

BLACK & WHITE CORRECTIONS IN PHOTOSHOP

This PDF file is best viewed at actual size (Command-H on the Mac; Control-H on the PC) to maximize the clarity of photos and screenshots.

INITIAL SCANS:

Resolution

The traditional rule has been to scan at 2 times the target linescreen. If you're going to print at 133 lines per inch (LPI) then scan at 266 DPI. Extensive testing has shown this formula is actually a little high. 1.5 times the linescreen is usually adequate and in my own testing I've found that 200 DPI photos get excellent results at 150 LPI (that's only 1.33 time the linescreen). The only exception to this rule is photos that have a lot of straight line detail. Try your own experiments to see what works for you - remember that twice the resolution equals four times the filesize. (3" x 5" at 300 DPI = 1,704k but 3" x 5" at 150 DPI = 330k). These formulas work for both B/W and color photos.

You can scan at higher resolution than ultimately required to capture more detail and then reduce the image in Photoshop to required values. Tests have shown that more than twice the resolution is a waste.

Method

Always scan photos in Grayscale (256 Grays). Some scanners offer other methods such as Halftone, 16 Levels of Gray, Line Art, etc. AVOID all of these. It's also good practice to scan in even multiples of your scanner's true optical resolution (eg: for a 600 dpi scanner, scan at 150, 300, 600 1200, etc).

Learn Black & White First...

Color is much more complicated so get good at correcting black & white images first. Walk before you run! What you learn here will carry over to your work in color.

Practice!

The numbers in this tutorial are not written in stone. They are averages that will be good starting points in most cases but not always the best answer. Learning Photoshop is a lot like learning to play the guitar or to play golf - you have to practice. Reading is just not enough.

SETTING TONAL RANGE:

(Before proceeding, go to Preferences->Display & Cursors and ensure that the checkbox for Video LUT Animation is checked.)

This is the first step after acquiring any image. You maximize the tonal range of the detail in your image - you take the detail you're presented with and try to distribute it across the entire spectrum (256 shades of gray). This is done most easily in the Levels dialog (Command/Control-L). Open an image, open the Levels Dialog box, and proceed. If you use the enclosed image stan1.tiff, your results should be similar to the ones in this tutorial.

1. Setting Output Levels

Determine the printable range of your image based on this chart:

Printing Stock	Printable Range as a dot percentage	Printable Range as Output Levels
Newsprint	12-88	30-225
Uncoated	10-90	25-230
Coated	5-95	12-243

In most cases you will be printing on a good quality paper either coated or a good hard finish uncoated white stock (don't skimp on paper quality - it will only cause you grief). We'll assume good stock here - you should be able to print detail from a 5% highlight to a 95% shadow value. Set the Output Levels sliders (the ones at the bottom of the dialog box) according to the chart above. This keeps the highlights from blowing out (going to pure white - no dots) and the shadows from plugging up (going to pure black - no dots).

The next step, while still in the Levels dialog is to set the Input Levels - that is to maximize the quality of the detail that you have.



