Panasonic Lumix FZ82   20-1200mm EFL x60 zoom
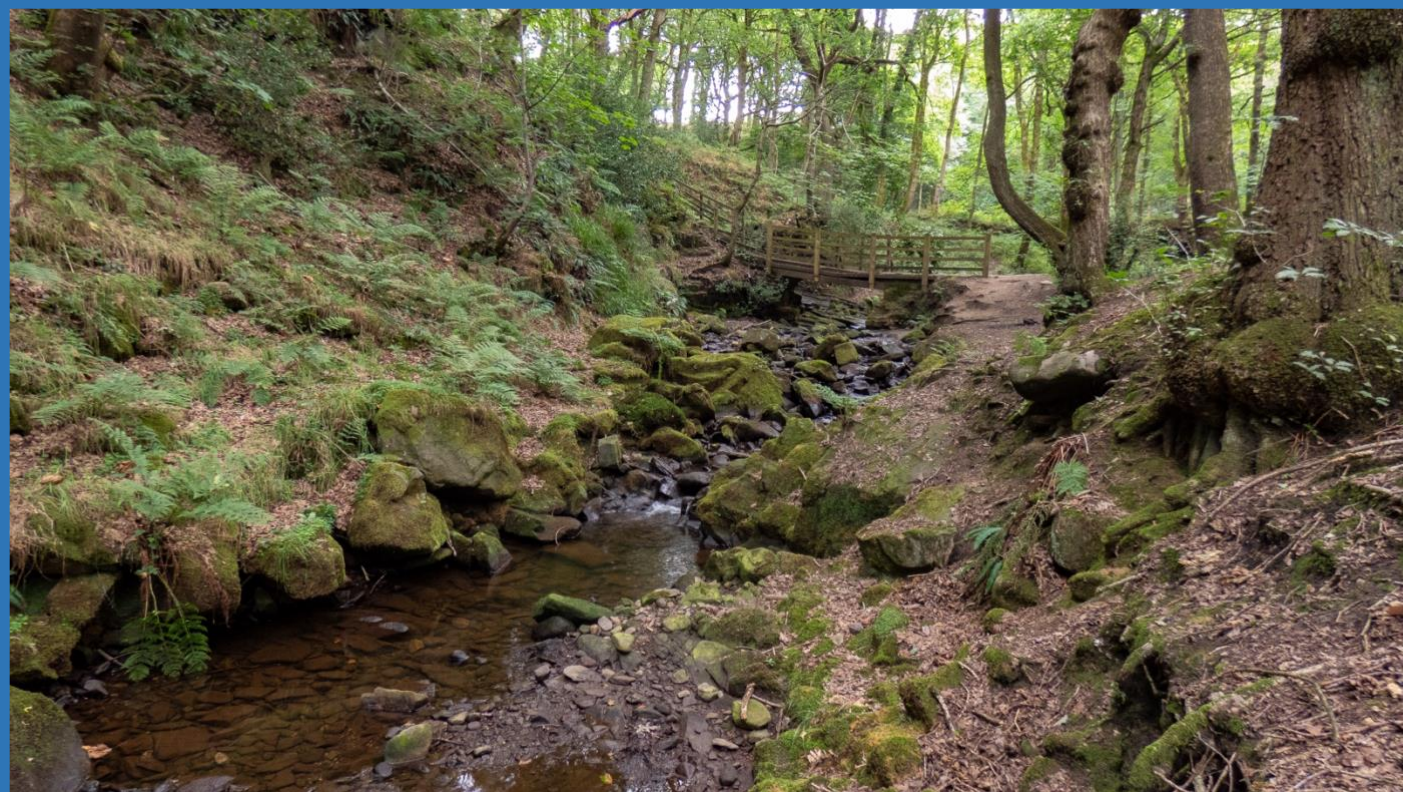
The Panasonic Lumix FZ80/82 New User's Guide

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Preface

You don't want excellent pictures from your Panasonic Lumix FZ80/82– you *demand outstanding pictures*, after all your Panasonic Lumix FZ80/82 is one of the most advanced digital bridge cameras that Panasonic have produced.

The Panasonic Lumix FZ80/82 boasts many features like the 18.1 mega- pixel MOS high sensitivity sensor, the 20mm – 1200mm (35mm equivalent) lens, USB charging, 4K shooting and 10 frames per second shooting mode.

The Panasonic Lumix FZ80/82 has enough customisable features to satisfy the most avid of amateur photographers.

This fantastic piece of opto-mechatronics is only let down by the hard to read documentation that comes with the camera in the form of the basic user's manual or the advanced guide found when you search for, and download, the advanced user guide.

You know what you want to find out is in there, however it is so hard to find and you don't know where to start. Furthermore, the "official" manual doesn't offer very much information regarding the basics of digital photography or photography in general.

This is where this field guide about the Panasonic Lumix FZ80/82 will help.
It explains the purpose of each of the Panasonic Lumix FZ80/82 functions and controls, how you should use them and, more importantly, why.

So, if you can't understand what basic settings to set up your camera with, because you don't understand, for example, how changing ISO or focus default method will affect your images, then you need this guide.

I don't assume any superior knowledge and won't talk down to you, either.

This guide isn't packed with pages and pages of check lists on how to take travel picture, wedding pictures, sports pictures etc., but will endeavour to give you the information that you will need to take great images on your own.

The first step is to familiarise yourself with the camera, the first pages of this guide will ensure you will do that.

As you gain more experience and new skills you'll be eager to know how to improve your exposures, fine tune the colour balance and use some of the essential tools of photography such as using the pop up electronic flash correctly and how to use the camera in a wide range of photographic lighting conditions.

The Panasonic Lumix FZ80/82 is not only very easy to use, it's also easy to *learn* to use as long as you have my little guide book to help you along the way.

The iA Intelligent Auto Mode

This, fully automatic, mode is recommended for those users new to the camera or simply want to use the camera in a "point and shoot" mode.
The camera uses "scene" type recognition and automatic exposure determination to expose the images.

By default, the camera is factory set to the more advanced iA+ mode and is generally the mode that I recommend new users begin with.
It has features which are invaluable when wanting to get great images and video from this camera.
The option however to go back to the basic mode is available via the REC set up menu.

This advanced mode allows you the user to adjust the exposure (effectively exposure compensation), the hue or tint of the image to apply either a warming or cooling tint to the image and a method to control the amount of foreground to background sharpness (known as depth of field).

Begin by rotating the top mode control dial to the iA position, aligning the iA symbol against the white index on the flash head.
When you point the camera at the subject the image processor will attempt to determine what type of scene that the lens is imaging on the sensor.

It looks for things colour and light intensity patterns and facial features to set the optimal exposure conditions.

You can see the scene type that has been selected by looking at the top left hand side of the LCD (or EVF if enabled). Initially the icon will be displayed with a blue colour for about two seconds and then will turn red. The possible icons that will appear are;

i🐾 [i-Portrait]	i🏔 [i-Scenery]	i🌷 [i-Macro]	i📷 [i-Night Portrait]*1
i🌃 [i-Night Scenery]	i🤚 [i-Handheld Night Shot]*2	i🍴 [i-Food]	i👶 [i-Baby]*3
i🌅 [i-Sunset]	iA When scene does not correspond to any of the above		

It is advised to check that the scene being captured is correctly interpreted by the camera.
Sometimes the scene recognition software incorrectly determines the scene being imaged.
If this is the case switch to the SCN scene mode and select the most applicable scene type for the scene being photographed.

