

CHAPTER 3: THE SHOOTING MODES

So far, I have discussed setting up the camera for quick shots, relying on Auto mode for taking pictures with settings controlled mostly by the camera's automation. As with other sophisticated digital cameras, though, the Coolpix P950 has a wide range of settings available, particularly for shooting still images. One of the goals of this book is to provide guidance about this range of features. To get started, I will turn my attention to the P950's several shooting modes, which provide you with many options for your photography.

To record still images, you need to select one of the available shooting modes: Auto, Program, Shutter Priority, Aperture Priority, Manual exposure, User Settings, Creative, Bird-watching, Moon, or Scene. So far, I have discussed the use of the Auto mode. Now I will describe the others, after some review of the first. (The Movie Manual mode, used for recording movies, is discussed in Chapter 8.)

Auto Mode

The Auto shooting mode is a good choice if you need to have the camera ready for a quick shot, maybe in an environment with fast-paced events when you won't have much time to fuss with settings.

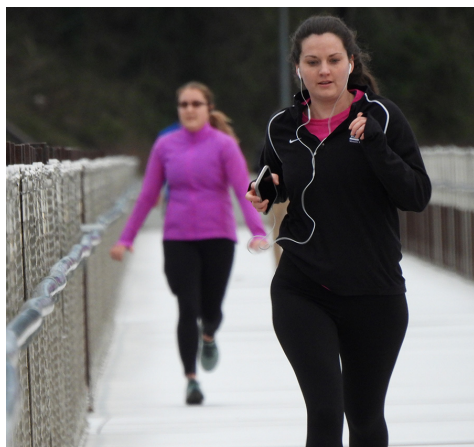


Figure 3-1. Auto Mode Example

For example, in Figure 3-1, I used this mode to grab a quick shot of a pair of runners coming toward me on a pedestrian bridge across the river. In this shooting mode, the camera does not try to figure out what kind of scene it is photographing, though it will detect human faces and focus on them if possible.

To set this mode, turn the mode dial, on top of the camera to the right of the viewfinder, to the green camera icon, as shown in Figure 3-2.



Figure 3-2. Mode Dial at Auto

With this mode, the camera makes several decisions for you and limits your options in some ways. For example, you can't set ISO or white balance to any value other than Auto, and you can't choose the metering method, use exposure bracketing, or use the Picture Control settings to alter the appearance of your images. In addition, you cannot select continuous shooting. The camera will not use its full range of shutter speeds; it is limited to a range between 1/2000 second and one second.

There are still a few settings you can control, however. For instance, you can choose any options for Image Size and Image Quality, including the Raw format for still images; you can use exposure compensation; and you can select any of five available modes for the built-in flash (if you have raised the flash unit). You also can select macro (close-up) autofocus or infinity autofocus as well as normal autofocus; and you can select manual focus. You also can use the self-timer, remote control and smile timer options. My recommendation is to set Image Size to the maximum of 4608 x 3456 pixels and Image Quality to Fine, and use the other available settings (such as exposure compensation and flash mode) as needed.

Program Mode

Choose this option by turning the mode dial to the P slot, as shown in Figure 3-3.



Figure 3-3. Mode Dial at Program

In this mode, the camera evaluates the light and selects both shutter speed and aperture to produce an exposure that the camera's programming considers to be normal. The camera will select an aperture within its full range of f/2.8 to f/8.0, though some aperture values are not available when the lens is zoomed in, as discussed in connection with Aperture Priority mode, later in this chapter.

The camera will select a shutter speed from 30 seconds to 1/2000 second, though the slowest shutter speed available varies with the current ISO setting. For example, when ISO is set to 100, the camera can use a shutter speed of 30 seconds, but at ISO 1600, the slowest shutter speed available in this shooting mode is two seconds.

The Program shooting mode lets you control many of the settings available with the camera, but not shutter speed and aperture. However, even though you can't directly set those two values, you can override the camera's automatic exposure to a fair extent by using exposure compensation, the flexible program feature, and exposure bracketing.