stan1.tiff

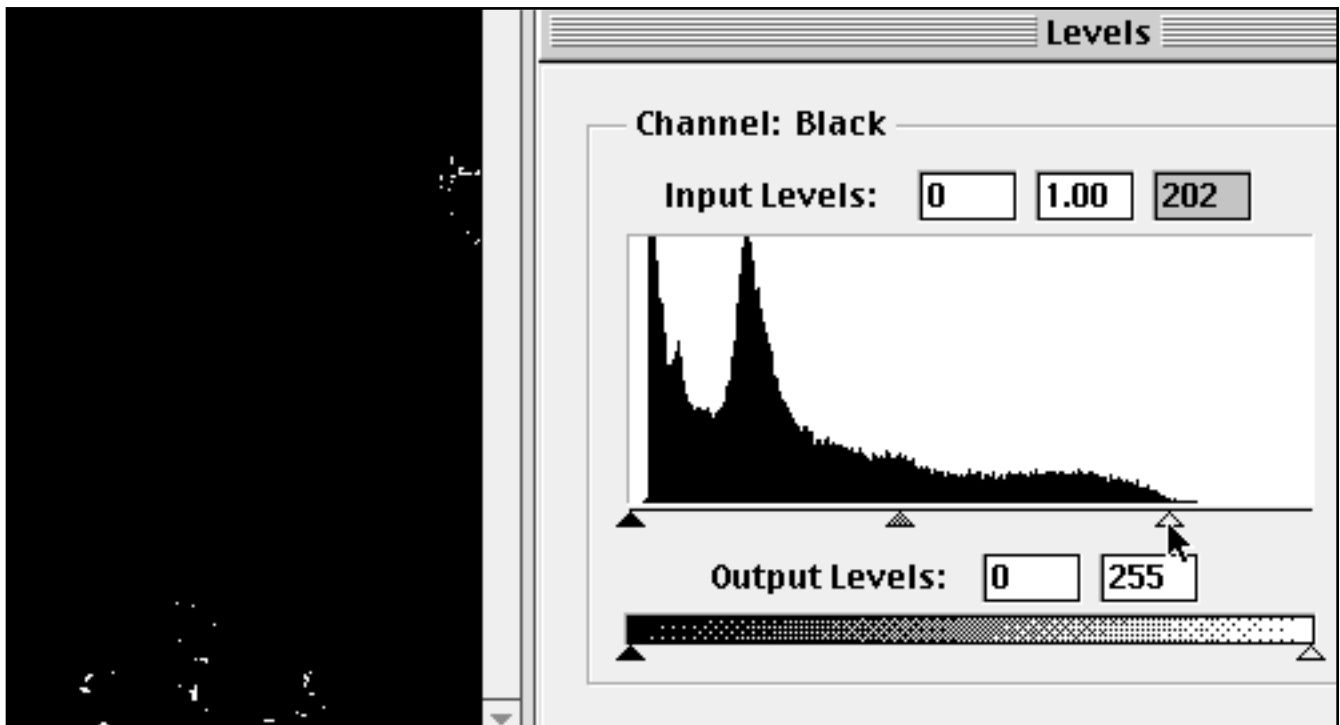
SETTING TONAL RANGE:

2. Setting Input Levels - Highlights

Photoshop has a very nifty feature to aid in this step - Highlight and Shadow Clipping. Move the Levels Dialog Box to the side you can see your image and UNCHECK the Preview checkbox.

Hold down the Option/Alt key and move the Input Slider on the right (Highlights) to the left. As you can see, the image turns black and gradually, as you move the slider, you see the brightest areas of your image emerge. If you let go of the mouse button, these areas and any brighter areas will be discarded. That point in the image will become the highlight value in your image (5% based on the Output Levels we set on the previous page).

Basically you are discarding areas of the image with no important detail and expanding the areas that do have printable detail into a fuller range of highlight values.

