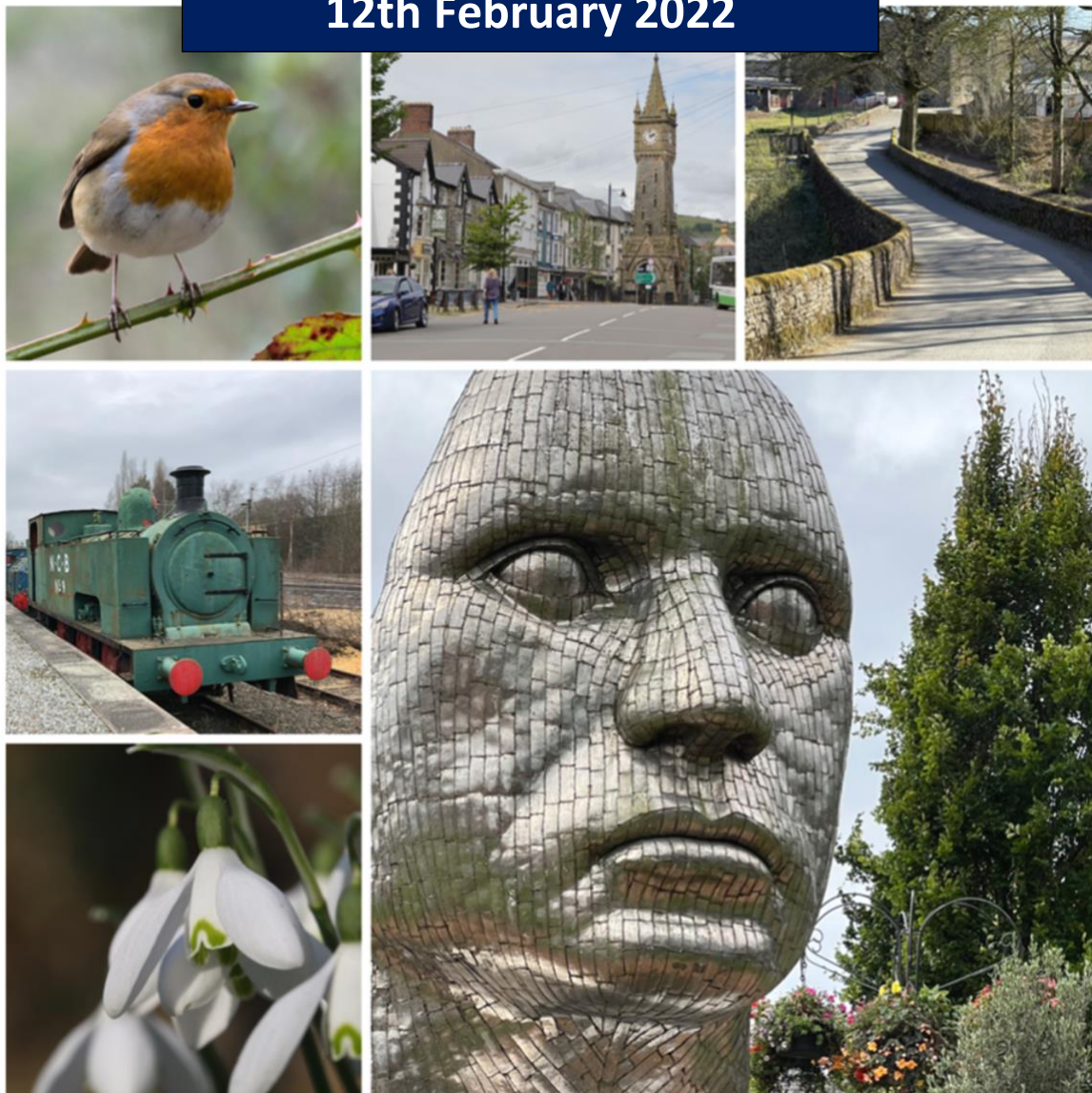


Newsletter for week ending 12th February 2022



Collage produced using Pixlr Smartphone App using iPhone Images

Welcome to this edition of the newsletter

Well my re-decoration of our lounge is now complete and I'm very happy with my handywork!

