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Learning Photography Course – 4. Every Control on the Camera

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1. 1 Reading a camera body



Here is a camera. Not a particular camera — there is no name on it, and there is not going to be, because the moment a badge appears on a diagram it starts teaching you one manufacturer rather than teaching you cameras. What you are looking at is the arrangement that almost every camera made in the last forty years has settled on, drawn plainly so that the shape of the thing is visible before any of it is labelled.

The first thing worth saying is that this arrangement was not designed. Nobody sat down and worked out where the controls should go. It accumulated, one decision at a time, across about a century, and the reason your camera has a dial in the top right where your index finger already is, is that a film camera put a winding lever there in the 1950s and every camera since has inherited the hand position.

That matters more than it sounds. It means the layout is not arbitrary, and it is not optimal either. It is historical. Some of it is genuinely well thought out. Some of it is where it is because of a mechanism that no longer exists.

So this module does something the specification sheets never do. It goes around the body, control by control, and for each one it answers three questions. What does this actually change? When would you reach for it? And what happens if you never touch it at all — because for a great many controls, the honest answer is nothing much, and a course that pretends every button matters equally is wasting your time.

By the end of this hour you should be able to pick up a camera you have never held, find the six controls that do most of the work, and know which of the remaining forty you can safely ignore until you need them.

Now, about this diagram.

It is drawn rather than photographed, and that is a deliberate choice worth explaining, because it affects how you should read everything that follows.

A photograph of a real camera teaches you that camera. Every label lands on a specific button of a specific body, and a viewer holding anything else spends the hour translating. Worse, a photograph carries all the visual noise that a real object has — the branding, the texture, the model number, the particular way that one manufacturer has arranged its own top plate — and none of that is the lesson.

A drawing can be generic. This body has a mode dial where mode dials usually go, command wheels where command wheels usually sit, a cluster of buttons on the back where your right thumb falls. It is recognisably a camera and it is not any camera, which is exactly what a teaching diagram should be.

There is a cost to that, and it should be stated plainly rather than glossed over. Some real cameras do not look like this. Fujifilm's rangefinder-styled bodies have no mode dial at all — the exposure mode is decided by which dials you leave on automatic, which we will come to. Some bodies have no top-plate screen. Some have two command wheels, some have three, and a few have one. Where a real camera departs from this diagram in a way that matters, the narration will say so rather than letting the picture quietly mislead you.

And one more rule, which is the channel's rather than photography's. Nothing on this diagram carries a manufacturer's name or a model number, and every label you see is typed on at the point the film is made rather than drawn into the picture. That means the words are chosen, and checked, rather than invented by whatever drew the image.

With that established, here is the organising idea of the whole module.

Every camera arranges its controls into four zones, and once you can see the zones, an unfamiliar body stops being forty mystery buttons and becomes four small problems.

Zone one is the top plate, and it is where exposure lives. The mode dial, the command wheels, the shutter release, the exposure compensation control, and on larger bodies a small monochrome screen summarising what the camera currently intends to do. If you are changing how bright the picture will be, your hands are here.

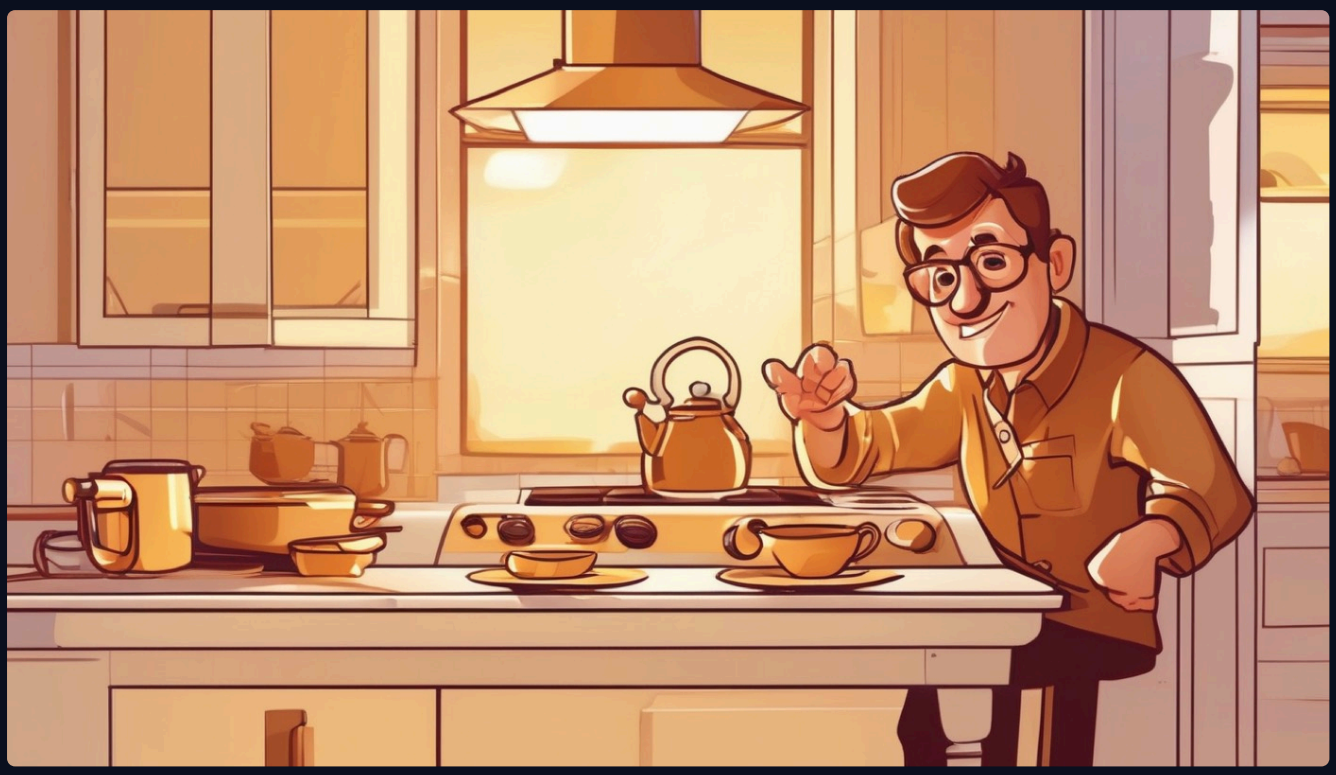
Zone two is the back right, and it is where focus and playback live. Under your right thumb: the autofocus-on button, the joystick or pad that moves the focus point, the magnify and playback buttons, the command wheel your thumb reaches. This is the zone you use while your eye is at the finder and the camera is at your face.

Zone three is the back left, and it is where the menu lives. The menu button, the display button, the delete button. These are the controls you press while the camera is away from your eye and you are thinking rather than shooting. Manufacturers put them on the left precisely because they are not urgent — your left hand is supposed to be under the lens.

Zone four is the front, and it is where the fast things live. A depth-of-field preview button, a lens release, one or two customisable buttons under your fingertips, and on the lens itself a focus-mode switch and often a stabilisation switch. Front controls are the ones a manufacturer expects you to hit without looking.

Four zones: exposure on top, focus behind your thumb, menus on the left, fast things on the front. That is the map. The rest of this module walks it.

2. 2 The mode dial



The mode dial is the single control that decides how much of the exposure decision you are making and how much the camera is making. Everything else on the body adjusts a setting. This one decides who is in charge.

Module two established the three settings and the relationships between them. This chapter is about the four dial positions that expose those settings to you in different combinations, and the names on them are a small mess that is worth clearing up first.

P is program. The camera chooses both the aperture and the shutter speed. You keep the ISO, the exposure compensation and everything else.

A, or Av, is aperture priority. You choose the aperture; the camera works out the shutter speed that makes the exposure correct.

S, or Tv, is shutter priority. You choose the shutter speed; the camera works out the aperture.

