

Chapter One: Introduction

Why Tinting Works

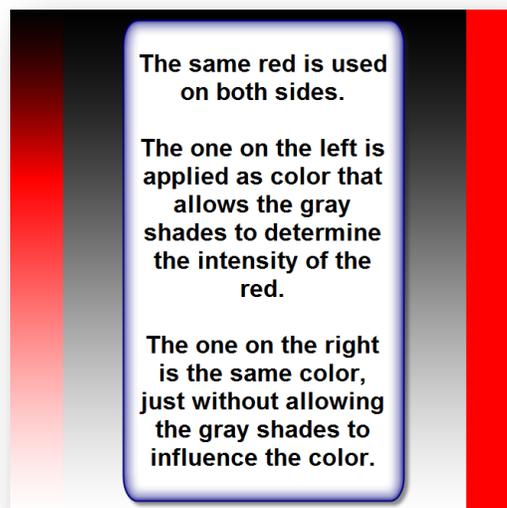
Files used: Black and White gradient.psd, Skin tones on light and dark skins.psd

The concept of being able to turn a black and white image to a full color image may seem a little bit like science fiction. Actually, it is something that has been done since the first days of photography and is even easier with today's tools and equipment.

As you move through this book you will notice that it demonstrates techniques that apply to any photograph as well as special techniques that are specifically for stereo (3D) images. Dating back to the beginning of photography, stereo images had their heyday between 1850 and 1920. Over the course of several years, I have produced hundreds of restored and tinted stereo images for my website: <http://www.civilwarin3d.com>. Restoring and tinting stereo images presents some unique challenges since each image is slightly different. If you choose to take on restoration of stereo images, first use the 2D techniques to restore the image. Then tackle the hurdles stereo images can create with the specific to 3D methods in this book.

So, how is it possible that you can turn a black and white (2D or 3D) image into color? Basically, the reason this is possible is in reality, there aren't any black and white images. They are a series of gray. The darker the gray, the darker the color that produced it; the lighter the shade, the more pale is the color. Knowing this, helps to determine what color to use. If you apply a dark red to an area of light gray, you will only get a pale shade of pink. The gray tones of the image determine what the final colors should be.

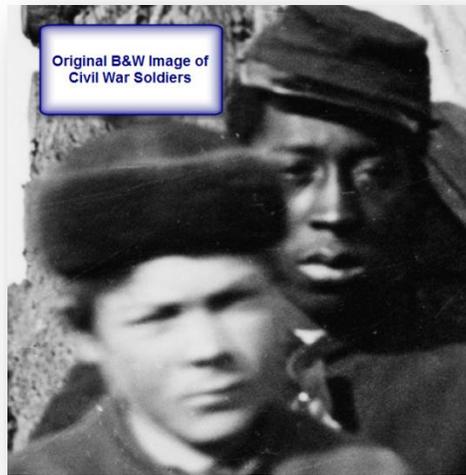
Looking at the image below you will see that the black area of the image at the top is slowly gradated to white at the bottom. There are 1,000 shades of gray between the top and bottom border. When color is applied to it, the red is completely invisible in both the solid black and solid white area. The only place that the red appears is in the areas of gray in-between.



WHY TINTING WORKS

For me, the real breakthrough came when I had an image of a very dark skin African-American standing next to a very pale Caucasian. I was sure that I would need to color each separately and find skin tone colors that would work for both. By that time, I had already seen examples of wood that when covered with a dark shade of brown would change from a pale to very intense color depending on the gray tones. However, I could not believe it would work with skin.

I decided to take a chance when applying the color to this black and white image.



I applied the same skin color to shade to both soldiers.



I next changed the layer to allow the gray underneath to determine the color intensity.



Using this same approach, you can create entire photographs that appear as if they had been photographed today. Probably the biggest (and repeated) compliment that I get regarding my work is, “How did you get the re-enactment to look so real?” Surprisingly this often comes *after* I tell them that I colored the black and white image in Photoshop. How can it look so much like a modern color photo? The secret is in the time and details that you spend with each image.

