

## Exposure - Part 1 – Bob Young

This is Part 1 of a 5-part tutorial which will take you through the basics of using the fully automatic mode (AUTO) to using your camera in full manual exposure mode (M). Along the way we will look at the Program Mode (P), Aperture Priority Mode (A or Av) and Shutter Priority Mode (S or Tv) and ISO. We will also discuss the exposure metering options of Multi-segment or Program, Centre weighted and Spot metering and look at their differences and under what circumstances you might choose one or the other.

To start with, let us define some terms:

**AUTO** – Virtually all “Point and Shoot” and compact cameras, as well as mobile phones, will have an automatic mode. When this mode is selected the camera controls all the exposure settings. You only have to point the camera at the subject or scene, compose your image in the viewfinder or LCD panel and press the shutter button. In most cases (75% or thereabouts) your camera will do a good job. But the results in dull weather, extremely bright sunshine with harsh shadows, or scenes where your subject is moving or scenes where there is a high contrast range the images may be less than satisfactory.



Typical command dial on Point & Shoot Camera

**Program mode (P)** – This is the first step in the photographer taking control away from the camera. The camera still controls the shutter speed and aperture settings, but the photographer is free to set the ISO and metering options. ISO can be set to “Auto” if desired and the camera will then control this setting in a similar manner to the full “Auto” mode.

**Aperture Priority mode (A or Av)** – This is the first big step in taking control of how the image “looks”. We are now able to control the parts of the image that are to be in sharp focus and allow the foreground and/or background to be less sharp or blurred.

**Shutter Priority (S or Tv) mode** controls the shutter and determines the length of time that the shutter is open and allowing light to fall on the image sensors in the camera. High shutter speeds e.g. 1/1000<sup>th</sup> second or less will freeze the action and we will clearly see all the wing feathers of a bird in flight. On the other hand, a shutter speed of 1/100<sup>th</sup> second would cause the outer edges of the wing feathers of our bird in flight to be blurred and indistinctive.

**ISO** (International Standards Organization) defines the relative sensitivity of the image receptors. In the good old days of film, if one wanted a ‘faster’ film to use in low light situations, you would buy a film rated at 400 ISO, whereas your normal daylight film would typically be rated at 50 or 100 ISO. Today the values are the same but instead of changing film, we now change the ISO value on the camera and the internal electronics adjust the image receptors light sensitivity. Typically we change the ISO setting to a higher value when light conditions are poor (e.g. cloudy skies) or where we want to be able to use higher shutter speeds

How we use the Aperture Priority, Shutter Priority and ISO options will be discussed in Part 2 when we will look at adding our own creativity to our images.

**Metering Modes** – Not all cameras will provide a choice of metering modes, but most digital single lens reflex (DSLR) cameras and some of the top end compact cameras will include these features. The common options are:

**Multi-segment or Program mode** – here the computer ‘divides’ the image into a number of segments: originally 5, but some of the latest models have 11 or more. The exposure meter will then allocate different levels of importance to each of these areas and use an algorithm which takes into account these levels to determine the correct exposure e.g. the centre segment would normally be given greater importance with perhaps the foreground segments being given a lower level than the centre, but a higher level than the background segments. The objective is to ensure the most important elements of the image (which are normally placed in the centre and foreground) are correctly exposed even if it means that the background ends up being under or over exposed.

**Centre weighted** is very much as the name says. The exposure meter will calculate the correct exposure based on light values of the centre of the image. This is often shown in the view finder as a circle with a diameter of 15 to 20 millimetres.

**Spot metering** is similar to centre weighted except that the area of the spot is much smaller and is normally shown as a circle with a diameter of less than 10mm. Typically the area of the image covered by a spot meter in a DSLR fitted with a 50mm lens would be about half the size of the same image when the camera is fitted with a 500mm telephoto lens.

Metering options will be discussed in Part 3.

In Part 4 we will look at why the exposure meter doesn’t always get it right and how we can overcome its limitations. The most commonly used method is **exposure compensation**. In discussing the use of the exposure compensation control, we will touch on the Zone System of exposure calculation and how we can apply that concept in evaluating our settings for the exposure correction value.

Finally in Part 5 we will discuss the basics of **manual exposure** with particular reference to its use in bird photography.

So let’s begin:

## **AUTO Mode:**

This is the simplest way in which to use your camera, but only allows very little input by the photographer in the creation of the image. As mentioned at the beginning of this article, in about 75% of cases, auto mode will produce a good result. For a lot of people this is quite acceptable and they have no wish to spend the time necessary to become more the ‘creative’ - for them the camera is simply a tool with which to record memories of their travels, family and friends. There is also a growing population of photographers whose only camera will be built into their mobile phone – for them auto mode is currently their only option.

Even though you don’t have the ability to modify the exposure in any way, you can improve your chances of getting better results in less than ideal lighting conditions by better understanding how your camera works.