It took me the best part of 3 weeks to finish the project which included the removal of the existing fireplace and installation of new electric fire and mantle, painting the ceiling, stripping the old wallpaper and re-decorating with new.

I also laid a new laminate floor and cover strips and up-sized the existing radiator as it was under-rated for the size of room

What has stalled the final reveal is the supply of soft furnishings and other materials. We have been quoted 12 weeks lead time for some of the new items of furniture and the story has been the same for curtains, cushions, wall clock, light fittings and even artificial flower displays.

OK the current health situation may be to blame for some delays but I hear the same story from a few wholesalers that they just cannot get the goods that they want imported like they had previously been able to.

Is this “Brexit” (in the UK you will understand that expression)?

It is certainly spoiling the completion of the project however I’m sure it will be great when it is finally finished.



The wall and floor finished.

We decided to keep the old leather sofa (a 3 seater and a 2 seater) as they very comfortable and hardly showing any signs of wear even after 10 years.

I have yet to change the grill in the radiator cover, that I made some years ago, and fit 75mm wide white strip wood vertical slats to “modernise” it a little!

Whilst removing the old fireplace and marble mantelpiece there was some remedial plastering needed doing and re-fitting skirting board.



The new electric fire and wall mounted 55inch TV and soundbar.

As expected the room was acoustically “bright” with the laminate floor and without any soft furnishings like curtains and carpets.

We fitted a large rug which does help and when the curtains finally arrive that should bring the reverberation down to an acceptable level.

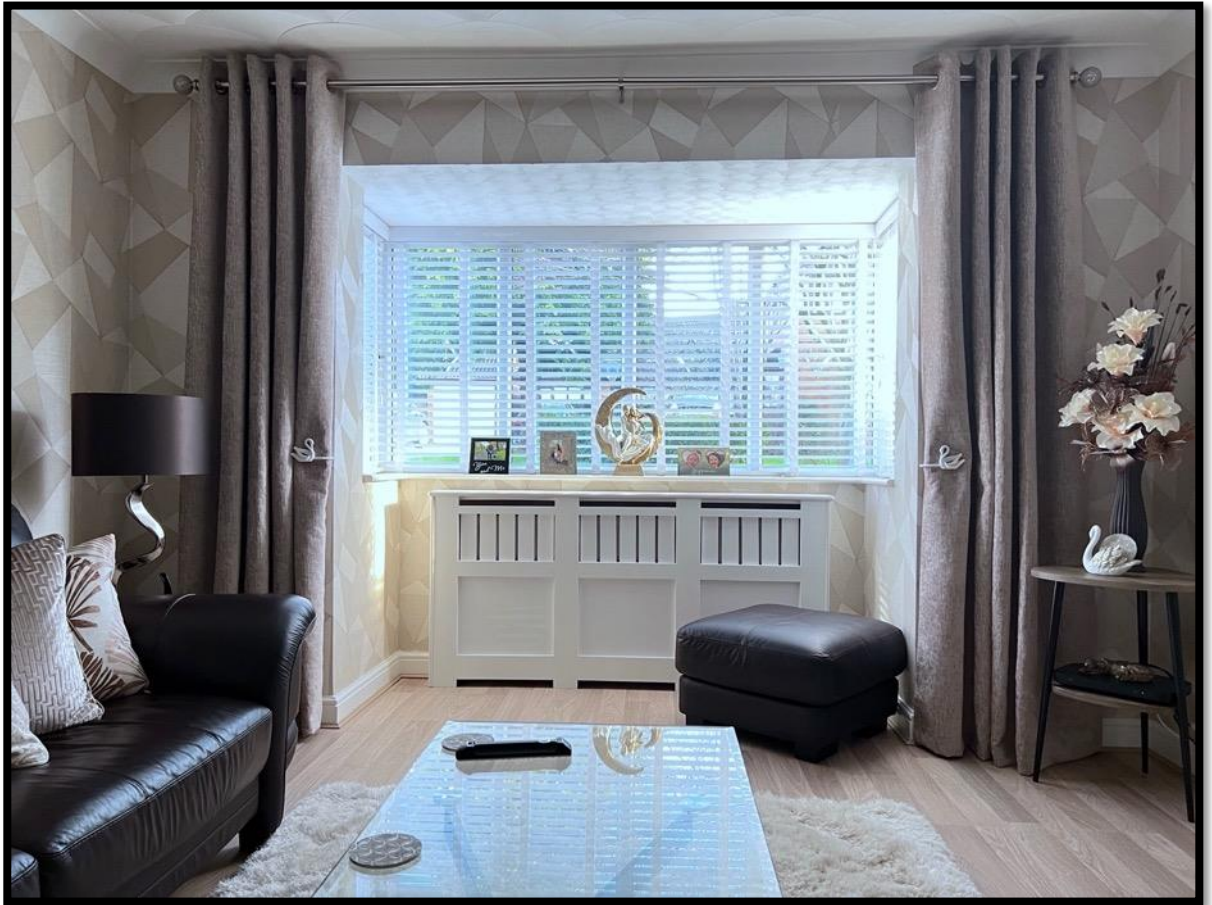
The fire has built in “mood” lighting as well as the adjustable flame colour and style. It is rated at 2KW but automatically switches between 1KW and 2KW depending on the rate of room temperature rise and nearness of the set point.

