your new selection (either Intelligent Auto or Superior Auto) is highlighted, press the Function button to exit to shooting mode.

Program Mode

Choose this mode by turning the mode dial to the P setting, as shown in Figure 3-8.

Figure 3-8. Mode Dial at Program

Program mode (sometimes called Program Auto mode) lets you control many of the settings available with the RX100 VI, apart from shutter speed and aperture, which the camera chooses on its own. You still can adjust the camera's automatic exposure to a fair extent by using exposure compensation, as discussed in Chapter 6, as well as exposure bracketing, discussed in Chapter 4, and Program Shift, discussed later in this section. You don't have to make a lot of decisions if you don't want to, because the camera will make reasonable choices for you as defaults.

The camera can choose a shutter speed as long as 30 seconds or as short as 1/32000 second. However, the fastest shutter speed available is 1/2000 second when Shutter Type is set to Mechanical on screen 5 of the Camera Settings2 menu.

In this shooting mode, the camera can choose any aperture in its full range from f/2.8 to f/11.0.

The Program Shift function, which is available only in Program mode, works as follows: When you aim the camera at your subject, the camera will display its chosen settings for shutter speed and aperture in the lower left corner of the display. At that point, turn the control wheel on the back of the camera. The values for shutter speed and aperture will change, if possible under current conditions, to different values for both settings while keeping the same overall exposure of the scene.

You also can use the control ring (the large ring around the lens) to make this setting, if the Control Ring option is set to the Standard setting through the Custom Key

(Still Images) item on screen 9 of the Camera Settings2 menu, as discussed in Chapter 5. If you use the control ring for Program Shift, you will see two circular scales on the display, with shutter speed and aperture values that shift as you turn the ring, as shown in Figure 3-9. (A similar display is visible at the bottom of the screen if you use the control wheel, but only if the Exposure Settings Guide menu option is turned on through screen 7 of the Camera Settings2 menu.)

Figure 3-9. Program Shift Display from Using Control Ring

With this option, the camera "shifts" the original exposure to your choice of any of the matched pairs that appear as you turn the control wheel. For example, if the original exposure was f/2.8 at 1/30 second, you may see equivalent pairs of f/3.2 at 1/25, f/3.5 at 1/20, and f/4.0 at 1/15, among others. When Program Shift is in effect, the P icon in the upper left corner of the screen will have an asterisk to its right, as shown in Figure 3-10.

Figure 3-10. Program Shift Icon on Shooting Screen

To cancel Program Shift, turn the control wheel (or control ring) until the original settings are in effect or move the mode dial to another mode, then back to Program. You also can cancel by pressing the flash pop-up button to raise the flash; Program Shift cannot function with flash in use.

Program Shift is useful if you want to use a slightly faster shutter speed to stop action better or a wider aperture to blur the background more, or you might have some other creative reason. This option lets the camera quickly evaluate the exposure, but gives you the option to tweak the shutter speed and aperture to suit your current needs.

Of course, if you need to use a specific shutter speed or aperture, you probably are better off using Aperture Priority, Shutter Priority, or Manual exposure mode. However, having Program Shift available is useful when you're taking pictures quickly using Program mode, and you want a fast way to tweak the settings somewhat.

Another important aspect of Program mode is that it expands the choices available through the Camera Settings1 menu, which controls many of the camera's settings that directly affect your images. You will be able to make choices involving ISO sensitivity, metering mode, DRO/HDR, Creative Style, Picture Effect, and others that are not available in the Auto modes. I won't discuss those settings here; see the discussion of the Camera Settings1 menu in Chapter 4 for information about all of the different selections that are available.

Aperture Priority Mode

You select Aperture Priority shooting mode by turning the mode dial to the A setting, as shown in Figure 3-11.