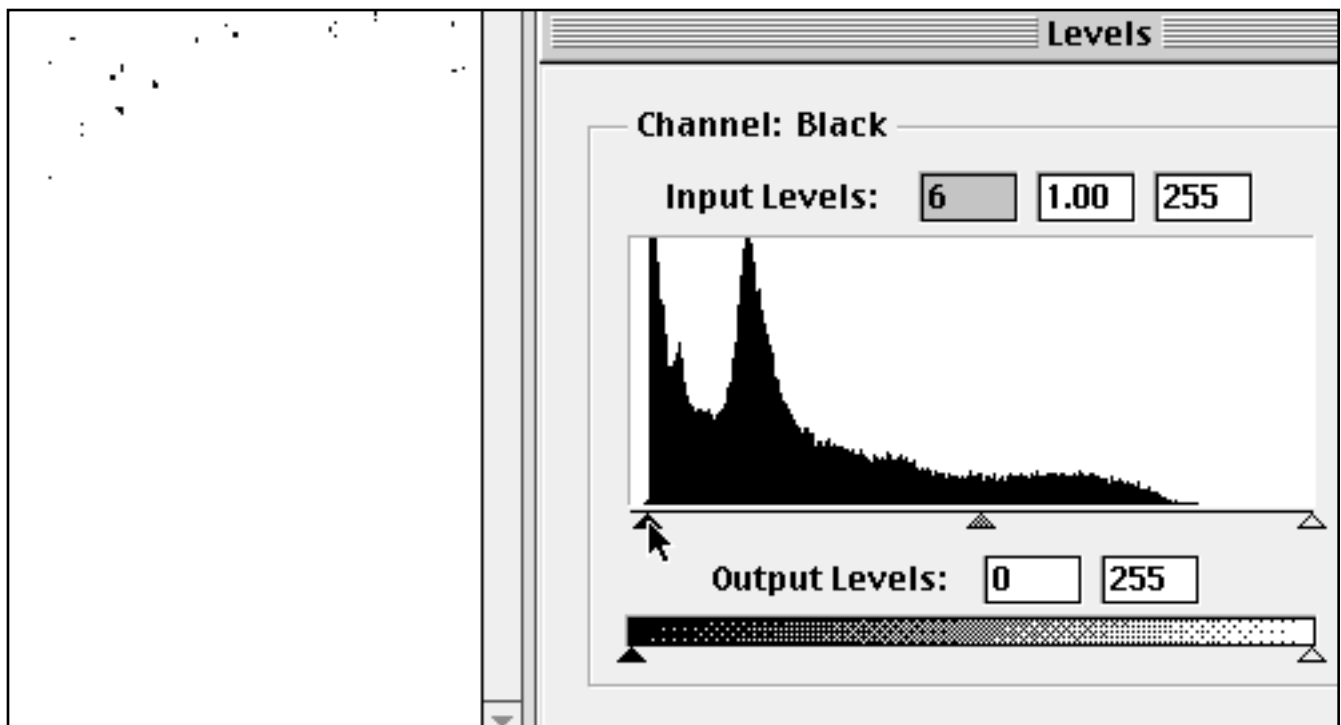


SETTING TONAL RANGE:

3. Setting Input Levels - Shadows

Hold down the Option/Alt key and move the Input Slider on the left (Shadows) to the right. As you can see, the image turns white and gradually, as you move the slider, you see the darkest areas of your image emerge. If you let go of the mouse button, these areas and any darker areas will be discarded. That point in the image will become the shadow value in your image (95% based on the Output Levels we set previously).

Basically you are discarding areas of the image with no important detail and expanding the areas that do have printable detail into a fuller range of shadow values.



The final step in Setting the Tonal Range is adjusting the Midtones...

SETTING TONAL RANGE:

4. Setting Input Levels - Midtones

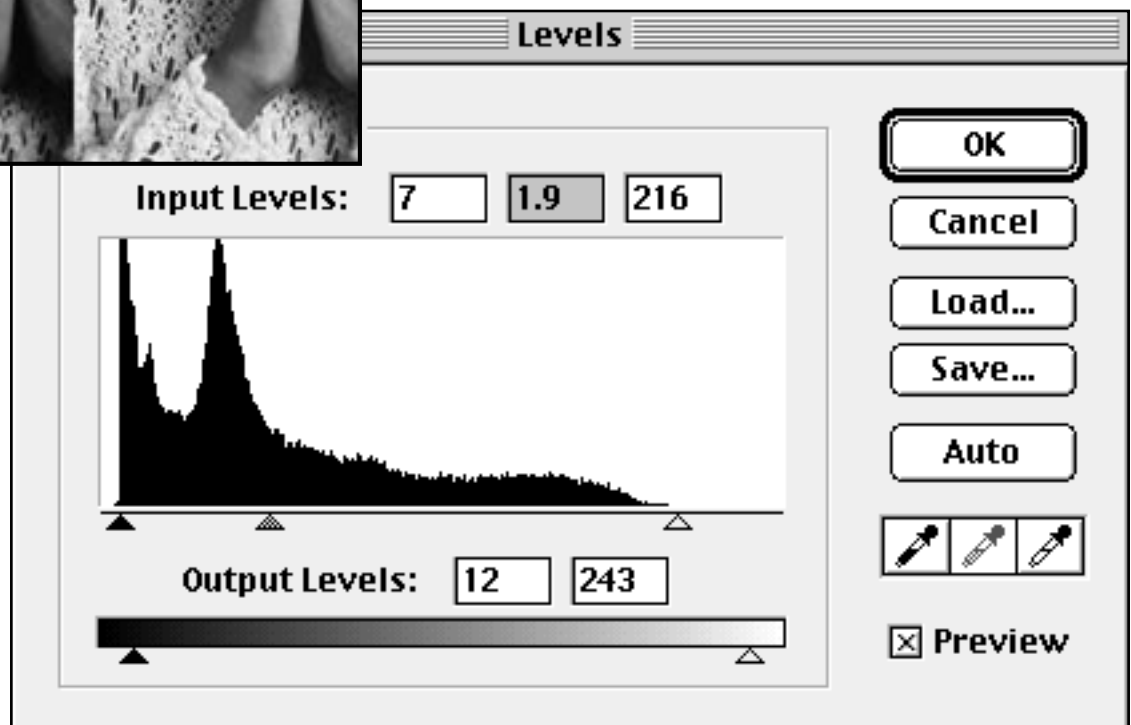
For this final step you have to click on the Preview checkbox to turn it back on. You will need to see the image change as you adjust the Midtones.

