

## CAMERA VARIABLES

Photography is an amazing blend of art and science: The best photographers are usually those who have taken the time to sharpen both their creative instincts and technical know-how. If you are a creative type and feel intimidated by your camera's workings, don't despair! Review the instruction manual that applies to your specific camera to learn what each of its functions do. Then, apply what you read through practice and hands-on photo sessions. Before long, an understanding of your camera's full range of functions and capabilities will become second nature. And the more you know about your camera's operation, the better able you will be at capturing images that meet and exceed your expectations. This chapter provides a series of demonstrations and prompts designed to encourage exploration of your digital camera's functions. *Note: Most pocket digital cameras offer a limited degree of manual control over such things such as aperture setting and shutter speed. Therefore, much of the content in this chapter is demonstrated using the manual functions offered by a digital SLR with plenty of manual controls. Even so, the information and lessons presented here are relevant to photography as a whole, and can be applied in various degrees to digital cameras of all kinds.*



Unless you are *trying* to take a blurred photograph for thematic or artistic reasons, you've got to learn how to get things in focus before clicking the shutter.

Most of the time, the camera's AUTO FOCUS function does a good job of bringing images into crisp focus. If the camera is having trouble focusing, it is usually a matter of there being too little light for the camera's sensors to properly function, or because you are holding the camera too near its subject.

Low light situations can often be handled by steadying the camera (SEE **STEADYING THE CAMERA**, PAGE 274). Learning to properly use the CLOSE UP setting on your camera (most are equipped with this feature) will solve the majority of your too-near-the-subject issues.

Take a look inside your camera's user manual for tips on getting the sharpest focus from your particular model. It is important to practice taking pictures under a variety of conditions so that when a great shot presents itself, you'll be able to quickly bring your subject or scene into proper focus.





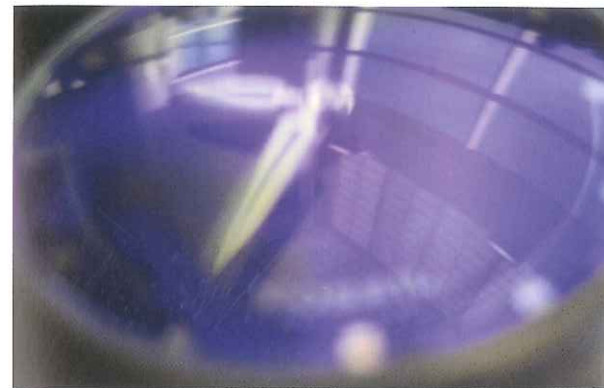


...but then again, who says that every shot needs to be *in* focus? The primary goal of any creative visual media is to communicate. And if a blurred image of your subject conveys an idea or message better than a crisp presentation—then by all means, let the image be blurred.

Blur can be used to turn the realistic into the abstract, convey motion or imply distress. Subtle blur (soft-focus) can be used to add notes of tenderness and comfort to a subject or scene.

If your camera is equipped with a **MANUAL FOCUS** mode, then you will be able to manually blur images according to the effect you are after. If your camera is in permanent **AUTO FOCUS** mode (as are many pocket digital cameras), you can still achieve images that are blurred by using one or more of these methods:

- Press and hold the shutter button halfway down while aiming at a subject that is significantly nearer to—or farther from—the camera than your actual subject. After focus has been obtained on this temporary subject, re-aim the camera at your real subject and finish depressing the shutter.
- Intentionally move your camera while shooting. SEE **SHAKE IT**, PAGE 242.
- Take pictures under low light conditions without a tripod—this is almost guaranteed to produce a blurred result (sometimes desirable, sometimes not).



There is a point near the camera at which objects come into focus. The measurement from this point, all the way to the point where things begin to fall out of focus (sometimes infinitely far away) is known as a shot's *depth of field*.

Depth of field (d.o.f.) is determined by lens-type, the aperture setting that has been selected, and how far away the subject is. Some lens/aperture combinations result in a shallow d.o.f.—others deep. The d.o.f. of most advanced digital cameras can be manually controlled (the degree to which depends on the lens that is being used). Control over d.o.f. is a good reason to consider upgrading to something more advanced once you've gotten a handle on the basics (few pocket digi-cams offer more than incidental control over their d.o.f.).

