

Guide to Photographing Art

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You, the art director, curator, and/or publication editor needs excellent images of your artworks to promote you in print, film (including slides), broadcast, multimedia production (CD, DVD), high definition electronic displays, email, web, and to satisfy submission requirements.

A professional specializing in art photography should be your first choice. The pro should supply you with high-resolution digital image files - at least 21 megabytes (MB) - on a CD or DVD. Start with these image files to satisfy every purpose listed above. It does not make technical sense to start with film.

If you are a good photographer, but you are not an art photography specialist, this guide will give you the special information you must use to make good images of art. Aim for excellence.

If you are not a good photographer, and must do it yourself for some reason, then follow this guide as best you can. Aim to produce good images.

Photographing art is a complex specialty, so be patient. Don't get stuck - ask for help. Practice makes better pictures, so practice.

This guide does not teach you how to make digital images from existing film or prints. Consult a professional for film-to-digital conversion.

This guide does not teach you how to make prints.

1. OVERVIEW

- 1.1. What you'll need
- 1.2. How photography works
- 1.3. Control the light source
- 1.4. Set up the subject, lights, and camera
- 1.5. Make Camera Settings
- 1.6. Focus, set exposure, and shoot
- 1.7. Experiment with lighting, perspective, and detail
- 1.8. Transfer your data and back it up
- 1.9. Either Don't edit
- 1.10. Or edit lightly

2. WHAT YOU'LL NEED

- 2.1. Digital camera. You'll need a 6 megapixel or higher digital camera with at least 3X zoom or its equivalent range in fixed focal length lenses.
- 2.2. Source. Strong white light.
- 2.3. Diffusers. To soften the light and make it one-directional.
- 2.4. Support. To hold the subject upright.
- 2.5. Tape measure. To line up camera with subject.
- 2.6. Level. To level artwork. A plumb helps adjust sculptures to vertical.
- 2.7. Backdrop. To provide a neutral, non-distracting background.
- 2.8. Tripod. Hand-held is NOT OK. Tripod is required for making images for film, print, or high definition electronic displays.
- 2.9. Computer and image editing software. If you're doing your own editing.

3. HOW PHOTOGRAPHY WORKS

- 3.1. When light hits a subject, some gets absorbed and some gets reflected. The camera captures what gets reflected. It focuses the image onto a detector (film or electronic).

3.2. Your beautiful subject has many colors in it. To capture them all you have to illuminate the subject with light that has many colors. That would be a “broad spectrum” or “daylight white” light source.

3.3. If you position the camera, subject, and light source properly, the subject will fill the frame, show no distortion, and have uniform illumination,

3.4. You control the camera by making the right settings, focusing carefully, and controlling exposure.

3.5. Once you’ve made pictures, you must either hand them to service providers or edit them yourself to suit your purposes: print, film, broadcast, multimedia production (CD, DVD), high definition electronic displays, email, and/or web. Basic editing involves crop, rotate, resize, and spot removal; and adjustment of brightness, contrast, color balance, and saturation.

4. CONTROL THE LIGHT SOURCE

4.1. Good sources. Bright halogen lamps are good, skylight is better, and sunlight is best. All have a broad spectrum. Halogen lamps are slightly yellowish or “warm”. That’s OK. Skylight on a clear day (the light you see in the shade, or light coming from a window but not directly from the sun) is slightly bluish or “cool”. That’s OK. Skylight on a cloudy day is even cooler. Still OK. Direct sunlight from about three hours after sunrise to about three hours before sunset is neutral white, the best color. Neutral white means as it has all colors of visible light in it in nearly equal amounts. Finally, you can see what professional lighting equipment looks like by visiting photography stores such as <http://calumetphoto.com>, <http://www.bhphotovideo.com/>, and others.

4.2. Bad sources. Tungsten lamps emit very warm light and are not OK. Fluorescent lamps, even those labeled “full spectrum”, have peaks and valleys in their spectrum, and are not OK. For the same reason, sodium, mercury vapor, and neon lamps are not OK. Light closer to sunrise and sunset is too warm, and is not OK.

4.3. Uniformity. Position light sources to provide highly uniform illumination. Uniform means the same brightness everywhere; no dim spots, no bright spots.

