

## *Photoshop CS2*

In this book I use the latest version of Photoshop, CS2, but older versions are quite serviceable. Some of my techniques work on versions as far back as Photoshop 5.5. If you're running an older version of Windows or Mac OS 9 Classic, as I am on one of my computers, the latest version of Photoshop you'll be able to run is Photoshop 7. Many of Photoshop 7's most valuable tools and filters are 16-bit capable, as is the all-important History Brush tool, but it only supports layers and adjustment layers in 8-bit mode.

If you think Photoshop is your cup of tea and you can't afford (or can't run) the latest version, search around and you may find legitimate individual copies of Photoshop 7 for sale for under \$100. If you buy a used copy, make sure that the seller transfers the serial number to you; Adobe has an established procedure for doing that. Also look for copies that are "upgradable," meaning that the original owner hasn't already upgraded to a later version of Photoshop. That gets you into the Photoshop food chain, where upgrades are much, much cheaper than full packages.

One big warning: Beware of vendors that claim to sell you "OEM" versions of Photoshop and websites that say you can download it from them. Photoshop has never been legally distributed that way. A vendor who seems to have unlimited copies of Photoshop at supercheap prices is selling counterfeit or pirated goods. Don't get taken in, and please don't support the crooks!

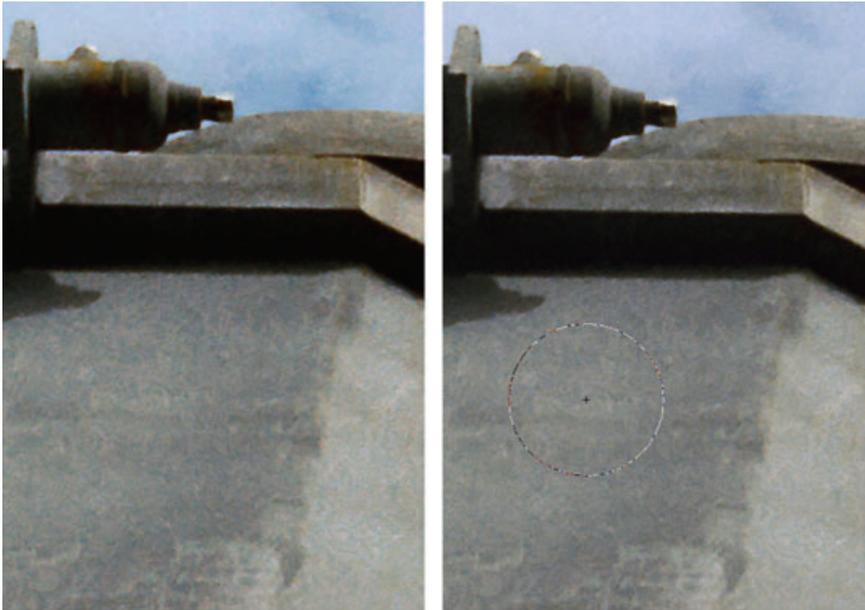
If you're a registered student, Adobe often has educational packages that save you considerable money over the list price. Look into this before paying regular prices for Photoshop.

Why do I think CS2 is worth the upgrade? For a start, you'll be able to use more memory (as much as 3.5 GB of RAM), but you'll need to be running on a 64-bit CPU with a 64-bit OS, like Windows Server or Mac OS X.

The tool cursor is changed for the better! In the past, it faded into invisibility over midtones. The new cursor is always clearly visible, regardless of the background (Figure 3-2). A new preference adds central crosshairs to a brush tip cursor. Now I can see the area a tool is affecting and precisely maneuver it at the same time, which is really useful when I'm trying to do precision cloning. I can assign the mouse scroll wheel to zoom in or out of the image. I do a lot of bit-twiddling and fine work when doing restorations; zooming in and out without touching the key-board is just great.

These "minor" changes save me lots of time and eyestrain. I swear I'd upgrade to CS2 just for these. The new Spot Healing Brush is a big improvement over the old Healing Brush. I didn't find myself using the original Healing Brush very much, because I thought there were better ways to fix problems. The new Spot Healing Brush is easier to use and works a lot better.

