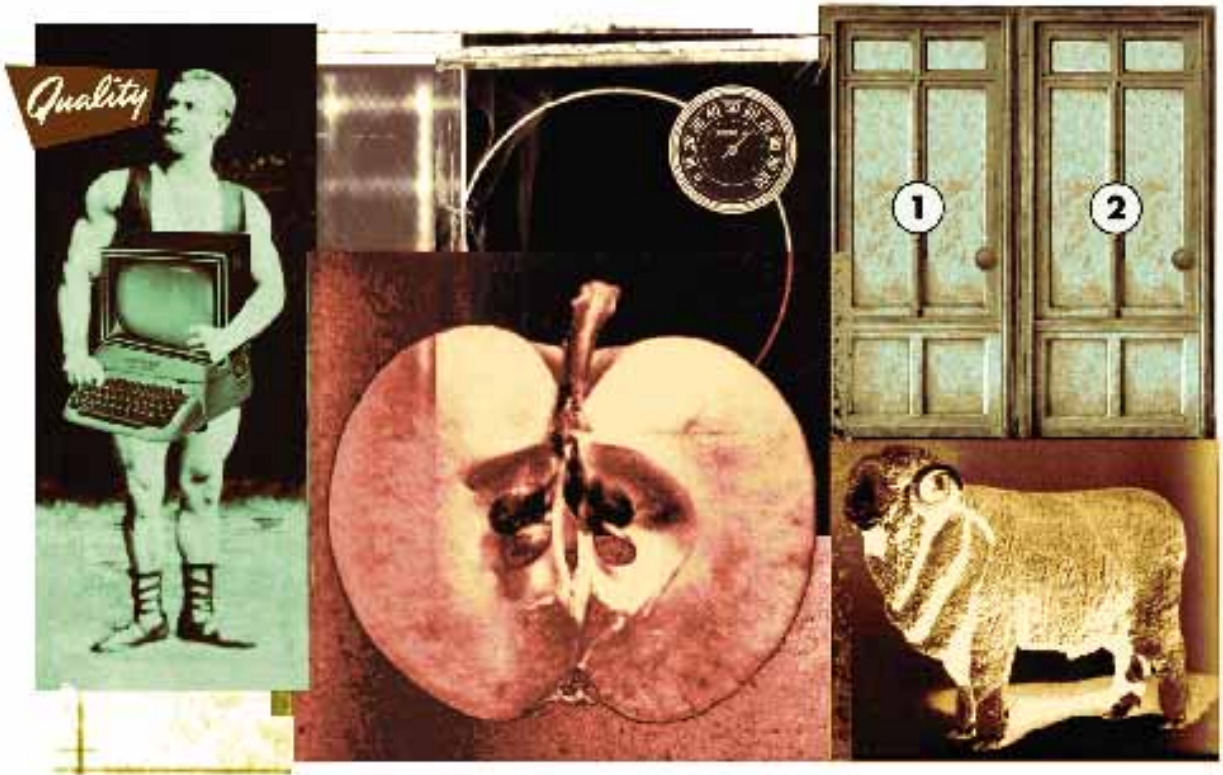


# the Well-Equipped Desktop

REVIEWS OF HARDWARE, SOFTWARE, BOOKS, AND MORE

Illustrations by Jennifer Jessee



Hardware: **We buy a Macintosh**

## Comparing Apples and ...

By Nicholas H. Allison

**For years**, buying a Mac was pretty simple. After all, there was only one company to buy it from—Apple Computer.

Sure, you were required to go through the usual due diligence of assessing how fast a machine you needed, what kind of capabilities were important, how much you were willing to spend, and so on. But the research side was simple: get a list of Apple's current product line—plus, perhaps, what was coming out soon—and find the closest match to your requirements.

In the last year or so, though, Apple has initiated a couple of significant changes in its personal-computer product line. The first was the transition to an entirely new type of CPU (central processing unit), the PowerPC chip. This meant that, for a while at least, buyers had to choose between the old processor architecture (based around the Motorola 68000-series CPU) and the new Power Macs based on the PowerPC. The second was Apple's recent, long-debated decision to license its operating system to other hardware vendors, meaning that you'd be able to buy a Mac-compatible machine made by somebody other than Apple.

Does this mean buying a Mac has gotten harder? Based on our experience in shopping for one late last fall, the answer is yes, but only a little—so far.