As you go through this manual, you will see examples using Photoshop CS5 on a Windows Computer. All of the tools are available for both Windows, Mac and (and a few on Linux). The majority of what is described here can be accomplished using Photoshop Elements (at about 1/5 the cost of the CS version) or even GIMP (GNU Image Manipulation Program <http://www.gimp.org/>) for free. The tool you use depends on your comfort knowledge and skill. But even on a limited budget, your ability to produce quality images is within your reach.

Finally, I don’t want you to become overwhelmed. A lot of times I hear things like, “Oh, but you’re an artist, so it’s easy for you”. The facts could not be farther from the truth. I believe that if I had some training as an artist I would have become better faster. I would have realized my mistakes and known how to correct for them. I do not have an art background, graphic design experience or previous skills at picking colors - nothing. Basically, if I can do it, you should be able to as well.

The long and short of it is - I learned most of what I needed to know when I got my first box of crayons. Stay in the lines, outline the area you want to color, shade in the rest. Well, it is a little more complicated than that. Think of it like this, your computer just became the world’s largest coloring book and you never have to worry about running out of your favorite color.

EQUIPMENT

Chapter Two: Tools Needed

Equipment

The short answer is:

- A computer (PC, Mac, Linux)
- A mouse
- A drawing program such as Photoshop, Photoshop Elements or GIMP

As you begin to work with images, you may want to expand the list above. For me I use the following:

- A 64 Bit Windows PC with a quad core processor and 6Gb of Ram
- Photoshop CS5 (no I have not upgraded yet). This is a very powerful graphic image program. But I did not start here. I did many of my early images using Photoshop 7 and then moved to Photoshop Elements and finally to CS5. If you are really on a budget, programs like GIMP <http://www.gimp.org/> will allow you to do almost everything shown in this manual for free!
- A drawing tablet with a stylus. While it is not necessary to use one, the difference in quality and speed is amazing. If you wonder what it is like to use a tablet, take out a pen and paper and sign your name. Now go on the computer and open a drawing program (such as Paint on the PC if you don't have Photoshop or GIMP yet). With your mouse try to sign your name again. It is difficult, isn't it?

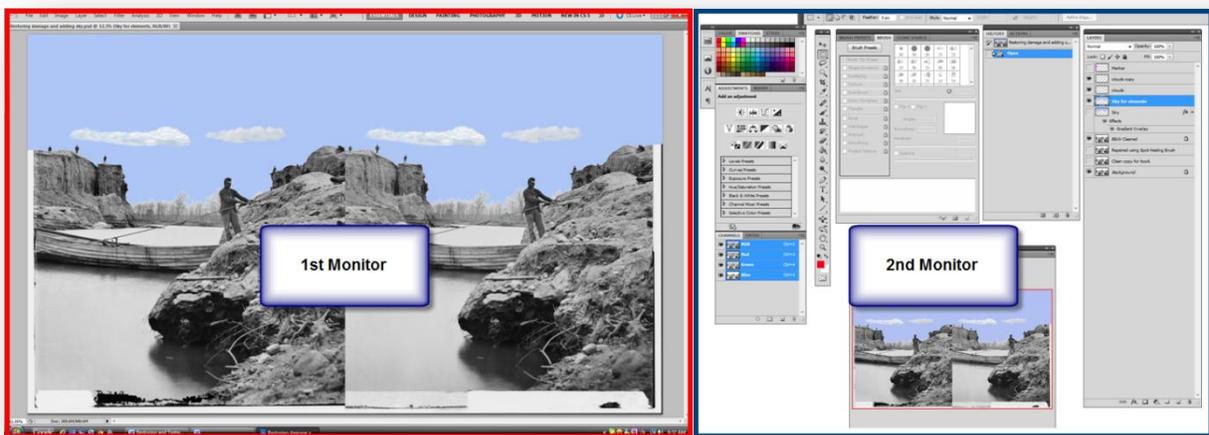
You know how to move the pen to form your signature the way you want but that same thing you do thousands of times a year looks like a horrible mess when you are using a mouse. You don't need an expensive tablet. The one I use was on sale for about \$150 dollars. I even purchased a used one of the same model as a backup on eBay for about \$100. The difference in the price is related to your skills as an artist. The more powerful ones have some additional sensitivity and automation available. For what we are going to do, a reasonably priced one will work well.

