

Total Dynamic Range with Total Control

Photoshop is one of the few things in life that lets us eat our cake and have it. There are those images where we just want to see more, and more clearly, than any single RAW conversion allows. From a digital camera that produces rich RAW data, tremendous tonal range can be included in one and the same image with a few steps in Photoshop. The technique is not new¹. The value-added of this note is to demonstrate the thought process and steps of an expanded application in considerable detail.

The first step in post-capture processing is to carefully study the RAW image, decide what the image should convey and then decide upon the editing it requires to do so. All this before the next mouse-click!

The RAW capture of my demonstration image and its analysis looks like this:

Figure 1. RAW Capture Analysis (Adobe Camera Raw)



Times Square at Night, Canon 1Ds ISO 640, 1/80th second; f/5.6
Photograph by Mark D. Segal, February 2005.

The objective is to capture the vibrancy of the scene, which in its present state this image lacks. Some of the neons are well exposed; the people are too dark, deadening the vivacity the image should portray; some of the neons are rather dull, detracting from the visual richness of the Times Square experience. Three things should happen to this image: (1) the right stuff should stay right; (2) the slightly dull stuff should be livened-up a bit and (3) the under-exposed stuff should be brightened. Sounds a bit like the Zone System after the fact?

¹ I am grateful to Katrin Eismann who explained this technique in "Photoshop Masking and Compositing", pages 228 to 231 and to Michael Reichmann (Luminous-Landscape) who demonstrated it to me.

Not all of these objectives can be achieved with one set of adjustments to the same RAW capture, even though it holds ample image data to achieve the objective in a manner to be demonstrated below. The problem is shown in Figure 2.

Figure 2. RAW Image Exposure Increased from 0.00 to 1.00



The exposure increase needed to correct the upper left over-exposed the right-side neons that were previously correct. Any further exposure increase to brighten the people on the side-walk will over expose all the neon. Conclusion: No single exposure adjustment to the RAW data will balance the whole image.

One could convert the original capture in its RAW state (where only minor clipping is present) and struggle with Curves. The curve strategy would be to dampen the extremes of contrast in the image and boost the under-exposed areas by lifting the portions of the curve corresponding to each zone enough to brighten that zone adequately. This approach certainly improves the image, as shown in Figure 3, but vibrancy is lost in the process. Unless there are ways of drawing a curve that I don't know, it doesn't seem possible with one tone curve to preserve both the amount of contrast and the amounts of brightness across the range that would satisfactorily achieve the objective of this image. Brightening the three-quarter-tones means reducing contrast, and boosting the mid-tones without blowing-out the quarter tones means reducing contrast in the upper ranges of the tone curve as well. Figure 3 shows that everything has become more visible, while trying to preserve contrast, but the overall effect is under-whelming.

Figure 3. Curves Adjustment



The solution for this image is a triple layer luminosity blend. The key to an easy and successful blending operation is to partly pre-conceptualize in what order to adjust the zones, what pre-blending adjustment each zone will require and what will be the extent of the blending.

In this case I started with the RAW capture of Figure 2 for the "About Right" zone, because after the exposure increase from 0.00 to 1.00 in Camera RAW it needs the least additional work and includes a fair-size portion of the image. This version of the RAW file will become the Background layer of the new image (hereafter called the "main image" once acquired from Camera RAW. The processing steps are:

1. Open the RAW file in Camera RAW.
2. Increase the Exposure to 1.00 paying attention only to the portion of interest.
3. Check for chromatic aberration, adjust if necessary then
4. Click OK to open the image in Photoshop. Keep the image in 16 bit mode.
5. Examine only the portion of the image that interests us and decide on adjustments.
6. I decided it needed a bit more "punch".
7. I duplicated the background, named the Layer "F5", and implemented my Photoshop Action named "F5" (and triggered by CTL F5), which is simply applying to layer F5 USM with Amount 20, Radius 50, Tolerance 0. This adds "punch" without impairing the image². F5 has its own layer so that its opacity and blending mode can be adjusted to taste; if one decided to trash it, the layer could be safely deleted.

The result for the main image portion of interest is shown in Figure 4.

² Michael Reichmann introduced me to this adjustment.