Although we won’t probably use the feature it can be programmed to come on in the morning and will do a test run to determine how long it would take to reach the set point and then adjusting the start time accordingly.

The original central heating radiator was incorrectly sized from the house being new so I took the opportunity to fit a new double panel radiator with a higher output.

That has certainly made a difference as the lounge always needed the addition of an electric fan heater to bring it to the 21C comfort level.

The new radiator can achieve this now and we can use the electric fire as a boost if needed in very cold weather.



The room is now complete with the new radiator cover that I made. The glass top coffee table and side tables and the wall clock finally arrived.

Overall I'm quite pleased at how it turned out – but more importantly Mrs H is very happy with the finished result so a few brownie points which can be exchanged for more photographic time!

Which Shooting Mode Should I use?

I get quite a few questions regarding which shooting mode to use with bridge cameras.

In this explanation of the use of the modes available I hope that it might help you if you too are wondering about this.

We realistically have four main shooting modes that we could select from: Manual, Aperture priority, Shutter priority and Program Auto mode (P). Lets' look at the case for each.

1. Manual Mode

This mode would give us the most versatility for dealing with tricky lighting scenarios. However, it does slow down the whole shooting process, as we would have to be aware of the current shutter speed, the aperture, and the camera meter reading as the ambient light situation potentially changes.

It is also possible that we might have to make a change to the ISO setting (if we weren't in an auto ISO setting), or manually change the ISO value if it was not giving us the appropriate camera settings for correct exposure.

As you can see, this mode demands your maximum attention to the technical aspects of the camera settings in order to get correct exposure in changing lighting.

2. Aperture Priority Mode

This mode allows us to set a suitable depth of field by allowing us to select the F-stop. However, that Depth of Field (DOF) zone of focus is subject to change based on the subject to camera distance and if we change the focal length of the lens by using the zoom control.

Whilst selecting an aperture to realise the depth of field that we desire we will need to carefully watch the shutter speed so that we don't run into camera shake or subject motion blur if the image contains elements that are moving.

One element of the exposure triangle (shutter speed) is automatically taken care of by the camera, thus relieving us of thinking about that one setting. In some cameras it may be possible to engage Auto ISO which will help in keeping the shutter speed at a reasonable value (linked to focal length)

3. Shutter Priority Mode

This mode allows us to set the amount of subject motion blur by use of the shutter speed. You will set the shutter speed high enough to freeze any camera shake and potential subject motion, or slow enough to allow elements of our image to intentionally blur.

With this mode we are allowing the camera to select an aperture value to give the correct exposure for our selected shutter speed (and ISO value) and hence the resulting depth of field.

4. Program Mode

This shooting mode could potentially work well in some situations, particularly if the camera were set to an auto ISO mode.

If, however, the camera wasn't set to an auto ISO mode, the shutter speed might drop down too slow or the aperture might max out at the widest opening giving us an exposure warning condition on the LCD or EVF.

Program mode is helpful for very fast shooting. However, I would only use it in conjunction with the auto ISO mode; otherwise, you must continually monitor both the shutter speed and aperture settings!

