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Photography's Greatest Brands



Hasselblad's X2D II 100C
Is Both Cool And Hot



Why An EVF Makes The
Leica M EV1 A Better
Camera For Today



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Hyper Hybrid
The Panasonic
Lumix S1 II Does It All!

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It ticks a lot of boxes, but is Sony's
RX100 VI the perfect compact camera
for enthusiasts? It's certainly the only
one that gets close at the moment.

IN YOUR DREAMS

I've written about the revival of the compact camera on this page a few times recently because, firstly, it's basically come out of nowhere which keeps us journalists intrigued. Secondly, it's no flash in the pan because the numbers don't lie, and the global sales figures are growing quite significantly month by month. And thirdly, compact cameras are great, especially the digital models which have extensive capabilities, but can still be pocket-sized... well, maybe jacket pocket size. It's also great that cameras – real ones – are cool again and, in some quarters, a fashion accessory you simply can't be without.

So, as they say, all good. Well, no not really. It's likely that, like me, you have a decent mirrorless camera or DSLR kit which is what you use the majority of the time, but there are a few times when you really need something smaller and, more importantly, a bit more discreet. But you still want good image quality, flexibility and affordability... because you've already spent enough on your main gear. I'm thinking here mostly of something to carry when travelling, but also to use in any situation where there are lots of people and around and you really don't want to attract a lot of attention. So, a compact camera is the answer, but the question is... is there one that ticks these three main boxes and that you can buy new now? The image quality requirement means a big sensor – Micro Four Thirds would be a minimum size for me – and versatility equals a zoom lens, preferably in the 24-70mm equivalent range. Affordability means I don't want to spend the sort of money needed to buy a Sony RX1R III or a Fujifilm GFX100RF. Both are brilliant, but neither have a zoom – although, of course, you can use crops to crib some additional focal lengths without sacrificing too much image quality. It's the same with the Leica Q3, but it's pricey too and, let's be frank, not really a compact. How about the Leica D-Lux 8? Yep, it looks the business, but it's a Panasonic Lumix LX100 II under the skin and so, despite the Leica fairy dust, I'd want to pay at least a grand less.

Under the flexibility criterion, I include an EVF – for me, at least, an essential ingredient – which knocks out the Ricoh GR IV along with the Canons and Sonys that are currently popular with people who've previously been using a smartphone to take pictures and so don't miss a viewfinder. The little Kodak- and Ilford-badged models that are also selling like the proverbial hot cakes are also out of the picture for obvious reasons.

So where does this elimination process leave us? Well, Sony's RX100 VI gets pretty close, if you don't mind the smaller 1.0-type sensor and the slightly awkward pop-up viewfinder... but at least you get a viewfinder and it works OK when you get used to it. And it's well priced too, in terms of what you'd likely want to pay for a 'second string' camera. Another option isn't a compact camera as such, but is a compact mirrorless camera in the petite shape of the OM System/Olympus OM-D E-M10 IV, especially if you match it with the 'pancake' 14-42mm power zoom (which is equivalent to 28-84mm). This package is actually cheaper than the Sony, but with a bigger sensor (with the same 20 MP res) and a more comfortable EVF. However, it's a bigger camera overall too, but is still small enough to meet the keep-it-low-key requirement. And, of course, the lens can stay 'fixed' if you want, but then the Sony's small sensor allows it to pack the equivalent of 24-200mm... which would mean a much bigger (and more expensive) lens on the M10 IV.

Back to square one. I know that demand for the camera I'm specifying will likely be smallish, but I don't think I'm alone in wishing for a fixed-zoom compact – and it doesn't have to ultra-small either – with a M43 or 'APS-C' size sensor, an EVF and an enthusiast-level feature set.

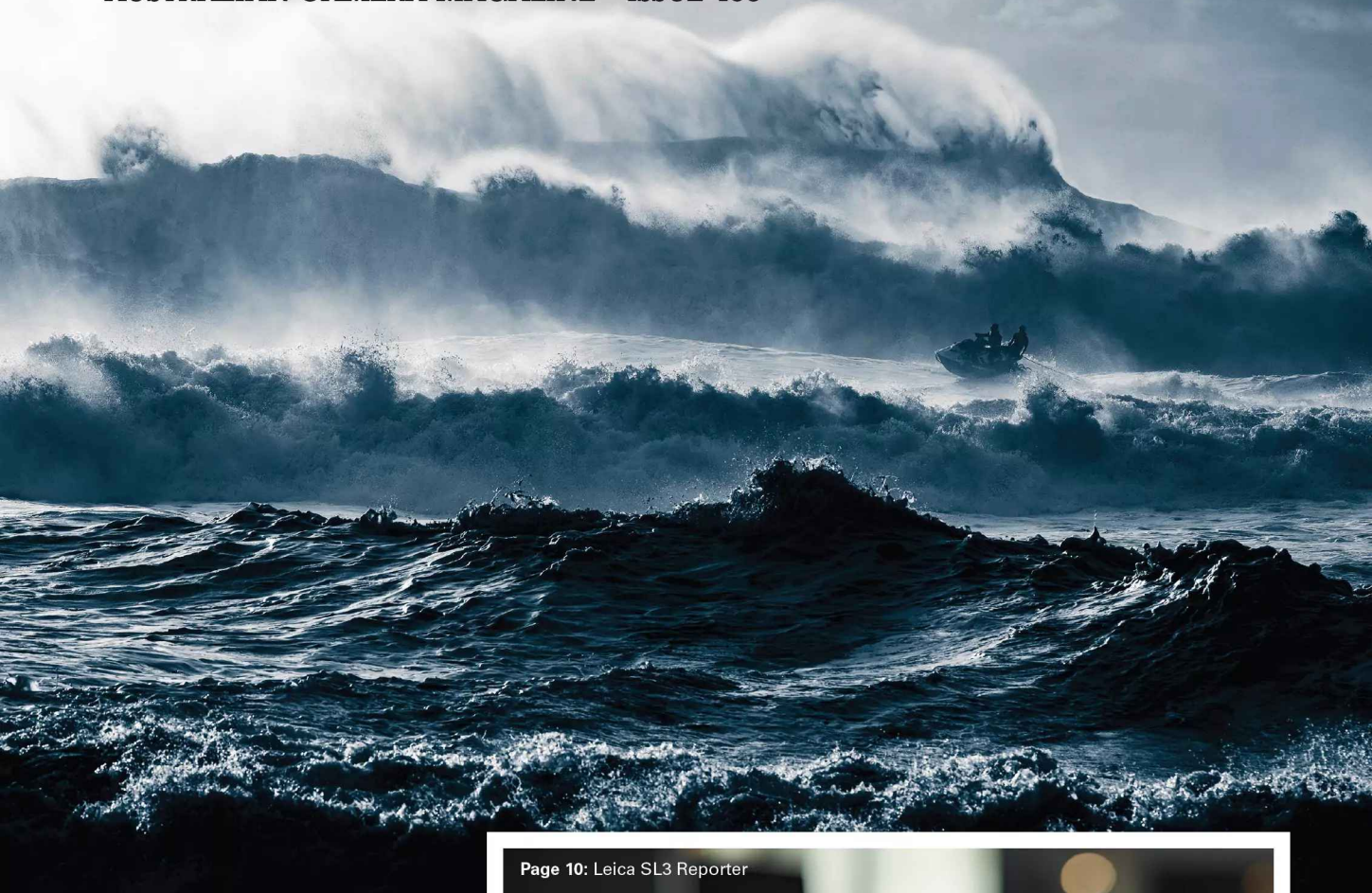
All those in favour say 'aye'.