Smart Sharpen goes way beyond Unsharp Masking. There's a new blur algorithm I prefer; Lens Blur doesn't produce as much bright haloing around edges or grain/noise enhancement as Gaussian Blur does. Shadow and Highlight controls let you define how much sharpening gets applied to light and dark tones. For example, you can suppress



**Fig. 3-2** Photoshop CS2 has a new cursor, and it's worth the price of the upgrade all by itself. The photograph on the left shows a circular brush cursor in Photoshop CS. It pretty much disappears against middle tones. The new CS2 cursor (right) never disappears, and you can add a crosshair to the middle for precision work.

shadow sharpening in film scans and underexposed digital photos that suffer from a lot of shadow noise.

The Reduce Noise filter also has a very nice range of controls; I can choose how much noise reduction to apply to each channel and select to preserve and even enhance certain levels of detail while reducing overall noise (Figure 3-3).

One unpleasant change: The progress bar now only pops up (in mid-screen) if an operation is taking longer than 8 seconds, a very long time to wait. Worse, the behavior is unpredictable: Sometimes it pops up after 2 seconds; other times it doesn't show after a dozen seconds or more. It's maddening. A Windows registry patch named ForceProgress\_ON.reg, in the Goodies\Optional Plug-Ins\Photoshop Only\Optional Extensions folder of the CD, will force the bar to appear any time an operation is going to take more than a fraction of a second. This is worse than the old, unobtrusive progress bar, but it's better than the erratic default behavior. I don't know what Mac OS users can do.

## Photoshop CS4

[www.adobe.com/products/photoshop/photoshop/](http://www.adobe.com/products/photoshop/photoshop/)

There is hardly need for another general review of Photoshop CS4, what with so many of them already in print. Instead, I'm going to emphasize those changes in the program that especially interest me. Here's what's happened to Photoshop since CS2, the version that was current with the first edition of this book.

The big change beneath the hood for Windows users, as I said in [Chapter 2](#), is that Photoshop can now address huge amounts of memory directly, if you're running on a 64-bit machine with 64-bit Windows installed. Mac users will have to wait until CS5 comes along; in the meantime Photoshop can make good use of large amounts of RAM above the 3 GB it can address directly.

A number of tools and functions that I use regularly have been substantially improved. Photomerge, in particular, became really useful with CS3. It's now a part of Auto-Align Layers and it works extremely well. I use it regularly for stitching together sections of scans of originals that are too large for my scanners. The tedious alignment and warping method I presented in the first edition of this book is thoroughly obsolete if you're a Photoshop user. If you tried Photomerge before and were rightly disappointed by it, give it another look. You will be very pleasantly surprised.

A note about Photomerge in CS4: Adobe eliminated the extremely useful "interactive layout" option. You can restore that functionality by installing the legacy plug-in, PhotomergeUI.plugin. And while I'm on the subject of restoring functionality, also install ContactSheetII.plugin to get back the ability to generate contact sheets from within Photoshop.

The Clone Stamp and Healing Brush tools have some new capabilities and improvements. The tools now preview the changes they're going to make as you move them over the photograph. This avoids much of the trial and error of figuring out if you've picked the right source spot. It also makes it much easier to catch yourself when you start cloning beyond the source area you meant to copy (something all of us have done far too many times).

Because the Healing Brush does a complicated blend of the source area with the target area, its preview function isn't anywhere as good, but it's still an improvement over the previous opaque circle. If you can remember that the Healing Brush tends to combine the texture of the source with the brightness and color of the target, you'll be able to do a better job of visualizing its effect from the preview.

Both tools can be set to sample the current layer, the current layer and those below it, or all layers. Furthermore, the Clone Source palette lets you specify five different sources to work from; these can be in different layers. The new palette makes aligned cloning between layers much easier, because you can see the relative position of the source and target in the palette coordinates before you click to set the target.

The Dodge and Burn tools are much better and more realistic looking, especially when they're used in the Highlight or Shadow range. Previously they tended to force very light or dark tones to pure white or pure black and gray out the true whites and blacks. The results were harsh and unnatural and, at the extremes, looked more like applying the Levels tool instead of a graceful tone adjustment. The new versions of the tools preserve a lot more shadow and highlight gradation at the same time that they lighten and darken tones in those areas, and hues don't gray out anything as badly. The improvements in performance are much like the difference between modifying tonal placement poorly with the Curves adjustment described in [Chapter 5, Figure 5-9](#), or well with the one in [Figure 5-10](#).

