 468-6223, (Nov '90)

**Microtech R50**

Because it uses Ricoh's new magnetic-cartridge technology, this drive offers a potentially more durable cartridge design than the older, established and more expensive (by Syquest) Syquest technology. Good for storing and transporting large files. Ricoh 30-MB cartridges may also offer better dust resistance. Doesn't match Syquest drives' speed, however. If you want to be an early adopter of this promising technology, the R50 is a good choice among Ricoh mechanisms. It comes with a cartridge and excellent utilities and formatting software. $1,299. Microtech International, Inc., 158 Commerce St., East Haven, CT 06512, (800) 626-4276 or (203) 468-6223, (Feb '91)

**Mirco CD-ROM 1**

This solidly built CD-ROM drive offers good performance. Has good audio software, but volume control is limited. SCSI-ID selection is via push wheel. External SCSI termination. No bundled CD-ROM discs. AC outlet provided. $697. Mirror Technologies, Inc., 633-4450. (Nov '90)

**Mirror M 40**

The well-designed Mirror M 40 is a 40-MB external SCSI hard-disk drive based on the fast, reliable Quantum P40S mechanism. Has an average seek time of 4.2 MB/second. Constructions and a low profile. SCSI-ID selection and SCSI termination are external, and two switched AC outlets are provided. Unfortunately, the single-port drive has a 25-pin non-detachable cable and the SCSI-ID switch allows "illegal" numbers 7 through 9. $399. PCPP (Personal Computer Peripherals Corp.), 4710 Eisenhower Blvd., Bldg. A, Fremont, CA 94538, (815) 884-3092. (Apr '91)

**Ricoh CM 231**

This CD-ROM drive is well built and offers fast Photoshop performance. Includes HyperCard audio software. SCSI-ID selection is via push wheel, External SCSI termination. $297. Optical Technologies International (OMI!), 180 Knowles Dr., Los Gatos, CA 95030. (Apr 14 464 or (408) 376-3511. (June '91)

**Optical Access International CM 231**

This CD-ROM drive is well built and has good audio features and also a high list price. Its non-standard disc caddy is difficult to load. SCSI-ID selection is done via CSW. External SCSI termination. Two-year warranty. $1,049. Optical Access International, 800 W. Cummings Pk., Suite 350. Woburn, MA 01801. (800) 433-5133 or (617) 937-3910. (June '91)

**Optima Concorde 1050**

The Optima Concorde 1050 is a 1-gigabyte hard-disk drive with an actual capacity of 988 MB. Average seek time of 15 milliseconds. Based on the Seagate ST41200NM mechanism. Provides good performance with the Disklink 2.1 SCSI driver. Software has partitioning, password protection, and file-recovery capabilities. SCSI-ID selection is via external button, and SCSI termination uses an external plug. $5,995. Optima Technology, 17526 Von Karman, Irvine, CA 92714, (714) 476-0515. (July '91)

**Optima DiskKovery 40**

The distinctively designed DiskKovery 40 is a 40-GB external SCSI hard-disk drive based on the slow, reliable Conner CP3040 mechanism. The price is attractive enough to forgive the sluggish performance, and the drive can be set up in either vertical or horizontal orientation. SCSI-ID selection and SCSI termination are external. SCSI-ID switch allows "illegal" numbers 7 through 9. Indicator lights are provided for disk-access activity, power-on, and termination status. $695. Optima Technology, 17526 Von Karman, Irvine, CA 92714, (714) 476-0515. (Apr '91)

**Optima Minifak 310**


**PCPC MacBotom 50MB**

The well-designed, inexpensive MacBotom 50MB is a 50-MB external SCSI hard-disk drive based on the new, fast Quantum P40S mechanism. External cartridge profile case fits well under a Mac Classic. SCSI-ID selection is external, but SCSI termination is internal. Power-on indicator lights are provided. Unfortunately, this single-port drive has a 25-pin non-detachable cable and the SCSI-ID switch allows "illegal" numbers 7 through 9. $399. PCPP (Personal Computer Peripherals Corp.), 4710 Eisenhower Blvd., Bldg. A, Fremont, CA 94538, (800) 288-8754 or (415) 657-2211. (July '91)

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**Mice Ratings**

- 4: Excellent
- 3: Very good
- 2: Good
- 1: Fair
- 0: Poor

**MacUser August 1991 Minifinders**
This well-designed MacinStor 1200-ST hard-drive disk based on the fast, reliable Quantum 540S mechanism. Good formatting software is provided, and the drive has a low-profile, elegant case. Unfortunately, the case is somewhat flexible. The drive is moderately expensive. SCSI-ID selection and SCSI termination are external. In our tests, this drive was the fastest of the drives with the same Quantum mechanism. $859.

Storage Dimensions

MacinStor 650 S1

This drive (formerly called HCV) is a 650 MB external disk drive built around the Maxtor XT-8760S mechanism. Based on the Seagate ST14000NM mechanism, it provides good performance with the MacinStor 3.0 SCSI driver. SCSI-ID selection is via external dial, and SCSI termination uses an external plug. It has good throughput performance. Good software is provided, considering the price. The MacinStor S1 is well-built. A transfer rate of 15 millisecond s, a transfer rate of 15 megabytes per second, and an outstanding 40,000-hour MTBF (mean time between failures) rating. $859.

Storage Dimensions

MacinStor 1020-S1

The MacinStor 1020-S1 is 1 gigabyte hard-drive disk with an actual capacity of 990 MB. It has an average seek time of 15 milliseconds, a transfer rate of 15 megabytes per second, and an outstanding 40,000-hour MTBF (mean time between failures) rating. $859.

Storage Dimensions

MacinStor MCE 880-HCI

This drive is one of the fastest erasable optical drives for reading data. Unique format of 1-gigabyte discscan't be read by other manufacturer's drives. Can format, read, write, and erase a standard 1-6.5 GMB disk, but performance suffers with these cartridges. Includes Retrospect backup software. Requires Mac Plus or later, $6,995.

Storage Dimensions

MacinStor PCE 880-HCI

The MacinStor PCE 880-HCI is one of the fastest erasable optical drives for reading data. Unique format of 1-gigabyte discs can't be read by other manufacturers' drives. Can format, read, write, and erase a standard 1-6.5 GMB disk, but performance suffers with these cartridges. Includes Retrospect backup software. Requires Mac Plus or later, $6,995.

Storage Dimensions

Systm RSSM600-B

The Sum RSSM600-B is an erasable optical drive. Meager software. Its default format is not
MICE RATINGS

ISO. Has an Option-key sequence to format its ISO standard. Slow. Requires Mac Plus or later. $4,300.
Sumo Systems, 1580 Old Oakland Rd., Ste. C-110, San Jose, CA 95131, (408) 453-5744, (Nov '90)

Sumo SSR 50 Removable CD-ROM Drive

Because it uses Ricoh’s new magnetic-disk-cage technology, this drive offers a potentially more durable cartridge design than the older, better-established (and incompatible) SyQuest technology. Good for storing and transporting large files, Ricoh 50-MB cartridges may offer better dust resistance. Doesn’t match SyQuest drivers’ speed, however. Good documentation. The Sumo SSR 50 Removable Supports AUX partitions and is bundled with built-around an Exabyte 8-MEG RAM. the Portable’s battery life is 111 maximum operation and good software.

Textel DM5020

The Textel DM5020 is a SyQuest removable-cage drive with an auto-switching power supply, external SCSI-ID selection, and a noisy fan. Performance is above average, but documentation is rudimentary. Requires Mac Plus or later. $4,950. Authentic and Mutate, $295. Adobe, 125 Shoreway Rd., Ste. 3000, San Carlos, CA 94070, (800) 331-3313 or (415) 955-8855, (June ‘89)

Hypermedia

101 Scripts and Buttons for HyperCard

101 Scripts and Buttons for HyperCard is a collection of scripts, buttons, fields, graphics, utilities, XCMDs, XPCNs, icons, cursors, and more for creating HyperCards. Version 1.1 reviewed. Requires Mac Plus or later. HyperCard 3.0 and a hard-disk drive. $49.95. Individual Software, Inc., 125 Shoreway Rd., Ste. 3000, San Carlos, CA 94070, (800) 331-3313 or (415) 955-8855, (June ‘89)

MIME TRIM

The MIME TRIM is a SyQuest removable-cage drive with an auto-switching power supply, external SCSI-ID selection, and a noisy fan. Performance is above average, but documentation is rudimentary. Requires Mac Plus or later. HyperCard 3.0 and a hard-disk drive. $49.95. Individual Software, Inc., 125 Shoreway Rd., Ste. 3000, San Carlos, CA 94070, (800) 331-3313 or (415) 955-8855, (June ‘89)

ADDMotion

ADDMotion is an extension to the HyperCard 2.0 development environment that provides a powerful set of animation tools. Animations are created with TimeLines (an editing window) and MediaController palette (resembling a VCR), with cells, actors, props, and object paths. Provides its own native animation tools. ADDMotion’s run-time XCMDs are included and can be distributed royalty-free. Not for beginners. Version 1.0 reviewed. Requires HyperCard 2.0. $295. Motion Works, Inc., 1334 W. Sixth Ave., Ste. 300, Vancouver, British Columbia V6H 1A6, Canada. (604) 732-0269, (July ‘91)

Authentic and Mutate

Authentic and Mutate are HyperCard extensions. Authentic and Mutate are HyperCard extensions. Authentic and Mutate are HyperCard extensions. Authentic and Mutate are HyperCard extensions. Authentic and Mutate are HyperCard extensions. Authentic and Mutate are HyperCard extensions.
**MINI FINDERS**


**Guide**


**HyperAnimator**

HyperAnimator lets you create talking heads for HyperCard stacks via a DA. Leads you through customization of sound resources. Easy to implement for those who know HyperCard well. Version 1.0 reviewed. Version 1.2 reviewed. Requires Mac Plus or later and HyperCard. $199.95. Bright Star Technology, Inc., 1450 114th Ave NE, S.E., Ste. 200, Bellevue, WA 98004. (206) 462-3707. (Feb '90)

**HyperBASIC**

HyperBASIC is a stand-alone XCMD-compiler application. You can program in BASIC to use it. Its BASIC is pretty standard and gives access to 352 Toolbox traps. There's no debugging utility, but it's fairly worthwhile, and the whole concept is a good system for HyperCard XCMD creation. Version 1.05 reviewed. Version 1.20 reviewed. Requires Mac Plus or later, HyperCard 1.2.1 or later, and a hard-disk drive. $99. Teknosys, Inc., 3223 Coconut Palm Dr., Ste. 111, Tampa, FL 33619. (813) 382-8373 or (813) 620-3494. (May '90)

**HyperCard**

With the exception of the lack of support for color and object graphics, HyperCard 2.0 is a huge improvement over earlier versions. There are some nice additions to graphics capabilities. Text formatting has added, and printing are significantly improved. More than one stack can now be open at the same time. Version 2.0 reviewed. Version 2.1 reviewed. Requires Mac Plus or later and System 6.0.5 (hard-disk drive and 2 megabytes of RAM recommended). Upgrade kit. $49; development kit. $199. Claris Corp., 5201 Patrick Henry Dr., Santa Clara, CA 95052. (408) 544-8554 or (408) 727-8227. (Dec '90) *'87 Eddy

**HyperDA**

HyperDA lets you browse through HyperCard stacks via a DA. Lets you see all the cells of a stack or your entire database at once. Needs a database and a hard驱 or a floppy-drive disk. Student version, $79.95; professional version, $299. MindLink, Inc., P.O. Box 98928, Honolulu, HI 96828. (808) 457-2025. (May '90)

**HyperHIT**

HyperHIT is a HyperCard SFCND and XCMDs that lets you build database applications in HyperCard. Has many powerful functions and tools. Good experience is required. Results can be slow. Version 1.0 reviewed. Version 3.0 reviewed. Requires Mac Plus or later and HyperCard. $129; upgrade, $29. Symmetry Software Corp., 860 E. 10th St., Royal Palm Beach, FL 33414. Scottsdale, AZ 85258. (602) 624-2485 or (602) 968-9106. (May '89)

**HyperTMON**

HyperTMON is a HyperCard application that lets you test Macs access stackware. Doesn't look pretty, even with global variables. Version 1.2 reviewed. Version 2.0 shipped. Requires Mac Plus or later. $129; upgrade, $29. Symmetry Software Corp., 860 E. 10th St., Royal Palm Beach, FL 33414. Scottsdale, AZ 85258. (602) 624-2485 or (602) 968-9106. (May '89)

**MindLink**

MindLink is a HyperCard-based CD-ROM. It leads you through a structured procedure that helps you find answers by providing you with quick reference. Performance can be frustrating. HyperCard is bundled. Version 1.0 reviewed. Version 2.0 shipped. Requires Mac Plus or later and a hard-disk drive or a floppy-drive disk. Student version, $79.95; professional version, $299. MindLink, Inc., P.O. Box 98928, Honolulu, HI 96828. (808) 457-2025. (May '90)

**Nutrition**

Nutrition is a HyperCard stack that is a good nutritional record keeper. The nutritional database needs more information, and adding new information is difficult. Includes conversion calculator. Version 2.0 reviewed. Version 2.0 shipped. Requires Mac Plus or later and HyperCard. $129; upgrade, $29. Somak Software, Inc., 535 Encinitas Blvd., Ste. 113, Encin­	istas, CA 92024. (800) 854-5020 or (619) 942-2556. (Feb '90)

**ScriptExpert**

ScriptExpert is a HyperTalk help tool for constructing HyperCard scripts. Version 2.0 shipped. Requires Mac Plus or later and HyperCard 1.2.5 or 2.0 (package includes software for both versions). $99.95. Hyperpress Publishing Corp., 1166-F Triton St., Foster City, CA 94404. (800) 633-4252 or (415) 345-4620. (Oct '88)

**Spinnaker PLUS**

Spinnaker PLUS is a HyperCard-like development environment. Uses concept of hypertext but with WindowMaker for HyperCard and graphics and color. Has unique specialized child for word-processing and database support. Supports HyperCard stacks via a DA. Lets Mac Plus or later, System 6.0.3 or later, and 2 MB of RAM. $495. Spinnaker Software Corp., 201 Broadway, Cambridge, MA 02139. (800) 323-8086 or (617) 494-1200. (Dec '90)

**SuperCard**

SuperCard offers capabilities that HyperCard lacks. An excellent tool for developing animated presentations and other graphically rich applications. Its control over the interface and its ability to produce stand-alone applications distinguish it from any dedicated animation or presentation productivity tool. SuperCard has improved significantly. Version 1.5 shipped. Requires Mac Plus or later and System 6.0.4 or later (2 MB of RAM recommended). SuperCard, 2485 or (602) 998-9106. (May '90)

**The Macintosh Bible**

The Macintosh Bible: STAX! Edition


**The Macintosh Bible**

The Macintosh Bible: HyperCard Edition


**ScriptEdit**

ScriptEdit is a HyperTalk utility for HyperCard programmers. Opens multiple script windows simultaneously from different stacks. Makes stack creation easier and more convenient than previously possible. Version 1.0 recommended. Requires Mac Plus or later. $79. Somak Software, Inc., 535 Encinitas Blvd., Ste. 113, Encin­	istas, CA 92024. (800) 854-5020 or (619) 942-2556. (Feb '90)

**Wild Things**

Wild Things is a collection of 40 XCMDs that also teaches you about XCMDs. Comes on four disks — two are devoted entirely to source code. Code is provided in Pascal.
ALL OF THE SPEED
NONE OF THE WORRY

DISKEXPRESS II NOW FEATURING UNIQUE NEW ADVANCED DATA VERIFICATION

This is your hard disk severely fragmented
Fragmentation pushes pieces of files all over your hard disk, forcing your disk head to work much harder just to keep up with your files. The worrisome results are increased head movement and progressively slower file access times that can slow down any Mac—even yours!

- Frequently used files
- Seldom used files
- Free space

Numbers & Letters are scattered pieces of single files

This is your hard disk defragmented
Even defragmenters can't help much. Ordinary defragmentation software just places pieces of individual files adjacent to each other. They don't have the intelligence to constantly monitor file usage to determine which of your files are frequently used and which aren't. So, any increases in performance are modest and only temporary, disappearing as soon as you use your Mac again. Don't worry, there's DiskExpress II.

MultiDisk™
Disk Partitioning
V1.27 is now 7.0 compatible & savvy
$89.95

DiskExpress™ II
Disk Optimizing
V2.07 is now 7.0 compatible & savvy
$89.95

MasterJuggler™
Resource Optimizer
$89.95

DiskExpress II

With DiskExpress II, your hard disk works much faster, smarter and safer. Right from the very first time you optimize. Because only DiskExpress II features revolutionary, patent-pending DiskOptimatic™ technology developed by ALSoft to safely keep your Mac optimized FOREVER. There's no more worry about optimization again. Plus, only DiskExpress II has the intelligence to work intuitively and transparently while you work, the way you work. It even optimizes around any bad spots on your hard disk “spared” by leading bad block sparing software. Only DiskExpress II monitors your daily file activity to determine the absolute priority for file placement on your particular Mac. That not only minimizes head movement, it delivers the kind of dramatic improvement in speed and performance that goes way beyond conventional defragmenters and ordinary disk optimizers.

DiskExpress II also gives special treatment to your Virtual Memory file and startup system extensions, enhancing Virtual Memory performance and improving the startup speeds of your Mac. What's more, with DiskExpress II's new advanced data verification, DiskExpress II double-checks all of its read and write activity to your hard disk—including the directory. So, you get all the speed you need with none of the worry of ordinary optimizers. To order yours FAST, call or fax ALSoft today.

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(MPW, TML, and Lightspeed), C
(MPW and Lightspeed), and FORTAN (MPW) for each of the XCMDs. Includes Hyper­
Card 1.2.1. Version 1.1.1 ship­­ping. Requires Mac Plus or later, System 6.0.3 or later, and a hard­
disk drive. Supports 32-bit Language Sys­­em Corp., 441-B Carlsile Dr., Her­­ndon, VA 22070. (703) 478-0181. (Dec ‘89)

The Vietnam War 4

The Vietnam War is a stack that uses HyperCard fully and brill­i­antly to provide an excel­lent history through the use of sounds, animation, generally superb graphs, and unobtrusive but ex­tensive links. Its only drawbacks are those inherent in HyperCard. Version 2.0 reviewed. Version 2.1 shipping. Requires Mac Plus or later, HyperCard 2.0, and a hard­disk drive. $24.95. Regeneration Software, 16561 Ti­maro Dr., Sun­­nyvale, CA 94086. (408) 438-5791. (Apr ‘90)

XCAL

XCAL is a set of HyperCard ex­ten­sions that turn your HyperCard stack into a spreadsheetlike abilities to stacks. Grids restricted to the size of single cards. Extends HyperCard’s math abilities significantly. Poor manual. Version 2.0 shipping. Requires Mac Plus or later (2 MB recommended), HyperCard (in­cludes both basic and advanced­level stacks). $149.95. Trendware Corp., P.O. Box 2285, Huntington, CA 90648. (203) 926-1116. (Jan ’90)

MINIFINDERS

Audiomedia

Audiomedia turns the Mac into a self-contained recording studio. Can play back, edit, and mix sound files and subject them to a variety of special effects. Has Chill that occupies huge amounts of hard-disk space (10 MB of disk space per minute of sound). Excellent manual — includes a chapter devoted to scientific audio theory. Version 2.0 shipping. Requires Mac II series, 2 MB of RAM, and a hard­disk drive. $995. Digidesign, 1360 Willows Rd., Ste. 101, Menlo Park, CA 94025. (415) 688-0600. (Oct ‘90) $99 Eddy Computer Friends ColorSnap 32+ $49.95

The Computer Friends ColorSnap 32+ is a NuBus card that digitizes single frames of video input. Above-average image quality. Software is powerful, complete and easy to use. Available in cataloging plus plug-ins for Photoshop and QuarkXPress. VHS-quality video includes compo­site, RGB, and S-video. Live­video display is slow and uses a small window; 24-bit images can be captured at 640 x 480 pixels. Requires Mac II series. $995. Computer Friends, Inc., 14250 N.W. Science Park Dr., Portland, OR 97229. (800) 547-3303 or (503) 626-2291. (July ‘90)

MacroMind Accelerator $119.95

The QuickView Studio is a NuBus card that sequentially digitizes single frames of video input. Poor image quality but nice soft­ware interface. Video-in options include composite, RGB, and S­video. Live­video display is slow and uses a small window; 16-bit live video is slower than 30 fps. Resizable images (8- or 16-bit) can be digitized. Requires Mac II series, 680-400, E-Machines, Inc., 9305 S.W. Gemini Dr., Beaverton, OR 97005. (800) 344-7274 or (503) 646-6696. (July ‘91)

FilmMaker

FilmMaker is a powerful anima­tion tool that includes five sepa­rate applications: Mark, Animate, Sound, Paint, and Produc­tion. It is limited to the animation process, so the original graphic images that become sequential frames in FilmMaker must be created in a paint/illustration program and imported as PICT, PICS, or EPS files. The program isn’t optimized for precisely registered frame animation. The interface seems incomplete and awkward. Version 2.0.1 reviewed. Requires Mac II series with 5 MB of RAM, hard-disk drive, and QuickDraw. $695. Para­com­p, Inc., 1725 Montgomery St., San Francisco, CA 94111. (415) 958-4991. (Apr ‘91) $99 Eddy interface

interface is a good tool for building interactive educational software. At first the program seems dedicated to creating an­i­mated “talking heads” with facial gestures synchronized to speech or other sounds. However, interface lets you build active animations and also control peripheral devices such as CD­ROM drives, VCRs, and video­disc players. One problem is that it writes Excel­lent animation, not animation. Also, the interface seems incomplete and awkward. Version 2.0 reviewed. Requires Mac II series with 5 MB of RAM, hard­disk drive, and Quick­Draw. $695. Paras­comp, Inc., 1725 Montgomery St., San Francisco, CA 94111. (415) 958-4991. (Apr ‘91) $99 Eddy Quicklmage 24 $995

Quicklimage 24 is an inex­pensive NuBus card that digitizes single frames of video input. Poor color fidelity. Software is easy to use and provides special-effects filters. Video­in options include composite and S­video but not RGB. Live­video display is slow and uses a small window; 24-bit images can be digitized, but maximum resolution is 640 x 480 pixels. Requires Mac II series. $995. Mac Microsystems, Inc., 810 W. Maude Ave., Sunnyvale, CA 94086. (800) 522-7797 or (408) 522-1200. (July ‘91)

Media Letter

The Media Letter is a monthly publi­cation that covers interactive and mul­timedia technologies. It in­cludes both basic and advanced material and seems aimed at users of these technologies rather than at developers. Founding editor Denise Caruso has assembled an excellent group of contributing writers. Topics covered include ethical issues, application notes, and some good opinion pieces. $395 per year; $95 for schools and non­profit s. The Myriad Group, P.O. Box 5199, Belmont, CA 94002. (415) 626-5426 or (415) 856-8900. (Oct ‘90)

TV Producer

The TV Producer Pro is a NuBus card that overlays Mac graphics and text onto a video signal. Original hardware design is still in use, but new version will provide access via control panel. Version 1.8 software shipping. Requires MacRecorder and can be fixed length or loop. Recordings can be installed into HyperCard stacks for easier distribution. Version 1.0 reviewed. Requires Mac Plus or later. $495. Farallon Computing, Inc., 2000 Powell St., Ste. 600, Emeryville, CA 94608. (415) 596-9000. (Dec ‘90)

Logitech Image Grabber

Logitech Image Grabber is a NuBus card that digitizes single frames of still­video input. Excellent image quality. Outputs gray­scale NTSC video. The Colour Adapter Module is an optional external box that adds color capability. The bundled software is powerful, but complex. Video­in options include composite, RGB, and S­video. Live­video display uses resizable 640 x 480­pixel window; 24-bit images can be digitized, but maximum resolution is 640 x 480 pixels. Requires Mac II series. Image Grabber, $1,499; Colour Adapter Module, $499. Advent Computer Products, Inc., 4450 Fairchild St., Ste. 200, San Jose, CA 95129. (408) 237-2795 or (408) 434-1441. (July ‘91) $99 Eddy Mass Microsystems

Quicklimage 24 $995

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MacroMind Director

MacroMind Director is a collection of serial animation and playback of color graphics and sound. By writing routines in Director’s scripting language, you can develop inter­active animations and also control peripheral devices such as CD­ROM drives, VCRs, and video­disc players. One problem is that it is difficult to use and provides special-effects filters. Video­in options include composite and S­video but not RGB. Live­video display is slow and uses a small window; 24-bit images can be digitized, but maximum resolution is 640 x 480 pixels. Requires Mac II series. Image Grabber, $1,499; Colour Adapter Module, $499. Advent Computer Products, Inc., 4450 Fairchild St., Ste. 200, San Jose, CA 95129. (408) 237-2795 or (408) 434-1441. (July ‘91) $99 Eddy Media Letter

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It's a contradiction we humans have been living with for millions of years: one brain, two ways of thinking. The right half of the brain is creative and carefree, while the logical left hemisphere is designed to put things in order. So when you try to get your head together and organize your hard disk, the result can be a filing system that doesn't work for either half.

That's why you need File Director, the left-brained program for right-brained people. File Director makes everyday operations easier by letting you logically arrange your files, folders, documents and applications on "pages" by date, job, client or whatever makes sense to you.

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And keep this in mind. We'll send you a free copy of Pyro!, the entertaining screensaver (a $39.95 value), just for writing "Pyro!" on the File Director registration card before you return it. For more information, call 1-800-873-4384 today.

Got half a mind to get organized? Get File Director.
**MINIFINDERS**

Mac II, Apple 8-bit-video card, and video source. $695. Computer Friends, Inc., 14250 N.W. Scientific Dr., Portland, OR 97229, (800) 547-3303 or (503) 626-2291, (May '88)

**VideoLogic DVA-4000 4k**

The company also offers a NuBus card that provides a complete set of audio/video features for multimedia. Excellent image quality. Sound is powerful and complete, and easy to use. Provides stereo audio that's controllable through software. Video-injectives include composite, RGB, and S-video. Live-video display is 24-bit in a resolvable window; 8-bit or 24-bit images can be digitized. Easily integrates with multimedia packages. Mac User, Mind Director, and Authorware Professional. Good documentation. Requires Mac II series. Software: VideoLogic, Inc., 421 First St., Cambridge, MA 02142. (617) 494-0530. (July '91)

**Music**

**Alchemy**


**Apple MIDI interface**

The Apple MIDI Interface is a simple musical-instrument digital interface with a 1-MHz clock rate. Has only one MIDI input and one output. Requires Mac Plus or later. $99. Apple Computer, Inc., 30255 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (June '88)

**Beyond**

Beyond is a competent music sequence for midlevel users, but it should be priced around $200 to make it competitive. Does a good job of implementing the Mac interface, and both the manual and the tutorial are excellent. Incorporates a unique feature that, at least on Macs based on a 68000 CPU, accelerates the program by adjusting its performance relative to the computer's internal clock. Version 1 reviewed. Version 2.0 shipping. Requires Mac Plus or later, MIDI interface, and MIDI synthesizer. $319. Dr. T's Music Software, Inc., 625 Miramont St., Ste. 1B, Needham, MA 02194. (617) 494-0530. (Feb '91)

**ConcertWare+**

ConcertWare+ MIDI is a composition and transcription program that can record multiple notes from a MIDI keyboard. Easy to use if you can read music. Handles eight tracks of eight voices each. Version 4.0 reviewed. Version 5.1 shipping. Requires Mac 512Ke or later. $1,909. Great Wave Software, 5533 Valley Dr., Ste. E, Scotts Valley, CA 95066. (408) 438-1990. (Dec '87)

**Cue:**

The Film Music System is a powerful and versatile assistant for scoring films. Automatically notating and logging cues and, searching for missing tempo. Also performs many minor jobs, such as generating a performing-rights cue sheet. Version 2.0 reviewed. Version 3.0 shipping. Requires Mac 512Ke or later (hard-drive disk recommended). $995. Opcode Systems, Inc., 3641 Haven Dr., Ste. A, Menlo Park, CA 94025. (415) 369-1311. (Feb '91)

**Deck**

Deck is a completely software-generated recording system, with an interface resembling the famous Tascam Port Studio four-track cassette recorder. MIDI and audio input can be mixed and synchronized, producing CD-quality stereo that's easy to access and manipulate. Version 1.0 reviewed. Version 1.03 shipping. Requires Digidesign's AudioMedia or Sound Tools card. $349. Digidesign, 1360 Willow Rd., Ste. 101, Menlo Park, CA 94025. (415) 686-0600. (Feb '91)

**Eddy**

Eddy Deluxe Music Construction Set

Deluxe Music Construction Set lets you up to 48 voices on eight staves and play the music through the Mac's internal speaker and/or MIDI. Copy-protected. Version 2 reviewed. Version 2.5 shipping. Requires Mac Plus or later (hard-drive disk recommended). $129.95. Electronic Music Industries, 1920 Gateway Drive, Sunnyvale, CA 94044. (800) 245-4525 or (415) 571-7171. (June '88)

**Digidesign MacProteus**

The MacProteus is a NoteCard that fits any member of the Mac II series. The card operates as a sampling sound synthesizer for desktop music production, providing a MIDI interface with Apple's MIDI Manager and PatchBay software. A wide variety of customizable sounds is available, and the card is easy to install. Can play 16-bit linear, 32-kHz mono or stereo samples, but it cannot create them. Version 1.02 reviewed. Requires Mac II series. $895. Digidesign, 1360 Willow Rd., Ste. 101, Menlo Park, CA 94025. (415) 686-0600. (Feb '91)

**Encore**

Encore is a quasi-rule-based music notation program with a nice interface. It supports multiple files and can deal with large files. Version 1.16a reviewed. Version 1.31 shipping. Requires Mac Plus or later, $955. Passport Designs, Inc., 625 Miramont St., Ste. 103, Half Moon Bay, CA 94019. (415) 726-0280. (May '90)

**EZ Vision**

Powerful enough for beginners, EZ Vision is a general-purpose sequencer that uses a standard tape-recorder analog, offering many of the best features in Opcode's professional sequencer. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later. $495. Broderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903. (415) 521-6263 or (415) 492-3200. (July '88)

**Listen**

Listen is an educational tool for car training. It offers a piano keyboard and a large display for input notes. Wide range of exercises. Supports MIDI. Version 2.1 reviewed. Requires Mac Plus or later and System 6.0.3 or later. $99. Imaja, P.O. Box 6386, Albany, CA 94706. (415) 526-4261. (Jan '87)

**MIDIPlay**

MIDIPlay is a music composition and creation program that works with MIDI data in real time. Unique, entertaining, and powerful but requires lots of practice and patience. Version 2.2 shipping. Requires Mac Plus or later, MIDI interface, and MIDI synthesizer. $149. Opcode Systems, Inc., 100 Crescent Rd., Ste. 1B, Needham, MA 02194. (617) 455-1454. (Oct '87)

**The Magic Flute Audio Notes**

The Magic Flute Audio Notes gives a thorough introduction to Mozart's opera. Nonintuitive interface, but it's manageable. Attractive graphics. Somewhat difficult to install. Requires Mac Plus or later, System 6.0.3 or later, a hard-drive drive, a CD-ROM drive, and speakers or headphones. $66. Warner New Media, 3500 W. Olive Ave., Ste. 1050, Burbank, CA 91505. (818) 955-9999. (Nov '90)