*The samples on this spread provide a simple demonstration of the effects of manually adjusting the d.o.f. while taking a series of shots.*

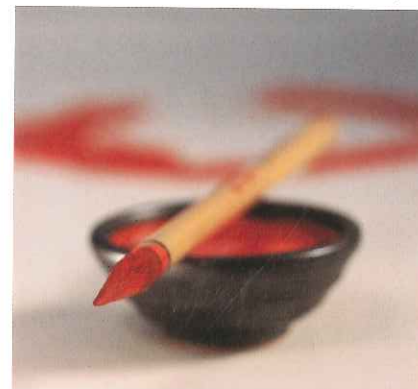
Look at photos in galleries, magazines, advertisements and web sites. Notice how a shallow depth of field is often used to confine the focus to certain essentials. Look for samples of a deep d.o.f. as well. Take note of which effect seems to work best in support of what type of message and stylistic result.

These samples demonstrate how changing a camera's depth of field affects its view of a scene.

In technical terms, the "f-stop" number (displayed to the right of the images, opposite) reveals how far open the camera's aperture\* was manually set for each shot. The lower the number, the wider the aperture opening, and the shallower the depth of field.

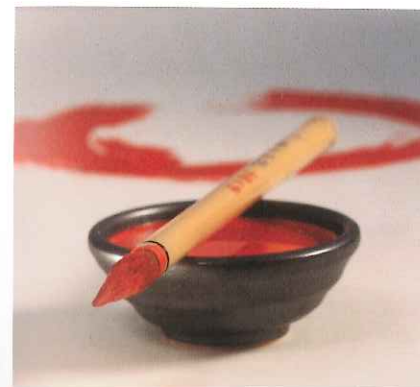
Conversely, reducing the aperture opening (represented by a higher f-stop number) increases the lens's depth of field. This narrower aperture opening also means that the amount of light getting to the camera's image-sensor is reduced. Therefore, when shooting with a deep d.o.f., more light or longer exposures may be needed to properly capture the image.

\*The adjustable iris-like opening inside the lens.



F 2.8

The photos on this page were each taken using a digital SLR fitted with a 100mm macro lens. Changes to depth of field affect different types of lenses to varying degrees. SEE LENSES, PAGE 322.



F 11



F 32



*Another depth of field demonstration: this one conducted outdoors.*

Digital cameras make ideal photographic learning tools since you can review your images on the spot and make adjustments to your technique accordingly.

The lens is focused on the grass in the foreground using a shallow depth of field. As a result, the lighthouse in the background is a barely distinguishable blur. ▶

Here, the d.o.f. has been increased. More of the grass in the foreground has been brought into focus and the lighthouse is now recognizable. This shot is a fairly good representation of the way the human eye would view the scene. ▶

Here, the camera's primary focus is still on the grass, and the lens' maximum d.o.f. can almost, but not quite, bring the lighthouse into focus. *Note: If I had wanted a shot where everything was in sharp focus, I could have moved the camera back a few feet so that the grass in the foreground was not so near to the camera's lens.* ▶

The f-stop setting used for this image is the same as it was for the above example. The only difference is that the primary focus is now on the lighthouse rather than the grass. Using a camera with manual depth of field control puts a great deal of artistic control in the hands of the photographer. ▶



F 2.8

The photos on this page were each taken using a digital SLR fitted with a 70-300mm telephoto lens. SEE LENSES, PAGE 322.



F 11



F 36



F 36



Most mid-level (and above) digital cameras have an AUTOMATIC EXPOSURE BRACKETING feature that can be used to instruct the camera to take a rapid set of three shots: One will be exposed at what is expected to be the correct level; one will be darker; and one lighter.

*Since no camera (or photographer) can always guess what the right amount of exposure for a particular shot will be, bracketing is sometimes necessary to ensure success.*

Bracketing is especially useful when there are both very dark and very light areas in a scene. Such extremes are beyond the capabilities of most cameras to accurately capture (an accurate reading of one extreme will usually be made at the expense of the other). Learn to recognize conditions such as these and, if possible, auto-bracket your shots so that you don't miss out on a good photo opportunity.