The LCD screen showing the location of displayed icons

When recording video the possible icons that may appear are;

🧑 [i-Portrait]	🏔 [i-Scenery]	🌆 [i-Low Light]	🌷 [i-Macro]
🅰 When scene does not correspond to any of the above			

Auto Focus, Face/Eye Detection and Face Recognition

When shooting in the fully automatic mode iA+ the camera will select the most appropriate focus method. In this mode, face detection is active (as shown in the image above) and eye detection software attempts to locate and focus on the eye closest to the camera.
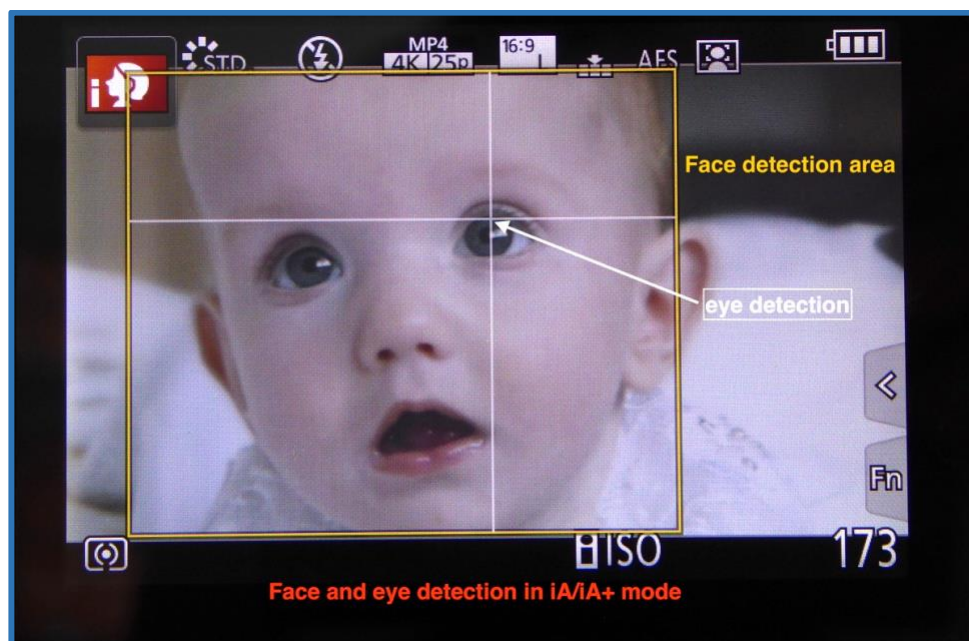
Face detection and eye detection in operation on the FZ80/82

This eye detection mode is automatic and focusses on the nearest eye to the camera. This method cannot be changed.

When in this mode the camera adjusts the exposure to give the best image based upon the metering from the face.

If face recognition has been turned on and faces have been registered if the camera detects a subject which has been previously registered, then an "R" is displayed on the upper right corner of the display.

The icon could be the i-Portrait, i-Night Portrait or the i-Baby icon depending upon the subject recognised.

If you experience some of your images not being recorded as you saw them at the time of shooting or images of a similar subject appear to be recorded differently to each other then it is worth having a look at how the iA+ method recorded them.

Panasonic do state that, in some scene types, you should watch the indicated icon when you shoot in this mode and if the wrong scene type is detected then you should select the most appropriate mode from the SCN mode dial setting and menu choice.

To see how the image was detected by the camera, with the memory card still inserted in the camera, select the green playback button on the back of the camera body.

Using the left or right navigation buttons of the 4-way controller scroll through to the image in question.

The playback mode selected to display image information

When you have selected the image that you want to review you can see how the camera detected the scene type. In the image above the camera correctly identified that this was a close-up scene and selected the I-Macro mode and below it identified the i-Landscape mode setting optimal parameters for this scene.

i-Landscape mode selected

If the camera doesn't recognise a scene type, then it reverts to a default setting and determines the exposure without adjusting other parameters such as saturation of colour or aperture.


no scene type detected here in this image, default parameters applied

A lot of thought has gone into the automatic scene detection algorithms and they are becoming very reliable in selecting the correct scene type for the image being recorded.

If the subject is being photographed where there is light shining behind the subject, which would cause the subject to be recorded with a dark appearance, the camera applies backlight compensation to lighten the recorded image.

The iA+ mode offers a few more features which I suggest that you experiment with to understand the benefits of being able to alter the automatically selected parameters.

The iA+ mode adds three additional controls for image adjustment; colour tint, background defocus and brightness correction.
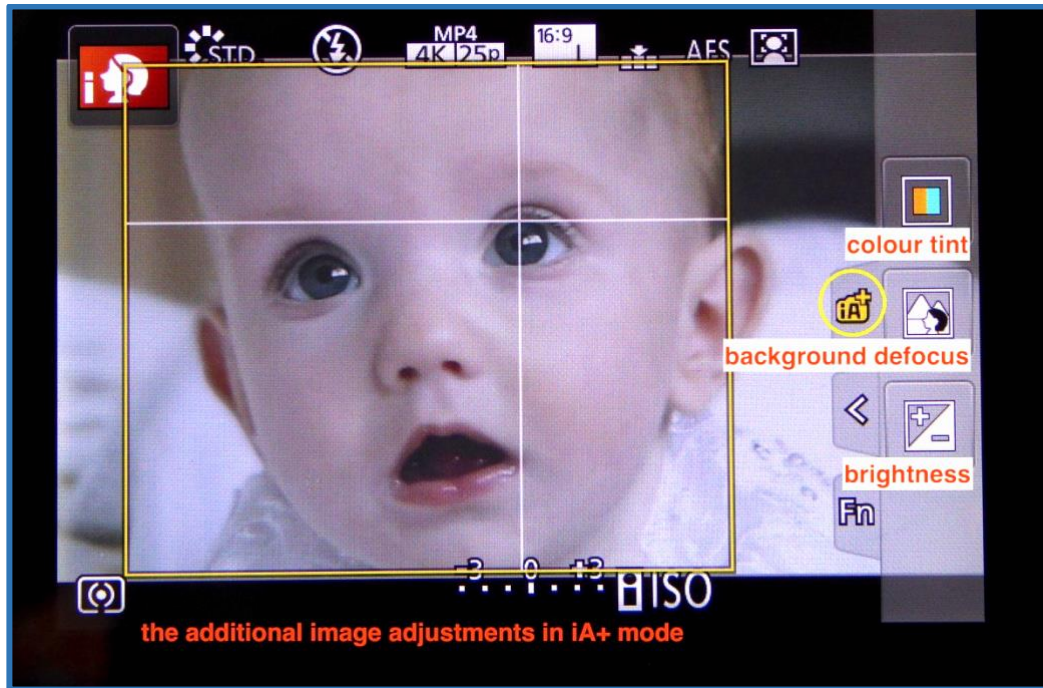
the three additional image adjustment controls

All three modes can be accessed by either the touch screen interface, touching first the iA+ tab to fly out the other menu options and then selecting the one to be adjusted.

Colour tint can quickly be accessed by using the WB button on the 4-way navigation pad.

Brightness can be quickly accessed by pressing in the top control wheel of the camera.

Background defocus can be quickly accessed by a double press in of the top control wheel of the camera.

All three controls can be applied to an image, if so required.

Colour tint allows you to add either a warming or cooling effect to the image if you feel that the Auto White Balance (AWB) has not achieved the image look that you desire.

the colour tint control

Once accessed the tint can be applied using either the top control wheel, or if you prefer the left or right navigation buttons on the 4-way pad.
The image on the LCD, or EVF, shows the change being made. The value will remain set until you turn off the camera or change to another mode.

This feature is useful for warming up scenes shot in cloudy, or overcast lighting, as the AWB is the only white balance pre-set available to iA/iA+ users.
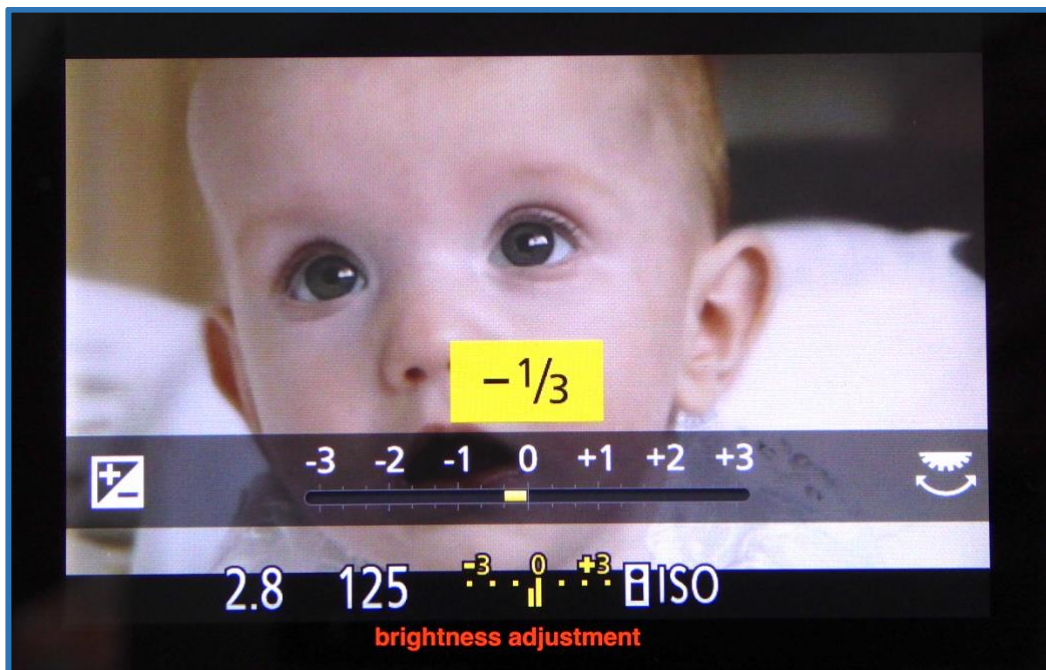
the brightness (exposure compensation) control

Brightness control, or as I would prefer to rename it exposure compensation, allows you to change the brightness of an image if the automatic metering of the camera has over reacted causing light scenes to go dark or dark scenes to be light.