4.4. Diffuseness. Direct sunlight, or a bright bulb, is strong and directional and therefore casts dark, sharp shadows. To diffuse the light, soften shadows, and make the illumination more uniform, put something translucent between the light source and the subject. This is called a diffuser. Make one or buy one from a professional photo supply store. It can be fabric or plastic or even frosted glass. Alternatively, aim the source at an opaque white reflecting surface (a reflector), and use the reflected light to illuminate the subject. Skylight on a foggy or cloudy day is already diffuse.

4.5. Eliminate shadows. With two diffuse sources of the same kind at similar but opposite angles, you can nearly eliminate shadows. To bring up texture and shadows within the subject, position one source at a different angle to the subject, or add a third, non-diffuse source.

4.6. Flash. You can use the flash on the camera as your light source if necessary. Otherwise, turn it off. If you must use it, keep in mind that it is strong, directional, and non-uniform. A camera-mounted flash often produces a flat-looking image because it hits the subject straight on: no shadows except behind. To mitigate these problems, aim it at a white reflective surface and use the bounced light for illumination.

5. SET UP THE SUBJECT, LIGHTS, AND CAMERA

5.1. Neutral color, non-patterned backdrop. Fashion or purchase a neutral dark, neutral gray, or neutral

white backdrop. Neutral means no color. Unless you intend to add a color cast to the image, use neutral backdrops. Non-patterned means no discernible weave or printed pattern. A weave or other grid-like pattern will likely produce unwanted moiré patterns (swirly bands of light and dark) in the digital image. A random pattern, like the patchy backdrops used in portrait photography, are OK.

5.2. Option A for backdrop. Use two pieces of matboard, one vertical and behind the subject, and the other horizontal and underneath the subject.

5.3. Option B (B is for Better). Hang stiff cloth from a horizontal rod, and let it swoop down behind then underneath the subject and come all the way to the front. This way there's no corner as with the intersecting mat boards. Stretch to eliminate folds. A curved backdrop produces a desirable gradual change in background tone in the image. This kind of backdrop also provides for easier editing later.

5.4. Position the subject. For 2D art this means the lens axis is perpendicular to the plane of the artwork, and exactly on center.

5.5. Position the lights. First achieve uniform illumination. Then tweak to reveal texture or dimensionality, soften highlights, minimize shadows, and so on.

5.6. Remove glass. Remove glass from framed pieces if possible. Otherwise you're capturing reflections. If you can't remove the glass, shoot from the side and reposition light sources to eliminate as many reflections as you can, and make the shot. The picture will be distorted – the near parts bigger than the far parts (called "keystoning"). You may be able to correct the distortion in the image editing program.

5.7. Use a tripod. Use a tripod. Use a tripod. Hand shake from heartbeat alone will wreck a slide or larger print made from a handheld camera. Image stabilization or "IS" technology is available in some lenses. It helps but does not solve the killer camera shake problem.

5.8. If you have a non-zoom lens. Ideally, choose a focal length that is near normal for the format. That means about 25 mm for most consumer or prosumer digital cameras, about 50 mm for digital SLRs whose detector is as large as a 35 mm film frame, and about 80 mm for medium format (2 ¼ inch) detector. The normal focal length produces the least distortion and highest resolution.

5.9. If you have a zoom lens. Start way back and zoom in. Then adjust the camera-to-subject distance and adjust the zoom until the subject looks as big in the viewfinder (the LCD or the eyepiece) as it looks to the naked eye. There are many such positions. Again, choose the position that puts the camera a conveniently far distance from the subject.

5.10. Vertically position the camera. Locate the center of the subject by eye, or better, use a long straight edge or tape measure to find the intersection of diagonals. The center of a rectangle is where the diagonals cross. Next use tripod adjustments to position the camera so that the lens is level with the geometric center of the subject, and aimed straight at it. You'll know it's right if, in the viewfinder, a rectangular subject seems perfectly rectangular – no keystoning. Get the subject to nearly fill the viewfinder or LCD, leaving about 10% extra space on all sides of the subject. If the art is in a frame, include the frame and add 10% extra. Make detail shots later.

6. MAKE CAMERA SETTINGS

6.1. Instruction manual. Get out your camera instruction manual. You will need it.

6.2. Memory. Use a memory card with enough space to store at least 24 full resolution pix. In your camera

instruction manual you'll find a table that gives the number of high-resolution shots you can fit on a memory card of a given size.

6.3. Resolution. Set to full, highest resolution, or largest pixel dimensions, and the highest quality. This will give you plenty of data to work with.