Choosing the Shooting Mode

Based on the above, which shooting mode would I choose?

I would choose shutter priority mode, program mode, or manual mode – Shutter priority first, program mode only if I was using the auto ISO setting, and manual mode if I had the experience to compose the images while carefully monitoring the shutter speed and aperture setting while shooting.

With our bridge cameras, and in particular the smaller sensor FZ100/150/200/300/330 with 1-2/3 inch sensor we have very large depths of field which doesn't alter that much on aperture change so aperture priority is less of a concern and the need to capture sharp images is more desirable than depth of field.

My own opinion on always recommending shooting in the Aperture priority mode and setting the aperture value at the lens "sweet spot" has changed by the continual use of the FZ80/82 where the longer focal lengths available on this camera often meant that my shutter speed was too long for many shots resulting in either camera shake or subject motion blur

So that's my summary of the main exposure modes of digital cameras. The next time you go out shooting images evaluate the scene and ask yourself the most important element that must be right in your final image.

If it is DOF and that demands setting a small aperture to achieve it, then if the shutter speed becomes too long for hand holding then you will need to use some way of adding stability to the camera in the form of a tripod/monopod or other mechanical means. Do this in preference to raising ISO which could impact image quality.

What Is Exposure?



When you first start taking pictures with your digital camera, you might be confused by the numerous buttons and menu options that your camera has.

However, there is no excuse with modern digital cameras for a bad in-camera exposures. By understanding how to expose an image properly, you will be able to capture digital images with the ideal brightness.

This will be including detail in both the shadows and the highlight areas. In this article I hope to explain exposure in detail, as well as helping you understand the three most important camera settings of all: shutter speed, aperture value and ISO value.

So what is exposure in a digital camera?

Exposure is the amount of light that reaches your camera sensor. This amount of light is key to how bright or dark your images will appear.

There are only two camera settings that affect the actual “luminous exposure” of an image: shutter speed and aperture value.

The other setting, the camera ISO value, also affects the brightness of your images, and it is equally important to understand this feature.

It sounds very basic, however exposure is a topic which confuses even seasoned photographers.

The reason for this is simple: for every captured scene, a wide range of shutter speed, aperture value, and ISO settings will result in an image of the proper brightness.

You haven't truly “mastered exposure” even once you can take an image that has the right brightness.

Even your camera's fully Auto mode will do that most of the time. Instead, getting the proper exposure for an image is about balancing those three settings so the rest of the image looks good, from the amount of depth of field that it contains to image sharpness captured.

If you really want to master exposure, simply reading about it isn't enough. You need to go out and about in a variety of lighting situations and practice what you've learned. There's really no easy way to learn a skill like this. Practice and more practice is key to this.

Let's look at the first element of exposure – shutter speed.

Shutter speed isn't particularly difficult. It is just the amount of time your camera allows light to fall on the imaging sensor.

This could be 1/60 of a second, or 1/10 of a second, or thirty seconds or even to minutes.

The longest allowable shutter speed with digital cameras tends to be around 30 seconds, although it does depend upon your camera.

So, why does shutter speed really matter?

There are two main reasons:

First, as you would expect, a long shutter speed (several seconds) lets in a large amount of light. If you take a normal daytime image with a 30-second shutter speed, you will capture an image that is completely white.

The opposite is also true, too. A fast shutter speed only lets in a small amount of light. If you take an image at night with a 1/2000-second shutter speed, the image might look completely black.

Second is the effect that the motion blur will have in your images.

Not surprisingly, a long shutter speed (such as five seconds) captures anything that moves during the exposure. If a person walks by, they might appear as a featureless streak across the image, since they aren't in one place long enough for the long exposure to capture them sharply. That's called subject motion blur.

By comparison, a quick shutter speed (such as 1/1000 second) does a much better job freezing motion in your images - even something moving quickly.

You can photograph a waterfall at 1/1000 second and see the individual water droplets frozen in time.



Actually there are two types of motion blur that you may encounter due to your setting of the camera's shutter speed: camera blur (also known as camera shake) and subject motion blur.