M is manual. You choose both.

The two-names problem is entirely cosmetic. Canon and Pentax write Av for aperture value and Tv for time value; Nikon, Sony, Panasonic and OM System write A and S. They do exactly the same thing. There is no behavioural difference hiding behind the different letters, and anybody who tells you there is has not used both.

I will say one thing in Canon's favour here, though. `Tv` — time value — is the honest label of the four. Module two made the point that "shutter speed" is a misleading name for a setting that is a duration: an eight-second exposure is not a speed, it is a length of time. Canon's dial calls it a time. Everyone else calls it a speed. Canon is right and lost.

And if you are holding a Fujifilm body in the rangefinder style, you may be looking for a dial that is not there. Those cameras have a shutter-speed dial on the top plate and an aperture ring on the lens, each with an `A` position, and the exposure mode is simply which of the two you have left on `A`. Both on `A` is program. Aperture ring set, shutter dial on `A` is aperture priority. Shutter dial set, aperture ring on `A` is shutter priority. Both set is manual. There is no mode dial because the mode is a consequence rather than a choice, which is either elegant or infuriating depending on the day.

Now, the other half of the dial.

Most consumer and enthusiast bodies put more than four things on the mode dial. There is usually a green `Auto`, often marked with a rectangle or a camera icon. There is frequently a cluster of pictograms: a running figure, a flower, a mountain, a face, a moon and stars.

These are the scene modes, and they get more contempt than they deserve.

What a scene mode actually is, is a preset. `Sports` is shutter priority at a fast speed with continuous autofocus and continuous drive. `Portrait` is a wide aperture with face detection on. `Landscape` is a small aperture with the sharpening and saturation pushed up. `Night portrait` is a slow shutter with the flash on, which is the one that surprises people and is also the one that is genuinely clever.

So a scene mode is not a different kind of photography. It is a bundle of the settings this course is teaching you, chosen by somebody at the manufacturer who had to guess what you were pointing at.

That is the real objection, and it is worth stating precisely rather than sneering. The problem with scene modes is not that they are for beginners. It is that they are opaque. The camera makes four or five decisions and tells you none of them, so when the picture comes out wrong you have learned nothing about why. Aperture priority makes exactly one decision on your behalf and shows you what it decided. That is the whole difference, and it is a difference about feedback rather than about skill.

There is also the green `Auto`, which is a stronger claim than the scene modes: it decides everything, including whether to fire the flash, and on many bodies it locks you out of the file format and the exposure compensation. If you are learning, `Auto` is the one dial position that actively prevents the thing you are trying to do.

Then there are the numbered positions. `C1`, `C2`, `C3` on Canon; `U1`, `U2`, `U3` on Nikon; `1`, `2`, `3` on Sony's dial. These are custom positions, and they are the most underused control on the entire camera.

A custom position stores the state of the camera. Not one setting — all of them. Exposure mode, aperture, shutter speed, ISO and auto-ISO limits, focus mode, focus area, drive mode, metering,

white balance, file format, and usually the state of a dozen menu items you have never looked at.

Here is how you set one up, and it takes about two minutes.

Put the camera in the mode you want. Set every relevant setting deliberately — not approximately, deliberately, because you are about to freeze all of them. Then go into the setup menu and find the item that will be called something like `Custom shooting mode` or `Save user settings` or `Register camera settings`, and save the current state to slot one.

From then on, turning the dial to `C1` puts the camera back into that entire configuration in one movement, regardless of what you did to it since.

The reason this is worth doing is not laziness. It is that the situations where you most need the camera set up correctly are the situations where you have the least time to set it up. A child does something once. A bird lands once. If you have a `C1` that means *fast shutter, continuous focus, continuous drive, auto-ISO with a generous ceiling*, you get there in one movement instead of nine.

My suggestion, and it is only a suggestion: make `C1` your action setup, `C2` your low-light setup, and leave `C3` for whatever you are currently working on. The third slot being temporary is the point — it stops the other two from being fiddled with.

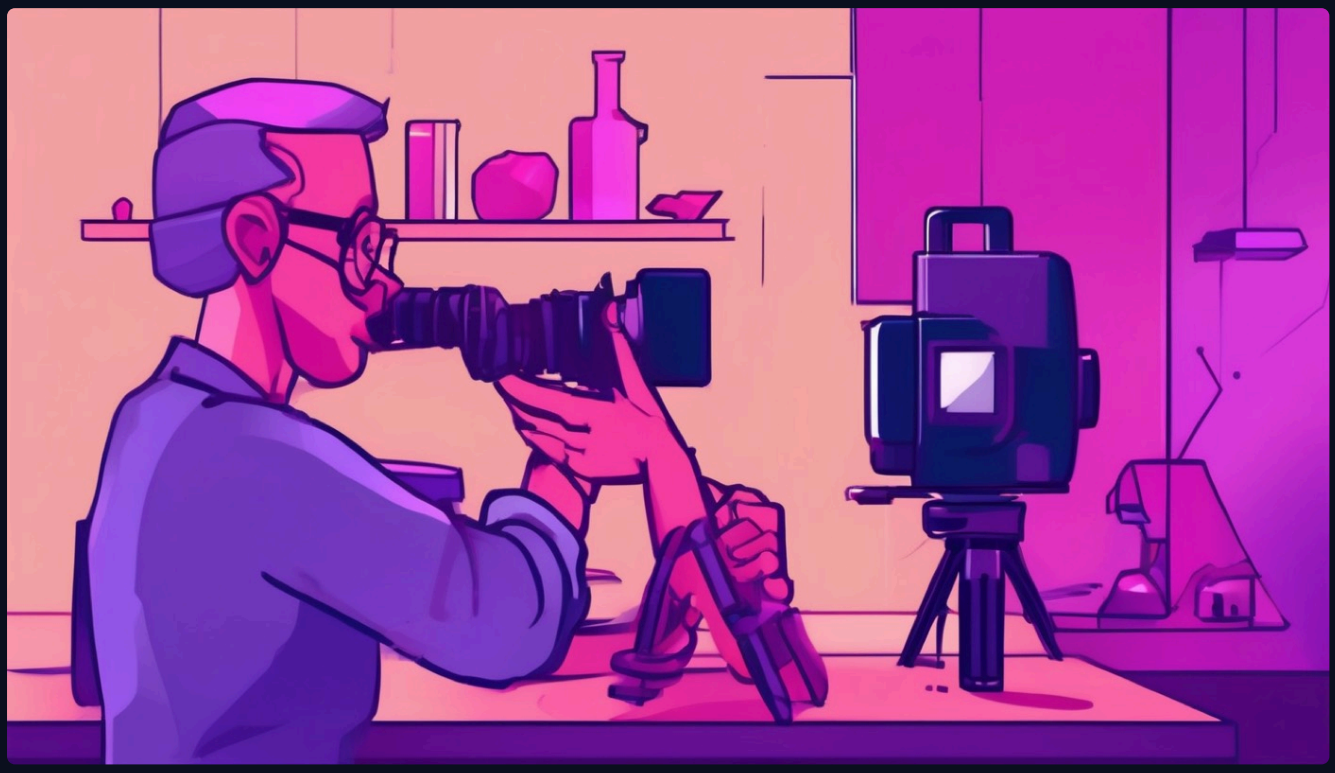
One last position on the dial, and it is a position that confuses people because of where the industry has ended up.

Most modern bodies have a video position, or a stills–video switch beside the dial. On the older cameras that first gained video, this was a mode in the ordinary sense: you turned to it and the camera started behaving differently. On current bodies it is closer to a second camera living inside the first. Video keeps its own exposure mode, its own ISO, its own white balance, its own focus settings and often its own custom positions, and switching between stills and video swaps the entire state rather than changing one thing.

That is genuinely useful and it catches everybody out at least once. You set the camera up carefully, switch to video, find that none of your settings are there, set it up again, switch back to stills, and find your stills settings exactly as you left them. Nothing is broken. You are simply operating two cameras that share a lens.