I discussed exposure compensation in Chapter 2, and I'll explain exposure bracketing in Chapter 4. Flexible program is the name Nikon uses for what is sometimes called "Program Shift" for other cameras. This option lets you adjust the values the camera selects in Program mode for shutter speed and aperture. For example, if the camera selects, say, 1/60 second at f/4.5, the flexible program feature will find equivalent combinations that result in the same exposure, such as 1/50 second at f/5.0, 1/40 second at f/5.6, or 1/30 second at f/6.3. To use this feature, when the camera is in Program mode, aim at your subject and turn the command dial (the wheel at the top right corner of the camera's back) to find an equivalent pair of shutter speed and aperture values.

When the camera is using one of these equivalent match-ups of settings rather than the originally chosen settings, it displays an asterisk at the upper right of the letter P that signifies Program mode in the upper left of the display, as seen in Figure 3-4.



Figure 3-4. Symbol for Flexible Program on Shooting Screen

To cancel flexible program, turn the command dial back to reset the original shutter speed and aperture, select a different shooting mode, or turn off the camera.

The flexible program feature is useful in several situations. For example, you may want to see what the "normal" settings are and then see if you can use a wider aperture to achieve a blurred background, or a faster shutter speed to stop the action or prevent blur from camera motion. And, when you're experimenting with the camera to see what it is capable of, it can be helpful to try various combinations of aperture and shutter speed to see which combinations give you the best results in different situations. With a digital camera, there's no added cost for trying these different approaches, and flexible program is a useful way to experiment.

One way to look at Program mode is that it greatly expands the choices available through the Shooting menu. You will be able to make choices involving white balance, ISO sensitivity, metering method, autofocus mode, continuous shooting, and others. I won't discuss all of those choices here; if you want to explore that topic, go to the discussion of the Shooting menu in Chapter 4 and check out all of the different selections that are available to you.

Shutter Priority Mode

Select Shutter Priority mode by setting the mode dial to the S indicator, as shown in Figure 3-5.



Figure 3-5. Mode Dial at Shutter Priority

In this shooting mode, you set the shutter speed and the camera will set the corresponding aperture in order to achieve a proper exposure. In Shutter Priority mode, you can set the shutter for intervals ranging from 30 seconds to 1/4000 of a second, although the camera has built-in limitations on the use of the fastest and slowest shutter speeds.

For example, if the ISO is set above 3200, the slowest shutter speed available is 15 seconds, and if the aperture is set to f/2.8, the fastest shutter speed available is 1/2000 second. In addition, the zoom range of the lens has a limiting effect on the availability of the fastest shutter speeds. For example, the fastest shutter speed available when the lens is zoomed fully in to the telephoto position is 1/2500 second. The chart in Table 3-1 sets forth some of these limitations.

Table 3-1. Limits on Shutter Speed Settings in S and M Modes	
Slowest Shutter Speed	ISO Value
30 seconds	100-3200
15 seconds	6400
Fastest Shutter Speed	Aperture Value
1/4000 second	f/6.3 - f/8.0*
1/2500 second	f/8.0**
1/3200 second	f/4.5 - f/5.6*
1/2500 second	f/3.5 - f/4.0
1/2000 second	f/2.8 - f/3.2
* At wide-angle zoom setting	

** At telephoto zoom setting

If you are photographing fast action like a baseball swing or a race at a track meet and you want to stop the action with a minimum of blur, you will need a fast shutter speed, such as 1/1000 of a second. In other cases, for creative purposes, you may want to use a slow shutter speed of one second or more to achieve a certain effect, such as leaving the shutter open to capture a trail of automobiles' taillights at night.

Figures 3-6 and 3-7 illustrate the effects of different shutter speeds for two shots of the same subject, a stream of colored beads being poured into a tall pitcher. For Figure 3-6, I set the shutter speed to 1/2000 of a second. In that image, you can see individual beads, as the fast shutter speed froze the action. In Figure 3-7, where I set the shutter speed to 1/30 second, the moving beads are smoothed out into a continuous flow, with no individual beads clearly visible.



Figure 3-6. Shutter Speed Set to 1/2000 Second



Figure 3-7. Shutter Speed Set to 1/30 Second

To set the shutter speed on the Coolpix P950, turn the command dial—the ridged dial at the top right of the camera's back, behind the power switch. (As discussed in Chapter 7, you can switch this function to the multi selector dial with the Toggle Av/Tv Selection option on the Setup menu.) The LCD (or viewfinder, if selected) will display the selected shutter speed inside a yellow rectangle at the bottom center of the screen, as shown in Figure 3-8.



