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Designed to provide state-of-the-art resolution and color control, this award-winning CRT monitor features a new electron gun for improved picture sharpness. Based on advanced Natural Flat Aperture Grille technology, the electronblueIV monitor delivers a geometrically precise image and minimal reflection, resulting in consistently perfect vision.



Made for ideas.

DOGS IT'S

Photoshop builds in Raw and JPEG 2000, Kodak pushes prosumer digital capture to 14 million pixels, and darkroom printers go digital

by Ron Giddings

Since our last look at professional digital photography two issues ago, two of the most popular digital SLRs (Olympus' E-20 and Canon's D60) have been discontinued; the CCD camp has decided to go small; and 10+ megapixel SLRs have become exclusively CMOS. Nikon has chosen to stick with CCDs that are smaller than full-frame 35mm and has introduced a new line of lenses specifically designed for the format. This effectively ended plans by Olympus and Kodak to create a standard lens mount for all manufacturers. Fuji's SuperCCD has evolved into version 4, with small high-definition cells being set in larger tone-enhancing cells. I was a little disappointed to see that Fuji views this as a way to make cameras smaller rather than enhancing the capabilities of their star SLR, the S2 Pro. Maybe later.

Since I've never understood marketing logic, I decided to pick one camera to try out the newest software which has just appeared for digital photography. Now there's something I can fathom... sort of.

POP DOTS. Although now only remembered as a design element in the paintings of pop artist Roy Lichtenstein, "Ben Day" dots, pictured here, were the invention of American artist/inventor Benjamin Day (1838-1916). Around 1878 he came up with a method of coloring and toning drawings by hand-inking textured gelatin sheets and rubbing them onto the drawing (sort of like Letraset). Nobody, surprisingly, had a problem visually translating dots into images. Now in the 21st century we are again translating dots (pixels) into pictures. The software that does this interpolation is where real imaging control lies.

BITS AND BYTES

Until now, the Raw format which digital cameras use was meaningless. Sure, plug-ins and high-end applications have appeared that could read 16-bit images, but first you still had to let the camera's proprietary software convert the Raw file to TIFF or JPEG.

Opening a 16-bit file was like looking at—a film negative. The colors and tones were so far off that it took a lot of time and skill to get a believable final image. There have been some great proprietary programs that only owners of the parent cameras have been able to appreciate; however, the fact of the matter is that as far as image manipulation goes, all roads lead to Photoshop. Any fiddling software for Raw files will have to be part of the world's most essential imaging software to be taken seriously.

And now it is.



DIGITAL DARKROOM

I'm old school darkroom myself. I endured the days of the catpiss smell of chemicals just for the adventure of turning a negative into a tangible print. I think I liked the process even more than the image itself, and I'm sure that knowing how I would be printing changed how I shot my pictures.

It was important to dig out the most tone and color that I could by whatever means (overdeveloping color paper is not recommended behavior). Well, if there's a place in the digital world for this attention-to-detail/passion-for-the-feel-of-the-image, it's found in software like Adobe's new Camera Raw & JPEG 2000 plug-in for Photoshop (which will be built right into Photoshop 8, expected in the fall), now available online for US\$99 (~CDN\$160).