This module is about the stills camera. But it is worth knowing that the video side has a parallel set of nearly all of these controls, and that adjusting one does not adjust the other.

3. 3 The command wheels



The mode dial decides who is in charge. The command wheels are how you actually give the instruction, and they are the controls your hands will touch more than every other control on the camera put together.

Most bodies have two. One sits under your right index finger near the shutter release — the front wheel. One sits under your right thumb on the back — the rear wheel. Some smaller bodies have only the rear one. Some larger ones add a third, usually around the four-way pad.

What each wheel does depends on the mode, and this is the bit that is worth memorising because it is completely consistent within any one camera:

In **aperture priority**, one wheel sets the aperture. The other usually sets exposure compensation.

In **shutter priority**, one wheel sets the shutter speed, and the other is exposure compensation again.

In **manual**, one wheel sets the shutter speed and the other sets the aperture. There is nothing left over for exposure compensation, which is why manual mode behaves oddly around compensation — a point chapter 4.4 has to deal with properly.

In **program**, turning a wheel does something rather elegant called program shift: it slides along the set of equivalent exposures, giving you a wider aperture and faster shutter, or a narrower aperture and slower shutter, without changing the brightness. Module two called these equivalent exposures. Program shift is a dial that walks along them.

Notice what that means. Program mode with program shift is not the beginner's mode it is sold as. It is a mode where the camera proposes a sensible pairing and you slide it to the pairing you actually want, and for street photography in changing light that is a genuinely professional way to work.

Which wheel does which job is, on most cameras, something you can change — and on most cameras, so is which direction counts as *more*.

That second one sounds trivial and is not. Every camera has a setting, usually buried under a heading like `Customise dials` or `Reverse dial rotation`, that flips which way you turn a wheel to increase a value. The reason it exists is that there is no natural answer. Turning the aperture wheel to the right makes the f-number go up, which makes the hole smaller, which makes the picture darker. Is that "more" or "less"? It depends entirely on whether you are thinking about the number or the light.

The advice here is simple and it is about consistency rather than correctness. Pick the direction that matches your exposure compensation scale — so that turning a wheel to the right always makes the picture brighter, or always makes it darker, whichever you prefer — and set every wheel on the camera to agree with that. A camera where two wheels disagree about which way is brighter will catch you out in the exact moment you cannot afford it.

Then there is the idiom that unlocks about a third of the controls on the body, and that nobody explains.

Hold a button, turn a wheel.

On its own, a wheel adjusts whatever the mode assigns to it. But hold down almost any labelled button on the camera and turn the same wheel, and the wheel now adjusts that button's setting instead. Hold the ISO button and turn: ISO changes. Hold the drive button and turn: drive mode changes. Hold the autofocus button and turn: focus mode changes; turn the other wheel and the focus area changes.

That is the whole idiom, and once you have it, you stop needing the menu for anything you do often. Every setting that has a labelled button becomes a one-handed adjustment you can make with the camera at your eye, without taking your attention off the picture.

It is worth sitting down with your own camera for ten minutes and going round every button on the body, holding it, and turning both wheels to see what happens. You will find two or three things you did not know were there. This is the single highest-value ten minutes in this entire module, and it is the one thing in it that I cannot do for you, because the assignments differ between bodies.

4. 4 Exposure compensation



Module two explained what exposure compensation is for: it is how you tell a camera that its meter has come to the wrong conclusion, without taking over the whole exposure yourself. This chapter is about the physical control, because exposure compensation is the setting with the widest gap between how important it is and how little attention its hardware gets.

There are two ways cameras give it to you, and they produce noticeably different habits.

The dedicated dial. A marked wheel on the top plate, usually to the right, running from minus something through zero to plus something, with detents you can feel. Fujifilm and Nikon's retro bodies and Sony's smaller cameras favour this. The great virtue of a dedicated dial is that it is *visible*: you can see what it is set to with the camera switched off, hanging round your neck, without looking through anything.

The button and wheel. A small button marked with a plus and minus inside a square, which you hold while turning a command wheel — or, in aperture and shutter priority on many bodies, simply the wheel your other hand is not using. The virtue here is that the control is under your finger while your eye is at the finder, so you can correct an exposure while you are still looking at the thing you are correcting.

Neither is better. They encourage different errors, which is the useful way to think about it. The dial makes you slow and makes you remember. The button makes you fast and makes you forget.

Wherever you set it, the camera shows it to you in the finder, and this is the part worth learning to read at a glance.

Somewhere in the viewfinder display — usually along the bottom, occasionally down the right side — there is a scale. It is marked in stops, with zero in the middle and marks running out to either side, and it is the same scale module two showed as the exposure meter. When you dial in compensation, a marker moves along that scale, and on most cameras a small plus-minus icon appears beside it.

Two things about that display are worth knowing, because they are where the confusion lives.

First, on many cameras the same scale does two different jobs depending on the mode. In aperture or shutter priority it shows the compensation you have dialled in. In manual it shows how far the current settings are from what the meter thinks is correct. Same scale, same marks, completely different meaning — one is your instruction, the other is the camera's opinion. If you are ever unsure which you are looking at, change the aperture and watch: if the marker moves, it is the meter; if it does not, it is your compensation.

Second, when you are looking through an electronic viewfinder, the brightness of the image itself already reflects the compensation. That is one of the genuine advantages mirrorless brought, and module three made the point: what you see is roughly what you will get. Through an optical finder it is not — the scene through the pentaprism is as bright as it is, and the scale is the only evidence that you have asked for anything at all.

And that brings us to the single most common unforced error in photography.

You are photographing something backlit. The meter is being fooled, the subject is coming out dark, so you dial in plus one and two-thirds. The pictures come right. Good.

Then you put the camera in the bag.

The next morning you photograph something entirely different in ordinary light, and every frame is blown out, and you do not immediately know why, because the camera is doing exactly what you told it to do eighteen hours ago and has been waiting patiently to do it ever since.

This happens to everybody. It happens to people who have been photographing for thirty years. The reason it happens is structural rather than careless: exposure compensation is the one setting that persists through a power cycle, persists through a lens change, persists through a card change, and produces a result that looks like a fault rather than like a setting.

So there are three defences, and I would use all three.

The first is a habit. Return it to zero when you finish the shot that needed it, not when you finish the day. The compensation belongs to that lighting situation, not to the camera.

The second is a check. Build a two-second glance into the moment you turn the camera on: mode dial, ISO, compensation. Three things, two seconds. This is the photographic equivalent of checking your mirrors, and like checking your mirrors it feels unnecessary right up until the one time it is not.

The third is a setting. Many cameras have a menu item — often called something like `Exposure comp. reset` or filed under the power-off behaviour — that clears compensation when the camera is switched off. Whether you want that is a genuine question. If you shoot one situation at a time, turn it on. If you work in a consistent light where a standing correction is right all day, leave it off, because a camera that keeps forgetting your correction is its own kind of irritating.