Figure 3-8. Shutter Speed Displayed on Shooting Screen

As you point the camera at scenes with varying lighting, the camera will select and display the appropriate aperture (such as f/4.5 in this example) to achieve a proper exposure.

Once you’ve pressed the shutter button halfway, watch the aperture number on the screen. If that number blinks, that means proper exposure at that shutter speed is not possible at any available aperture, according to the camera’s calculations. For example, with a shutter speed of two seconds in a well-lighted room, the aperture number may begin to blink, indicating that proper exposure is not possible. The camera will still let you take the picture, despite having blinked the number to warn you. The camera is saying, in effect, “Maybe you shouldn’t do this, but that’s your business. If you want an overly bright picture for some reason, help yourself.” (This situation is less likely to take place when the camera is in Aperture Priority mode, because in that mode, there is a wide range of shutter speeds for the camera to choose from—a range from 30 seconds to 1/4000 second in some situations, depending on factors such as ISO, aperture, and continuous-shooting settings.)

When you are setting shutter speed, the fractions of a second are easy to read because they are displayed as standard fractions, such as 1/5 or 1/200. Some of the longer times are a bit harder to read; the camera displays them using quotation marks. So, for example, two seconds is displayed as 2”, and 1.3 second is displayed as 1.3.”

One feature of the shutter speed display on the Coolpix P950 is a bit confusing, at least to me. Some of the camera’s shutter speeds are displayed as fractions whose denominators are decimal numbers, such as 1/1.3. I would have trouble understanding that number without doing some arithmetic, so Table 3-2 provides

a brief chart that converts these few values into terms that may be easier to comprehend:

Table 3-2. Fractional Shutter Speed Equivalents	
1/2.5	= 0.4 = 2/5 second
1/1.6	= 0.625 = 5/8 second
1/1.3	= 0.77 = 10/13 second (0.8 sec)

Finally, there is one other limitation on available shutter speeds. When you have selected one of the continuous-shooting options from the Continuous item on the Shooting menu, that setting imposes a restriction on what shutter speeds can be set. For example, if you have selected Continuous H, which causes the camera to shoot in a rapid burst, the slowest shutter speed available is 1/30 second.

Aperture Priority Mode

Aperture Priority mode, represented by the A setting on the mode dial as shown in Figure 3-9, is the inverse of Shutter Priority. In this mode, you select an aperture value and the camera selects a corresponding shutter speed to achieve a proper exposure, within a range of 1/2000 second to 30 seconds, with some limitations involving ISO and other factors. (For example, a shutter speed of 30 seconds is available in this mode only when ISO is set to 100.)



Figure 3-9. Mode Dial at Aperture Priority

The camera’s aperture is a measure of the current width of its opening that lets in light to create the image. This width is stated numerically in f-stops. For the Coolpix P950, the range of f-stops is from f/2.8 (wide open) to f/8.0 (most narrow), though this range is limited in some circumstances, as discussed below. The amount of light that is let into the camera to create an image is controlled by the combination of aperture (how wide open the lens is) and shutter speed (how long the shutter remains open to let in the light).

For some purposes, you may want to control the width of the aperture, but let the camera choose the corresponding shutter speed, so you can control the

depth of field. Depth of field is a measure of how well a camera is able to keep multiple objects or subjects in focus at different distances. For example, say you have three subjects lined up so you can see all of them, but they are standing at different distances—5, 7, and 9 feet (1.5, 2.1, and 2.7 meters) from the camera. If the camera's depth of field is shallow at a particular focal length, such as five feet (1.5 meters), then, if you focus on the subject at that distance, the other two will be out of focus and blurry. But if the camera's depth of field when focused at five feet is broad, then it may be possible for all subjects to be in sharp focus in your photograph, even if the focus is set for the subject at five feet.

The wider the camera's aperture is, the more shallow its depth of field is at a given focal length. So in the example discussed above, if you have the camera's aperture set to its widest opening, $f/2.8$, the depth of field will be relatively shallow, and it will be possible to keep fewer items in focus at varying distances from the camera. If the aperture is set to the narrowest, $f/8.0$, the depth of field will be greater, and it will be possible to have more items in focus at varying distances.