Figure 3-11. Mode Dial at Aperture Priority

In this mode, you select the aperture and the camera chooses a shutter speed for proper exposure. With this mode, you can exercise some control over depth of field of your shots. When you select a narrow aperture,

such as f/11.0, the depth of field will be broad, with the result that more items will appear to be in sharp focus at varying distances from the lens. On the other hand, with a wider aperture, such as f/2.8, the depth of field will be relatively shallow, and you may be able to keep only one subject in sharp focus.

Figure 3-12. Aperture Set to f/2.8

Figure 3-13. Aperture Set to f/11.0

In Figures 3-12 and 3-13, where I photographed two model lighthouses, the settings were the same except for aperture values. I focused on the lighthouse in the foreground in each case. For Figure 3-12, I set the aperture of the RX100 VI to f/2.8, the widest possible. With this setting, because the depth of field at this aperture was quite shallow, the lighthouse in the background is fairly blurry. I took Figure 3-13 with the camera's aperture set to f/11.0, the narrowest possible setting, resulting in a greater depth of field, making the background appear noticeably sharper.

These photos illustrate the effects of varying aperture by setting it wide (low numbers) to blur the background or narrow (high numbers) to enjoy a broad depth of field and keep subjects at varying distances in sharp focus. A need for shallow depth of field arises often in the case of outdoor portraits or photographs of subjects such as flowers. If you can achieve a shallow depth of field by using a wide aperture, you can keep the subject

in sharp focus but leave the background blurry, as in Figure 3-12.

This effect is sometimes called "bokeh," a Japanese term for a pleasing blurriness of the background. In this situation, the fuzzy background can be an asset, minimizing distraction from unwanted objects and highlighting the sharply focused portrait of the subject.

You should note that, in order to achieve the long optical zoom range of 200mm, Sony found it necessary to set the widest aperture of the lens for this camera at f/2.8, which is not as wide as with some other models, and it increases as the lens is zoomed in, as discussed below. Therefore, this camera does not readily achieve a heavily blurred background by varying the aperture alone. If you want to blur the background as much as possible, it is advisable to use a long focal length by zooming in the lens to 100mm or more, and move fairly close to the subject, while keeping the subject fairly far in front of the background. An example of this approach is shown in Figure 3-14.

Figure 3-14. Blurred Background from Long Focal Length

Here are the steps to set the aperture. After moving the mode dial to the A setting, use either the control ring or the control wheel to change the aperture. If the control ring does not change the aperture, check the setting for the Control Ring option of the Custom Key (Still Images) item on screen 9 of the Camera Settings2 menu, as discussed in Chapter 5; that menu option has to be set to Standard or Aperture for the ring to carry out this function.

If you use the control ring to set the aperture, the camera will display a circular scale showing the changing aperture values, as seen in Figure 3-15, and

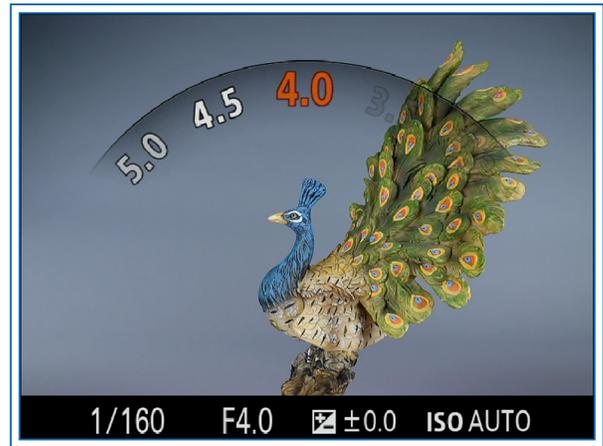the selected value will also appear in the bottom center of the screen.

Figure 3-15. Aperture Setting from Using Control Ring

If you use the control wheel instead, the camera will display a sliding scale at the bottom of the screen, if the Exposure Settings Guide option on screen 7 of the Camera Settings2 menu is turned on.