Paul Burrows

Paul Burrows, Editor.

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Leica has had a busy few months, first with the controversial M EV1 (on test in this issue) then the tougher-stuff SL3 Reporter and also the Q3 Monochrom for B&W fans. Sony's fifth-generation A7 arrives with a new 'partially-stacked' sensor for a lot more speed and smarter autofocus. Fujifilm's popular X-T30 entry-level X mount body



▲ Page 8: Fujinon XC 13-33mm

Page 10: Leica SL3 Reporter



also gets a big upgrade with the Mark III version offering many new goodies including 6.2K 'open gate' video and an expanded set of AI-based subject recognition modes. Incidentally, both Sony and Fujifilm have also updated their kit lens offerings with, respectively, the FE 28-70mm f/3.5-5.6 OSS II and the Fujinon XC 13-33mm f/3.5-6.3 OIS

zooms. From Canon comes the EOS R6 Mark III which also introduces a 'partially-stacked' sensor and, consequently, can shoot at up to 40 fps even with 14-bit RAW files. And Canon certainly beats the budget with its new RF 45mm f/1.2 STM super-fast prime lens which, believe it or not, is priced at just \$699.

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Our Showcase sponsor, Sigma lenses – via Australian distributor C.R. Kennedy Photo Imaging – is providing the competition's grand prize of a lens – your choice of model and mount – valued at up to \$1000. The 2025 Showcase has now closed with the Rounds 5 and 6 winners in this issue, but don't worry, the 2026 competition is now up and running with six upcoming rounds just waiting for some great photography. Submit your entries online at camera@futurenet.com

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If Santa somehow didn't get the message about your new camera request, it's time to go out and buy it for yourself. Our buyer's checklists for mirrorless cameras, DSLRs and the digital RF models allow you to directly compare all the key specifications and features at the main price points.

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there's much more, and it's very well priced compared to the previous model. Form an orderly queue now.

44 ON TRIAL PANASONIC LUMIX S1 II

Panasonic's Mark II upgrades of first the S1R and now the S1 have produced arguably the most powerful hybrid full frame mirrorless cameras on the market at the moment. The S1 II brings a 'partially-stacked' sensor to the party so it can shoot at 70 fps, still with continuous AF/AE adjustment and full-size RAWs, JPEGs or HEIFs. If you want the full-fat 14-bit RAW files, there's still a blisteringly fast 60 fps on tap.

56 ON TRIAL – LEICA M EV1

Replacing the Leica M's traditional rangefinder/viewfinder with an EVF was always going to cause a stir, but the proof is in the pudding. The M EV1 is a much more convenient and efficient camera to use, but has lost none of the traditional M characteristics. If you've always promised yourself a Leica M, the EV1 is the one to have.



OUR FRONT COVER:

Featured on this issue's front cover are Hasselblad's brilliant X2D II 100C and Leica's controversial (but also brilliant) M EV1. Our comprehensive test reports start on pages 32 and 56 respectively. The inset photograph is by Yuka Takahashi (from Japan) who placed third in the Young Photographer category, Ocean Photographer of the Year 2025 competition. For all the winner and finalists turn to page 20.



LEICA DELETES THE 'M' WITH FIRST EVF MODEL

SO YOU PROBABLY all know that the 'M' in Leica's legendary line of rangefinder cameras stands for *messsucher* which is the German word for a rangefinder-in-a-viewfinder arrangement. So now that there's an M model with an electronic viewfinder – and therefore obviously no rangefinder – is it still really an M? Discuss.

Leica was bound to cause a stir with the M EV1, but on the other hand, it was always going to happen and, for the purists, the traditional optical viewfinder/rangefinder models will continue. As has often been observed about the Q series fixed-lens cameras, there are plenty of plusses associated with an EVF and the M EV1 is already finding plenty of supporters. It's another step in Leica's delicate balancing of the M camera's traditional elements with the need to be appealing – and relevant – to new users in the modern digital era.

Aside from the new EVF, the M EV1 is pretty much the same as a standard M11 model, but with the 'Content Credentials' authenticity security from the M11-P and M11-D. Installing the electronic viewfinder has resulted in a few changes externally, most notably the disappearance of the optical finder's window on the front panel. Of course, there's still an eyepiece at the back. Accommodating the EVF module has also meant removing the manual ISO dial from the top panel so sensitivity adjustments are via the new camera's 'Quick Menu' monitor-based control screen as per the Q3 models. However, the lever on the front panel which was previously used for previewing the brightline picture frame pairs has been retained and now sets the focus assists – a focus peaking display or a magnified image (5x or 10x), or the 'digital zoom' settings (which are 1.3x or 1.8x crops on the sensor). It's now renamed the 'Fn lever'. Focusing, of course, is still manual, but a key aspect of the EVF is that it will show the full image frame with any lens, eliminating the need for an external viewfinder for the 21mm and 24mm focal lengths which are wider than the OVF's angle-of-view while also making it much easier to focus the 90mm telephoto lenses. Plus there's a preview of exposures and depth-of-field along with other adjustments such as the 'Film Style' presets.

