

Pen Photography 101

Written by Gerry Rhoades

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Introduction

This article is meant to be a starting point for those who are just getting started at photographing pens and those who want to improve. Just like pen turning, good pen photography requires practice and the more you do it, the better your photos will be.

Digital photography has made the task of photographing pens easier and quicker in some ways and more complicated in others. The ease comes from immediate feedback. My photo background dates back to the prehistoric days of cut film and roll film and I really like being able to see if the shot is good right now. The problem with digital cameras, and even point and shoot film cameras is that they are now so automatic, they're more difficult to use for some things. Most digital cameras cannot be focused manually and many have no provision for manual exposure settings. You can easily take photos of pens by just pointing and shooting, but they are likely to be of marginal quality unless you take a few extra steps.

Which Features of a Camera are Important?

In order to take good photographs of pens and other small objects, you need a camera that has *macro focusing capability*, can have the *shutter speed and aperture set manually* and, ideally, has a *custom white balance option*. This doesn't mean you need to run out and spend \$1,000 or more on a camera. There are many cameras available that have all three of these features for \$200-300, such as the Canon Powershot S3-IS, Nikon CoolPix 5400 and Panasonic Lumix DMC-FZ10. A zoom lens isn't necessary for photographing pens, but it can be helpful. If you're thinking of buying a new camera or shopping for your first, don't get caught up in the mega-pixel "wars." If your camera will also be used for general family use and you don't need prints larger than 8x10, you do not need more than 6 mega-pixels. The manufacturers are constantly increasing the resolution (mega-pixels) of their cameras, but the average consumer doesn't need it. A professional who needs to make 16x20 or larger prints needs a 12 or more mega-pixel camera, but a camera with that kind of resolution is generally a waste of money if your primary purpose is posting pictures on the internet and 4x6 or even 5x7 snapshots.

The Owner's Manual

This is probably a good time to talk about the owner's manual. My number one recommendation is to **read the owner's manual**, at least twice, so you understand what the camera can and cannot do. This tutorial is not meant to take the place of the owner's manual, nor could it ever do that. Unfortunately, some of the owner's manuals that come with cameras are not very well written. This is particularly true of the manuals that come with digital single lens reflex (DSLR) cameras – those with interchangeable lenses. If you have a DSLR, there is probably a Magic Lantern Guide available for it and I highly recommend them to get the most from your camera. Magic Lantern Guides are published by Lark Books and a complete listing can be found on their website, <http://www.larkbooks.com/mlg> .

Exposure

One of the two important aspects of taking a good photo is the correct **exposure**. I used to teach photography, long before digital, and one of the things I had my students do was to photograph a white sheet of paper and a black sheet of paper, two different photos, with black and white film. The photos were taken in the same light and the exposure for each was set using a light meter. They then developed the film and looked at the two negatives. Everyone was always shocked that they could not tell the difference in the two negatives; they were identical in terms of density. The students had assumed that using a light meter would give them two distinctly different and properly exposed negatives. I won't go into the long technical explanation of why that happens, but light meters will always set the exposure to approximate what is called a "gray card" . . . no matter what object you point them at or how bright the object is. So, the answer is to point the light meter at a "gray card" to **get the proper exposure**. A gray card reflects 18% of the light that hits it. Clear north sky from about 10am to 2pm also has the same reflectivity. Setting the proper exposure for the existing lighting is important if you want people to be able to see what the pen actually looks like. An incorrect exposure can sometimes even affect the way colors are shown. Gray cards can be purchased from B & H Photo, <http://www.bhphotovideo.com/> for as little as \$3.95. However, an even better option is the 12" x 12" 18% gray microfiber cleaning cloth called Spudz which is \$8.95 from B & H, http://www.bhphotovideo.com/c/product/387585-REG/Spudz_PHOTO25_Micro_Fiber_Cleaning_Cloth.html . I have one of these attached to each of my camera bags.