If you're doing handheld photography, camera shake could be very significant. It's impossible to hold your camera perfectly still while you're taking an image, and even slight shake can lead to very blurry looking images. This is more exaggerated when you are using mid to long telephoto focal lengths with your camera.

That's one reason why many photographers end up using tripods!

However, although a tripod protects against camera movement, it does nothing to prevent subject or movement within a scene.

For example, if you're taking landscape photos on a windy day – even with a tripod – you might end up with areas of blurriness. This is called subject motion blur.

Sometimes, you can use camera shake or subject motion blur artistically, and it can look good. For example, if you're photographing clouds as they pass through over a mountain range, a long shutter speed might be a nice touch to make the clouds look "wispy".

In most images though you will probably want to capture it with crystal sharpness. Again the skill of selecting the right value of shutter speed will only come with practice. There are a number of factors that will dictate the likelihood of a sharp image being captured.

If there is any movement in the scene being captured such as grass blowing, waves crashing or clouds moving etc then a relatively fast shutter speed is necessary to arrest this movement so 1/125 to 1/250sec would be normal in this situation.

As I mentioned previously lens focal length can also affect both camera shake and subject motion blur. The movement of the lens (cause by hand shake) causes the image to move more quickly with longer focal lengths at the sensor plane and so a faster shutter speed is needed to capture a sharp image.

The “old” photographer’s rule here is to use a shutter speed that is at least 1/focal length. So if we take the “effective” focal length of the lens – say 400mm in the case of the FZ1000 then you should use a shutter speed of 1/500 sec to stop this motion blur.



If you want a quick-and-dirty guideline? Then use 1/500 second or faster for sports and wildlife action. Use 1/100 second or faster for telephoto portrait images.

Use 1/50 second or faster for wider-angle portrait or travel photos where your subject isn't moving too much. If your subject is completely still, and you have a tripod, use any shutter speed you want.

Let's now look at Aperture value.

The Aperture in a camera lens is just like the pupil of your eye and just like the pupil in your eye, it can open or shrink to change the amount of light that passes through.

The shape of the aperture varies with different camera models. It is made up of several metal blades – usually from five to nine (or more in larger lenses).

Aperture blades work a lot like the pupil in your eyes. At night, your pupils dilate so you can see things more easily. The same is true for aperture. When it is dark, you can open the aperture blades in your lens and let in more light.

Aperture is written as a F number. For example, you can have an aperture of F2.8, F8, or F16, and so on.

It's important to realise the bigger the number the smaller the "hole" in the aperture blades – so a F2.8 Aperture value has a much larger "hole" than one set at F8 for example. A large aperture lets in more light. Apertures like F1.4 and F1.8 practically let you capture images in the dark.

Conversely, a small aperture like F16 (with nearly closed aperture blades) lets in far less light.

By changing your aperture value and shutter speed settings, you can capture exactly the amount of light you want – resulting in a photo with the proper exposure. That is what makes aperture value so powerful.

So, which aperture setting is best for photography and capturing the proper in-camera exposure?

Well it depends upon the image that you are trying to capture.

Aperture influences two effects that are more important than anything else: exposure and depth of field.

Let's have a look at how these work in practice.

The most important effect of aperture is on depth of field.

Depth of field is the amount of your scene, from the front to the back, that appears sharp. In a landscape photo, your depth of field might be huge, stretching from the foreground to the horizon. In a portrait photo, your depth of field might be so thin that only your subject's eyes are the only areas that are sharp.



Aperture changes your depth of field, which makes a big difference if you want to capture the best possible photographs.

Changing the depth of field in an image will completely alter the way it looks.

On smaller sensor cameras (FZ200/300/330), small apertures (like F4 or F5.6) give you a large depth of field (due to the equivalent aperture being F22 in 35mm equivalence terms) If you want everything from front to back to appear sharp, those are good settings to use.

Large apertures (like F2.8) capture a much reduced depth of field, with a shallow focus effect if you are using a larger sensor like micro four thirds, APS-C or even better a full frame camera.

Unfortunately at the wide angle settings with the smaller sensor cameras the equivalent 35mm aperture is still about F16 so they still capture relatively deep depth of field.

