

Understanding the Controls and Settings on your Digital Camera



This is a brief guide to the basic controls and settings on a modern DSLR or bridge camera. It cannot possibly cover all the settings and all the intricacies of every camera on the market and it is not a substitute for your camera manual.

The purpose of this guide is to look and some of the common buttons, settings and functions, what they do and, most importantly, what you can do with them to make your photographs better.

Shutter Release


Fires the shutter !

In most cameras its surrounded by the On/Off switch

Shutter release is a two stage button.

Pressing halfway normally locks focus and exposure

Pressing fully takes the picture



There is much more to the shutter release than you might first imagine. It is a two stage button.

Pressing the shutter release down half-way will normally

- Wake up the camera, if it has gone to sleep to save battery power
- Cause the autofocus system to activate and focus on the image
- Activate the light meter and calculate the exposure settings
- Lock the focus and exposure (while you maintain pressure on the button)

Pressing the button fully down then fires the shutter and takes the picture.

If you just pick up the camera and press the button right down, without pausing at the half way point, then the camera may not have time to do all it has to do before the shutter is fired – in particular, the autofocus mechanism may not have obtained a focus lock

The on/off dial normally around the shutter release switches the power on/off

Thumbwheel

Some cameras have a single thumbwheel, the better ones have two, one front and one back

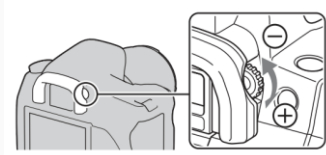
The thumbwheel is used to set the shutter/aperture when not using AUTO mode



On many cameras there is a wheel which can be used to adjust the shutter speed or aperture settings when using the camera in certain modes. Some cameras have a separate wheel (the other one is normally at the back of the camera) for shutter and aperture control.

With cameras with a single wheel, the wheel is used to change the shutter speed in Shutter Priority (**S** or **Tv** Mode), and automatically switches to controlling the aperture in Aperture Priority (**A** or **Av**) Mode. In other modes (eg Manual) the exposure compensation button (**+/-**) is commonly used to switch the function of the wheel.

Dioptr Adjustment

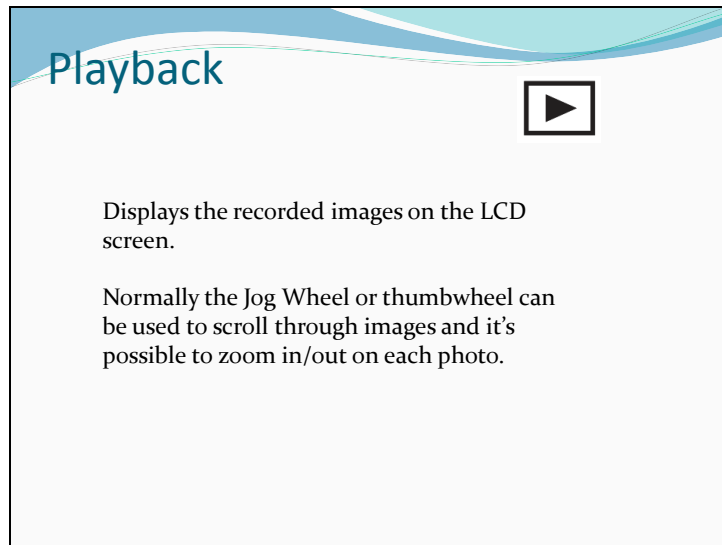


Adjusts the eyepiece to suit your vision

Before you take any pictures its essential that you can see what you are shooting. You should use the Dioptr adjustment wheel, mounted by the side of the eyepiece to suit your eyesight.

If you normally take photos while wearing glasses, make sure that you have your glasses on when making the adjustment.

Its worth checking this from time to time since on certain cameras it is all too easy to accidently move the diopter adjustment.



The playback button allows you to scroll through your recorded images and displays them on the LCD screen.


Normally the thumbwheel or Jog control is used to move from image to image. It is also normally possible to zoom in/out on an image to examine it in detail. Some cameras also have a degree of editing built in and for example, may allow you to crop an image in camera.



If you don't like any image the delete button will delete it, Normally you have to confirm that you really do want to delete the image – just to be sure.