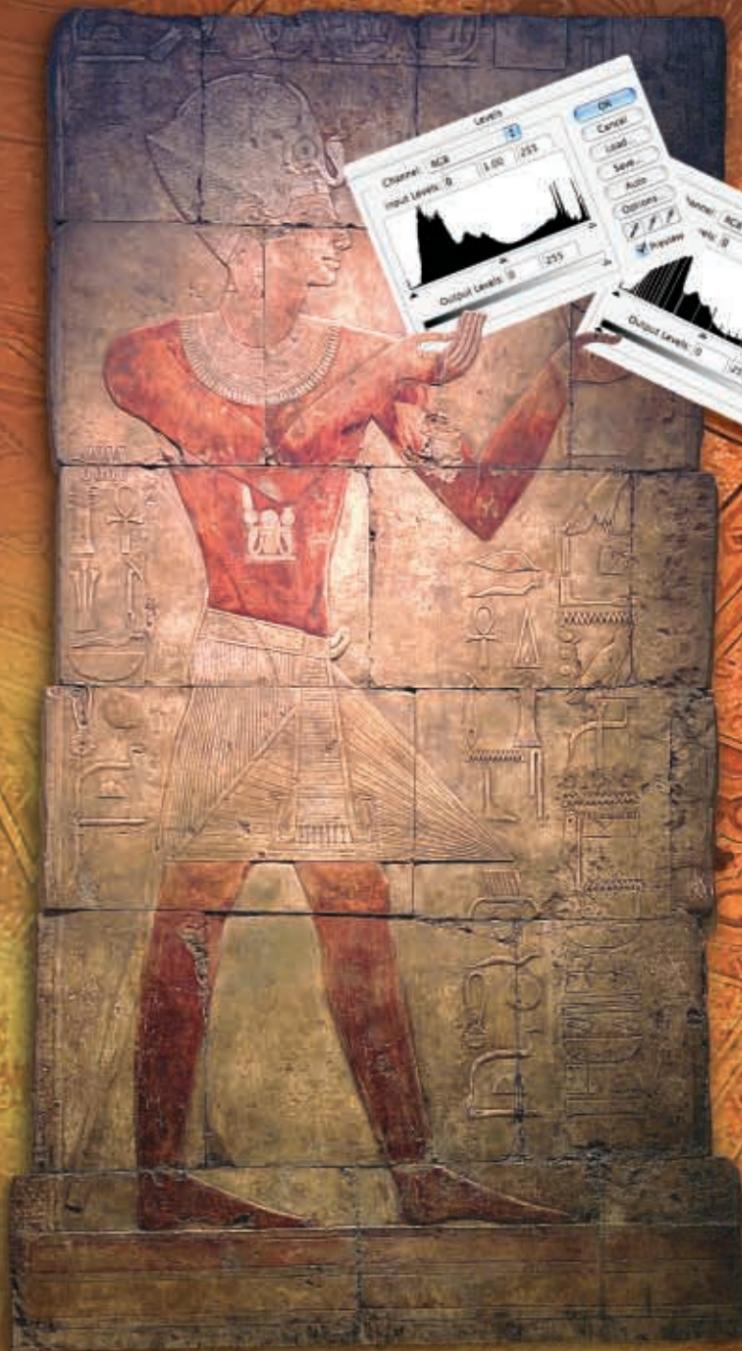
Adobe has a genuinely exciting new tool here. Every camera out there hasn't been profiled yet (that would be asking a lot), so Camera Raw may not be able to use the white balance "as shot" for your camera.

For this article, I tested Kodak's new 13.89-million pixel DCS Pro 14n, which sells for US\$4,995/CDN\$7,700. (Special thanks to Toronto's Henry's camera emporium for providing classic Micro-Nikkor 105mm and Nikkor zoom 20-35mm lenses as well as memory cards.)

Camera Raw can open Raw files from the 14n even though it is not yet "officially" supported. But you're probably going to change the white balance anyway, once you see the effect it has when combined with the tint adjuster. The rule here is to let your camera determine exposure and white balance to get all the goods necessary on the chip, then sweeten it in Camera Raw.

I hope photographers don't push Adobe too hard on profiling every new camera that appears. Remember Adobe PressReady? Adobe decided there were too many variables in the printing world to take on everyone's PostScript profiling and dropped the whole thing.

However, Camera Raw is very promising as is. Once photographers start working with it, realistic requests will shape its future development. For now, we have some stunning techno-alchemy at work here. Sharpening and tone control in 16-bit is a real treat, but even if we go nuts with enhancement, real world necessities like "smoothing" digital noise and moiré suppression are available. This is all the stuff that your camera did before you could bring your image into 8-bit Photoshop! An added plus for Mac users is CR's expanded capabilities with AppleScript. You should read the tutorials at Adobe's website, where you can learn how to write "droplets" for Camera Raw conversions of different shooting situations. You can drop a folder of RAW images onto a droplet and go to lunch while they "cook". Fantastic!



CAMERA RAW. Although your monitor isn't going to show you the difference between 16-bit and regular 8-bit, it's easy to understand what's happening by looking at the histograms of each. Take a 16-bit picture, adjust the tones with levels, and save it. When you open levels again you will see the new histogram. Now reduce your original picture to 8-bit and make exactly the same tonal changes. This new histogram will have gaps in it, indicating trashed information that didn't have such a drastic effect on the 16-bit version.



Although I've rendered the *BACKGROUND IMAGE* for this article artsy/Daguerred, the picture of the domed ceiling of the Royal Ontario Museum was very satisfying to take. It's great being able to use wide-angle lenses on a digital SLR—in this case, Kodak's DCS Pro 14n. With the arrival of *FULL-FRAME CMOS SENSORS*, we no longer have to settle for cropped images—a 20mm is once again a 20mm.