*Note: Most pocket digital cameras do not have an AUTOMATIC EXPOSURE BRACKETING feature. Many do, however, offer manual control over the relative brightness of their images. You can "manually bracket" with this type of camera by taking a set of shots using various brightness settings.*

A tough scenario for any camera's light-reading sensors: an extremely bright sky combined with dark foreground areas. In cases like this, it's a good idea to use the camera's AUTOMATIC EXPOSURE BRACKETING feature (if it is so equipped). That way, you stand a better chance of getting at least one shot that is properly exposed.

In this series of bracketed shots, the first image is overexposed (note the lack of detail in the "burned-out" areas of the clouds).

The next shot, though better than the first, still shows evidence of overexposure.

Finally, the darkest of the three shots captures the sky as it should be—though now, the foreground is a bit lifeless compared to before. Fortunately, the best of both worlds can be had with a little help from the computer... (SEE DIGITAL BRACKETING, PAGE 344).





*Though purists may grimace, modern images often contain areas of intentional overexposure as a matter of style and a means of thematic delivery.*

Overexposure is another of those artistic judgment calls. It's up to the photographer to decide when this kind of image abuse is appropriate for the sake of visual impact—and when it should be outlawed in favor of a more P.C. (photographically correct) presentation.

Photoshop's LEVELS and CURVES controls can also be used give an an overexposed look to an image, whether the original was overexposed or not. SEE LEVELS ADJUSTMENTS, PAGE 332, AND CURVES CONTROL, PAGE 334.

Decay, emptiness and abandonment all seem to be thematically at work in this scene; so why not degrade (overexpose) the image itself to enforce these connotations?