If you accidently delete and image that you want, then remove then immediately switch off the camera, remove the card and take it to your local PC expert. The file can normally be recovered so long as its not been overwritten by newer pictures.

PictBridge



Sets up your camera to print directly to a PictBridge compatible printer

Allows printing directly from the camera to the printer – no computer required

PictBridge is a technology that allows you connect you camera directly to your printer and print out your photos without needing to have, or use a computer.

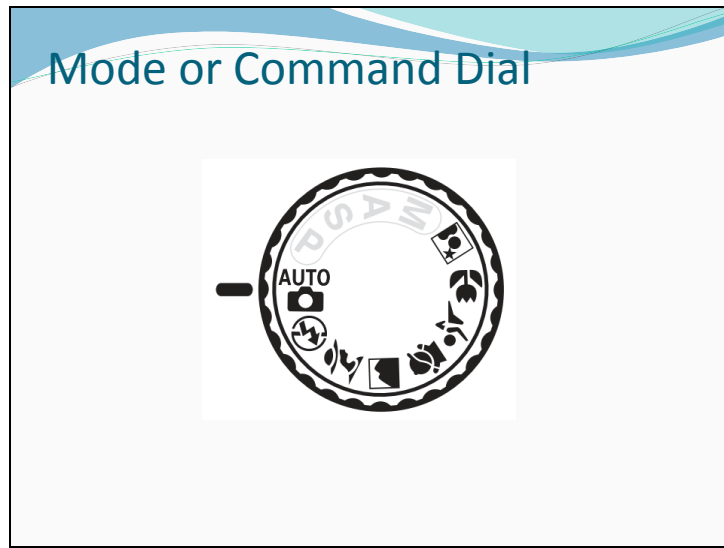
Jog Dial

Many cameras have a multi-function “jog-dial that can be used to select various functions.



The Jog Dial is a multi-function button and it does different things on almost all makes of camera. It is normally used to access functions that are not used often enough to justify having their own special button, but are used enough to make having to locate them via the normal menu options too much of an ordeal – so this is a compromise.

This example is from a Canon Powershot SX1 IS, Pressing a 12 o'clock switches between manual and autofocus, 3 o'clock lets you control the ISO, 6 o'clock the drive mode. The dial also rotates to let you select the scene mode and the button in the middle fixes the desired options.

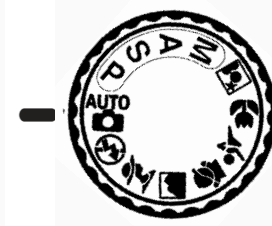


The command dial is the dial which you will probably use most often, assuming that you want to have some creative control over your photos and you do not leave it on AUTO all the time.

Auto

All settings set to Automatic including:

- Shutter Speed
- Aperture
- ISO
- Flash
- Metering Mode
- White Balance
- Autofocus Mode

A close-up image of a camera's mode dial. The dial is circular with various icons around the perimeter representing different shooting modes: 'P' (Program), 'S' (Shutter Priority), 'A' (Aperture Priority), 'M' (Manual), 'Av' (Aperture Priority with auto ISO), 'Tv' (Shutter Priority with auto ISO), 'M' (Manual), 'A' (Aperture Priority), 'S' (Shutter Priority), 'P' (Program), and 'AUTO'. The 'AUTO' position is currently selected, indicated by a white line on the dial's ring.

All settings taken out of the hands of the user

- Takes passable pictures in most situations
- Quick an easy
- No creative control

In AUTO mode then the camera chooses all the settings. It calculates the exposure required and then uses a factory set formula for manipulating the shutter speed, aperture and ISO settings. This formula can be quite complex and it can take into account whether or not the camera thinks you are photographing a landscape, action or portrait.

You have no control, the camera chooses everything – and does a good job most of the time. However, it has to use averages values and average settings based on what the average user may want. As a consequence the results are often average too – but at least you get something in the vast majority of cases.

Many photographers tend to leave their camera on AUTO so that they can quickly grab a shot if the opportunity suddenly arises, once they have a shot “in the bag” then, if time and circumstances permit, they can then use more considered settings.