It is hard to illustrate this effect with a camera like the Coolpix P950, for a couple of reasons. First, the image sensor, where the light is gathered to form the image, is relatively small, which results in the depth of field being relatively deep at all apertures. Second, the widest aperture available is $f/2.8$, whereas some compact cameras have lenses that open as wide as $f/2.0$, or even $f/1.4$. With such cameras it is easier to achieve a blurred background, because the depth of field can be quite shallow at such a wide aperture.

With the P950, the widest aperture you can shoot with is $f/2.8$, and that aperture is available only when the lens is zoomed back to its extreme wide-angle setting, where depth of field is greater. If you zoom the lens in to a telephoto setting, the maximum aperture decreases steadily. At the maximum zoom range, the widest aperture available is only $f/6.5$, which is not far from the narrowest aperture of $f/8.0$.

Despite the difficulty of demonstrating the effects of using different apertures, Figures 3-10 and 3-11 illustrate these effects to some extent with two images taken at the same time and in the same location. For both images, the lens was zoomed out to its full wide-angle setting of 24mm. The first image was taken at an

aperture setting of $f/2.8$, the widest possible setting; the second one was taken at $f/8.0$, the narrowest aperture setting. In both cases, I focused on the mannequin in the foreground.



Figure 3-10. Aperture Set to $f/2.8$

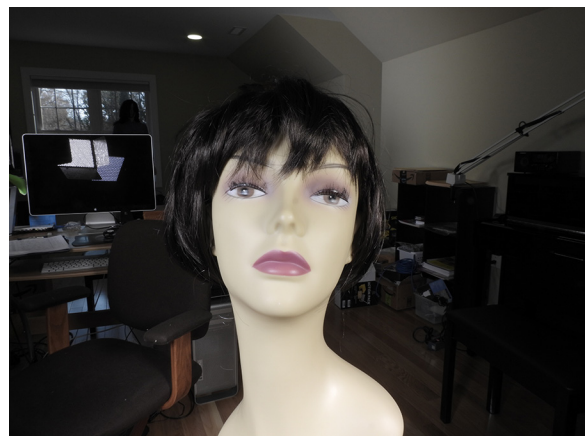


Figure 3-11. Aperture Set to $f/8.0$

As you should be able to see by looking at the window in the background, in Figure 3-10, with the wider aperture, the background is somewhat blurred because the depth of field is relatively shallow at that setting. In Figure 3-11, on the other hand, the background is in sharper focus because the depth of field is greater at the narrower aperture setting.

If you want to capture the sharpest image possible, especially when you have subjects at varying distances from the lens and you want them all to be in focus, you may want to control the aperture and make sure it is set to the highest number (narrowest opening) possible. It also helps to have the lens zoomed back toward its wide-angle setting and to be somewhat distant from the subject.

On the other hand, there are times when photographers prize a shallow depth of field. This situation arises often in the case of outdoor portraits. For example, you may want to take a photo of a person standing outdoors with a background of trees and bushes, and possibly some other, more distracting objects, such as a swing set or a tool shed. If you can achieve a narrow depth of field, you can have the person's face in sharp focus, but leave the background quite blurry and indistinct. This effect is sometimes called "bokeh," a Japanese term describing an aesthetically pleasing blurriness of the background.

To achieve the greatest blurring of the background, you should try to use a wide aperture, zoom the lens in as much as possible, and get as close to the subject as possible. It also is helpful to have as much distance as possible between the main subject and the background.



Figure 3-12. Background Blur from Long Zoom Setting

Figure 3-12 is an example using this effect. The blurriness of the background can reduce the distraction factor from unwanted objects and highlight the sharply focused image of your subject.

To set the aperture, once you have moved the mode dial to the A setting, aim the camera at your subject and turn the multi selector dial to change the aperture. The number of the f-stop will appear inside a yellow rectangle at the bottom center of the screen. The shutter speed chosen by the camera will show up also, to the left of the aperture, as seen in Figure 3-13. When you press the shutter button halfway, the camera will lock in the selected shutter speed.