Figure 3-16. Aperture Setting from Using Control Wheel

When you set the aperture, as seen in Figure 3-16, the f-stop (f/4.0 in this case) will appear at the bottom of the screen next to the shutter speed. The camera will select a shutter speed that will result in a normal exposure given the aperture you have set. When the Shutter Type option on screen 5 of the Camera Settings2 menu is set to Auto or Electronic, the camera can choose shutter speeds from 30 seconds to 1/32000 second.

When Shutter Type is set to Mechanical, the range of available shutter speeds is from 30 seconds to 1/2000 second.

Although in most cases the camera will be able to select a corresponding shutter speed that results in a normal exposure, there may be times when this is not possible. For example, if you are taking pictures in a very bright location with the aperture set to f/2.8, the camera may not be able to set a shutter speed fast enough to yield a normal exposure, especially if you are using the mechanical shutter instead of the electronic shutter. In that case, the fastest possible shutter speed (1/2000 second) will flash on the display to show that a normal exposure cannot be made using the chosen aperture. The camera will let you take the picture, but it may be too bright to be usable.

Similarly, if conditions are too dark for a good exposure at the aperture you have selected, the slowest possible shutter speed (30", meaning 30 seconds) will flash.

In situations where conditions are too bright or dark for a good exposure, the camera's display may become bright or dark, giving you notice of the problem. This will happen if the Live View Display item on screen 7 of the Camera Settings2 menu is set to Setting Effect On. If that option is set to Setting Effect Off, the display will remain at normal brightness, even if the exposure settings would result in an excessively bright or dark image. I will discuss that menu option in Chapter 5.

One more note on Aperture Priority mode: 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/4.5.

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 label. Then select Aperture Priority mode and set the aperture to f/2.8. Now zoom the lens in by moving the zoom lever to the right. After the zoom is finished, the aperture will have changed to f/4.5 because that is the limit for the aperture at the full-telephoto zoom level. (The aperture will change back to f/2.8 if you zoom back to the wide-angle setting.)

Also, when you set an aperture as narrow as f/11 with this camera, lens diffraction comes into play and limits the sharpness of your images. So, unless you have a fairly strong reason to use f/11, such as a need to maximize depth of field in a brightly lighted area, you should try to use apertures no narrower than f/8.0 if possible.

Shutter Priority Mode

In Shutter Priority mode, you choose the shutter speed and the camera will set the corresponding aperture to achieve a proper exposure of the image.

Figure 3-17. Mode Dial at Shutter Priority

In this mode, designated by the S position on the mode dial, as shown in Figure 3-17, you can set the shutter to be open for a time ranging from 30 seconds to 1/32000 of a second, if the Shutter Type menu option is set to Auto or Electronic. If that option is set to Mechanical, the fastest setting available is 1/2000 second.

If the built-in flash is in use, the fastest setting available is 1/100 second with the electronic shutter and 1/2000 second with the mechanical shutter.

If you are photographing fast action, such as a bird in flight, a baseball swing, or a hurdles event at a track meet, and you want to stop the motion with a minimum of blur, you should select a fast shutter speed, such as 1/2000 of a second. For Figure 3-18 and Figure 3-19, I used different shutter speeds in photographing a group of colored beads as I poured them into a large bowl.
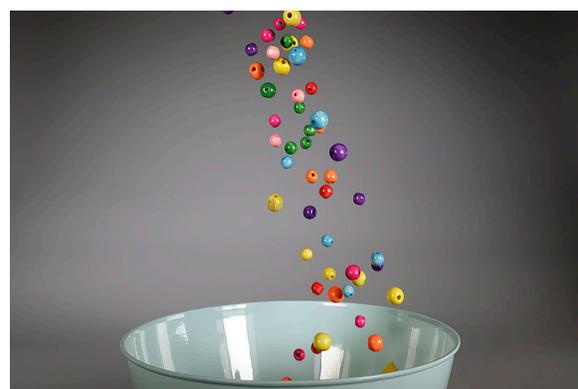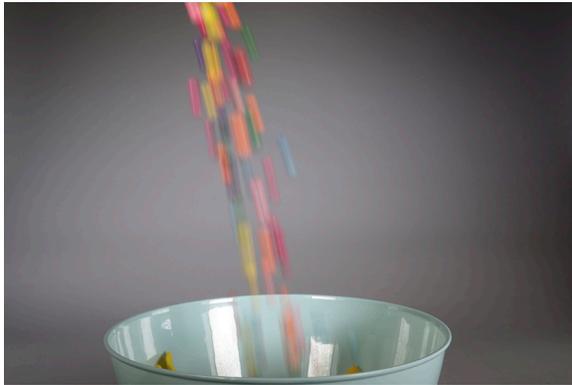