Auto – Flash OFF

**All settings set to Automatic as AUTO
except
Flash is disabled and will not fire**

Useful where you want to use AUTO
BUT where the use of flash prohibited

Sometime a higher ISO may be selected
To compensate for no flash

Show shutter speed with no flash may result in
camera shake – watch for the warning in the
viewfinder

A close-up photograph of a camera's mode dial. The dial is circular with various modes around the perimeter: 'M', 'A', 'S', 'P', 'BKT', 'M', 'A', 'S', 'P', 'BKT', 'M', 'A', 'S', 'P', 'BKT'. The 'NO FLASH' mode is highlighted with a white background and a black border. A small black tab is visible on the right side of the dial, indicating the current selection.

The NO FLASH option is useful in situations where the use of flash photography is banned, may be inappropriate, or where you simply do not want to use it.

Beware though, if you do not use flash, then the camera will have to select a slower shutter speed, which may lead you into problems with camera shake, or it may increase the ISO setting which can result in “noise”.

You can compensate for camera shake to some degree by using image stabilisation (if your camera or lens supports it), but be aware that this does have its limits – it can compensate to some degree for your holding of the camera but cannot compensate for moving subjects. Anti-Shake use useful – but is not a panacea.

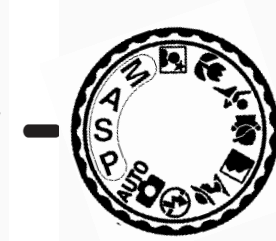
Shutter Priority

YOU set the shutter speed, the camera automatically adjusts the aperture to obtain the correct exposure.

Use where you want total control of the shutter speed.

Take care – if you set a speed too slow you may get camera shake.

If you set too high a speed then aperture cannot be adjusted enough you may get under-exposed images – watch for the warning in the viewfinder



Note CANON cameras
Use Tv (Time Value) rather
than S to indicate Shutter
Priority

In Shutter Priority mode, you have full control of the shutter speed, you can set it as fast or as slow as you like – the camera will automatically set the aperture to compensate to archive the correct exposure, at least as far as it can.


If you set a low shutter speed, then watch for camera shake – as a rule to thumb, the shutter speed should always be kept to at least the same value as the focal length of the lens – so of you are using a 250mm lens, keep the shutter speed above 1/250th of a second. Anti-Shake systems can give you a bit more leeway – some claim UP TO four stops – that would allow 1/15th second with a 250mm lens – personally I would not bank on it – TWO stops (1/60th second) seems more realistic

High shutter speeds can be used to freeze action, slow shutter speeds can be used in low light and to blur motion – use a tripod for very low speeds.

Manual

In Manual mode its down to you to set the correct aperture and shutter speed combination.

The viewfinder will show you what it considers the correct exposure to be, its then up to you co control both the shutter speed and aperture to achieve the correct exposure.



●	1/30 F5.6	-2 1 0 1 2+	⚠️ 🔋
●	1/30 F8	-2 1 0 1 2+	⚠️ 🔋
●	1/125 F8	-2 1 0 1 2+	
●	1/60 F8	-2 1 0 1 2+	

In manual you are in complete control. You set both the aperture and shutter speed. The camera will tell you what it thinks the correct exposure should be, but it won't adjust anything – that's all up to you. Its normally a matter of adjusting the aperture and shutter speed to move the maker to the centre of the exposure scale.

The aperture/shutter speed indicators in the viewfinder and on the LCD display may also flash or turn red if the exposure is not what the camera thinks it should be

By changing the shutter speed, aperture and possibly ISO, it up to you to set the correct exposure.

Scene Modes

Most DSLR and Bridge cameras feature SCENE modes, these may be selected via the command dial, or on some models, by selecting SCENE on the command dial, then using the menu system to choose the desired scene setting.



Most cameras have some common SCENE modes on the command dial, some have a SCN setting from which you can then select from a wide range of different scene settings.

Scene modes are essentially different sets of pre-programmed settings designed to give better results in common situations. Some cameras have a limited range of scenes on the command dial, with some cameras you must select the scene from the menu, or function options. Some use a combination of both, common scene modes on the command dial, less frequently used ones need to be selected from the menu.

Some cameras also have one or more CUSTOM modes, which you can set up and program yourself

Portrait

Sets the camera to use a wide aperture (small f number) for a restricted depth of field.

May also set the colour profile to produce accurate skin tones.

If flash is used, it often engages red-eye reduction.