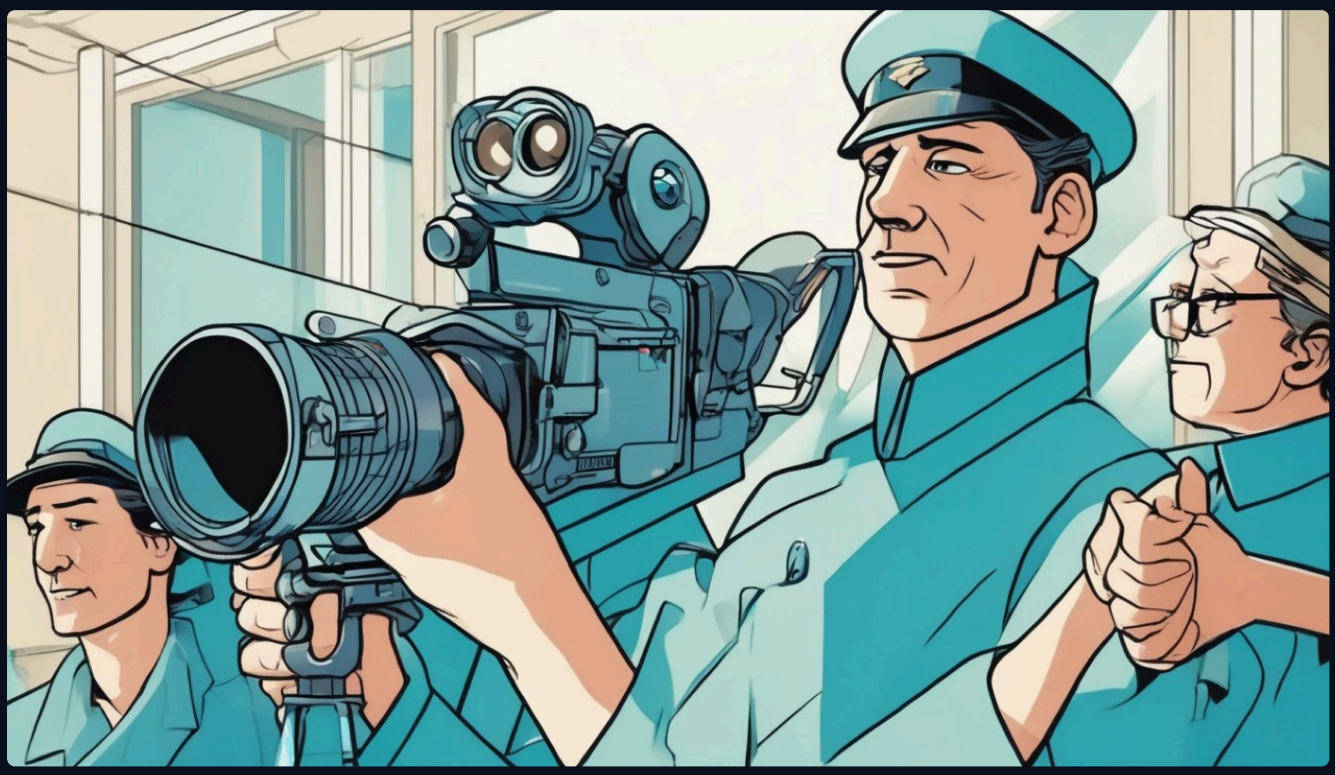
One last thing, and it is the awkward corner of this control.

In manual mode, both wheels are taken — one is the aperture, one is the shutter — so there is nothing left to apply compensation with, and in the old days the question did not arise, because in manual you were the meter.

Then auto-ISO in manual became common, and the question came back. If you are setting the aperture and the shutter speed and letting the camera choose the ISO, the camera *is* making an exposure decision, and it can be wrong about it in exactly the way it is wrong in any other mode.

Modern bodies do allow compensation in manual with auto-ISO, and it works the way you would hope: the aperture and shutter stay exactly where you put them, and the compensation shifts the ISO the camera chooses. It is worth finding out whether your camera does this and how it wants you to ask, because manual with auto-ISO and working compensation is one of the most useful modes on a modern camera — you control the two settings that change the *picture*, and the camera handles the one that only changes the brightness.

5. 5 Metering mode



Module two covered what a reflected-light meter assumes and why snow comes out grey. This chapter is about where the control lives and how to drive it, which is a shorter subject with one genuinely useful trick in it.

Selecting the metering mode is usually a button marked with a small circle inside a rectangle, held while turning a wheel — the idiom from 4.3. On bodies without a dedicated button it lives in the quick menu, the screen you get by pressing Q, Fn or the centre of the pad. On a few cameras it is a small collar around another control, which is a leftover from film bodies.

Wherever it is, the current mode is shown in the finder as an icon, and the icons are reasonably standard across makers: a filled rectangle with dots for evaluative or matrix, a rectangle with a large circle for centre-weighted, and a small dot for spot.

Three modes matter, and module two explained what each one measures. What that chapter did not say is when the control is actually worth reaching for, so let me be blunt about it.

Evaluative, or matrix, is right almost always. It reads the whole frame, divides it into zones, compares the pattern against a reference and makes a judgement. On a modern camera it also knows where your focus point is and where any detected faces are, and weights accordingly. It is very good. If you never touch this control, you will not lose many pictures.

Centre-weighted is a legacy mode with one modern use. It reads the whole frame but weights the middle heavily. Its value today is predictability: it does the same thing every time regardless of what

is in the scene, which matters if you are matching exposures across a series of frames and you do not want the meter re-deciding between shots.

Spot is the one you reach for deliberately. It reads a small circle, a few per cent of the frame, and nothing else. It is the mode for when you know exactly what in the scene should be correctly exposed and you do not care what happens to the rest — a face against a bright window, a lit performer on a dark stage, the moon.

Now the trick, which is the reason this chapter exists.

On many cameras, spot metering does not measure the centre of the frame. It measures **wherever your focus point currently is**, if you turn that setting on.

Think about what that gives you. You move the focus point onto your subject's face. The camera focuses there and meters there, from the same small area, in one action. No recomposing, no exposure lock, no arithmetic. The two decisions that both concern the subject are made from the subject.

The setting is usually filed under the metering or the custom-function menu, with a name along the lines of linking spot metering to the focus point. Not every camera offers it and not every camera offers it in every focus-area mode — commonly it works with a single point and not with a wide or tracking area, which makes sense, because a tracking area does not have a single place to meter from.

If your camera has it, and you use spot metering at all, turn it on.

And when you cannot meter from where you want to focus, there is the other tool, which is exposure lock.

The button is usually marked AE–L, or with an asterisk on Canon bodies, and it sits under your right thumb. Press it and the camera freezes the current exposure reading. Recompose however you like; the exposure does not move. Take the picture; the exposure is the one you locked.

The reason this exists is that framing and metering often want different things. The correct exposure might be read from a small bright area at the edge of the scene, but the picture you want is composed quite differently. Lock, recompose, shoot.

Two practical points about it that the manual will not emphasise.

The first is that you should find out whether your lock button holds while pressed, or toggles on and off. Both behaviours exist, both are usually configurable, and the difference is the difference between a picture and a mistake. A toggle you have forgotten about is exposure compensation's problem all over again: a setting quietly persisting past the moment it was for.

The second is that on many cameras the lock button also locks focus by default, and on many cameras that is not what you want. Which is the natural way into the next chapter, because separating those two functions is one of the most useful things you can do to a camera.

6. 6 Focus modes and areas



Focus has more controls attached to it than any other function on a modern camera, and they divide cleanly into three questions that people habitually merge into one.

When does the camera focus? That is the focus mode.

Where does it look? That is the area mode.

What is it looking for? That is subject detection.

Three separate settings, usually three separate menu items, and the frustration people report with modern autofocus is very often one of these set sensibly and another set for a completely different kind of photograph.

Start with when.

Single, or one-shot. Press the button, the camera focuses, it locks, and it stays locked while you keep holding. Nikon and Sony and Fujifilm write `AF-S`. Canon writes `One Shot AF`, and its own documentation describes it as being for still subjects. Use it for anything that is not moving towards you or away from you.

Continuous, or servo. Press and hold, and the camera keeps focusing for as long as you hold, tracking the subject as the distance changes. Nikon and Sony write `AF-C`; Canon writes `Servo AF` and describes it as being for moving subjects.

Automatic selection. The camera decides which of the two you needed. Nikon writes `AF–A`; Canon calls it `AI Focus AF mode`. It works by watching whether the subject's distance is changing and switching accordingly, and the honest assessment is that it is fine, it is slightly slower than choosing correctly yourself, and it occasionally switches at the worst moment. It is the automatic transmission of autofocus.