**Master Tracks PRO**


**MIDIBASIC**

MIDIBASIC is a simple, highly useful routine for writing MIDI software. Sketchy documentation. Works with both Microsoft BASIC and ZBasic. Version 1.0 reviewed. Version 3.0 shipping. Requires Mac Plus or later. (April '89)

**Music 2**

Music 2 is a music program for those who are not interested in the length of skirts. With no skill, you can "jam" with rock, jazz, rap, or country tunes. A sort of "Sing Along with Mitch" for the Mac. Reviewed. Requires Mac Plus or later. $495. Broderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903. (415) 521-6263 or (415) 492-3200. (July '88)

**MUSICMETH**

A music sequencer to play MP3 format. Requires Mac Plus or later. $295. PPL Audio, 3118 Santa Fe Ave., Austin, TX 78745. (512) 448-2172. (May '91)

**System 6.0.2**

System 6.0.2 reviewed. Requires Mac Plus or later and System 6.0.3 or later. ($99. VPI Research, Inc., 656 Bair Island Rd., Redwood City, CA 94063. (415) 361-1710. (Aug '90)

**MusicMETH**

A music program for those who are not interested in the length of skirts. With no skill, you can "jam" with rock, jazz, rap, or country tunes. A sort of "Sing Along with Mitch" for the Mac. Reviewed. Requires Mac Plus or later. $495. Broderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903. (415) 521-6263 or (415) 492-3200. (July '88)

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MINIFINDERS

ambitious task of integrating MIDI sequences into Mac-based multimedia presentations. The XCMIDs package designed to work with HyperCard, SuperCard, and MacroMind Director. MIDIPaly's main job is to export MIDI music and other stacks, or the Clipboard, but it can also export many of its own sound-control buttons (such as Start, Continue, and Stop) to other stacks. Other goodies let you fine-tune overall characteristics of MIDI sounds. Version 1.0 reviewed. $39.95. Opcode Systems, Inc., 3641 Haven Dr., Ste. A, Menlo Park, CA 94025. (415) 369-8131. (May '91)

Music Mouse

Music Mouse is a program that gives you instant musical feedback as you move the mouse and type on the keyboard, thus controlling tempo, vibrato, volume, and so on. Version 2.04 shipping. Requires Mac Plus or later. $79. Dr. T's Music Software, Inc., 100 Crescent Rd., Suite A, Malibu, CA 90265. (413) 455-1454. (May '87)

MusicPro

MusicPro was designed for preparing lead sheets, piano-voices parts, and small ensemble scores. It's easy to learn and use. Can import and play back almost anything. Version 1.0 reviewed. Versions 2.0 shipping. Requires Mac Plus or later with a hard-disk drive, MIDI instrument and interface, and printer. $399. Coda Music Software, 1401 E. 79th St., Bloomington, MN 55425. (800) 843-2066 or (612) 854-1288. (May '90)

NoteWriter II

NoteWriter II is a completely non-rules-based notation program. Doesn't read, write, or understand MIDI and doesn't play back files. Designed to get you into and out of the MIDI environment. Version 2.5 reviewed. Version 3.0 shipping. Requires Mac Plus or later. $595. Passport Designs, Inc., 625 Miramontes St., Ste. 103, Menlo Park, CA 94025. (415) 726-0280. (Sept '90)

Perceive

Perceive is a multi-track music synthesizer application aimed at the school environment. Contains six modules of varying quality — Tutor, Drills, MiniDesignWave, MiniWaveDraw, Sound Machine, and Tuning. Requires Mac Plus or later, MIDI interface, and a hard-disk drive. $199.95. Video Software, Inc., 1401 E. 79th St., Bloomington, MN 55425. (800) 843-2066 or (612) 854-1288. (Mar '90)

Professional Composer

Professional Composer produces performance-quality sheet music, using Adobe's Sonata font. Scores can be created from scratch or imported from Performer (and can be exported to Performer for MIDI playback). Copy-protected. Version 2.3 shipping. Requires Mac Plus and hard-disk drive, MIDI instrument and interface, and printer. $399. Coda Music Software, 1401 E. 79th St., Bloomington, MN 55425. (800) 843-2066 or (612) 854-1288. (May '90)

SampleCell

SampleCell is a sample-playing Mac II NuBus card. Comes with excellent software tools and more than 600 MB of pre-recorded sounds on a CD-ROM. Hardware comprises a 49 key NuBus controller, a NuBus card, and a NuBus card. The card has 16 MIDI channels. Supports MIDI key-boards, sequencers, and programs compatible with Apple's MIDI software. $2995. Mac Plus or later, 4 MB RAM, 3.5 MB disk, and a CD-ROM drive. Version 1.2 reviewed. $995. Opcode Systems, Inc., 3641 Haven Dr., Ste. A, Menlo Park, CA 94025. (415) 369-8131. (June '91)

Super Librarian


The Voyager CD AudioStack

The Voyager CD AudioStack is a HyperCard tool kit that lets you precisely control a compact disc (in a CD-ROM player) to create musical stacks. The scripts are thoroughly and clearly commented, and anyone with HyperCard proficiency should find them easy to modify. Requires Mac Plus or later, HyperCard or SuperCard, a hard-disk drive, a CD-ROM drive, and speakers or headphones. $99.95. The Voyager Company, 1351 Pacific Coast Hwy., Santa Monica, CA 90401. (213) 451-1383. (Nov '90)

Number Crunching

Calculator Construction Set

Calculator Construction Set lets you build almost any sort of calculator imaginable. The finished calculators are working DAs. Takes some effort and you need to read the manual, but the results are worth it. Version 2.0 reviewed. Version 2.0.9 shipping. Requires any Mac (hard-disk drive recommended), $89.95. Dub-Click Software, Inc., 9316 Deering Ave., Chicago, IL 60643. (818) 700-9525. (Feb '90)

Data Acquisition & Analysis

Analogue Connection Workbench

Analogue Connection Workbench is an icon-based application generator for generating data acquisition, control, and analysis. Users create flow diagrams that make live color plots. Powerful and easy to use. Version 3.0 reviewed. $399.95. Digidesign. (800) 445-4866 or (206) 889-7777. (Aug '90)

MICE RATINGS

MICE RATINGS

The String Quartet!!!

The String Quartet!!! is a completely non-music-oriented piece of software. Basically it's an interface between MIDI and sound. It's easy to install and navigate. SMTP-E syncing, 32 simultaneous Ins and Outs, unlimited overdubbing, and compatibility with Professional Composer for transcription. Version 2.2 reviewed. Version 3.0 shipped. Requires Mac Plus or later with 2 MB of RAM. System 6.0.3 or later, MIDI interface, and two floppy drives (hard-disk drive recommended). Prices $66. Warner New Media, 3500 W. Olive Ave., Ste. 1050, Burbank, CA 91505. (818) 957-9999. (Jan '88)

Practice Musica

Practice Musica uses an interactive game and practice approach to teach music theory and ear training. Excellent tool for serious music study as well as for developing a trained ear for intervals, chords, and melodies. Includes simple pitch reading and writing, scales, modes, interval recognition, and chord spelling. Supports MIDI. Version 2.2 shipped. Requires Mac Plus or later, $129. Opcode Systems, Inc., 3641 Haven Dr., Ste. 103, Menlo Park, CA 94025. (415) 726-0280. (Sept '90)

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Super Librarian

Super Librarian is a multiplatform PATCH FILE manager for MIDlTime Piece interface, $495. Opcode Systems, Inc., 3641 Haven Dr., Ste. A, Menlo Park, CA 94025. (415) 369-8131. (June '91)

TurboSynth


UpBeat

UpBeat turns the Mac into a front panel for a highly complex and versatile drum machine. Input patterns with mouse, MIDI key-
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MINIFINDERS

Strawberry Tree, Inc., 160 S. Wolfe Rd., Sunnyvale, CA 94086. (408) 540-1800. (July '91)

**ATLAS™ MapMaker 4.5** 
ATLAS™ MapMaker is a digital cartographer that displays demographic and marketing information geographically. A huge library of maps and supporting data is available (some at additional cost) but no internal database management program is free at presentation mapping; provides international maps; and supports U.S. boundary maps by state, county, ZIP, ADI, and DMA. Version 4.5 reviewed. Requires Mac Plus or later. $495. Strategic Mapping, Inc., 4030 Moorpark Ave., Ste. 250, San Jose, CA 95117. (408) 437-0400. (July '91)

**Business Simulator 795**
Business Simulator is a simulation-game business training tool. Make decisions that manage a company through several stages during 25 years. Decisions become tougher over time. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later and a hard disk or extra floppy drive. 569.95. Strategic Management Group, Inc. (SMG), 3624 Market St., Philadelphia, PA 19104. (800) 445-7098 or (215) 387-4000. (Dec '87)

**DeltaGraph 4.5**
DeltaGraph is a charting and graphing program with 22 types of 2-D and 3-D charts. Uses up to 256 colors per chart. Produces high-quality business graphics. Easy to use and can import data from most sources. Version 1.0 reviewed. Version 1.5 shipping. Requires Mac Plus or later, System 6.0.3 or later, and a hard disk drive. $195. DeltaPoint, Inc., 2 Harris Court, Ste. B-1, Monterey, CA 93940. (800) 367-4334 or (408) 648-4000. (Mar '90) *87, 89 Eddy Drr*.

**Descartes 1.0.3**
Descartes 1.0.3 is a digital cartograph- er that displays demographic and marketing information geographically. Has innovative, ease-of-use, iconic, internal database manager. Although it doesn’t provide international maps, it includes U.S. boundary maps by state and county. Looks support for Apple’s Deluxe. Version 1.0.3 reviewed. Requires Mac SE or later with 2 MB of RAM. $795. Descartes, Inc., 13 Brick Alley, Cambridge, MA 02138. (800) 445-7098 or (215) 795-4751. (Mar '91)

**GeoQuery 1.0**
GeoQuery is a digital cartographer that displays demographic and marketing information geographically. The program provides major characteristics of U.S. boundary maps, as well as several international maps, but it supports U.S. boundary maps by state, county, ADI, and DMA (not by ZIP code). Excellent feature set for creating maps that’s an interface for Apple’s DEL. Is helpful for networked corporate users.

Version 1.0 reviewed. Version 2.0.1 shipping. Requires Mac Plus or later and System 6.0.3 or later. GeoQuery Corp., 775 Avenida R. Shuman Blvd., Ste. 380E, Naperville, IL 60563. (800) 541-0181 or (708) 375-0553. (Mar '91)

Igor is a data-visualization and -analysis program. Offers reasonably complete set of options and manipulation features of a statistics program but can define anything mathematically. Powerful macro language and easy command structure. Good performance. Printing quality and speed are excellent. Imports graphics as well as data and supports color. Version 1.1 reviewed. Version 1.2 shipping. Requires 1 MB of RAM available for application, System 4.1 or later, and a hard disk drive. 599. WaveMetrics, Inc., 2088, Lake Oswego, OR 97035. (503) 620-3001. (June '90)

**IPLab Spectrum 4.5**
IPLab Spectrum is a scientific data- processing package that extracts and analyzes data from photographic-quality color images. Supports video capture and includes scripting language Interface is neither particularly intuitive nor intuitive. Allows mathematically expressed image modification down to the pixel level. Provides scalable image-command to cycle through a series of images. No morphology and quantitative analysis. Version 1.0 reviewed. Requires color Mac II series with 4 MB of RAM. $749. Signal Analytics Corp., 374 Maple Ave., E. Ste. 200, Vienna, VA 22180. (703) 281-3277. (July '91)

**thhink 1.0**
Formerly named STELLA Software for Business, thhink is a simulation tool for modeling systems. It requires that you master a discipline called system dynamics. Version 1.02 shipping. Requires Mac Plus or later. $430. academics only. Available. High Performance Systems, Inc., 45 Lyman Rd., Ste. 300, Hanover, NH 03755. (800) 352-1202 or (603) 643-9366. (June '89)

**KaleidaGraph 1.0**
KaleidaGraph is a super dedicated graphing and analysis program. Data can be entered in a 256-column-by-32,000-row spreadsheet. Exceptionally nice printed output. Version 2.0 reviewed. Version 2.1 shipping. Requires Mac Plus or later. $249. Synergy Software, 2457 Perkiomen Ave., Reading, PA 19606, (800) 876- 8788 or (215) 679-2727. (Feb '90)

**LAVIEW 2 1**
LAVIEW 2 is a graphical programming environment for creating applications that manage data acquisition, robotics, automation, machine-control operations. Data analysis includes complex math and signal processing. It is one of the best-designed and most efficiently designed systems on the Mac. Mac Plus or PC for creating "virtual" instruments: Engineers accustomed to sketching block diagrams (before programming a data-acquisition task) will feel comfortable with this program, where the user’s drawing becomes the actual functioning software interface. Version 1 reviewed. Requires 4 MB of RAM and a hard disk drive, $1,995: run-time version, $495. National Instruments Corp., 5054 Burg Point Plwy., Austin, TX 78750. (800) 433-3488 or (512) 794-0100. (May '91) *89 Eddy MacADIOS II 1.05*

The MacADIOS II is a hardware and software interface for laboratory instruments. Standard configuration samples up to 142 kHz. Sketchy documentation. Requires the purchase of the presentation card, $1,490; software interface, $600. GW Instruments, 35 Medford St., Somerville, MA 02143. (617) 625-4096. (July '88)

**MacGraphics 1.0**
MacGraphics is a digitizer with chart-recorder functions and some statistics capabilities. Records up to 85,000 samples per second and works with a wide selection of GW hardware. Version 1.04 reviewed. Version 1.05 shipping. Requires Mac Plus or later. $795. GW Instruments, 35 Medford St., Somerville, MA 02143. (617) 625-4096. (July '89)

**MacLab 1.0**
The MacLab is a hardware/software package that turns your Mac into an oscilloscope with chart-recorder functions. Records from 2 samples per hour to 80,000 samples per second. Nice interface and analysis features, such as tangent of mask and area under curves. Built-in businuss system. Version 1.2 reviewed. Requires Mac Plus or later. $3,550; optional differential amplifiers, $1,125. Academic Instruments, Inc., 175 Sarasota Center Blvd., Sarasota, FL 34240-9258, (813) 371-1003. (July '89)

**MacPanq 1.0**
The MacPanq is a hardware/software oscilloscope and chart-recorder that records from 2 samples per hour to 10,000 samples per second. CE-approved. No computer or hardware can be used remotely. Version 1.05 reviewed. Requires Mac Plus or later. $2,950. Synergix Software, 2457 Perkiomen Ave., Reading, PA 19606, (800) 876-8788 or (215) 679-2727. (Feb '90)

**SuperANOVA 1.0**
SuperANOVA is a powerful program for graphic data analysis, for shape analysis in a highly visual manner. Version 1.0 reviewed. Version 3.0 shipping. Requires Mac Plus or later. $395. Abacus Concepts, Inc., 701 Devonshire Dr., Box C-17, Champaign, IL 61820, (217) 355-1665. (Oct '90)

**CyberGraph 1.0**
CyberGraph is a data-analysis package that lets you analyze huge arrays of numbers by viewing them as pictures. Requires some knowledge of FORTRAN. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac II or SE30 with an 8-bit video display, System 6.0.3 or later, and a hard disk drive. $395. Spyglass, Inc., 1202 or (603) 643-9636. (Jun '89)

**CyberGraph 1.0**
Spyglass Transform is a data-analysis package that provides a variety of ways to view arrays of numbers as pictures. Can string pictures together and animate them, which lets you see how a picture changes over time, in space, or with any other independent variable. Has excellent color tools and a variety of other features. Requires some knowledge of FORTRAN. Version 1.0 shipping. Requires Mac II or SE30 with 8-bit video display, System 6.0.3 or later, and a hard-disk drive. $395. Spyglass, Inc., 701 Devonshire Dr., Box C-17, Champaign, IL 61820, (217) 355-1665. (Oct '90)

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The answer's easy. Get a Mobius 030 Display System. The biggest thing to hit monitors in years. A big screen with built-in acceleration that lets you keep pace with the latest Macs. Even System 7. Turning your Mac Classic or SE into a genuine workstation.

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**MINIFINDERS**

later, $495. Abacus Concepts, 1984 Bonita Ave., Berkeley, CA 94704 (800) 666-7828 or (415) 540-1949. (Mar ‘90) [☆☆☆☆☆ 89i Eddy Tacialcian 2.0 ****]  
Tacialcian 2.0 is a digital cartography program that graphs demographic and marketing information geographically. It has an excellent interface that incorporates Apple’s D.A.L. A large library of maps and mapping data is available, but there is no internal database manager. The program has no international maps but supports street-level maps by state, county, ZIP, ADI, and DMA. It has excellent performance. Version 2.0 reviewed. Requires Mac II series, a color monitor, 4 MB of RAM, and a hard drive, $995; CD-ROM, $3,995. Tacialcian Technologies, 16 Haverhill St., Andover, MA 01810. (800) 617-7666 or (508) 475-4475. (Mar ‘91) [☆☆☆☆☆ 90i Eddy Ultime/X ****]  

**MATHEMATICS**  

**Expressionist ******  
Expressionist is a program designed to assist users in mathematical applications easily, can be installed either as a DA or as an application. Flexible and has good documentation for word-oriented applications easily. Version 2.03 shipping. $129.95. Precision, 939 Howard St., San Francisco, CA 94103. (415) 543-2252. (July ‘90)  

MathCAD ****  
MathCAD is a solid math processor for equation solvers. Creates charts, although its data-handling abilities are quite limited. Data entry needs to be improved and made more Mac-like. Version 2.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later. $495. MathSoft, Inc., 1001 Broadway, Cambridge, MA 02139. (800) 628-4220 or (617) 577-1017. (Apr ‘90)  

Mathematica ****  
Mathematica is a powerful tool for doing all kinds of math. Offers arbitrary-precision numerical calculations, symbolic computation, PostScript graphics, and text-based programmability. Version 1.2 reviewed. Version 1.2 shipping. Requires Mac Plus or later with 2 MB of free RAM for application. $1,949. Mathematica, version II, $795. Wolfram Research, Inc., 100 Trade Center Dr., Champaign, IL 61820. (800) 441-6284 or (217) 398-0700. (Nov ‘90) [☆☆☆☆☆ 89i Eddy MathType ****]  
MathType is a mathematical-equation-writing program. Can be installed either as a DA or for an application. Equations can be copied into word-processing files. Inconvenient to use with text-based equations. Version 2.1 shipping. Requires Mac Plus or later. $149. Design Science, 4028 Broadway, Long Beach, CA 90803. (800) 827-6865 or (213) 433-6085. (July ‘90)  

ModelIt! ****  
Model-It! is a good tool for simple mathematical modeling and small dynamic systems. Good manual. Performance is adequate — input is mediocre, and output is basic. Requires prior knowledge of modeling — here’s no AI. Version 1.0 reviewed. Requires Mac II+ or $1,295. Norris Software Systems, 5201 Western Ave., Ste. 432, Kentwood, Michigan 49508. (616) 588-5774. (Jun ‘90)  

Theorist ****  
Theorist is an elegant equation solver that’s versatile, full-featured, and powerful. There are no procedures everything is done with user-created propositions that are easy to build. Superb interface. Dozens of math functions and transformations are automatically activated by a few menu commands. Can visualize equations and the values through graphs and animation, including 3-D and color. Version 1.0 reviewed. Version 1.1 shipping. Requires Mac Plus or later. $399. SeaweedMicroSystems, Inc., 3808 39th Ave. S.W., Seattle, WA 98116. (800) 347-7008 or (206) 321-2123. (May ‘90)  

DataMerge ****  
DataMerge simplifies manipulation of tabular data. It works with all major spreadsheet programs and can merge up to nine files. The files can be larger than existing RAM. Excellent performance. Version 2.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later. $995. SeaweedMicroSystems, Inc., 3808 39th Ave. S.W., Seattle, WA 98116. (800) 347-7008 or (206) 321-2123. (May ‘90)  

Desktop Help for Excel ****  

Excel ****  
Excel 3.0 is a full-featured high-end spreadsheet package. Incorporates a hard-disk drive, a new user interface, and major interface improvements. Has global search-and-replace and rows-into-columns transposition. Integral linking within documents or to other documents. Customizes menus and creates dialog and alert boxes. Strong statistical functions and math/maths abilities. Enhanced graphics and charting capabilities. Powerful outlining, macro programming, and style sheets. Version 3.0 reviewed. Requires Mac Plus or later. $495. Microsoft Corp., One Microsoft Way, Redmond, WA 98052. (800) 426-9400 or (206) 882-8080. (July ‘91) [☆☆☆☆☆ 91i Eddy Full Impact 2.0 ****]  
Full Impact is a high-end spreadsheet program with impressive abilities. The ability to import and export Excel files directly and provide global search-and-replace, virtual memory, and programmable buttons. It has excellent 3-D charting and text integration as well as 32-bit color and presentation capabilities. Version 2.0 reviewed. Requires Mac Plus or later. $595. Ashton Tate Corp., 201 Hamilton Avenue, Torrance, CA 90502. (800) 437-4329 or (213) 329-8000. (Feb ‘91)  

Eddy MacCalc ****  
MacCalc is a low-end spreadsheet program with good data-analysis tools. It has a streamlined user interface. Models can be annotated at each construction step. Fonts, sizes, and formats are variable from cell to cell. Excel, MultiPlan, 1-2-3, and Lotus 1-2-3 can be converted into MacCalc format without losing their formats or models. Lacks integral graphics capabilities. Requires Microsoft Windows for graphics. Requires Mac Plus or later. $139. Bravo Technologies, P.O. Box 10078, Berkeley, CA 94709. (415) 841-8552. (July ‘90) [☆☆☆☆☆ 86i Eddy Microtemp Financial Calculators ****]  
Microtemp Financial Calculators is a set of worksheets for Excel and Works that calculate common personal and small-business financial problems. The program includes cash flow, real estate, and investment-rate-of-return calculations. Version 1.0 reviewed. $79.95. Microtemp, 318 Mendocino Ave., Ste. 22, Santa Rosa, CA 95404. (707) 575-1453. (May ‘90)  

PowerMacros for the Excel User ****  

Trapeze ****  
Trapeze is a mathematical program offering the power of a spreadsheet program and the flexibility of a page-layout program. Supports a 68880 math coprocessor and calculates in the background. Under MultiFinder Spreadsheets can be up to 1,600 pages long. Can open and link up to 32 spreadsheets. Wide variety chart types and excellent control over graphics. Page-layout mode is difficult to learn. Non-standard interface. Version 2.1 shipping. Requires Mac Plus or later. $495. Microsoft Corp., One Microsoft Way, Redmond, WA 98052. (800) 426-9400 or (206) 882-8080. (July ‘91) [☆☆☆☆☆ 91i Eddy WingZ ****]  
WingZ is a sophisticated high-end product with remarkable 3-D graphics. HyperScript language lets you change menus, options, and functions by editing the menu script file. Requires a lot of custom macro programming to perform linking operations. Minimum recalculating technique can take longer than recalculating an entire spreadsheet. Version 1.1 shipping. Requires Mac Plus or later (2 MB of RAM recommended). $399. Informix Software, 1601 College Blvd., Lenexa, KS 66219. (800) 438-7627 or (913) 599-7100. (July ‘90) [☆☆☆☆☆ 86i Eddy Works ****]  
Works is Microsoft Works an easy-to-use combination of word-process­ ing, spreadsheet, graphics, database, and tele­ communication software. Works’ spreadsheet component is a basic system that can perform most basic calculations. Data entry can be line, bar, stacked bar, pie, or combination; charts can update automatically when new data is entered. The sorting function is merely adequate. The word-processing module within this integrated package rates only three mice but is adequate for simple office needs. Version 2.0 reviewed. Requires Mac Plus or later. $295. Microsoft Corp., One Microsoft Way, Redmond, WA 98052. (800) 426-9400 or (206) 882-8080. (Jan ‘91) [☆☆☆☆☆ 86i Eddy STATISTICS Data Desk ****]  
Data Desk, a business statistics package, is excellent for sophisticated users. Designed specifically for analyzing and exploring interactive graphics and solid data handling. Easy to use. Good documentation and
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- Microsoft Mail

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**MINIFINDERS**

on-line help. Lacks economic procedures and presentation-enhancement features. Importing requires prolonged effort.

**Version 3.0 reviewed. Requires Mac 512K or later and System 4.1 or later. $95. Odesta Corp., 4084 Commercial Ave., Northbrook, IL 60062. (800) 325-5422 or (708) 498-5615. (Apr '90)**

**Exstatix**


**Fasstat**

Fasstat is a statistics package that features a Mac interface and is easy to learn. Good data analysis and graphing. Capabilities result graphically and numerically. Graphing abilities aren't presentation quality and can be hard to manipulate. Version 1.0 reviewed. Requires Mac Plus or later and a hard-disk drive. $195. Systat, Inc., 1800 Sherman Ave., Evanston, IL 60201. (708) 864-5670. (Nov '89)

**JMP**


**Mintab**

Mintab is a high-end statistics package with sophisticated procedures such as multivariate and ARIMA. Fast. Handles data efficiently. Limited documentation and on-line help. Has no support for color graphics. Version 2.2 shipping. Requires Mac Plus or later with a hard-disk drive. $695. Mintab, 3081 Enterprise Dr., State College, PA 16801. (814) 485-3555 or (814) 239-3280. (Nov '90)

**SPSS for the Macintosh**


**StatView SE + Graphics**

StatView SE is a complete data-analysis package. Excellent for any kind of descriptive, comparative, or multivariate statistics. Works in color or on a monochrome, but is not catastrophically equipped Mac II machine. Tables and graphics must be viewed as separate output. Version 1.3 shipped. Requires Mac Plus or later in series 6802 or 68030 processor and FPU. $495. Abacus Concepts, 1984 Bonita Ave., Berkeley, CA 94704. (800) 668-7288 or (415) 540-1949. (Apr '90)

**StatView SE + Graphics**


**STATXAT for the Macintosh**

STATXAT for the Macintosh is a statistics program with good Mac-like interface. Some slow and awkward features, such as dialog features. Good graphics, including 3-D charts and color graphics. Consumes a lot of memory. Version 5.0 reviewed. Version 5.1 shipping. Requires Mac Plus or later with 4 MB of RAM and a hard-drive disk. $795. Design, Logit, ProbIt, and Test modules. S$110 each. SYSTAT, Inc., 1800 Sherman Ave., Evanston, IL 60201. (708) 864-5670. (Nov '90)

**O R G A N I Z A T I O N A L T O O L S**

**Acta Advantage**

Acta Advantage is an outline application. Also comes with the Acta DA, Smart Paste lets you paste material from other applications into Acta outline format. Includes drivers for translating Acta outlines into MORE and ThinkTank and into MacWrite, WriteNow, Works, and RTF files. Version 1.03 reviewed. Version 1.04 shipping. Requires Mac Plus or later. $129. Symmetry Software Corp., 8603 E. Royal Palm Rd., Ste. 110, Scottsdale, AZ 85258. (800) 624-2485 or (602) 998-9106. (Aug '90) *89 Edmark**

**DiagramMaker**

DiagramMaker is a multipurpose object-linking program. Forms a network of custom-designed objects. Links to other programs such as center, corner, or center of sides. Customizes organization charts from text outlines, Lines join on contact and can be pulled into arcs. Objects can be linked to other documents. Automatic right-angle line maintenance. Useful text-find feature. Version 1.1 reviewed. Version 2.0 shipping. Requires Mac Plus or later. $295. Action Software, 177 E. Franklin St., Ste. 122, Chapel Hill, NC 27514. (800) 826-0550 or (919) 544-9219. (Jan '90)

**Personal Info Managers**

**Address Book Plus**

Address Book Plus is a name- and address manager. It prints on one side of a page only. A limited DA allows file access from other applications. Good sorting and import/export abilities. Wide range of font and type-size options. Fast and flawless performance. Version 2.0 reviewed. Requires System 6.0.3 or later. $99.95; upgrade, $25. Power Up Software Corp., 2292 Campus Dr., San Mateo, CA 94403. (800) 851-2917 or (415) 340-5900. (Apr '90)

**Alarm Events**

Alarm Events is a DA that provides an integrated electronic appointment book. Its interface resembles a monthly calendar, where the dates act as buttons and open up to your daily schedule; a five-day view is also available. You can set alarms to go off at specified times, and you can keep track of events that are automatically kept in an ongoing-to-do list. It can provide advance warning of upcoming events, and you can designate recurring events. Version 1.0 reviewed. Version 1.03 shipping. $129.95. CE Software, Inc., P.O. Box 65580, West Des Moines, IA 50265. (800) 523-7613 (515) 284-2274. (Feb '91)

**Business Class**

Business Class is a HyperCard stack that contains world-travel information and itinerary plans. Features help you locate countries but lacks United States domestic-travel information. Incompatible with HyperCard 2.0. Requires Mac Plus or later. $49.50. Farallon's Activation (Mediagenic), 3885 Bohannon Dr., Menlo Park, CA 94025. (415) 329-0500. (Mar '88)

**CalendarMaker**

CalendarMaker is a reliable, innovative DA that manages your appointments and reminders. Isn't as full-featured as competing packages but offers a unified interface and excellent control of recorded or system sounds. These sound enhancements include the ability to create repeating reminders or single alarms with your voice, which is digitized and saved with Farallon's MacRecorder driver. Requires Mac Plus or later. $495. For exporting or archiving a record of past activities. Version 1.0 reviewed. Version 1.1 shipping. $495. Psychosystems, Inc., P.O. Box 431, Charleston, WV 25322. (800) 866-4260 or (304) 340-4260. (June '91)

**City to City**

City to City is a HyperCard stack that provides travel information on 31 U.S. cities, including details about hotels, restaurants, and nightlife. It can also create a itinerary. Incompatible with HyperCard 2.0. Version 1.0 reviewed. Requires HyperCard and a printer. $49.50. Activation (Mediagenic), 3885 Bohannon Dr., Menlo Park, CA 94025. (415) 329-0500. (Sept '88)

**Calend-Air**

Calend-Air is a reliable, innovative DA that manages your appointments and reminders. Isn't as full-featured as competing packages but offers a unified interface and excellent control of recorded or system sounds. These sound enhancements include the ability to create repeating reminders or single alarms with your voice, which is digitized and saved with Farallon's MacRecorder driver. Requires Mac Plus or later. $495. For exporting or archiving a record of past activities. Version 1.0 reviewed. Version 1.1 shipping. $495. Psychosystems, Inc., P.O. Box 431, Charleston, WV 25322. (800) 866-4260 or (304) 340-4260. (June '91)

**C•A•T**

C•A•T is a personal-information manager that tracks contacts, activities, and time. The program has documentation and user-interface problems. Features include capacities for an unlimited number of contacts for each account, 16 pages of notes for each, letter writing, drawing, simple math calculation, and even dialing the phone. Difficult to use. Version 1.0 shipping. Requires Mac Plus or later. $495. Chang Laboratories, Inc., 3350 Scott Blvd., Huntington Beach, CA 92648. (714) 494-2000. (Nov '90)

**Mice Ratings**

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MacUser August 1991 MiniFinders 193
**MINIFINDERS**

**DynoDex****


**Focal Point II****

Focal Point II is a major upgrade of this popular organizational tool. The program contains 18 modules, an E-mail system, and the Task Manager module as well as more options, calendar, telephone log, and client accounts. Version 1.0 reviewed. Requires HyperCard 1.2.2 or later and a hard-disk drive. $199.95. TENpointO, 3885 Bohannon Dr., Menlo Park, CA 94025. (415) 232-7616. (Apr '91)

**For the Record****

For the Record is a database program designed for legal, financial, and personal records. Allows password locking for screens containing sensitive personal data. The program is comprehensive, is easy to learn and use, and has smooth operation. Its database fields can be modified, and summary reports can be generated and printed. Good documentation. Version 2.0 reviewed. $595. Nolo Press, 950 Parker St., Berkeley, CA 94710. (800) 992-6656 (outside CA) or (415) 848-2198. (Jan '91)

**Front Desk MultiUser****

Front Desk MultiUser is a schedule and resource manager best suited for small professional offices in a networked multiuser environment. Basic functionality but simple and capable. Version 6.10 shipping. Requires Mac Plus or later, System 4.2 or later, and a hard-disk drive. Single user, $99; 10-user pack, $500. Peachtree Software, 1505 Pavilion Place, Norcross, GA 30093. (800) 247-3224 or (404) 564-5800. (Jan '91)

**IdealFishier****


**Intouch****

Intouch is a simple, fast DA that keeps track of names, addresses, telephone numbers, and mailing lists. Version 1.0 reviewed. Notes. Provides basic search capabilities plus the ability to easily print customized labels and envelopes. Versions 1.2 and 1.2.1 ship in advance of shipping. Printing on labels is included in any size that fits into your layout, including bar codes and facing identification marks; embedded graphics for any of your return-address selections; and special messages in the lower left corner of envelopes. Provides options for auto-dialing telephone numbers via the Mac-speaker or modem. Version 1.0 reviewed. $79.95. Advanced Software, Inc., 1095 E. Duane St., Ste. 103, Sunnyvale, CA 94086. (800) 346-5392 or (408) 733-0745. (Apr '91)

**MacPhonebook****

MacPhonebook handles names, addresses, and telephone numbers. Single user, $99; 10-user pack, $199.95. Focal Point, 1095 E. Duane St., Ste. 103, Sunnyvale, CA 94086. (800) 346-5392 or (408) 733-0745. (Apr '91)

**My Time Manager****

My Time Manager is a complete time-management system with a full time entry index. Includes reminder functions, and has a good, and the publisher support is excellent. Version 2.0 reviewed. Version 3.5 shipping. Requires Mac Plus or later. $49.95. Synex, 692 Tenth St., Brooklyn, NY 11215. (800) 477-9639 or (718) 499-6293. (Oct '91)

**Rendezvous****

Rendezvous is a classy personal organizer with excellent printing abilities. Useful and well-designed calendar, planner, diary, and to-do list forms. Lacks a name-and-address section and needs automatic transfer of data between sections. Version 2.5 reviewed. Requires Mac Plus or later and System 6.0 or later. $200. PMC Telesystems, Inc., P.O. Box 7548, Vancouver, British Columbia, Canada V6B 4A9. Canada. (604) 255-9949. (Feb '90)

**Smart Alarms 3.0 and Appointment Diary 3.1****

Smart Alarms version 3 lets you set simple, reliable reminders for events (including recent projects), and these reminders pop up no matter what application you’re using. Appointment Diary 3.1 is a bundled DA that provides separate electronic appointment books. Smart Alarms lets you set simple, reliable reminders for events (including recent projects), and these reminders pop up no matter what application you’re using. Appointment Diary 3.1 is a bundled DA that provides separate electronic appointment books. Smart Alarms lets you set simple, reliable reminders for events (including recent projects), and these reminders pop up no matter what application you’re using.