Often will set the ISO to a low value

If the camera supports it, it often engages "face detection" autofocus



Portrait mode, believe it or not, is designed for the taking of portraits. In many ways its similar to the Aperture priority setting, it normally selects a wide aperture for limited depth of field and a shutter speed fast enough to be hand-held.

The in-camera image processing is often tweaked to enhance skin tones.

Various methods of red-eye reduction, including pre-flash and post image processing may also be activated and the ISO is normally set to a low value for best results.

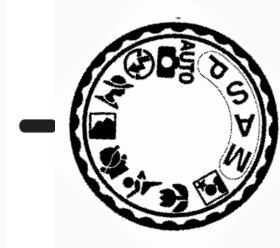
If the camera features "face detection" autofocus, then this is often activated as well.

Landscape

Sets the camera to use a small aperture (large f number) for greatest depth of field.

May also set the colour profile to accentuate greens and blues.

Often will set the ISO to a low value and flash will be turned off.



This mode it normally selects a small aperture for maximum depth of field and a shutter speed fast enough to be hand-held.

The in-camera image processing is often tweaked to enhance blues and greens.

Flash will normally be disabled and ISO set to a low value for best results.

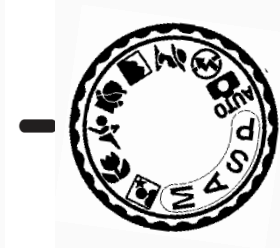
Sports

Sets the camera to use a fast shutter speed to freeze action

May also set the auto-focus mode to continuous or predictive

May set the shooting mode to continuous allowing several frames per second to be shot.

Often will set the ISO to a higher value

A circular camera mode dial is shown with a magnifying glass over the 'S' (Shutter Priority) mode. The dial includes various modes: 'M' (Manual), 'A' (Aperture Priority), 'S' (Shutter Priority), 'P' (Program), 'B' (Bulb), 'OFF', 'ON', 'M', 'A', 'S', 'P', 'B', 'OFF', 'ON'. The 'S' mode is highlighted by a magnifying glass.

This setting is in many ways similar to Shutter Priority. The shutter speed will normally be set to a fast setting to freeze action

The ISO is normally set to a higher value to allow faster shutter speeds.

Autofocus is often set to Continuous or Predictive to that the camera continues to adjust focus while its locked on an object.

Drive mode will often be set to continuous allowing shots to be taken for as long as the shutter is held down

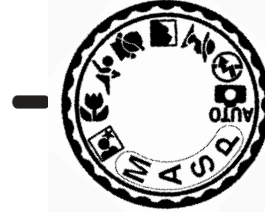
Macro

On bridge cameras this often moves one of the lens elements allowing you to focus on very close objects.

May also set a small aperture for maximum depth of field

Often will set the ISO to a low value

Use for close-up shots of flowers, insects, and other small objects. The camera automatically focuses on the subject in the centre focus area. The use of a tripod is recommended to prevent blur.



This adjusts the settings to those required to take close-up photos. It usually selects a small aperture for maximum depth of field and a low ISO value for best quality – which will result in a slow shutter speed, so the use of a tripod may be necessary.

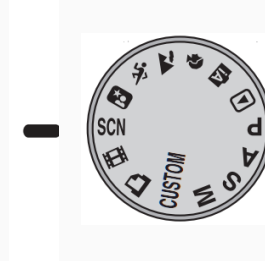
The autofocus mode will be set to single sample, centre of frame in most cases.

With some bridge camera, it may also move one of the lens elements allowing it to focus very near the front of the lens.

On DSLR cameras a lens with a Macro facility will be required for close-up work

Other Modes

Some cameras, especially bridge cameras, also have a range of other scene modes, often selected by rotating the command dial to SCN, then selecting the desired mode from the on-screen menus.



- Bulb
- Snow
- Beach
- Fireworks
- Party
- Sunset
- Foliage
- Aquarium

Bulb mode is normally only found on higher end cameras. It may be an option on the command dial or it may be selectable from the menus. It is designed for very long exposures. On Bulb, you press the shutter release and the shutter opens – and it remains open until you press the shutter release again. It can be used for very long low light exposures (such as “star trails” and “painting with flash”). It requires the use of a tripod and a remote shutter release is also normally a good idea.

The other modes offer a range of presets designed to make the best of your photographs in common scenarios – how useful they are is debatable !