### **New chips, new competitors**

First, the transition to the PowerPC chip is a *fait accompli*: Apple isn't selling any more Macs based on the older "68K" chip design. Even if they were, you wouldn't want one. The PowerPC chip uses what's called "RISC" architecture, for "reduced instruction set computing." Put simply, this means that the chip is optimized to execute a much smaller set of instructions, those that are most frequently used. Put even more simply, this means it runs a great deal faster. These chips are also less expensive to manufacture than their predecessors.

Making the transition to a new chip architecture is a complex and risky undertaking, and Apple seems to have gotten curiously little credit for how smoothly they pulled it off. Amazingly, there were virtually no compatibility headaches for users—from the

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first day PowerPC-based machines were released, they have run software built for the older CPUs as well as PowerPC “native” programs written to take advantage of the CPU’s capabilities. (Apple accomplished this in part through leaving a good deal of the basic system software in non-native form, which exacted a speed penalty; with each new update of System 7, Apple ports more of the system software to native mode.)

The first generation of Power Macs were desktop machines built around the PowerPC 601. The next chip off the line was the 603, which is similar to the 601 but is smaller, less expensive, and less power-hungry, making it especially suitable for portables. In mid-1995 Apple released its first desktop machines incorporating a third type of PowerPC chip, the 604, which runs two to three times as fast as the 601.

OK, so the Mac-vs.-Power-Mac question is settled. What about clones—computers made by companies licensing the Mac operating system? (Apple doesn’t allow them to be called Macintoshes, reserving that brand for its own offerings; so you’ll see ads for “Mac compatibles” that sport a “Mac OS” logo.)

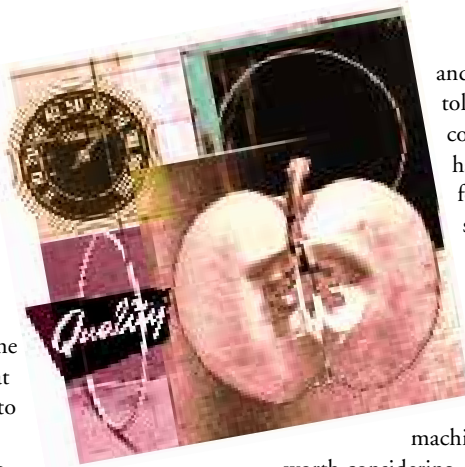
Apple’s decision to license its operating system was spurred mainly by a desire to increase the overall size of the Mac market, which is somewhere around a tenth of the size of the PC market.

Over time, it’s possible that this strategy will result in the kind of teeming, diverse

ecosystem that makes up the DOS/Windows hardware and software market. So far, though, for a variety of reasons (including shortages of some components that Apple provides to clone vendors), Apple’s licensing efforts haven’t gone as rapidly as some observers had hoped. At this writing (early November), there are only three companies selling Mac clones: Power Computing, DayStar Digital, and Radius.

Apple, of course, is still the prime provider of Macs—by far. Their product line includes desktop machines built around the 601 chip (the 6100, 7100, 7200, and 7500 series) and the 604 chip (the 8500 and 9500). But what choices are the clone vendors making available?

Power Computing got there first, and is offering the broadest set of options. Their machines have gotten excellent reviews for both performance and compatibility. They don’t sport the sleek industrial design that has always characterized Macintoshes; in fact, they’re housed in a standard PC case. But they’re priced aggressively and are mostly sold directly rather than through dealers. Power Computing offers a wide variety of customizable configurations,



and also throws in lifetime toll-free tech support. Of course, these machines have been on the market for only a few months, so their longevity—and that of the company, which is also brand-new—are unproven. But based on the reviews we’ve seen, Power Computing machines are certainly well

worth considering.

Power Computing offers several varieties of 601-based machines with NuBus expansion slots, and at press time had announced a forthcoming line of machines built around the 604 chip and PCI expansion-bus architecture (see the sidebar “On the PCI bus” on page 33). In a novel innovation, these PowerWave machines can be purchased with both PCI and NuBus expansion slots, providing backwards compatibility if you have NuBus cards you want to keep using.