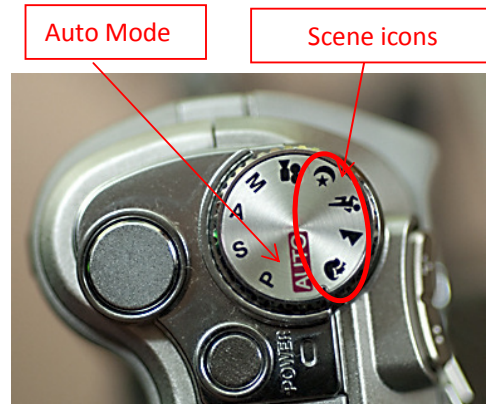
Most cameras using AUTO mode will have difficulties in very dull or very bright light. High contrast scenes such as a white bird against a dark background will frequently result in an image with very

little detail in the white plumage. Similarly a dark bird against a light back ground will generally produce an image with little detail in the dark areas.

## Scene Modes:

Many “point and shoot” and compact cameras also offer options to improve your photos without having to learn anything about how to calculate the correct exposure. These are referred to as the ‘scene’ modes – little icons of a face, hills, an athlete, moon and stars.

Turn the control wheel to the ‘face’ and you are telling the camera that you are taking a portrait. The camera will automatically set the exposure to concentrate the viewer’s attention on the face by slightly blurring the background. Similarly use the icon of the two people when taking group photos. Selecting the athlete instructs the camera to use a higher shutter speed to capture the action in a sports shot. The ‘hills’ is the option to choose when taking landscapes; this will tell the camera to adjust the settings to ensure that all elements from the foreground to the background are in focus. The moon and star is the place to be for taking twilight or night shots. Try these out and see if you like the results. My own experience is that they frequently give a better result than using AUTO mode alone, but in most cases an experienced photographer will get equal or better shots by using the advance functions which we will discuss in later parts of this tutorial.



Dial set to "Auto" mode

The **Portrait mode** will apply the same technique which an experienced photographer might apply to separate the person from the background. Typically they would increase the size of the lense aperture which has the effect of ‘blurring’ the foreground and background. This effect is known as controlling the depth of field with the greatest effect being achieved with the lense aperture set to the maximum opening. In Part 2 of this tutorial, we will discuss the application of this technique using the Aperture Priority mode (A or Av). But for now you do know that you can achieve a level of control over the depth of field by choosing the portrait icon. The extent may vary from one camera to another and may also vary according to how far you are from the subject.



Portrait mode slightly blurs the background making the bird stand out more clearly

The **Landscape mode** will typically select the smallest lense aperture size which will increase the depth of field and try to ensure that all elements in the image from foreground to the background are in focus. So you now have 2 ways to control depth of field and you didn’t even need to learn anything about exposure calculation methods – all you have to do is select the appropriate icon. Experience gained from taking test shots will teach you the extent to which you can exercise control over the depth of field in your images.



Landscape mode gives this image great depth of field with everything in focus from foreground to background

The **Sports mode** allows you to exercise some control over the illusion of movement in your images. If you select the athlete icon, the camera will select a higher shutter speed, thus reducing motion blur in the image. To some extent you will be able to freeze the action. You can use this icon for any situation where your subject is moving and you want to eliminate the possibility of motion blurring. You might also experiment with increasing the ISO value to say 400 ISO or 800 ISO if your camera has this capability. This could permit your camera to select an even higher shutter speed and increase the 'freezing' effect.



Zooming in plus sports mode enables you to freeze the action.

The **Night scene mode** basically works in the opposite way to the sports mode. Rather than increasing the shutter speed, the camera will select a much slower speed which will compensate for the reduction in the light level. Because we can anticipate that the camera will try to select a slower shutter speed, we can also use this icon to deliberately blur the motion. This can produce attractive images of running water and waterfalls.

Adding the option to use these 4 icons to your photographic repertoire gives you 2 ways to control depth of field and 2 ways to control motion, and all 4 options require nothing from you other than selecting the appropriate icon: everything else is automatically controlled by the camera just as it was in full AUTO mode.

### Tips and tricks:

**\*\*** If you are taking a photo of a person in very bright sunshine which is creating very dark shadows on the face, can you move to a shaded area or move out of the direct sunlight? Can you ask the person to turn away from the sun so that the sun is shining more from behind than in front of the person?

If you cannot move the subject, can you move? Can you change your position so that the deep shadows are not so prominent in the photo?

**\*\*** But sometimes moving yourself or the subject is just not possible. In this case can you wait until the light is more favourable? In summer the hours between 11.00am and 3.00pm are generally the least favourable time for outdoor photography because the sun is more or less directly overhead and does create unsightly shadows under the eyes and cheeks. Taking your outdoor photos between 8.00am and 10.00am or 4.00pm and 6.00pm will generally result in much better lighting conditions which will be reflected in the quality of your image.