6.4. Quality. Also known as JPEG setting or degree of compression. Choose "highest quality", or "lowest compression" to avoid nasty boxy artifacts, loss of detail, and inaccurate color that otherwise wreck slides and prints. In some cameras, resolution and quality are combined. Example: for Olympus cameras, the selection might read SHQ 3200 x 2400. This means super high quality (least compression), and largest pixel dimensions (i.e. the detector is actually 3200 pixels wide by 2400 pixels high).

6.5. File format. Choose TIFF if available (for uncompressed file) or JPEG (compressed). [If you're an expert, and the camera offers RAW format and you have software to decode and edit RAW image files, shoot RAW at the highest bit depth. The file size will be about twice the TIFF size and about 6 times the size of the highest quality JPEG.]

6.6. Sensitivity or ISO. Choose the default (usually auto ISO, or ISO 100 or 200).

6.7. White balance. Choose "auto" and make a test shot. If this produces a color cast in the image that you don't see in the actual scene, experiment with white balance settings to match your light source. Try "fluorescent", "tungsten", "sunlight", "shade", "flash", and so on. Experienced photographers put a "gray card" in the scene, then set the white balance so that gray spot in the image is actually gray, then make two exposures: one with the gray card present, and one with it absent. During editing, the first image is used to correct the second.

6.8. Turn on auto-focus and select the type of focus. For 3-D subjects, select multi-point autofocus rather than single point. If auto focus fails to find the most pleasing plane of focus, go to manual focus, if available, and adjust focus manually.

6.9. Turn on auto-exposure and select the type of metering: Select "spot" or "center-weighted" metering when aiming at subjects whose brightness contrasts strongly with the background. Select "overall" or "average" if the subject does not have too great a range of brightness, or when the subject and background have similar brightness. You may need to experiment.

6.10. Turn off auto-sharpening or set the degree of auto-sharpening to minimum. Otherwise, the slide, print, or high definition screen image will show halos around edges. Don't worry if the resulting image seems a little "soft". During image editing you can adjust sharpness appropriately for specific purposes.

6.11. Turn off auto-contrast or set the degree of auto-contrast to minimum. Otherwise, the camera will cut out image data corresponding to detail in bright regions and detail in dark regions. Don't worry if the resulting images seems a little "flat". During image editing you can adjust contrast appropriately for specific purposes.

6.12. Turn off the flash. (Unless, unfortunately, it is your only decent light source.)

7. FOCUS, SET EXPOSURE, AND SHOOT

7.1. Focus. Most cameras focus automatically and precisely. This is fine for 2-D subjects. For 3-D subjects, go to manual focus (if you can). In manual focus you can make sure that most of the object is acceptably sharp from front to back, or that the part that must be in sharp focus is in sharp focus.

7.2. Set the exposure mode. Most cameras set exposure automatically and accurately. You can simply choose a setting such as Auto, P, or a scene mode. When you choose any of these, the camera automatically optimizes the combination of aperture (the lens opening) and shutter speed.

7.3. Control depth of field. For 3-D subjects, choose “A” or “Av” (aperture priority) mode. Then by subsequently adjusting the aperture, you can control the depth of field: the range from front to back that’s in suitably sharp focus). To increase depth of field, increase the F-number (smaller aperture); or vice versa. When you shoot in “Av” mode, the camera will automatically choose the shutter speed for you.

7.4. Set the exposure manually. For experts. Do this only if you have a light meter that provides aperture/shutter speed combinations, or if the camera metering system can give you an exposure to begin with.

7.5. Turn on exposure bracketing. This will produce three shots that differ in exposure from “ideal” by some increment. Set the increment to 1/2 EV.

7.6. Place a gray card in the scene. This is the professional alternative to using auto white balance. The image with the card present will be used as a reference for making color corrections during image editing. Cards are available, for example, from Kodak or GretagMacbeth.

7.7. Shoot using the timer. Set the delay to about 10 seconds, press the shutter release button, remove your hand, and wait for the camera to make the shot. For digital SLRs, use mirror lock for the ultimate vibration reduction.

7.8. Or shoot using a remote control.

7.9. No timer or remote? If you do not have a timer or a remote control, use a shutter release cable, or as a last resort, the “slow squeeze” method when pressing the shutter release button to minimize camera movement during exposure.