B&W printing has also gotten a lot better. The Black & White... adjustment not only gives you a lot of control over the precise conversion of colors to tones and includes some very useful presets, it makes it easy to apply a slight tint to the image to emulate classic brown or sepia toned prints. It's not quite as good or as flexible as duotone conversion, but it's good enough for most purposes and it's a heck of a lot easier to do. (It took me six pages to explain how to use duotones in the first edition of this book.)

Photoshop CS4 (and the latest versions of Photoshop Elements) has a new kind of adjustment: Vibrance. Vibrance is similar to saturation but a lot smarter in several ways. Vibrance changes the saturation of colors, but it has its strongest effect in the middle range of color saturation. Its influence gets weaker the closer a color gets to being purely saturated or completely neutral. It also has less effect on the brightest highlight and deepest shadow tones. Finally, Vibrance has less effect in the range of colors corresponding to skin tones. The overall result is that Vibrance produces a more natural-looking change in saturation than the Saturation adjustment does and is less likely to produce garish, artificial-looking results.

Adobe is gradually converting all its filters to Smart Filters, and many third-Party Filters can be used that way. A Smart Filter is a lot like an adjustment layer. It doesn't directly alter the pixels in the underlying layers, and you can change its settings at any time. It's what Adobe calls a "nondestructive" operation. You can revise to your heart's content or even throw away the filter entirely and your original, underlying photograph remains unaltered. If you're

familiar with how useful adjustments layers are, you'll immediately understand how great it is to have filters that work that same way.

If you aren't familiar with adjustment layers, it's time to learn. A lot of this book makes heavy use of adjustment layers, and Adobe is gently nudging all users in that direction. The new Adjustment Panel in Photoshop CS4 integrates this workflow even more firmly into the structure of Photoshop and collects all the kinds of adjustment layers into one easily accessible location. Mind you, all the old-fashioned ways of doing things are still available through the traditional drop-down menus. You don't have to use adjustment layers; you can apply operations directly to your photographs if you must. Adobe isn't forcing you (yet) to take this newer approach to your work, and neither am I. But we both strongly encourage it.

## Photoshop Performance Enhancement

Like any large beast, Photoshop can move ponderously slowly. It's a gorilla, after all, not a greyhound. Fortunately, the right hardware and software decisions on your part can perk it up considerably. Unlike real-world performance enhancement, this won't involve the use of semilegal drugs or risk congressional investigation. It's not even very expensive. Lloyd Chambers has a Website (<http://macperformanceguide.com>) loaded with useful tips for improving Photoshop performance. My experimental results largely agree with his.

To get maximum performance, you may need to install three Adobe Photoshop plug-ins: "DisableScratchCompress," "Bigger Tiles," and "ForceVMBuffering" (<http://www.adobe.com/support/downloads/detail.jsp?ftpID=4049>). DisableScratchCompress may not make much of a difference if you have a fast hard drive, but it won't hurt. Bigger Tiles instructs Photoshop to process data in larger chunks. On my system, Lloyd's "medium" benchmark clocked in with an abysmal 900 seconds without that plug-in. Adding the plug-in cut the time to a little over 400 seconds.

I shouldn't have needed ForceVMBuffering, according to the technical notes, but my initial test results showed no performance gains from increasing my RAM from 4 GB to 6 GB. This plug-in solved the problem. Install it if you suspect that Photoshop isn't making use of all your RAM. The only disadvantage of running ForceVMBuffering is that other applications will become sluggish after Photoshop's eaten all your RAM, because the OS will have to swap code blocks when other apps need memory space.

## All About Memory

Here's why Photoshop seems to plod when you need it to sprint: Photoshop uses RAM for storing the image you're working on, for intermediate results,

for undo and history states, and as workspace for plug-ins and filters to do their calculations. When it runs out of RAM, it uses hard drive space if it can (some functions require real RAM). Then two things happen. The bad news is that using the hard drive as working memory is much, much slower than using RAM, and your performance will plummet as much as 10×. The worse news is that those functions that require real RAM could simply seize up.

Great Photoshop performance demands as much RAM as it can handle and really fast hard drive access when it needs it. The former is straightforward; the latter can get tricky.