Figure 3-18. Shutter Speed Set to 1/2000 Second

In Figure 3-18, I used a shutter speed setting of 1/2000 second. In this image, you can see the individual beads

clearly. In Figure 3-19, with the shutter speed set to 1/60 second, the beads blur together into what looks almost like a continuous stream.

Figure 3-19. Shutter Speed Set to 1/60 Second

Choose this mode by turning the Mode dial to the S position, as seen in Figure 3-17. Select the shutter speed by turning the control wheel or the control ring. The Control Ring function must be set to Standard or Shutter Speed using the Custom Key (Still Images) option on screen 9 of the Camera Settings2 menu for the ring to control shutter speed.

As with Aperture Priority mode, the camera will display a sliding scale of shutter speeds as you turn the control wheel if you have the Exposure Settings Guide option turned on in the Camera Settings2 menu. It will always display a circular scale of shutter speeds when you use the control ring to make the setting.

Figure 3-20. Shooting Screen in Shutter Priority Mode

Although the Mode dial uses the letter "S" to stand for Shutter Priority, on the detailed display screen, as shown in Figure 3-20, the camera uses the notation Tv (for time value) in the lower right corner, next to the

icons showing that the control ring or control wheel can be used to make this setting.

As you cycle through various shutter speeds, the camera will select the appropriate aperture to achieve a normal exposure, if possible. As I discussed in connection with Aperture Priority mode, if you set a shutter speed for which the camera cannot select an aperture that will yield a good exposure, the aperture reading at the bottom of the display will flash. The flashing aperture means that proper exposure at the selected shutter speed is not possible at any available aperture, according to the camera's calculations.

For example, if you set the shutter speed to 1/320 second in a fairly dark indoor environment, the aperture number (which will be f/2.8, the widest setting, if the lens is at its wide-angle setting) may flash, indicating that proper exposure is not possible. As I discussed for Aperture Priority mode, you can still take the picture if you want to, though it may not be usable. A similar situation may take place if you select a slow shutter speed (such as four seconds) in a relatively bright location. (This situation is less likely to happen in Aperture Priority mode, because of the wide range of shutter speeds the camera can use to achieve a good exposure.)

If the current settings in this mode would result in an image that is excessively dark or bright, the LCD display will grow dark or bright to show that effect, but only if the Live View Display option on screen 7 of the Camera Settings2 menu is set to Setting Effect On. If that option is set to Setting Effect Off, the display will show a normal image even in unusually bright or dark conditions.

Manual Exposure Mode

One of the many features of the RX100 VI that distinguish it from more ordinary compact cameras is that it has a fully manual exposure mode, a useful tool for photographers who want to have full creative control over exposure decisions.

To control exposure manually, set the mode dial to the M indicator, as shown in Figure 3-21. You now have to control both shutter speed and aperture by setting them yourself. To set the aperture, turn the control ring around the lens (assuming the control ring is set for this function through the Camera Settings2 menu, as

discussed in Chapter 5); to set the shutter speed, turn the control wheel on the back of the camera.

Figure 3-21. Mode Dial at Manual Exposure

If the control ring is not set to control aperture, or if you prefer not to use the ring for that purpose, you can use the control wheel to adjust both aperture and shutter speed. To do that, press the Down button to switch between the two selections.