The EVF itself is an OLED panel with a resolution of 5.76 megadots, a magnification of 0.76x and refresh rate of 60 fps so it's likely the same unit that's used in the Q3 models. The eyepiece has a strength adjustment of -4.0 to +2.0 dioptres.

The rest of the camera is as per the standard M11 model – 60.3 megapixels (effective) BSI-type CMOS with the 'Triple Resolution Technology', 'Maestro III' processor, 64 GB of internal memory and an SD UHS-II memory card slot, either aperture-priority or manual exposure control modes, and continuous shooting at up to 4.5 fps (with a 3.0 GB buffer memory). The durable construction is also unchanged, comprising a diecast aluminium chassis with aluminium top and bottom covers and leatherette inserts (although these have the same patterning as the Q3 models to differentiate from the RF M models).

The Leica M EV1 is priced at \$13,990 body only and is available to buy now. For more information visit <https://au.leica-camera.com> To purchase online go to <https://leica-store.com.au> Our full test of the M EV1 is in this issue.

A VIEW TO THE FUTURE

WOULDN'T YOU LOVE to have been a fly on the wall at the Leica product planning meeting when somebody piped up, "You know what, I think we should be build an M body with an electronic viewfinder". Clearly, he – or she – wasn't immediately shown the door because we now have the M EV1 along with the many opinions about whether it's essentially A Very Good Thing or the end of the world as we know it.

When a brand has been built on basically one design configuration – the 35mm rangefinder camera – that legacy can be both a blessing and a curse. While today's Leica has diversified into a number of camera systems and even beyond – luxury watches and high-end video projectors, for example – the classic rangefinder camera is still synonymous with the immediately recognisable red dot badge. The digital era Ms can trace their lineage directly back to 1954 and the M3 which makes this line one of the longest in the history, if not the longest (given Rolleiflex TLR production was a bit stop-and-start towards the end). With the possible exception of Hasselblad, no other camera-maker has such an iconic design inextricably tied up with its past, present and, more significantly, future. Not everybody who buys a Leica buys an M, but they do buy a Leica because of what the M has made it. And the history is a big part of this – not just of the cameras, but also the many famous photographers who used them. These serve as enduring endorsements.

To Leica's credit, it's been able to tread the fine line between preserving the essential elements of an M camera and maintaining relevancy, although to be honest, from the M3 to the M7 any advances were comparatively small. The transition to digital capture was a much greater challenge and Leica had to have a few goes at it before arriving at a happier marriage of tradition and technology. Through it all, two things have been sacrosanct – the build quality with its inherent reliability and the rangefinder focusing. Manual control remains at the heart of an M camera – with the simplicity also contributing to reliability – and this is still the case with the M EV1, but there's a good argument that the focusing assists provided by an EVF are more helpful than a double-image rangefinder. Here, then, new tech is helping the old school way of doing things to stay relevant. Just as Leica still makes a 35mm M camera, it's still going to make RF-equipped digital models and the thinking back at HQ is that the M EV1 is more about attracting new devotees to the system than anything. My thinking is that Leica could now go all the way with, essentially, an M mount version of something similar to the current Q3. It would need to accommodate a focal plane shutter – having only a sensor shutter might be going just a bit too far – but the automation would be much better implemented than has been achieved so far even with the M11 models. The focusing would, of course, still be manual. After all, the M system is as much about the superlative lenses as it is about the camera bodies. What's more, with so many M lenses being used on mirrorless cameras via a mount adapter, it would make sense if Leica offered an M-style mirrorless body to snare some of those users. This would be a very different camera to an SL, but when you think about it, not so very different from a digital M in body if not in spirit. You'd definitely badge it 'M-something' because it's still using the M mount. It'd be a unique camera in this day and age, but then from when SLRs became the 35mm camera of choice for both amateurs and pros, the Leica RF cameras have been sitting on the banks of the mainstream... and are even more removed in the digital era. Yet the appeal has, if anything, increased and, as the M EV1 is already proving, would continue with a camera that's still an M at heart, but also delivers all the benefits of contemporary camera tech (autofocusing aside, of course). It will just be the next – logical – chapter in the story of world's most successful camera line. – **Paul Burrows, Editor.**

5TH GEN SONY A7 IS FASTER AND SMARTER

IMMEDIATELY LINING UP against Canon's newly-minted EOS R6 Mark III (see separate news item), the fifth-generation iteration of Sony's original A7 full frame mirrorless camera has a new sensor and new processor combo which significantly boost both its speed and its capabilities.

Like the R6III, the A7 V's CMOS sensor features a 'partially stacked' architecture to give a faster read-out speed, but retains the same effective resolution of 33 megapixels as the previous IV model. Both the R6III and Nikon's Z6III have 24 megapixels (effective) partially-stacked sensors.

The Sony's new imager is matched with a faster and more powerful 'Bionz XR2' processor which incorporates an AI processing unit to drive a variety of imaging functions, including 'Real-Time Recognition AF'. Sony says its partially-stacked 'Exmor RS' sensor has a read-out speed that's 4.5 times faster than the conventional version used in the A7 IV. Consequently, the new camera has a top shooting speed of 30 fps which comes black-out-free with continuous AF/AE adjustment between the frames (which operates at 60 fps) and, what's more, is also available with 14-bit RAW capture. 'Pre-Capture' buffering – as per the A1 II – has been added too, with adjustable durations from 0.03 seconds (i.e. one frame at 30 fps) up to 1.0 seconds (30 frames). There is a choice of slower speeds at 5.0, 10, 15 and 20 fps.

The camera has dual memory card slots; one dedicated to SD devices and with UHS-II speed support and the second compatible with both the SD and CFexpress Type A formats.

The new sensor's native sensitivity range is equivalent to ISO 100 to 51,000

with extensions on either side to ISO 50 and 204,800. The five-axis in-body image stabilisation – which uses sensor shifting – has been improved to give up to 7.5 stops of correction for camera shake at the centre of the frame, up from 5.5 stops previously.

The AI-driven subject recognition – 'Real-Time Recognition AF' in Sony speak – expands to include cars, aircraft, trains and insects while there's improvements to the detection of faces and eyes with humans, animals and birds. The recognition of humans also includes 'pose estimation' using the position of the head, torso and limbs. As also introduced with the A1 II, there's an Auto subject recognition mode which covers all the detectable subjects, but can also be configured to include only the subjects that you specifically want. More generally, the A7 V's hybrid AF system employs 759 phase-detection points giving 94 percent frame coverage, while the low-light sensitivity extends down to -4.0 EV.