These three photos show the correct exposure as well as one which is one stop over-exposed and one which is one stop under-exposed. All three photos were taken with the lens at the same aperture, f/11. The shutter speed for the correct exposure was 1/40 second. On the under-exposed photo it was 1/80 second and on the over-exposed photo it was 1/20. Note that "one stop" means either twice as much light or half as much light. With shutter speed it's easy to figure out what a "one stop" change is, either multiple by 2 or divide by 2. With aperture, it is more complicated. These are the full stop apertures that have become standard in photography:

1.0, 1.4, 2.0, 2.8, 4.0, 5.6, 8, 11, 16, 22 and 32. Lenses used on 4x5 and larger view cameras have apertures as small as 128, but that isn't important here.



Over-exposed @ 1/20

Correct exposure @ 1/40

Under-exposed @ 1/80

White Balance

The other, and equally important, key to accurate color rendition in digital photography is getting the white balance set correctly for the lighting conditions. All light has a color which is measured in degrees Kelvin. Regular incandescent bulbs are about 2800-3300K, typical daylight and electronic flash are 5500-6000K. The lower the temperature in Kelvin the redder the light and the higher the temperature the bluer. It should be noted that the human eye and brain, working together, filter what is seen and eliminate seemingly "odd" colors. So, just because you don't see the maple in the pen as pink does not mean the camera will not. Ideally, you want to use light that is 5500K, but assuming your digital camera has a custom white balance setting, you can use any light source. If your camera doesn't have a custom white balance setting you must get light bulbs which are 5500K because any other color temperature will change the colors of the object being photographed. Do not believe the claims of some light bulb manufacturers that their bulbs show true colors or that they are just like daylight. If the package doesn't state the color temperature, don't waste your money. Most, but probably not all CFL bulbs, also state the color rendering index or CRI. The higher the CRI, the more accurate the colors will appear. If you buy 5500K CFL bulbs, make sure the CRI is at least 90. All digital cameras have an "Auto" white balance setting and some digital cameras will produce very accurate colors under a variety of lighting conditions when set to "Auto." Unfortunately, some will produce very inaccurate colors when set to "Auto." You will have to experiment with your camera to determine how accurate this setting is.

The two photographs below show one taken with the correct white balance and one taken with the white balance set for incandescent bulbs but the lighting was actually CFL bulbs.



Depth of Field

Depth of field needs to be discussed because a photo of a pen that is only partly in focus will not look good even if the exposure and white balance are correct.

Depth of field (DOF) is the distance through which objects will appear to be in focus. DOF is controlled by three factors; distance from the camera to the subject, focal length of the lens and aperture. As the subject is moved closer to the camera, DOF decreases. As the focal length of the lenses decreases, DOF increases. As the aperture is closed down, DOF increases. Pen photography, by its very nature, results in a shallow DOF, because the subject is close to the camera. My camera is typically about 15 inches from the pen, and many point and shoot cameras will be quite a bit closer. If I set the aperture to f/11, the DOF is just about 0.75 inches. If I set the aperture to f/16, the DOF increases to 1 inch. These are pretty typical DOF measurements for photographing pens. You can maximize this shallow DOF by orienting the pen as close as possible to parallel to the back of the camera. And you should definitely avoid placing the pen at a steep angle to the camera.

Putting it All Together!

So much for theory, here's how to put it all together.

1. ***I recommend using three lights for photographing pens and diffusing the light.*** I use a home-made light cube made from 12-inch squares of 3/16" white translucent plexiglass glued together with CA. I purchased the plexiglass from <http://www.delviesplastics.com/> and used five 12" x 12" pieces of #2447 translucent white. I have one light on each side and one directly above. I use 27w 5500K CFL bulbs. I turn the lights on and leave them for several minutes to completely warm up because I found the color changes a bit after they're been on for a while.



2. ***Put the camera on a sturdy tripod*** and exactly follow the camera maker's directions for setting the white balance. Some may tell you to use a plain white sheet of paper and some may tell you to use a gray card. If you can use a gray card it will be more accurate than a sheet of white paper. My camera has a custom white balance setting and the ability to recall the setting at any time. When ***setting the white balance***, make sure the white paper or gray card fills the viewfinder completely. If you use white paper, try very

hard to find white paper with a brightness factor close to 100, do not use any paper with a brightness factor less than 95 because it will not really be white.