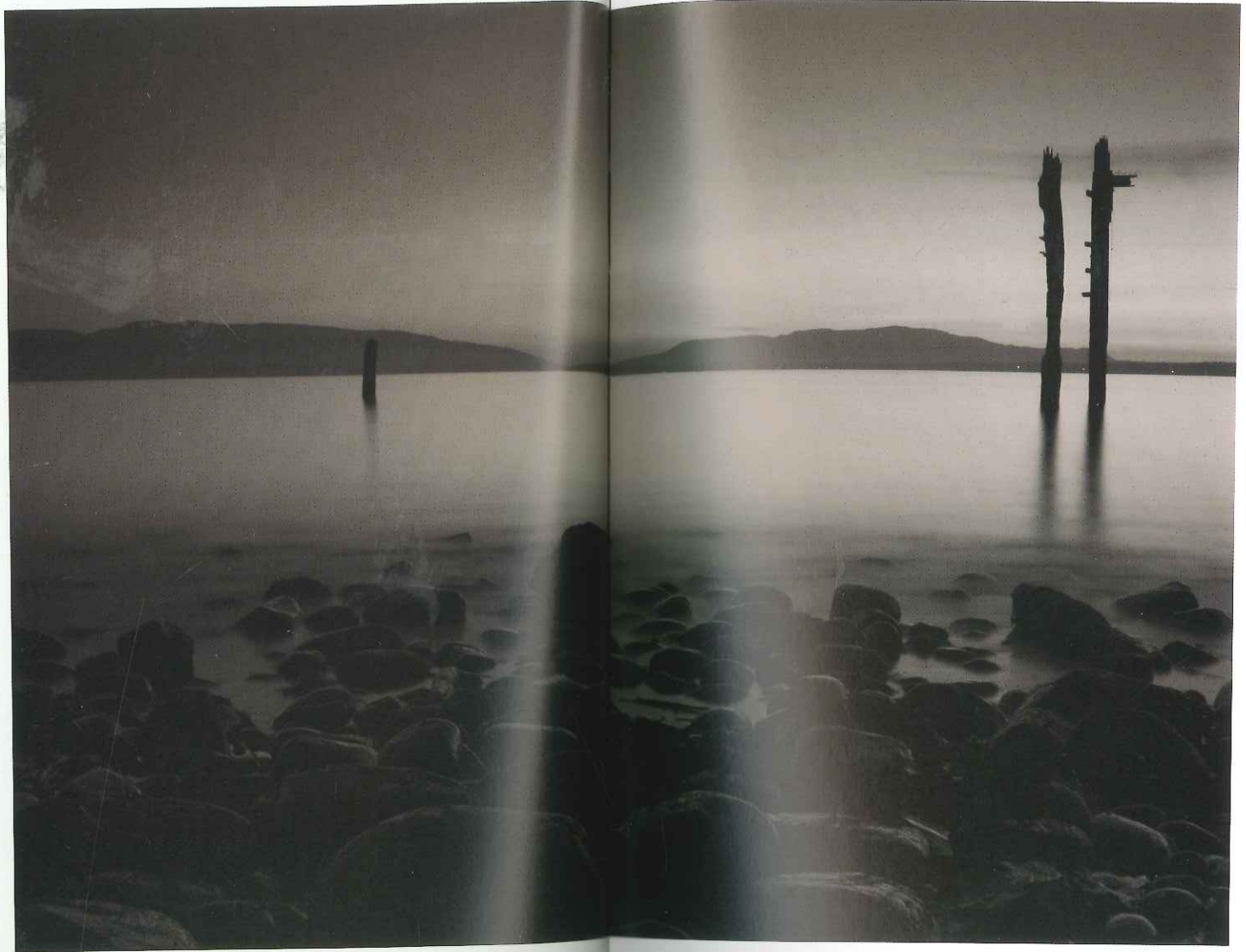


An ominous and enormous slab of concrete rises out of shallow surf. Its massive presence (and mysterious purpose) seem to be heightened by the overwhelming glare that surrounds it.



Here, overexposure enhances the hardcore industrial look of a burly set of bolts.





This scene was captured in near-darkness following sunset. I set the digital SLR on a low tripod and left the shutter open for a full 30 seconds. This allowed the lens to take in enough light to capture the scene and turned the choppy action of the waves into a surreal mist. Shots like this require the capabilities of an advanced digital camera and a basic understanding of its manual controls. For

most creative-minded people, an excellent way to learn about the functions of their advanced cameras (shutter, aperture, flash, etc.) is through hands-on use. A suggestion—review the manual to find out what the buttons do, and then start shooting. Experiment freely with the full range of your camera's controls under a variety of conditions.



Nearly all high-end digital cameras have a CONTINUOUS SHOOTING mode. Many pocket digi-cams offer this feature as well.

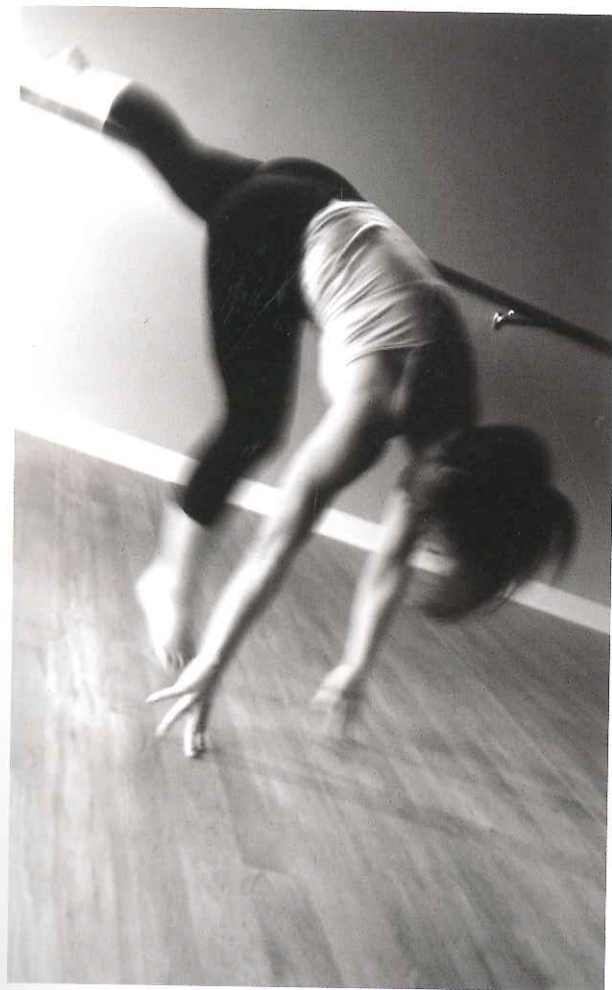
This mode is ideal for taking photos of subjects that are moving too quickly for the eye to follow since it directs the camera to take a series of shots in rapid succession. You can review your accumulated set of images for favorites after you are finished taking pictures.

