Appendix A

INFRARED PHOTOGRAPHY



Wour digital camera might also be capable of infrared photography. By fitting an infrared filter to the end of your lens—just as film photographers do—you can capture images in infrared light, as shown in Figure A.1. However, there are some caveats to digital infrared shooting.



Figure A.1 With an infrared filter, you can capture just the near-infrared spectrum of light. In infrared, vegetation appears very bright whereas skies turn very dark.

Most image sensors are so sensitive to infrared light that camera makers have to put a strong infrared "cut" filter between the lens and the sensor. Without this filter, the sensor will yield images with very strong color casts. Despite these filters, some infrared does get passed through to the camera's sensor, allowing you to use your digital camera for infrared photography. Unfortunately, there's no hard-and-fast rule for how strong a camera's IR filter is—the only way to find out is to experiment. Before investing in an infrared filter, you can get a rough idea of a camera's infrared sensitivity with the help of the remote control from a TV, VCR, or stereo. Just point the remote at the camera's lens, press and hold a button on the remote, and then take a picture of the remote. If the camera can see the light of the remote (see Figure A.2), you'll know that the sensor is picking up some IR. The brighter the light, the better your camera will be for infrared shooting.

As with a film camera, you'll still need an infrared filter on the end of your lens. A number of filters are available for infrared photography, but the most popular are the Kodak Wratten 89b, 87, and 87C filters. Hoya makes two filters, the R72 and RM72, which are equivalent to the Kodak 89B. B+W also make Wratten equivalents, the 092 and 093.



Figure A.2

You can get a pretty good idea of the infrared capabilities of your camera by taking a picture of a remote control's infrared emitter. Note that in the second image, the remote's emitter is "lit up" with infrared light.

> The right filter is partly a matter of taste, because different filters yield different levels of contrast. Depending on your camera's infrared sensitivity, you'll need either a brighter or a darker filter. Note that infrared filters are expensive, and the larger the diameter, the more you'll have to pay. Before buying a particular filter, you might want to poke around some of the more popular digital photography online forums for advice from other users who have shot infrared with your type of camera. If you can't find any usable advice, you'll simply have to experiment with different filters. Because they are so dark, you can expect infrared filters to cut four to ten stops from the available light! That means you'll be using very long exposures even in

bright daylight. Obviously, a tripod is essential for infrared photography. To pick up some extra stops (and reduce lengthy exposure times), you can set your camera to a higher ISO, but this will make your images noisier. Typically, Wratten 87 exposures in bright daylight at ISO 200 start at around five seconds. Because the filter can confuse your camera's light meter, you might have to do a little experimenting to find the right exposure.

Focusing

Because the infrared filter is so thick, your camera's autofocus will be useless—there simply won't be enough light for you to focus. Also, your exposure times are going to be very long, so you'll definitely need a tripod or something sturdy to set your camera on. Unfortunately, the filter is also thick enough that you won't be able to see through the viewfinder, so manual focus isn't really an option. To shoot with an infrared filter, you'll need to do the following.

- 1. Before putting on the infrared filter, put your camera on a tripod and frame your shot.
- 2. Autofocus, just as you normally would. When the camera has locked focus, switch the lens to manual focus. This will ensure that you don't accidentally re-auto-focus.
- 3. Put the IR filter on your lens. Be *very* careful not to bump the focus ring, or you might throw the lens out of focus.

As long as you don't accidentally refocus, you should be ready to consider exposure.

Choosing an IR Exposure

Because of the huge reduction in light caused by the IR filter, you'll be shooting with a very long shutter speed. Fortunately, your camera should still be able to calculate a good exposure. After focusing and installing the IR filter, as described previously, do the following:

- 1. Put the camera into Aperture Priority mode and set the aperture to somewhere between f8 and f11. This will give you a deep depth of field that will help compensate for any focus problems you may have.
- 2. Meter as normal.
- 3. Take a shot.

It's a good idea to bracket your shots, simply because IR exposure can be tricky. After taking your first shot, you might want to try a few more with even slower shutter speeds. You can slow the shutter speed down by dialing in some overexposure with your exposure compensation control (a +1 exposure compensation will double your shutter speed, +2 will quadruple, etc.). Or you can switch to Manual mode, enter the shutter speed and aperture that you were using in Aperture Priority mode, and then change shutter speed manually.

Because you'll be shooting with a slow shutter speed, you'll ideally want to use your camera's mirror lock-up feature and a remote control or self-timer. This will help reduce camera vibration. Also, bear in mind that because of the long exposure times, shooting moving objects or landscapes on a windy day can be problematic, as your results can be smeared or soft.

You don't have to have a Black-and-White mode on your camera to shoot infrared images. When you shoot color through an infrared filter, most images will appear in brick red and cyan tones, rather like a duotone (see Figure A.3). You can easily convert these to grayscale later.



Figure A.3

When you first pull an infrared image out of your camera, it will have a strong red cast. You can correct that with a white balance adjustment, to achieve a color image, and then convert that image to grayscale.

> Because of the bright light required, you'll typically shoot infrared only outdoors. Any incandescent objects—glowing coals, molten metal—will emit a lot of infrared radiation. The thermal radiation produced by the human body, however, is way beyond the sensitivity of the near-infrared capabilities provided by your camera.

Modifying Your Camera for Infrared Shooting

If you're serious about infrared shooting, then you might want to consider looking into a modified digital SLR for infrared work. There are several companies that will open up your SLR and remove the IR cut filter that compromises infrared shooting. This will result in a camera that can shoot infrared using much shorter shutter speeds, making far more subject matter suitable to infrared shooting. The downside is that the camera's ability to reproduce normal color will be compromised. Check out *maxmax.com* for more details.