**Touchscreen Software****

Touchscreen Software, Inc., 1095 E. Duane St., Ste. 103, Sunnyvale, CA 94086. (800) 346-5392 or (408) 733-0745. (Apr '91)

**WillMaker 4.0****

WillMaker is a simple, valuable program for creating wills. Not elegant but does the job reliably and well. Can present a series of straightforward questions for you to answer or full information screens that explain legal issues. Printed output is fairly plain, but text can be exported for use in a word-processing or page-layout program. The program cannot handle conditional questions. Includes an excellent manual that covers the software, wills, estate planning, and professional advice. Version 4.0 reviewed. Requires Mac Plus or later and System 6.0 or later. $69.95. Nolo Press, 950 Parker St., Berkeley, CA 94710. (800) 992-6655 or (408) 733-0745. (Apr '91)

**Project Planners & Organizers**

- **AEC Information Manager**
  - AEC Information Manager is a dedicated database program for managing project information. Designed for use with MacProject II or Micro Planner. Helps manage data needed to make decisions and monitor status. Alarm keeps track of critical dates. Version 1.5 reviewed. Requires Mac Plus or later. $695. AEC Software, 22611 Markey Ct., Bldg. 113, Sterling, VA 22170. (703) 450-1980. (Oct '89)

**Business Plan Toolkit**

Tim Berry’s Business Plan Toolkit is an integrated set of Excel macros and templates. A Card-based text that makes creating business plans and forecasts relatively easy. Excellent manual. Version 4.0 shipping. Requires Mac 512K or later and System 4.2 or later. $149.95. Palo Alto Software, 260 Sheridan Ave., Ste. 219, Palo Alto, CA 94306. (800) 229-7541 or (415) 325-1830. (Sept '89)

**FastTrack Schedule**

FastTrack Schedule is a flexible Gantt-based program that uses a hierarchical outline format. Provides a high degree of functionality and excellent on-screen and printed-graphics abilities.

**FlowMaster**


**KeyPlan**

KeyPlan is an outline/project planner. Lacks some of the powerful tools of MacProject II or Micro Planner Plus but is easier to use. Flexible, fast, and easy. Version 1.5 reviewed. Requires Mac Plus or later and System 4.2 or later. $395. MacVONK USA, 313 Iona Ave., Narbeth, PA 19072. (215) 660-0666. (Sept '89)

**MacFlow**

MacFlow is a specialized flowchart tool. Creates a variety of business diagrams including decision trees and Gantt/schedule charts. Top-level chart objects work like buttons in...
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HyperCard, revealing underlying details or even launching separate applications. Good hierarchical modes, plus flexible control of connection or intersection of lines and symbols. Imports art for conversion to custom symbols. Requires Mac Plus or later. Requires Mac Plus or later and System 6.0.3 or later. $225. Mainstay, 5311-B Derry Ave, Agoura Hills, CA 91301. (818) 991-6540. (July '89)

**MacProject II**

MacProject II is a well-executed PERT and CPM project-management system with time and expense reporting. Can manage projects and produce management reports. Crisp documentation with a few oddities makes this package a true value. Version 2.1v3 shipping. Requires Mac Plus or later. $152. Lionheart Press, Inc., P.O. Box 3579, Alburg, VT 05440. (514) 644-2534 or (408) 727-8227. (Oct '89)

**MacScheduler**

MacScheduler is a simple Gantt-based project-management and outliner system. Offers advanced project-time scaling but isn't for advanced Gantt users. Limited color, graphics, and printing capabilities. Useful spreadsheet and graphing tools. Interface complicated by too many hierarchical menus, which could be combined into dialog boxes. Tracks slipped start or completion dates. Version 2.5 reviewed. Requires Mac Plus or later. $125. Mainstay, 5311-B Derry Ave, Agoura Hills, CA 91301. (818) 991-6540. (June '91)

**MacScheduler Plus**

MacScheduler Plus is a powerful Gantt-based project-management and outliner system for advanced Gantt users. Offers project-time scaling. Limited color, graphics, and printing capabilities. Useful spreadsheet and graphing tools. Interface complicated by too many hierarchical menus, which could be combined into dialog boxes. Tracks slipped start or completion dates. Can calculate financial information and cost schedules. Version 1.0 reviewed. Requires Mac Plus or later. $345. Mainstay, 5311-B Derry Ave, Agoura Hills, CA 91301. (818) 991-6540. (June '91)

**MetaDesign**


**Micro Planner and Project Exchange**

Micro Planner and Project Exchange is a full PERT and CPM implementation with advanced resource leveling and management reporting. Output can be used easily for management presentations. Micro Planner version 6.1f and Interface version 1.08 shipping. Requires Mac Plus or later. Micro Planner, $595. Project Exchange, $595. Micro Planning Co., PO Box 1080, 655 Redwood Hwy., Ste. 311, Mill Valley, CA 94941. (800) 852-7526 or (415) 389-1420. (Oct '89)

**PERT & Critical Path Techniques**

PERI & Critical Path Techniques is a technically sophisticated project-management system that has full Gantt and CPM implementations, including all second-order slack and timing calculations, and doesn't make good use of the Mac interface. Version 6.0 shipping. Requires Mac Plus or later. $152. Lionheart Press, Inc., P.O. Box 3579, Alburg, VT 05440. (514) 644-2534 or (408) 727-8227. (Oct '89)

**Project Scheduler 4**

Project Scheduler 4 is this project-management software is frustratingly nonintuitive, but it has several advantages. Full-time project planners (especially if they need WBS or OBS codes). A variety of time lines and reports is possible. Users familiar with DOS might very well be able to manage projects using this program. Version 1.0 reviewed. $685. Sicor, 393 Vintage Park Rd., Foster City, CA 94404. (415) 570-7700. (Jan '91)

ScheduleMaker

ScheduleMaker is a dedicated employee- or equipment-scheduling system that uses a simple Gantt-type chart format. Not a project-management tool. Automates the process of figuring out when an employee is needed and what tasks need to be done. Includes both Gantt chart and flowcharting tools. Interface complicated by too many hierarchical menus, which could be combined into dialog boxes. Tracks slipped start or completion dates. Version 1.0 reviewed. Requires Mac Plus or later. $295. Meridian, 1700 Democracy Blvd., Baton Rouge, LA 70817. (504) 256-3222. (Oct '89)

**TopDown**

TopDown is a strong flowchart and organization-chart tool with a choice of connection modes for each individual line. Generates text-based reports. Excellent right-angle-reconnection talents, even with major object shifts. Limited user control of line-symbol connection. No line nodes for other linkages. Limited navigation through hierarchy, view to page to page. Version 1.1a reviewed. Version 2.0 shipping. Requires Mac Plus or later and System 6.0.3 or later (hard-disk drive recommended). $345. Kaelton Software Corp., 947, Box 1777, Santa Monica, CA 90406. (415) 455-4446. (Sept '90) **89 Eddy**

**Languages**

**AIAIS Prolog**


**ExperCommon Lisp**

ExperCommon Lisp is a standard Lisp development system. Not for Common Lisp-developers. The system includes source-level debugging and extraordinarily fast compile—link times. This is the development system to use if you program in Pascal. Version 3.0 shipping. Requires Mac Plus or later. $249; upgrade, $69. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014. (800) 441-7234 or (408) 253-9600. (Sept '90) **89 Eddy**

**ExperProlong II**

ExperProlong II is a Prolog based on the Exper system. Integrates various Prolog dialects in a common knowledge base. Has full support for GOP (object-oriented programming) and has an exemplary development environment that includes integrated source-level debugging and extraordinarily fast compile—link times. This is the development system to use if you program in Pascal. Version 3.0 shipping. Requires Mac Plus or later. $249; upgrade, $69. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014. (800) 441-7234 or (408) 253-9600. (Sept '90) **89 Eddy**
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Anatool is a CASE package with building DFDs. Excellent interactive front-end that establishes tables of text and automatically generates application, which will be much larger in ToolBook format than when compacted in HyperCard, Version 1.2 reviewed. Requires Mac Plus or later, a 386-based PC with 4 MB of RAM, and a way to perform Mac-to-PC text transfer (if the Mac has no Network Drive). Note 2.5-inch PC disks, $199. Heiser Software, P.O. Box 232019, Pleasant Hill, CA 94523, (800) 887-7667 or (415) 943-7667. (June '91)

The Debugger V2 is a run-time debugger. MacNoisy is a well-established global interactive decompiler. Powerful tools are not aimed at casual users. The Debugger is great if you have two seconds. A new feature is its IBS (Interactive Build System), which can save a great deal of testing time. Both parts of the package work well with all common environments, including THINK Pascal, THINK C, THINK Pascal, Turbo Pascal, MPW Pascal, and MPW Pascal. Extensions are available for Grid Manager, Speech Manager, Matrix Manager, Advanced Manager 1, and Telecommunications Manager. Version 2.0 reviewed. Version 2.1 shipping. Requires Mac Plus or later. $129.95. Mainline, 5311 Berry Ave., Agoura Hills, CA 91301, (818) 991-6540. (June '89)

PostShow II is a useful editing environment for THINK C, THINK Pascal, Turbo Pascal, MPW Pascal, and MPW Pascal. Extensions are available for Grid Manager, Speech Manager, Matrix Manager, Advanced Manager 1, and Telecommunications Manager. Version 2.0 reviewed. Version 2.1 shipping. Requires Mac Plus or later. $129.95. Mainline, 5311 Berry Ave., Agoura Hills, CA 91301, (818) 991-6540. (June '89)

Comment

Comment is an electronic version of Post-it notes. This mini word processor lets you attach notes to a specific place in a document, or to a window on the desktop. Version 2.0 reviewed. Version 2.03 shipping. Requires Mac Plus or later and System 5 or later. $99.95. Denbe Software, 3035 N.W. 74th Ave., Miami, FL 33122, (800) 622-6827 or (305) 794-9545. (Dec '88)

Desk is a collection of seven powerful DAs: DeskPaint, DeskDraw, DeskWrite, DeskSecretary (appointment calendar), DeskCom (modem control), DeskCalc, and DeskFile (minidatabase). Although not a part with Microsoft Works, Desk lets you access its DAs from within any application. Version 1.0 reviewed. Version 3.0 shipping. Requires Mac Plus or later and System 5 or later. DeskFile requires a color display system, 2 MB of RAM, and a hard-disc drive. $599.95. Zedcor, 450 E. Speedway, #22, Tucson, AZ.
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MINIFINDERS

Now Utilities 99
Now Utilities is an inexpensive collection of tools: StartUp Manager INIT (controls INITs, control panels, and Chooser dictionaries); Super Boomerang INIT (adds navigation features to Open/Save dialog boxes); Profiler (hardware/software analysis); Notify, WYSIWYG Menu, FinderKeys, MultiMaster (desktop and menu-bar management), DeskPicture (custom desktop backgrounds), and ScreenLock (a crash-prone, moderately secure password system without the Mac's superior security). Version 2.0 reviewed. $129. Now Software, Inc., 5205 W. Harrison, Ste. 455, Portland, OR 97201, (800) 237-3611 or (503) 274-2001 (Apr '91).

QuickKeys 2 39
QuickKeys lets you make full use of your Apple extended keyboard. Assign any command (menu choices, DAs, and the like) or series of text blocks and/or commands to any keyboard combination. Enormously powerful. This new version has added the capability to run macros that trigger sequences of tasks. Customers say that 2 still can't handle conditional macros. Some applications, INITs, or control panels may have incompatibility problems. Version 2.0 reviewed. Version 2.1 shipping. $185. CE Software, Inc., P.O. Box 65580, West Des Moines, IA 50265, (800) 523-7638 or (515) 224-1995 (May '91) *82 Eddie

SuperGlue II 29
SuperGlue II, an excellent print-to-disk program, offers superior operation along with many nice touches, such as Glue Notes (Post-it-like notes) and One-Timer, a key that makes operation immensely easier. Version 2.01 reviewed. $129. SuperGlue II, Inc., 515 E. 17th St., Fort Collins, CO 80525, (800) 682-9670, (760) 441-7234 or (408) 253-6900. (Apr '91) *82 Eddie

SUM II (Symantec Utilities for Macintosh) 19
SUM II is an upgraded, expanded version of the excellent SUM disk utility package. Includes utilities for partitioning, encrypting, backing up, defragmenting, and optimizing floppies and hard-disk drives. Straightforward and reliable for defragmenting and optimizing. Requires Mac Plus or later and System 6.0.2 or later. $149.50. Symantec Corp., 1020 1 Torrey Pines, San Diego, CA 92121, (800) 926-9670 or (619) 441-7234 or (408) 253-6900. (Apr '91) *82 Eddie

Pyro! 9
Pyro! is a finder screen that lets you change the look and feel of your Mac's interface. You can modify scroll bars, menus and their backgrounds, window borders, title bars, text, and so on. Extremely easy to use; Personality is unique, because it can change your menu font and create 3-D menus. Provides only eight cursors and doesn't include any sounds. Version 1.0 reviewed. Requires Mac Plus or later and System 6.0.2 or later, $59.95. Baseline Publishing, Inc., 5801 Benjamin Franklin Dr., Suite 11, Bethesda, MD 20814. (410) 540-5535 (Aug '88)

POWERmenu 49
POWERmenu is the key to a truly interactive menu. The first allows full access to menus from anywhere on-screen. The second, Gadget, includes a phone dialer, notepad, and useful launchers for DAs, control panels, and applications. Version 1.03 reviewed. Requires System 5.0 or later. $79.95. Magic Software, Inc., 2239 Franklin St., Bellevue, WA 98004. (206) 441-7234 or (408) 291-0670, (Jan '90)

Globe Dimmer 39
Globe Dimmer dims the screen when the Mac is inactive, and Switch-a-Roo lets you switch between any two color modes instantly. Globe Dimmer accepts all colors, and Switch-a-Roo can customize the Finder's Color menu. Version 1.0 reviewed. Requires Mac II series with 2 MB of RAM. System 4.2 or later, and a color monitor. $79. Microesoft Publishing, Inc., 5801 Benjamin Cr. Dr., Ste. 103, Tampa, FL 33604, (813) 882-8655, (Sept '89)

Step Out II 19
Stepping Out II is a software alternative to a large-screen monitor. Lets you create a virtual screen (as large as memory allows) inside the Mac. Users can automatically scroll to new document position as you type or draw. Version 2.0 reviewed. Requires Mac Plus or later. $95. Berkeley Systems Inc., 1700 Shattuck Ave., Berkeley, CA 94709. (415) 540-5535 (Aug '88

MICE RATINGS 19

Mice ratings are based on the 8-MB limit on your Mac SE/30 or Mac II. Let's see what your application unit (UIA) does. Version 2.0 reviewed. $129. Now Software, Inc., 5205 W. Harrison, Ste. 455, Portland, OR 97201, (800) 237-3611 or (503) 274-2001 (Apr '91).
When it comes to selecting the right scanner, be forewarned. There is a difference you can see in black and white. And color. Just look at this comparison between the La Cie Silverscanner and the Microtek 3002S. Both images were scanned at default settings with no corrections. This entire ad was then created and separated using Adobe Photoshop, Quark XPress 3.0 and a Linotronic 330.

As you can see, Silverscanner produced a better-looking image than the Microtek scan. Silverscanner lets you scan color, gray-scale, halftone and line art with dazzling clarity. La Cie gives you more with OCR compatibility, faster color previews, versatile scanning controls and up to 1200 dpi.

FREE Software. Silverscanner comes with two FREE bonuses: Adobe Photoshop (full version) and La Cie's exclusive Silverscan plug-in modules for Photoshop, ColorStudio, Digital Darkroom, Enhance 2.0, ImageStudio and Ragtime.

A Company You Can Count On. La Cie is a Plus Development Company, backed by $400 million in assets. That means you can trust La Cie to provide a constant source of high-quality Macintosh peripherals. Plus dependable service and support. Silverscanner is the color scanner you've been looking for. See for yourself. Order yours today.

To order or for more information, call toll-free 800-999-0143

La Cie Silverscanner: 16 million colors; 256 smooth shades of gray; production quality line art; up to 1200 dpi—all in a single pass.
often necessary) applications, control panels, and INITs — and even some System software. Version 1.2.4 reviewed. $169.95. Affinity Microsystems Ltd., 1050 Westminster Ave., Boulder, CO 80302. (800) 367-6771 or (303) 442-4840. (May '91)

Tidy II !!!! Tidy II! is a System Folder and streamlines its contents visually. Attractive, intuitive interface. Customizable categories, including folder and item capabilities. Also available for download on Zmac and other on-line services.


**MINIFINDERS**

Virtual is a virtual-memory program. Provides up to 15 MB of effective RAM. Excellent performance and superb support. Version 2.0 reviewed. Version 2.0.3 shipping. Requires Mac Plus or SE (with accelerator card). (It is necessary to upgrade or replace the system software.) $169.95. Apple Computer, Inc., 1400 Sharon Dr., Menlo Park, CA 94025. (800) 950-5880 or (415) 324-0727. (Apr '91) **$189 Eddie**

WORKS PLUS COMMAND VERSION 1.1

Virtual adds on only select files, although these options are limited. Performance is very good. Version 1.70 shipping. $99. Terramark, 1538 Martin Ave., Ste. 413, Los Angeles, CA 90046. (213) 882-5013 or (415) 962-8652. (Aug '90)

**Backmatics !!!!**

Backmatics is an INIT that scans your hard disk whenever you shut down and backs up all the changed files. Can back up to floppy, a folder on your hard disk, or a server. Wide-ranging, easy-to-use exclusion abilities. Slow but utterly reliable. Version 2.0 shipping. Requires Mac Plus or later and System 4.2 or later. $99.95. Software Exchange, Inc., 2239 Franklin St., Bellevue, NE 68005. (800) 342-6243 or (402) 291-0705. (July '90)

**Car-Back !!!!**

Car-Back combines disk cataloging and backup, Good catalogator, but backing up from one partition to another on the same drive crashed the program. Other performance was OK. Can perform incremental and mirror-image backups. The interface and all operational procedures could use some work. Version 1.0 reviewed. Version 1.1 shipping. Requires Mac Plus or later. $59.95. Macs Plus, Inc., 66 West Riverdale, P.O. Box 413, Menlo Park, CA 94025. (914) 490-1277. (Jan '90)

**Disk First Aid !!!!**

Apple's reliable Disk First Aid is a simple diagnostic tool for disks and hard-disk drives. It has limited file-recovery abilities compared with blockbuster utility packages such as Norton Utilities. For the Macintosh user, you can't complain about its price. Free with every Macintosh. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Apr '91)

**Fastback !!!!**

Fastback is a backup utility that supports incremental and differential backups and offers a choice of compression levels. Backup collections can be saved as products. Macs Plus, Inc., 66 West Riverdale, P.O. Box 413, Menlo Park, CA 94025. (914) 490-1277. (Jan '90)

**AutoBack !!!!**

AutoBack creates copies of non-backed-up data files on another hard-disk drive (or on selected tape drives) whenever you save or activate a file. Doesn't back up only applications and System files. Can back up on selected files, although these options are limited. Performance is very good. Version 1.70 shipping. $99. Terramark, 1538 Martin Ave., Ste. 413, Los Angeles, CA 90046. (213) 882-5013 or (415) 962-8652. (Aug '90)

**Backmatics !!!!**

Backmatics is an INIT that scans your hard disk whenever you shut down and backs up all the changed files. Can back up to floppy, a folder on your hard disk, or a server. Wide-ranging, easy-to-use exclusion abilities. Slow but utterly reliable. Version 2.0 shipping. Requires Mac Plus or later and System 4.2 or later. $99.95. PCPC (Personal Computer Peripherals Corp.), 4710 Eisenhower Blvd., (Bldg. A), Gigi, CA 90046. (800) 622-3888 or (813) 884-3020. (Oct '89)

**Redux !!!!**

Redux is an excellent incremental backup program. It backs up your backup packages, together with data packages, with two backup packages. Can back up to floppy, folders, or volume images. You can write scripts, using BackTalk, the Redux control language. Comes with Redux Restore, a restore utility that can be distributed freely. Version 1.5 reviewed. Version 1.6 shipping. Requires Mac Plus or later. $99. Microserver Publishing, Inc., 480 Benjamin Ctr. Dr., Ste. 103, Tampa, FL 33634. (813) 882-8635. (July '89)

**Retrospect !!!!**

Retrospect is a full-featured backup and archival package. Supports storage devices from floppy to DAT drives. Retains backup data, so you can move your archives to electronic bulletin boards or on-line services. The interface is simple and straightforward, and Diamond can create self-extracting compressed archives (adding about 35 KB to the compressed file in the process). Version 3.3 reviewed. $75. Sercan Corp., 1501 E. 34th Ave., Sarasota, FL 34236. (813) 954-5622. (Apr '91)

**DIRECTORY !!!!**

DIRECTORY is a fast, excellent file-cataloging tool. Easy-to-use Finder-like interface. It produces good printed reports. Includes auto-indexing option, printing capability, and a DA that can find files both on your disks and in DIRECTORY catalogs. Version 4.0 shipping. $94. Scallian Engineering, Box 906, Cambridge, MA 02138. (617) 495-9600. (Sept '90)

**Disk Ranger !!!!**

Disk Ranger is primarily a file-cataloging program. It uses search filters, filtering abilities, plenty of useful sorting options, and good reporting capability, and it works quickly. Comes with a DA that reads catalog files created by the program; also searches effectively for files. Disk Ranger prints survey labels, on ImageWriters only. Also includes a DA that can find files both on your disks and in DIRECTORY catalogs. Version 5.0 shipping. $4,653. Shipping. Requires Mac Plus or later. $50. Microscape Publishing, Inc., 3410 The Chamberlain, Salem, NH 03079. (802) 882-0076 or (617) 495-9600. (Sept '90)

**DiskDoubler !!!!**

DiskDoubler consists of an INIT and an application for file compression and expansion. The INIT provides a simple interface, adding a pull-down menu to the Finder.

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Findswell\\n
Findswell is an indispensable utility that installs a new button in the Open dialog box of every Mac application. Click on the button to type a search string, and click on Find, and Findswell searches for any files that match. Version 2.01 shipping. Requires Mac Plus or later. $39.95. Working Software, Inc., P.O. Box 1844, Santa Cruz, CA 95061. (408) 423-5696. (Nov '87) * 87 Eddie

INITPicker\\n
INITPicker is a control panel that offers a scrollable list of INITs in the System so you can determine their loading order. Holding down a predetermined key combination at startup automatically shuts off all INITs and bypasses the INITPicker screen. Can be invoked at startup. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later. $39.95. MicroSeed Publishing, 5801 Franklin Dr., Ste. 103, Tampa, FL 33634. (813) 882-8635. (Aug '89)

KiwiFinder Extendr\\n
KiwiFinder Extension lets you manage, sort, and search through large numbers of files, using a simple application called Manager. The application maintains a database about all the files on your hard-drive. KiwiFinder adds buttons to the Mac's standard Open and Save dialog boxes, making many of the options available with the Manager application. For users with reasonably organized hard drives, this pack-age isn't necessary, but it can aid those who need help with large-scale file management. Version 1.02 reviewed. $99. Kiwi Software, Inc., 10834 E. Bandera Rd., San Antonio, TX 78216. (210) 335-8147. (Aug '90)

MacTools Deluxe\\n
MacTools Deluxe contains utilities, a backup program, security options, partitioning software, search/launch capabilities, and a code-partitioning program called FileEdit. MacTools Deluxe has mediocre file-recovery performance — unless it is preinstalled as a preventive system, in which case it has good panic performance and recovers deleted or erased files well. $129. Central Point Software, Inc., 15220 N.W. Greenbrier Pkwy., #200, Beaverton, OR 97006. (503) 888-8199 or (503) 680-8800. (Apr '91)

MultiDisk\\n
MultiDisk is an excellent software disk partitioner that allows partitions to be dynamically resized, password-protected, and encrypted. Can erase partitions from the Finder. Version 1.11 reviewed. Version 1.2 shipping. Requires System 6.0.3 or later. $39.95. AlSoft, Inc., P.O. Box 297, Spring, TX 77383. (713) 338-4060. (May '89)

On Cue\\n
On Cue lets you switch applications without returning to the Finder. Under MultiFinder, action is taken on a pop-up menu. Can also launch directly to a specific document. Version 1.0 reviewed. Version 1.3 shipping. Requires Mac Plus or later. $59.95. ICONSimulations, Inc., 648 S. Wheeling Rd., Wheeling, IL 60090. (708) 520-4469. (Sept '87) * 87 Eddy

On Location\\n
On Location finds files and text strings. Once they're found, you can view file contents (for most common document formats) open a file in its native application; or copy, delete, rename, or move a file. Its main asset is blazing speed. Nonstandard interface, Expensive, but has a one-year, money-back guarantee. Version 1.0 reviewed. Version 1.0.2 shipping. Requires Mac Plus or later and a hard-drive. $129.95. ON Technology, Inc., One Cambridge Center, Cambridge, MA 02142. (617) 235-0928. (Aug '91)

PickTure\\n
PickTure is an INIT/control panel that serves as a visual file selector. Presently, it shows miniature screen shots of all files a selected application can open. Double-clicking on the screen shots opens the desired file. Radio buttons allow navigation through folders. Version 1.0 reviewed. Requires Mac Plus and later. System 6.0.3 or later. $89.95. Right Answers, Box 3699, Torrance, CA 90510. (213) 525-1311. (July '91)

POWERIcons\\n
POWERIcons creates duplicate version icons. Version 1.0.4, $35.00; 5.06, $54.95; Mac Plus or later. $350. Satori Software, 2815 Second Ave., Ste. 295, Seattle, WA 98121. (206) 447-0270. (Sept '91)

Silverlining\\n

Sniffy\\n
Sniffy is a first-class file-find utility that, like a sniff, a file-compression and -archiving utility, it’s bigger and better — stuffs and unstuffs files quicker and better. Now includes built-in compression, optional compression speeds, and a control-panel file for quick access. Version 1.0 reviewed. Requires Mac Plus or later and System 6.0.3 or later. $59.95. Aladdin Systems, Deer Park Center, Ste. 23A-171, Aiptos, CA 95003. (408) 685-9175. (Dec '90)

Super Boomerang\\n
Super Boomerang is a handy INIT that adds full navigational and search features to Save dialog boxes. It automatically remembers all the files and folders recently accessed. Can be configured to always show certain files and folders. Big 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later. With Now Utilities, $129. Free upgrade from Boomerang, Now Software, Inc., 520 S.W. Harrison St., Ste. 435, Portland, OR 97201. (800) 237-3611 or (503) 274-2800. (Apr '90)

PRINTING

BulkMailers\\n
BulkMailers is a basic mail manager with many powerful sorting features. Post setup can be difficult. Can handle up to 90,000 names and addresses. Skips record. Version 3.23 reviewed. Version 3.32 shipping. Requires Mac Plus or later. $350. Satori Software, 2815 Second Ave., Ste. 295, Seattle, WA 98121. (206) 447-0270. (Oct '90)

FasTele\n
This envelope-printing DA has powerful features and flexibility, but its bugs and quirks diminish utility. Features include unlimited number of records, full font control, graphics capability, postal-bar-code creation, data export/import, and print merge. You can customize envelope sizes or use ten predefined standard formats. Version 1.03 reviewed. Version 2.0 shipping. $180. Vertical Solutions, P.O. Box 1150, Beaverton, OR 97005. (503) 671-0790. (Apr '91)

FastLabel\\n
FastLabel is a good label creator and printer. Excellent tools for designing labels and including graphics and icons. Prints envelopes by default. $119; $49.95 for labels. Weak list handling. Version 2.0 reviewed. Version 3.0 shipping. $79.95. Vertical Solutions, P.O. Box 1150, Beaverton, OR 97005. (503) 671-0790. (Apr '91)
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Grapple Spooler

Grapple Spooler is an adequate spooler but no speck demon. Installation is simple and there are few problems, but sometimes using a hard disk drive can slow down using a spooler. Version 1.0 shipping. Requires Mac Plus or later, System 6.0.2 or later, and 1 MB of RAM (hard disk disk drive), 600 MB of RAM (hard disk drive), $79 Orange Micro, Inc., 1400 N. Lakeview Ave, Anaheim, CA 92807, (714) 779-2772. (Apr '90)

JetLink Express

Bundled with a serial cable, JetLink Express is a printer driver that lets you print to non-PostScript HP printers. Provides a set of four special outline fonts that it uses automatically when you choose the standard Adobe fonts. Terrible manual. Check application compatibility before buying. Performance with HP printers is good but sacrifices many features offered by a properly configured PostScript printer. Version 2.0 shipping. Requires Mac Plus or later, System 6.0.2 or later, hard disk drive, and HP-compatible printer. $195. GET Softworks, Inc., 4644 Lonely Hwey., Ste. 188, Burnaby, British Columbia V5C 6B7, Canada. (604) 291-6222 or (604) 921-0121. (Aug '91)

KiWiEnvelope!