*Shooting pictures in this mode can eat up large amounts of disk space relatively quickly: A large-capacity media card will help keep you from having to change cards or quit shooting in the middle of the action.*

Once again, digital media grants an unprecedented measure of fearlessness to artistic exploration such as this—few photographers who use film have the courage to incur the film processing costs associated with such rapid-fire shooting.

*The quickness of the dancer's movements throughout this session meant that it would be impossible to predict the exact outcome of each shot. Therefore, I selected the camera's CONTINUOUS SHOOTING mode so that I could take a steady stream of photographs during her routine. Out of the 1000 or so images that I ended up taking, I found 50 that I liked enough to keep. A success rate such as this (about 5%) is not untypical for this kind of catch-what-you-can shooting.*

*Note: I wanted these images to contain just enough motion blur to convey a sense of the model's movements. To gain this effect, I set the shutter speed of the digital SLR at 1/15th of a second. Longer exposures would have meant more blur; shorter exposures, less.*



If you want to include some motion-blur in a shot of a moving subject, try one of these three techniques.

1. As the subject passes, follow it with the camera (called *panning*). You can freeze your subject against a blurred backdrop if you follow the speed of the passing subject as you pan.

Note: Each of these motion-blur techniques requires that the camera's exposure time is not so fast that it freezes all action (SEE **STOPPING TIME**, PAGE 170). With a digital SLR, this may mean selecting a shutter speed that is longer than  $\frac{1}{4}$ th of a second. With a pocket digi-cam, you might need to shoot under relatively dim light so the camera will automatically select a slow shutter speed.

2. Hold the camera steady and snap a picture as the subject passes by. Naturally, this transfers the emphasis in visual detail from the subject to the backdrop. This can be an effective shooting technique if the backdrop is the real center of attention (a cityscape, for example) and the moving subject is being included for stylistic purposes.

3. Pan the camera at a faster or slower speed than the moving subject. This will cause both the subject and the backdrop to blur. More impressionistic than realistic, this technique can result in artful and communicative images.





*If you came across a zebra standing under a blue spotlight, you would almost certainly see the animal as a regular zebra, not as a completely new species of hoofed mammal. This, in spite of the fact that the zebra's colors have been shifted to blue and black by the light.*

An obvious point, but also a useful demonstration of how our eyes and mind automatically combine to try to tell us what the actual colors are in the things we see.

Your camera, on the other hand, has no way of knowing anything about the light being cast on a subject. Oftentimes, this is okay, such as when you want to record a scene just as it is (ambient light and all). Other times, however, you may want to select one of your camera's WHITE BALANCE settings—one that corresponds to the prevailing light conditions. This feature (available on most digi-cams) shifts the balance of colors that the camera records so that they will appear normal when the images are viewed. An example: If the zebra mentioned earlier was photographed using CUSTOM WHITE BALANCE\* control, this feature could have instructed the camera to ignore the blue light being cast and to record the scene as the eye would view it under natural light.

*Also, consider using white balance controls to intentionally and creatively alter the the colors of a scene.*

*\*The CUSTOM WHITE BALANCE control allows you to point the camera at a particular hue and tell it to use this as a reference point for true white. Try it out for yourself under a variety of lighting scenarios. Consult the user's manual if you need help figuring out how to use your camera's white balance controls.*

Opposite: These photos were each taken using light from the same 500-watt quartz bulb. The WHITE BALANCE setting was changed for each shot (the labels correspond to the various settings used). The custom setting captured the colors most accurately, but also seemed to present the scene in a relatively cold light—contrary to what you might expect given the subject matter. Which WHITE BALANCE setting do you think best suits the presentation of this image?



AUTO EXPOSURE



DAYLIGHT



CLOUDY



FLUORESCENT



TUNGSTEN



CUSTOM



**Lenses: a semi-technical rundown.**

The majority of photos in this book were taken with a pocket digital camera. When a more advanced camera was needed for a particular shot, a digital SLR was used along with one of the four lenses shown on this spread. Here is a brief description of each lens and its strengths.

**FYI:** This set of numbers refers to the range of a lens's focal length. Lower numbers mean a wider field of view and a lower degree of magnification. Higher numbers = greater magnification and a narrower field of view.