When you press that button, either the shutter speed number or the aperture number on the display will turn orange for about 10 seconds to show that that value is currently being controlled by the control wheel. Also, the label beside the gray icon for the control wheel in the lower right corner of the display will change between Av (for aperture value) and Tv (for time value) when you press the Down button to switch the wheel's function. Figure 3-22 shows the display when the control wheel is controlling shutter speed.

Figure 3-22. Display When Control Wheel Adjusts Shutter Speed

As you adjust shutter speed and aperture, a third value, to the right of the aperture, also may change. That value is a positive, negative, or zero number. The meaning of the number is different depending on the current ISO setting.

In Chapter 4, I'll provide more details about the ISO setting, which controls how sensitive the camera's

sensor is to light. With a higher ISO value, the sensor is more sensitive and the image is exposed more quickly, so the shutter speed can be faster or the aperture more narrow, or both.

To set the ISO value, press the Menu button to access the menu system, go to screen 6 of the Camera Settings1 menu, and highlight the ISO item. Press the Center button to bring up the ISO menu, as shown in Figure 3-23, and scroll through the selections using the Up and Down buttons or by turning the control wheel.

Figure 3-23. ISO Menu

Choose a low number like 125 to maximize image quality when there is plenty of light; use a higher number in dim light. Higher ISO settings are likely to cause visual "noise," or graininess, in your images. Generally speaking, you should try to set ISO no higher than 800 to ensure the highest image quality.

If the ISO value is set to a specific number, such as 125, 200, or 1000, then, in Manual exposure mode, the icon at the bottom center of the display is a box containing the letters "M.M.," which stand for "metered manual," as shown in Figure 3-22.

In this situation, the number next to the M.M. icon represents any deviation from what the camera's metering system considers to be a normal exposure. So, even though you are setting the exposure manually, the camera will still let you know whether the selected aperture and shutter speed will produce a standard exposure.

If the aperture, shutter speed, and ISO values you have selected will result in a darker exposure than normal, the M.M. value will be negative, and vice-versa. This value can vary only by +2.0 or -2.0 EV (exposure value)

units; after that, the value will flash, meaning the camera considers the exposure excessively abnormal.

Of course, you can ignore the M.M. indicator; it is there only to give you an idea of how the camera would meter the scene. You very well may want part or all of the scene to be darker or lighter than the metering would indicate to be "correct."

As with the Aperture Priority and Shutter Priority modes, the camera's display will become unusually bright or dim to indicate that current settings would result in an abnormal exposure, but only when the Live View Display option on screen 7 of the Camera Settings2 menu is set to Setting Effect On. For example, Figure 3-24 shows the camera's display when Manual exposure settings would result in a dark image, with Setting Effect On.

Figure 3-24. Manual Exposure Screen with Setting Effect On

If, instead of a specific value, you have set ISO to Auto ISO, the icon at the bottom center of the screen changes. In this situation, the camera displays the exposure compensation icon, which contains a plus and minus sign, as shown in Figure 3-25. The reason for this change is that, when you use Auto ISO in Manual exposure mode, the camera can likely produce a normal exposure by adjusting the ISO. There is no need to display the M.M. value, which shows deviation from a normal exposure.

Instead, the camera lets you adjust exposure compensation, so you can set the exposure to be darker or brighter than the camera's autoexposure system would produce.

Figure 3-25. Manual Exposure Screen with Auto ISO in Effect

To set exposure compensation in Manual mode, you cannot use the ordinary control for that purpose—the Down button—because that button toggles the function of the control wheel for controlling aperture or shutter speed, as discussed above. To control exposure compensation in Manual mode, you can use the Exposure Compensation item on screen 6 of the Camera Settings1 menu, or you can assign exposure compensation to the control ring or to the Custom, Center, Left, or Right button. You make that assignment using the Custom Key (Still Images) option on screen 9 of the Camera Settings2 menu, as discussed in Chapter 5. You also can use the Function menu to adjust exposure compensation, if that adjustment has been included in that menu, as discussed in Chapter 5.