Even the reasonably priced ones have some great features. For example, if you make a mistake and want to erase something that you drew with your mouse - you would have to select the erase icon from the tool bar, then go back to the drawing and repeat the same clunky steps to erase it that you did to draw it in the first place. With a stylus on a tablet, simply turn it upside down (just like having an eraser on your pencil) and erase. When you are done, turn it over again and you are back to filling in the next area.

CHAPTER TWO: TOOLS NEEDED

- Dual Monitors. For those of you that have used them, no explanation is needed. For everyone else having two (or more) monitors quickly moves from a nice novelty to a must have necessity. I have been known to travel on vacation with a laptop and a spare monitor in the car so I don't have to go without.

A second monitor allows you to split work between two screens. For example, I may have the computer screen on the left showing me a modern color photo of a location or item I am working on and the image on the right shows the period black and white that I am trying to restore. Often what I will do is load the image I am working on into one screen and put all of the tools and controls in the other monitor. This way I do not have my image cluttered with parts of the application. For me this is very effective. I do not have to move things out of the way or rearrange my image as much as I would with a single monitor.



Dual monitors also are handy for other types of computer work and you find yourself soon wondering how you managed without one. You need to watch it though, or like me, you will find yourself dragging one along on vacation.

- A scanner. You don't need it to get started. You can use available images from many public sources. When you want to restore images that are part of your personal collection, then a good quality scanner is important.

Of course, there are other tools and equipment you could use. Some of this will depend on your budget, some will depend on your comfort level but most importantly it should depend on your needs. I would suggest that you start with the equipment you have. Do not go investing hundreds (or thousands) of dollars on hardware and software, just to find that you do not have any interest in this new hobby.

Chapter Three: Obtaining your images

Is it public domain?

Searching the internet it is easy to find a black and white image that you could use to repair and color. Just because you can find them does not give you the permission to use them. Many of these images are part of private collections, have existing copyrights or are not in the public domain. Be sure that you check on each image that you use, to determine if you have the rights for what you want to do. That same image that you used to practice and improve your skills at home, may cause a legal nightmare if you try to sell or display your altered version of the image.

A great example of just what can happen is with the “Hope” poster of Barack Obama. Shepard Fairey created the poster in 2008. It soon became the iconic image of the presidential campaign. Later it was ascertained that Fairey had used a photograph taken by AP photographer Mannie Garcia in 2006 that he found on Google to make the image. Associated Press sought compensation for the use of its image, an out of court settlement was reached and Fairey plead guilty to destroying documents related to the case. If you notice, I am not showing either the poster or the original photo (since they are not in public domain). If you would like to read more go here: http://en.wikipedia.org/wiki/Barack_Obama_%22Hope%22_poster.

CHAPTER THREE: OBTAINING YOUR IMAGES

Public domain sources that contain period images are:

The Library of Congress has thousands of images available in the public domain:

<http://www.loc.gov/pictures/collections/>

US Government Image collection: (mostly public domain)

<http://www.usa.gov/Topics/Graphics.shtml>

Wikipedia also has a large collection of public domain images:

http://en.wikipedia.org/wiki/Wikipedia:Public_domain_image_resources

Additional sources: (Please confirm public domain status)

<http://www.public-domain-image.com>

<http://copyrightfriendly.wikispaces.com/>

http://commons.wikimedia.org/wiki/Category:Public_domain

<http://www.publicdomainpictures.net/>



3D Content:

The best source for Public Domain Stereo Cards is probably the Library of Congress:

<http://www.loc.gov/pictures/collection/stereo/>

You can always go to your search engine and search on “public domain images”. Be sure to validate that you have the permission to use the images that you download.