These scenes are typically those shot in lighting such as in snow or at beach scenes or where there is a large ratio between foreground subject and background.

To correct for these errors in metering this control allows for + 3 or − 3, f-stops of exposure compensation in 1/3 f-stop increments.

Push in the top control wheel to access the control and then use the top control wheel, left or right navigation buttons on the 4-way navigation buttons or using the touch control to drag the slide bar to change the applied value.

The final control, the background defocus, allows you to change the aperture which the camera has automatically selected.

This automatic value will have been determined by the camera evaluating the image data from the sensor for scene type and both scene brightness and any subject movement occurring in the image.

It will select the most appropriate aperture, a small one (usually F8) for landscapes and a large one for portraits (usually F2.8), however, you can over-ride this and select the aperture that you want to use in your image.

By changing the aperture, you are adjusting the depth of field (DOF) achieved in the image. Large apertures result in very small depths of field whilst smaller apertures give larger depths of field.

Armed with this knowledge you can achieve the desired look for the background focus by changing the background blur.

Thus, a subject can be made to stand out in isolation from the background, such as in a flower study or portrait, or you can apply more depth of field when shooting smaller wildlife to ensure as much of the subject is in focus as possible.
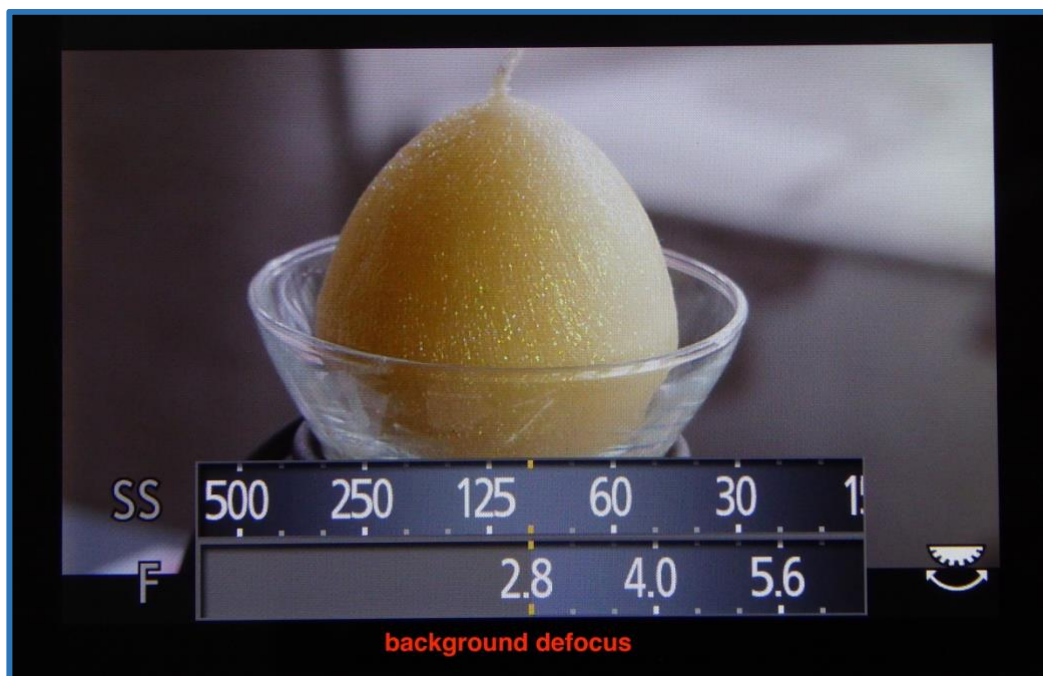
the background defocus control

Whilst you can change the aperture (f-stop) value the camera will determine the shutter speed and ISO and these cannot be adjusted.

Again, the value for the f-stop can be changed with the top control wheel, the left and right navigation buttons on the 4-way controller or by touching and dragging the f-stop indicator on the touch screen.

As you change the aperture you may see the shutter speed change and the image on the LCD or EVF will give a true indication of the background is being rendered by the lens at the aperture set.

If you see the scale has red colouring, then you cannot set the exposure in this range.

As these two modes, iA and iA+, are especially designed for either new users to the camera or for use in situations where a "point and shoot" mode might be preferred, the amount and degree of exposure parameter adjustment is reduced accordingly.
Exposing the new user to the advanced features of the camera would not make for a sensible introduction to photography with this device.

Menu Items Adjustable in the iA+ Mode

In the (REC) menu:

[Photo Style], [Aspect Ratio], [Picture Size], [Quality], [AFS/AFF/AFC], [Burst Rate], [4K PHOTO], [Auto Bracket], [Self Timer], [i-Handheld Night Shot], [i-HDR], [Time Lapse Shot], [Stop Motion Animation], [Shutter Type], [Conversion], [Colour Space], [Stabiliser], [Face Recognition.], [Profile Setup]

In the (Motion Picture) menu:

[Photo Style], [Snap Movie], [Rec Format], [Rec Quality], [AFS/AFF/AFC], [Continuous AF], [Conversion], [Wind Noise Canceller], [Zoom Mic]

In the (Custom) menu:

[Silent Mode], [Half Press Release], [Pinpoint AF Time], [Pinpoint AF Display], [Focus/Release Priority], [AF+MF], [MF Assist], [MF Assist Display], [MF Guide], [Peaking], [Histogram], [Guide Line], [Centre Marker], [Highlight], [Zebra Pattern], [Monochrome Live View], [Constant Preview], [Dial Guide], [LVF Disp.Style], [Monitor Disp. Style], [Monitor Info. Disp.], [Rec Area], [Remaining Disp.], [Auto Review], [Fn Button Set], [Zoom lever], [Lens Position Resume], [Lens Retraction], [Q.MENU], [Video Button], [Touch Settings], [Touch Scroll], [Menu Guide]

In the (Setup) menu all the items may be set.

Taking Images Using the Program Auto Exposure Mode (P)

In the iA+ mode we have seen that the camera attempts to recognise a scene type and set exposure parameters which would enhance that mode.

In landscape mode, for example, the camera may select a small aperture to increase the depth of field recorded, if the lighting situation allows. It also enhances blues and greens in the subject giving better sky and ground contrast.

If we turn the top mode dial to the **"P"** position we still have automatic control of the exposure being determined by the camera however, scene determination is turned off.

Using this mode may eliminate some of the incorrectly exposed images that sometimes happen in the iA+ mode when scene determination fails to select the appropriate type.

In this mode, the exposure is determined by the camera metering system and depending upon scene brightness will set an exposure for this image.

Metering can be set to the most appropriate type for the scene being recorded. I will cover metering later in this guide.

The camera will normally select a wide aperture to keep exposure times fast. This is to eliminate, if possible, hand shake and subject motion blur.

If you wanted to change this aperture/shutter speed combination to increase depth of field for example by selection a smaller aperture, then this can be achieved using a feature referred to as "program shift".

When you half depress the shutter button to activate focus and metering then as the aperture/shutter speed combination is being displayed on the LCD screen (in yellow) if you then rotate the back control dial you will enter this mode.

You can adjust the combination of aperture and shutter speed and the aperture will stay locked in at this value until you either turn off the camera or rotate the control wheel until the indication turns off.

The camera adjusts exposure by changing the shutter speed. This value of aperture remains in memory even if you select another mode and then return to the "P" mode.

Essentially you have set the camera into "Aperture priority mode"

Program shift is indicated by a double headed arrow visible on the lcd screen.