This DA has simple features for one-shot envelope printing, but it needs font flexibility. Features include unlimited number of records, graphics capability, and postal-bar-code creation. Envelope sizes are limited. Has on-line help. Version 1.3 reviewed. $49.95. KiWi Software, 6546 Pardal Rd., Santa Barbara, CA 93117. (800) 321-5494 or (805) 685-4048. (Nov '90)

MacEnvelope

This combination DA/application has many powerful features for envelope printing and mail management, but it lacks font flexibility and unlimited-record capability. Features include graphics capability, postal-bar-code creation, data import/export, and print merge. You can customize envelope size, or you can use 11 predefined standard formats as well as 150 custom templates. Sorts by name or ZIP code. A Plus office pack, $995. Somak Software, 535 Encinitas Blvd., Ste. 113, Encinitas, CA 92024. (600) 842-5020 or (619) 425-2556. (June '91)

SuperLaser spreadsheet.

SuperLaser Spooler supports a wide range of printers, including the HP DeskWriter. It also prints beautifully excellently. Installation is a snap, and you use it as a standard spooler. Version 2.0 reviewed. Version 2.1 deferred. Requires Mac Plus or later and System 4.1 or later. $149.50. Fifth Generation Systems, 10409 N. Reiger Rd., Baton Rouge, LA 70809. (800) 873-6024 or (504) 291-7221. (Apr '90)

SuperSpool


PrintBarrier

PrintBarrier calculates and prints bar codes at varying resolutions. It supports UPC, EAN, Interleaved 2 of 5, and Code 39. It is adept at creating bar codes with pre-assigned values. Version 1.1 reviewed. $1,595. GET Softworks, Inc., 4644 Lonely Hwey., Ste. 188, Burnaby, British Columbia V5C 6B7, Canada. (604) 291-6222 or (604) 921-0121. (Aug '91)

QuickEnvelope

This DA has limited features and flexibility for envelope printing, which is a pity. Features include full font control and print merge. You can customize envelope size or use pre-defined standard formats. Without features such as graphics-importing and postal-bar-code capability, QuickEnvelope can't compete with similar envelope-printing utilities. Version 1.0 reviewed. $495. GCC Technologies, Inc., 500 Water St., Waltham, MA 02154. (600) 422-7777 or (603) 622-4640. (Jun '90)

UltraScript for the Macintosh

UltraScript provides software-only PostScript emulation that lets Mac applications get the max­imum quality possible from non­PostScript printers. A serious disadvantage is that Adobe Type 1 fonts must be converted into a proprietary format in order to work with UltraScript. This is not as difficult as it sounds, but it is a chore. Version 1.1 reviewed. Requires Mac Plus or later and at least 3 MB of RAM (hard drive recommended), $195. UltraScript Plus, $445 (includes network spooler and 43 fonts). QMS, Inc., One Mission Pass, Mobile, AL 36618. (800) 320-2665 or (205) 682-3030. (Feb '91)

Security

A.M.E. (Access Managed Environment)

This industrial-strength security system offers some of the most complete features available for the Macintosh. While it is expensive, it makes it suitable only for knowledgeable users. System administrators will appreciate the Activi­ty monitoring feature, which can record any activity done on the protected Mac. You can assign access levels for users, and password pro­tection is sophisticated. DES encryption is available. A.M.E. is effective, but it is a security system for a professional user error that the program can irretrievably lose data. Version 1.1 reviewed. Requires Mac Plus or later, System 6.0.2 or later, and 1 MB of RAM. (Nov '90) Advanced Security

Advanced Security consists of three applications: File Security, which can scramble files; Print Security, which encrypts your work; HD Security, which locks hard disks so they can be opened only by a special floppy; and Virus Security, which checks itself for changes when it's run. Version 1.2 reviewed. Requires Mac Plus or later. Single-user license, $275; site license, $1,800; available. Advanced Gravis Computer Technology Ltd., 7400 MacPher­son, #111, Burnaby, British Columbia, V5J 5B6, Canada. (604) 434-7247. (May '90)

DiskLock

The easy-to-use security program DishLock keeps the contents of your hard drive private. The im­portant improvements in this version include the ability to do background processing, protec­tion against writing of changed files and folders, and support for the U.S. Data Encryption Standard (a faster proprietary encryption is also provided). It does not offer customizable user levels, administrative functions, or a hierarchy of privileges. Like all security software, DiskLock works best for people who never forget their password. Version 2.0 reviewed. Requires Mac Plus or later and System 4.1 or later. $189. Fifth Generation Systems, 10409 N. Reiger Rd., Baton Rouge, LA 70809. (800) 873-6024 or (504) 291-7221. (Mar '91)

FileGuard

FileGuard is an excellent security package that operates primarily in the background. It is unique in that it can protect folders, applications, and data files, which it accomplishes by using an easily updated list of persons who have different levels of access. There is no DES encryption (a U.S. govern­ment standard), but its proprietary encryption is well done. FileGuard provides support for the optional MacCard magnetic-identity-card reader, which operates as part of the ADI circuitry. Version 2.5 reviewed. Requires Mac Plus or later, or SE to later. $595; 5-user office pack, $995; 10-user office pack, $1,595. FileGuard, Inc., 4650 Arrow Hwy., E-6, Montclair, CA 91763. (714) 624-2594. (Apr '91)
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<th>Instructions</th>
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<tbody>
<tr>
<td>2 MB</td>
<td>Remove all four existing 256K SIMMS, install two 1 MB SIMMS, leave two sockets for future expansion.</td>
</tr>
<tr>
<td>2-1/2 MB</td>
<td>Remove only two 256K SIMMS, install two 1 MB SIMMS.</td>
</tr>
<tr>
<td>4 MB</td>
<td>Replace all four 256K SIMMS with four 1 MB SIMMS.</td>
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</tbody>
</table>

To upgrade an 8-socket Mac II, Ile, etc., use SE 30 to this amount of memory.

<table>
<thead>
<tr>
<th>Amount of Memory</th>
<th>Instructions</th>
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</thead>
<tbody>
<tr>
<td>4 MB</td>
<td>Remove all four existing 256K SIMMS, install four 1 MB SIMMS, leave remaining sockets for future expansion.</td>
</tr>
<tr>
<td>5 MB</td>
<td>Keep existing 256K SIMMS, install four 1 MB SIMMS in remaining sockets.</td>
</tr>
<tr>
<td>6 MB</td>
<td>Remove all four 256K SIMMS, install eight 1 MB SIMMS.</td>
</tr>
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FontMonger provides type format conversion in any direction, among PostScript Type 1, Type 3, and TrueType fonts. In converts type to Adobe Illustrator or EPS files, so you can combine graphics and type, and then install the results back into a font. FontMonger's type modification abilities include access to unencoded characters, generating custom oblique characters, generating superior and inferior characters, and generating em and en fractions. FON0361 $65.
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Claris  
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GM0020 Draw2D 2.0 285  
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A font expansion card for Apple's most powerful laser printer which adds the popular Adobe TypeSet 1.2 and 3 Postscript language fonts to the LaserWriters. The card plugs directly into the font expansion connector on the NTX's controller board and becomes a resident part of the printer. The NTX PostCard NTX comes bundled with Adobe Type Manager software and Adobe TypeSet 1.2, and contains bitmapped fonts for the Macintosh. FON0410 $469.

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MacUser Magazine rates Intouch "the best name-and-address DA for the Mac," (4 1/2 mice). Intouch is an easy-to-use Macintosh Accessory that stores unlimited names, addresses, phone numbers and notes, prints envelopes and labels, dials telephone numbers and more! Because Intouch is a DA, it provides you with instant access to your notes. Network 3-pack now available. UTI0192 $39.

Dial-Click  
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Fifth Generation Systems  
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G100908 SimCast 1.2 1 $45
G100135 SuperLaserSpot 2 00 Single User 93
ICOM Simulations, Inc.  
UTI0104 On Cut 35
Insight Development  
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LNG 0002 THINK's Pascal 3.0 119

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MINIFINDERS

**Ft. Knox Finders**

Ft. Knox is an excellent security utility that offers a range of protection against virus infection. Files or volumes can be "sanitized" to U.S. top-secret standards. Version 1.0.5 shipping. Requires Macintosh 8.6 or later. $395.

Transfinite Systems Co., P.O. Box N, MIT Branch Post Office, Cambridge, MA 02139. (617) 969-9570.

**MaccasCard Reader**

The MaccasCard is a magnetic-identity-card reader that operates as part of the ADB circuitry and requires use of SAM (Symantec Anti-Virus for Macintosh). A self-contained stack that includes SAM, security, applications, and partitions. Requires Mac SE or later. With SAM, Software $349. ASD Software, Inc., 149 North St., E-6, Montclair, CA 91763. (714) 624-2594. (Apr '89)

**MacSafe**

MacSafe is a dual-file security program that lets you put multiple files into a "safe," where you can protect them further through two types of encryption (including DES). Flexible and easy to use. Allows for installation on hard-disk drive. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac SE or later. $189.95. Kent Marsh Limited, Inc., 1200 Post Oak Blvd., Suite 210, Houston, TX 77056. (800) 325-3587 or (713) 623-8618. (Mar '87)

**NightWatch**

NightWatch locks up your hard-disk drive by using a floppy startup disk that acts as a key. Type in the correct password, and access to the hard-disk drive is allowed. Version 1.02 reviewed. Version 1.03 shipping. Requires Mac SE or later. $193.95. Kent Marsh Limited, Inc., 1200 Post Oak Blvd., Suite 210, Houston, TX 77056. (800) 325-3587 or (713) 623-8618. (Sept '88)

**Rival**

Rival is an INIT that inspects open files for known viruses. Rival checks files constantly, but delays are hardly noticeable. Also scans disks and does some file repairs. Experienced users can easily add protection against newly discovered viruses. Version 1.0 shipping. $99. Microseed Publishing, Inc., 5801 Benjamin Cir. Dr., Ste. 103, Tampa, FL 33613. (813) 882-8653. (Sept '89)

**SAM (Symantec AntiVirus for Macintosh)**

SAM (Symantec Anti-Virus) is a clear step forward in virus protection. An easy upgrade procedure lets users upgrade SAM to fight new viruses by calling a hotline service. Newsline. The INIT portion, SAM Intercept, has been improved slightly, but its interface has suffered in the process. Virus Clinic (the batch-checking application) is excellent, offers better interface than previous power. Version 2.04 reviewed. Version 3.0 shipping. Requires Mac SE or later and System 6.0 or later. $99.95. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014. (800) 441-7234 or (408) 253-9600. (Aug '91)

SecureInt.

SecureInt locks files and folders, makes the System Folder invisible, erases files not on its user-specified approved list, locks disks after use, refreshes (replaces) specified files with clean copies after use, and password-proTECTS everything. Also purges files as a disk fills up, but this is too dangerous to use in most cases. Particularly good at resisting efforts to bypass it. Version 2.3 shipping. Requires Mac Plus or later. $149.95. Direct Software, Inc., 1032 Irving St., Ste. 513, San Francisco, CA 94122. (415) 347-1950. (Aug '90)

Virex

Virex is a virus preventer, detector, and eradicator that works against known viruses. Excellent support and update history. Version 1.1 reviewed. Version 3.2 shipping. Requires Mac Plus or later and System 4.2 or later. $99.95. 10-pack, $599. Microcom, Inc., P.O. Box 51489, Durham, NC 27717. (919) 490-1277. (Jan '90)

**Word Processing**

**Better Working: The Resume Kit**

Better Working: The Resume Kit is a port of a popular DOS program. It does an adequate job of structuring simple résumés but ultimately isn't much better than a good word processor. Has a good manual and is a good place to start, but that's not really enough. Version 1.0 shipping. $39.95. Spinnaker Software Corp., 201 Broadway, Cambridge, MA 02139. (617) 323-6088 or (617) 494-1200. (July '90)

**DocUpComp**

DocUpComp is a utility that lets you create two versions of a word-processing document. Inserted text in the newer document is shown with underlining, and both Word and text appear in boldface. Older document shows deleted and moved text with strikeout characters. An excellent report featuring details all revisions made to a document. A definite winner.

**Writer's Dreamtools**

A set of five highly informative HyperCard stacks. The Chichés and Catchphrases stack is fascinating. These also include a Slack Event Day by Day, the Stack of Decades, and the Stack of Lists. Comes in G- and X-rated versions. Requires HyperCard 2.0 (including HyperCard in a Box). Five-stack set, $149. Slippery Disks, P.O. Box 1126, Los Angeles, CA 90069. (800) 522-7234 or (213) 274-3600. (May '90)

**OCR**

AccuText is an automatic, on-screen OCR program built on several expert systems that combine shape and context analysis. Can read poorly copied, multiformatted pages. It's set up for manually selecting and arranging blocks of text to recognize. Good-page-format preservation. No boxy, edging recognized before saving to a file. Version 1.1 shipping. Requires Mac SE with 68020 accelerator card, SE/5 or II series with 4-channel RAM (5 MB under MultiFinder), System 6.0.3 or later, and a floppy or hard-disk drive. $799. Xerox Imaging Systems, 185 Albany St., Cambridge, MA 02139. (800) 248-6550. (July '90)

**CDP 9000**

The CDP 9000/TopScan consists of the CDP 9000 (a large scanner that connects to your Mac with a SCSI cable) and TopScan software, which installs on your hard disk. Results are blazingly fast and highly accurate. Attractive Mac interface, including a window that previews the current page. Requires SE or Plus or later with a hard-disk drive. Scanner and software, $31,950. Calera Recognition Systems, 2500 Augustine Dr., Santa Clara, CA 95054. (800) 544-7621 or (408) 986-8746. (Nov '90)

**OmniDraft**

OmniDraft is an add-on that improves OmniPage's ability to recognize dot-matrix characters. OmniDraft becomes part of OmniPage after installation and adds a check box for dot-matrix text recognition. Produces fairly accurate scans. Version 1.0 shipping. Requires OmniPage 2.1. $100. Caere, 100 Cooper Ct., Los Gatos, CA 95030. (800) 355-7726. (Sept '90)

**OmniPage**

OmniPage is an automatic on-screen recognition program. Works best on complex magazine pages. Strict adherence to shape analysis avoids most substitution errors.
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Omniproof ****

Omniproof is a document-comparison program that compares any two versions of a file and gives a detailed report that shows what has been changed, inserted, or deleted, or changed. Can also print documents with revision bars to show editing. Sold as a companion to OmniPage but is a separate program at $1000. $150. Coare, 100 Cooper Ct., Los Gatos, CA 95030, (800) 535-7226. (Sept '90)

Parallel Reader ****

The Parallel Reader is a hardware/software combo that is Caere's bid for the corporate high-end OCR market. It is actually an IBM-compatible that you network to your Mac. You must add on one of the three scanners it supports (Fujiitsu 3093, HP ScanJet Plus, or Metascan). The Parallel Reader forces you to do DOS and transfer your files into Mac format, speeds up multipage OCR work and allows batch-deferred processing. Requires scanner, an auto document feeder, PC keyboard and monitor, and Mac/PC communications cable and software. $150. Coare, 100 Cooper Ct., Los Gatos, CA 95030, (800) 535-7226. (Nov '90)

Read-It!!!

Read-It!!! is a Mac-based OCR package that includes printer drivers for most scanners, batch processing, background operation under MultiFinder, and 22 font tables. Recognizes multiple columns, italics, and some foreign characters but not underlined text. Version 2.0 reviewed. Version 2.1 shipping. Requires Mac Plus or later and a scanner. $495. Odual Corp., 7529 Red Rd., Ste. A, South Miami, FL 33143, (800) 822-0772 or (305) 668-4665. (June '89)

TextPert****

TextPert is a trainable OCR package with acceptable accuracy. Needs to learn fonts. Supports most Mac languages but in roman fonts only. Directly supports popular scanners. Version 3.0 reviewed. Version 3.5 ships. Requires Mac Plus or later, a high-resolution (at least 200 dpi) scanner, and a hard-disc drive. $995. CTA, 747 Third Ave., Third Floor, New York, NY 10017, (212) 424-2112 or (212) 935-2880. (Oct '89)

Typist****

Although this unique, hand-held OCR scanner can input text directly into a Mac application, its finicky character-recognition performance makes it hard to recommend. The software processes about 500 wpm, but the resultant text contains many errors. Our testing found software incompatibilities and SCIS conflicts. The software accepts different type styles and sizes, but performance doesn't compare with standard OCR software using a good flatbed scanner. Version 1.0 reviewed. 4 MB of RAM recommended, $595. Coare, 100 Cooper Ct., Los Gatos, CA 95030, (800) 535-7226. (Mar '91)

Spelling & Grammar Checkers

Correct Grammar ****

Correct Grammar is an excellent British (grammar checker) and Mac-based application handles a wide variety of input. The interface is good, although some of the type is too small. Customization is easy and necessary. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later, hard-disc drive, and System 4.2 or later. $99. Liferay Software, Inc., 33 New Montgomery St., Ste. 1260, San Francisco, CA 94105, (800) 543-3783 or (415) 541-7864, (June '89)

Graham Speller!!

Graham Speller is a DA-based spelling checker with a macro feature. Clumsy interface. Version 1.1 reviewed. Requires Mac 512K or later, $44.95. Graham Software Co., 869 Ingalls Cir., Arvada, CO 80003, (303) 422-0740. (Sept '90)

Grammatik Mac!!!

Grammatik Mac is a port from DOS that has an ugly, awkward interface. It lists spelling and grammar abilities, which are overshadowed by the interface, are quite good. Customization is reasonably easy. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later. $99. Reference Software International, 330 Townsend St., Ste. 123, San Francisco, CA 94107, (800) 872-9935 or (415) 541-0222, (Jun '90)

Inside Information!!!

Inside Information is a "hierarchical dictionary" that provides large categories of words you can search through in almost the same way as you do a thesaurus. But it lets you explore subjects, much as a country's reading list. It has 4,500 categories, organized by major fields and subfields. It has three search views: outline (with expandable/collapsible headings), the tree view, and the more-comprehensive graph view. A Reverse Dictionary function lets you search for words according to your definition. This feature, as does the overall utility, needs refinement and expansion. Version 1.0 reviewed. $119. Microlytics, Inc., Two Tobyve Village Office Park, Pittsfield, MA 01240, (800) 828-6293 or (716) 248-9150. (Feb '90)

Language Master!!!

Language Master is an electronic dictionary/thesaurus in a DA. The main dictionary has a high capacity of thornification points, and part-of-speech information for more than 83,000 entries. The thesaurus has 40,000 unique entry points with synonyms for different parts of speech. Version 1.0 reviewed. Version 2.0 shipping. Requires Mac Plus or later, System 6.0.3 or later, and a hard-disc drive. $79.95. Franklin Electronic Publishers, Inc., 122 Burrs Rd., Mount Holly, NJ 08060, (800) 540-5314. (Jan '90)

Microsoft Foreign-Language Dictionaries

Microsoft provides electronic dictionaries for use with Word. Of the five, English (US), English (British), French, Spanish, German, Italian, Swedish, and Dutch. Each dictionary acts as a replacement for the standard English dictionary, so you can use only one dictionary at a time. Without trying to include every word in each available foreign language, these dictionaries can catch misspellings, incorrect placement of tildes, and even incorrect accents marks. Requires Microsoft Word 4.0, $75. Each Microsoft Corp., One Microsoft Way, Redmond, WA 98052, (800) 426-9400 or (206) 882-8080, (Feb '91)

RightWriter!!

This grammar checker is strong on checking but flawed on presentation. Works well with MultiFinder. Format compatible with all versions of MacWrite (2.2 to 5.0). MacWrite II: Word 3.0 and 4.0; WordPerfect 1.0 to 1.04; WordStar 1.0, 2.0, and 1.1. Includes application-specific text editors. It is fully customizable. Relevant text should be more clearly delineated. Version 3.10 reviewed. Requires Mac Plus or later and hard-disc drive. $95. QUE Software, 11711 N. College Ave., Carmel, IN 46032, (800) 922-0244 or (317) 571-3465. (Aug '90)

Sensible Grammar!!!

Sensible Grammar is a useful proofreading program based on phrase lists instead of on word lists and rules. Grammar-checking abilities are slightly above average. Simple operation, but you work on the original document. Almost an exact duplicate of the spelling checker is a handicap. Version 1.0 reviewed. Version 1.0.5 shipping. Requires Mac Plus or later and System 6.0 or later. $99.95; upgrade, $25. Sensible Software, Inc., 335 E. Big Beaver, Ste. 207, Troy, MI 48083, (313) 528-1950. (Dec '88)

Sprocket Coach Professional!!!

Sprocket Coach Professional 3.0 is a good, powerful spelling checker. New features include a reduced-size double-sided control panel, clearer dialog boxes, greater flexibility in keyboard-command-equivalent assignments, and totally redesigned Hot Seaters — the best available. Coacher can check spelling in batches or interactively. The program's main drawback is that it takes time and effort to learn. Version 1.0 reviewed. Version 3.1 shipping. Requires Mac Plus or later, System 5 or later, and a hard-disc drive. $195. Denue Software, 3305 N.W. 74th Ave., Miami, FL 33122, (800) 622-6872 or (305) 594-4696. (May '90)

SpellSwell!!

SpellSwell is a stand-alone batch spelling checker. Also checks for punctuation and other errors. Good dictionary, thorough checking, nice output, but not quite as good as guessing. Excellent performance. Version 2.0 reviewed. Version 2.2 shipping. Requires Mac 512K or later and 1 MB of RAM under MultiFinder. Software. Inc., P.O. Box 1844, Santa Cruz, CA 95061, (408) 423-5696. (Sept '89) * '89 Eddy

TechWords

TechWords is a set of seven supplementary dictionaries for use with Microsoft Word. The dictionaries cover scientific areas such as physics, biology, life sciences, and computer technology. Word correctly identifies terms contained in these supplementary dictionaries, but such words aren't listed as alternatives when you find incorrect words, using Word's spelling checker. $79. Geocomp, 66 Commonwealth Ave., Concord, MA 01742, (508) 369-8304. (Feb '91)

Thunder II!!!

Thunder II is a major upgrade of the popular spelling checker. An INIT/Commands panel. Thunder II launches at startup. Users select the dictionaries and applications with which it should check. There are dictionaries for plaintext, punctuation, capitalization, and double-word errors. Includes application-specific "compatibility modules" to retain character formatting. Editable glossary. Version 1.1 reviewed. Requires Mac Plus or later and System 5 or later, $99.95. Baseline Publishing, 17117 Moriah Woods Blvd., Ste. 207, Arvada, CO 80007, (313) 528-1950, (Dec '88)

Word Finder!!

Word Finder is an electronic thesaurus that won't replace your trusted Roget's but is useful for checking synonyms while you type. Version 2.0 reviewed. Requires Mac Plus or later and System 6.0.3 or later. $39.95. Microlytics, Inc.,

** MICE RATINGS **

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5893 or (716) 248-9150. (Feb '90)

WorksPlus Spell  

WorksPlus Spell is a speedy spelling and hyphenation checker for Microsoft Works. It includes a guided interactive spell checker and a dictionary. Noteworthy is its Search/Replace function plus elegant multiple-column and mailmerge features. Performs sluggishly on Pitesse, SEs, and Classics. With its open hooks for PC-

Two new Macs file translation systems. WordWrite II is an excellent choice for mixed environments. Allows only one header and footer per document. Version 1.0 reviewed. Version 1.1v1 shipping. Requires Mac Plus or later. $29. Claris Corp., 5201 Patrick Henry Dr., San Clara, CA 95052, (800) 548-

QuickLetter  

QuickLetter is a well-designed and powerful word processor. Good at creating letters and envelopes.

MindWrite  


This high-end word processor has an intuitive design and is easy to learn, but it has a range of menu options that will intimidate novices (no Short Menu option is provided). The program is aimed at technically proficient users who need extensive control over long documents. Graphics handling has been greatly improved and now includes Page Graphics, a surprisingly powerful system with basic DTP functions. Part of Nissus' power is due to its extensive searching and macro capabilities. File size is limited primarily by the Mac's available RAM. Version 3.01 reviewed. Version 3.05 shipping. Requires Mac Plus or later (hard-drive disk recommended). $935. Paragon Concepts, Inc., #312, Solana Beach, CA 92075. (800) 922-2993 or (619) 481-

Vantage  

Vantage is a text editor兼DA and the commercial version of the MacWrite Plus project. Changes include: counts the number of lines, words, sentences, paragraphs; or a selection; and searches and replaces on characters (including invisibles). Supports macros and external commands written in Pascal. Includes a spelling checker. Version 1.1 reviewed. Version 1.5 shipping. Requires Mac 512Ke or later. $99.95. Baseline Publishing, 1770 Mortah Woods Blvd., Ste. 14, Memphis, TN 38117. (800) 926-9676 or (901) 682-

Word  

Word has an excellent speed and a huge list of useful features. Table command lets you create multi-column tables of text and graphics by specifying the columns and output. Supports semi-automated mail-merge. Good value and compatibility. Requires Mac Plus or later. $89.95. MicroSoft Corp., 1555 N. Technology Way, Orem, UT 84057. (800) 321-4586 or (312) 633-5000. (June '91)

WriteNow  

WriteNow is a low-level word processor. Big problems in using Word. Editors may have many of the awkward interface problems of previous versions. Good internal file management system. Graphics management is separate program, Word for Word. WordPerfect excels at technically proficient users who need extensive control over long documents. Graphics handling has been greatly improved and now includes Page Graphics, a surprisingly powerful system with basic DTP functions. Part of Nissus' power is due to its extensive searching and macro capabilities.
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Thinking of setting up your own DTP business? Then grab a copy of Desktop Publishing Success. Authors Felix Kramer and Maggie Lovaa cover every aspect of establishing and running a DTP operation, including assessing equipment needs, finding customers, pricing and bidding, working efficiently, subcontracting, and accounting. There are even profiles of successful desktop publishers and an appendix on doing corporate DTP. It’s well worth the $27.50 investment.

(800) 541-2318.

By Aileen Abernathy

ATM for graphics? Well, maybe. Ray Dream — best known for Ray Dream Designer, its 3-D modeler/renderer — has introduced JAG, a $99.95 utility that uses anti-aliasing to eliminate the jaggies in 8- and 24-bit PICT images and PICS animations (TIFF users are out of luck). JAG stands for jaggies are gone, and it works by averaging pixels along the detected edges of an image. (415) 960-0765.

Want to transform your scanned photos or paintings into sophisticated art but lack the talent or the wherewithal for an expensive graphics package? Check out Aldus’ Gallery Effects, which offers class special effects at a budget price ($199). Gallery Effects performs its magic on TIFF and PICT2 images as well as on PICS animations. Volume 1: Classic Art offers 16 customizable effects, including chalk, charcoal, watercolor, emboss, and graphic pen (shown here). The program comes in four formats: an application; a DA; an XCMD for SuperCard and HyperCard 2.0; and plug-in modules for Photoshop, Digital Darkroom, and SuperPaint (for an as-yet-unreleased version!). From Silicon Beach Software (an Aldus subsidiary). (619) 695-6956.

Fonts, fonts, fonts: Don’t expect to see any Adobe Originals fonts in TrueType format (surprise, surprise). After trumping Apple with its Multiple Masters strategy, Adobe announced that it holds the exclusive license to digitize typefaces from Berthold, Europe’s leading type vendor. Linotype previously released some Berthold faces, including Walbaum and Post Antiqua, but Adobe will be the sole distributor of all future faces. First out: Imago, Nofret, and Formata.® MasterWorks Type Library, Volume 1, is the first offering from Digital Typeface Corp., the font foundry owned by LaserMaster (best known for its plain-paper imagesetters). The collection of 100 Type 1 fonts (culled from the DTC, URW, and ITC foundries) has serif, sans serif, decorative, and script faces. Type families include such illustrious names as ITC Clearface, ITC Souvenir, and URW Antiqua. Retail price is $1,695 (that’s $16.95 per face). (612) 943-8920.

Updates: The Oasis/Wacom Image Creation Kit gives you a copy of Oasis and a Wacom 6-x-9-inch graphics tablet with a cordless, pressure-sensitive stylus for just $1,195. Oasis, a 32-bit painting program, offers pressure-sensitive tools that let you mimic traditional art media. (707) 576-7722.® The shipping dates for QuarkXPress versions for non-Mac platforms have slipped to the end of 1991 and beyond. First out will be the Windows version, followed by OS/2. Quark is hedging its bets on whether it will actually ship the NeXT version it announced last fall. Apparently, demand hasn’t justified the development costs thus far.®
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PostScript Type Tricks

The new versions of Illustrator and FreeHand make it a snap to create snazzy display type.

By Janet Ashford

Creating imaginative display type on a computer hasn’t always been easy. Although you could add basic colored fills and strokes to PostScript fonts, using Illustrator or FreeHand, you couldn’t fill the characters with blends, patterns, or bit-mapped art without first converting them to graphic outlines with programs such as Metamorphosis, Evolution, or TypeStyler.

TypeStyler offers several canned effects (graduated blends, for example) that can be added instantly to all the characters, but it doesn’t have the flexibility of a PostScript drawing program. And in Illustrator 88, you had to paste a custom fill into the letters one at a time and use various tricks to keep the counters (the enclosed spaces in letters such as A, D, and P) from filling up.

Happily, the 3.0 versions of Illustrator and FreeHand make creating display type a snap. Both programs can automatically convert PostScript type to outlines, and they can link outlines to form a multiple clipping path that you can use as a mask. This feature lets you paste a fill into several characters at once, and it automatically keeps the counters unfilled and transparent.

Graphic designer Janet Ashford coauthored The Verb Book of PostScript Illustration.
**Editing the Outlines**

The text is modified to create a jagged bottom edge. The bottom segment(s) of each letter is clipped away with the scissors tool (top). A wavy line is drawn, and the endpoints of each letter are dragged down to meet it (center). The line is deleted, and the letterforms are closed when new baselines are drawn between the endpoints (bottom).

**Creating a Blend**

Two wavy horizontal shapes are drawn with the freehand tool, colored gold and dark brown, and positioned one above the other. Using the blend tool, the artist executes a six-step blend between the shapes. The small number of steps creates a visibly banded, striated look reminiscent of the layers of the earth's crust.

**Masking the Blend**

The letters of EARTH are selected and turned into a multiple clipping path when Make Compound is chosen from the Paint menu and the Mask box is checked in the Paint Style dialog box. The letters are positioned over the blend, sent to the back, and then grouped with the blend to create the masked effect. The combined elements are shown here in Artwork Only mode.

**Adding a Background**

Each letter now contains a portion of the blend. A solid black rectangle is placed behind the letters to set off their colors. The complete blend is still visible in Artwork Only mode, but in Preview mode, it does not appear in any areas outside the clipping path. The open counters in the A and R allow the black background to show through.
Creating More Text

The word air is set in Bodoni Italic and rotated. The letters are converted to outlines and repositioned so that the top lines of the large a and two smaller letters are aligned and the dot is tucked closer to the i. Finally, the counter in the a is enlarged.