Manual is the fourth position, and on most systems it is a switch on the lens as well as a setting in the body, which is a good example of the same function appearing in two places with different precedence. When those two disagree, the lens usually wins.

Now where.

The area modes are the camera's answer to "which part of this frame am I supposed to be focusing on", and they run from a single tiny point to the whole frame. Canon's published list of focusing methods gives a good sense of the range, and I will read them as Canon names them, because they show the logic: `Spot AF`, `1-point AF`, `Expand AF area`, `Zone AF`, `Flexible Zone AF`, `Large Zone AF Vertical`, `Large Zone AF Horizontal`, and `Whole area AF`.

Eight options, and they are one dial with two ends. At one end, a small area you place precisely and the camera obeys exactly. At the other, the whole frame and the camera decides. Everything in between is a trade of your precision against the camera's ability to keep up with something moving.

The shape of that decision is straightforward. **The smaller the area, the more control you have and the more work you are doing.** A single point on a static subject is perfect: you say where, the camera does it. A single point on a bird in flight is a way of missing a bird in flight, because you cannot keep a small box on a moving animal while also holding the camera steady and thinking about composition. That is what the larger areas are for. You give up the exact placement and get back the ability to follow something.

Fujifilm, incidentally, keeps this simpler and names its focus modes with single letters – `S`, `C` and `M` – which tells you something about how much of this complexity is genuinely necessary and how much is competitive feature listing.

And now what – which is the part that has changed most in the last few years, and the part where the four manufacturers most visibly disagree.

Subject detection means the camera is no longer looking for edges and contrast. It is looking for *things*. And each maker has decided for itself what things are worth recognising, which is a fascinating little window into how they see their own customers.

Canon offers a short list of broad categories. People, Animals, Vehicles, and No Priority. Under Animals it puts dogs, cats, birds and horses. Under Vehicles it puts motorsport cars and motorcycles, aircraft and trains. It also offers Upper Body as a detection target, and left or right eye priority on some bodies. And it offers something the others do not – Action Priority, which Canon describes as

recognising specific actions in football, basketball and volleyball. That is a different kind of claim entirely. The rest of the industry is recognising *nouns*; Canon is recognising *verbs*.

Sony divides it more finely. Its Recognition Target setting offers Auto, Human, Animal or Bird, Animal, Bird, Insect, Car or Train, and Airplane. Sony is the only one of the four to name insects as their own category. For animals and birds it also lets you say which part to recognise — Eye, Head and Body, or Eye and Head, or Eye alone — and if you pick the combined Animal or Bird setting, a further control decides which of the two takes priority when both are possible. There are three numbered sensitivities behind that, each running one to five, governing how far the camera will let the subject move, how stubbornly it holds on, and how readily it recognises in the first place.

Nikon states that its Z 9 detects nine subject types: people, dogs, cats, birds, cars, motorbikes, bicycles, trains and airplanes. Nikon is the only one of the four to treat a bicycle as a different thing from a motorbike, which is a small decision that tells you somebody at Nikon thought about cycling photography specifically.

Fujifilm lists animal, bird, automobile, motorcycle and bike combined, airplane and train — and keeps people entirely outside that list, as a separate face and eye setting with options for eye off, automatic, right eye priority and left eye priority.

Four manufacturers, four different ways of carving up the world, no two the same. There is no standard here and there is not going to be one.

But there is one fact about this that matters more than the lists, and it is this. Nikon publishes a page in the Z 9's own manual titled *New AF Subject Detection Options: Birds and Airplanes*. Those two categories were not on the camera when it was sold. They arrived by firmware, afterwards, for free.

That is worth pausing on, because it changes what a camera is. For most of photographic history, the controls on a body were the controls it had, permanently, from the factory to the skip. A modern camera's control set is partly software, and software is updated. The camera you own in three years may recognise things that do not currently have a category, and the way to find out is to actually read the release notes when an update appears, rather than installing it because a dialogue box asked you to.

Two more physical controls belong to focus, and they both concern getting the focus point where you want it.

The joystick is a small nub under your right thumb that moves the focus point around the frame, usually in eight directions, usually with a press to recentre it. It is the best solution anyone has found. It works with your eye at the finder, it works in gloves, and it does not require you to look at anything.

The touch-drag pad is the alternative: the rear screen stays active while your eye is at the viewfinder, and you slide your thumb across it to drag the focus point. It sounds like it should be terrible and is surprisingly good, with one setting that makes all the difference — the option to use only part of the

screen, usually the right-hand half or quarter. Left as the whole screen, your nose moves the focus point, and a camera that refocuses every time you breathe is not a camera anybody keeps using.

Which leaves the one genuine technique in this chapter, and it is worth the five minutes it takes to set up.

Back-button focus.

By default, the shutter release does two jobs. Press it halfway and the camera focuses. Press it fully and the camera takes the picture. One button, two functions, bound together.

Back-button focus separates them. Focus moves to a button on the back of the camera — usually one already marked `AF-ON`, right under your thumb — and the shutter release is left doing nothing but taking pictures.

Why bother? Because focusing and shooting are not actually the same decision, and tying them together forces compromises.

Consider: you focus on a subject, then recompose slightly to improve the framing. With the shutter release doing both jobs, you have to keep it half-pressed throughout, and any full press to take a second frame risks the camera re-focusing on whatever is now in the middle. With back-button focus, you focus once, let go of the back button, and the focus simply stays. Shoot as many frames as you like, recompose freely; nothing refocuses until you ask it to.

Or: your subject is moving, so you want continuous focus, but every so often it passes behind a foreground object. With back-button focus you just lift your thumb for a moment, and the camera holds the last good focus rather than racing off to the obstruction.

Or — and this is the one people find most liberating — you no longer need to switch between single and continuous focus at all. Leave the camera in continuous permanently. Hold the button down and it tracks; tap it and release and it behaves exactly like single-shot. The mode selector becomes something you set once and forget.

Here is how to set it up, and the wording differs between makers but the steps do not.

One. Find the custom-function or button-assignment section of the menu and locate the item that controls what the shutter button does when half-pressed. It will be named something like `Shutter/AF-ON` or `AF activation` or `Half-press shutter`. Set it so the half-press no longer starts autofocus — usually a value like `Off`, or `Metering only`, or `Exposure only`.

Two. Confirm that the `AF-ON` button starts autofocus. On most cameras it already does, and this step is just checking. If your camera has no `AF-ON` button, assign the function to the exposure-lock button instead, which sits in almost the same place.

Three. Set the focus mode to continuous and leave it there.

Four. And this is the step people skip: go and use it for a week without switching back.

That last one is not padding. Back-button focus feels wrong for about three days, because thirty years of muscle memory says the shutter button focuses. On the fourth day it stops feeling like anything, and after that going back to the default feels like the camera is interfering. Almost everyone who abandons it abandons it inside the three days.

If, after a genuine week, you still dislike it, put it back. It is a preference, not a virtue, and photographers whose work I admire use it and photographers whose work I admire do not.

7. 7 Drive modes



The drive mode decides what happens when you press the shutter release all the way down: one picture, several pictures, or a picture in a little while. It is a control most people set once and never revisit, which is a shame, because two of its positions solve problems that people otherwise solve badly.

The name is another fossil, incidentally. On a film camera the drive was the mechanism that physically wound the film on and cocked the shutter, and a motor drive was an accessory you bolted to the bottom of the body to do it for you. There is no film to wind and no motor to do it, and the control is still called the drive.

Single takes one frame per press. It is the default and it is right for most photography. Its virtue is not efficiency; it is that it forces a decision. One press, one picture, one moment you chose.

Continuous takes frames for as long as you hold the button. Most cameras offer at least two speeds – a low and a high – and the distinction matters more than the numbers attached to it.

Continuous low is the useful one and is chronically underused. It gives you a handful of frames a second, which is enough to catch the moment a smile lands or a hand moves, while still producing a number of pictures you will actually be willing to look through afterwards.