When using the longer focal lengths the maximum aperture will only be f5.9 so program shift range is limited to f5.9 to f8. I would not recommend using program shift other than at the lower zoom settings up to 50mm where the range will be f3.9 to f8.
Program Shift is not available in the following cases:
When recording 4K photos
When recording with [Post Focus]

When the ISO sensitivity is set to [ ]

Taking Images Using the Aperture Priority Mode

Aperture priority is selected by the user when the main exposure driving reason is one of the need for depth of field (DOF). Selecting a wide aperture (like F2.8) produces a shallow depth of field and conversely selecting a small aperture (like F8.0) will give deeper depth of field.

Selecting a large aperture, a long focal length and placing the subject close to the camera with the subject far from the background is the usual way to produce images with great differentiation of subject from background.

This can be used to great advantage in portraiture and wildlife.
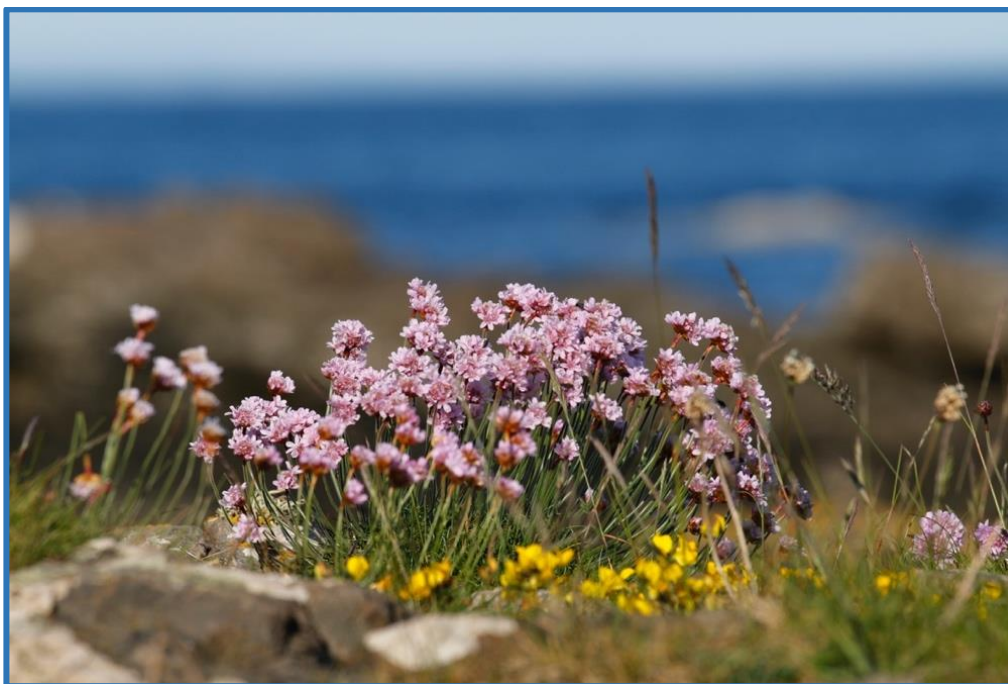
Selecting a large aperture/long focal length for reduced depth of field

Aperture priority is selected by rotating the top mode control dial to the **"A"** position.

Use the back-control wheel to set the aperture.

The range of adjustment is from F2.8 to F8.0 at the wide angle (20mm EFL) length setting.
As this camera model does not have a constant aperture zoom lens it means that as the zoom length is changed from wide angle to a telephoto position the minimum aperture will change depending upon the zoom level set. At full zoom of 1200mm EFL the maximum aperture is just f5.9.

Focal length	Maximum aperture available
20	F2.8
50	F3.9
90	F4.7
200	F5.5
400	F5.6
1200	F5.9

Taking Images Using the Shutter Priority Mode

Shutter priority mode is usually selected when the main exposure driving reason is one of controlling subject motion.

By selecting a fast shutter speed (like 1/2000 sec) subject motion may be completely frozen whilst conversely selecting a longer exposure (like 1/8 sec) will allow a degree of subject motion blurring such as you might see in images of flowing water or clouds streaking across a skyscape image.
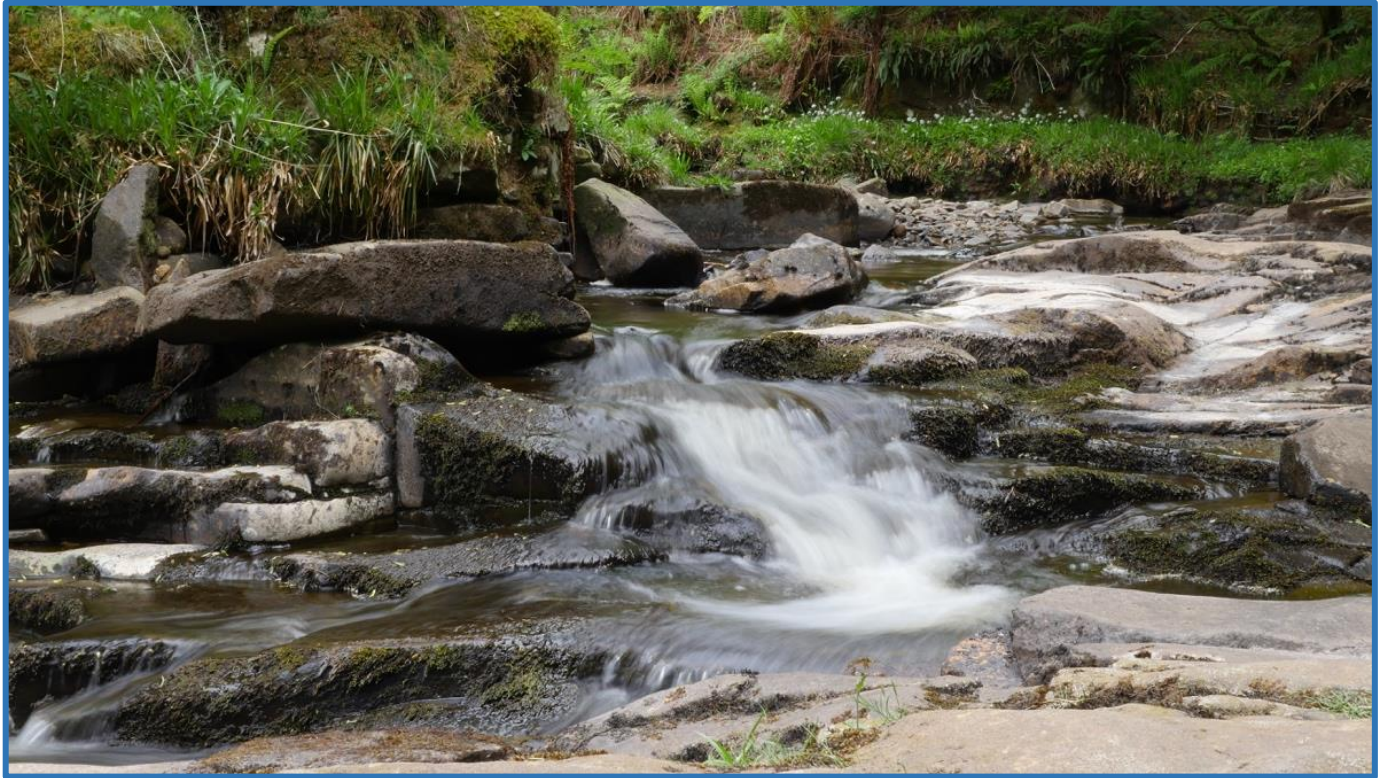
A longer exposure allows some creative subject motion blur

Shutter priority is selected by rotating the top mode control dial to the **"S"** position.
Use the back-control wheel to set the shutter speed or the side control wheel

The range of adjustment is from 1 second to 1/16000 sec if the electronic shutter is used and 4 seconds to 1/2000 sec when the mechanical shutter is used.

The camera automatically adjusts aperture to give the correct exposure (and possibly ISO if Auto ISO is selected).

## Taking Images Using the Fully Manual Exposure Mode

Manual exposure mode is normally selected when both control of depth of field using the aperture control and subject motion control using the shutter speed is required.

Manual mode is selected by rotating the top mode control dial to the **"M"** position.

By using the back-control wheel, you can change the value of the selected control.

The range of adjustment is from 1 second to 1/16000 sec if the electronic shutter is used and 4 seconds to 1/2000 sec when the mechanical shutter is used and the aperture can be adjusted from F2.8 to F8.0 only when using the 20mm EFL zoom position.