ISO Selector

The ISO selector determines how sensitive the sensor is, low ISO values give better quality images but higher ISO values can be used in lower light conditions.



ISO determines how sensitive the sensor is to light, the higher the value then the more sensitive it is and the narrower the aperture and the faster the shutter speed you can use.

Typically ISO values on cameras go from 100 ISO to 1600 ISO or more. Eg:

100
200
400
800
1600
3200
6400

Each value being twice as “sensitive” than the one before it. Unfortunately as you increase the sensitivity the quality of the image reduces, so it pays to use as low an ISO value as you can.

Anti Shake

Different manufacturers use different methods for reducing camera shake and/or call the same method different things.



IS

VR

Canon and Nikon build anti-shake into SOME of their DSLR lenses, Canon call it IS (Image Stabilisation) and Nikon call it Vibration Reduction (VR). Other DSLR manufactures such as Olympus, Sony, Pentax and Samsung build anti-shake into the camera themselves, so it works with any lens.

Anti-shake technologies can work in a number of different ways and can be useful when hand-holding a camera at low shutter speeds.

The more primitive option (which is not really ant-shake at all in my book) is just keeping the shutter speed high enough. You can also do this yourself, manually, by using the simple rule of thumb that the shutter speed should never fall below the focal length to the lens being used. So if you use a 250mm lens, don't use a shutter speed of less than $1/250^{\text{th}}$ of a second.

Other methods which actually allow you to use a slower shutter speed with less chance of camera shake tend to use a gyroscopic sensor that detects the camera movement in your hand. The camera then compensates for this movement by either moving the sensor slightly, or moving a special element in the lens.

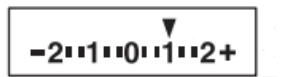
Manufactures often claim a 4 stop advantage, that is you can use a 250mm lens, not at $1/250^{\text{th}}$ but at $1/15^{\text{th}}$. These claims are normally over optimistic – in reality a 2 stop difference is more like it

Exposure Compensation

This is used to override the camera's automatic exposure. By pressing this button and then, depending on the camera, rotating either a thumb wheel or using the jog dial you can adjust the exposure



You can normally adjust the exposure in 1/2 or 1/3 stop increments up to -2 or +2 stops



If you want to deliberately over or under expose a photo you can do so using this button, this can be useful if the scene is especially bright, exceptionally dark or is of very high contrast.

Auto Exposure/Auto Focus Lock

This locks the exposure/focus setting allowing you to focus/set the exposure and then re-compose the photo - similar to pressing the shutter release down half way


AE-L
AF-L

This can be used to lock the exposure/focus setting, similar to holding the shutter release at half way but the exposure and focus can be locked independently of each other.

Auto/Manual Focus

Normally a slider switch is used to switch between AF Automatic Focus and MF Manual Focus. Some cameras also have a Continuous Autofocus setting

Some cameras may also have an option to select an individual AutoFocus point



The diagram shows a vertical slider switch with three positions labeled MF, AF, and AFC. Below the switch is a square icon with a crosshair, representing a focus point selection.

Three or sometimes four focus modes are available on most cameras.

MF – Manual focus – you have to focus yourself

AF – The camera will focus automatically. You can in most cases, select the autofocus point with the jog wheel. Once focus is obtained the camera will lock focus as long as you hold down the shutter release






AFC – Autofocus Continuous – the camera will focus and will continue to adjust the focus even if the shutter release is half-down – this is useful for moving objects.

AF Predictive – Focuses on the subject and predicts how it is moving, in which direction and how fast and focuses on the point it will be at the moment the shutter opens.

(There is always a small delay between pressing the shutter release button and the shutter actually opening as the aperture needs to be “stopped down” to the pre-set value, and the mirror assembly needs to be raised out of the way before the shutter can be released.)

Drive Mode

On many cameras a Drive Mode button is often used to select between a number of related functions. On other cameras each function has its own button.

-  Self timer Fires the shutter after a delay (normally adjustable)
-  Single Shot. The shutter must be depressed for each shot
-  Continuous. The camera continues to take photos while the shutter is held down.
-  Bracketing. Multiple images are taken with slightly different settings
-  There may also be an option to switch the camera to wireless remote control

Self timer

This fires the shutter after a pre determined delay, you can normally select from at least two pre-determined delays (often 2 sec or 10 sec), or you can in some cases set your own delay.