Sony is also bringing AI processing to

bear on the auto white balance control which uses intelligent scene analysis to better determine the prevailing light source to give more accurate colour reproduction.

A physical focal plane shutter is retained which allows for continuous shooting at 10 fps and has a speed range of 30-1/8000 second with flash sync up to 1/250 second (or up to 1/320 second in the camera's 'APS-C' crop mode). The sensor shutter has a top speed of 1/16,000 second.

The A7 V's EVF is unchanged from the previous model so it's a 1.3 centimetres OLED panel with a resolution of 3.68 megadots and a magnification of 0.78x. It's switchable between 60 fps and 120 fps refresh rates. The monitor upgrades to an 8.0 cm LCD TFT touch screen panel with a resolution of 2.1 megadots and four-axis angle adjustments. The A7 V now has two USB Type C ports – one for data transfer (at 10 Gbps) and one primarily for power (USB-PD), but also with USB 2.0 speeds for data.

On the video side, the A7 V records 4K UHD (3840x2160 pixels) using the full width of the sensor (so downsampled from 7K) and at up to 50/60 fps. Up to 100/120 fps recording in 4K is available with an 'APS-C' / Super 35 crop. However, it's not possible to record at the 7K res and there are no RAW video options, either internally or externally. With the XAVC S-I codec (an H.264 equivalent), there's 10-bit 4:2:2 colour and ALL-Intra compression which gives a bit rate of 600 Mbps and, naturally, requires the speed of a CFexpress Type A memory card.

There's an AI-driven 'Auto Framing' video function which automatically crops to always keep the detected subject at the same size in the frame. Additionally, a 'Framing Stabiliser' feature automatically maintains a subject's location within the frame when you're shooting while on the move.

The Sony Alpha A7 V is priced at \$4699 for the body only and will be available locally in late December. **For more information visit www.sony.com.au**





LONG-LIVED SONY FE STANDARD ZOOM UPDATED FOR FASTER AF

A POPULAR OPTION as a kit lens for buyers of Sony Alpha full frame mirrorless camera bodies, the FE 28-70mm f/3.5-5.6 OSS standard zoom has been around since the system was launched in 2013. The Mark II version arrives with the new A7V body and the main upgrade is to its autofocus drive so it can operate at up to 120 fps and keep up with Sony's fastest Alpha series bodies. It can also support autofocus while zooming.

The FE 28-70mm f/3.5-5.6 OSS II maintains the previous model's key attributes of a compact size, light weight and affordability. It weighs in at just 293 grams and is 83 millimetres in length. The screwthread filter fitting is 55 millimetres. The barrel is weather-sealed and a fluorine coating is used on the front element to help better repel moisture and grease.

On the inside, the optical construction employs nine elements in eight groups which includes three aspherical types and one made from glass with extra-low dispersion (ED) characteristics to help minimise chromatic aberrations. Focusing is performed internally via a linear-type motor and the minimum focusing distance is 30 centimetres at 28mm and 45 centimetres at 70mm. The new model supports the 'Breathing Compensation' processing that's available in the later Alpha bodies to eliminate any changes in the image size as the focusing distance changes. This is an important consideration for video shooters. Also with videography in mind, the zoom's optical image stabilisation has been upgraded to work alongside Sony's in-body stabilisation to support the 'Active Mode' for smoother handheld video shooting.

The Sony FE 28-70mm f/3.5-5.6 OSS II is priced at \$699 and will be available from mid-January 2026. **For more information visit www.sony.com.au**



LEICA SL3 REPORTER EDITION IS TOUGHER STUFF

THE LATEST LEICA camera to get the Reporter treatment is the SL3 60 megapixels mirrorless body which is finished in a dark green colour with its 'Leica' badging blacked-in and the famous red dot logo deleted. The main control dials are also finished in black.

It looks like it means business and is does as the Reporter edition's finish is highly scratch resistant and it also has an aramid fabric covering to further toughen up its exterior. As with the standard model, the weather protection measures are to the exacting IP54 standard which is the highest in the mirrorless camera world (the OM System models, including the OM-5 Mark II, are the next best at IP53). The body is also insulated to allow for operation in subzero temperatures down to -10 degrees Celsius. The SL3 Reporter has an all-metal body construction which comprises aluminium top and bottom covers – machined not pressed – over a magnesium alloy chassis and the dials are also milled from solid billets of metal alloy.

On the inside, there's no change from the standard SL3 so you get a 60.3 megapixels full frame BSI-type sensor paired with Leica's latest-generation 'Maestro IV' processor for 15 fps continuous shooting and 8K video at 25/30 fps, 4K at 50/60 fps. There's also Leica's "Triple Resolution Technology" which allows you to shoot at lower resolutions – either 36 MP or 18 MP – but without any cropping so there's no increase in the effective focal length of the attached lens. Instead, the camera groups sets of pixels together with subsequent demosaicing and resizing. This also results in an increase in the dynamic range – Leica claims a whole stop – and a reduction in noise that's equivalent to two stops.

Other models that have previously been issued as 'stealthy' Reporter editions include the SL2-S, the Q2 and the M10-P. It's also worth noting here that the Reporter green is a different shade to Leica's famous Safari olive green which is currently available on a special edition M11-P, but has been used on many models since the 1970s (starting with the R3 35mm SLR, and M3 and M4 35mm rangefinder cameras).

The Leica SL3 Reporter is priced at \$12,890 body only (\$700 more than the standard SL3 body) and available in Australia now. **For more information visit <https://au.leica-camera.com>** To purchase online go to <https://leica-store.com.au>



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FUJIFILM'S COMPACT X-T30 LIVES ON WITH MARK III UPGRADES

IF YOU DON'T like the X-M5 because it doesn't have a viewfinder and the X-T50 is more camera than you need (or can afford), the X-T30 III could be your 'just right' Fujifilm X mount mirrorless camera. It retains the compact and lightweight body of the previous model – along with the retro SLR-like styling – and also the same 26.1 megapixels 'CMOS X-Trans 4' sensor, but this is now mated with the later-generation quad-core 'X Processor 5' engine. Consequently, you now get the latest iteration of Fujifilm's subject-detection hybrid autofocus, the full set of 20 current 'Film Simulation' profiles, a maximum continuous shooting speed of 20 fps (or 30 fps with a 1.25x crop) and up to 6.2K res 'open gate' video with 10-bit colour.