Exposure is indicated by the exposure meter at the centre, bottom of the LCD display screen.
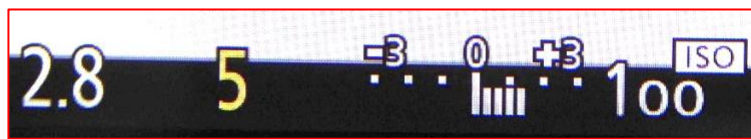
If shutter speed and aperture values have been set for image condition reasons, as mentioned previously, then ISO is used adjust the exposure to give a "0" meter indication.

It is important to recognize that this 'exposure meter' is an estimate of the exposure recommended by the camera metering system.

The metering mode and subject type will affect the outcome of the image and as such it is import to also understand how and when adjustments should be applied to correct for the situations.

For example, it may be necessary to set the exposure meter to read with a few of the indicator bars (which are 1/3 F-stop increments) on the plus side if shooting scenes where the background has a higher brightness than the principal foreground subject.

A useful feature now incorporated into the FZ80/82 is the ability to have the ISO adjust automatically to give the correct exposure.

This allows you to change camera position without the additional worry of resetting the ISO to give the correct exposure. If you have set iISO in the aperture priority mode, then this will become Auto ISO in the manual mode.

The camera only supports exposures up to 4 seconds with the mechanical shutter so long night time exposures are not possible with this camera.
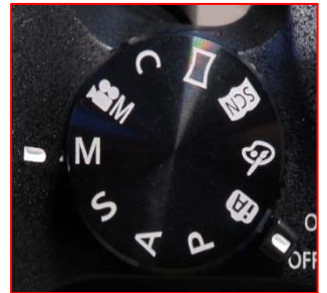
Using the Constant Preview Mode in Manual Mode

When recording images in the manual mode the image on the LCD screen (or EVF) is automatically adjusted by the camera to give an image of 'normal' brightness for you to be able to view it.

There is however a mode, the "constant preview mode" which can be set which enables you to see the result of the ISO, aperture and shutter speed combination – a real time view of the depth of field and the affect that the shutter speed has on image motion. This mode is set to "ON" in the Custom Set Up menu (spanner + C) on page 5/9 under Constant Preview.

When this mode is enabled you will see any changes you make to any one of these parameters. This is useful to be able to preview the effect of changing the controls on your image.

The caveats are that if you set ISO to AUTO you will not see any change as the camera will adjust ISO every time you make a change to aperture or shutter speed and you cannot use this in the pre-burst mode of 4K photo mode.

If you find this a useful feature when you shoot a lot of the time in the manual exposure mode, then it may be worth programming a function button to switch on the mode rather than having to go into the menu.

Leaving it set to on may cause you to feel nauseous if the shutter speed is set low due to the very slow refresh rate of the screen and the image motion blur effect.

By assigning it to, say, the Fn2 button you can toggle this effect on and off just when you want to see the effect of changing either the shutter speed or the aperture has on the resulting image.

Assigning One Push AE in the Manual Exposure Mode

Setting Up Your Camera to Meet Your Photographic Needs

Everyone's preferences will be different as to how to set up the controls of the FZ80/82 to make the camera ideally suited to your style of photography.

Panasonic have created several programmable buttons and controls to enable specific adjustments to be created to meet your needs.

In most cases function buttons, can be re-assigned from their default operation to one where you would gain greater advantage.

The Fn2 button is one where you have the greatest degree of freedom as to which function to assign to it. Fn2 by default engages the 4K post focus feature. If you do not use this mode, then reassigning this button to a feature that you use more frequently is useful.

It maybe that you want to use this button to quickly access the facility to move the AF area and set its size or you may want to use this button as the switch to a monochrome live view in the EVF.

You can also re-map the on screen Fn buttons (Fn4 – Fn8) to provide access to your own controls. These however are not as accessible as the physical buttons Fn1 – Fn3.

These re-assignments are made in the Custom (spanner + C) menu under the Fn Button Set option.

Cursor Button, Menu/Set Button Operation

The 4-way cursor button is used to navigate through menus, either up/down or left/right.

Selection is made by depressing the Menu/Set button in the middle of the cursor control. When "Cursor Button Lock" is assigned to a FN button it is possible to disable the Menu/Set operation of this button thus preventing changes being made.

DISP Button Operation

The DISP (display) button can be used to cycle the content of the LCD or EVF through six different screen displays for the LCD and four displays for the EVF. Each depress of the button steps the display on by one screen.

The six LCD display screens displayed in the image recording mode;

with information

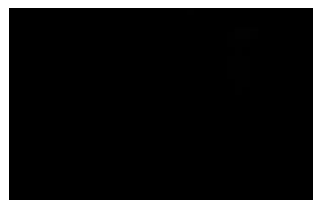*without information*

with information + level

without information + level

Image set up information

turned off

The EVF cycles through the first four of these displays, omitting the image set up and blank screens.

Long Exposures – The Undocumented Feature

The longest exposure available with the FZ80/82 is just 4 seconds. This poses severe limitations for those wanting to make longer time exposures for scene like cloud scape, silky motion water and waterfalls etc.

By using the "Artistic Night Scene" (number 15 of the scene types) it is possible to extend exposures up to 60 seconds.
Obviously in daylight the light must be reduced by using neutral density filters.
These will be of the order of around 10 stops (ND1000) in bright sunshine or the ND2-ND400 variable MD filter in overcast situations.

25 seconds at f8, ISO 80

The ISO is fixed at ISO 80. Begin by using auto focus or manual focus to establish the focal point before switching over to manual focus and then installing the ND filter as the camera may be unable to focus with this reduced light through the filter.
Then set the shutter speed until the exposure meter is reading 0EV. The use of the EV compensation can effectively change the aperture (within the range available for the zoom setting applied)

This video explains the whole process in detail.

Using Close-up Lenses on the Panasonic Lumix FZ80/82

Close-up photography can often be very rewarding and opens new ways of being creative.

The camera itself will focus to within a few centimetres of the subject.

In some instances, this may all you may require. In other situations, like wildlife for example, you may not be able to get so close to your subject. To overcome this, you need to use a supplemental lens to the main camera lens.

This has the effect of reducing the focus distance of the main lens. (see how close-up lenses work in newsletter week ending xx/xx/2018 for more details).

Although it is possible to purchase cheap sets of close-up lenses I do not recommend them as the optical quality in some cases is quite poor. An achromatic lens is the best solution.

These lenses are constructed from two or more elements and reduce colour fringes and edge distortion.

The most popular type is the Raynox lens system available in two strengths the M150 and M250. The 250 is quite powerful and more difficult to use and has very shallow depth of field when used at high magnification. For that reason, I recommend the M150 lens.

To establish the working distances of the camera lens and supplementary lens combination I used a simple rig so that I could measure the subject to the front of the camera lens. I did this a the closest focus distance and again at the infinity focus position.

I created a simple chart to illustrate the size of image versus the zoom setting and focus position.

If you purchase your own lenses it may be worth constructing your own chart.

Zoom Setting in mm (EFL)	At Minimum focus cms	At Infinity focus cms
50	5	8

90	10	20
200	19	25
400	19	26
800	22	27
1000	22	27

This table relates to the Polaroid 250 lens equivalent to #4 lens

At the 50mm zoom Setting and minimum focus the subject width was 5 cms and at 1000mm just 1.2 cms

The Raynox M150 had a very similar profile with just a slightly higher magnification and shorter working distance. At 50mm min focus 5.5cms wide and 0.8cms at 1000mm max focus

Zoom Setting in mm (EFL)	At Minimum focus cms	At Infinity focus cms
50	4	-
90	8	29
200	15	22
400	15	21
800	18	20
1000	18	20

Using Flash

Flash allows us to capture images in low light situations where the need to raise the ISO would result in producing unacceptably noisy images.

The simplest use of flash is to use the "pop-up" flash that is fitted to the camera. This neat, stowaway, cobra-style flash head although not very powerful does allow the capture of these low light images.

The on-camera flash uses either TTL (through the lens) exposure determination or it can be set to the manual mode.

TTL flash works by monitoring the light reaching the sensor and the quenching the flash when the exposure is correct. This sounds like an ideal solution to the problem of flash exposure however TTL exposure for flash is just like exposure for conventional images – there are situations where it can be fooled.

If your subject is bright, or darker, than a typical mid– tone subject then you will still need to use some form of exposure compensation to achieve the correct exposure for that scene.