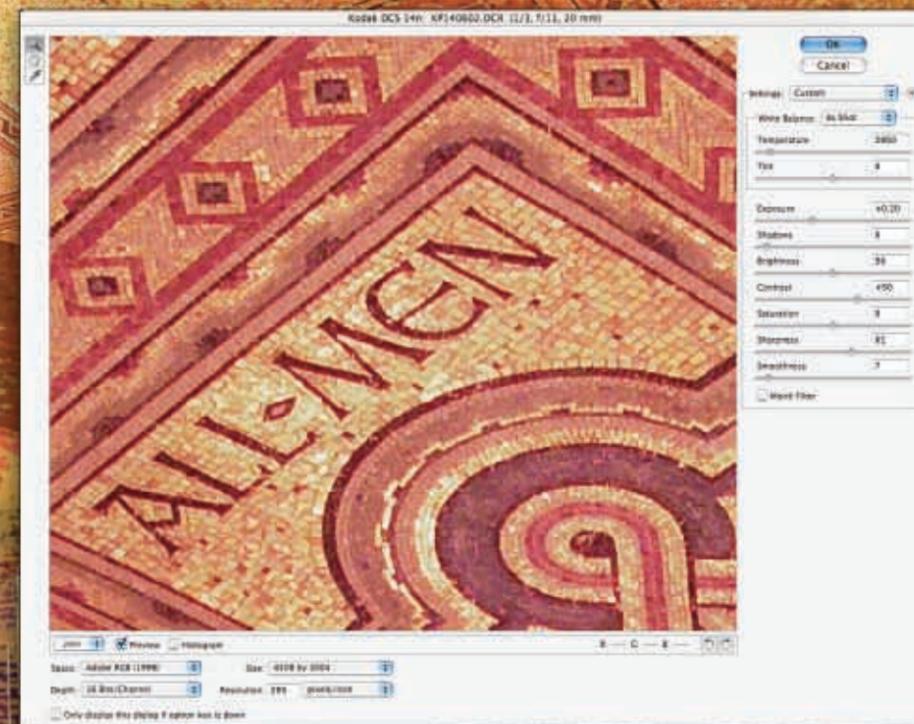
JPEG 2000 — HOW CAN YOU NOT GET EXCITED?

I was investigating JP2 (which uses wavelet compression) just before the Adobe Camera Raw/JPEG 2000 bundle was announced, and with born-again enthusiasm I talked about it with everyone I knew. Finally, here was lossless JPEG compression that supported CMYK and (wait for it)—transparency! Finally, here was a way to send an art director a cover image and a separate "floating" title graphic that could be placed wherever the layout demanded. This was a Photoshopper's dream!

But apparently I'm the only one who thinks so. Adobe slipped its JPEG 2000 plug-in into Photoshop Elements, for heaven's sake! Then later it gets stuck into a bundle with Camera Raw. What's with that?

So I started Googling my way through the dry-as-dust technical reports and came across an international group of JPEG 2000 developers at www.aware.com/products/compression/jpeg2000.html. I discovered a few companies that were giving away free JPEG 2000 solutions (www.fnordware.com and www.monkeybreadsoftware.de/freeware/index.html). But there were only two (www.elysium.tld.uk/jpeg_2000.html and www.aware.com/products/compression/jpeg2000.html) who had browser plug-ins (Windows only, thank you).

So maybe Adobe wasn't waving its flag because there were some free plug-ins out there. In the "advanced" part of the menu Adobe has given us a taste of where JP2 can go in the future. Through its ability to include "alpha channels", JP2 can use different compressions on different parts of an image. A fuzzy background can be squeezed right down while the important areas are left detailed.



ADOBE CAMERA RAW. I'm glad we're finally done with teeny plug-in windows. Since we are being given so much control over our images, we should be allowed to see the effects full screen.



When we start to see browser plug-ins for jp2 we should see features like Add Zoom, Panning, and Magnifier Glass integrated into standard web browsers. All this plus 40 to 60 per cent more compression than regular JPEG!

TRANSLATION, PLEASE

Let's remember that our digital image still began as pixels on a sensor grid. It's inside the software that the gaps between the pixels are "interpolated" into meaningful imagery. How a camera does this is the technology that gives a Canon image a different look from a Kodak image.

Back in the days of analog, a photographer took shots with a specific film because it had the qualities he was looking for. The DCS Pro 14n gives you a selection of "looks" (portrait or product, for instance) with which to shoot. Mind you, these are settings which are applied to your Raw "neg" when you save to 8-bit—the Raw file remains untouched. I chose "portrait" for the picture of my son's buddy, Julien (at left), and was amazed at how much the prints I made had the creamy quality of Kodak's classic Vericolor films!

Oh, yes—Raw does black-and-white very nicely as



If you're bravely going into the digital future of photography, you're going to think about *PORTABILITY*. Pro SLRs such as the Kodak DCS Pro 14n (which captured all the pictures shown here) work with laptops through Firewire and enable one to preview shots on a screen instead of the small LCD on the camera back. A huge advantage is the ability to set the white balance by "eyedropping" a grey card that's included in the picture. This pretty much guarantees that your camera is getting all the tones and colors it should. Kodak's Camera Manager software lets you capture the picture, zoom in to check sharpness, balance colors, and take the final shot from the laptop. Rilly Groovy.

well. This suggests to me that we have only seen the beginning of the possibilities that digital photography opens up.