As I have demonstrated before in my YouTube videos the only way to capture shallow depth of field for things like portraits outdoors is to use the trick of using the F2.8 aperture and the longer focal lengths keeping the camera close to the subject but keeping the subject as far from the background as possible.



When using the camera in the semi-automatic modes like Aperture priority the other affect that aperture has of reducing the amount of light as you decrease the size of the aperture hole (i.e. setting it to a bigger number like F11) is largely masked by the fact that the camera adjusts the shutter speed (and ISO if you have auto ISO enabled) thus keeping the image brightness the same on the LCD screen.

The shutter speed scale is very easy to remember. An exposure of 1/100 second lets in twice as much light as an exposure of 1/200 second, because it is twice as long (remember your fractions!).

Unfortunately the aperture scale is a little more difficult because of the logarithmic nature of the scale.

The menu option of digital cameras also makes this difficult to comprehend at times because it is possible to set the increments between each aperture value to either 1/3 EV (exposure value units – the same as F-stops) or whole increments 1 EV units.

In the full increment mode the scale looks like F2.8, F4, F5.6, F8, F11 etc., and each step going from the larger to the smaller aperture (i.e. F2.8 to F4) reduces the amount of light by exactly half.

By understanding this fundamental law of exposure you can quickly use aperture value and shutter speed changes to give the correct exposure or the desired amount of depth of field or subject motion blur in the final image.

The final thing that affects exposure but is not part of the “luminous” exposure is the ISO setting.

When we used film emulsions we were locked down to a fixed ISO value – the sensitivity of the film emulsion. Fine grain film has a slower speed (lower sensitivity) than a more coarse grain structure film emulsion.

With our digital cameras they have what is referred to as the native sensitivity. This is usually the lowest setting (without any ISO expansion settings made).

This is ISO 80 in the case of the FZ80/82, 100 in the case of the FZ200/300/330. This native ISO will give the very best image quality that the camera can deliver.

What is the purpose of the ISO adjustment then?

Well this is an artificial way of adjusting the amplification of the electrical signal coming from each of the pixel photosites on the camera sensor.

As with any amplification process not only is the signal amplified but also any noise present in the system is also amplified.

If you have ever listened to the background noise of a radio station between broadcast segments you will be aware of this fact. The louder you have the volume control set, the louder this background noise will sound. We call this difference the signal to noise ratio.

In our cameras the higher values of ISO will introduce the familiar “graininess” in our digital images with associated loss of sharpness and contrast.

There are many factors that can come into play here which will affect just how much noise is introduced into the image.

Pixel size is probably the most influential cause of this. Smaller pixels gather less total light than larger pixels.

There is always a compromise between pixel count and pixel size for any given physical sensor size.

We want higher resolutions and that demands smaller pixels in order to resolve this detail however this comes with a noise penalty and there have been many advancement made in the sensor fabrication (like back side illuminated or BSI CMOS sensors) which can help to restore some of the losses incurred by using smaller pixel dimensions.

Lithium Ion Self Discharge Tests – Which Batteries are the best

In a previous newsletter I was commenting on how batteries will discharge if left in the Panasonic Lumix camera due to the standby circuit. I also mentioned that all batteries will self-discharge over a period of time.

I tested 5 batteries over a period of 28 days measuring the battery terminal voltage to determine the rate of self-discharge in these cells.

Each battery was fully charged with the same battery charger.

It was interesting to see the different terminal voltages even with the fully charged cell.

The BatteryTec and DTSE batteries had the most rapid decay in terminal voltage with the Panasonic battery remaining almost constant during the same period.

I suspect that this is due to the purity of materials used in the construction of the battery.

The Duracell and Patona batteries also performed well over the same period.