7.10. Repeat with the exact same exposure settings, this time without the gray card. This image will be the one, once corrected, used for publication.

7.11. Review your shots. Set the camera to review mode. Choose the best exposures. Judge the sharpness by zooming in while looking at the LCD screen or viewfinder.

7.12. Make another shot at the selected exposure. The second shot gives you an alternative in case something went wrong with the first that you were unaware of.

8. EXPERIMENT WITH LIGHTING, PERSPECTIVE, AND DETAIL

8.1. Change lighting. Rearrange lights to emphasize different features.

8.2. Change perspective. Reposition the camera to the left, right, above, or below the subject; change the focal length by changing lenses or adjusting the zoom. Shorter focal length, or wider angle, or zooming out, exaggerates shape. Longer focal length, or more telephoto, or zooming in, flattens shape.

8.3. Make close-ups to capture details. Zoom in on features that demand close inspection or that illustrate your skill.

8.4. Finish variation shots before moving on to the next subject.

9. TRANSFER YOUR DATA AND BACK IT UP

9.1. Transfer images from the memory card in your camera to a storage destination.

9.1.1. Option A: Follow the instructions that came with the camera. You may have to use the USB cable or the dock that came with the camera to connect the camera to the computer, and you may have to use the software that came with the camera.

9.1.2. Option B: Follow the instructions that came with the camera. Remove the memory card from the camera and plug it into a matching slot on your computer, printer, or memory card reader. Your computer may then automatically launch its own picture software or the software that you installed when you got your camera. Alternatively you may launch an image editing program of your choice, and use File>Browse to view the images and their information.

9.2. Review your images. Select the pictures that best satisfy the requirements for each of your purposes. Toss pictures that are obviously not useful (e.g., out of focus, badly exposed, badly illuminated, badly composed, etc.).

9.3. Save your selections. Using the camera's software, the computer's picture software, or your chosen image editing software, save the selected images to your hard drive in a file folder you create for that purpose. The file folder name should include the date and subject. Example: "081206DisneyWorld" is the name of the folder that holds all the shots made on August 12, 2006 at Disney World.

9.4. Back up your selections. Back up your selections. Back up your selections. Copy the selections from the hard drive to a CD or DVD using the computer's CD or DVD-writing software. Label the CD with the date of the shoot and the subject matter, and store it in a slipcase or "jewel box", or a plastic sleeve, in a cool, dark, dry place.

9.5. No computer? Bring the camera or memory card to a camera store and have them burn all the originals onto a CD. Label the CD with the date of the shoot and the subject matter, and store it in a slipcase or "jewel box", or a plastic sleeve, in a cool, dark, dry place.

10. EITHER DON'T EDIT

10.1. Don't edit at all if you're sending the picture to a service provider for processing. If you're giving them a CD or DVD, give them a copy of yours. Label the disk with the word "Copy", the date of the shoot and the subject matter, and your contact information, and get it to the service provider. If you're sending the files electronically via the internet (either as email attachments or FTP), follow the service provider's instructions exactly.

11. OR EDIT LIGHTLY

11.1. Image editing. Edit your digital images using standard image editing software. The software that came with your camera may be limited. Before you choose the software, get advice from a digital imaging expert. Once you get the software, get training. You will have to make color management settings appropriate to the task. Please follow this advice. You'll save a whoppingly huge and enormously large amount of very valuable time for yourself and anyone who receives your images.

11.2. Calibrate your monitor. There are two levels of calibration: rough and precise. To calibrate roughly, i.e. without using special equipment, follow the instructions of your operating system (Windows or MacOS), or of the image editing program you're using. To calibrate precisely, borrow or purchase monitor calibration

equipment and software. The equipment is a mouse-sized object that you place right against the screen. It reads patterns of color that the software sends to the screen, calculates the adjustments that will produce accurate color, stores the calibration results, and then applies the adjustments to images displayed on the screen.

11.3. The absolute necessity of calibrating your monitor. The result of calibration is that when you display an image, the colors correspond to the image data. Without calibration, what you see will not correspond to the image data. When you make adjustments to an image viewed on an uncalibrated monitor, you turn good data into garbage. Do not edit images on an uncalibrated monitor.

11.4. Select an image. Using File>Browse, select an image that shows the whole subject, and open the file.

11.5. Rotate. Find a line that should be perfectly vertical or horizontal, and if it is not, then make it so by rotating.