Continuous high is for genuine action, and it is a commitment. Everything about the camera changes when you hold that button: the buffer, the card, the battery, and above all the editing

session at the other end. Nothing produces an unedited photo library faster than a high-speed burst used as a substitute for timing.

Which is the honest framing of this control. **Continuous drive is not a way of improving your odds; it is a way of sampling a moment you have already anticipated.** If you press the button when you see the thing happen, you have already missed it and a burst will not rescue you. If you press it just before, because you read what was about to happen, the burst gives you the frame where the expression is right. The skill is the anticipation. The burst only records it.

Then there is the self-timer, which has two quite different uses and everybody knows only one.

The known use is being in your own photograph. Two seconds or ten, usually, sometimes with a count of frames.

The unknown use is that the self-timer is the cheapest vibration control on the camera. Put the camera on a tripod for a long exposure, and the act of pressing the shutter release moves it. The two-second timer removes your hand from the equation entirely. No remote release needed, no cable, nothing to buy. If you are photographing on a tripod and you are not using either a remote or the two-second timer, you are introducing camera shake with your finger and then blaming the tripod.

A remote release does the same job and adds something the timer cannot: it lets you choose the instant. A cable or a wireless trigger or the manufacturer's phone app all work. The phone apps are generally slower and more fragile than anyone would like, but they add a live view on a bigger screen, which for macro and for anything at an awkward angle is worth the irritation.

Two more drive-adjacent controls exist mainly to deal with the camera shaking itself.

Mirror lock-up is a digital SLR control, and module three explained the mechanism it addresses: in an SLR the mirror has to swing up out of the light path before the shutter opens, and that swing is a small violent movement at exactly the wrong moment. Mirror lock-up splits the operation in two. The first press raises the mirror; the second takes the picture, with the mirror already up and the camera already settled. For long lenses and long exposures on an SLR, it is the difference between sharp and nearly sharp. Mirrorless cameras do not have this control, for the obvious reason.

Electronic first curtain solves the same class of problem one layer further in. A mechanical focal-plane shutter opens by moving a curtain across the frame and closes by moving a second one after it, and starting the first curtain moving is itself a small mechanical shock. Electronic first curtain starts the exposure electronically — the sensor simply begins collecting, row by row — and ends it with the mechanical second curtain. No shock at the start, so no shutter shock in the picture.

It is not free, and the cost is worth knowing because it catches people out. At very fast shutter speeds, electronic first curtain can clip the shape of out-of-focus highlights, which shows up as bokeh circles with a flat side. If you see that, you have found the limit, and the fix is to turn it off for that shot.

Fully electronic shutter — both ends electronic, no mechanical movement at all — is the third option, and module three already covered its cost: on most sensors it reads the frame row by row rather than all at once, which skews fast-moving objects and can band under some artificial lights. Stacked sensors read fast enough for this to be largely gone, which is much of what you are paying for in an expensive body.

Finally, the buffer, which is the thing that decides how long continuous drive lasts.

Frames do not go straight to the memory card. They go into fast memory inside the camera, and are written out to the card in the background. The buffer is that fast memory.

While there is room in it, the camera shoots at full speed. When it fills, the camera can only take a new frame as fast as it can clear an old one to the card — so the burst does not stop, it *slows*, to the speed of whatever card you have in.

I am deliberately not going to give you a number of frames here, because that number is true of one camera and false of the next, and it changes with the file format, the card and sometimes the firmware. What is worth holding is the behaviour, and three consequences of it.

First, the format you shoot changes the depth of the buffer. Compressed raw is smaller than uncompressed raw and therefore more frames fit. If you regularly hit the buffer, the cheapest fix is the file format, not a new camera.

Second, the card is the drain rate, and therefore the recovery rate. A faster card does not make the burst start faster, but it empties the buffer sooner, which means shorter waits between bursts and a quicker return to full speed.

Third — and this is the one that catches people out — the camera can be busy after you stop shooting. While the buffer is emptying, some functions are unavailable: playback may refuse, the menu may be sluggish, and on some bodies the card door warns you not to open it. That is not a fault. That is your pictures still being written, and the correct response is to wait.

8. 8 Bracketing



Bracketing means taking the same picture several times with one thing varied, so that you have the right one afterwards rather than having to be right at the time. It is the camera's insurance policy, and like insurance, the interesting question is not how it works but when it is worth paying for.

Set up, it lives with the drive mode on most cameras — often as a position on the same control, sometimes as its own menu. You tell it three things: which quantity to vary, how many frames to take, and how far apart to space them.

Exposure bracketing is the original. Module two explained the stop, and the spacing here is in exactly those stops. Three frames at one stop apart gives you the metered exposure, one a stop darker and one a stop brighter. Five frames at two-thirds of a stop gives you a tighter spread and more of it.

There are two quite different reasons to do it, and they want different settings.

The first is uncertainty, and it is the historical reason. On transparency film there was almost no latitude and no way to check, so you bracketed because you might be wrong. Digital has largely removed this: you can look at the histogram module two taught you to read, and know. Bracketing for uncertainty on a digital camera, with time to review, is a habit left over from a problem that has been solved.

The second is dynamic range, and it is the reason that survives. Some scenes contain more range than the sensor can hold in one frame — a dark interior with a bright window, a landscape against a

sunset. No single exposure holds both ends. So you take several, deliberately, and combine them afterwards. Here you are not hedging; you are collecting, and every frame is needed.

That second use has an important practical consequence: the frames must line up. Use a tripod if you can. If you cannot, hold still and shoot the bracket as a burst so the frames are as close together in time as possible — and know that software alignment is good but is defeated by anything in the scene that moved between frames.

White balance bracketing varies the colour temperature instead of the brightness, producing one frame as metered, one warmer and one cooler.

Here I will be straightforward: if you shoot raw, this control is pointless. White balance in a raw file is a note attached to the data rather than something baked into it, and you can set it to anything you like afterwards with no loss whatever. Module ten covers why. Bracketing a decision you can make later, for free, with more information, is spending three frames to avoid one adjustment.

If you shoot JPEG it is a different matter, because there the white balance *is* baked in, and in mixed lighting — a room with daylight through a window and tungsten lamps inside — there may genuinely be no single right answer. Then bracketing is reasonable.

Focus bracketing, which several makers call focus stacking or focus shift, is the modern one and it is the most useful of the three.

The camera takes a series of frames, moving the focus a small distance further away each time, so that the series between them covers a depth that no single frame could. You then combine them, keeping the sharp part of each.

It exists because of a hard physical limit that module five will cover properly and that module eight will put to work. At close distances, depth of field becomes very shallow — at true macro magnification it can be a millimetre or less — and stopping the aperture down to fix it eventually makes things worse rather than better, because diffraction starts softening the whole frame. Focus bracketing steps around the trade entirely. Shoot at the lens's sharpest aperture and get depth from the stack instead.

You set two things: how many frames, and how big a step between them. Small steps and many frames for close work; larger steps and fewer for a landscape where you just want the near rock and the far mountain both sharp. Most cameras will do the whole run automatically from one press.

It needs a still subject and a still camera, which rules out wind, water and animals. Within those limits it does something no aperture setting can.

So when is bracketing the right answer, and when is it a habit?

It is the right answer when the scene genuinely exceeds what one frame can record — more dynamic range than the sensor holds, more depth than the lens can give at a usable aperture. In those cases the extra frames are not spares; they are parts.

It is a habit when you are bracketing because you have not checked. Three frames because you are not sure is three times the files, three times the editing and no more understanding than you had before. The histogram is right there. Look at it, correct it with the control we covered in 4.4, and take one picture.

There is one honourable exception to that, and it deserves saying because the rule above is a little smug. If the moment will not come back — a ceremony, a first look, something happening once — then bracketing costs you storage and buys you certainty, and storage is cheap. Bracket the irreplaceable. Check the histogram for everything else.