As I noted above, not all apertures are available at all times. In particular, the widest aperture, f/2.8, is available only when the lens is zoomed out to its wide-angle setting (zoom lever moved toward the W). At the

highest zoom levels, the widest aperture available is f/6.5. To see an illustration of this point, here is a quick test. Zoom the lens out by moving the zoom lever all the way to the left, toward the W. Then select Aperture Priority mode and choose an aperture of f/2.8 by turning the multi selector dial all the way to the left. Now zoom the lens in by moving the zoom lever to the right, toward the T. When you release the lever, the aperture displayed at the bottom of the screen will change to f/6.5. If you try to reset the aperture to f/2.8 after the zoom action is done, you will see that the lowest aperture number you can set is f/6.5, because that is the widest aperture available on the P950 at the telephoto zoom level. (The aperture will change back to f/2.8 if you move the zoom back to the wide-angle setting.)



Figure 3-13. Aperture Value Displayed on Shooting Screen

Manual Exposure Mode

The Coolpix P950 has a fully manual mode for control of aperture and shutter speed, which helps you enjoy creative control over exposure decisions.

This mode is useful when you want to use settings that result in an unusual effect, such as an abnormally dark image. For example, I used Manual exposure mode for Figure 3-14 to photograph a bust of Cleopatra against a bright background. I experimented with various Manual mode settings to find the exposure that resulted in this image, which was shot at f/4.5 for 1/8 second, with ISO set to 100.

I also often use Manual mode to take a series of photos at different exposures to create HDR (high dynamic range) images using special software. I will discuss that process later in this chapter, in the discussion of the Backlighting/HDR setting of Scene mode.



Figure 3-14. Manual Exposure Example

To use Manual exposure mode, set the mode dial to the M indicator, as shown in Figure 3-15. You now have to control both shutter speed and aperture by setting them yourself.



Figure 3-15. Mode Dial at Manual

To set these values, first look at the camera's display and find where the shutter speed (such as 1/800) and aperture (such as F5.0) are displayed at the bottom of the screen, as shown in Figure 3-16.

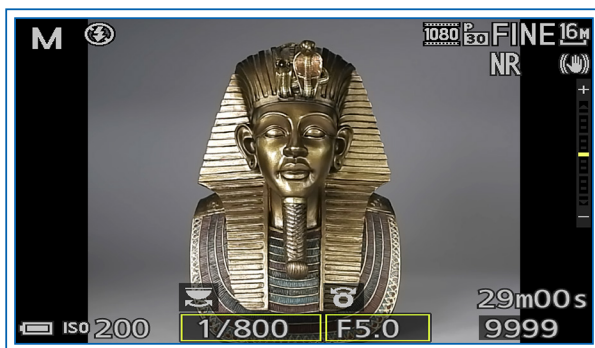


Figure 3-16. Shooting Screen in Manual Exposure Mode

At the bottom of the display is the shutter speed on the left, inside a yellow rectangle. Above that value is a curved arrow beneath an icon that represents the command dial. These icons mean that the shutter speed value is controlled by the command dial (the wheel at the top of the camera's back, behind the power switch). To the right of that value is the value for the aperture, or f-stop, inside another rectangle. Above that value is an icon showing a dial that is oriented vertically; that

icon represents the multi selector dial, on the back of the camera surrounding the OK button.

To adjust the settings, turn the command dial until you have selected the shutter speed you want, and turn the multi selector dial to set your desired aperture. As you adjust these values, watch the vertical scale that appears at the right of the screen, as shown in Figure 3-16.

You will see the tick marks turn yellow, either above or below the scale's center point, as the values change. When the exposure is set as the camera judges to be normal, there will be a lone tick mark in the center of the scale, as shown in Figure 3-16.

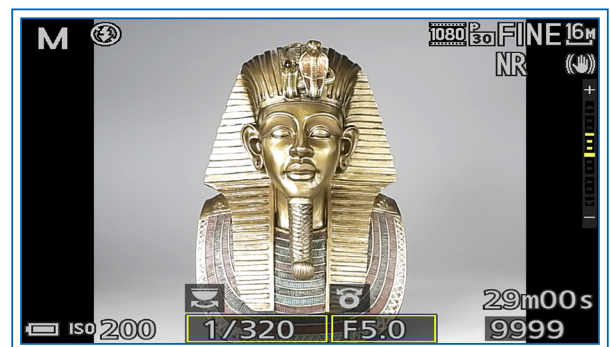


Figure 3-17. Manual Mode with Exposure Too Bright

If the marks above the center of the scale turn yellow, as in Figure 3-17, the exposure is too bright; if they turn yellow below the center, it is too dark. If the setting becomes more extreme than the scale can indicate, a yellow triangle appears at the top or bottom of the scale, indicating that the scale's limit has been exceeded, as shown in Figure 3-18.