Preparing Another Image

A copy of the a’s counter is saved as a separate EPS file and opened in Photoshop, where it is converted to a bitmap. This outline serves as the basic shape for a new image. To add color to the image, its mode must be changed to RGB Color.

Painting a Custom Pattern

The artist dumps solid blue into the shape’s outline and interior and then uses the airbrush tool to paint clouds. Painting around the outline with the brush tool ensures that the image will paste back into the counter in the Illustrator text without leaving gaps. The cloud image is saved as an EPS file so that it can be placed in Illustrator.

Masking the Clouds

The cloud image is brought into Illustrator, by use of the Place Art command, and positioned over the counter in the letter a. In Artwork Only mode, the cloud shape is represented by a placeholder box (left), but the actual artwork is visible in Preview mode (right). The counter outline is defined as a mask, sent to the back, and then grouped with the cloud shape to produce the finished effect.

Completing the Image

The final touches include overlapping the air and EARTH images slightly, drawing a tan circle and sending it to the back as a background, and adding more text in Bodoni. To ensure that the cloud image prints when the Illustrator document is placed in a page-layout program, the Include Placed Images box is checked when the Illustrator file is saved. (Note that the placed art is still linked to the Photoshop file, which must be kept with the finished artwork.)
Tools To Consider Using When Your Mac Won't Read DOS Disks.

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Do people care about standards? People do. Compaq, Digital, MIPS, Microsoft, Santa Cruz Operation (SCO), Silicon Graphics, and Sony, among others, have signed on to the Advanced Computing Environment initiative. The basic idea: interoperability across platforms through common hardware and operating systems. CPU: Intel x86 or MIPS RISC chips. OS: Open Desktop UNIX, from SCO, or OS/2 3.0 (which runs DOS and Windows apps), from Microsoft. And Apple? Well, some people adopt standards. Others make Macs.

By Henry Bortman

Routers on parade: Cayman has upgraded its GatorBox LocalTalk-to-Ethernet router; it's now the GatorBox CS. The CS has EPROM chips that store information about the router's configuration so that if there's a power outage, it can reestablish itself automatically. (The old GatorBox had to reload its configuration from a Mac on the network.) The CS circuit board is also available as GatorMIM CS, a plug-in module for Cabletron's Multi Media Access Center hubs. The MMAC can simultaneously support Ethernet, token ring, and FDDI (a fiber-optic-network interface). $2,795 for either the GatorBox CS or the GatorMIM CS. And coming soon to a GatorBox near you: DECnet Level 1 routing and an optional rack-mountable design.

Webster will also offer DECnet Level 1 routing on its MultiPort Gateway. Look for this upgrade by early fall. The currently shipping unit ($4,995) routes AppleTalk traffic among an Ethernet port and four LocalTalk ports. A DMA controller lets all four LocalTalk ports be active at once. The MultiPort Gateway also functions as a TCP/IP gateway. (800) 457-0903. Meanwhile, the venerable FastPath, which used to be the only game in town for DECnet routing, has moved up to version 5, the first major upgrade of this LocalTalk-to-Ethernet router since Shiva acquired it from Novell. The new rev sports separate processors for AppleTalk I/O, similar to those in the Macintosh IIfx; PROMs; interchangeable media-interface modules, for easy support of 10BASE-T; and (hallelujah!) greatly improved management software. $2,799.

Print jobs in a queue: Looking for something to do with your old Mac Pluses? Try running Compumation's Print Central network print-spooler software. Print Central can support up to six output devices from as many as eight print queues. And — how come nobody thought of this before? — it automatically resolves LaserPrep conflicts, eliminating the endless printer resetting that many users are painfully familiar with. $795. (814) 238-2120.

Colors across a network: Timbuktu 4.0 is now shipping. This new version, which is System 7.0-compatible, lets users share color and gray-scale screens, with appropriate dithering. (Previous versions displayed remote screens only in black-and-white.) It's not a speed demon, but it is an impressive bit of engineering. Also in 4.0: An Exchange Clipboard feature, for machine-to-machine cut-and-paste, and fully backgroundable file transfers. $195; upgrade, $35.
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Disks of a Different Color

DOS disks deserve the same respect Mac disks get, so go ahead—mount them on your desktop.

By John Rizzo

Connectivity is always more complicated than it seems. Take the simple matter of floppy disks. A Mac with a SuperDrive can read DOS disks, yet when you stick a DOS floppy into the drive, your Mac asks if you want to initialize the disk. The reason for this apparent contradiction is that although the SuperDrive can read a DOS disk, as advertised, the Mac's operating system can't (the SuperDrive is standard in all Macs made today but did not ship in the Mac Plus and earlier models or in older SEs). The System is trained to recognize only disks formatted in HFS (hierarchical file system) — anything else looks like gibberish to it.

Apple's solution is AFE (Apple File Exchange), which comes with the standard Mac System software. AFE is a utility that lets you look at the contents of a DOS disk and copy a DOS file to a Mac disk. But with AFE, Apple shows that it has a double standard for moving files. For Mac floppies, hard disks, and removableies as well as DOS CD-ROMs, you can double-click on the disk icon to see its contents and click-and-drag to copy files from one volume to another. But to see the contents of DOS floppies and removableies, you have to use the AFE utility, which has a less-than-intuitive interface similar to that of the Font/DA Mover and which doesn't allow you to mount DOS disks. It hardly seems logical that neither System 6.x nor System 7.0 can mount a DOS disk on the desktop.

A Single Standard

Fortunately, you can make up for the Systems' shortcomings with one of two utilities, DOS Mounter, from Dayna Communications, or AccessPC, from Insignia Solutions, both of which cost less than $100. These products let the Mac recognize the DOS file system on floppy disks and removable cartridges, so you can see and use these disks in the Finder. DOS Mounter, the first utility to eliminate the interface double standard, was followed by AccessPC, which expanded on the DOS Mounter idea and offers more functionality.

Popping one of these utilities (accessed through a control panel) into your System Folder fixes the operating system, but you're still out of luck if you don't have a SuperDrive. Fortunately, both DOS Mounter and AccessPC work with external DOS floppy drives from Apple, PLI, and Kennect. DOS Mounter also works with version 2.3 and later of the DaynaFile, Dayna's DOS floppy drive for the Mac.

DOS Mounter and AccessPC also work with various DOS-formatted removable-media devices, such as Bernoulli, SyQuest, and erasable optical (also known as magneto-optical) drives. If your removable cartridge has DOS partitions, AccessPC and DOS Mounter can mount each partition as a separate desktop volume.

Unfortunately, some removable-media drives come with drivers that don't follow...
Apple's specifications for software drivers. These drivers don't work with DOS Mounter or AccessPC, because they don't tell the system (including installed INITs) that a disk has been inserted when a non-Mac disk is in the drive. The result is that your DOS SyQuest cartridge can't mount. Therefore, you must use a driver that follows Apple's specs. Many such drivers are available; the manufacturer of your removable-media drive may be able to recommend a good one. In addition, both Dayna and Insignia offer a driver that works. Dayna will send you a free driver if the software driver for your SyQuest or erasable optical drive has problems with DOS Mounter; AccessPC comes with a universal driver called Multi-Driver (see Figure 1). Multi-Driver uses disk-caching techniques to speed SyQuest and erasable-optical performance, but to use this option, you have to format the media with Media Formatter, another utility that comes with AccessPC. If you decide to use Multi-Driver or Dayna's driver, proceed with caution, because the software driver you use is a big factor in determining the performance of a storage device — the replacement driver may not be as fast as the driver you already have.

One of AccessPC's biggest assets is that it can mount the "hard-disk drive" file of SoftPC (Insignia's DOS-emulation package, which lets you run DOS programs on your Mac) as if it were a real hard drive connected to your Mac. SoftPC uses a file that acts as a PC drive C:, or the place you usually store your DOS files and directories. Normally, the only way to see this file's contents is by running SoftPC and using the DOS command DIR. However, by using AccessPC to mount the SoftPC hard-disk-drive file on the desktop, you get a volume that you can drag files into and out of.

**What's in a Name?**

You may want to do more than just look at the contents of a DOS disk or copy files to your Mac disk. If you need to copy Mac files to the DOS disk or actually use the DOS files on your Mac, you'll first have to modify the files. If they're already in a format Mac applications can read (such as WKS, from Lotus 1-2-3), the modifications will be small and can be done automatically by both DOS Mounter and AccessPC. If your DOS files are unintelligible to Mac applications, you'll need a file-translation program, such as MacLinkPlus/Translators, from DataViz (see review, July '91.
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Part of the formatting problem is because DOS and Mac files are named differently. DOS filenames are limited to eight characters before a period, followed by a three-character extension. DOS filenames can’t have spaces, asterisks, or slashes the way Mac names can. DOS Mounter and AccessPC take care of this problem by keeping two filenames for a file created on a DOS disk (although despite what AccessPC’s manual says, this doesn’t always work). For example, the Mac filename Rizzo Recipes becomes RIZZORE& on the PC, where the ampersand lets you know that the name has been altered. A second file with a similar name, such as Rizzo Recipes/Italian, becomes RIZZORE1. DOS Mounter shows you the Mac name when the disk is mounted on a Mac and the DOS name when the disk is mounted on a PC. AccessPC works the same way unless the Save Mac Info to Disk option is turned off, in which case it always displays the DOS name, even if the DOS disk is in a Mac (see Figure 2).

DOS Mounter and AccessPC store both the Mac and the DOS filenames on the DOS disk itself. AccessPC gives you the choice of turning this disk storage of filenames off with its Save Mac Info to Disk feature. If you do turn it off, AccessPC figures out the filenames on the fly whenever the disk is opened.

If you need to use DOS files on your Mac, the three-character extension of a DOS filename can be translated into the information that Mac applications need. Mac files don’t have extensions, but they do have two invisible tags called Creator and Type, each of which is designated by a four-letter code. When you double-click on a DOS file, you get the familiar “Application Busy or Missing” message, because no Creator is identified. The Creator code (XCEL for Microsoft Excel, for example) designates the application that opens when you double-click on the file. The Type code designates the format of the file. This can be a generic standard format such as TEXT, PICT, or WKS or an application-specific format such as WDBN, for Word 4.0. Applications have the Type code APPL.

When you copy DOS disks to the Mac, both DOS Mounter and AccessPC automatically add a Creator and Type to a file, based on its DOS filename extension. This is called extension mapping, and you can set this up in an AccessPC or DOS Mounter control panel (see Figure 3). You can set up extension mapping so that all DOS files ending in .DOC become double-clickable Word files or all Lotus .WK1 files open in WingZ when you double-click on their icons. If you need to change the Creator or Type after you’ve copied a file to the Mac, you’ll need to use ResEdit or a utility such as DiskTop or DiskTools.

Using extension mapping doesn’t guarantee that your Mac applications will be
able to read DOS files. You still may need a file translator — such as DataViz's MacLinkPlus/Translators or Traveling Software's LapLink Mac III — if the DOS file contains formatting codes your Mac application doesn't understand. This formatting appears as random gibberish when the DOS file is opened with a Mac application. A file translator gets rid of the gibberish by translating the formatting code to code the Mac understands.

AccessPC and DOS Mounter take about the same length of time to mount disks. On a 11ci with the disk-cache control panel turned on, both utilities took about 8 seconds to mount a DOS disk containing 41 files (totaling 676K) the first time and about 4 seconds each time after that. DOS Mounter slowed down if you turn off the cache. AccessPC's speed improves if you turn off Save Mac Info to Disk — it took slightly less than 4 seconds to mount a floppy disk the first time, as opposed to 8 seconds with this option turned on.

**The Bottom Line**

Overall, AccessPC is the better DOS-disk-mount utility. It works great in combination with Insignia's DOS-emulation package, SoftPC. AccessPC is also faster than DOS Mounter if the Save Mac Info to Disk option is turned off. However, unless you use SoftPC on a regular basis, it's probably not worth switching to AccessPC if you already have DOS Mounter (which is bundled with the DaynaFile and MacLinkPlus/Translators) because both basically do the same thing and AccessPC costs slightly more. Either way, it's time to end the double standard and mount your DOS disks.

*MacUser* technical editor John Rizzo has written more than 120 articles on Mac-to-PC connectivity and other issues.
Use AccessPC to get MS-DOS data into your MAC applications. **Fast.** Now, using MAC software, you have access to MS-DOS and PS/2 disks and cartridges.

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Mystery Lesson

A new crop of system-management tools makes solving network problems faster and easier.

By Kurt VanderSluis

On a recent troubleshooting adventure, a client asked me to determine why 3 Macs that were part of a 50-Mac network were crashing intermittently. I had recently received three new system-management tools—GraceLAN, Network SuperVisor, and Status-Mac—all of which can gather and present a list of the INITs, applications, system configurations, and SCSI devices being used by each Mac on a network. They seemed like the right tools for the job, so I decided to give one of them a real-world workout.

There are many reasons why a Mac can crash, but one common problem is a memory-allocation conflict among INITs. Walking through my client’s office, I noticed that the people on the network were using lots of INITs, some of them very old. I saw what appeared to be Pyrol 1.0 (the current version is 4.01) and thought I heard a Talking Moose. Although there are 50 Macs in this office, there is no full-time network administrator or any policy on software piracy or paying for shareware. Consequently, the Macs had a large variety of software, legal and illegal. All the machines did have a commercial antivirus utility installed, so I didn’t immediately suspect a virus as the source of the crashes.

I chose Technology Works’ GraceLAN as my troubleshooting tool and installed its Responder INIT on the three Macs that were experiencing the crashes problem and on five randomly selected noncrashers. I then placed the GraceLAN application on another Mac and used it to scan the eight Macs in the test group to get their configuration information. In about 20 minutes, I had all the data I needed. In fact, I had a tremendous amount of information to sort through—unfortunately, GraceLAN has no database for compiling the resulting information. (Both Status-Mac and Network SuperVisor do have databases for organizing network data.) GraceLAN can display the data on-screen or print it, however, so I printed the detailed information for each of the eight Macs and laid everything out on a large desktop, hoping that my human-based pattern recognition and deductive subroutines would solve the mystery.

The question that I wanted to answer was, what’s special about the system configuration of the three crashers that makes them different from the noncrashers? Considering how system-management packages are marketed (and priced), you might get the impression that all you have to do is rev up GraceLAN, Network SuperVisor, or Status-Mac (or another system-management tool such as TrafficWatch II, NetAtlas, or TalkManage), and a few minutes later the program will give you The Answer. Wrong. System-management tools merely gather and display information. You, the network manager, are still responsible for providing the answers.

In my efforts to ferret out the information, I had one clue: The Macs usually crashed when
people were away from their desks, not while they were using the machines. One of the users (I love this kind of user) even had a crash log he had been keeping since the first crash. It listed the time, date, and conditions for each of the crashes. Six of his seven crashes happened while he was away from his desk. This kind of scenario usually indicates that a screen saver is involved.

Looking at the list of INITs, I saw that the commercial screen saver Pyro! 2.0 was loaded on all three of the machines that were crashing. It was also loaded on two of the five machines that were not crashing. Clearly, Pyro! 2.0 alone was not sufficient to cause the crashes. I looked to see what else the troubled Macs had in common and found that all three had two shareware INITs — SuperClock (which puts a clock onto the menu bar) and HierDA (which creates hierarchical pull-down menus) — loaded as well. (HierDA was an older shareware version, not the current commercial version, Now Menus, that’s included with Now Utilities.)

At this point, I factored in some previous experience: I’d had troubles with HierDA a couple of years ago. Back then, HierDA conflicted with MORE 2.0 and I had to remove it. Among the eight machines, all three crashers had HierDA — but so did three of the noncrashers. However, only the crashers had both Pyro! 2.0 and HierDA. With this combination as the possible culprit, I called Fifth Generation Software (the maker of Pyro!) to ask if there were any known conflicts between Pyro! 2.0 and HierDA. The tech-support person said that the company didn’t have lists of known conflicts with Pyro!, and even if it did, the list certainly wouldn’t extend back to the 2.0 version.

Because no one could tell me otherwise, I decided that the crashes were being caused by a conflict between HierDA and Pyro! 2.0, but the evidence felt inconclusive to me. I even searched outside the test group, but no other Mac had this combination of INITs. We removed HierDA from the machines, and in the weeks since this episode, those three Macs have not crashed again. But is this a success story?

My uneasiness stems from the fact that I don’t know whether I actually solved the problem. For example, all three of the crashing Macs were also using SuperClock. Perhaps it was the combination of Pyro!, SuperClock, and HierDA that caused the Macs to crash. Or maybe each Mac had a different problem and my investigative technique of looking for commonalities was misguided from the start. This lack of conclusion troubles me — but not my client, who is happy to be rid of the crashing problem.

What are the weak points of this investigation that prevented a concrete solution? For starters, I used only eight Macs in my test group, because I wanted to reduce the time I had to spend sifting through the data. I was prepared to add
You might think a system-management package can give you The Answer. Wrong. These tools merely gather and display information.

more Macs if the situation warranted, but ideally, I should have used the entire network as my test group.

I could have included the entire network (without being buried under the resulting pile of data) if GraceLAN or its competitors had been capable of performing all the pattern matching for me — that is, if the program could have automatically sifted through the data and found the common elements. This is not a trivial computing problem when you have an undirected search algorithm (you don’t know what you’re looking for), and it’s compounded by the fact that you may have “fuzzy” information — that is, some of the information you think is correct may actually be wrong. For example, one or more of the Macs I classified as “non-crashing” might actually have been crashing but the user was not reporting it. Unfortunately, the artificial intelligence required for pattern matching and evaluating data accuracy is not built in to any of the programs — yet.

Although system-management tools can’t automatically search for patterns, they are proficient (to varying degrees) at finding an already defined combination. For example, if you think that a crashing problem is caused by the combination of HierDA and Pyro! 2.0, Status+Mac will let you perform a Boolean search to locate the Macs with that combination.

All these system-management tools are relatively new and will probably be upgraded by the time you read this. We’re still learning how to use them, and the developers are still inventing what they do. Although these tools can’t provide any intelligence yet, they are useful for gathering and displaying information, and you should consider them your troubleshooting toolbox. Just remember that the answers still have to come from you. —

Kurt VanderSluis is president of The Network Group, a training and consulting firm in Seattle.

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How to Get On-Line Support

Stuck on hold every time you call tech support? Going on-line with your problems can save you time and money.

By Owen W. Linzmayer

When you run up against a brick wall while working on your Mac, do you instinctively pick up the phone and dial tech support? If so, you probably know the frustration of constant busy signals and long-distance holding patterns. But if you have a modem, there is a way of getting tech support without the hassles.

With a modem and a telecommunications program (such as MicroPhone or White Knight), you can log on to national on-line information services such as America Online and CompuServe anytime. Most major software publishers and hardware manufacturers have employee who roam the electronic information services answering questions, solving problems, and keeping in touch with customers. This support is usually free (except for normal on-line charges) and complements the companies' telephone technical help.

The benefits of on-line support include access to top-notch technical personnel, prompt and thorough replies, updates and patches for products you own, and—because most on-line services have local access numbers—some savings in long-distance telephone calls.

You'd like to try on-line support but don't know where to find it. See Table 1, which contains a directory of some of the major companies that use on-line services. (If the manufacturer of a product you use

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**On-Line Information Services**

**America Online**

Since its premiere in 1989, America Online (AOL) has quickly become a major consumer telecom service for Mac and Apple II users. Much like CompuServe and GEnie, AOL offers computing-support bulletin boards; special-interest forums; huge download libraries; interactive conferences; and multiplayer, on-line games.

AOL's graphical interface helps Mac users feel right at home. In contrast to users of the larger, older information services, who must enter terse instructions via a command-line interface, AOL users simply point and click on folders, filenames, and icons.

Despite AOL's friendly interface, you can't easily automate the process of logging on and off after gathering information as you can with CompuServe. Fortunately, the low monthly fee of $5.95 covers one free hour of connect time. Additional use is charged at $5 per hour evenings and weekends and at $10 per hour weekdays. Initial sign-up is free.

America Online, 6119 Westwood Center Drive, Vienna, VA 22182; (800) 227-6364 or (703) 448-8700.

**AppleLink**

AppleLink, maintained by Apple Computer, provides access to information about Apple and third-party programs and products. Subscribers can read the latest press releases, look up product prices and specifications, send and receive E-mail and disk files, receive answers to technical questions, and learn about software updates. Virtually every Mac developer (7,200 at last count) has an AppleLink account.

The $70 AppleLink Startup Kit is available to Apple vendors; suppliers; developers; resellers; user groups; consultants; and select business, education, and government customers. Connect-time costs $12 per hour, with a $12 monthly minimum.

Incidentally, AppleLink has a gateway that lets you exchange messages via Internet, an international network consisting mainly of UNIX-based computers in universities and large corporations. Internet users should direct E-mail to the appropriate AppleLink address and add @applelink.apple.com to the address. If you'd like to know more about Internet, download "The Hitchhiker's Guide to the Internet" (filename HHIKER.SEA) from MacUser's on-line service Zmac (see the CompuServe section). This detailed description of Internet and its features is in Library 7 (Reference) of the Download & Support Forum.

AppleLink, 20525 Mariani Avenue, M.S.: 47B, Cupertino, CA 95014; (408) 974-3309.

**CompuServe**

CompuServe (CIS) is geared toward the consumer market. It consists of special-interest forums where users can exchange messages on subjects from computers to cooking, politics to personal finance. Most forums have related libraries containing text documents and computer files you can download for the price of the connect time.

CompuServe currently boasts 750,000 subscribers, and the various Mac forums are extremely active. MacUser and MacWeek chose CIS as the home of Zmac, their own on-line service, because it's where the most Mac fanatics hang out.

After buying a sign-up kit for $29.95, users can access CompuServe from any kind of computer by using a basic telecom package. The cost of the CompuServe connect time depends on the speed of your modem: $5 per hour at 300 bps (bits per second), $12.50 at 1,200 or 2,400 bps, and $22.50 at 9,600 bps. CompuServe offers two Mac applications (CIM and Navigator) designed to overcome the system's antiquated teletype writer interface and minimize on-line connect charges (both programs were reviewed in the March '91 issue, page 62).

CIS and MCI Mail share a gateway, so subscribers can exchange E-mail. When creating a new message on CompuServe for an MCI Mail address, at the To prompt, enter >MCI/MAIL and a space; and then the recipient's MCI Mail address.

CompuServe Information Services, P.O. Box 20212, Columbus, OH 43220; (800) 848-8199 or (614) 457-0802.
The personnel who monitor on-line address employee within the company or direct your comments to the appropriate counts usually reply to inquiries promptly on-line address; for example, they may send private E-mail directly to the accounts, areas (called special-interest groups, message in the public-bulletin-board most companies prefer that you post your maintain a CompuServe E-mail address public-bulletin-board address (designated by the GO command). Although you can send private E-mail directly to the accounts, most companies prefer that you post your message in the public-bulletin-board areas (called special-interest groups, roundtables, or forums) so that other people on-line can read your message and the company's reply. You'll benefit from the unsolicited responses offered by knowledgeable users — it's not uncommon to post a question at night and return the next morning to find half a dozen detailed replies.

If you don't yet subscribe to any of the major on-line services listed in Table 1, check out the "On-Line Information Services" sidebar for brief descriptions of each service, along with information on sign-up fees and connect charges. There's a lot of overlap among the various services, so unless you're an insatiable information junkie, you probably need to sign up for only one or two services.

By the way, a growing number of companies operate an in-house bulletin-board system (BBS) as well. Sometimes limited to registered users, these systems are based at the company's headquarters and can be accessed with standard telecom software. If you have difficulty connecting, call the company's technical-support hot line for assistance.

San Francisco-based free-lance writer Owen W. Linzmayer's on-line accounts are OWEN INK (America Online), OWEN (AppleLink), and 72511,70 (CompuServe).
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Introducing the new TurboPS Personal Series laser printers.

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End users please circle 56 on reader service card.
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Table 1: On-Line Tech Support, continued
Everyone knows that in order to do a job right, you need the right tool. For precision drawing and drafting, you need a powerful, easy-to-use program well-suited to the project at hand. Like MacDraft® or Dreams.® Each a serious, no-nonsense tool for architectural and engineering design & drafting, as well as technical illustration. Designed to respond quickly and accurately to the way you think and work.

If your job requires a versatile program offering a full complement of drawing tools including arcs, polygons, and Bezier and spline curves, choose MacDraft. You can create multi-layered scaled drawings in both English or metric, while MacDraft’s auto dimension lines and area calculations are displayed in the units of your drawing. You can also rotate text and objects by less than 1°, create custom line styles, and store commonly used graphic elements in user-created symbol libraries. All this and much, much more.

When you need higher levels of power and more advanced features, choose Dreams. Dreams expands on MacDraft’s drawing and editing capabilities and provides these extras: A parallel line tool to create walls and intersections, keyboard editing for precise resizing or placement of objects, and tools to extend and trim lines and create fillets (arcs tangent to lines). With Dreams, you can merge objects together or subtract one from another, glue lines and curves together to create objects, or unglue complex shapes into their component edges. Dreams also provides associative dimensioning that will automatically update when an object is resized or moved. The list goes on and on...

So before you start your next project, choose the right tool for the job. MacDraft or Dreams. Two powerful programs offering different levels of sophistication and features at prices you can afford.
Table 1: On-Line Tech Support, continued

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Here’s a batch of hidden and undocumented tips for getting the most out of System 7.0.

By Bob LeVitus

Last month I presented the case for waiting a while before upgrading to System 7.0. No sooner had I written that column than I proceeded to ignore my own advice. I’ve been using various versions of System 7.0 since the beginning of the year, and I’m happy to report that it hasn’t been all bad: The beta software I’ve been using (I’m writing this before the official ship date) has been pretty stable, and I’ve had a chance to discover lots of new features and helpful shortcuts. Some of these are undocumented; others might be described in the manual, but they’re not intuitively obvious and can take a little time to get used to.

Take the Trash, for example. Before System 7.0, when you launched a program, shut down, or restarted your Mac, the Trash was emptied without any warning. In System 7.0, however, the Trash works the way trash cans do in real life: When you throw something away, it stays in the trash until you empty it (in the case of System 7.0, you do so by using the Empty Trash command), even if you launch a program, shut down, or restart. This is pretty straightforward — and yes, I know it’s in the manual — but I have to admit that a few days passed before I noticed that the Trash wasn’t emptying. And then it took a few more days before I started remembering to take out the trash periodically.

In the spirit of the Trash that doesn’t empty behind your back, I offer you the best of System 7.0’s hidden secrets. You’re bound to find your own as you start using the new System, so let me know what you come up with (you can reach me on Zmac’s MacUser Forum or on CompuServe at 76004,2076). I’ll report on any particularly good secrets in the coming months, and the winners will receive genuine all-cotton, “I Beat the System” T-shirts, so keep those cards and letters coming.

Finder Secrets

Background File Copying. One of my favorite System 7.0 features is that you can copy files in the background while you’re working on something else. (Yeah, this is in the manual too, but I didn’t pick up on it for weeks.) Just make sure you launch the application you want to work in before you begin copying the files, because you can’t use the Finder while you’re copying files but you can use any application that is already open. You may notice a slight degradation of performance — a twitchiness similar to that during background printing — but it’s a small price to pay for the time you save when you have work to do.

Colorized Icons. If you’re the creative type, you might enjoy editing or colorizing some of your icons. With earlier versions of System software, you had to use ResEdit or other complicated icon-editing software, but System 7.0 lets you edit or colorize icons, using nothing more complicated than a painting program. Here’s how:

1. Select an icon, and choose Get Info from the File menu (Command-I).
This used to be a Full-Page Ad.

**POWER TOOLS**

**BEATING THE SYSTEM**

2. In the Get Info window, click on the icon once to select and copy it.
3. Open a new document in a painting program and paste the icon into the document.
4. Modify the icon in any way you want, select it, and copy it.
5. Return to the icon’s Get Info window, and paste in the new icon. Presto — that file, folder, or disk now sports your redesigned icon.

*Spaces at the Beginning of Filenames and Folder Names.* Under System 6.x you can’t begin a filename or folder name with a space, but under System 7.0 you can precede a name with as many spaces as you like. This is great, because names that begin with a space appear at the top of the list (in lists that are sorted alphabetically, a space is listed above letters and numbers). The Apple Menu Items folder works the same way. The more spaces you put before a file’s name, the closer to the top of the Apple menu it appears.

*Trash.* We can’t leave the Finder without mentioning the Trash again, so here are a couple more tips:
1. The Trash icon stays wherever you put it, even after you restart or shut down. Move the Trash anywhere you like: it’ll still be there next time you start up your Mac.
2. Usually you get a warning when you choose Empty Trash from the Special menu, but you can turn this warning off. To do so, select the Trash, choose Get Info from the File menu, and uncheck “Warn before emptying” check box.

**Alias Secrets**

System 7.0’s new aliases are great, but some of the ways to use them are not immediately obvious. Here are some of my favorites.

If you make an alias of a folder — any folder — and put it into the Startup Items folder in the System Folder, that folder opens automatically when you start your Mac (if you put an individual document or application into this folder, it launches on startup). I keep an alias of my Apple Menu Items folder in the Startup Items folder, so that it’s always open on my desktop when I turn on my Mac. That gives me two ways to access items in my Apple menu — from the Apple menu itself or from the Apple Menu Items folder. (Speaking of which, don’t forget that you can put anything, including a folder or an alias of a folder, into the Apple Menu Items folder. When you choose a folder’s alias from the Apple menu, the folder pops open, which is particularly convenient if it is nested several folders deep.) Aliases are also great if you’re on a network. I love the “office-on-a-floppy-disk” trick, which lets you use a floppy disk to access your Mac from any other Mac that’s running System 7.0 on the network. Here’s how:
1. Create an alias of your hard disk and copy it to a floppy disk.
2. In the Sharing Setup control panel, turn on File Sharing.
3. To make your hard disk available on the network, select it and choose Sharing from the Finder’s File menu. In the Sharing dialog box, click on the “Share this item and its contents” box and set up the appropriate access privileges.

You can now mount your hard disk from any Mac on the network by merely inserting the floppy containing the alias of your hard disk and double-clicking on the alias.

In a similar vein, if you frequently mount the same remote hard disk or server, make an alias of its icon. After that, you won’t need to use the Chooser to mount it — just double-click on the alias. Or drop the alias into your Apple Menu Items folder, and choose it from the Apple menu.

**Miscellaneous Secrets**

*Balloon Help.* Before you decide you’re too much of a power user to need Balloon Help, check out this tip. Make sure Balloon Help is turned on, and go to About This Macintosh on the Apple menu. When you point to the bar graphs that show how much memory is allocated for your open applications and system, a balloon pops up, telling you how much of that memory each application is actually using (see Figure 1).

*TeachText.* If you double-click on a text or PICT file and don’t have the application that created that file, you no longer get the dreaded “Application busy or missing” dialog box. Instead, System 7.0 asks if you’d like to open the document by using TeachText. TeachText also opens screen snapshots created with Command-Shift-3. These PICT files are automatically named Picture 1, Picture 2, and so on and placed on the desktop. If you double-click on one of these files, it opens in TeachText. You can even use TeachText’s new selection rectangle to copy part of a picture and paste it somewhere else. If you want to open a PICT file in another application such as...
Canvas or Photoshop, drag the screen dump's icon over the application's icon.

**Hiding Applications.** I always hated the fact that you couldn't hide an active application's windows when running MultiFinder under System 6.x. As a result, if you ran several applications at once, your screen became cluttered with windows that you weren't using. System 7.0's flexible hide-and-show feature fixes that nicely: You can hide or show any combination of windows, using the Application menu at the far right of your menu bar.