Move the middle slider (Gamma) to the right or left to adjust the midtones up or down as needed. In ALMOST ALL cases, scans from the desktop will be too dark and you will be moving the slider to the left. Values of 1.4 or 1.5 are fairly common. As you can see below our test image was quite dark and required a gamma of about 1.9 to open up the detail - this is higher than normal.



Helpful Tip:

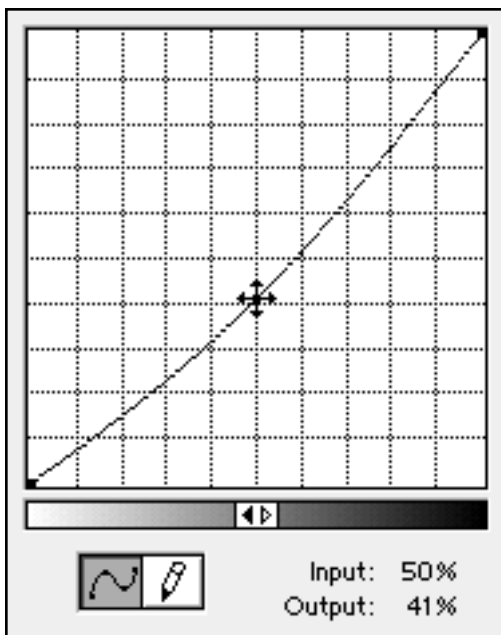
In all of Photoshop's native dialog boxes you can increment values in any numeric field with the up and down arrow keys on your keyboard. Holding the shift key down while doing this multiplies the increment by 10. In our Gamma adjustments, you can hold the shift key and hit the up arrow several times. Let go of the shift key to fine tune the setting.