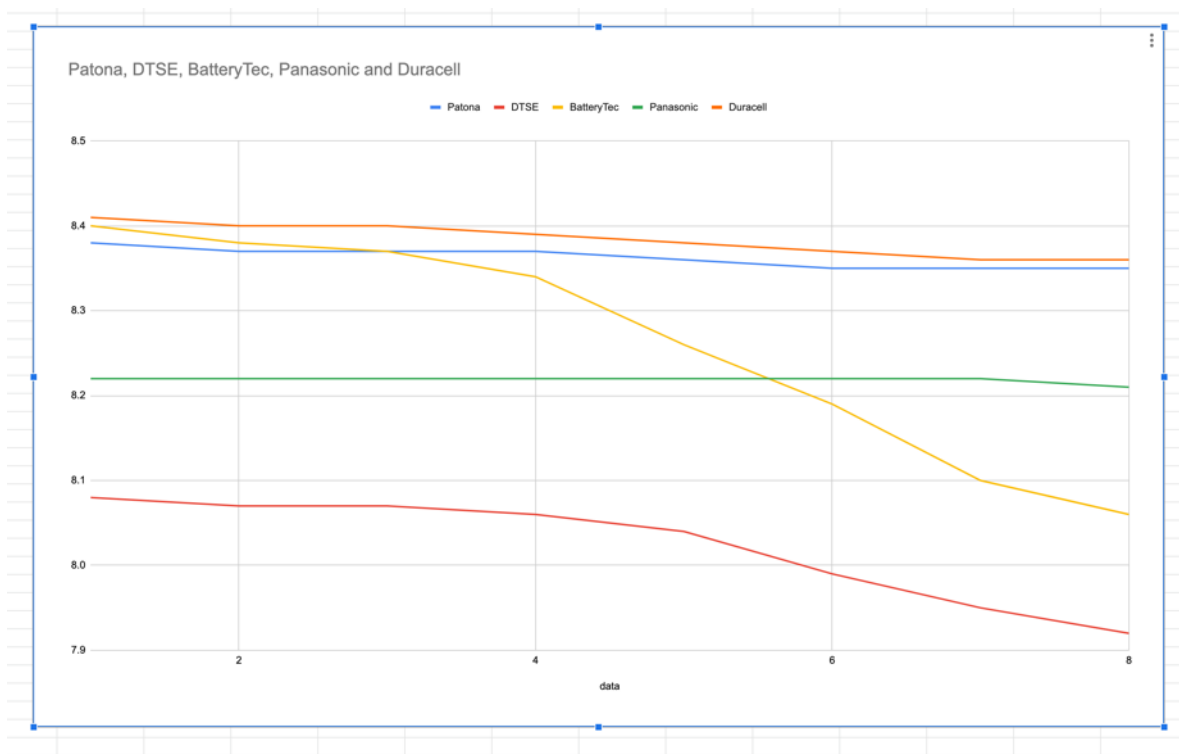


Chart showing the self-discharge rate of lithium ion batteries by make, over 28 days

So whilst the Panasonic battery may be many more times expensive than the Patona or Duracell the overall charge capacity, self-discharge rate and internal build quality may be enough justification to purchase over the third party batteries.

Panasonic Lumix FZ1000 Mk2 compared with Sony RX10 MkIV

I've done some basic tests with both of these cameras at various focal lengths and my initial findings are listed below.

In terms of use and ease of menu navigation the FZ1000 mk2 definitely wins here. With its touch screen interface menu navigation is very swift. In contrast Sony have still got to implement touch operation in their menu system. Sony Menus are very extensive and do take some getting used to – coming from a Panasonic background.

The Sony is much bulkier and heavier so taking this camera out for a days hiking is going to tell on your shoulder compared to the lighter FZ1000 MK2.

But all that aside is the final image quality worth the extra expenditure of the Sony camera.

Well if you look at full screen 100% image size from each camera (even on my 27inch iMac monitor) it is very difficult to make out a clear winner as both cameras produce excellent out of camera JPEGs at the default processing parameters. If you push up the magnification to 300% you can begin to see the difference and the Sony has the advantage here.

As the sensors both have the same resolution (as the pixel count is 20.1 M in each case) then the difference must be in the Zeiss lens of the Sony camera giving higher edge contrast. Is it that obvious?

Well to me no it isn't and I would probably never be cropping in to these degree.

So where does the Sony really score highly? Well it's the focal length that is achieved by the Sony camera. In 35mm 3:2 aspect ratio the Sony has a focal length range of 24 to 600mm. The Panasonic is limited to just 400mm here.

In stills mode the Sony camera aperture range is F2.4 to F16 surpassing the Panasonic F2.8 to F11. Whether the F16 aperture in the Sony can deliver images without the effects of diffraction taking place I have yet to test.