There are also several less obvious ways to use hide-and-show. If you hold down the Option key as you make a selection from the Application menu, the application you're in will be hidden when the application you've selected becomes active. If you Option-click on the desktop, the currently active application will become hidden and the Finder will become active. And if you Option-click on any window, the application you're working in will be hidden and the application for the window you Option-clicked will become active.

**Changing Views.** If you're viewing a folder on the desktop by one of the list views (Name, Size, Kind, Label, Date), you can change the view without having to go to the View menu. Simply click on the column header you want (Name, Size, Last Modified, and so on) to change to a different list view. This feature is so obvious that you wonder why it hasn't been in the System software for years (which, by the way, is how long third-party utilities such as DiskTop and DiskTools have had this feature).

**Keyboard Shortcuts**

System 7.0, and Finder 7 in particular, offers significantly more keyboard control than did earlier System software. If you haven't done so already, choose Finder Shortcuts from the Balloon Help menu and take a look at the keyboard shortcuts documented there. They're excellent, and worth learning, but it seems that a few were left out.

If you learn only one keyboard shortcut, make it this one: Command-Option-Escape — it forces the active program (or the Finder) to quit if it freezes. This won't save anything in the program that was active when you froze, and it doesn't always work, but when it does work, you can gracefully exit from the hung application and save any documents you might have open in other applications. Note: When you use this trick, be sure to restart your Mac as soon as you've saved your work. The freeze indicates that something serious is wrong. If you continue to work without restarting, chances are that the problem will get worse and eventually cause another freeze or crash.

Here's another good one: You can eject or unmount a disk or volume by selecting its icon and typing Command-Y (yes, you can also use Put Away on the File menu, but this is the keyboard-shortcuts section). Finally, here's one tip that is documented in the Finder Shortcuts window, but it's worth repeating: To disable all extensions, including all control panels that contain INIT resources, hold down the Shift key when you start your Mac.

**Stupid Mac Tricks**

Just so we can finish with something sweet and non-nourishing, here are some concealed screens and pictures, all of which are interesting or amusing, none of which are useful. Both Apple and Claris have a long-standing tradition of hiding these screens inside their programs. For example, several versions of the Apple Installer...
Polar bears, musk-ox, grizzlies, caribou — more animals than you’d find in Yellowstone — can be found on the magnificent coastal plain of the Arctic Refuge in Alaska. Unfortunately, this portion of our last arctic wilderness has caught the eye of the oil industry. Right now Congress is considering proposals that would allow the oil companies to drill there, even though reports indicate there’s less than a one-in-five chance oil would be found.

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Apple and Claris have a tradition of hiding pictures and messages inside their programs.

reveal a secret message when you type “ski” at the first screen. And someone at Claris stashed one of the best-known Easter eggs — the infamous adults-only Zebra Lady — in MacPaint 2.0. Here are some treasures to hunt for in System 7.0.

Open the Memory control panel, and hold down the Option key as you pull down the pop-up hard-drive menu. Instead of seeing the names of hard drives attached to your Mac, you get a menu with the names of the virtual-memory design team, including humorous hierarchical credits.

Next, try holding down the Option key when you pull down the Apple menu. Choose About the Finder, and you’ll see a pleasant mountain landscape. Look familiar? If you’re a longtime Mac user, it should — it’s a copy of the original About The Finder box, which appeared in Finder 1.0.

Finally, the Puzzle that appears on the Apple menu conceals a double surprise. (Do the following on a copy of the Puzzle only.)

1. With the Puzzle open, choose Cut or Clear from the Edit menu. The System 7.0 picture disappears, and the Apple logo replaces it. If you choose Cut or Clear again, the Apple logo will be replaced by a number puzzle.

2. You can create your own puzzle by pasting an image into the puzzle from the Clipboard.

Thanks to all who’ve shared their System 7.0 experiences with me electronically via Zmac, AppleLink, and AmericaOnline and to the publishers and authors who let me peek at their System 7.0 books: Ventana Press and Craig Danuloff for *The System 7.0 Book*, available now at a bookstore near you, and BMUG and Alex Lau for *The Hitchhiker’s Guide to System 7.0*, available from BMUG (you can contact the group at [415] 549-2684 [spells BMUG]). These books are packed with information you won’t find in the Apple documentation, and I highly recommend both.

Bob Levitus has just finished new editions of his books *Dr. Macintosh and Stupid Mac Tricks* (from Addison-Wesley, Reading, Massachusetts, 1991).
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There's more to a great spreadsheet than just plugging in numbers. Here's how to plan, create, and troubleshoot the perfect spreadsheet.

By Thom Hogan

Software is getting more sophisticated. Each new release of a product seems to add dozens of features, refine old features, and make subtle changes to the program that affect the way you work.

But that's on a macro level. The commands you enter and the order in which you enter them might change when you move to new software, but the underlying philosophy of how you work shouldn't. The Microsoft Excel 3.0 release, for example, has more changes in it than I can adequately describe in the space of this column. Yet, having used it for a while, I'm struck by the thought that the more things change, the more they stay the same. Microsoft's ads try to get you to believe that the way you'll work with spreadsheets in the future is going to change because of Excel 3.0, but they're wrong.

Which brings me to the subject of this month's column: how to design effective and useful spreadsheets. I use Excel 3.0 in my examples, but what I have to say applies to any spreadsheet or graphing product. The rules and ideas I outline are pretty general, but I'll try to point out particular examples and how these rules might affect your everyday work.

The Planning Stage

Designing a good spreadsheet, also called a worksheet, is a great deal like designing a good program. Think about it: Programs are a series of instructions that solve a problem or do useful work, which is almost exactly what a spreadsheet does too. Therefore, all the rules of programming pertain to the design of spreadsheets. This is especially true if you're redesigning a worksheet you'll use over and over, such as an expense or budget report. The more you're likely to use a worksheet, the more planning you need to do before you even launch the spreadsheet program.

There are as many ways to program as there are programmers, but in general, consider the following elements when starting a new worksheet:

Know what output you want to see. Work backward to determine what input and calculations are necessary to create that output (more on this later).

Look for reusable concepts. A modular worksheet is fast to create, and if you're really careful about how you create modules, you may be able to reuse them.

Keep it simple. The more complex you make the process, the more likely it will be to contain a mistake.

Design the worksheet as if you were creating it for others to fill in and use. Don't assume that everyone knows the same shortcuts and shorthand methods you do.

Refine your work before using it. The worst thing you can do is to make changes to your worksheet after you've started using it. You could make changes that will corrupt the worksheet's structure or the integrity of the calculations.

Make sure you know the spreadsheet
**THE EXPERT'S EDGE**

**Figure 1: Design your worksheet with the final output in mind. Work backward to determine what input and calculations are necessary to create that output, and make sure it conveys the message no matter who's using it. This example was designed to show a product's quarterly sales figures by region.**

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That's how it is with worksheet design — it's the final output that counts. Is it accurate? Can it be understood? Does it summarize all the detailed information necessary to present the full picture?

Map out how you want the output to look before you start typing into your spreadsheet. Once you know what output you need, you can figure out where the results will come from. Let's say, for example, that you need quarterly sales figures for a product line by region. Your final primed might look something like that in Figure 1. Simple and effective, this clearly summarizes the results you want to present.

**Keep 'Em Separate**

Here's the rule that separates the real spreadsheet programmers from the wannabes: Keep assumptions, input, calculations, and output separate. Why? Well, consider this. What happens if you need the same results, but the input keeps changing? Or the boss disagrees with your optimistic assumption that business will pick up by 231 percent next quarter? Or you find that one of your calculations is incorrect? Where do you go to fix these things if you've woven all the elements together into a mishmash of numbers?

Many people manage to do a decent job of separating input and output, mainly because they end up discovering that it's easier if all the input goes in one place (scrolling around a big worksheet looking for things that need to be entered is a waste of time, and you're almost guaranteed to mess something crucial), but assumptions are often woven into a worksheet just about anywhere, without regard for how they might need to be changed later.

For example, let's say that you're trying to project next year's monthly sales from last year's. Your goal is to do about 20-
percent better next year, so you end up with a row of calculations like this: Al*.20, Bl*.20, Cl*.20, Dl*.20, and so on for 12 months.

This looks like a reasonable way to deal with the problem, but it isn’t. Finding the underlying assumption used to calculate each cell value later will be time-consuming, and changing it will require the same amount of work all over again. Instead, create a section of the worksheet for assumptions. Create two cells, one containing a label that says “Projected Sales Increase (in percent)” and the other containing the .20 (20 percent) increase you anticipate. Your row of sales figures now uses the value of this cell instead of the fixed .20 you entered previously. That way, you can raise or lower your growth estimates (or make them negative!) simply by entering one number.

Here is some basic advice to consider:

• Separate assumptions from data and calculations so that the assumptions are clearly defined and easy to change.

• Separate input from the rest of the worksheet so that a user can go to one place to enter all the information needed to compile the results.

• Keep calculations separate from assumptions, data, and output; otherwise it’s difficult to check their integrity.

• Use modular worksheets, which make maintenance, testing, and modification chores easier.

Check It Out

It’s vital to build cross-checking in to your work and to make sure that nothing invalidates those cross-checks. What exactly is a cross-check? Let’s say that you have monthly figures across the columns and several expense items down the rows. You want a total of monthly expenses and a total yearly expense value. So, spreadsheet whiz that you are, you use the SUM function to quickly add the values in each column and put a number at the bottom of each column. You may even sum across the months for each expense item and then sum the yearly expenses to create one grand total. So far, so good.

But if you don’t put in a cross-check to validate that grand total, you’re asking for trouble. To create the grand total, you need only one set of figures — either the expenses sums or the monthly sums. You should have used both. I generally put a second cell immediately to the right of grand-total values that calculates the sum a second way. If the numbers are different, then I know that one of my subtotal calculations is wrong and I can immediately start looking for the error. If a sum can be calculated in more than one way, use that second calculation as a cross-check.

But you’re still not quite there. Usually I see worksheets with the sum butted right up against the row or column of figures it summarizes. What happens if you have to add a new row or column? If you do it within the block of cells, you’ll probably be OK (assuming you used a range calculation — as in SUM(A1:A32) — inserting a new row anywhere between rows...
The more you're likely to use a worksheet, the more planning you need to do before you even launch the spreadsheet program.

1 and 32 updates the range calculation automatically in every spreadsheet). But if you insert the new row or column anywhere else, you may be in trouble. Thus, when I build a block with summary calculations, I like to leave one or more empty rows or columns at the end of the block and include them in the sum calculation. Cross-checking helps verify that the inserted row or column is being handled correctly.

Check It Again
It's surprising how many people believe that spreadsheet programs are perfect. They put calculations throughout their worksheets and never bother to check any of them manually. The truth of it is that spreadsheet programs are almost perfect: You should get exactly what you expect when you use one to calculate a value. The problem is a human one. You aren't always perfect.

Let's say that you've got a worksheet that calculates a whole bunch of state-tax values. Because you're dealing with dollars and cents, you ask the spreadsheet program to round each value to two places after the decimal point. However, if you also have a calculation that sums all these rounded values, you're going to be in for a surprise: The spreadsheet program will use the actual values in the summation but will display rounded values, so the sum may not exactly match the numbers being summed! Had you checked your work with a calculator, you might have uncovered this problem. In this example, we're dealing with only a few cents, but this sort of problem has a way of sneaking into important work that deals with significant values. Any time you instruct a spreadsheet program to round the displayed values or limit the number of digits shown, you need to take extra care to check its work. And sometimes you just plain make mistakes, such as assuming that you included something in a SUM function when you didn't.

You should have to check a worksheet manually only once, but make sure you do it with realistic values. I often put annotations at the top of worksheets or progress that say "unchecked" so that I know that I shouldn't start using them yet.

Be Organized
You should try not to have calculations that skip around within a worksheet. You can usually tell if a worksheet is well designed simply by viewing the formulas used. If you see calculation ranges such as SUM(A1:A32), then you're looking at a worksheet that was carefully considered before it was distributed. However, if you see formulas that look like this: SUM((A1:A12)+(A15)+(A17:A32)), then the chances are that the person who designed it wasn't thinking in logical groupings. Is there really a valid reason why the summation skips cells A13, A14, and A16? Do those cells even relate to the other things in that column?

This is not to say that everything has to be perfectly arranged in blocks, but it sure helps if the majority of your work is well organized. Think about it for a second. You probably wouldn't trust a worksheet that had the months of the year arranged across the top of a spreadsheet like this: March, January, September, November, and so on. If you've got formulas that jump around as much as this goofy calendar, you're probably making the chore of programming your worksheet more difficult than it has to be. And you're certainly going to have a rough time building cross-checks and isolating input from output.

Keep Reading
I've described some simple rules that can help focus your mind as you begin to create a worksheet. If you'd like to know more, check out these books: Ledin and Ledin's The Programmer's Book of Rules (New York: Van Nostrand Reinhold, 1979) has nothing to do with spreadsheets, but it is an excellent introduction to organizing your thoughts and ideas and putting them into action. Nevison's The Elements of Spreadsheet Design (New York: Brady, 1987) goes into much more depth than I can cover here. Take a quick browse through your local library or bookstore, and you'll find dozens more books that will help you make great worksheets.

Then Hogan is software evangelist at GO Corp. He hopes to reprint this column in PanUser in the near future.
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Excel

Pressing the Command key while selecting cells is the usual way to make multiple noncontiguous selections in Excel. However, this can be a nuisance (not to mention a strain on your finger!) if you have many items to select. Instead, simply press Shift-F8 once, and Excel goes into the Add mode, letting you click or click and drag anywhere to add to your selection. Pressing F8 once takes you into the Extend mode and lets you make contiguous selections without having to hold down the Shift key.

Tod E. Gentille
Redondo Beach, CA

PageMaker 3.0 and 4.0

Here's a fast way to realign the zero point on the grid to its default position at the upper left of nonfacing pages and the upper center of facing pages: Choose Page Setup from the File menu, and click on OK without entering any changes in the dialog box. The zero point instantly resets to its default.

Bill Planey
Fort Worth, TX

QuarkXPress 3.0

Here's a tip that can revolutionize how you zoom in on parts of a document for better viewing: Select the Item tool, and move the cursor to the area of the document you want to fill the screen. With the mouse button down, press Control-Option-Command and draw a box around the area. When you release the mouse, the boxed area will enlarge as needed and will be centered on your screen.

Kurt Holdorf
Littleton, CO

Macs and Cats

Our cat, Cairo, has chewed up every cable connected to my Mac'slex, monitor, laser printer, modem, and surge protector as well as all my power cords. After emerging from under the desk, Cairo would often have a seizure (we think he was giving himself electroshock therapy).

I solved this problem by buying 20 feet of flexible plastic tubing about 1.5 inches in diameter. I cut the tubing to the correct lengths for each cable and fished the cables through each one. The diameter of the tubing was large enough to contain the cables, and Cairo couldn't chew through it. Here's how to create a 11-inch ruler with .25-inch increments:

1. In your open document, choose Page View (Command-B) and repeat a Return at the top of the page on which you want the ruler to appear. Select the new first line. Open Word's ruler (Command-R), and click on the flush-right, single-spaced, and paragraph-spacing icons. From the Document menu, choose the Insert Table command. Specify a one-column 44-row table with columns that are .22-inch wide. Click on the Format button, choose Borders, and add borders on all except the left side. Click on OK.

2. Open the Character dialog box (Command-D), and select a 10-point font that is subscribed by 2 points and condensed by 1.5 points.

3. Open the Paragraph dialog box (Command-M), and set the line spacing to -.24 inch (make sure you specify a minus sign). Click on the Position button. For the Horizontal setting, select Left and Page. For Vertical, select Top and Page. This positions the ruler in the margin so it doesn't interfere with the text. Click on OK, and close the Paragraph dialog box.

4. Number every fourth cell of the table from 1 to 11, and you have your ruler.

Keep a copy of the ruler in the Scrapbook (or as a Glossary item), so you can paste it wherever you need it. You'll probably want to cut it after you've finished with it — otherwise it takes up space in galley view (the standard document-viewing mode). To cut the ruler, switch to galley view (Command-B toggles between Page and Galley View), and delete both the ruler and the empty line above it.

Robert Fraser
Chandler, AZ

Tip 4.0

Word's ruler lets you know precisely where you are horizontally on the page, but you may want to see the exact position of text and graphics vertically too. You can create a vertical ruler on any page by inserting a narrow one-column table on the left side of any page (see Figure A). Here's how to create an 11-inch ruler with .25-inch increments:

1. In your open document, choose Page View (Command-B) and enter a Return at the top of the page on which you want the ruler to appear. Select the new first line. Open Word's ruler (Command-R), and click on the flush-right, single-spaced, and paragraph-spacing icons. From the Document menu, choose the Insert Table command. Specify a one-column 44-row table with columns that are .22-inch wide. Click on the Format button, choose Borders, and add borders on all except the left side. Click on OK.

2. Open the Character dialog box (Command-D), and select a 10-point font that is subscribed by 2 points and condensed by 1.5 points.

3. Open the Paragraph dialog box (Command-M), and set the line spacing to -.24 inch (make sure you specify a minus sign). Click on the Position button. For the Horizontal setting, select Left and Page. For Vertical, select Top and Page. This positions the ruler in the margin so it doesn't interfere with the text. Click on OK, and close the Paragraph dialog box.

4. Number every fourth cell of the table from 1 to 11, and you have your ruler.

Figure A: DTP programs have vertical rulers, so why not word processors? Microsoft Word 4.0's Table function lets you create a narrow rule you can place inside your document's left-hand margin.
enough for all except the monito-r-cable connectors. To handle these, I simply slit the tubing lengthwise and then taped it back together.

Al Frank
Edina, MN

Scanners

Scanning text that is 12- point or smaller can cause problems, especially when you're using a font such as Times that has thin stems. Even if you scan at 400 dots per inch, the thin stems tend to break up and, in many cases, disappear. If you use a scanner to do OCR (optical character recognition) work, you may find that the text reproduces so badly that it's unreadable by the OCR program.

However, you can dramatically improve the quality of OCR scans by putting a piece of red rubylith over the pages to be scanned (rubylith, available from art-supply stores, is transparent plastic film). This approach often works better than using the scanning software's Darken command (if it has one). This technique works with both flatbed and hand-held scanners.

Danny Wong
Toronto, Ontario
Canada

Microsoft Works 2.0

If you want to create layouts with multiple columns of text in Microsoft Works 2.0, you have to use the Draw mode to create the columns. Unfortunately, you can't produce good-looking justified text in this mode, because the last line of each paragraph will also be justified, even if it contains only two words (see Figure 1). To get around this, use the following technique after you've finished editing the text and have placed the columns in the document:

1. Go to the last line of each paragraph, and completely fill the space between the last word of the paragraph and the right margin with xs (or any other character you want).
2. Select the xs, and choose White from the Color - Black Dots submenu, on the Format menu. This makes the row of xs invisible on a white background. The columns now print flawlessly.

Tim Howard
Indianapolis, IN

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On Beyond MiniFinders
If the 1,000 MiniFinders featured in this issue of MacUser only whet your appetite for more, then check out the Zmac Buyer’s Guide database. This comprehensive 3,000-product database incorporates MiniFinders plus information gleaned from MacWEEK to help you make crucial buying decisions. The Zmac Buyer’s Guide is available as an interactive on-line database (type GO ZMC:GUIDE) or as a downloadable text file. The tab-delimited text file is suitable for importing into several popular database templates or into a HyperCard stack, all of which are also available on-line. To download the full 3,000-product Buyer’s Guide, type GO ZMC:DOWNLOAD and locate the file BUYER.TXT in Library 7 (Reference). If you want to look up only a specific category of Mac product, such as hard-disk drives, search for the keyword BUYER to locate the available subcategories. A special MiniFinders format of the text file gives you only the products that MacUser has reviewed and rated.

PostScript-Font Catalog Now On-Line
Shareware display fonts have cleaned up their collective act recently with a spate of ATM-compatible Type 1 PostScript fonts. We screened 200 shareware typefaces and came up with the top 50 Type 1 fonts. We’ve assembled the Shareware Font Catalog so that you can preview what the fonts look like before paying for connect time to download them. Most of these fonts are free or require a shareware fee of less than $15. Get the Shareware Font Catalog in Library 4 (Fonts) of the Download & Support Forum on Zmac. (Type GO ZMC:DOWNLOAD.) The filename is FNTCAT.SIT.

Also in This Issue
To learn more about the Byzantine commands and pathnames in the Internet maze (mentioned in Owen W. Linzmayer’s Power Techniques article “How to Get On-Line Support” in this issue), you can download the Hitchhiker’s Guide to the Internet. This text file details the intricacies of the world’s densest telecommunications service. The filename is HHIKER.SEA, and it’s in Library 7 (Reference) of the Download & Support Forum.

How to Join Zmac
Here’s how you can get access to Zmac:
1. If you’re a CompuServe (CIS) user, just type GO ZMAC at any prompt.
2. If you’re not a CIS subscriber, you can sign up for Zmac by following these directions:
   1. Call (800) 635-6225 (voice) to find your local access number.
   2. Set up your modem and telecommunications software with the following standard Mac settings:
      8 bits, one stop, and no parity.
   3. Dial your local access number. When connected, press Return. You’ll see the following prompts on-screen. Your responses are printed in boldface-type.
   HoDt Name: CIS
   User ID: 177080,5200
   Password: Z*MAC
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   4. You will then be prompted for additional information, including a credit-card number for billing purposes. If you cannot bill a credit card, call the CompuServe customer-support line listed below. Sign-up is free, but normal access time is billed at $12.50 per hour.
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Questions, anyone? Here's where to get answers from the experts. Bob LeVitus is the author of the best-selling Dr. Macintosh. Andy Ihnatko isn't. But he knows a lot about the Mac, and he's got a heck of an attitude. Together, they're ready to answer your questions about everything Macintosh.

Write to Help Folder, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

Don't want to wait for an answer? Post your question on Zmac, MacUser's on-line service, and get a reply from Bob, Andy, or one of the other MacUser experts. See the masthead in this issue for instructions on how to sign up.

By Bob LeVitus and Andy Ihnatko

What's ResEdit?

Q. You often mention ResEdit. What is it? Who makes it? Where can I get it?

Bob: ResEdit is Apple Computer's resource-editing software. Resources, which are stored in an application's resource fork, are computer code that makes up elements of a program; windows, icons, menus, and pictures are all examples of what is stored in resources. ResEdit lets you manipulate resources to customize applications, add Fkeys, and so on. Figure 1, for example, shows how you can use ResEdit to change the pattern in a window's scroll bars. (For more on ResEdit, see "Return to ResEdit."

By Bob LeVitus and Andy Ihnatko

Who ever said there was such a thing as a stupid question? OK, my chem professor did, but he said it only to me. The only stupid question is the question you don't ask. Here at Help Folder, we don't care how simple you think your question is . . . just send it in! (However, if it's such a simple question that you're embarrassed to even ask it, we'll conceal your identity by crediting the question to a famous cold-cuts manufacturer.)

Q. I recently purchased a Mac IIci, and I've noticed that you no longer get the little yellow plastic disk-facsimile packaged in the internal floppy drive. This may not be an earth-shattering question, but when shipping a Mac, is it a good idea to put a floppy disk—either a real one or the yellow plastic doohickey—into the drive for protection, or might this hurt the drive?

Bob: Here's what Apple's Worldwide Peripherals Product Marketing department had to say on this one: "Since the introduction of the 1.4-megabyte drive (known as the SuperDrive), we no longer ship floppy drives with the yellow plastic doohickey, because the drives have been improved with an antistrip mechanism that keeps the heads steady. As far as how to transport the CPU and drives, it's best to do what Apple does: no floppy disk, no plastic doohickey, no nothing."

That's it—straight from the horse's mouth. Bottom line: If you have a SuperDrive, you don't need the doohickey; if you have an 800K drive, you do.

Figure 1: ResEdit lets you tweak programs and customize a program's interface. In this example, ResEdit is used to open the System file's PATs resource, which contains the scroll-bar pattern. By manipulating this resource, you can create a new pattern.
on-disk. The first, published by BMUG, is \textit{Zen and the Art of Resource Editing} ($20 for nonmembers, $15 for members). This book is an excellent introduction: It's short and well written and will get you started with ResEdit quite nicely. You should also take a look at \textit{ResEdit Complete} ($29.95), published by Addison-Wesley. It's more thorough, more technical, and more expensive than the BMUG book.

Andy: Just as Sumo wrestlers traditionally purify the wrestling ring before every match, by ancient and honorable tradition, we Mac writers always accompany every mention of ResEdit with the following warning: Fooling around with ResEdit can be dangerous business. Picture Yosemite Sam stumbling into a dark room, lighting a match, and discovering he's surrounded by gunpowder kegs... get the idea? When you tinker with resources, always work on a copy of a program and not on the original program. That said, I encourage all Macintosh owners to get ResEdit and start playing. There is no better path to being named Jedi Artichoke of the office/lab/campus than to be seen using a copy of ResEdit with confidence and recklessness — and success.

\textbf{WYSIWYG or DizzyWYG?}  
\textbf{Q.} Are all Mac Pluses alike? \textbf{WYSIWYG} (what you see is what you get) performance? I use Word 4.0 to compose and lay out a newsletter on the Plus (with ATM) in my office. I then save the newsletter on a floppy and walk it over to another Plus (without ATM) that's connected to a laser printer. When I print, I discover that the page layout has changed — the columns have shifted, and there is more "room" at the end of the document. I suspected that ATM was the culprit, so I turned it off on my machine,
rebooted, checked the format of the document, and still encountered the problem on the other machine when I tried to print. What’s going on here?

Jim Joska
Sacramento, CA

Andy: I’m willing to bet that the problem lies with your printer drivers. Make sure that you have the LaserWriter driver installed in the System Folder on the Mac you’re using to create the document and that you’ve selected it in the Chooser before you start working. You tell a Mac application about the sort of paper you’re using in the Page Setup box, which can change depending on which printer driver you’ve selected in the Chooser.

If, for example, you’ve selected the ImageWriter driver, your Word document is laid out based on the paper size you’ve selected in the ImageWriter’s Page Setup dialog box and also on which areas of the page the ImageWriter’s print head can actually move to and print on (the “maximum imageable area” of the page). When you carry the disk to the LaserWriter’s Plus, Word jiggers all the page elements around to fit the LaserWriter’s page setup, and shazam! — you get messed-up formatting and frayed nerves.

Also, make sure that the individual settings within the two LaserWriter Page Setup dialog boxes match; it’s possible to give the LaserWriter a larger print area, and failure to match this setting on your personal Mac will probably lead to more of the same problems.

MacroMaker Broke
Q. I have a Mac II with System 6.0, on which I have used Microsoft Excel 1.5 and Apple’s MacroMaker 1.0.1 without any problems.

As soon as I started using Excel 2.2, however, I discovered that MacroMaker 1.0.1 wouldn’t work anymore. Will upgrading to System 7.0 solve my problems, or is there an updated version of MacroMaker I can use?

Carlos Sanders
Lomita, CA

Bob: First, according to Microsoft tech support, there is an incompatibility between MacroMaker 1.0.1 and Excel 2.2. You need MacroMaker 1.0.2, which is included with System-software versions 6.0.5 and 6.0.7. MacroMaker 1.0.2 should work properly.

Next, you probably should not be using System 6.0 — it has several known bugs. Upgrade to System 6.0.5 or later as soon as you can.

Finally, System 7.0 will definitely not solve your problems; in fact, it could make them worse. MacroMaker 1.0.2 doesn’t work with System 7.0, and Apple is no longer supporting it. So if you’re planning to upgrade to System 7.0 and want MacroMaker-like abilities, you’ll need to buy a third-party macro program. I recommend QuicKeys 2, from CE Software, or Tempo II Plus (see Figure 2), from Affinity Microsystems, both of which should have System 7.0-compatible versions available by the time you read this.

Even if you plan to continue using System 6.x, you might want to investigate QuicKeys 2 or Tempo II Plus. Each is significantly more powerful than MacroMaker.

Andy: A third-party macro package is really de rigueur. The only thing MacroMaker’s useful for is seeking an answer to the legendary philosophical question “Was MacroMaker written to make all Microsoft programs crash, or are all Microsoft programs written to make MacroMaker crash?” Very Zen.

Ghosting and Cracking Laser Type
Q. When we print on letterhead paper and envelopes with our laser printer, the type ghosts and cracks. Once a letter has
gone through the printer and has been run through the postage machine, there is a ghost image of the middle part of the letter on the bottom of the page. Because the bottom third is folded to come in contact with the middle third, we suspect that the pressure from the postage machine makes the type rub off. On envelopes, the type cracks and flakes off by the time a letter arrives at its destination.

We've tried many different kinds of paper — some specially made for laser printers — but the problem still occurs. Is there special toner that reduces this problem, or will we just have to use cheap-looking, copier-type paper for all our work?

Mike Norris
Danville, KY

Bob: First, go to an artist's supply store and buy a can of spray-on fixative. It's what artists spray on drawings and sketches to keep them from smearing. Not surprisingly, it's perfect for preventing laser-printer toner from smearing. Hold the can as far away from the paper as you can to spray a very light coating on letters and envelopes. This should solve most of your problems. Then experiment to find the kind of paper that works best for you. As you say, some kinds of paper are better than others. Once you've decided which kind does the trick, have your next batch of letterhead and envelopes printed on it.

Andy: Now that laser printers are a certified fixture of the '90s office, lots of paper manufacturers are scrambling to produce quality papers that won't cause trouble with machinery (for some suggestions, see "The Paper Trail," March '91, page 181). It may take some time on the phone with your office-supplies rep, but I'm sure you'll be able to find a laser-studio paper stock that fits with your corporate image.

You might also consider using a heavier typeface. I'm told that, depending on the paper, type with thicker stems may have less ghosting.

Application Out to Lunch?

Q. I've got a Mac Plus, 2.5 megabytes of RAM, and a 60-megabyte external hard-disk drive. Two days ago, for no apparent reason, everything came to a grinding halt. The symptoms:

• When I try to open a document from the desktop, I
get an error message that tells me the application is "busy or missing" — even if it's not. I can open documents only if the application is by itself on the desktop and not in a folder.

• It takes forever (or close to it) to copy files from a floppy onto my hard disk. At times it almost seems as though the screen has frozen.

• It takes at least five minutes to open the System Folder.

Here's some information you might find useful: I've recently added quite a few PostScript fonts to my collection, and my System Folder is filled to the brim with printer-font files (the screen fonts, incidentally, are managed by Suitcase II). Could this affect overall performance? Am I headed for a complete crash? Please help.

Marcy Poulos
Sparta, MI

Bob: The "application busy or missing" syndrome is a common symptom of a damaged desktop file (see Figure 3). The desktop is an invisible file (meaning that you can't see or modify it without special tools) on every Mac disk. It contains important information for the Finder about the files on that disk.

The solution: Rebuild the desktop file. This is easy to do: just hold down the Command and Option keys while starting up your Mac. You'll see a dialog box that asks if you're sure you want to rebuild the desktop. Click on OK (this technique works under both System 6.x and System 7.0). If you run System 6.x under the Finder (not MultiFinder), you can also rebuild the desktop by holding down the Command and Option keys when you quit any application. You'll see the same dialog box, and the results are exactly the same as with the previous technique. When you rebuild the desktop, your Mac will spin and whir for a while, but when it's finished, your problems should be over.

Your other problems are also symptoms of a desktop that needs rebuilding — copying files takes a long time, and folders containing lots of files (such as the System Folder) take forever to open. The reason for this is that the invisible desktop file isn't a very good housekeeper. It usually retains information about files that have long since been deleted. This excess information makes the invisible desktop file swell to gargantuan proportions. Unfortunately, the larger your desktop file, the slower things such as file copying and folder opening go. Also, swollen desktop files are more likely to become corrupted, leading to disks that won't mount and — yes — to system crashes.