These numbers represent the lens's range of maximum aperture openings. A lens's ability to take in light and its depth of field capabilities are determined by its max. aperture opening. See Depth of field, page 306.

**Standard zoom. 18-55mm, f/3.5-5.6:** Great all-around lens. Capable of taking fairly wide-angle shots as well as moderate zooms.



**Macro. 100mm, f2.8:** Specially designed to focus at small distances for exceptional close-up shots.

At f2.8, this lens is good under low light conditions and has extremely fine depth of field control. This d.o.f. finesse also means that macro lenses work well for portraits since they can focus sharply on a subject while blurring the backdrop. A fun lens!



**Wide angle. 12-24mm, f4.5-5.6:**

Not quite a fish-eye lens, but close. This lens captures a very wide view of things and has the ability to keep entire scenes in focus. Good for taking indoor shots in spaces that are too confining for the narrower field of view of other lenses; also excellent for sweeping landscape shots and portraits that include the subject's surroundings.



**Telephoto. 70-300mm, f4-5.6:** A mid-level telephoto lens such as this is great to have on hand when a standard zoom lens cannot satisfactorily magnify a distant subject. Far more powerful telephotos are available, though their prices are also highly magnified.





An advantage offered by most digital SLRs is that their lenses can be changed. Extra lenses grant extra options when it comes to the kinds of images that you will be able to compose and capture with your camera.

*When I head out for a planned photo session, I almost always bring my digital SLR's standard lens along with a wide-angle and a telephoto. This way, I will be able to take advantage of many different kinds of photo opportunities, both expected and otherwise.*

If you find yourself getting serious about photography, and are looking for more capabilities than those offered by your pocket digital camera, consider buying a digital SLR with an extra lens or two. Ask for the advice of experienced photographers when considering equipment upgrades such as these.

Swapping lenses while in the middle of a photoshoot is one of those skills worth practicing beforehand in the relatively controlled environment of your home or office. Being able to quickly (and safely) change lenses in the middle of a photoshoot can mean the difference between capturing a fleeting image opportunity and missing it altogether.

Early morning sunlight illuminates the historic barracks at Fort Casey in northwest Washington state.

*I took this photo with my digital SLR's standard 18-55mm lens.*



Standing in the same spot as before, I switched to a wide-angle lens (12-24mm) to capture more of the overall scene. This is a favorite lens of mine—especially when going after sweeping views of the earth and/or sky.



...and then I swapped lenses for a telephoto unit (70-300mm) to capture a composition made up of porch seats and architectural details. This shot was taken from the same position as before, with the lens zoomed to about half its maximum level.





Intriguing optical effects can be achieved using low-tech alternatives to specialty lenses and digital after-effects.

Collect a small arsenal of pseudo “lenses” and explore their reality-altering potential. Investigate the effects of your camera’s zoom and focus functions as you shoot through these alt-lenses. Save examples of your shots as a reminders of the kinds of effects you can apply to certain photo opportunities in the future.

*In addition to the ideas shown here, try taking pictures through shards of colored glass, drinking glasses, eye-glasses, sunglasses, magnifying glasses, bubble wrap, discarded lenses from old cameras, marbles, binoculars.*

The photos on the facing page were taken by aiming a pocket digi-cam at this mask through a variety of cheap, improvised “lenses.”



Molded glass  
container cover

Kaleidoscope



Peephole

Toy eyepiece





**Leaning towers.**

Keystoning is the **slanting, exaggerated perspective effect** seen in the top image. Most lenses will cause keystoning when shooting upward at tall buildings, etc. Sometimes this is okay—especially in contemporary media where image “imperfections” are tolerated as long as they work toward a desired style of presentation.

**Software to the rescue.**

If a perception of accuracy outweighs stylistic ideals for a particular shot, you can “fix” the image using Photoshop’s **DISTORT** function (ironically named in this case). This example shows how the handles around the image have been individually moved to warp the image in such a way that its vertical lines run parallel with the framing of the photo.

**Done.**

The final image was cropped from the adjusted Photoshop document. Now, the subject’s vertical lines are parallel with the sides of the image.

Note: Keystoning such as this can often be avoided in the first place by using a wide-angle lens and finding a way to shoot the subject from a vantage point that is near its vertical center (from a nearby rooftop or the balcony of another building, for instance).