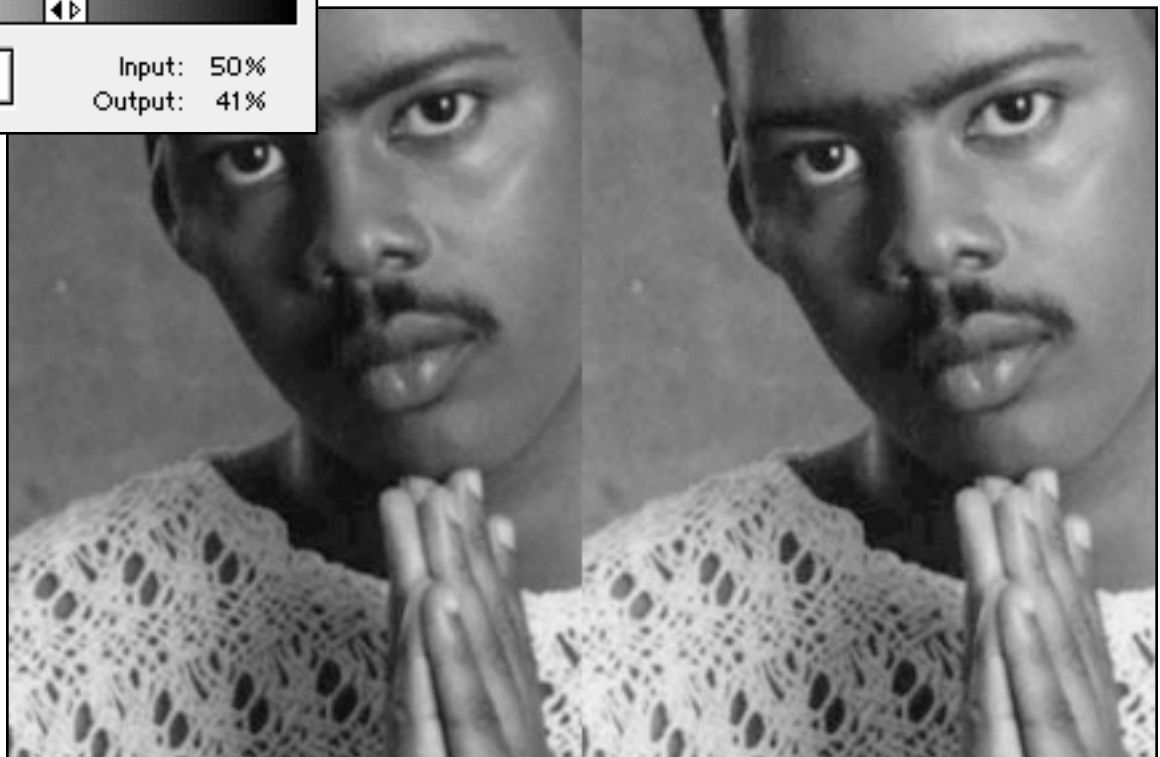
CORRECT FOR DOT GAIN:

Lighten the Midtones

When ink hits paper, the dots in a halftone spread a little. This is called Dot Gain. An image may look great on screen but it WILL DARKEN on press. Refer to the chart below and open the Curves dialog box. Place a point at the center of the grid and pull the curve down from 50 to about 41. This will give you compensation for a 10% gain in the midtones (a pretty good starting point for good stock) and it leaves the highlight and shadow values intact. Your image may start to look a little washed out, but it will darken back up on press. Experiment.



Projected Dot Gain	Dot % in Curves to get 50% Dot on Press
10%	41%
15%	36%
20%	33%
25%	30%
30%	28%

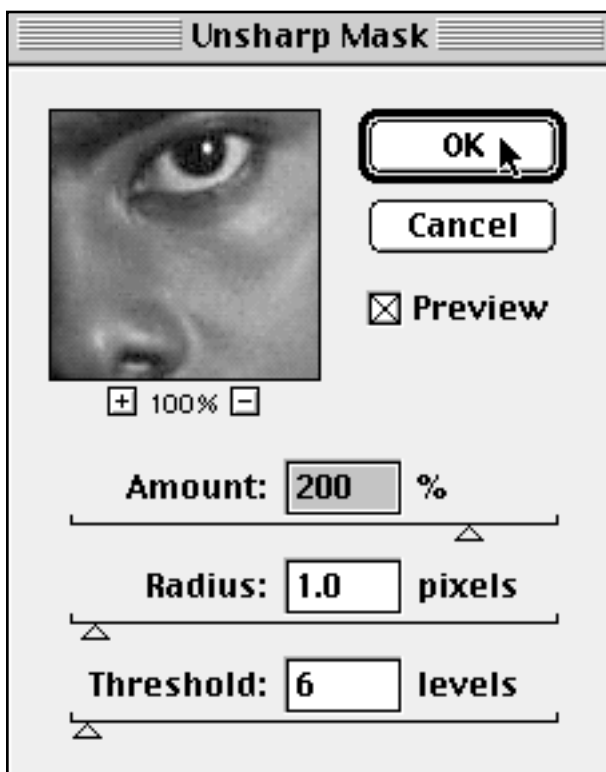


SHARPENING THE IMAGE:

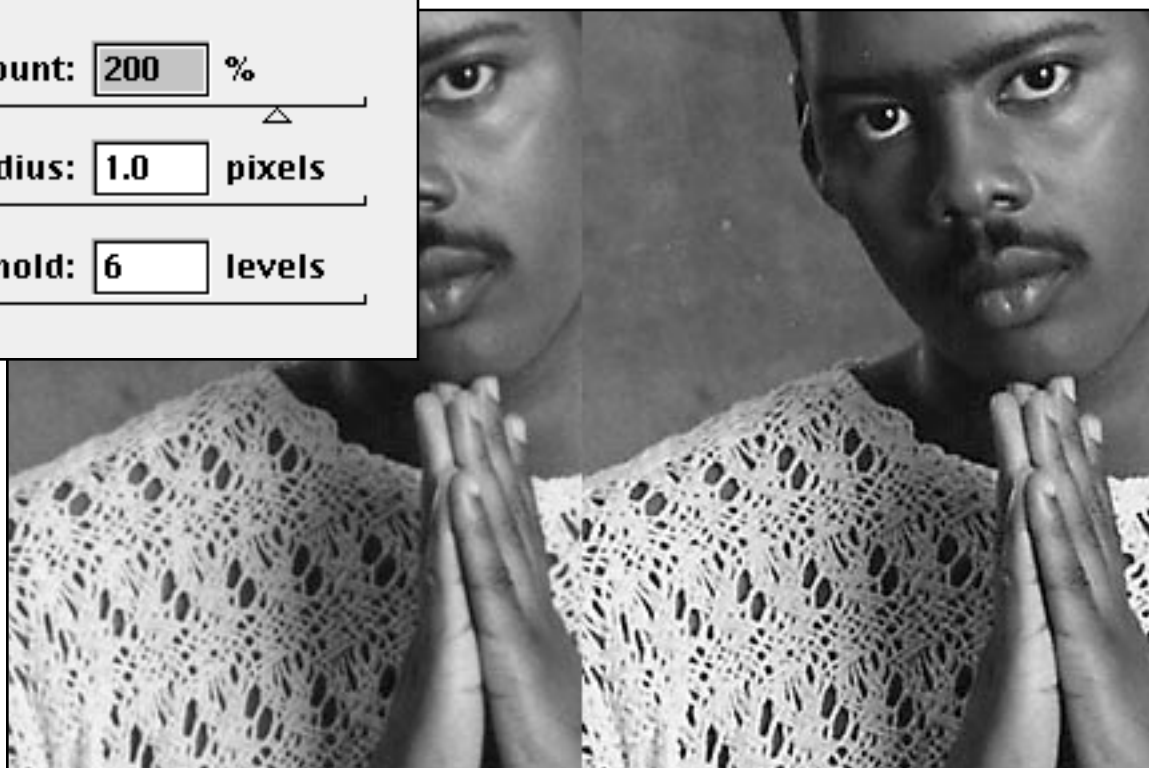
Use Unsharp Masking

This is the only sharpening option in Photoshop that should be used. It's the only one with any adjustments. Virtually ALL your scans will need sharpening.

Sharpening is achieved by placing a slight halo along the edges in an image. The Amount is how much of the effect is applied. Settings average from about 50 to 200 with 100 to 150 being common. Radius is the width of the halo. Normal settings are between .5 and 1.5 pixels. Most often 1 pixel is about right. Threshold is the sensitivity of the effect. Low settings allow sharpening of fine detail. As you raise the threshold, finer details are ignored by the filter. Here a fairly low setting allows sharpening of the facial hair and fine detail in the sweater. A closer shot of the face might require a higher setting to avoid



unwanted sharpening of the pores in his face while still allowing sharpening of the moustache & details in the lips and eyes. Settings are resolution dependent (as with most filters). Larger images usually require more sharpening. Halftoning tends to soften an image so if it looks a little too sharp on screen, it's probably just about right.



THE FINAL RESULTS:



Initial Scan

Adjust Tonal Range

Compensate for Dot Gain
and Sharpen