For years I've advised my friends to rebuild their desktops every month or two. Apple used to recommend that you do it once a year, which I didn't think was often enough. Apple seems to have changed its tune, though — the System 7.0 documentation recommends rebuilding it once a month or every other month.

Besides rebuilding your desktop, here's something else you should do just to be on the safe side: Scan your system for viruses, and make sure that you have some sort of virus protection installed.

By the way, did you know that Suitcase II allows you to place those printer-font files in well as Directory Assistance, a time-saving shortcut to opening and creating folders.

So visit your dealer and pick up a copy of Norton Utilities for the Macintosh. Or call 1-800-343-4714, Ext. 731F for more information.

Because you really do have a lot to lose.
any folder you like? As long as the printer fonts and the screen fonts are stored in the same folder, they'll work fine.

**Andy:** One of the reasons this desktop business is so wretchedly inefficient is that the original desktop file was designed to deal with several dozen files per volume, rather than the several hundred we deal with today. One trick for getting around this is to find a friend who has the AppleShare server software and beg, borrow, or steal a copy of Apple's Desktop Manager INIT. This INIT replaces the Finder's normal mechanism for managing the desktop with a more efficient and faster mechanism (for more on the Desktop Manager, see "Net Prophet," April '90, page 275).

Finally, you could consider partitioning your disk. My 85-megabyte drive's performance picked up noticeably when I put the System Folder, my applications, and my documents into their own individual partitions. Because each partition has its own desktop file, you'll avoid the commonplace Too Many Files problem.

**Bob:** For what it's worth, System 7.0 has the Desktop Manager built in to it and is much better than earlier versions of the System software when dealing with disks containing thousands of files and folders.

**Watching the Connectives**

Q. I've got three questions I can't seem to find any answer to. Could you give them a shot?

1. Can you add an ADB (Apple Desktop Bus) port to a Mac Plus?

2. Does any company manufacture an interface that lets a DAT machine function as a hard-drive-backup device?

3. Does anyone make a universal AppleTalk box that lets devices that normally communicate with the Mac's serial ports function in a network environment (specifically, using a MIDI interface)?

It seems as if I'm having trouble connecting.

David Reichert
Spring Valley, NY

**Andy:** 1. No, you can't add an ADB port to a Plus.

2. Yes and no, but more no than yes. The fact is, the guts of a DAT player and a DAT backup device (or of a CD player and a CD-ROM drive) are indeed practically identical. The reason the latter can't be used as the former is that most designers didn't think that the average audiophile shopping for stereo equipment would want an industry-standard SCSI (small computer system interface) port, which is what you'd need in order to get these players working with a Mac. Out of the box, there's no way to get raw, digital information (not the "music" but the data that represents it on the tape or disc) out of the drive and into the Mac, so, if you're hoping to make all that high-priced audio gear tax-deductible as a legitimate business expense, you'll have to claim it as a dependent.

Looking on the bright side, almost all DAT recorders (and some of the obscenely expensive CD players) have real digital connectors for making digitally perfect copies of digital recordings. If some enterprising company were to...
determine that there’s a market for a DAT-to-SCSI/Mac interface box, it wouldn’t be an insurmountably difficult project to complete. I don’t know of any company actually working on such a device, but it’s not impossible.

3. And on to the universal-AppleTalk-box question. Finally, something I can answer with a yes! The NetSerial, made by Shiva, does exactly what you want. You plug the serial device (for example, a label printer) into NetSerial and NetSerial into your AppleTalk network, and you’re in business. Now any Macintosh on the net can use the serial device simply by accessing it through the Chooser (to do so, each Mac has to have the NetSerial cdev installed). Other than that, operation is transparent. We have a couple of NetSerials installed at the Boston Computer Society/Mac office, and they work great.

Get in Touch
Q. Through which on-line services can I contact you? 
Lance Chun
via GEnie
Bob: I’m on GEnie (R.LEVITUS), America Online (LEVITUS), and Zmac (76004,2076). See the masthead in this issue for instructions on how to sign up for Zmac. I check my mail on these several times a week.

Andy: You can reach me on Zmac (72511,204). I’m not on GEnie or America Online, but I use local bulletin-board services such as the Graphics Factory (617) 849-0347 and the Boston Computer Society’s BBS (617) 625-6747.

Separator Anxiety
Q. In “19 Ways to Customize Word” (September ’90, page 302), Craig Danuloff explains that the Separator entry that comes at the end of Word 4.0’s Commands dialog box is used to add dimmed lines to custom menus.
I want to add a separator in the File menu between Quit and ‘Fast Save Enabled, but every time I try, I get a separator at the end of the menu instead. Is there any way you can control where a separator is placed in a Word 4.0 menu?

Jay Lechtman
Reisterstown, MD

Andy: Unfortunately, you can add a separator only to the very end of a menu; you can’t tell Word to stick one between X and Y. To do that, you need to delete all the menu items that you want to put under the separator; add the separator; and replace the menu items one by one, using the Append radio button before clicking on Add. Using Append ensures that the menu items go exactly in the order you specify rather than conforming to the whimsical ideas of certain corporate software junta.

Bob: In defense of the corporate software junta in question, it should be noted that Microsoft is the only publisher that provides a mechanism for adding and deleting commands from your word processor’s menus. It may not be pretty, but it’s certainly a good feature.

Andy: Good point. Just be happy Microsoft doesn’t design cars. “I’m sorry, officer, my husband must have edited the Buick Settings file this morning. Yesterday that pedal was for the brakes!”

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<td>4SR SyQuest, one cart</td>
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<td>OptiDisk™ 1000 Fiber Optic Drive</td>
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The 4SR uses SyQuest cartridges, available as single, combo or dual removables.

OptiDisk™ 600—the least expensive way to store your data.

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*Low power internal drives that meet Classic, Hiz & LC power specs.

Seagate MacWren Drives

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<td>$3490</td>
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*Highest capacity internal drives for Mac ev. ci. SE and SEII. These also work in the II and II+.

UltraCombo and DAT

Combs are excellent choices for network users or for use in graphics, pre-press or CAD applications, where storage and workable hard drive space is imperative.

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<td>2000/100DAT</td>
<td>$7290</td>
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Over 30 combinations available.

Macworld finds our drives quietest.

"The quietest of the 64 drives tested...fast—three of the twelve tested were "Third Wave"...and finally, a good bargain." —Macworld, March 1991.

XAPSHOT brings 24 bit images to the Mac.

Take a look at the new XAPSHOT still video camera from Canon.

XAPSHOT allows you to import high quality still video images to your MAC using a frame grabber. It stores up to 30 images on 2" diskettes and can be connected to your TV for previewing. Great for video, slide graphics and point work.

**From $429**

**XAPSHOT Bundle—24 bit frame grabber**

**749**

**2" Video diskette**

**10**

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| (10 mb) w/40mb Maxtor | 815
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*Remove SIMMs & drive from Hsi, install in Classic.

**LC 16MHz FPU, VRAM SIMM and 2 mb SIMM now available.**

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Third Wave, an environmentally conscious company, manufactures a full line of 1 and 2 mb SIMMs without releasing harmful CFCS into the atmosphere. Call for manufacturer direct prices on SIMMs for all Macs, NTX printers, 1BM (1x9, 4x8) and PS/2 and NIPPs.

**LC VRAM**

$145

**LC 16MHz FPU**

$19

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<thead>
<tr>
<th>Affordable Macintosh Systems</th>
<th>Solutions that Make Sense...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac LC System</td>
<td>PRICECOUNTERS</td>
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<tr>
<td>Macintosh LC CPU, 40Mb hard drive, 2Mb RAM, Standard keyboard, Apple 12&quot; RGB color monitor</td>
<td>Seiko Color monitor</td>
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<tr>
<td>Your Price: $2285</td>
<td>NEC Silentwriter M.90 $1599</td>
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<tr>
<td>Mac IIci System</td>
<td>TI Microlaser PS17 $1299</td>
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<tr>
<td>Macintosh II ci CPU, 1/3 H $215</td>
<td>Quantum 40Mb Ext. $315</td>
</tr>
<tr>
<td>Mac Pro Extended keyboard, Seiko Signia 15&quot; FPD Monitor $861</td>
<td>Express Modem 9600 $757</td>
</tr>
<tr>
<td>Your Price: $4955</td>
<td>Micron 128K Cache CI $310</td>
</tr>
<tr>
<td>Mac III System</td>
<td>Seiko Signia 15&quot; FPD Monitor $861</td>
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<td>Macintosh III CPU, 1/3 H $215</td>
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</tr>
</tbody>
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Macintosh II ci CPU, 1/3 H $215
Mac Pro Extended keyboard, Seiko Signia 15" FPD Monitor $861
Your Price: $4955

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RastorOps 24L $739
RastorOps 24SE $599
RastorOps 24DV $332
RastorOps 24CSV $299
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Radius Pivot $797
Radius Printer $797
Radius Printer $825
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Over 5000 Products Call $930

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Zoom 2400 v.42 Modem $49
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Zoom 2400 Modem $95
With Cable and Software
Waxom 6v9 $509
Waxom 12v12 $759
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### Accelerators

<table>
<thead>
<tr>
<th>Model</th>
<th>Price ($)</th>
</tr>
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<tbody>
<tr>
<td>Fast Cache iici</td>
<td>$269</td>
</tr>
<tr>
<td>40 MHz PowerCache iici</td>
<td>$895</td>
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<tr>
<td>25 MHz PowerCard</td>
<td>$995</td>
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<tr>
<td>33, 40 &amp; 50 MHz PowerCard</td>
<td>$37/mo*</td>
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<tr>
<td>SCSI PowerCard (0 Meg)</td>
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<tr>
<td>I'R 32K iici Cache Card</td>
<td></td>
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<tr>
<td>PLI QuickSCSI Card</td>
<td></td>
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<tr>
<td>Sigma DoubleUp Data Compression Card</td>
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<tr>
<td>Mac SE, Plus, Classic</td>
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### Scanners

<table>
<thead>
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<th>Scanner</th>
<th>Price ($)</th>
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<tr>
<td>Caere TYPIST</td>
<td>$465</td>
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<tr>
<td>Epson ES-300C</td>
<td>$1649</td>
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<tr>
<td>Microtek 600ZS</td>
<td>$1645</td>
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<tr>
<td>UMax UG80 (256 Grey Scale)</td>
<td>$995</td>
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<tr>
<td>OmniPage</td>
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<tr>
<td>Chinon</td>
<td>$569</td>
</tr>
<tr>
<td>NEC Portable New!</td>
<td>Call!</td>
</tr>
<tr>
<td>PLI (Sony)</td>
<td>$695</td>
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<tr>
<td>Toshiba</td>
<td>$695</td>
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### Monitors

<table>
<thead>
<tr>
<th>Monitor</th>
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<tbody>
<tr>
<td>E-Machines T16</td>
<td>$70/mo*</td>
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<tr>
<td>E-Machines TX16</td>
<td>$96/mo*</td>
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<tr>
<td>Ikegami CT20&quot; Trinitron</td>
<td>$2565</td>
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<tr>
<td>MegaGraphics Rival 19&quot;</td>
<td>$1095</td>
</tr>
<tr>
<td>RasterOps Systems</td>
<td>Call!</td>
</tr>
<tr>
<td>Seiko 14&quot; &amp; RasterOps 245</td>
<td>$979</td>
</tr>
<tr>
<td>Sigma L-View Multimode</td>
<td>$1349</td>
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<tr>
<td>SuperMac Systems</td>
<td>Call!</td>
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### Data Modems

<table>
<thead>
<tr>
<th>Modem</th>
<th>Price ($)</th>
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<tr>
<td>Challenger VP2400</td>
<td>$75</td>
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<tr>
<td>Hayes Ultra 9600</td>
<td>$675</td>
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<td>Zoom VP2400 V.42 bis</td>
<td>$175</td>
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<tr>
<td>Practical Peripherals 9600SA</td>
<td>$499</td>
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<tr>
<td>US Robotics 14.4 V.32 bis</td>
<td>$695</td>
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### CD ROM

<table>
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<tr>
<td>Abaton Scan 300/Color</td>
<td>$995</td>
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### OPTICAL CARTRIDGES

<table>
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<tr>
<th>Cartridge Type</th>
<th>Price ($)</th>
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<tr>
<td>512K &amp; 1024K</td>
<td>$125</td>
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</table>

### Macintosh Systems

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  - Buys and Sells
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- ARTICULATE SYSTEMS: $185
- VOICE LINK: $549
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- **QMS PS410 SPECIAL** $70/mo
- **QMS 815, 825** $1895
- **CalComp Colormaster Plus** Cal!
- **Kodak Diconix Color 4** Cal!
- **QMS 815, 825 SPECIAL** $70/mo $1895

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**TI microLaser**

- **PS17** $47/mo $1265
  - MacUser #1 Personal Printer
- **PS35** $58/mo $1565

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**TI microLaser XL**

- **PS17** $90/mo $2425
- **PS35** $100/mo $2725

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- **DoveFax** $275
- **DoveFax Plus** $359
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  - **9600M Plus** $599
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$49

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- Endlink 1.1.3
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- Banner Mania 34
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- Will Maker 4.0
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- MacFlow 3.1.5
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40 MB
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- Type Library (vol-1200)
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- AutoD eros
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- Freeware 3.0
- PageMaker 4.0
- PrePrint 1.0
- Persuasion 2.0
- Personal Press
- Canvas 2.1 w/free upgrade
- Certificate Maker 2.0
- Claris CD 2.0
- ColorStudio 1.0
- Delta Graph 1.1
- Dreams 1.1
- Enhance v.1.03
- Fast Track Schedule
- FilmMaker

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- Polarized Monitor Filter
- Cables all Types
- Curtis MVP Mouse ADB
- Database 101 Keyboards
- Simultie 1 LEC
- SimCity Superiors 12C
- SimEarth
- Stratego
- Talking Math Rabbit 2.2
- Taster 102 E
- Traqtor
- The Playroom
- Videl.
- Wellness

### MUSIC
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- Encore
- Passport MIDI Interface
- Master Tracks Pro 4.5

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- Data Club Three Pack 289
- imacwriter

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- 4. 3.5 SUPERDRIVE
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- Quick Keys 2
- S.A.M. Anti-virus 3.0
- S.U. Utili 4.0
- Stepping Out II
- Stuff it Deluxe 20
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- Super Glue 74
- System 7
- Vantage 1.3
- View 96

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- Microphone III 19.0 207
- PhoneNet Connector 189
- DB-9 or DIN-8 30
- SupraModern 2400 29
- SupraModern MacPac 189
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- TOPS working Board 13.0 83
- TOPS Telecommunicators DB-9 or DIN-9 20
- Versatran 139
- Versatran v3.5 163
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<tr>
<th>Drive</th>
<th>Internal</th>
<th>External</th>
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<tbody>
<tr>
<td>40PRO</td>
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<td>$289</td>
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<td>52LPS</td>
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<td>105PRO</td>
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**Maxtor**

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**Seagate**

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<tr>
<td>30Mb</td>
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**MICROPOLIS**

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<tr>
<td>600Mb</td>
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</tr>
<tr>
<td>1.2Gig</td>
<td>$2399</td>
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</table>

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<table>
<thead>
<tr>
<th>Additional cartridges only $66!</th>
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<table>
<thead>
<tr>
<th>Drive</th>
<th>Internal</th>
<th>External</th>
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<tr>
<td>1Mb</td>
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<tr>
<td>2Mb</td>
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**Texas Instruments Printers**

<table>
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<th>Price</th>
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<tr>
<td>Microlaser PS17</td>
<td>$1279</td>
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<td>Microlaser PS35</td>
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<td>Microlaser XLP517</td>
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**MICROWRIGHTS**

<table>
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</tr>
<tr>
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<td></td>
</tr>
</tbody>
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Hypernet Din 8 Connectors ... 27
Hypernet DB-9 Connectors ... 27
Hypernet Connectors 10-Pac 185
Farallon Cable Kits ........... Call
We only sell names you can trust: RasterOps, Microtek, Texas Instruments, Seiko, Sharp, Ikegami, and others. And now there's RealTech... (our "house brand")... premium quality hardware at affordable prices.

We GUARANTEE you'll be pleased with the power, performance, and competitive price of RealTech products, which are:

• 40-60% LESS than the comparable Apple product.
• Backed by a ONE-YEAR WARRANTY with an optional two-year add-on.
• Backed by our famous guarantee and return shipping policy. If you're not satisfied with any RealTech product, call us. We'll refund your purchase price (minus consumables)...and we'll even pay the return shipping costs.

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Software & Hardware That Fits
610 South Frazier
Conroe, Texas 77301

1-800-972-3018

Microtek 600 DPI Scanners

600ZS Color Scanner includes Adobe Photoshop—full version, with 24-bit color editing and color separation capabilities

Scannaker 600ZS Color Scanner. A low-cost, high-resolution color scanner capable of scanning 16 million colors at up to 600 dots per inch. Outstanding image quality in a compact, flatbed design.
• 16.8 million colors
• 3 scanning passes (red, green and blue filters)
• 14 brightness settings for each color plane
• Scanning speed 150 seconds (letter size)

SAVE! Only $1469

Scannaker 600GS Grayscale Scanner. 8-bit grayscale scanning of halftones, fine art, and mixed at up to 600 dots per inch for extra-sharp image quality, flatbed design.
• Up to 256 shades of gray
• 1 scanning pass (gray filter)
• 14 independent brightness and contrast settings

SAVE! Only $1119

Microtek Scanmaker Slide Scanner

The affordable 35mm color slide scanner. Scan landscape or portrait slides at 1850 dpi. Captures 24-bit color and 6-bit gray scale. Bundled with Photoshop, you'll be able to produce 4-color separations from your color slides.

Powerful, affordable laser printing...

from TI's compact microLaser PostScript printers.

300 dpi with HP LaserJet Series II emulation standard, 1.5 MB RAM upgradable to 4.5 MB RAM. Optional accessories: 2nd paper tray, separate envelope tray!

$1299

TI microLaser™
XL PS 17. 16 pages per minute; 35 resident fonts; 25,000 pages per month duty cycle. Call for best price!

$2095

DAYSTAR DIGITAL ACCELERATORS:
Your Performance Edge.

Leading edge technology provides superior performance! Daystar delivers the fastest accelerators in the business. Easy to install, One year warranty and toll-free technical support.

"...the Daystar board just screamed."
— MacUser, Feb. '89

Mac II, Mac IIx, Mac IIcx
25 MHz........................................... 1065
25 w/68882.................................... 1205
40 MHz................................. 1335
40 w/68882............................... 1565
50 MHz................................. 1845
50 w/68882............................... 2125

Mac IIci
40 MHz........................................... 925
40 w/68882............................... 1135
50 MHz................................. 1635
50 w/68882............................... 1915

Fast Coche IIci
RAM Powercard........................... 709
SCSI Powercard.......................... 1060
1 Megabyte SIMMS...................... Call
4 Megabyte SIMMS...................... Call
Classic Memory.......................... Call

Ask about our no-hassle upgrade program for the Mac IIcx.

We can schedule a swap-out of your mother board with the Daystar accelerator that's already installed. Double or triple your speed with no down time. Now that's service you won't find anywhere else!
### 21" Display!

**RealTech Dual Page 21" Display**
No more squinting and scrolling! Seeing two pages at once will save you hours of time.

The latest in flicker-free monochrome technology provides true WYSIWYG! 21" landscape display with 1152 x 870 resolution, 74 dpi. Vertical refresh rate of 75 Hz, full gray scale capability, and flat CRT (P4 phosphorus, polished screen). One-year warranty.

<table>
<thead>
<tr>
<th>CPU</th>
<th>Monitor</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac SE</td>
<td>Mono</td>
<td>$995</td>
</tr>
<tr>
<td>Mac II, Illc, Illci</td>
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<td>$995</td>
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<tr>
<td>Illx, Illx, SE30</td>
<td>GS 256</td>
<td>$1479</td>
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<tr>
<td>Mac Ili</td>
<td>Mono</td>
<td>$1059</td>
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<tr>
<td>Mac Portable</td>
<td>Mono</td>
<td>$1249</td>
</tr>
</tbody>
</table>

**RealTech Full Page Display**
At this price, you can't afford not to have one of these incredible eyesavers!

Quality, flicker-free images at a price that lets you experience the convenience of large-screen viewing:
- 15" portrait display
- 870 x 640 resolution, 80 dpi
- Vertical refresh rate of 74 Hz
- Full gray scale capability
- Flat CRT, P4 phosphorus, polished screen
- One-year warranty

<table>
<thead>
<tr>
<th>CPU</th>
<th>Monitor</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac II, Illc, Illci</td>
<td>Mono</td>
<td>$579</td>
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<tr>
<td>Illx, Illx, SE30</td>
<td>GS 256</td>
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<tr>
<td>Mac Ili</td>
<td>Mono</td>
<td>$495</td>
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<tr>
<td>Mac Portable</td>
<td>Mono</td>
<td>$849</td>
</tr>
</tbody>
</table>

**MONITORS w/Cards**
- Sony Trinitron 1304 14" w/8-bit......1108
- Magnavox 14" w/8-bit.............918
- NEC Macsync 14" w/8-bit.............828

**Other Monitors Available!**
Please call for prices.

**RealTech ClearVue/GS**
Unmatched image quality!
Flicker-free images in 256 shades of gray for accurate proofing. Includes virtual Desktop and Pan/Zoom features for maximum productivity! 1024 x 768 resolution; 19" display, 72 dpi. Paperwhite phosphor. Integrated tilt & swivel base. 75 Hz vertical refresh rate.

**Ikemage 19" Trinitron Color Systems**
Ikemage is the undisputed champ in color reproduction. Comes with an integrated tilt/swivel stand, and auto and manual degaussing. Full antiglare coating, 75 Hz vertical refresh rate, and flicker-free images reduce eye strain and improve user comfort. Comes with a high resolution 1024 x 768 video card.

The right solution for every budget!

<table>
<thead>
<tr>
<th>System</th>
<th>Colors</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entry Level</td>
<td>256</td>
<td>$2569</td>
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<tr>
<td>Professional</td>
<td>256</td>
<td>$2895</td>
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<tr>
<td>Master's</td>
<td>16 Million</td>
<td>$3495</td>
</tr>
</tbody>
</table>

**Seiko 14" Trinitron**
High-resolution Trinitron tube makes it possible to view 16 million shades of color! 640 x 480 resolution, 72 dpi. 14" display has integrated tilt & swivel base. 43% brighter than the leading competitor!

**RasterOps ClearVue/GS**
Unmatched image quality!
Flicker-free images in 256 shades of gray for accurate proofing. Includes virtual Desktop and Pan/Zoom features for maximum productivity! 1024 x 768 resolution; 19" display, 72 dpi. Paperwhite phosphor. Integrated tilt & swivel base. 75 Hz vertical refresh rate.

**RasterOps ClearVue/GS**
Unmatched image quality!
Flicker-free images in 256 shades of gray for accurate proofing. Includes virtual Desktop and Pan/Zoom features for maximum productivity! 1024 x 768 resolution; 19" display, 72 dpi. Paperwhite phosphor. Integrated tilt & swivel base. 75 Hz vertical refresh rate.

**WE'LL BUY IT BACK!**
Our dedicated, highly-trained service technicians are some of the finest in the country.

**SYSTEMS**

- Mac Classic, 4 Mb RAM, 40 Mb Hard Drive: $1395
- Mac Ilsi B&W Full-Page System, 3 Mb RAM, 40 Mb Hard Drive, Mac 101 Keyboard: $3649
- Mac Ilsi 14" Trinitron, 3 Mb RAM, 40 Mb Hard Drive, Mac 101 Keyboard: $4169
- Mac Ilsi B&W Full-Page, 5 Mb RAM, 40 Mb Hard Drive, Mac 101 Keyboard: $5499
- Mac Ilsi 14" Trinitron, 9 Mb RAM, 105 Mb Hard Drive, Mac 101 Keyboard: $11,159
- Mac Ilsi B&W Dual-Page, 9 Mb RAM, 105 Mb Hard Drive, Mac 101 Keyboard: $5139
- Mac SE/30 System, 5 Mb RAM, 105 Mb Quantum, Mac 101 Keyboard: $1395
- Mac SE/30 14" Trinitron System, 5 Mb RAM, 105 Mb Quantum, DataDesk Switchboard: $3649
- Mac Ilsi GS 21" Dual-Page System, 5 Mb RAM, 105 Mb Quantum, Mac 101 Keyboard: $5139
- Mac Ilsi 19" Trinitron 8-bit Color, 5 Mb RAM, 170 Mb Hard Drive, Mac 101 Keyboard: $4169
- Mac Ilsi 19" Trinitron 8-bit Color, 8 Mb RAM, 170 Mb Hard Drive, Mac 101 Keyboard: $5139
- Mac Ilfx 21" B&W Dual-Page, 4 Mb RAM, 170 Mb Hard Drive, Mac 101 Keyboard: $11,159
- Mac Ilsi B&W Full-Page System, 3 Mb RAM, 40 Mb Hard Drive, Mac 101 Keyboard, Felix: $3649

We specialize in high-end graphics systems.

Mac Ilfx with 8 Mb RAM, RasterOps 24-bit Video Card, Ikegami Trinitron 19" Color Monitor, RasterOps Video Accelerator with 4 Mb RAM, 660 Mb Internal Hard Drive, DataDesk Mac 101 Keyboard, MicroTek 600ZS 24-bit Color Scanner, QMS ColorScript 100 Thermal Color Printer with 5 Mb RAM: $21,999

FAX: 1-409-539-4141  Call: 1-409-760-2400
610 South Frazier  •  P.O. Box 3106  •  Conroe, TX 77301

1-800-972-3018
Our buying power gives you your buying power!

**QUANTUM HARD DRIVES**
Reliable drives backed by a 2-year warranty.

<table>
<thead>
<tr>
<th>Internal Hard Drives</th>
<th>Price</th>
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<tbody>
<tr>
<td>105Q</td>
<td>425</td>
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<tr>
<td>170Q</td>
<td>775</td>
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<tr>
<td>210Q</td>
<td>835</td>
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<table>
<thead>
<tr>
<th>External Hard Drives</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>105Q</td>
<td>510</td>
</tr>
<tr>
<td>170Q</td>
<td>860</td>
</tr>
<tr>
<td>210Q</td>
<td>920</td>
</tr>
</tbody>
</table>

**APPLIED ENGINEERING**

| HD Superdrive 1.44 | 225 |
| HD Superdrive 1.44 | 225 |
| Quadralink         | 199 |
| Cache-In (Lcl Cache Card) | 199 |

**DataLink Modems**

| Ex 2400 Modem       | 165  |
| Ex 2400 w/MPN-5     | 199  |
| Ex 2400 w/MPN-5 & Fax | 235 |
| LC w/MPN-5 & Fax    | 235  |
| MacPortable w/MPN-5 & Fax | 199 |

**Large-Capacity Storage Devices**
All of our high-quality drives come with a one-year warranty; an optional second year is available.

If a drive fails within 90 days, send it back. Within 48 hours of receiving your unit, we'll ship you a replacement drive overnight—at our expense. You may extend this replacement policy to a full year for the modest cost of $169.

<table>
<thead>
<tr>
<th>MB</th>
<th>MS</th>
<th>MB/Sec</th>
<th>Price</th>
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<tbody>
<tr>
<td>Int 312</td>
<td>14</td>
<td>1.4</td>
<td>$1499</td>
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<tr>
<td>Int 423</td>
<td>16</td>
<td>1.4</td>
<td>1619</td>
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<td>Int 433</td>
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<td>1979</td>
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<td>Int 660</td>
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<td>Int 644</td>
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<tr>
<td>Int 1011</td>
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<tr>
<td>Int 1011</td>
<td>15</td>
<td>2.5</td>
<td>3449</td>
</tr>
</tbody>
</table>

**Peripheral Land**, recognized leader in removable cartridge drives, introduces the latest in Syquest technology—the Infinity Turbo 88.

**PERIPHERAL LAND**

| 1.44 Mb Floppy | 329 |
| Infinity Turbo 88 | Call |
| Infinity Dual Turbo 40 | 1850 |

**PERIPHERAL LAND**

| Electrostatic 12 x 12 | 879 |
| Electrostatic 12 x 17 | 1289 |
| Electrostatic 15 x 15 | 1289 |
| Standard 12 x 12      | 799 |
| Standard 12 x 17      | 1199 |
| Standard 12 x 18      | 1199 |
| Standard 15 x 15      | 1199 |

**WACOM TABLETS**

| Standard 18 x 25 | 3199 |
| Standard 6 x 9   | 559  |
| Menu Panel 12 x 12 | 839  |
| Menu Panel 12 x 17 | 1249 |
| Menu Panel 12 x 18 | 1249 |
| Menu Panel 15 x 15 | 1249 |

**Circuit City**

Choice of stylus or 4-button cursor.

**EVALUE**

**TARGUS PREMIUM CASES**

| IV II Case          | 49  |
| Mac Plus Case       | 59  |
| SE Extended KB Case | 75  |

**EMAC 150T Tape Back-up**

$665

**ZOOM MODEMS**

| Kurtz 12 x 12 Tablet | 399 |
| Kurtz 17 x 12 Tablet  | 659  |
| MacFlp (80 diskettes) | 139 |
| MacPro Plus Keyboard | 139  |
| DataDesk SwitchBoard | 159  |

**SATISFACTION GUARANTEED!**

---

**6 REASONS TO ORDER FROM US (besides saving money!)**

1. 30-day money back guarantee on all hardware (except for special-order items). No ifs, ands, or buts!
2. Toll-free tech support when you need advice or want to order.
3. Pay when shipped... We charge your credit card only when your order is shipped—not when you place the order.
4. Overnight delivery when you need it.
5. Business leasing available.
6. Installation & training anywhere in the U.S.

**“WE’RE NOT HAPPY (unless you are!)**

We want you to become a repeat customer. So we give you discount mail-order prices...superior service & selection...an unbeatable hassle-free warranty...toll-free tech support...and an unsurpassed return policy.

What’s more, we do it all with a smile...because that’s what you deserve.”

---

Several members of our management team (l to r): Barbara, Jim, Lew, Rial.
We Take Care Of You

Lowest Prices • Overnight Delivery • Money Back Guarantees*

**ECONOMY**

- **SHARP**
- **PROMETHEUS**
- **VENTANA PRESS**
- **LOGITECH**
- **I-PROTECT**
- **ICD**
- **ERGOTRON**
- **FARALLON**
- **KENSINGTON**

**Compatible with all modems.**

Baud Rate feature allows either modem can drastically cut trans­mission time and cost. The Extended Baud Rate feature allows either
to send and receive data accurately at speeds up to 9600bps.