With Manual exposure mode, the settings for aperture and shutter speed are independent of each other. When you change one, the other one stays unchanged until you adjust it manually. But the effect of this system is different depending on whether you have selected a specific value for ISO as opposed to Auto ISO.

If you select a numerical value for ISO, which can range from 80 to 12800 (or even higher when Multi Frame Noise Reduction is selected for the ISO setting), the camera leaves 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.

However, if you select Auto ISO for the ISO setting, then, as discussed above, the camera will adjust the ISO to achieve a normal exposure if possible. In this case, Manual exposure mode becomes like a different shooting mode altogether. You might call this the

"aperture and shutter speed priority mode," because you are able to set both aperture and shutter speed but still have the camera adjust exposure automatically by changing the ISO value.

The ability to use Auto ISO in Manual exposure mode is very useful. For example, suppose you are taking photographs of a craftsman using tools in a dimly lighted area. You may want to use a narrow aperture such as f/7.1 to achieve a broad depth of field and keep the tools and other items in focus, but you also may want to use a fast shutter speed, such as 1/250 second, to freeze action. If you use Aperture Priority mode, the camera will choose the shutter speed; with Shutter Priority mode, the camera will choose the aperture, and with Program mode, the camera will choose both values. Only by using Manual exposure mode with Auto ISO can you choose both aperture and shutter speed and still have the camera find a good exposure setting automatically.

Even with the ability to use Auto ISO, though, there may be situations in which the camera cannot produce a normal exposure. This could happen if you have limited the scope of the Auto ISO setting by establishing a narrow range between the Minimum and Maximum settings for Auto ISO. It also could happen if you have chosen extreme settings for aperture and shutter speed, such as 1/500 second at f/11.0 in dark conditions. In such situations, the ISO Auto label and the exposure compensation value at the bottom of the display will flash, indicating that a normal exposure cannot be achieved with these settings.

The range of apertures you can set in Manual mode is the same as for Aperture Priority mode: f/2.8 to f/11.0. (As with other shooting modes, the widest apertures are not available when the lens is zoomed in.)

The range of shutter speeds in Manual mode is the same as for Shutter Priority mode: 1/32000 second to 30 seconds if Shutter Type is set to Auto or Electronic and 1/2000 second to 30 seconds if Shutter Type is Mechanical.

If the flash is in use, the fastest setting available is 1/100 second with the electronic shutter and 1/2000 with the mechanical shutter. However, there is one important addition to the range of shutter speeds in this shooting mode. In Manual exposure mode, if Shutter Type is set to Mechanical or Auto, you can set

the shutter speed to the BULB setting, just beyond the 30-second mark, as shown in Figure 3-26.

Figure 3-26. Shutter Speed Set to BULB

With the BULB setting, you have to press and hold the shutter button to keep the shutter open. You can use this setting to take photos in dark conditions by holding the shutter open for a minute or more.

One problem is that it is hard to avoid jiggling the camera, causing image blur, even if the camera is on a tripod. In Appendix A, I discuss using a remote control to trigger the camera. After the exposure ends, the camera will process the image for the same length of time as the exposure, to reduce the noise caused by long exposures. You will not be able to take another shot while this processing continues. (You can disable this setting with the Long Exposure Noise Reduction option on screen 2 of the Camera Settings1 menu.)

Another feature available in this mode is Manual Shift, which is similar to Program Shift, discussed earlier. To use Manual Shift, you first have to assign one of the control buttons (Custom or Center) to the AEL (autoexposure lock) Hold or AEL Toggle function using the Custom Key (Still Images) or Custom Key (Movies) option on screen 9 of the Camera Settings2 menu, as discussed in Chapter 5. (The Left or Right button can be assigned to AEL Toggle, but not to AEL Hold.)

Then, after making your aperture and shutter speed settings, change the aperture setting while pressing the button assigned to the AEL function. (If you selected AEL Toggle, you don't have to hold down the button; just press it and release it.)

When you do this, the camera will make new settings with equivalent exposure, if possible. For example, if the