Like the X-M5 and the X-T50, the X-T30 III has a dedicated selector dial for the main 'Film Simulation' profiles which also has three positions for assigning to custom 'recipes'. The 'baked in' profiles include the more recent Nostalgic Neg and Reala Ace settings. The AI-based subject recognition modes for autofocus are for animals, birds, cars, motorcycles, bicycles, airplanes, trains, insects and drones, along with face- and eye-detection for humans. In the camera's fully automatic shooting mode, automatic subject recognition is available.

Pre-Shot buffering is now available with continuous shooting when using the sensor shutter. The X-T30 III's physical focal plane shutter allows continuous shooting at up to 8.0 fps. There's a single memory card slot for SD devices – still at only UHS-I speed though – and the camera can capture 10-bit HEIF files as well as 8-bit JPEGs and 14-bit RAWs.

Video recording benefits significantly from the faster processor so the X-T30 III

can record, as just noted, there's 6.2K 'open gate' recording at 25/30 fps with 10-bit 4:2:2 colour and LongGOP compression. This uses the entire sensor area to give more flexibility with cropping, including the vertical 9:16 format for mobile devices. Alternatively, there's 17:9 aspect 4K DCI or 16:9 UHD at up to 50/60 fps and 2K DCI or UHD at up to 200/240 fps. Bit rates are up to 200 Mbps. As with the X-M5, there's a 'Short Movie' mode for shooting brief Full HD clips (15, 30 or 60 seconds) in the vertical 9:16 aspect specifically for social media applications. However, the X-T30 III is a more photography-orientated camera so doesn't have quite the same video capabilities as the X-M5 which is specifically aimed at video content creators.

The Mark III model retains the same OLED-type EVF as previously with a resolution of 2.36 megadots and 0.62x magnification. The monitor screen has a resolution of 1.62 megadots, touch controls and is adjustable by tilt only. Other features include a built-in flash, a panorama mode, a multiple

exposure facility, an intervalometer, a choice of six auto bracketing modes (including for focus), and a new Instax shooting mode which uses the instant print formats and frames. However, as before, the bodysell isn't weather sealed and there's still no in-body image stabilisation (although electronic stabilisation is available when shooting video).

The X-T30 III is powered by the 1260 mAh NP-W126S lithium-ion battery which is used in quite a number of the lower-end X mount bodies. Fujifilm quotes 425 shots per charge when the camera is the Economy power mode, and in-camera recharging is available via the USB C port.

Fujifilm's X-T30 III is priced at \$1679 body only (available now) and at \$1949 when packaged with the Fujinon XC13-33mm f/3.5-6.3 OIS. This kit will be in available during January 2026. **For more information visit www.fujifilm.com.au** Fujifilm X mount camera bodies and lenses are backed by a three-year warranty when purchased from an authorised Fujifilm Australia reseller.



FUJINON XC 13-33MM IS THE LIGHTEST X MOUNT ZOOM YET

DESIGNED TO COMPLEMENT the more compact Fujifilm X mount bodies, the Fujinon XC 13-33mm f/3.5-6.3 OIS is a new kit zoom that weighs a mere 125 grams and is only 38 millimetres in length (although it extends a further when zoomed out). Not surprisingly, this is the smallest and lightest X mount zoom lens that we've seen so far.

The focal range is equivalent to 20-50mm and, despite its small size, the zoom still incorporates optical image stabilisation which

gives up to four stops of correction for camera shake. This is a big plus for using with the X mount bodies which don't have IBIS such as the new X-T30 III and the X-M5.

The optical design employs ten elements in nine groups which includes a total of seven special types – four aspherical and three with extra-low dispersion characteristics. These collectively correct for distortion, field curvature and chromatic aberrations. The minimum focusing distance is 20 centimetres which is maintained across the full zooming range. There's a nine-blade diaphragm to give smoother, rounder out-of-focus effects.

The Fujinon XC 13-33mm f/3.5-6.3 OIS zoom is priced at \$649 and will be in available in late January 2026. Fujifilm X mount



lenses are backed by a three-year warranty when purchased from an authorised Fujifilm Australia reseller.



Photo Credit | Architectural photography by Jamee van den Brink | Jamee works at Toowoomba Camera House

Camera House

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MARK III CANON EOS R6 HAS BOOSTED RES AND VIDEO SPECS

THE EOS R6 Mark II is already a very capable camera, but Canon has added some extra fire power to the new Mark III model which steps up to 32.5 megapixels (effective) sensor, 7K RAW video recording internally and upgrades to both the AF and IBIS. The Mark II model, by the way, continues on in the R mount line-up.

The new sensor – essentially the same as is being used in the C50 Cinema EOS body – has a faster read-out so a 40 fps continuous shooting speed is retained even with the higher resolution and burst lengths are extended... up to 330 JPEGs or 150 14-bit RAW files at a go. Pre-capture buffering is now available with JPEGs and 10-bit HEIFs as well as RAW files and for up to half a second (i.e. 20 frames) for both stills and video. The new sensor has a sensitivity range equivalent to ISO 100 to 64,000 with an extensions either side to ISO 50 and ISO 102,400. The R6 III still has two memory cards slots, but now one of them is for the faster CFexpress Type B devices which are needed to support the higher-res continuous shooting and the higher video bit rates. As before, the second slot is for SD memory cards and has UHS-II speed support.

The in-body image stabilisation (IBIS) has a small increase in its effectiveness and now gives up to 8.5 stops of correction for camera shake (up from 8.0 stops). Canon's 'Dual Pixel CMOS AF II' system has improved control algorithms for tracking with, as before, AI-based subject recognition for animals, birds cars, aircraft and trains. The detection for humans works with eye, faces, heads and bodies, but there's now also the 'Registered People Priority' function from the R1 and R5 II. This allows up to ten faces to be stored in a prioritised order which the camera will subsequently recognise so, for example, it could be set to look for the bride and groom in a wedding situation.

In essence, the R6 III and C50 are quite

similar under the skin as hybrid cameras, but the latter prioritises video shooting – so, for example, it doesn't have an EVF, but does have active cooling via a built-in fan – while the former is primarily designed for stills. That said, the third-gen R6 still boasts pretty decent video capabilities, starting with 7K 'open gate' recording which uses the whole sensor area to allow for more flexibility with formats (such as 16:9 vertical shooting for mobile devices). The 7K RAW video is recorded in the 17:9 aspect (at 6960x3672 pixels) at up to 50/60 fps and with the option of a 'Light' mode for smaller file sizes.