**Utilities**

- **ABCOM**
- **CARRY CASE C.L. C.J.S., MS#T**
- **CARRY CASE SE PLUS EXTEND KB**
- **DUST COVER FOR CLASSIC PLUS OR SEI**
- **ARTICULATE SYSTEMS**
- **VOICE LINK**
- **VOICE NAVIGATOR II**
- **ATTN**

**Communications**

- **ERGOSTEM**
- **MAC TILT MAC SE PLUS**
- **FARALLON**
- **MACRockey 2.0**
- **1-PROTECT**
- **FILTER ANTI RADIATION - SE PLUS**
- **FILTER ANTI RADIATION FULL PG**
- **FILTER ANTI RADIATION+MONITOR**
- **ICD**
- **GRAFLEX**

**Cutting Edge 52 MB Quantum LPS**

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>52 MB Quantum LPS</td>
<td>$459</td>
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<tr>
<td>165 MB Quantum LPS</td>
<td>$691</td>
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</table>

- **PROTECTOR**
- **FILTER ANTI RADIATION - SE PLUS**
- **FILTER ANTI RADIATION FULL PG**
- **FILTER ANTI RADIATION+MONITOR**
- **ICD**
- **KENSINGTON**
- **MAC STAND & CABLES**
- **KEYTACOM**
- **MAC PREP**
- **LOGITECH**
- **MCDSUMER**
- **MOUSE SYSTEMS**
- **LITTLE MOUSE ADDS**
- **VENTALINE PRESS**
- **SYSTEM 7 BOOK**

**Printers/Scanners**

- **BEST PERSONAL SCAN**
- **COLORSTUDIO**
- **COLORSTUDIO by LetraSet True Color imaging software.**
- **COLORSTUDIO can help you create color illustrations; scan and input existing prints, slides and drawings; retouch color photos... assemble montages and composite images all on your Macintosh!**
- **COLORSTUDIO by LetraSet True Color imaging software.**
- **COLORSTUDIO by LetraSet True Color imaging software.**

**Hard Drives**

- **CUTTING EDGE**
- **9600/9600M PLUS V.32/42 MNP5**
- **9600/9600M PLUS V.32/42 MNP5**
- **24/96MSR FAX MODEM**
- **V-SERIES ULTRA 9600 MODEM**
- **24/16 MSR FAX MODEM**
- **V-SERIES ULTRA 9600 MODEM**
- **24/16 MSR FAX MODEM**
- **V-SERIES ULTRA 9600 MODEM**
- **24/16 MSR FAX MODEM**

**Monitors & Boards**

- **COLORSTUDIO**
- **COLORSTUDIO by LetraSet True Color imaging software.**
- **COLORSTUDIO by LetraSet True Color imaging software.**
- **COLORSTUDIO by LetraSet True Color imaging software.**
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**Business**

- **IDEAFISHER**
- **IDEAFISHER**
- **IDEAFISHER**
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- **IDEAFISHER**

**Cutting Edge 9624e External Modem**

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Price</th>
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<tbody>
<tr>
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<td>9624e External Modem</td>
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<tr>
<td>9624e External Modem</td>
<td>$129</td>
</tr>
</tbody>
</table>

**High Speed Data Transfer**

- **MULTI-AD SEARCH**
- **Multia-Search**
- **Multia-Search**
- **Multia-Search**
- **Multia-Search**
- **Multia-Search**
- **Multia-Search**
- **Multia-Search**
- **Multia-Search**
- **Multia-Search**

**Other Thinkers**

- **IDEAFISHER**
- **IDEAFISHER**
- **IDEAFISHER**
- **IDEAFISHER**
- **IDEAFISHER**
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- **IDEAFISHER**
- **IDEAFISHER**
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- **IDEAFISHER**

**Software**

- **MULTI-AD SEARCH**
- **Multia-Search**
- **Multia-Search**
- **Multia-Search**
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- **Multia-Search**
- **Multia-Search**
- **Multia-Search**
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- **Multia-Search**

**General Ledger Pro**

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<tr>
<td>General Ledger Pro</td>
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</table>

**Multi-Ad Search**

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Price</th>
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<tbody>
<tr>
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**Hardware**

- **MegaGraphics**
- **MegaGraphics**
- **MegaGraphics**
- **MegaGraphics**
- **MegaGraphics**
- **MegaGraphics**
- **MegaGraphics**
- **MegaGraphics**
- **MegaGraphics**
- **MegaGraphics**

**Software**

- **IDEAFISHER**
- **IDEAFISHER**
- **IDEAFISHER**
- **IDEAFISHER**
- **IDEAFISHER**
- **IDEAFISHER**
- **IDEAFISHER**
- **IDEAFISHER**
- **IDEAFISHER**
- **IDEAFISHER**
The Personal Scanner™ Designed as a compact peripheral for either Macintosh or PC compatibles, Typist can input 500 words per minute directly into any application. It also features true 300 dpi resolution to achieve high quality optical character recognition.

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>THE TYPIST</td>
<td>$499</td>
</tr>
</tbody>
</table>

- **Volume discount pricing**
- **Open an account within 2 hours**
- **Call about our special pricing**

**Correct Grammar**
Correct Grammar for the Macintosh identifies errors in grammar, style, usage, punctuation—even spelling with a 350,000 word dictionary. You can customize Correct Grammar to respect your personal writing style or compare the accuracy of your writing with a sentance to the education level of your intended audience.

<table>
<thead>
<tr>
<th>PRODUCT</th>
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<tr>
<td>CORRECT GRAMMAR</td>
<td>$499</td>
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**Networking**

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<th>PRODUCT</th>
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<td>SMARTCOM II</td>
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**Utilities/Programming**

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**Language Systems**

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<td>FORTYONE with MNH</td>
<td>$388</td>
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**Presentation Professional**

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<th>PRODUCT</th>
<th>PRICE</th>
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<tbody>
<tr>
<td>PRESENTATION PROFESSIONAL WITH MACRENDERMAN</td>
<td>$329</td>
</tr>
</tbody>
</table>

**Policies**

- **VISA, Mastercard & American Express accepted.**
- **Credit card not charged until order is shipped.**
- **California residents add 7% sales tax.**
- **Returns**
  - Call for R.A. number before return
  - Restrictions may apply
  - *Money Back Guarantee* Most products have a 30-day money back guarantee. Please inquire when you order.

**International Dealer Program**

- We ship regularly to 65 countries worldwide
- Call about our special pricing

**Corporate Accounts:**

- Open an account within 24 hours
- Volume discount pricing
- School purchase orders accepted

Fed. ID # 95-4183196

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**FAX:** 818-504-9380  **Tel:** 818-504-1800

11050 Randall Street, Sun Valley, CA 91352  **(818) 504-1800**

Please circle 138 on reader service card.
CPU's and More...

Custom configurations are just one of our many specialties. Whether it's something as simple as a Mac the rest of the world would call a laptop or as high end as the Macintosh Classic, LC and fat. The Pro drives are half-height. All ETC internal drives come with brackets, cables and DataQuest™ formatting software.

ETC 52 Mb Quantum LPS, 17msec $275.00
ETC 105 Mb Quantum LPS, 11 msec $575.00
ETC 105 Mb Quantum LPS, 10 Mb $495.00
ETC 170 Mb Quantum Pro, 11 msec $695.00
ETC 210 Mb Quantum Pro, 11 msec $765.00

External Drives and More...

ETC's external drive come in a zero-footprint half-height cases with a Universal power supply, power outlets, push button SET$ addresses, cables, and ExtraMoreI™ formatting software.

ETC 52 Mb Quantum LPS, 17msec $275.00
ETC 105 Mb Quantum LPS, 11 msec $575.00
ETC 105 Mb Quantum LPS, 10 Mb $495.00
ETC 170 Mb Quantum Pro, 11 msec $695.00
ETC 210 Mb Quantum Pro, 11 msec $765.00

Big Hard Drives and More...

If you need a lot of on-line storage, ETC's line with the Seagate/Imagio WREN drives are the best value on the market. With a 1/4" inch form factor, the ETC internal drives will be a fine fit in the Mac II, III, and IIsi.

ETC 1 Mb WREN-1, 16.5 msec $1195.00
ETC 233 Mb WREN-Runer-1, 10.7 m $1449.00
ETC 613 Mb WREN-5, 16.5 msec $1359.00
ETC 676 Mb WREN-6, 15.5 msec $1795.00
ETC 676 Mb WREN-Runner-2, 11.8 msec $2095.00
ETC 615 Gb WREN-7, 15msec $4490.00

Removals, DAT and More...

If you and your data are always on the move, don't shut down or backup without using one of these. All the systems below come with appropriate software, SCSI cable and one cartridge.

ETC 45R Syquest Removable $455.00
ETC 88R Syquest Removable $955.00
ETC 1.2 Go DAT Tape Backup $1495.00
ETC 2.0 Go DAT Tape Backup $1815.00

45 Mq Syquest Removable Cartridge $54.00
88 Mq Syquest Removable Cartridge $95.00
30M DAT Tape for ETC DAT 1 $252.00
90M DAT Tape for ETC DAT 2.0 $313.00

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If you need networking solutions today, we can provide you with everything from BNC connectors, cables, and terminators to LocalTalk routers, EtherNet interface cards and Repetitors. Call us and we'll help you build your network at a price you can afford.

Phone network adapters $395.00
AppleShare File Server Software 2.0 $475.00
Cisco 3500 Cartridge $5280.00
EtherNet Thicks and Thin $395.00
Macintosh IIEtherThick NCB Card $249.00
Macintosh IIEtherThick NCB Card $249.00
EtherNet IIEtherCard $249.00
EtherNet IIEtherCard $249.00
EtherNet IIEtherCard $249.00
EtherNet IIEtherCard $249.00
EtherNet IIEtherCard $249.00

Video and More...

We have a complete collection of Apple and Apple compatible video products. Call us with your video equipment needs and we will tell you which video system is right for you and your system.

Apple 17" Monochrome Monitor $295.00
Apple 12" RGB Monitor $429.00
Apple 13" RGB Monitor $695.00
Apple 15" Portrait Monitor $769.00
Apple Two Page Monitor $1195.00
Apple 14" Ten Pro 512 BGR $549.00
Macintosh Display Card+4 $534.00
Macintosh Display Card+4 $295.00
Macintosh Display Card+4 $295.00
512K VRAM Upgrade for Mac LC $295.00

High-end Video and More...

If you need to see more than $40480 here are some of the most innovative video solutions around.

Mac II Systems
RasterOps 8L Hitachi System $3295.00
RasterOps 8L Trinitron System $3995.00
RasterOps 24L Hitachi System $4579.00
RasterOps 24L Trinitron System $5295.00
CorrectColor Advantage $1450.00
ClearView/GS 19" Gray Scale System $1414.00
ClearView 11" Monochrome System $1160.00

Mac II and Classic Systems
RasterOps 8LRC 19" Hitachi System $3314.00
ClearView LC 19" Monochrome System $1195.00
ClearView Classic 19" Mono Monitor System $1195.00

Mac II Display Boards
RasterOps 8L Display Board $278.00
RasterOps 8L Display Board $278.00
RasterOps 24L Display Board $278.00
RasterOps 24L Display Board $278.00
RasterOps 24L Display Board $278.00
ClearView/GS/SLC Display Board $278.00

Multimaster Boards
RasterOps 24X4TV LT Board $3195.00
RasterOps 24X7STV Board $1695.00
24STV Acceleration Board $198.00
RasterOps Video Expander NTSC $475.00

Printers and More...

If you need it in print, the collection of printers we have to offer can't be beat in performance or price. Because printers can be accessed in a network or via direct connection, most manufacturers don't stock cables. We'll help you get it hooked up right.

QuickDraw
AppleImageWriter II $249.00
Apple Personal LaserWriter SC $424.00
HP DeskWriter w/AppleTalk Interface $555.00
CorPilot II & III Call

TextType
Apple StyleWriter $439.00
Apple Personal LaserWriter LS $693.00

Passport
Apple Personal LaserWriter NT $1795.00
Apple LaserWriter II NT $272.99
Apple LaserWriter II NT $272.99
Apple LaserWriter II NT $272.99
Epson EPS-1300 with RISC System $224.00
CorPilot II & III $1995.00

Ti LaserMaster FS17 with AppleTalk $1599.00
Ti LaserMaster FS17 with AppleTalk $1599.00
NEC SilentWriter 2 Model 90 $169.00
Dansys FS-410 $1995.00

Extended Warranty Service for your Macintosh

As the fastest-growing direct retailer of Macintosh systems nationwide and software, Mac and More can now double the warranty on your Mac system with membership in Club 24. Services include:

• 24 month warranty on Apple products
• Shipping via FedEx includes both ways
• 72 hour repair or replace turn around

Want more details?
Call 1-800-MAC-0052 now!
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**TI microLaser PS17 $1245**

6 ppm Adobe Postscript • AppleTalk Interface Included

1MB Memory $75 • 3MB Memory $175

Replacement Toner $55 • Envelope Feeder $249

---

### NEW! $1425
**Microtek 600ZS**

600 DPI 24 bit Scanner with Photoshop

---

**SYSTEMS & SOFTWARE**

<table>
<thead>
<tr>
<th>SYSTEMS</th>
<th>SYSTEMS NOW AVAILABLE</th>
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<tbody>
<tr>
<td>MacClassic</td>
<td>925</td>
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<tr>
<td>Mac LC</td>
<td>1715</td>
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<tr>
<td>Mac II</td>
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<td>Mac SE/30</td>
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<td>Mac IV/800</td>
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<td>Macintosh Portable</td>
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**HARDWARE**

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<td>1152</td>
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<tr>
<td>Reader/CRN 264</td>
<td>623</td>
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<tr>
<td>Reader/CRN 424</td>
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**SIMMs: all types/least prices**

<table>
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<td>Apple 128K SIMM (RCR)</td>
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<td>Apple 256K SIMM (RCR)</td>
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<td>Apple StyleWriter</td>
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<td>Apple ProLine LaserWriter</td>
<td>425</td>
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<tr>
<td>Apple ProLine Color Scanner w/Photoshop</td>
<td>3549</td>
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<tr>
<td>Apple Fax/Remote Printer</td>
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<td>Apple Fax/Remote Printer</td>
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<tr>
<td>Apple Fax/Remote Printer</td>
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**PLI Infinity / Odyssey 88**

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<td>$599 / $999</td>
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**QyPress 3.1**

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<td>$449</td>
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**HP DeskWriter**

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<td>$469</td>
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**Seiko CM-1445**

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<td>$545</td>
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**Macintosh LC**

<table>
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<tr>
<th>Price</th>
</tr>
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<tbody>
<tr>
<td>$1715</td>
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</tbody>
</table>

**Bottom Line Distribution**

**Fax:** 1-900-420-8770

**International Fax:** 512-476-6399

2201 Rio Grande, Austin, Texas 78705

**1-900-420-3737**

**S2 PER MIN**
Laser Printer Sale!

CrystalPrint Express Laser Printer
$3,599
- 12 pages per minute
- 11 Font Families (39 typefaces)
- 3 megs of RAM
- Dual paper trays
- Solid Blacks for graphics
- Letter, Legal and transparencies

Crystal Print MacPublisher Laser Printer
$1,699
- 8 pages per minute
- 11 Font Families (39 typefaces)
- 2 Micks of RAM
- Adobe type one support
- Solid Blacks for graphics
- Letter, Legal and Transparencies

Crystal Print Publisher II Laser Printer
$2,125
- 8 pages per minute
- 11 Font Families (39 typefaces)
- 3 meg of RAM
- Adobe type one support
- Solid Blacks for graphics
- Letter, Legal and Transparencies

Microlaser PostScript Laser Printer
PS17 $1,345
PS35 $1,645
- 1.5 Megabytes of RAM
- 6 pages per minute
- Letter, Legal and transparencies

NEC SilentWriter 90 Laser Printer
$1,649
- 6 pages per minute
- Adobe PostScript®
- 35 scalable fonts
- 2 Micks of RAM
- Letter, Legal, Envelopes, Transparencies and Labels

QMS-PS® 410 PostScript® Laser Printer
$1,979
- 2 Megabytes of RAM
- 4 pages per minute
- Letter, Legal, Envelopes, and Transparencies
- Auto switching between Macintosh and IBM
WARNING...
BEWARE OF 900 NUMBERS!
When you call MacLand for technical information, or to place an order, the call is absolutely FREE! Why pay for information when you can obtain professional answers from technically trained MacLand technicians for FREE!

Seagate/Wren

Seagate/Wren Drives Now
Have a TWO Year Warranty!

<table>
<thead>
<tr>
<th>Drive Type</th>
<th>Capacity</th>
<th>Speed</th>
<th>Internal Price</th>
<th>External Price</th>
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<tbody>
<tr>
<td>3.5&quot; Drives</td>
<td>204 Mb</td>
<td>15 ms</td>
<td>$899</td>
<td>$999</td>
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<td></td>
<td>428 Mb</td>
<td>14 ms</td>
<td>$1,649</td>
<td>$1,749</td>
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<td>5.25&quot; Drives</td>
<td>300 Mb</td>
<td>14 ms</td>
<td>$1,099</td>
<td>$1,199</td>
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<td>676 Mb</td>
<td>15.5 ms</td>
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<td>1.2 GB</td>
<td>16 ms</td>
<td>$2,699</td>
<td>$2,799</td>
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Hard Disk Drive
Megabyte Sale!

Quantum

<table>
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<tr>
<th>Drive Type</th>
<th>Capacity</th>
<th>Speed</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>Internal</td>
<td>External</td>
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<tr>
<td>Quantum LPS52 12ms</td>
<td>$299</td>
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<td>Quantum LPS105 12ms</td>
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<td>Quantum 210 15ms</td>
<td>$749</td>
<td>$849</td>
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</tbody>
</table>

SyQuest

42 Megabyte
Removable Hard Disk Drives

$425
Cartridge not included

Upgrade your Mac's
Memory
Simm Sale

<table>
<thead>
<tr>
<th>Simm Type</th>
<th>Price</th>
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<tbody>
<tr>
<td>Single Cartridge</td>
<td>$69 Each</td>
</tr>
<tr>
<td>Five Pak</td>
<td>$67 Each</td>
</tr>
<tr>
<td>Ten Pak</td>
<td>$64 Each</td>
</tr>
</tbody>
</table>

FREE! Included with your Simm order is our 22 page, step by step, easy installation guide.

SyQuest Removable
Cartridges

Will fit ANY 44 Removable Hard Disk Drive

To Order Call 1-800-333-3353/Technical Info and Customer Service Call 1-800-388-3118
4685 South Ash Avenue, Suite H-5, Tempe, Arizona 85282 (602) 820-5802
### Day Star

- Fast Cache lcci: $329
- Power Cache lcci 40 Mhz: $1,049
- Power Cache lcci 50 Mhz: $1,799

### Questronic

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- 2.0 Gigabyte DAT Tape: $1,599

### Radius

#### Monitors

- Pivot lcci/lsl: $799
- Pivot ll, SE/30, LC w/ Card: $999
- Color Pivot lcci/lsl: $1,499
- Color Pivot 3 bit System: $1,999
- Full Page Display
  - Mac Classic, SE, LC: $899
  - Direct Color/GX Interface: $599

#### Accelerators

- Accelerator 16 SE: $399
- Accelerator 25 SE 68851: $949
- Rocket 040 Accelerator: $2,599

### Fax Modems

- Abaton 24/96: $289
- Dove 24/96: $349

### Magnavox

- Two Year Warranty
  - 14" Color Monitor: $469
  - 14" Color Monitor w/8 bit: $699
  - 14" Color Monitor w/8 bit SE/30: $699
  - 14" Color Monitor w/24 bit: $799

### Hewlett Packard

- Desk Writer: $549

### Accelerators

- Accelerator 16 SE: $399
- Accelerator 25 SE 68851: $949
- Rocket 040 Accelerator: $2,599

### Key Tronic

- MacPro Plus Keyboard: $139

### Scanners

- Microtek 600ZS Color: $1,599
- Microtek 600GS: $1,299
- Hewlett Packard Scan Jet: $1,545
- Caere Hand Scanner: $459
- Logitec Hand Scanner: $369

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Most major credit cards accepted. All shipments made by Airborne Express Standard Air, which is 1-2 day service. Call for shipping costs.

Products purchased in error are subject to a 20% restocking fee. All prices subject to change without notice. All products subject to availability.
Here’s what MacUser Magazine said about the CrystalPrint Express in the October 1990 issue:

“We expect the Express to live up to its name and emerge as the fastest of all PostScript® printers for both text and graphics.”

CrystalPrint Express
- Super fast 12 pages per minute
- 3 Megabytes of RAM
- Dual Paper Trays
- Letter, Legal, Labels, Transparencies, and Envelopes
Retail Price: $5,695  **Sale Price: $3,599**

Here’s what MacUser Magazine said about the CrystalPrint Publisher II in the October 1990 issue:

“...the fastest PostScript® printer MacUser Labs has ever seen.”

CrystalPrint Publisher II
- 8 pages per minute
- 3 Megabytes of RAM
- 39 Typefaces
- Letter, Legal, Labels, Transparencies, and Envelopes
Retail Price: $3,795  **Sale Price: $2,125**

New
CrystalPrint MacPublisher
- 8 pages per minute
- 2 Megabytes of RAM
- 39 Typefaces
- Letter, Legal, Labels, Transparencies, and Envelopes
Retail Price: $2,995  **Sale Price: $1,699**

To Order Call 1-800-333-3353/Technical Info and Customer Service Call 1-800-388-3118
4685 South Ash Avenue, Suite H-5, Tempe, Arizona 85282  (602) 820-5802
Please circle 50 on reader service card.
High performance internal for SE, SE30, Ci, Cx, Mac II, IIx, IIfx. Say something about quiet.

<table>
<thead>
<tr>
<th>MB</th>
<th>INTL</th>
<th>EXTL</th>
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<tr>
<td>52</td>
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<td>170</td>
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<td>779</td>
</tr>
<tr>
<td>210</td>
<td>699</td>
<td>799</td>
</tr>
</tbody>
</table>

For a limited time, with any drive purchase, you can buy Redux, Init Picker or Rival by Microseeds Publishing. Any one, $20; any 2, $33.95; all three, $44.95.

Retrospect Remote "10 Pack" available with tape drive purchase for $129.00.
<table>
<thead>
<tr>
<th>Drive Type</th>
<th>Capacity</th>
<th>Price</th>
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<tbody>
<tr>
<td>WREN</td>
<td>600MB</td>
<td>$1649</td>
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<tr>
<td>SyQuest</td>
<td>-based sub-systems</td>
<td>includes one cartridge. Additional cartridge $69</td>
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<tr>
<td>TAPE</td>
<td>-based sub-systems</td>
<td>includes one cassette &amp; Retrospect Add'l cassettes $17-$24</td>
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<td>MB</td>
<td>INTL EXTL</td>
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<td>1.2G</td>
<td>2499 2649</td>
<td>2649</td>
</tr>
</tbody>
</table>

**CD ROM**

For a limited time, includes "Nautilus" CD ROM

**CD ROM Drives for Macintosh**

- APS CD Toshiba $499
- TEAC 60 $539
- TEAC 155 $599
- WangDAT $1699
- WangDAT $2699
- ARDAT $1499

**TOFLOWS**

- 30 Day Money Back Guarantee
- All Drive products carry a 30 day Money-back guarantee. Your risk in the transaction is the cost of shipping.
- Disk for Disk Replacement Warranty
- Quantum, Maxtor (excluding Panther 1.2G), Syquest and ARDAT Drives carry a two year "parts & labor" disk-for-disk replacement warranty. WREN, TEAC, WangDAT, Conner drives and Syquest Cartridges carry a one year "parts & labor" disk-for-disk replacement warranty.
- Brackets and Cables Included
- All Hard Drives include brackets, cables, cords and LED's required for operation in the specified Macintosh. All Hard Drives come pre-formatted with Apple's latest stable all-platform System software. 18.8 MB of Publicly Distributable software from the B'MUG Library, and the "ALLIANCE POWER TOOLS" SCSI formatter/hard partitioner.
- 30 Day Performance Guarantee
- If your drive fails to perform properly in the first 30 days and our technical support staff can't solve the problem over the phone, we'll ship you a replacement drive overnight and have your suspect drive picked up at our expense. Offer is subject to some limitations. Products being returned for credit and international orders do not apply.
- Toll-Free Technical Support
- Toll Free Technical Support 9:30am to 5:30pm Monday thru Friday, Central Time. As often or for as long as you need.
- Prices and Specifications subject to change without notice.

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**ACCEPTED CORP. PO's, NO SURCHARGE**

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**M-F 8:30AM-7PM CT. SAT 10AM-4PM CT**

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**ALLIANCE PERIPHERAL SYSTEMS, 2900 S 291 HWY. LOWER H. INDEPENDENCE MO 64057**
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<table>
<thead>
<tr>
<th>Size</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 MB</td>
<td>$328</td>
<td>$398</td>
</tr>
<tr>
<td>90 MB</td>
<td>$358</td>
<td>$438</td>
</tr>
<tr>
<td>135 MB</td>
<td>$448</td>
<td>$528</td>
</tr>
<tr>
<td>185 MB</td>
<td>$598</td>
<td>$678</td>
</tr>
</tbody>
</table>

**Mean Time Between Failure** is the average life expectancy of a drive. 24 hour factory replacement available for 5.25" drives for additional fee.

### Fujitsu 5.25" Drives
5 Year Warranty! *120,000 Hours MTBF*

<table>
<thead>
<tr>
<th>Size</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>357 MB</td>
<td>$1298</td>
<td>$1448</td>
</tr>
<tr>
<td>680 MB</td>
<td>$1698</td>
<td>$1798</td>
</tr>
<tr>
<td>1.2 Gig</td>
<td>$2598</td>
<td>$2698</td>
</tr>
</tbody>
</table>

### Siemens 525 MB Tape Backup
525 MB Tape $998

- Use two tapes for 1 gigabyte
- Fast network and unattended backup capabilities

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- Incredibly fast!

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2 Year Warranty

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<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>JX450</td>
<td>$4,295</td>
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<tr>
<td>JX 300</td>
<td>$1,795</td>
</tr>
<tr>
<td>JX 730</td>
<td>$1,695</td>
</tr>
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</table>

### Quantum Drives

<table>
<thead>
<tr>
<th>Size</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>40MB  3.5&quot;</td>
<td>$258</td>
<td>$339</td>
</tr>
<tr>
<td>52MB  3.5&quot; LPS</td>
<td>$304</td>
<td>$379</td>
</tr>
<tr>
<td>80MB  3.5&quot;</td>
<td>$409</td>
<td>$479</td>
</tr>
<tr>
<td>105MB 3.5&quot;</td>
<td>$358</td>
<td>$458</td>
</tr>
<tr>
<td>105MB 3.5&quot; LPS</td>
<td>$488</td>
<td>$588</td>
</tr>
<tr>
<td>120MB 3.5&quot;</td>
<td>$569</td>
<td>$658</td>
</tr>
<tr>
<td>170MB 3.5&quot;</td>
<td>$688</td>
<td>$778</td>
</tr>
<tr>
<td>210MB 3.5&quot;</td>
<td>$798</td>
<td>$898</td>
</tr>
</tbody>
</table>

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The Fujitsu External floppy drives have a one year warranty. These are the same drives that retail for $259!

Only $99

### WREN! DRIVES

<table>
<thead>
<tr>
<th>Size</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>300MB F/H</td>
<td>$1248</td>
<td>$1398</td>
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<tr>
<td>300 H/H</td>
<td>$1698</td>
<td>$1798</td>
</tr>
<tr>
<td>337 MB RUNNER</td>
<td>$1398</td>
<td>$1498</td>
</tr>
<tr>
<td>404MB</td>
<td>$2149</td>
<td>$2249</td>
</tr>
<tr>
<td>600MB</td>
<td>$1688</td>
<td>$1749</td>
</tr>
<tr>
<td>1.2 Gig</td>
<td>$2548</td>
<td>$2648</td>
</tr>
</tbody>
</table>

### 44MB REMOVABLE
With Cartridge $458.00

2 Year Warranty

### Commercial Color Scanner

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>JX450</td>
<td>$4,295</td>
</tr>
</tbody>
</table>

### COMMERCIAL COLOR SCANNER

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>JX 300</td>
<td>$1,795</td>
</tr>
</tbody>
</table>

### COLOR SCANNER

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>JX 730</td>
<td>$1,695</td>
</tr>
</tbody>
</table>

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Crisis - The Tale of Jeremy Fisher 83
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Fauré - Requiem in D Minor 279
Fauré - Requiem in D Minor 279
Fauré - Requiem in D Minor 279
Fauré - Requiem in D Minor 279
Fauré - Requiem in D Minor 279

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Rescues are good buddies for 7.0. This
means you can enjoy the new balloon
help under Finder and many of the inter­
face helps, just like the SE and the Classic.

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work together. This means you are stuck
with the 6.0 series of system software until
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Here are seven suggestions that can and should be implemented by word-processor designers:

1. **Envelope printing.** Every word-processing program should be able to bar-code and print envelopes sideways effortlessly. It stuns me that a product such as MacEnvelope can stay on the market this long without one single word-processor publisher saying, “Duh, why don’t we do that?”

2. **Paint-style cut-and-paste.** Cut-and-paste in Mac word processors is a fraud. It’s not much better in desktop-publishing packages. You typically block off some text with a select-block technique, cut it into the buffer, and then paste it someplace else. But human cutting and pasting doesn’t work this way: Text should be cut out as if you were using scissors. And you should be able to lay it anywhere — even over other text. If something had to be lined up precisely, you’d create virtual lines on-screen and adjust the text with a fine-tuning option. The old block-style cut-and-paste could be an option for simple moves.

There are a lot of good reasons for paint-style cut-and-paste in a word-processing program. If you want to adjust columns for aesthetic reasons, it can be an ideal tool.

3. **Rubber margins.** A good desktop-publishing program can do this, so why can’t all word processors? With “rubber margins,” the user selects the margin line and chooses a “rubber” option, where the margin line stays on-screen and the pointer can be positioned on the margin to pull it out to anywhere it’s needed for a special effect.

4. **A good spelling-checker dictionary and real thesaurus.** Am I the only one who thinks that Mac word-processing programs have the worst dictionaries in the known universe? Anyone who uses both a PC and a Mac will agree that the PC’s writing tools are far superior. There are dozens of spelling checkers and dictionaries along with scads of elaborate thesauri on the PC. Mac spelling checkers are not only bad but also painful to use.

The most annoying aspect of most Mac spelling checkers is the additional mouse click that’s required to ask the Mac to guess. Why doesn’t it do this automatically? I’ve always wondered why this extraneous step was so popular. But after using the WriteNow! spelling checker for a while, I realized that its publisher is too embarrassed to have the program ever guess, because its guesses stink!

5. **Improved selection control.** Here’s a hypothetical situation: On page 2 of a 100-page document is a complex table with complex margins and many intermixed typefaces. It would be tough to duplicate. The text of the rest of the document is set in Geneva, but I want to change it to Bodoni. If I press Select all and choose Bodoni, this complex table will be ruined forever: There’s no way to deselect this little chunk. I have to cut and paste it and hope that nothing gets screwed up. Of course, I can also hand-select the 100 pages by holding down the mouse button and scrolling for half an hour. This method is really outdated.

6. **Intermixed-face-and-type adoption.** Another situation similar to the one above occurs when you have a huge document and you want to change the type from 12-point to 10-point, except that the 12-point type also contains 15-point heads. After making the global change, you have to go through all the pages and, like a cannibal, try to find all the shrunken heads. This also happens if you have mixed typefaces in a document. Why can’t you just tell the word processor to change all instances of Helvetica to, say, Tekton, without changing any other font? This shouldn’t be hard.

7. **Finally, NEW special effects.** Since the invention of MacWrite, we’ve seen outline, shadow, and shadow outline — and nothing since. Seven long years have passed without anything new being added. I would like to see chroma, neon, and a dozen other stock effects, but apparently today’s programmers are still so blown away by Bill Atkinson’s original (and old) ideas that they can’t even think of one new thing!

Are these ideas impossible to implement? Are they impossible to code? How long are the Mac word-processing vendors going to rest on the laurels of past victories? The situation is pathetic.
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