Image Restoration

By Ron Carran
May 11, 2007

There are many definitions of “restoring” a photo. You may want to fix the color, the tone, the contrast, or you may need to repair some damage on an old family memory. All of these can make a photo look “new,” or at least restore the appearance that you want.

Here are some techniques you can use to accomplish these tasks. Although some color and tonal corrections are relatively easy to achieve, repairing damage can take long hours of slow, methodical work. Most of the restoration that you might want to do to a photo will be successful if you take the necessary time.

**Note:** Many of the following examples have been taken from Katrin Eismann’s wonderful book, “Photoshop Restoration & Retouching.” The photos are copyrighted and may not be given out. Please respect the copyright and do not give them to anyone else.

**Note2:** I will update this document in the next few days, so the sections with no step-by-step instructions will be embellished.

Where to Start?

Assessing the Image
Before you do anything else, you need to assess the photo you want to repair, and decide what you want to do with it. Does it need tonal correction only, or are there structural problems to deal with?

First Steps
Probably the best starting point is with the most gross defect. However, sometimes you need to lead up to the biggest problem. If the exposure is uneven, it might be best to equalize it before trying to repair a rip or crease. You may cover up some defects while equalizing the tone.

Once that is done, getting to work on the big stuff is probably the way to go. But first, you need to set up Photoshop to the right defaults.
Setting up Photoshop
We are going to use Curves and Levels quite a bit in restoring, so we need to set up their parameters.

Open a new image (any image will do, even a blank one).

Open a curves or levels adjustment layer.

Set white and black points in Curves or Levels
Setting Auto options in curves/levels


**Adjusting Color & Tone**

Starting with a photo that needs a color cast removed, we can neutralize this color cast and adjust its dynamic range.

Consider this photo (from Katrin Eismann's book)

![Image Restoration](image.jpg)

The orangish color cast is quite pronounced. The picture probably was taken indoors without a flash. We can fix this easily in this case, using Curves or Levels.

Start with a Threshold adjustment layer to find the lightest and darkest point in the photo.

![Threshold Adjustment](threshold.jpg)

Notice the selected threshold points, 1) being the white point and 2) being the black point. We have to use our common sense sometimes to pick these points, because we do not know if the woman's shirt was actually white. But we'll assume it was. Also, the black point is a guess. It shows where the darkest point of the picture lies, but that doesn't necessarily mean it was black. But let's try these points and see if it works.
The resulting picture looks pretty good. We made some good judgments on where to place our white and black points.
If a photo is under or overexposed, or has faded with time, we can use Layer Blending Modes to help adjust the tone until it looks right. Consider this photo:

Copy the background layer and change the new layer’s blending mode to **Screen**, and you get:
On an underexposed picture, doing the same with the **Multiply** blending mode fixes the picture right up.
You can use one or more Levels adjustment layers to achieve similar results. Take this image which requires multiple adjustments.

This picture needs exposure equalization and density buildup. We can add some Levels adjustment layers to perform those remedies.
These adjustments yield this picture, which has a much more even exposure range through it.
Patching

Patching Dust, etc.
This is the part of photo restoration where you can be the most creative. Fixing a photo that has damage may require many different techniques, sometimes used in unorthodox ways. Here are some examples of photos that need special care.

Using Patterns for Healing
In this photo, we want to clean up the spots on both boys’ skin. One way is to find a portion of skin that is not damaged, or an area that you have fixed up and made smooth. With a sample, we can make a pattern that can be used to replace areas where the damage has occurred.

The technique is to draw a marquee around the good area, go to Filters/Pattern Maker, then click Generate. If you have too many repeating artifacts, you can hit Generate again. When you are satisfied that you have a satisfactory pattern, click the Save button at the bottom of the little preview window. Name your pattern, then hit Cancel to leave the Pattern Maker without applying you pattern.

Now, select the Healing Brush and click Pattern on the Options Bar instead of Source. Select the pattern you just made, and paint with short strokes on the damaged areas of the photo.

Dust & Scratches Filter (PhotoshopWorld 2001, pp. 121-123)
Here’s another technique for getting rid of dust and scratches that will work on the same photo.

1. Duplicate the background layer and select the copy.
2. Open the Filters/Noise/Dust & Scratches filter.
3. Bring the Radius up to where the dust and scratches disappear.
4. Bring the Threshold back until they just start to reappear.
5. Place a Layer Mask on the copy layer and fill with black.
6. Paint with a soft white brush on the mask (in airbrush mode) to “erase” the noise selectively.
**Patch Tool**
This tool allows you to fix large scars in unimportant areas with a minimum of trouble. You can activate the tool in 3 ways, Source, Destination or Pattern. Using the *Destination* option should work well for some of these blemishes.

![Image Restoration G Westchester Photographic Society May 11, 2007](image)

**Float and Move Technique** (pp. 138-140)
This technique can get rid of small spots in an unimportant area like the wall to the right of the woman. It is faster than cloning each spot independently. It involves offsetting a copy of an area by a pixel or 2, then changing the Layer Blending Mode to *Lighten* (to get rid of dark spots) or *Darken* (to get rid of light spots).
Major Renovation
Here is a picture that needs some data from another source to fix it up successfully.

We’ll use this picture as the source for the missing part of the subject’s head.
With a lot of judicious cloning and healing, we can end up with this.

There are many more techniques that you can try. As I stated earlier, Katrin Eismann’s book, “Photoshop Restoration & Retouching” will guide you through some seemingly impossible patch jobs. In the book are many other resources you can use to help you perform some impressive fix-up jobs.