At 4K, both the DCI and UHD aspects are available with frame rates of up to 50/60 fps when oversampled from 7K and up to 100/120 fps

Full HD video can also be in 17:9 or 16:9 with frame rates of up to 150/180 albeit with a small 1.13x crop compared to shooting at 100/120 fps. Oversampling – from 3.5K – is again available at all but the fastest frame rates. In most cases there's the option of the H.265 codec with 10-bit 4:2:2 or 4:2:0 colour or the H.264 codec with 8-bit 4:2:0 or 10-bit 4:2:2 colour; and with either All-Intra or LongGOP compression. The R6 III also has the Canon Log 2 and Log 3 gamma profiles and HDR recording (either PQ or HLG profiles). Canon quotes pretty generous maximum clip lengths, but without active cooling, temperature build-ups will likely be the deciding factor here. ProRes RAW at 7K heads the external recording options over HDMI and the new camera now has the full-size Type A connection port.

The Canon EOS R6 Mark III is priced at \$4299 body only or \$6149 packaged with the Canon RF 24-105mm f/4.0L IS USM zoom. Canon Australia provides a five-year warranty for cameras and lenses purchased from an authorised reseller. **For more information visit www.canon.com.au.**

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LEICA'S Q3 NOW IN GLORIOUS B&W

THE MUCH-LOVED Q2 Monochrom now has a successor in a Q3-based version which means that there's 60.3 megapixels resolution on tap along with the newer and faster 'Maestro IV' processor. It uses the same Summilux 28mm f/1.7 ASPH prime lens as the standard Q3 model.

The Q3 Monochrom's sensor goes without a colour filter array so it only records in B&W which enhances the resolution further while also slightly reducing noise (the RRGB filters knock out around a stop of light). Interestingly though, the B&W sensor doesn't have PDAF so the Q3 Monochrom's autofocus uses only contrast-detection measurement. There are a couple of other changes compared to the colour Q3 and Q3 43 models, most notably the revised control interface introduced with the SL3 mirror-

less camera, and the CAI 'Content Credentials' secure metadata which prevents the unauthorised usage or changing of images recorded by the camera. Obviously too, there aren't any colour 'Film Style' profiles.

The Q3 Monochrom has Leica's "Triple Resolution Technology" which allows you to

have either 36 MP or 18 MP resolution, but without a crop so there's no increase in the effective focal length either. However, you can crop conventionally to the equivalent of 35mm, 50mm, 75mm and 90mm which correspond to image sizes of 39, 19, 8.0 and 6.0 megapixels respectively. The B&W camera's construction is unchanged from the colour models which means an aluminium and magnesium alloy body with weather sealing up to the IP52 standard. Also the same is an OLED-type EVF with a resolution of 5.76 megadots and a magnification of 0.76x, along with a tilt-adjustable 7.62 cm TFT LCD monitor screen with a resolution of 1.84 megadots resolution. Continuous shooting is possible at up to 15 fps using the camera's sensor shutter, and the Q3 Monochrom records video at up to 8K resolution and 25/30 fps or 4K up to 50/60 fps... make your own B&W movies.

The Leica Q3 Monochrom is priced at \$12,090 and is available in Australia now. **For more information visit <https://au.leica-camera.com>** To purchase online go to <https://leica-store.com.au>



CANON PRICES NEW F/1.2 SPEED RF PRIME LENS UNDER \$700

YES, YOU READ it right. Canon's new 45mm f/1.2 prime lens in the RF mirrorless mount is yours for just \$699. Canon says it's the company's most compact and affordable f/1.2-speed lens, but it's a claim that goes well beyond just the Canon brand. Right now, this is the cheapest f/1.2-speed full frame autofocus prime on the market, full stop.

Weighing in at 346 grams and just 75 millimetres in length, the RF 45mm f/1.2 STM has an optical construction comprising nine elements in seven groups with includes one 'PMo' (plastic moulded) aspherical type. As the 'STM' suffix indicates, the autofocus drive uses a stepping-type motor which

has the necessary torque to move the large diameter focusing group at the front of the lens. This is performed internally so there's no change to the lens's physical length, and the minimum focusing distance is 45 centimetres. STMs are also fast and quiet, but not as fast as Canon's 'USM' ultrasonic drive or the 'VCM' motor in Canon's so-called hybrid photo/video lenses. Stills photographers won't notice it though and obviously portraiture is a key application for this lens, especially give the very shallow depth-of-field inherent at the widest apertures.

The 45mm f/1.2 has the RF system's multi-function control ring which can be set to various operations including setting apertures, ISO values or exposure compensation. The minimum aperture setting is f/16 and a nine-blade aperture gives smoother, rounded out-of-focus effects. The external construction isn't weather-sealed – one area where Canon has been able to save on production costs – but this isn't likely to concern many potential adopters of this lens.



The Canon RF 45mm f/1.2 STM will go on sale in Australia in December. Canon Australia provides a five-year warranty for cameras and lenses purchased from an authorised reseller. **For more information visit www.canon.com.au**



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Ocean Photographer Of The Year 2025. Photograph by Yuka Takahashi © 2025



PHOTOGRAPHY EXHIBITIONS & EVENTS

Current to 6 February: Exhibition. *You Are Here – Melbourne Memory-Scapes*. A remarkable collection of black and white aerial photographs of Melbourne and its surrounds from the 1960s, drawn from the City of Melbourne collection. At the City Gallery, Melbourne Town Hall, 90-130 Swanston Street, Melbourne, Victoria 3000. Entry is free. Gallery hours are 8.30am to 5.00pm Monday to Friday. For more information visit citycollection.melbourne.vic.gov.au

Current to 22 February: Exhibition. *Olive Cotton And Her Contemporaries*. This exhibition brings together Cotton's photographs and the work of her leading international peers including key modernist photographers such as Dora Maar, Berenice Abbott, Lucia Moholy, Edward Weston and Tina Modotti. At the Gippsland Art Gallery, 70 Foster Street, Sale, Victoria 3850. Gallery hours are 9.00am to 5.30pm Monday to Friday, 10.00am to 4.00pm on weekends. For more information visit www.gippslandartgallery.com

Current to 18 April: Exhibition. *Southern Sky Astrophotography 2025*. Showcasing the winners of the 22nd annual David Malin Awards presented by the Central West Astronomical Society. The theme of these images is 'People And Sky'. At the Sydney Observatory, 1003 Upper Fort Street, Millers Point, NSW 2000. Entry is free. Observatory hours are 12.00am to 7.30pm Thursday to Saturday. Visit www.powerhouse.com.au – and follow the links to Sydney Observatory – for more information.