Again. an understanding the metering modes of the camera will pay dividends in getting the correct exposure.

Centre weighted or spot metering may help depending upon the subject and its size in relation to the background.

When using a manual flash unit outdoors the quoted guide number (that's the number by which aperture and distance when multiplied together give for a quoted ISO {usually 100}) no longer applies as there are usually no reflective surfaces to bounce back the light onto the subject. Consequently, the exposure will be underexposed.

If you are also going to be using a diffuser to soften the light than this will also reduce the flash power reaching the subject.

If your main interest is using flash outdoors, for wedding photography for example, you may find it prudent to purchase a more powerful flash unit to overcome these limitations.

Type of Light Source

1. Full Flash.

We normally refer to full flash when the flash unit is the principal or only light source for the image – it totally controls the exposure. It is usually essential when working at high exposures or trying to capture small and active subjects, such as insects.

One negative consequence of using this method of flash lighting is that it usually produces black backgrounds and harsh shadows when used with small apertures.

When used in bright sunlight the sun might be considered as a fill in light source to prevent these two conditions spoiling your image.

It's not usually advisable to use the pop up flash of the camera or use a hot shoe mounted flashgun as often the extended lens, or lens hood, may cause shadowing on the lower portion of your image.

It also produces very flat and uninteresting lighting.

If no other option exists but to use the pop up flash head or hot shoe mounted flash unit then it is better to add some form of diffuser to the flash to increase the size of the apparent light source.
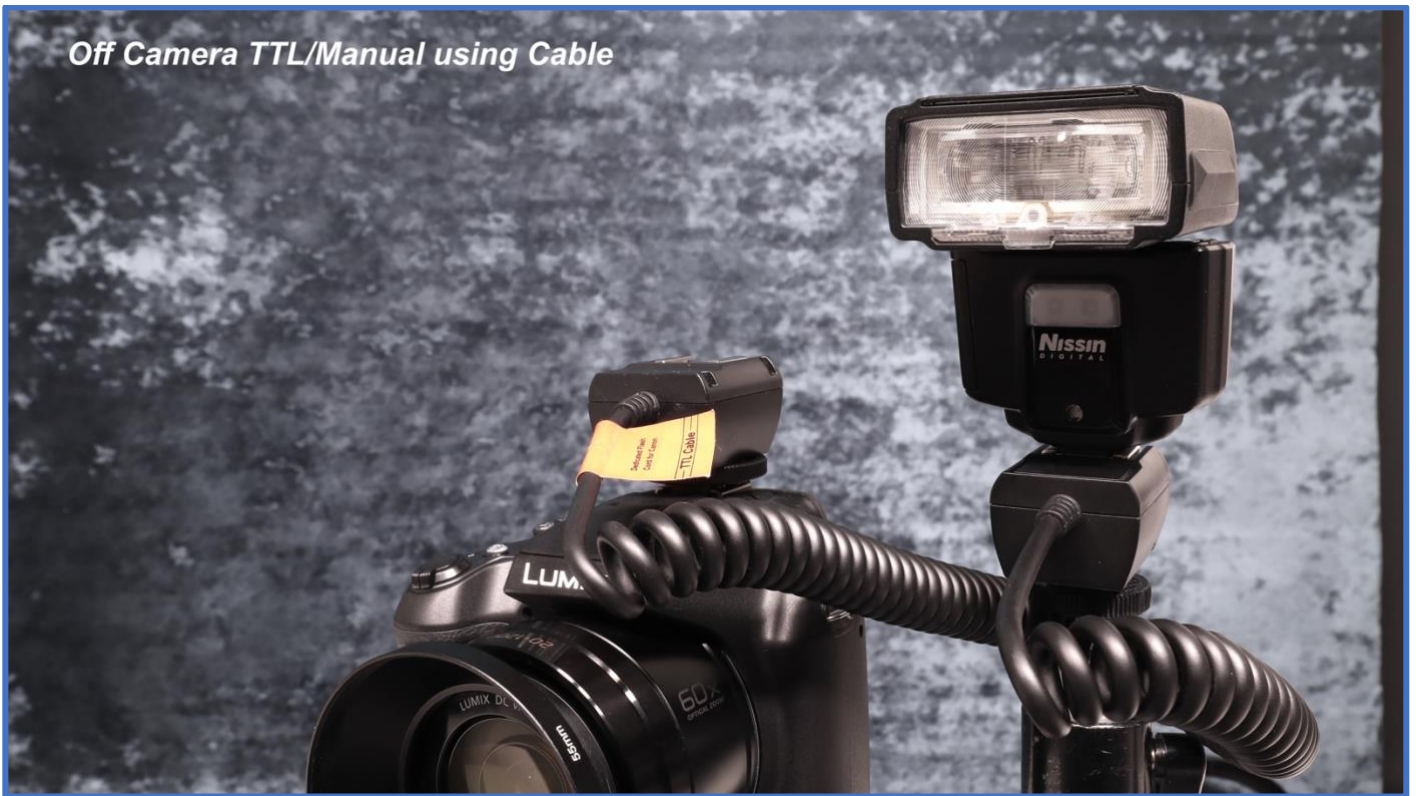
A larger light source provides a softer light.

A simple hot shoe mounted diffuser is shown below

It is far better to use either a TTL compatible extension cable and TTL compatible flash unit, as shown next, or a wireless TTL flash unit controlled by the pop up flash head which acts as the master controller for the flash unit.

Off Camera TTL/Manual using Cable

If you are using this arrangement it is often better to have the flash unit mounted on an "L" shaped bracket which positions the flash unit above and to the left of the camera. This provides consistent light placement and lighting direction.

2. Fill in Flash.

Fill in flash is when you photograph a subject using daylight or artificial light as the principal light source and then add some degree of flash exposure to it.
The flash is there to provide sufficient light to either lower the contrast if the principal light source is providing backlight or add some extra sparkle on a dull day.
One important point to remember here is that you are not using the flash to arrest subject motion but just to add supplementary light to brighten shadows and lower contrast in the image.

The ratio of light to dark areas "the lighting ratio" is usually kept to about 1 – 1 2/3 f-stops or simply stated the shadows are about 2 – 3 times darker than the principally lit areas.

Remember this fill in flash cannot arrest subject motion so any subject motion needs to be controlled somehow (shooting on a still day rather than breezy or using mechanical restraints on flower stems for example) to capture sharp images.
The internal flash is essentially TTL controlled, the camera controlling the duration of the flash pulse by monitoring the light being received back on the sensor.
If, as in the case of normal exposures, the metering is "fooled" by the subject or background intensity the flash can be adjusted with the flash power compensation setting.
This is found in the Flash REC set-up menu on page 5 (if you are in a non- iA mode) and the in the Flash submenu page 1

The flash power can be increased or reduced by the equivalent of 2 complete f-stops. This is a handy feature if you find the flash is consistently causing blown out or dark images.
When using the internal flash, white balance is automatically set to the Flash WB setting however if you find the images are too cold you can change the white balance operating point for the flash setting to make it warmer.

You will find the white balance fine control point adjustment in the second page of the white balance setting tool.

Flash Modes in PASM operation

When using the pop up flash with this camera unlike some DSLR or compact system cameras that automatically raise the flash head when flash is thought required by the camera the FZ80/82 does not. It must be raised manually if needed.

In all modes, it is essential to remove the lens hood (if fitted) to prevent shadowing on the image.
In some situations, in the iA modes it will display a message saying "raise the flash head" however there doesn't appear to be much logic behind this and sometimes it doesn't show this even in total darkness!

You have four modes of flash operation you can select

Forced flash On - Fully Auto
Fully Auto with Red Eye Reduction
Slo Synch Shutter Mode
Slo Synch Shutter with Red Eye Reduction

Fully Auto

In this mode. the camera determines if the flash is required (based upon ambient light) for the exposure, and, if it does so controls the amount of light required by monitoring the light captured by the sensor in a short pre-flash burst of light prior to the main exposure.
It then adjusts the main flash pulse duration to control the exposure.
Close-up flash will have a very short duration compared to subjects further away requiring a longer pulse of light to build the exposure. If the resulting images are dark or light, then as mentioned previously the power can be adjusted via the flash exposure compensation menu.