Single Shot

Takes one photo each time the shutter is pressed – the default

Continuous

Keeps taking photos as long as you hold the shutter down. Different cameras will be able to shoot at different rates normally somewhere between 2 and 6 frames per second. How fast and how many photos can be shot like this will depend on the camera and on the image quality settings.







Bracketing

The commonest form of bracketing is exposure bracketing, one shot is made at the “correct” exposure and then one, or more, slightly under exposed and overexposed. The amount of difference can normally be set. Some cameras also support other forms of bracketing eg Dynamic Range Bracketing

Wireless

Allows the camera to be triggered by a remote wireless release.

White Balance

AWB (Auto WB)	The camera automatically detects the light source and adjusts the colour tones
 (Daylight)	Allows you to manually select the type of light
 (Shade)	
 (Cloudy)	
 (Tungsten)	
 (Fluorescent)	
 (Flash)	
Custom	Lets you set the colour temperature manually




Light is not white – it is tinted with various colours.

- Morning and Evening light is “warm” it has lots of reds and yellows in it
- Bright sunlight has a bluish tint
- Incandescent light bulbs tend to be orange
- Fluorescent lights give a greenish light

Normally you don't need to worry as the camera will work this out and compensate in the same way they our eyes do.

Occasionally though the camera may get it wrong or you may want full control, in which case you can switch from AWB (Automatic white balance) and set the value yourself.

Metering Mode

 (Multi segment)	For general shots. The image is divided into segments, the brightness of each segment measured and the exposure based on the average value.
 (Center weighted)	Similar to Multi-Segment, but the segments near the centre of the image are given a greater priority
 (Spot)	Bases the exposure only at the metering point (normally the centre of the screen) . Use when shooting images with large variations in brightness

When the camera meters the light it can do so in different ways, three options are normally available

Multi-Segment (Evaluative)

Evaluates light from all parts of the image and then bases the exposure on the average. This works well in a lot of cases but can lead to inaccurate exposure if some parts of the scene are much brighter than others, a dark foreground and a sunny sky for example.

Centre Weighted







Works in a similar way to evaluative but it attaches more importance to the central part of the image.

Spot

Takes the meter reading from a very small area (which you can select). Very useful when you have a scene with high contrast and want to make sure that the selected part is properly exposed.

Flash Mode

Various flash options may be able to be set according to the sophistication of your camera, including:

	FLASH OFF	Switches OFF the flash and prevents it firing under all circumstances
	AUTO FLASH	Fires the flash if the light levels are low
	FILL-IN FLASH	Fires the flash even if the light levels are high
	SLOW SYNC	Uses a slow shutter speed to expose the background and fires the flash also
	REAR CURTAIN SYNC	Fires the flash just before the exposure is completed.
	WIRELESS SYNC	Fires the flash off-camera (requires a compatible external flash unit)

Various flash modes are available.

The above I think says it most of it.

If you use wireless flash there is normally the option to select a flash “channel”. This can be useful if you happen to be in the same location as other users with the same type of camera, if users set their cameras to use different channels, then it stops other peoples cameras triggering your flash (and vice versa)

Image Quality

The quality of the recorded photograph can be adjusted on most cameras normal options include

STANDARD JPEG	Normally not worth bothering with, the recorded image is smaller in size so you can fit more on your memory card – but quality is compromised.
HIGH QUALITY JPEG	Most suited for general.
RAW	For the purists, the image is recorded “as seen” with no post-shot processing. The image is larger than a high quality JPEG and you have to process it on a computer afterwards.
RAW+JPEG	Best of both worlds, gives you a JPEG and RAW version of the image simultaneously – but takes more room on your memory card.

For the vast majority of people and purposes then recording the image as a high-quality JPEG is the best option. It gives good image quality and a reasonable file size and you can do most things you would ever want to do with a JPEG image.

I don't see the point in saving JPEG images at any other setting than High Quality (Sometimes called FINE), it seems pointless to spend a lot of money on a good camera and then set it to record poor quality photos. The only saving grace is that you can get more images on your card – my answer to that is to buy another (or a bigger card).