**\*\*** In situations where you are taking a full length photo of a person and the background is either very light or very dark, here is a trick which you might be able to use to avoid the person being silhouetted or being over exposed. Many cameras will allow you to lock the exposure. Move in very close to the person, so close that their face takes up almost the whole image area. Now gently press the shutter, but only half way down and hold it in this position. You have now asked the camera to set the correct exposure for the person's face and to keep this setting until you fully depress the shutter button. Now you can move back until the person is positioned in the viewfinder or LCD as you require and then finish depressing the shutter button. The result will be an image where the person is beautifully exposed, but the background may be lighter or darker than normal – that shouldn't matter because you are really interested in the person not the background. *[You will need to check your manual to see whether this works with your camera. On some cameras, this technique*

*locks the focus not the exposure – others will allow you to select whether it will lock the exposure or the focus.]*

\*\* There will be times when you just do not have time to adjust your camera settings. This image of the Lyrebird at full pace was a case in question. I could not have stopped the motion using the relatively slow shutter speed I was using on the mountain. The solution was to pan the camera keeping the bird centred in the viewfinder then pressing the shutter

release while continuing to pan with the bird.

Panning is just twisting from the hips while following the bird – all the time trying to

make sure that you keep the bird in the same relative position in the viewfinder. If you are successful the background should show horizontal streaking while your bird is pretty much in focus.



Panning produced the tell-tale signs of the horizontal blurring of the background while keeping the Lyrebird in reasonably sharp focus.

## 'P' Mode

Program mode (P) mode is not very different to the Auto mode so I will not spend as much time on it. In respect to the exposure functions, it only allows you to manually set the ISO value and to use the exposure compensation function (if provided on your camera). It may also allow you to select the exposure metering mode. Exposure metering modes and exposure compensation are advanced functions and will be discussed in Parts 3 and 4. So that leaves us with the ISO setting.

As I said earlier the ISO setting controls the sensitivity of the image receptors. But it does more than that: it also has a significant impact on the level of detail in the image. The lower the ISO value the more detail we are able to capture, conversely, the level of detail will decrease as we increase the ISO value. But most importantly ISO is one of the 3 elements which determine the correct exposure: the other 2 are aperture value and shutter speed.

In Part 2 we will look at the relationship between ISO value, aperture value and shutter speed, but for today it is only important for you to understand that these 3 settings must be considered as one overall setting and that **if we make a change to one value we must make an equal and opposite change to one of the others.**

Applying this to our exposure values, if I decrease the ISO value (which decreases the sensitivity of the image receptors), then I must increase the length of time that the shutter is open allowing more light to fall on the receptors OR increase the size of the aperture opening which would also increase the amount of light falling on the receptors.

As a further example, if I wanted to take images of birds in flight, I might want to reduce the length of time that the shutter was open to avoid the fast moving wings from being blurred. To compensate for the reduction of light falling on the sensor due the change in shutter speed, I need to increase either the sensitivity of the sensor (ISO) or the size of the lense aperture to allow more light to fall on the sensor.

What is important for you to understand at this point is that when we start to make changes to any of the three components in the exposure equation we are dealing with compromises. A change in one element effects one of the other components and that will have an effect on the 'look' of our image. That effect may be very subtle and may not be readily seen unless the image is viewed at full

size. Part 2 of this tutorial will continue from this point and we will look at the relationship between ISO, Shutter speed and Aperture size, and how changes to these values affect the look of the image.

## Homework:

Before starting the next part of this tutorial, I would suggest that you do 4 things:

1. Find the user manual that came with your camera. If you can't locate it, you will probably be able to download an electronic version from the manufacture's site or Google the make and model of your camera followed by "user manual" e.g. "Nikon D2X user manual"
2. Study the sections relating to setting the ISO value, Aperture value and Shutter speed. You need to know how to change these without referring to the manual. Most of you will be familiar with these procedures but if you are new to photography or have just bought a new camera, do not overlook this step.
3. On a fine day go out and take some photos – lots of them! Try out every option / tip that I have included in this part of the tutorial and TAKE NOTES OF WHAT YOU DO!
4. When you get home look at the photos on your computer and compare the results of the different techniques with your notes. For example, was the image taken using the Portrait icon better than just the AUTO setting? Could you see any difference between the images taken at 100 ISO as compared with those at 800 ISO?

I would recommend that you do this exercise several times; each time taking the best results from the previous trials and trying them with other techniques. For example, say you found that you liked the portrait taken with the portrait icon better than the AUTO version and that the ISO 200 setting was the best of your tests for the ISO comparison. Try taking portraits using the icon setting at various ISO settings – is ISO 200 the best for portraits? Do you find that ISO100 is best for males and ISO400 better for females or is some other value preferred?

(Confession: I simulated the effects of using the scene modes using my Nikon camera. I don't have 'point and shoot' camera. However the effects are realistic in terms of what to might expect to achieve - Bob)

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