IMAGE RESOLUTION: (DPI VS. MEGA PIXELS)

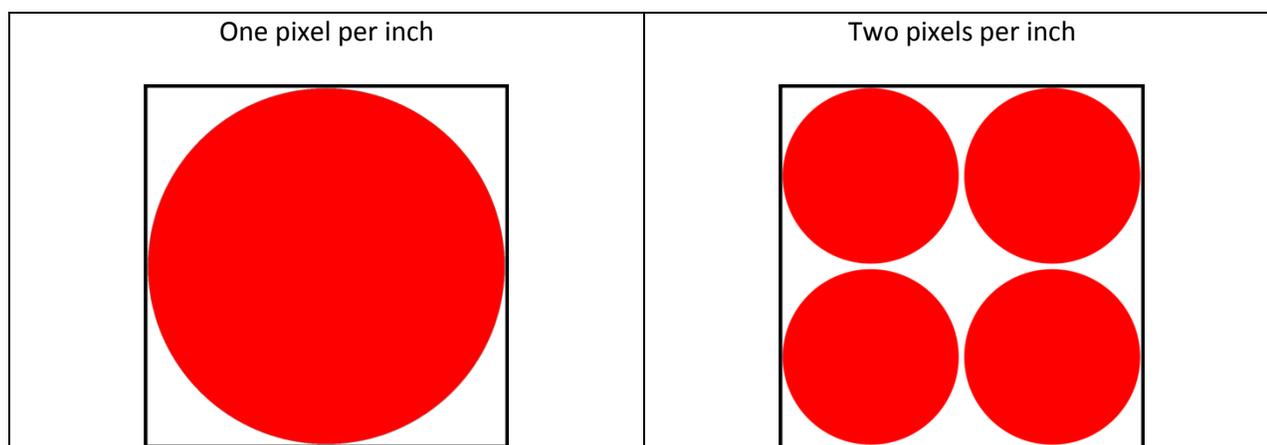
Image resolution: (DPI vs. Mega Pixels)

Files Used: Dots per inch.psd

Typically the screen resolution for your monitor will be 72 pixels per inch (some have resolutions of 96 pixels). When you look at it on the screen, this appears fine. It would appear that printing this will look great. If you try to print an image with this type of resolution you will find that its quality will suffer greatly.

There are several reasons for this, primarily the quality difference between screen and print. Print resolutions typically start at 300 pixels and can even be 600 or more pixels. If you do the math it would appear that the screen resolution is about one fourth ($300/72 = 4.16$) but in reality the image quality difference is much greater.

The reason has to do with how the calculation is made. The pixels per inch (or DPI- dots per inch) is based on how many single points can be crammed into an inch. The easiest way to explain it is to look at a simple example.



As you can see moving from one pixel per inch to two does not double the number of pixels that you can get in a 1 inch square. It is actually four times the number. When you increase the pixels per inch, you need to multiply the number by itself ($1 \times 1 = 1$ dot per inch, $2 \times 2 = 4$ dots per inch, etc.).

So with this in mind we need to figure out the maximum number of “dots” we could put on a screen with 72 pixels per inch. We know from our example above that we need to multiply both the horizontal and the vertical number of pixels (72×72) this gives us a total number of dots of 5,184, which seems like a lot. Now let’s do the same for 300 pixels per inch (300×300) and we get 90,000! Now if we divide 90,000 by 5,184 we see that the printed document is not 4 times the quality, but more than 17 times the quality! By just going from 300 to 600 DPI the quality difference between screen and print jumps to a dramatic 69 times! ($600 \times 600 = 360,000 / 5184 = 69.4$).

What this means is that the higher the pixels, the better the quality. Naturally, you would think you would want the number to be really high. Many scanners are capable of scanning 2,400 or even 4,800 dpi. Knowing what we just looked at and going on the concept of bigger is better, why not? Well the answer really is space. An 8 x 10 photo scanned at 4,800 dpi can be so large that most computers will not even be able to open it for editing!