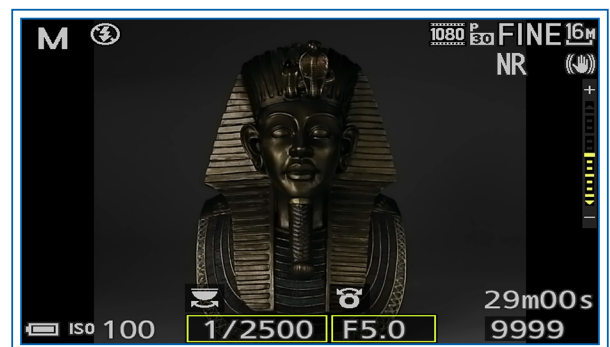


Figure 3-18. Manual Mode with Exposure too Dark

If you are shooting in dim light, such as indoors or in a shadowed area, you may find it impossible to center the yellow tick mark on the exposure scale by adjusting the shutter speed and aperture unless you use a very slow shutter speed, such as one second or longer. If you

are handholding the camera, you won't be able to hold it steady for more than about 1/30 second, so it will be difficult to get a clear exposure.

In that situation, you can adjust exposure by changing the ISO setting. I will discuss ISO in more detail in Chapter 4, because it is an option found on the Shooting menu. Briefly, ISO is a setting that controls the sensitivity of the camera's digital sensor. The higher the ISO value, the more sensitive the sensor is to light. With higher ISO values, you can achieve a normal exposure with narrower apertures and faster shutter speeds.

With the advanced shooting modes, including Manual, you can use the Auto ISO settings, which cause the camera to set the ISO value as needed to reach a good exposure level, within a specified range of ISO values. If you use an Auto ISO setting in Manual mode, you can choose the aperture and shutter speed you want, and still have the camera achieve an automatic exposure setting by varying the ISO value, if possible under current lighting conditions.

You also can use the ISO Sensitivity menu item to select a specific value such as ISO 400, 800, or even higher, as shown in Figure 3-19.

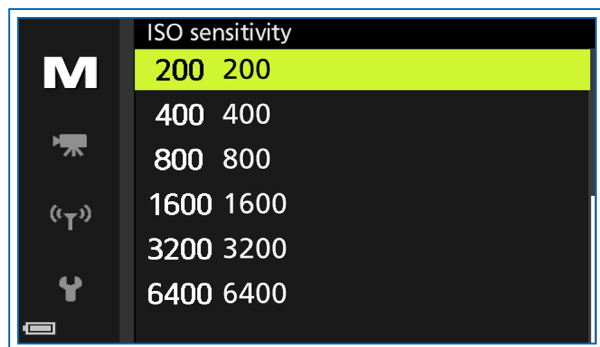


Figure 3-19. ISO Sensitivity Menu

Of course, you don't have to adjust ISO or other values in an effort to center the indicator on the exposure scale; that scale is there only to give you an idea of how the camera would meter the scene. You may want parts of the scene (or the whole image) to be darker or lighter than the metering system would indicate to be "correct." In Manual mode, the settings for aperture and shutter speed are independent of each other. When you change one, the other one stays unchanged until you change it manually. The camera is leaving the creative decision about exposure entirely up to you, even if the resulting

photograph would be washed out by excessive exposure or underexposed to the point of near-blackness.

As with Aperture Priority mode, the range of available apertures in Manual exposure mode varies as the lens is zoomed to various focal lengths. Also, the range of shutter speeds has certain limits, as listed earlier in Table 3-1 in the discussion of Shutter Priority mode. For example, the slowest shutter speed available at ISO 6400 is 15 seconds; at ISO 3200, the slowest is 30 seconds.