Current to 3 May: Exhibition. Ocean Photographer Of The Year 2025. All the winners and finalists (118 images in all)

in this international competition run by *Oceanographic* magazine. At the Australian National Maritime Museum, 2 Murray Street, Darling Harbour, Sydney, NSW 2000. Entry fee is \$35 for adults with concessions for children under 15 (and an \$89 fee for families). Museum hours are 10.00am to 4.00pm daily (9.30am to 5.00pm during school holidays). For more information and bookings visit www.sea.museum/whats-on/exhibitions

Current to 6 September: Exhibition. *Trent Parke: The Christmas Tree Bucket*. A tender and darkly humorous portrayal of the photographer's extended family coming together to celebrate Christmas. At Gallery 14, Level 1, National Gallery Of Australia, Parkes Place, Parkes, Canberra, ACT 2600. Entry is free. Gallery hours are 10.00am to 5.00pm daily. For more information visit <https://nga.gov.au>

Current to 7 February 2027: Exhibition. *Mervyn Bishop: Close Up*. Mervyn Bishop

is one of Australia's most important photographers and this exhibition is drawn for the archive of over 200,000 images held in the State Library Of NSW's collection. At the Exhibition Galleries, State Library Of NSW, Macquarie Street, Sydney, NSW 2000. Entry is free. Exhibition hours are 9.00am to 8.00pm Monday to Thursday, 9.00am to 5.00pm on Friday and 10.00am to 5.00pm on weekends. For more information visit www.sl.nsw.gov.au/exhibitions

14 March – 10 May: Exhibition. *Olive Cotton And Her Contemporaries*. This exhibition brings together Cotton's photographs and the work of her leading international peers including key modernist photographers such as Dora Maar, Berenice Abbott, Lucia Moholy, Edward Weston and Tina Modotti. At the Cowra Regional Art Gallery, 77 Darling Street, Cowra, NSW 2794. Gallery hours are 10.00am to 4.00pm Tuesday to Saturday, 10.00am to 2.00pm on Sunday. For more information visit www.cowraartgallery.com.au

Southern Sky Astrophotography 2025. Photograph by Rob Embury © 2025





Photo credit | Described by competition judges as "*Just fantastic in every way*" this stunning photograph was captured by **Kylie Williams** of **Camera House Bunbury**. The image earned Kylie 1st Prize in the Architecture category of the **Camera House Photographer of the Year 2025 competition** | Shot on a Nikon Z 6 II paired with a NIKKOR Z 28mm f/2.8 (SE) lens | ISO 2500 | f/2.8 | 1/125 sec

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EYE ON THE STORM

The Story

Winner of the newly-established Climate category in the 2025 Standard Chartered Weather Photographer of the Year competition, this image is one of ten selected by the United Kingdom's Royal Meteorological Society (RMetS) to form its Climate Gallery. The ten were selected from the 750 entries received in the Climate Category – from both amateur

and professional photographers – based on their compelling storytelling about climate change achieved through the use of outstanding photographic skills. The ten images show how photography is a powerful visual medium for documenting both the extreme weather events made more likely by climate change – such as floods and bush fires – and the slower changes that everybody

may all notice over time wherever they live such as ice-melt in the ocean or the effects of droughts on important habitats. As a collection, the images illustrate how global shifts in climate are affecting daily lives, agriculture, health and livelihoods... and highlight the urgent need for action.

The Photograph

Titled *West Texas Special*, a spiralling



column of dust and wind is photographed in April 2024 on the Texas Plains by American photographer Jonah Lange. The location was near Sudan, Texas, USA.

"This tornado picked up tons of dust as it landed. I peered on from the south side as it moved slowly off to the east," Jonah recounts. "West Texas is known for dust... as shown here!"

The tornado churns with intense

energy, its collar cloud clearly visible as it pulls red soil into the air. A smaller satellite vortex dances nearby, while an impressive dark hail core looms behind the spiral. On the day this image was taken, hailstones up to 7.6 centimetres were reported.

Drought conditions in West Texas are becoming more frequent and severe, drying out the soil and increasing the avail-

ability of loose dust.

As temperatures rise, so does the intensity of thunderstorms, creating the perfect conditions for destructive events like this one.

The Photographer

Jonah Lange is a photographer and storm-chaser based in Fort Collins, Colorado, USA. "I have a passion for showing people Mother Nature's most beautiful moments," he explains. "Photography and weather have shaped my life since sixth grade when I picked up my parents' old camera and captured my first supercell. That moment sparked a passion for both storms and visual storytelling. I dived into learning photography, upgrading from a Nikon D3300 to a full-frame D800, and eventually to dual-camera time-lapse set-ups.

"What began as a childhood fear of thunderstorms grew into a lifelong drive to chase them. Influenced by shows like *Storm Chasers* and *The Weather Channel*, I started pursuing storms as soon as I could drive, expanding from local chases to trips across the Great Plains – from Texas to North Dakota.

"Today, storm chasing and photography are inseparable parts of who I am – capturing the raw power and beauty of weather and turning it into art."

To see more of Jonah Lange's dramatic weather photography visit <https://www.jonahlange.com>

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THE FIXER

Camera repair technicians are becoming a rare breed, especially ones with access to specialised services such as milling bespoke metal components or sourcing difficult-to-find spare parts. A mishap with a zoom lens while travelling in Italy led Bruce Usher to Sydney Camera Repairs in the inner-west suburb of Ashfield.

I photographed Aquila – whose actual name is Kyong Jin Lee – in his Ashfield workshop in July 2025 using my Nikon D750 with a Nikkor AF 20-35mm f/2.8D zoom lens that I'd bought second-hand back in 1993. When I was in Bologna, Italy, in September 2024, this lens had accidentally rolled off a lounge and hit a tiled floor... hard. At first, it seemed OK, but

the next morning, it gave me three images and then refused point-blank to work. I had to buy a replacement, again second-hand, when I got to Milan.