DayStar is aiming at a more specific niche with a pair of very high-powered machines that each features four—yes, *four*—PowerPC 604 chips. These Genesis MP machines use a multiprocessing architecture DayStar developed in conjunction with Apple. Utilizing the PCI bus architecture and emphasizing high performance and user expandability, they’re likely to appeal to users involved with multimedia, video, and prepress. One Genesis MP offers six PCI expansion slots and is priced at almost \$15,000; the other, with three slots and otherwise slightly scaled down, is priced at just under \$10,000. The only hitch is that applications need to be able to take advantage of the multiprocessor architecture. But at press time (late November) a growing number of important developers had announced their intention to support it—including Adobe (for Photoshop, Premiere, and After Effects), Strata, Live Picture, Kodak, Ray Dream, and Macromedia.

The other contender in the Mac clone market is Radius. The company is focusing its first clone system on images, touting the Radius System 100 as a ready-to-go “digital imaging solution.” It includes a pre-installed copy of Photoshop, the performance of which is enhanced by Radius’s Thunder IV GX 1600 graphics ac-

### the Box Score

#### Keeping tabs

Apple’s decision to license its operating system means more choices for shoppers. However, things haven’t yet progressed to the point where the major magazines are doing roundups of competing systems, with comparative ratings. So it pays to seek out reviews of all the machines that might fit your needs and budget. With that in mind, below is a guide to recently published evaluations of Macs and their brethren.

**MacUser**, December 1995  
Power Mac 7200/90 and 8500/120

**Macworld**, October 1995  
Power Mac 9500/132; separate review of Power Mac 7200, 7500, and 8500

**MacWEEK**, September 25, 1995  
Power Computing Power 120 and Radius 81/110

**MacUser**, August 1995  
Power Mac 9500 (120 and 132); separate review of Power Computing Power 100

**Macworld**, August 1995  
Power Computing Power 100

**MacUser**, June 1995  
DayStar Genesis MP, Power Computing Power 80 and Power 100, and Radius System 100

### On the PCI bus

**PCI.** Everybody's talking about it—but what is it?

The initials stand for Peripheral Component Interconnect, and, as the name implies, it's a way to connect peripheral components—such as monitors, digital-video cards, or external storage devices—to your computer. You'll sometimes hear PCI referred to as a "bus architecture" or an "expansion-bus architecture." A "bus" is simply a pathway along which data moves. PCI is a standard for the bus that peripheral devices use to talk to the CPU.

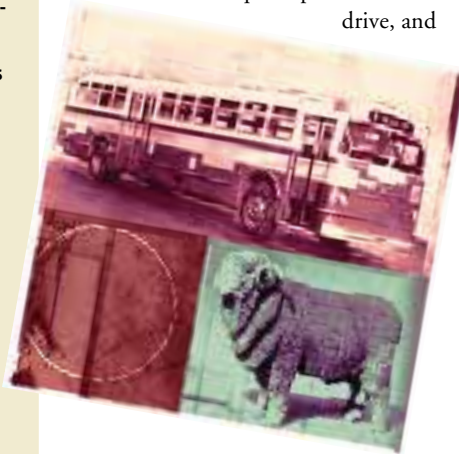
Apple is moving to the PCI standard and away from NuBus, the peripherals standard it has used for many years. There are two good reasons for this: speed and compatibility.

The PCI bus standard, which was developed by Intel, is a great deal faster than NuBus: PCI's theoretical maximum throughput is 132 MB per second, compared to the NuBus maximum of 40 MB per second. (Don't take these numbers too literally, but they do provide a comparison between the two standards.) NuBus had become a bottleneck in recent Mac systems, and PCI should fix that.

In addition, for the first time Apple's expansion-bus technology will conform to a broader industry standard. This means that developers can build PCI-based cards and sell them—with some tweaking for each platform—to both Mac and PC customers. This should lead to a much wider range of peripherals choices for Mac users.

Some observers have complained that Apple's new PCI-based machines don't offer any backwards compatibility with NuBus-based cards. Clone maker Power Computing sees a market opportunity here, and by the time you read this it should be selling its PowerWave machines, which can be ordered with 2 PCI and 2 NuBus slots. Alternatively, there's an external adapter offered by Second Wave Inc. that will allow you to use NuBus cards with any PCI-based Mac.

celerator. Based on the PowerPC 601 chip, the system also features 72 MB of RAM and a fast 2-gigabyte hard drive. The system carries a suggested retail price of \$12,495, and looks like an attractive option for anyone seeking a serious, pre-configured Photoshop workstation. In addition, Radius subsequently announced a more mass-market-oriented system called the 81/110; it's also built around the 601 chip, but offers 16 MB of RAM, a quad-speed CD-ROM drive, and



built-in support for video (for a 17-inch monitor) and Ethernet. Its estimated street price is not much over \$3,000.