Fully Auto with Red Eye Reduction

When selecting this mode, the camera will fire a long pre-flash burst of light before the actual main exposure in attempt to force the subjects who are looking towards the camera to slightly close the pupils in their eyes.
This reduces the likelihood of the flash of the main exposure being reflected into the camera from the back of the retina where it would take on the red appearance from the blood vessels at the back of the eye.

flash without red-eye reduction

Slow Sync Mode with Red Eye Reduction
(not available if using Shutter Priority Mode)

In this mode, the shutter speed is set to a longer exposure time thus allowing more of the ambient light to affect the final exposure.
It is useful for recording brighter background in your images rather than have the usual dark/black background we normally associate with flash pictures, especially outdoors.
Again, red eye reduction is employed during this exposure sequence.

The range of the flash is determined by the ISO of the camera. If you are using iISO or Auto ISO the range will be from the closest focus of the lens at its current zoom position (30cms or 1 foot at wide setting to 13.5m 44 feet at tele position).
Unlike DSLR cameras with FP (focal plane) shutter mechanisms the FZ80/82 which does not have such a shutter mechanism will synchronise flash across its entire shutter speed range of 1 second to 1/2000 second (in slow sync mode) or 1/60 to 1/2000 in all other modes. This makes it useful if you want to use high-speed synchronisation when using external flash units with high ambient lighting conditions.

Using External Flash Units

The use of external flash units with the camera opens-up the possibilities for much more creative flash photography and I will be covering this in greater detail in another section.
Basically, though the camera can control an external flash unit which is inserted into the hot shoe of the camera, or connected via a fully TTL compatible extension cable from the flash unit to the hot shoe of the camera.
It does this by a communication link through the hot shoe to the flash unit to control things like the position of the zoom head (if the unit has an auto zoom) and the value of the camera aperture setting if the flash gun is not used in the TTL mode.

Fully Automatic TTL units

The latest generation of flash units supports a lot more features and improves on the semi-automatic models.
Fully Automatic TTL Flash Unit Most support TTL either via the hot shoe interface or some have a wireless communication using the pop up flash of the camera to act as the "commander" to control the slave flash unit.
Most will now feature bounce and swivel head movement to allow better control of bounced light.
The FZ80/82 can support the TTL mode when these units are directly connected or connected via an extension cable to the hot shoe or by slave flash units which accept the Panasonic optical wireless flash standard.

Adding a touch of flash to ambient light

With a bit of thought, and understanding of some basic techniques, using flash need not look unnatural, nor spoil the quality of the ambient light.
For those who don't like using flash and prefer ambient light only, quite often flash can help to augment the available light.
It can do this without appearing to look like flash at all.
It just looks like great natural looking light.
It can add just a sparkle to the eyes in the form of a catch light which immediately grabs our attention.

a touch of bounced flash with catch light panel raised to add accent to the eyes.

When using flash outdoors, we quite often just do exactly that – we use flash to augment the available 28 light, rather than flash being our primary source of light.

The basic technique here is that we let the camera meter for the ambient light and then either:

1) Make sure our ambient exposure is correct, and then we could use the flashlight to lift the shadow areas and lower the contrast –this is essentially fill flash. The flash isn't used as the main source of light; it just helps control the contrast of the image.

2) We under-expose the available light to some degree by using –EV dialled in and then use the flash make up the difference to give us the correct exposure. This helps to make our subject stand out against a darker background.
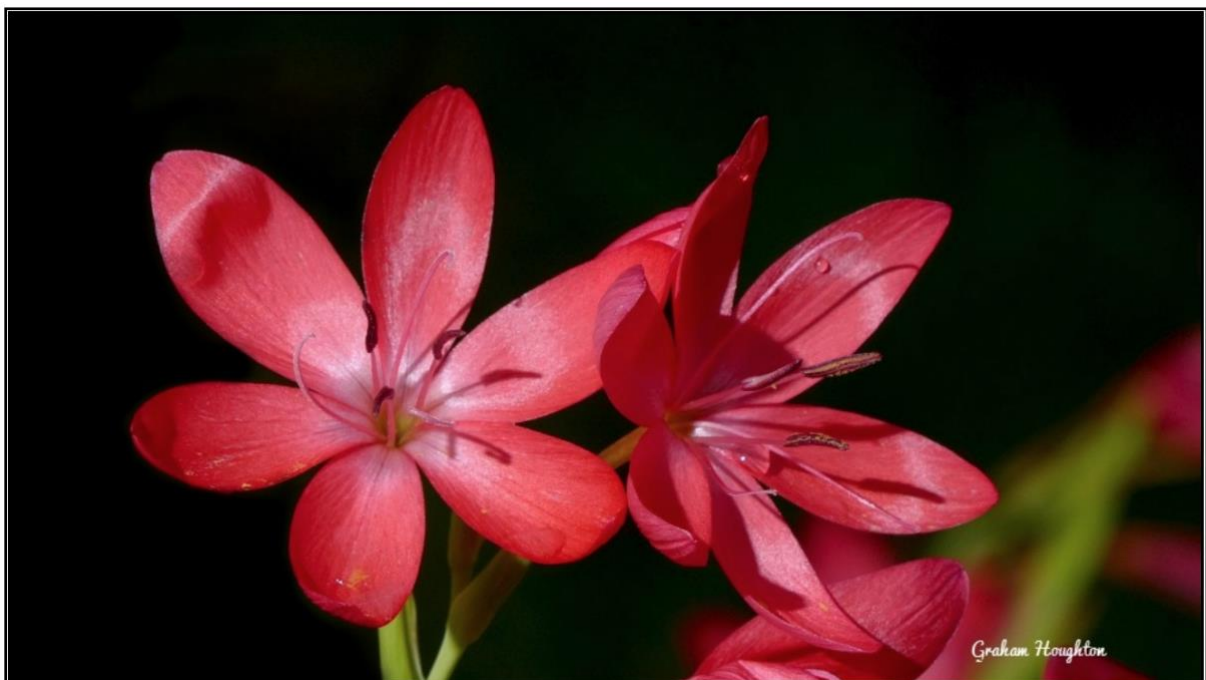
Underexposing the background with –EV compensation

Before continuing and discussing flash exposure compensation, which is primarily used to control the flash output power, it is worth spending a moment considering the two options for controlling exposure compensation within the camera:

1) Exposure compensation is used with the automatic shooting modes of P, A and S. and

2) Flash exposure compensation

Setting flash exposure compensation affects the flash output only. Ambient exposure is unaffected.
This can be set on the external flash unit flashgun itself or used to control the popup flash on the camera.
Flash exposure compensation is used to compensate for the flash output when the flash is used in Auto or TTL mode. It obviously can't be set when the flash is used in manual output.
With manual flash, you'd just be dialling the actual power output level up or down.

1) Exposure compensation

I know many new photographers have trouble understanding the concept of using exposure compensation when the scene or subject is light in tone, and conversely decreasing exposure compensation when the scene or subject is darker in tone. It does seem counterintuitive.
The reason for doing so, is that your camera's meter is designed to expose for everything as a middle grey tone and will compensate for these light and dark subjects.
If you are using one of the semi-automatic modes (P, A or S) the camera will expose for any light toned subject to make it look like average or mid grey.

As an example, someone in a white shirt against standing against a white wall, will appear under-exposed.

In this situation, you need to increase the exposure compensation to prevent the under exposure.
The same logic holds true for darker subjects or scenes.
Someone in a dark suit against a dark wall, will have overexposed, or light, skin tones as the camera tries to make the dark subject again a mid-grey.

2. Flash exposure compensation

There are two scenarios to consider when we think about how flash exposure compensation works: One is when the flash is merely used as fill in flash and the other when the flash is the principal or main light source.

There are probably many situations which fall somewhere in-between these, however having a good understanding of these two situations, will give a better sense of what flash exposure compensation does.

When using fill in flash (TTL or Auto flash), you will most likely dial down your flash exposure compensation to output just a tiny bit of fill light.
So, in this case, your flash exposure compensation will be dialled down to around -1 to -3 EV.
However, when your flash is the main source of light, you will probably be setting your flash exposure compensation to around 0EV to +1 EV depending on the lightness/darkness of your subject and scene.

Factors that affect flash exposure compensation

There are several controlling factors which would affect how your camera meters TTL flash, and would therefore affect how much flash exposure compensation that you will need to dial in. These are:
• The reflectance of your subject
• The ratio of subject to background size
• how far the subject is from the background
• whether the subject is off-centre or centred in the frame
• the amount of ambient light
• Whether the subject is backlit – (strong backlighting always require a lot more flash exposure compensation).

This might seem quite daunting at first however experience gained by trial and error will soon help you to better understand where and when to use flash exposure compensation.