To get the absolute best in quality then some cameras can save images in RAW format. Unlike JPEGs which are processed images, RAW files are, as the name suggests, raw data from the camera sensor, they contain ALL of the image data and as such they are big. A camera with a 12mp sensor will produce a 12Mb raw file (typically even a high Quality JPEG is normally only 3-5Mb), so you get far less on a memory card. RAW images MUST be processed on a computer before printing.

Display

DISP

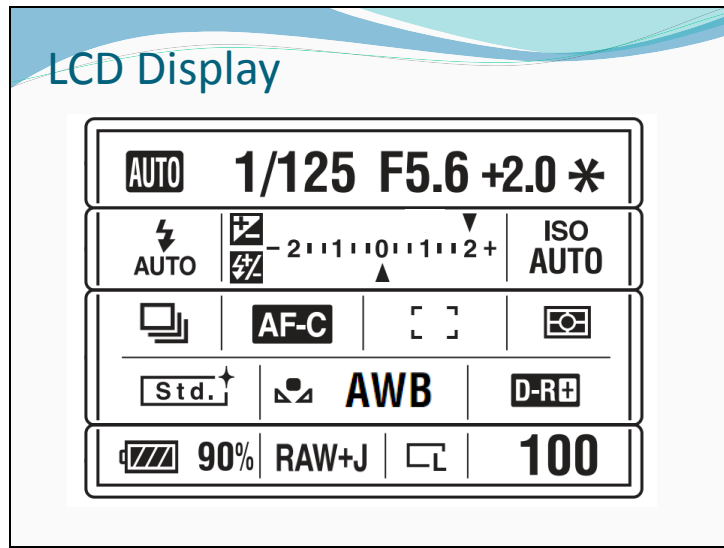
The DISP button is used to switch between display modes it may switch between the Optical View Finder (OVF) and LCD screen.

It may also switch enable various other options in the LCD, including for example composition guides, information and histogram

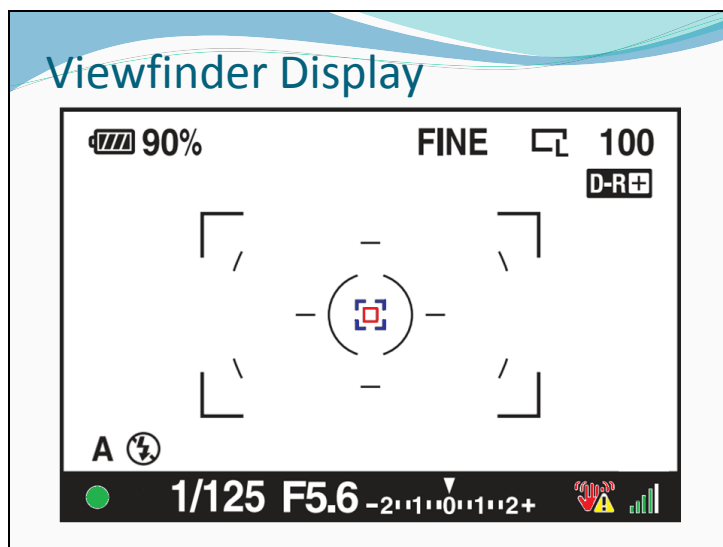
Diagram illustrating the camera's LCD display with various information elements labeled 1 through 19:

- 1. Av/Tv bar
- 2. Histogram
- 3. Spot AE Point Frame
- 4. AF Frame
- 5. Battery Charge Indicator
- 6. Remaining Time/Elapsed Time (Movies)
- 7. Buffer Warning
- 8. Recordable Shots (Stills)
- 9. Shutter Speed, Aperture Value
- 10. Exposure Level Indicator
- 11. Camera Shake
- 12. Histogram
- 13. Spot AE Point Frame
- 14. AF Frame
- 15. Battery Charge Indicator
- 16. Remaining Time/Elapsed Time (Movies)
- 17. Buffer Warning
- 18. Recordable Shots (Stills)
- 19. Shutter Speed, Aperture Value, Exposure Level Indicator

The DISP button is used to change the display. Sometimes it is used to change what information is actually displayed on screen and it can also be used to switch between the Optical View Finder and LCD screen (LiveView) on some camera



Most DSLR camera show basic information in the viewfinder. Additional information is often displayed either on the LCD screen or on a dedicated display on top of the camera. This display is from a Sony a350



Some of the information is also replicated in the viewfinder