9. 9 The menu tree



Everything so far has been a physical control. What remains is the menu, which is where a camera keeps the several hundred settings that did not earn a button — and where most people's relationship with their camera quietly breaks down.

The first thing worth understanding is that camera menus are not badly designed. They are designed for a different problem than the one you have. The manufacturer has to fit every setting somewhere, in a structure that works for a professional who knows exactly what they are looking for. You are usually the opposite: you know what you want to happen and not what it is called.

The shape, though, is remarkably consistent across makers once you know to look for it. Almost every camera's menu divides into five groups, in roughly this order.

Shooting settings. Everything that affects the picture you are about to take: file format and quality, white balance, picture styles or film simulations, in-camera corrections, long-exposure noise reduction.

Autofocus settings. Everything from chapter 4.6, plus the fine tuning: how quickly tracking gives up on a lost subject, whether the camera may take the picture when focus is not confirmed, illumination for the focus assist lamp.

Playback settings. What happens after the picture exists: review duration, what the information screens show, rotation, protection, rating, and the deletion functions.

Setup. The camera as an object rather than as a photographic instrument: date and time, language, card formatting and card-slot behaviour, power saving, sensor cleaning, firmware version, and the wireless functions.

Custom functions. The interesting one, and the one this chapter's next section is about: every button assignment, every dial direction, and the behavioural details that turn a camera into your camera.

Some makers add a sixth group for video, and on bodies where video is a parallel camera, that group repeats much of the shooting and autofocus sections in its own right.

Once you can see those five groups, an unfamiliar menu becomes navigable. You may not know what a setting is called, but you can nearly always work out which of the five it lives in, and that reduces the search from hundreds of items to dozens.

Now — the settings worth changing on day one. These are the ones that affect what you can do later, that are annoying to discover after the fact, and that the factory default gets wrong for someone learning.

Set the file format to raw, or to raw plus JPEG. Module ten explains what raw contains and exactly what the JPEG engine throws away. The short version is that a JPEG is a decision made permanently, by the camera, at the moment of capture. If you might ever want to change your mind, shoot raw. The cards are large enough now that the old objection has gone.

Set the colour space to Adobe RGB, or leave it on sRGB deliberately. Either is defensible and module ten covers the difference. What is not defensible is not knowing which it is on.

Turn off long-exposure noise reduction unless you are using it. When it is on, an exposure of thirty seconds is followed by the camera taking a second, dark exposure of the same length to subtract. That is thirty seconds where you cannot shoot, on every frame, and at night it halves your working rate.

Set the auto-ISO ceiling and the minimum shutter speed yourself. Auto-ISO is genuinely excellent, and it is excellent only when it knows your limits. Set the highest ISO you are content with, and the slowest shutter speed you trust yourself to hold — and if the camera offers to derive that from the focal length, which many do, take it.

Turn on the highlight warning and the level. The blinking overexposure display and the electronic horizon are both off by default on most cameras, and both are useful on almost every frame. 4.11 comes back to them.

Set the card behaviour if you have two slots. Overflow, where the second card takes over when the first is full, or backup, where every frame is written to both. Backup is the one that saves you, and it costs you nothing but capacity.

Set the file naming and, if you can, the copyright field. Your name and contact details are written into every frame's metadata. It takes two minutes once.

Format the card in the camera, not on a computer. Every time, before a shoot. Formatting in the camera builds the file structure the camera expects; copying files off and deleting them on a computer leaves the structure in a state the camera did not create.

That is eight things, and they take about twenty minutes together. Everything else can wait until you have a specific reason.

Finally, and this is the step almost nobody takes: once your camera is set up the way you want, **save the configuration**.

Most bodies will write their entire settings state to the memory card as a single small file, under a menu item called something like `Save/load settings` or `Camera settings save/load`. That file can be loaded back.

Three reasons it is worth doing. If you ever reset the camera, or send it for repair and it comes back at factory defaults, you are twenty minutes of menu-crawling away from where you were — or one file load. If you own two bodies of the same model, you can make the second one behave exactly like the first, which matters enormously when you are switching between them under pressure. And if you are about to experiment with a large change to the custom functions, saving first makes it reversible.

Keep the file somewhere other than the card, since you are going to format the card.

10. 10 Custom buttons and My Menu



Two features exist on almost every modern camera specifically to fix the problem the last chapter described — that the thing you need is buried and you do not know what it is called. Both are almost universally ignored, and both take under ten minutes.

The first is button customisation. Most cameras let you reassign a substantial number of their buttons: the front buttons, the exposure-lock button, the movie-record button when you are shooting stills, the centre of the four-way pad, often the lens's own function button, and on some bodies the direction of the wheels and even what a long press does as distinct from a short one.

The question is which functions deserve a button, and there is a test that answers it.

A function earns a button if you need it with the camera at your eye.

That is the whole rule. If you can take the camera down, think, and press three things, the menu is fine — that is what the menu is for. But if the thing needs changing while you are looking at the subject, in the second before it stops being there, then it needs to be under a finger.

Run your own photography through that test and the list comes out short. For most people it is four or five functions.

Magnify, to check focus at a hundred per cent without leaving the viewfinder. If your camera has a button for this already, learn where it is; if not, assign one.

Focus-area mode, if you change between a single point and a wider area often — which you do if you photograph both static and moving subjects in the same outing.

Subject detection, for the same reason, if you switch between people and animals or between a subject and a vehicle.

ISO, if it does not already have a dedicated button. It usually does.

A one-press reset to a known state, if your camera offers something like it. Some bodies have a function that temporarily forces a set of settings while held — hold the button and the camera becomes fast shutter, continuous focus, continuous drive; release and everything returns. It is a custom mode you do not have to turn a dial to reach, and on the cameras that have it, it is the best button on the body.

And one piece of advice that is worth more than any specific assignment: **do not assign everything.** A camera with fourteen customised buttons is a camera where you cannot remember what any of them do. Assign four or five, leave the rest at their defaults, and you will actually use them.

The second feature is My Menu, which most makers offer under that name or something close to it — a page you build yourself, holding only the menu items you personally use, in the order you want them.

It is the answer to the settings that fail the button test but that you still need regularly. Formatting the card. The self-timer. Long-exposure noise reduction. Bracketing. The interval timer. Sensor cleaning. Things you reach for weekly rather than hourly, that live six levels deep in a menu you otherwise never visit.

Build it to fit one screen. That is the whole discipline. A My Menu that scrolls is a menu, and you have simply made a second one. Six or seven items that all appear at once, so that finding one is looking rather than searching.

And on most cameras there is a setting that makes the whole thing work properly: the option to have the menu button open My Menu directly, rather than opening wherever you last were. Turn it on. It means the first thing you see, every time, is the page you built for yourself.

Which brings us to the reason any of this matters, and it is not efficiency.

There is a real feature of a camera that never appears on a specification sheet, and it is whether you can operate it without thinking about it.