The Sony also has a lower native ISO of 100 compared to 125 in the Panasonic camera.

For those who want to shoot video in a totally flat profile the Sony adds a few log profiles it its suite of options.

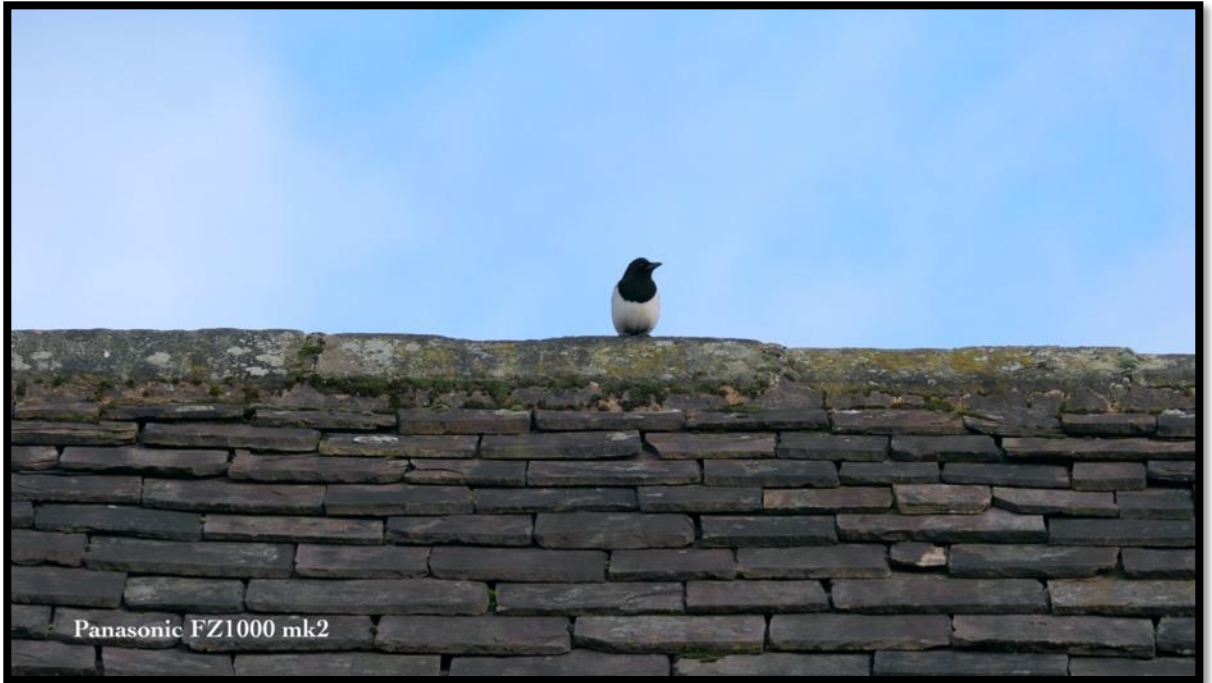
Here are a couple of comparison images from each camera at default JPEG processing.



Variability due to changing ambient light – adding more contrast to the Sony image.



Again changes in ambient lighting between shots (only a few seconds) has given advantage to the Sony camera.



400mm full zoom of the FZ1000 mk2 versus 600mm full zoom on the Sony camera shows its advantage for wildlife shooters.

It's clear from these tests that I need to shoot the test shots where there is less change in ambient lighting. The day that I went out was changing rapidly as high winds were blowing clouds across the sun every few seconds.

Now my decorating phase has come to a close I will be able to retest again.

I hope to begin my delayed tutorial series covering the FZ80/82 for absolute beginners in the next couple of weeks – I'm looking forward to starting it as this camera is still selling very well and raising the most number of questions regarding its use.

I also need to do a detailed comparison with the FZ1000 mk2, the Sony RX10 mk IV and an APS-C camera (the Fuji XT-4) with pro grade lenses. I have a feeling that the difference in image quality is going to be marginal but the convenience factor of the bridge camera is likely to be the major advantage over a camera plus a bag full of heavy lenses.

So until the next letter, thanks again for your readership and I hope to see you very soon.

Graham