### What we needed

Our two-person art department has been getting by on a Power Mac 7100 (which uses NuBus architecture and the PowerPC 601 chip) and a Quadra 840AV, a two-year-old machine based on the 68040 chip. Those machines work fine, but the 840 was becoming seriously dated, and we had budgeted a capital expenditure of about \$6,000 for late in the year.

What exactly were we looking for? Speed, mostly—but within certain limits. Most of what we do is design and layout in PageMaker. Sure, our art staff needs to open and work with submitted artwork in Photoshop and Illustrator, manipulate modest-sized desktop scans (for instance, covers of reviewed books), and create the occasional illustration, photomontage, or special effect. But the bulk of the magazine's truly intensive Photoshop work (color correction and working with large, high-res scans) is done by our color house.

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However, PageMaker files for a large, graphically intensive publication like ours can require some serious computing power. We've also found that creating PDF files for such publications is a resource-intensive process (Acrobat Distiller is a software PostScript RIP) that we need to perform increasingly often. Not to mention the inexorable rule that whatever seems zippy today will fall, with alarming rapidity, to the middle and then the back of the pack.

Given these considerations, it was clear that Radius's System 100 and DayStar's Genesis MP machines were a little rich for our blood (and our budget). On the other hand, Power Computing's offerings at the time were all based on the 601 chip and the NuBus bus architecture; it seemed clear to us that the 604 and PCI were the wave of the immediate future.

The Power Mac 9500 was the first machine Apple released featuring these two technologies. Among its attractions are six PCI expansion slots (controlled by two separate PCI buses); the capacity for a whopping 768 MB of RAM; a quad-speed CD-ROM drive; a 512-K Level 2 cache; and the System 7.5.2 operating system, which has an improved 68K emulator and more native PowerPC code than previous versions. In addition, the CPU is on an easily removable card, so upgrading to a faster chip in the future (which is a plausible option, given the 9500's PCI architecture and high RAM capacity) will be fairly painless.

We found that we could buy the 9500/120—equipped with a 120-MHz PowerPC chip, 16 MB of RAM, a 1-gigabyte hard drive, and a PCI-based video card from ATI with 2 MB of VRAM—for about \$4,400. Adding 24 MB of RAM to bump the system to 40 MB and another 2 MB of VRAM so the video card would drive our 21-inch monitor at high resolution brought the total price tag to around \$5,600.

There's another, faster version of the 9500 we considered briefly: the 9500/132. It's fundamentally the same machine, but does its computing with a 132-MHz PowerPC chip and sports a 2-gigabyte hard drive; we were quoted a price of \$5,060. However, it comes with no video support (that is, you have to buy a card to run your monitor), so we would have ended up spending about \$1,000 more for

an equivalently equipped setup. The performance difference didn't seem worth it, especially since it would have put us over our budget.

In the fall, Apple also began offering one other 604- and PCI-based machine: the 8500. It's been well reviewed, and offers many of the advantages of the 9500, except that its built-in video isn't as fast as the ATI video card that we bought with our 9500; it tops out at a potential of 512 MB of RAM (still an astronomical number); it has three, rather than six, PCI expansion slots; and its Level 2 cache is smaller (256 K). We probably would have been perfectly happy with it, but decided the marginal advantages of the 9500 were worth the cost.

The machine arrived within ten days of our ordering it, and—as usual with Apple products—it was easy to set up and get running. And it is *fast*. Especially notable so far is the screen redraw—which is hardly surprising, since that's where we're seeing the PCI technology at work. Early adopters of the 9500, and of other 604 and PCI machines, have experienced some

compatibility problems with certain utilities, applications, and network environments. We didn't—but it's an area worth researching before you buy (to get started, see the Box Score on page 30).

### In the end

So what did we learn from our shopping experience? Has buying a Macintosh gotten any harder?

Yes, a little. After all, we did have to sort through several different companies' offerings, and a few—for instance, Power Computing's Power 120 and Radius's 81/110—offered very similar packages. That's sort of the way things are in the PC world. And prices are starting to move fast, sort of the way they do in the PC world.

Nonetheless, even though shopping for a Mac has gotten a little harder, one can only hope it will get harder still—that Apple's OS licensing will continue, and that the marketplace will produce more and more options for Mac buyers. ▀

*Nicholas H. Allison is editor-in-chief of Adobe Magazine.*



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