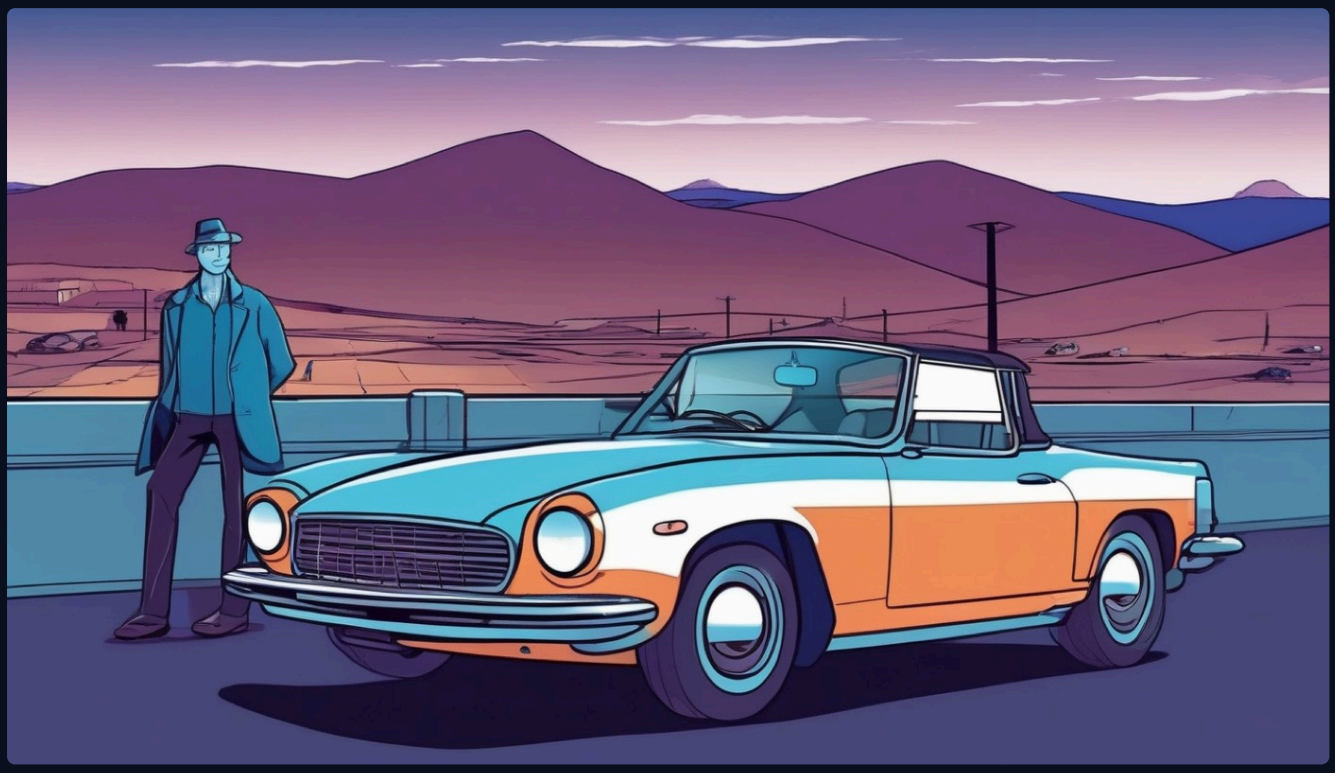
Photography is mostly attention. The picture exists for a moment; what you do in that moment is decided by where your attention is. If part of it is spent working out which button changes the focus area, that part is not on the light, or the expression, or the edge of the frame. The controls are competing with the photograph for the same limited resource.

The cure is repetition, and repetition needs consistency. A camera whose controls you have arranged deliberately, and then left alone, becomes something you operate the way you operate the pedals in a car — which is to say not consciously at all, until something changes.

Which is also the argument against constantly re-customising. Every reassignment resets the clock on the habit. Set it up thoughtfully, once, live with it for a few months, and change something only when a genuine friction shows up repeatedly. A camera you have fiddled with every fortnight is a camera you have never learned.

And it is the strongest argument for staying within one system, far stronger than any of the arguments about lenses and mounts that people usually give. Two bodies from the same maker put the controls in similar places and call things by the same names. Switching between two different makers means two sets of names for the same functions, two dial directions, two menu structures and two sets of muscle memory quietly competing. That is a real cost, it is paid in attention at the worst moments, and it is almost never mentioned when cameras are compared.

11. 11 The displays



Everything covered so far changes what the camera does. The displays are how the camera tells you what it is doing, and they are worth a chapter because the default configuration on almost every camera shows you a lot of information and not necessarily the information that would change your next decision.

There are up to three surfaces, and they have different jobs.

The top-plate screen, on larger bodies, is a small monochrome panel showing the current settings. Its particular virtue is that it works with the camera switched off or asleep, and it is readable in bright sunlight where the rear screen washes out. It is a status display: what is the camera currently set to. It is the fastest way to catch the exposure compensation you left dialled in yesterday.

The rear screen is the flexible one. It shows a live view, or the full settings, or a quick-control panel, or the playback, depending on what you press. On an articulated body it also lets you shoot from positions your eye cannot reach, which is worth more to most photography than it is usually given credit for.

The viewfinder overlay is the one that matters most while you are actually taking pictures, because it is the only one you are looking at when the camera is at your face. An optical finder overlays a modest amount of information at the edges. An electronic finder can overlay anything at all, and the temptation is to overlay everything.

Which brings us to the three things worth turning on, none of which are on by default on most cameras.

The highlight warning — the blinkies. Areas that have clipped to pure white blink black in the playback and, on some cameras, in live view. Module two explained why this matters more than the shadow end: highlight clipping is unrecoverable, because where the sensor has saturated there is no information left to bring back, whereas the shadows usually have something in them. A flashing patch tells you instantly, without reading a histogram, that you have lost something permanently. Turn it on.

The live histogram. The histogram module two taught you to read, overlaid on the finder before you take the picture rather than after. This is a genuine advantage of an electronic viewfinder and it is switched off by default on most bodies. With it on, the exposure decision moves from *take, review, correct, retake* to simply looking at the scale and dialling the compensation before the first frame.

Two honest caveats. The live histogram is derived from the preview image, so it reflects the JPEG rendering rather than the raw data, exactly as module two said — the raw file has a little more headroom than the histogram suggests. And it takes up room. That is a real trade and you may decide against it; decide against it knowingly.

The electronic level. A two-axis indicator showing whether the camera is level and whether it is tilted forward or back. It is switched off by default and it is the single cheapest improvement available to most landscape and architectural photography. A horizon a degree and a half out is instantly visible to a viewer and awkward to fix afterwards, because straightening crops the frame and softens it very slightly. Getting it right in the camera costs nothing.

Beyond those three, the general principle for setting up a display is one of subtraction rather than addition.

Most cameras cycle through several display layouts each time you press the display button, and most let you decide which layouts are in that cycle. The useful arrangement is a short cycle of two or three, each of which is genuinely different, rather than a long cycle of six that all look alike.

I would have three. **A clean one** — the image and almost nothing else, for when composition is the whole problem and any overlay is in the way. **A working one** — the exposure settings, the level and the histogram, which is where you spend most of your time. And **a detailed one**, for the occasions when you need everything.

Then turn off whatever is displayed that you never act on. A grid you never use, a battery percentage you glance at once an hour, a file counter. Each item costs a little of the frame and a little of your attention, and a display that shows only things you would actually respond to is a display you can read at a glance rather than one you have to search.

The test for any element on the finder display is the same test as for a spec-sheet number in module three, and the same test as for a button in 4.10. **What decision does this change?** If seeing it would

make you do something differently, keep it. If you have never once acted on it, it is decoration that happens to be made of data.

And that, finally, is what this whole module has been about.

We started with a diagram of a camera nobody makes, and went round it: the mode dial that decides who is in charge, the wheels that carry almost every instruction you will ever give, the compensation control that is the most useful and most forgotten setting on the body, the metering that decides what the camera is looking at, the focus controls that split into when, where and what, the drive that decides how many, the bracketing that buys certainty when certainty is worth buying, the menu and its five predictable groups, the handful of buttons worth making your own, and the displays that tell you what all of it is currently doing.

Forty-odd controls. Perhaps eight of them you will touch every time you photograph anything.

That is not a criticism of the other thirty-two. They exist because somebody needed them, and one day you will be the somebody. But a camera is not a thing to be mastered in the sense of knowing every function. It is a thing to be made invisible, so that the part of you that is looking at the light is not also the part that is hunting for a menu item.

The controls are not the photography. They are what you move out of the way, so that the photography can happen.

Module five takes the front of the camera off and looks at the lens.

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Not regulated financial advice.