Figure 4. Background Layer – Upper Left Portion "Punched-up"

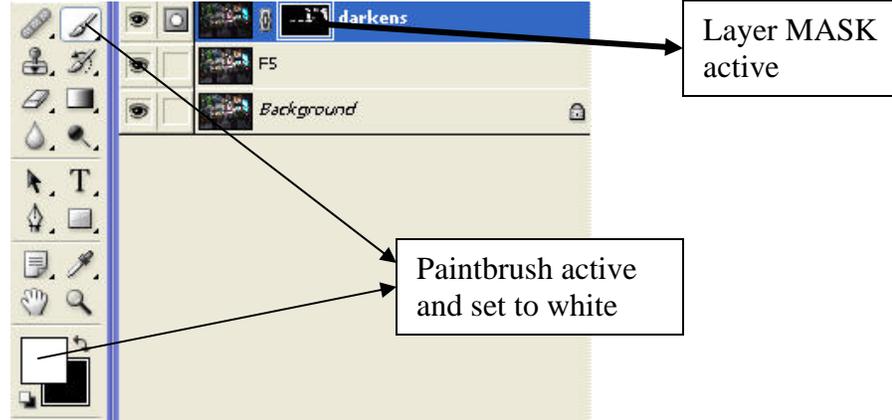


Notice how much more vibrant this portion of the image is compared with the similar area in Figures 2 and 3.

The next step is to deal with the upper right portion of Figure 1, that was "About Right" in the original RAW capture. Leave the main image Open. The subsequent steps are:

8. Re-open the RAW capture in Camera RAW.
9. Set the exposure to whatever setting makes the upper right portion of Figure 1 correct to your taste (for me in this case it was 0.00 – the original setting). Pay no attention to the rest of the image – it won't be used.
10. Click OK to send this version of the RAW capture to Photoshop.
11. With this new version active, layer it on top of the F5 layer as follows:
12. Type CTL A to select it. (CTL = CMD in Mac)
13. Type CTL C to copy it.
14. Close it without saving.
15. Make the F5 layer active in the main image.
16. Type CTL V to paste the copied version into the main image on top of F5, and title this new layer "Darkens". Keep "darkens" active.
17. Go to Layer>Add Layer Mask and click "Hide All". Actually, this is a misnomer. It does not hide all. It only hides the layer we just finished pasting into the main image.
18. The "Darkens" layer **MASK (not the Darkens layer itself)** is active as seen by the border around the mask icon in the layers palette (if it is not active, click on it to activate it). The paint brush tool should be active and the foreground color in the tools palette should be white (please see Figure 5).

Figure 5. Tool Set-up to Adjust the Upper Right Portion of the Image



19. I quote Katrin Eismann: "White reveals, black conceals" – by selectively painting the upper right portions with white, those parts of the hidden layer will be revealed correctly in the main image. In our example, the four upper right neon signs in Figure 2 that are circled as over-exposed are painted with white, revealing the darker underlying layer where the brush was applied, bringing these signs into the correct exposure selected for them in step 9. There are several controls for achieving precision here: (a) the brush opacity can be set to less than 100% to control the rate at which the neons are darkened as a result of painting. (b) The size and hardness of the brush can be adjusted to precisely control the scope of the painting action. (c) The opacity of the whole layer can be adjusted. In fact, if different signs deserve different degrees of darkening, the opacity of the brush can be adjusted separately for the painting of each sign in order to paint-in exactly the degree of darkening wanted. (d) Errors are corrected by re-painting them with black. When completed the upper portion of the image will look like this (Figure 6).

Figure 6. All Neons Corrected



However, the bottom portion of the image will be still too dark, as shown in Figures 1 and 2. A similar process is now blended-in to the main image with the following steps.

20. Go back to the RAW file, re-acquire it in Camera RAW and set the exposure high enough to reveal the people on the sidewalk to the extent desired. This is an artistic judgment. In this image we want them neither too revealed (because it is night) but also not so obscured that they are a dark lifeless blob. Adjust Exposure to the desired amount for getting the people correctly exposed, paying no attention to the rest of the image because it will not be used.

21. With this image active, repeat steps 10 to 14 above.

22. In the main image, activate the Darkens layer.

23. Type CTL V to paste the copied image into the main image on top of the Darkens layer and name this new layer "Lightens".

24. Repeat steps 17, 18 and 19 above, thereby lightening the people as wanted.

The main image is now complete with the intended exposure in each zone of the photo, as shown in Figure 7.

Figure 7. The Completed Image



Compared with Figures 1, 2 or 3, this is a vast improvement.

A note on sharpening: I used PK Sharpener Pro Capture Sharpener immediately after opening each image in Photoshop, then used PK Output sharpener on the composite.

Mark D. Segal

mgsegal@rogers.com

Toronto, March 2005.