Manual Flash

To obtain the correct flash exposure, we need to understand how the four primary factors will affect it:
- Lens aperture
- The camera sensitivity ISO
- The distance from the flash to subject
- The flash output power

Of these, two are directly related to the camera and two related to the actual flash unit itself.
As we have seen before, especially shooting outdoors, it is best to have a reasonable level of ambient light in the scene so that the background does not become dark if we expose only for the flash element of the exposure.
This will be controlled using the camera controls of aperture and ISO setting and to a degree the shutter speed we select for the flash synchronisation. When we employ manual flash the only way we can control the influence of this light on the subject is to 34 either change the output power (if the unit has a variable output setting facility) and/or change the distance from the flash to the subject.
Remembering the rule of the Inverse Square Law which affects how light intensity varies as the square of the distance then as we move the light source from its current position to one which is half way to the subject then the resulting light intensity on the subject will be 4 times as bright allowing us to stop down our exposure by 2 full f-stops.
The converse is also true if you double the distance the light intensity falls off by 2 complete f-stops.
With manual flash, there is a lot of trial and error involved to get the exposure correct or the balance between ambient light and flashlight correct.
You can use a dedicated ambient/flash light meter such as the Sekonic L308 to assist you in getting it right.
When using TTL flash (which is the case with the pop up flash of the FZ80/82), the flash output power (effectively the flash duration) is varied and controlled by the camera's metering system.

This means that within a certain range, our selected aperture or ISO sensitivity value, or the distance from the flash to the subject does not influence our TTL flash exposure.

The previous statement is paramount to understanding the use of TTL flash, especially outdoors.
I repeat the statement again, as it is so important to understand this point.
When using TTL flash, either on or off camera, our selected aperture or ISO sensitivity setting does not affect our exposure – and in some respects, becomes transparent to our exposure metering.

The camera and flash unit work together in calculating the correct flash exposure by increasing or decreasing the output (duration) of the flash. What does affect our exposure, is the reflectivity/tonality of our subject, and how large the subject is to the rest of the background when viewed in the camera frame.
So, in summary: Aperture setting and ISO do not control flash exposure when we use TTL.
The camera in its communication with the flash unit via the hot shoe, extension cord or commander/slave function will cause it to increase or decrease the output power (duration of pulse) as the camera deems necessary for correct exposure.
This is probably something that is difficult to comprehend at first, however you can easily verify this for yourself.

Changing aperture from f2.8 to f4

In the above images, I changed the aperture to 1 f-stop smaller and the camera instructed the flash to increase the flash duration to compensate.

Changing ISO by 3 f-stops

In the above image, I changed the ISO to 800 (an increase of 3 f-stops) and the camera shortened the flash duration to compensate and produce the same exposure.

Comparing these sets of results to the two things that affect manual flash, you'll notice that none of these aperture or ISO setting seems to influence our TTL flash exposure.

This will be consistent providing the electronics of the flash unit can accommodate the requested output from the camera.
If the flash is already firing at maximum power then it cannot respond to a command for more power.
Similarly, if the flash is working at its shortest pulse duration (minimum power effectively) it cannot reduce the power level anymore if requested to.

Flash Sync Speed

With DSLR and focal plane shutters in cameras flash synchronisation speed is a real issue when trying to use the flash unit outdoors as the maximum shutter speed is often limited to 1/250 or 1/320 second with these cameras.
The FZ80/82 doesn't have this type of shutter and you can synchronise flash at any of the shutter speeds available to you.
This makes setting up for balanced daylight and fill flash far easier as we don't have to consider what shutter speed the camera will be selecting when taking the exposure.
We don't, for example, have to resort to adding ND filters to get wide aperture and short shutter speeds, we can use f2.8 at whatever speed the camera selects and the flash will always synchronise and give a uniform exposure over the entire frame.

Putting It Altogether, Outdoor Flash

Looking first at manual flash – we have 4 controls: – Aperture, ISO Setting, Flash to Subject Distance, Flash Power.
The closer you move your manual flash to your subject, the brighter the light reaching the subject would be, and hence it would affect your exposure. Similarly, it should already make sense that if we increase or decrease the power setting on our manual flash, this too would affect your exposure.
Now, considering the controls available to adjust exposure between ambient exposure, and manual flash exposure, we can see that there are two common controls – aperture and ISO.

This means that the shutter speed becomes the independent control for available light exposure.
So, when we balance manual flash to ambient light, it makes most sense to start by adjusting the shutter speed, since adjusting the aperture or ISO in an attempt to change the ambient exposure, will also affect the manual flash exposure.
This is a crucial concept then for manual flash exposures – within a certain range, shutter speed has no effect on flash exposure.

This is shown in the three images below (not from FZ80/82 but the point remains the same). The manual flash power, flash distance, ISO and aperture were all held constant with just the independent shutter speed being adjusted for each image. You will see the exposure for the subject (which is primarily lit by the flash) stays constant whilst the background lit by ambient light gets brighter as the shutter speed is reduced thus allowing more of this to affect the final exposure.

| *1/160 f13* | *1/50 f13* | *1/13 f13* |

This key will allow us to better mix flash with available light – by controlling the shutter speed.
The simple reason why shutter speed doesn't affect our manual flash exposure, is that flash exposure is a pulse (or pulses) of light, and ambient light is continuous.

You just need the entire image on the sensor be lit by the burst of light from your flash and, as we have seen, the FZ80/82 doesn't suffer from high speed shutter synchronisation problems.

Now let's turn our attention to TTL Flash.

TTL flash is totally different than manual flash when it comes to balancing ambient and flashlight.

With manual flash, you had the 4 controls for flash exposure – Aperture, ISO, Flash to Subject Distance and the Flash Power.

With TTL flash however, none of those have an appreciable influence on the flash exposure.

Your camera - flash setup will follow our chosen aperture and ISO combination and will adjust any change in the distance to the subject, and give you what it deems to be correct exposure, by adjusting the output (power) from your flashgun.

This means that we can now use Aperture and ISO and Shutter Speed – all three controls – to control available light, without influencing our flash exposure. (up to the limit of the output power from your flash gun)

With manual flash, if you decided to change any of your settings (aperture, ISO, distance or power), you would have had to change something else to keep correct exposure.

For example, if you were shooting at f6.3 and wanted f2.8 for shallower depth of field, you would have to change one or more of the other settings to maintain correct exposure for manual flash.

But if you changed your aperture, this would then affect ambient exposure too, and you would have to adjust the shutter speed and/or ISO accordingly.
So, with manual flash, making any changes to any of the 4 controls settings, will have a consequential effect and you would have to adjust something else again.

However, with TTL flash if you decided to change your aperture to control your available light then your TTL flash exposure will remain the same since your camera and flash would still give you the correct exposure.

The same goes for ISO and distance. These settings in effect become transparent to TTL flash exposure.
With manual flash, shutter speed was the only independent control for your available light, and you would change the shutter speed to allow more available light in.
With TTL flash, you could change your ISO and aperture or shutter speed as your control to adjust the available light exposure.

You would have to adjust your flash exposure compensation then to adjust your TTL flash exposure.

So now with TTL flash, if you wanted the same effect – allowing more available light in – you need not resort to a slower shutter speed, or you could change your aperture setting or ISO to allow ambient light to affect that part of the exposure more.

Accessories

The accessories featured in Part 8 of the video series

Nikon DK20 eyecup on amazon UK
https://amzn.to/2QoirOl

Nikon DK20 eyecup on amazon USA
https://amzn.to/2QrnnlA

Lens Pen on Amazon UK
https://amzn.to/2N9exuI

Lens Pen on Amazon USA
https://amzn.to/2NGNLJI

55mm Wide lens hood on Amazon UK
https://amzn.to/2QrzAXy

55mm Wide lens hood on Amazon USA
https://amzn.to/2NGicj3

Viewing hood on Amazon UK (needs the plate adaptor)
https://amzn.to/2ObAuFL

Viewing hood on Amazon USA (needs the plate adaptor)
https://amzn.to/2QpHz7p

ALZO Tripod adaptor plate on Amazon USA (also ships to UK)
https://amzn.to/2p4SlU8

Godox TT350O flashgun on Amazon UK
https://amzn.to/2Qsil8v

Godox TT350O flashgun on Amazon USA
https://amzn.to/2QroUIm

a few images from the FZ80/82

50 seconds, f5.6 @ ISO 80