11.6. Correct distortion. Select the whole image and transform it by “distort”, “skew”, or another method the software offers. Handles appear at the corners and sides of the image. You “grab” them and move them up/down, left/right. Example: an image of a square picture turned out like a trapezoid (top skinny, bottom fat). Grab the handle at the top left and pull to the left. Grab the handle at the top right and pull to the right an equal amount. Keep doing this until the image has perfect perspective.

11.7. Crop. Careful! Get rid of unnecessary background, but don’t cut too deep. The frame of a framed picture is considered to be part of the artwork for most purposes. Leave a little background around the frame when you crop. Cropping just cuts away, leaving a smaller image. Better image editing software permits you to specify the shape, dimensions, and resolution of the image that results from applying the cropping-tool.

11.8. Spot. Get rid of spots, unwanted highlights, blemishes, and so on, by using the “clone”, “rubber stamp”, or “healing brush” tool.

11.9. Crop for detail. If you need a detail that you forgot to shoot full-frame, then crop to create one. But be sure to “save as” a new file with the word “Detail” in the filename! E.g., “EmilyPortraitDetail”.

11.10. Don’t auto-adjust. If you use “auto correct”, “quick fix”, “auto brightness”, “auto contrast”, “auto saturation” and so on, you will probably get results that are inferior to those achieved with manual adjustments.

11.11. Adjustments. Manually adjust levels (a histogram with sliders to remove color cast, reestablish color balance, and adjust contrast). One usually uses Levels to correct for casts, and Curves to make fine adjustments. These tools permit specification of white, gray, and black points, which will always be available in the image made with a gray card present. An example of the workflow is given in www.outbackphoto.com/workflow/wf_65/essay.html. The corresponding corrections are saved and then applied to the image made without the gray card present. Your monitor MUST be calibrated before you use such tools. In all subsequent color adjustments, make your adjustments then back off a bit. Otherwise, contrasty images will lack vital detail in shadows and highlights; and oversaturated images will seem too punchy. Either will print badly, whether on slide film or on paper. An expert (a juror or art director, for example) is likely to be irritated by an over-edited image.

11.12. Resize. Each type of display device has a certain resolution (e.g. computer screens about 72 dpi, desktop printers about 200 dpi, high resolution printers about 400 dpi, etc.). You resize to change the pixel dimensions and the resolution so the image fits. In the following examples, let’s say the image from the

camera is 45”W x 30”H x 72 dpi. The uncompressed file size is 21 MB. Now let’s say you need a web page image, a proof print from your desktop printer, and a slide.

Example 1: Web page image: The original image width and height are too big for a computer screen. Re-size, say, to 6”W x 4”H x 72 dpi. Sharpen (see below). “Save As” in a new folder named “Web Images”. The uncompressed file size is now just 373 kB. If you save as JPEG, you can compress it to up to 1/10 this size for faster downloads, but in general, use a medium level of JPEG compression.

Example 2: Proof from desktop printer: Resize, say, to 9”W x 6”H x 200 dpi. Sharpen (see below). “Save As” a TIFF file in a new folder named “Proof Images”. The new file’s size is now 6.5 MB. In the Print dialogue, be sure to use

Example 3: Slide: Your service provider asks you to supply a TIFF image file with a width of 11” and a resolution of 300 dpi. When you resize, check the “Constrain Proportions” box, resize the width to 11” (the height will automatically adjust to 7.33”), and the resolution to 300 dpi. Sharpen (see below). “Save As” a TIFF file in a new folder named “Slide Images”. The new file’s size is now 22 MB.

11.13. Sharpen. This comes after resizing and is the last step before saving an image file for a particular purpose. Sharpen cautiously. In image editing software, the sharpening process first finds edges (the region between two areas in a picture that differ in lightness/darkness by a certain amount). Then it lightens the pixels on the light side of the edge, and darkens the pixels on the dark side of the edge. This enhances contrast near edges, making the picture seem sharper. Using the Unsharp Mask tool, adjust the amount of sharpening, the radius (in pixels) of the lightening/darkening, and the threshold – the number of levels (from 0 to 255) of difference that have to exist before the software calls it an edge. In general, set the radius to the width (in pixels) of the finest detail; increase the threshold to keep noise from getting sharpened; and adjust the amount so that the image, when viewed at 100% (1 image pixel per screen pixel), looks sharper but does not show halos around each edge.