3. Now, ***take the gray card***, which you probably had to buy mail order from some place like B & H or Amazon.com and place it where the white paper was. Make sure it fills the viewfinder. Switch the camera to A(perture) priority (in photographic jargon aperture and f-stop are the same) and the f-stop to the not quite the largest number your camera has, probably around 8, unless you have a single lens reflex in which case you should set the aperture to f11 or f16 depending on the lens.
4. After setting the f-stop, partially depress the shutter release button and ***the camera will show you what shutter speed is required***, 1/25 for example. Now remove the gray card from the tent and replace it with the pen you want to photograph. Place the pen so that it is parallel to the back of the camera to ensure the entire pen will be in focus.
5. ***Switch the camera to M(annual) and set the shutter speed to 1/25 or whatever speed you got with the gray card in place***. If your camera is not a DSLR, BE SURE the camera is set for Macro focusing (generally a flower symbol) and that the camera is within the macro focusing range of the camera. Some DSLRs have a flower symbol but it does not provide true macro focusing, it only closes down the aperture. Look through the viewfinder or look at the screen and depress the shutter about half way. The pen should snap into focus if you are using autofocus.
6. ***Take the picture***. You should now have a properly exposed photo of the pen and the colors should be accurate. If the picture looks a hair dark, you can reduce the shutter speed and take another photo. If it looks too light, increase the shutter speed. Then upload the photos to your computer and see which one is best.

If, during the testing with the gray card, the camera indicates you need a shutter speed slower than about 1/50, you should use the automatic timer to take the picture to eliminate any camera movement due to depressing the shutter release manually.

This photo shows my photo setup just before releasing the shutter. The large white paper keeps out unwanted reflections. One hole in the paper is for the lens and the hole above it is for the flash. I use the flash on very low power and with a diffuser to put the “shine line” on the pens.



Odds and Ends

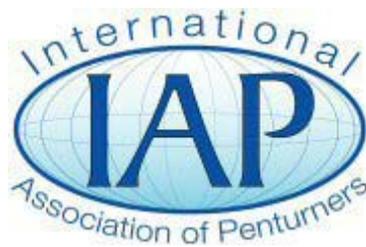
Color film and digital cameras by extension have a limited range of brightness that can be recorded and still show detail, and this brightness range is significantly less the human eye can recognize. Black and white film has the same limitation but the range is greater. What this means is that you will have problems photographing pens with extreme contrast, if you need to have detail in either the light or dark areas. If you are photographing a dark pen and want to retain detail in the dark area, you can mitigate this problem by using a darker background and slowing the shutter speed by 1/3 or 1/2. This will help the dark area but if the metal is a bright silver color, it will most likely wash out.

For those who have a DSLR, I highly recommend getting a macro lens of 50-100mm focal length. Even third-party macro lenses are notoriously sharp, provide great contrast and will give you much higher quality images than the usual 18-55mm “kit” lenses. Used macro lenses are available on eBay on a regular basis and often at quite reasonable prices. I purchased a 55mm f/2.8 Micro-Nikkor on eBay for about \$100 and this is the only lens I use to photograph pens. The lens won’t autofocus on my Nikon D40, nor will it meter. Focusing is done just the way I’ve always done it, although the D40 does have an indicator that lights up when it “thinks” the object is in focus. To get around the metering problem, I use the histogram to check that the highlights in the image are not being “clipped,” which means that the histogram is not against right side of the graph. Rather than trying to explain a histogram, I will refer you to this explanation, <http://www.dpreview.com/learn/?/key=histogram> . Check your camera’s manual to see if you can view the histogram on the LCD. If you have a DSLR, you definitely can, but how you get it to display varies by camera brand. In short, you do not want the right side of the histogram touching the right margin of histogram frame.

And finally some thanks

To Keith Larrett (VisExp), Lou Metcalf (DCBluesman), Roy Robaldo(Oklahoman), and Al Stramiello (DocStram) for their editing help, suggestions and encouragement.

**This tutorial was downloaded from
The International Association of Penturners**



<http://www.penturners.org>