However, there are longer exposures possible in this shooting mode, even with the ISO set as high as 1600. In Manual mode, the shutter speed settings of Time and Bulb are available, when ISO is set to 1600 or lower. With the Time setting, the shutter opens when you fully press and release the shutter button, and it closes when you fully press and release the shutter button a second time. With the Bulb setting, the shutter opens when you press the shutter button down, and it stays open until you release. The maximum exposure with either of these settings is 60 seconds. Neither setting is available when continuous shooting is activated.

The Auto Flash and Slow Sync flash modes are not available with Manual exposure mode.

Scene Modes

The Coolpix P950 offers several of what I will call scene modes. The terminology can be a bit confusing, because the camera's menus and documentation use the word "scene" in several similar and overlapping contexts. First, there are two modes that occupy slots marked by icons on the mode dial: Bird-watching and Moon. Next, there is another slot on the mode dial marked SCENE. When you select that setting, you can press the Menu button to the lower left of the multi selector and scroll through a list of 19 specific scene settings: Portrait, Landscape, Sports, Night Portrait, Party/Indoor, Beach, Snow, Sunset, Dusk/Dawn, Night Landscape, Close-up, Food, Fireworks Show, Backlighting, Easy Panorama, Pet Portrait, Selective Color, Multiple Exposure Lighten, and Time-lapse Movie. I will discuss all of these scene settings individually, but first I will provide some general remarks about these shooting mode options.

Scene modes are different from the other shooting modes I have discussed up to this point. These modes do not have a single defining feature, such as permitting

control over one or more aspects of exposure. Instead, when you select a scene shooting mode, you are in effect telling the camera what sort of environment the picture is being taken in, and what type of image you are looking for, and you are letting the camera decide what settings to use to produce that result.

Some photographers may not like scene modes because they take some creative decisions away from you and limit your options in some ways. For example, you will find that the Shooting menu options are sharply limited when the mode dial is turned to the SCENE setting or either of the scene modes with slots on the mode dial, such as Bird-watching. For example, you cannot set the white balance, but must rely on the camera's Auto White Balance setting, which may not always properly evaluate the existing light source. In most cases, you cannot select features such as continuous shooting, and you can't choose a metering mode or an ISO setting.

Despite the limitations, though, I find the scene settings useful in certain situations. You don't have to use these settings only for their labeled purposes; you may find that some of them are well-suited for shooting scenarios you are regularly faced with. For example, you may find the Sports setting works well for shots of children at play, or that the Sunset setting, which emphasizes red hues, is great for images in a particular garden that is rich with reddish plants and flowers. The Bird-watching setting can work well for taking images of various sorts of wildlife, not just birds.

You need to know something about each of these options to decide whether it's one you would want to select. In general, a given scene setting carries with it a variety of values, including things like focus mode, flash status, range of shutter speeds, sensitivity to various colors, and others. I will discuss each of the scene settings so you can make informed choices. I will first discuss the settings that have their own slots on the mode dial, followed by the settings that are grouped under the SCENE setting on the dial. I will include sample images for some of the most commonly used options.

MOON MODE

This is the setting indicated by the moon icon on the mode dial next to the SCENE setting, as seen in Figure 3-20.



Figure 3-20. Mode Dial at Moon

The Coolpix P950, with its great optical zoom range, is a natural for shooting images of the moon without having to attach the camera to a telescope. With the Moon setting, Nikon has provided a shortcut to using appropriate settings for these shots.

With this option, the camera disables the flash and turns on the self-timer to three seconds so the camera will have time to settle down after you press the shutter button, to avoid camera shake. You can change this setting to ten seconds or turn the self-timer off if you want. You can use exposure compensation, which is useful if the moon appears too bright or too dim because of its phase. If you have the focus mode selector set for autofocus, focus is fixed in the center of the frame, at the infinity setting. You can switch to manual focus using the focus mode selector, if you prefer. You can set Image Quality to Fine or Normal, but not to Raw.

The camera also uses two special settings to help with this type of shot. First, as shown in Figure 3-21, when the lens is zoomed out to its wide-angle setting, the camera places a small rectangle in the center of the focus frame.



Figure 3-21. Shooting Screen in Moon Mode

By default, that small inner frame represents the viewing angle when the lens is zoomed in to 1000mm. You can place that frame over the moon with the lens zoomed back to its wide-angle setting, then press the OK button to cause the camera to zoom immediately to the 1000mm focal length. In that way, you can easily