Buying a modestly faster CPU isn't cost-effective unless you can afford to buy top tier and max out on performance-enhancing accessories. The difference in price between a machine with the fastest CPU you can get and one that is 10% slower is typically around 15%, or several hundred dollars. Unless the other components in the box are also being upgraded to higher-performance ones, the average performance difference you'll see between the two machines is only about 5% overall improvement. Buy as much RAM as you possibly can, even at the expense of other system improvements. It's the best return for your dollar. Then get a faster hard drive.

If you're still running a 32-bit platform, though, it's really time to bite the bullet and upgrade your machine. Regardless of how much physical RAM you have in a 32-bit system, most operations need to take place in the lower 2 GB of RAM. Photoshop will be competing with plug-ins, some OS functions, and print rendering for that precious 2 GB of space.

You may be able to get noticeable improvements in performance at no cost at all by adjusting Photoshop's settings. Check out these Adobe URLs and read all the tips. I bet you will find one or more that you can apply to your system:

Optimize performance in Photoshop CS3 on Mac OS:

<http://tinyurl.com/3bwedw>

Optimize performance of Photoshop CS3 on Windows XP and Vista:

<http://tinyurl.com/3xawjy>

Your computer already has monitoring tools that will let you see where bottlenecks are. Task Manager in Windows and Activity Monitor in Mac OS X (Figure 3-1) will show you how much real memory your various programs (including the OS) are using and what's consuming CPU cycles that could be better used by Photoshop.

Photoshop itself includes an important monitoring tool, the Info Palette (Figure 3-2). Set the options for that window to display scratch sizes and efficiency. The former tells you how much memory Photoshop is consuming at that moment. It's a good way to track when you're getting close to the point

**Fig. 3-1** Activity Monitor (or Task Manager in Windows) is a useful tool for keeping track of how much of your system resources are being consumed by applications like Photoshop.



**Fig. 3-2** Photoshop's Info Palette lets you track how much memory Photoshop is using and how efficiently it's running.

where Photoshop will start swapping to disk. Efficiency tells you how fast an operation runs. When there are no bottlenecks it will report close to 100%. When you start swapping to disk, that number will plummet. I've seen it get as low as 11%; operations that should take 7 seconds if they could be handled entirely in RAM took a full (boring!) minute.

If you're running Photoshop CS4 on a 64-bit Windows platform, Photoshop can directly use RAM up to a phenomenal amount. Photoshop CS2 and CS3 (Win/Mac) and CS4 (Mac) can use 3 GB of RAM directly and can use 3/4 GB of RAM between 3 GB and 4 GB as additional working space for plug-ins. Free RAM above that gets used as scratch space in preference to the hard drive. Regardless of the version of Photoshop you're running, the more RAM you can put in your system, the less likely it is that Photoshop will have to start using the scratch disk.

With 6 GB of RAM installed, my Lloyd's medium benchmark time dropped to an astonishing 220 seconds from 400 seconds with "only" 4 GB RAM. How could a few GB of RAM make such a difference? Part of the answer lies in the effectiveness of RAM buffering. Without it, Photoshop was doing a high level of scratch drive reads and writes. With it, Photoshop still wrote a 16-GB

scratch file, but reads dropped to zero. All the data that Photoshop actually needed to run the benchmark was being held in RAM. That made scratch drive performance much less important.

Photoshop competes with other software for RAM. Modern operating systems swap around chunks of RAM and code on demand. Don't leave Photoshop idling in the background just for convenience's sake. It becomes a lot more sluggish as other applications and demands on the system nibble away at the blocks of memory that Photoshop was using. Whenever you're doing serious work, start Photoshop fresh.

Use the Edit/Purge command. When you start to get close to the disk-swapping point, you can free up a lot of RAM. Remember that once you purge all, you have no history and no undo state. Make sure you're really happy where you are with your work before you do this. Still, sometimes it's the only way to avoid massive slowdowns in performance.

Be aware, though, that Photoshop isn't 100% perfect about freeing up memory that it doesn't need. Monitor the info palette; if memory seems to be creeping up even when you've purged, it's a good time to shut down Photoshop and restart it to give it a clean slate.

In summary, buy as much RAM as you can afford. Add hard drives, but avoid USB 2; you're going to take a severe performance hit under the best of circumstances. FireWire 400 is okay; FireWire 800 is better. If you want to do it up right from the get-go, add an eSATA interface card and set up a dual-drive array.

My assorted software tweaks and RAM and hard drive upgrades have roughly doubled my speed on the most time-intensive Photoshop operations, at about one-third the cost of the computer.