BLOW IT UP

So, let's see. We've massaged our 16-bits down to 8-bit and fired it off as a JPEG 2000 file for client approval. The client likes it so much that they decide they'd like to blow it up to poster size. That means resampling up. Once again, some sort of software is going to interpolate and fill in the spaces between pixels. But where does the extra information come from? This is real digital magic now.

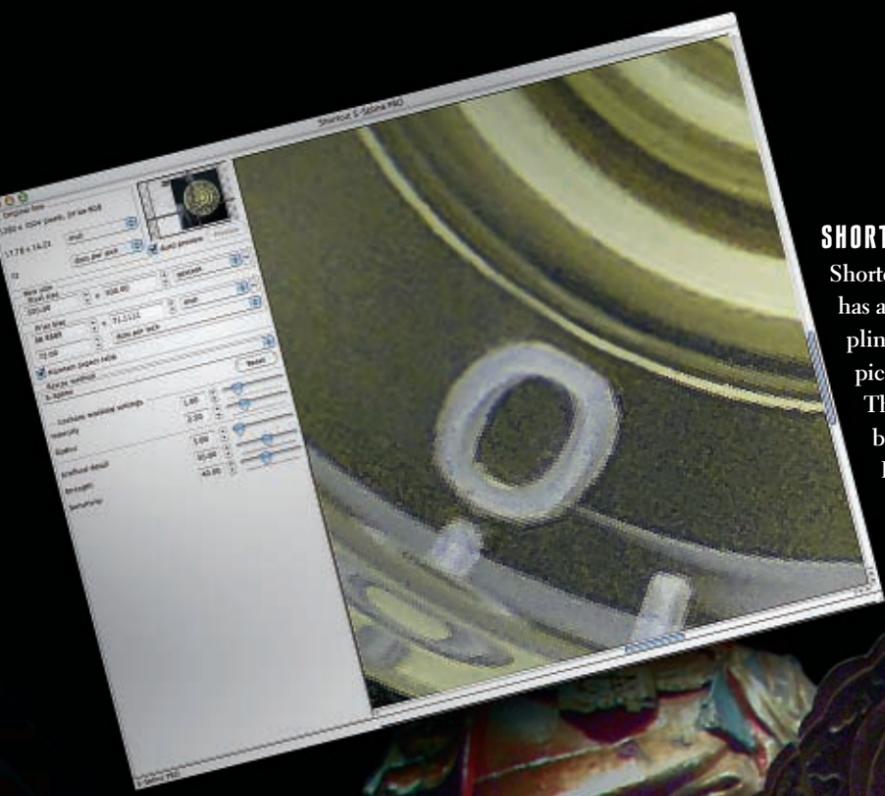
Every Photoshopper has laughed at the scene in the movie where the guy in charge is looking at a blurry photo on a monitor and says, "Can you clean this up a bit?" His techie fingers fly across the keyboard...and poof! a crystal clear photo of the bad guy. Yeah, sure.

Well...guess what? I'm not laughing any more.

Upscaling software is here. All upsampling software compares neighbouring pixels to determine how to smooth "jaggies". How this happens is described in an exchange at www.binbooks.com/books/photo/ji/1/57186AF8DE, but you've got to see it to "get" it. I tried one from Human Software (www.humansoftware.com) called XFile but found the interface window too small and difficult to manoeuvre the image. The results of the resampling both up and down were impressive, but I expected a little more from the people who brought us Squizz.

However, the real star—the one that made me think of that movie scene—comes from a developer in the Netherlands called Shortcut.





SHORTCUT TO ENLARGEMENTS

Shortcut's S-Spline Pro (US\$129/~CDN\$200 from www.shortcut.nl) has a beautiful big window and a choice of a number of resampling methods. You may prefer Lanczos over B-Spline for specific pictures. But the champion is their own S-Spline algorithm. The effects are most pronounced with big blow-ups (300%+) but I could see changes due to reinterpolation even at 100%. How does it know that those six grey squares are supposed to be a circle? Truly digital magic! If these three software tools are any indication of what can be done, I think we're just at the beginning of a whole new art medium. 🌟

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SPLINE SHINES. Watching this program convert jaggies into smooth curves right before your eyes warrants a wow! Sharpening takes on a whole new dimension when S-Spline is reshuffling pixels into new arrangements. If you have to upscale your digital images, this is the program you want to have on your side.

BUDDAH BING BUDDAH BOOM. Despite getting a "WARNING! Maximum recommended exposure time exceeded for this firmware version", I found the Kodak 14n had no trouble in the deepest, darkest interior of the Royal Ontario Museum. Here we see Buddah playing air guitar while a babe lip syncs.