Despite now having the newer Nikkor AF-S 14-24mm f/2.8G ED wide-angle zoom, I decided to get the much-loved 20-35mm lens repaired and that's when I encountered Aquila and his one-man camera repair

business which is located in Sydney's inner-west.

In the main illustration reproduced here, Aquila is holding a Paxette II, a high-quality 35mm rangefinder camera which had excellent optics. The Paxette line was made by Braun Photo Technik in Nuremberg, Germany, during the 1950s. The Paxette II model actually has interchangeable lenses using the Leica M39 screwthread mount.

In his left hand is a Mikroma II 16mm miniature camera that was made by Meopta in Prague in 1957, in what was then known as Czechoslovakia (now Czechia). This pair are from Aquila's vast collection of cameras and lenses.

Aquila came to Sydney in 1995 from South Korea. He was sponsored by Wilton Camera Service – a camera repair business which was based in the heart Sydney's CBD – and he worked there as a technician

◀ Camera repair technician and collector Aquila with two cameras for his vast collection – a Braun Paxette II and a Meopta Mikroma II 16mm subminiature.

for three years, concentrating on mostly on Leica equipment.

At the start of the digital era, he moved to Canon Australia and was there for three years. Nikon followed where, along with a number of other models, he worked on the D1X pro-level DSLR which was launched in February 2001 and had a 5.3 megapixels (effective) 'APS-C' size CCD sensor. However, at the time, it was a major advance in professional DSLRs, especially in terms of the resolution. Aquila ended up spending ten years with Nikon Australia before moving to Ashfield where he set up his own business called Sydney Camera Repairs.

The Back Story

Aquila's brother-in-law ran a camera shop in the South Korean countryside around 300 kilometres from the capital, Seoul. He mostly offered black-and-white processing and printing services, but also some wedding photography. In 1975 and still a teenager, Aquila began doing some wedding photography for his brother-in-law on the weekends and during the school holidays. He shot with both a Nikon F and an Asahi Pentax SB2 – a rare version of the Spotmatic S3 and now very collectible – and was spending a lot of time reading Japanese photography magazines.

Turning 19 meant conscription into the South Korean army where Aquila learned to shoot video and also video editing using U-matic tapes... a cassette format for ¾-inch video tape.

He was tasked with filming army manoeuvres and remained in the service for three years. Repairing cameras for newspaper photographers followed and then he saw a newspaper article about a Japanese man who was training people in Seoul to repair European-made cameras – Leicas, Rolleiflexes and Hasselblads. Aquila visited him which subsequently resulted in three years of one-to-one tuition for three years. During this time, he even stayed at the instructor's home.

These days, Aquila has a friend in Los Angeles who helps with sourcing spare parts especially for Hasselblads and Leicas. He also uses a watchmaker in Sydney who

does some of the precision repairs for him plus there's another friend in South Korea who builds custom cinema lenses and does any metal milling work he might need. Consequently, there aren't too many camera repair challenges that Aquila can't tackle.

His personal camera is a Nikon D700 full frame DSLR body used with customised (i.e. the mounts have been changed) Leica R manual focus prime lenses – a 50mm standard and a 24mm wide-angle – which today are still considered some of the finest lenses ever made for 35mm SLRs and consequently highly-prized, including by cinematographers. 📷

Sydney Camera Repairs is located at 36 Holden Street (entry is via Arthur Street), Ashfield, NSW 2131. Inquiries to info@sydneycamerarepairs.com.au





OCEAN PHOTOGRAPHER OF THE YEAR 2025

The dynamism and diversity of the planet's oceans are celebrated in these winning image as well as the many challenges and their consequences for marine life.

The Ocean Photographer of the Year competition is a celebration of our beautiful blue planet, as well as serving as a platform for highlighting the many plights it is facing.

Ocean photographers of all disciplines and experience levels – both amateurs and professionals – were invited to submit their most impactful imagery to be judged by a panel of ocean photographers, editors and museum/gallery curators. Entries were invited in nine categories. The competition's organiser, the British magazine *Oceanographic*, says the categories are deliberately designed to be quite broad in their focus and open to interpretation. "This is to make OPY as inclusive as possible and to ensure the bravest and boldest

photographers can find a suitable category in which to enter their work."

The 2025 competition's overall winner is Yury Ivanov who was born in Russia, but is now based in Bali, Indonesia. His photograph captures a pair of amphipods from the *Cyproideidae* family, each only measuring around three millimetres in body length, resting on a coral. Commonly called the 'ladybugs of the sea', these tiny creatures display striking colouration and symmetry. The judges were compelled not just by the beauty and balance of the image itself, but also the simplicity of the message behind it "... that the ocean is a place of wonder, colour, and life of all sizes".

"It required a lot of patience and precision to compose and light the shot properly," Yury explains. "It was taken at a depth of 19 metres, during a sunny day with

▲ Photograph by Yury Ivanov (Indonesia), overall winner, Ocean Photographer of the Year 2025. Amphipods from the *Cyproideidae* family, commonly called the "ladybugs of the sea" – resting quietly on coral. Each of them measures around three millimetres in body length. The location is Bali, Indonesia.

calm sea conditions. In total, it took me six dives to get the shot I wanted. The result reveals an intimate glimpse of underwater life that is often overlooked."

Yury is an award-winning underwater photographer and PADI Dive Master who has completed over 15,000 dives. He moved to south-east Asia more than 14 years ago where he has since made Bali his home to photograph the local macro marine life. He specialises in studying nudibranchs – sea slugs – and co-authored the identification guidebook *Nudibranchs Of The Coral Triangle*. His work has taken him to underwater sites across Indonesia, the Philippines, Egypt, the Maldives, Palau, the Black Sea, and Thailand – but it's Bali's vibrant reefs and nudibranch-rich coastlines that continue to inspire him the most.

Australian Winners

For the first time in the annual competition's history, two Australian photographers were selected from the over 15,000 images submitted and judged category winners. A

“

It's a humbling experience, reaffirming the wonder of the ocean and its inhabitants, and the urgent need to conserve it.”

total of 13 Australian photographers were finalists in 2025.

Craig Parry won the Human Connection Award: People And Planet Ocean category for his picture, captured from overhead using a drone, of people attempting to rescue a stranded humpback whale.

“In the early hours of 1 July, we received a call about a stranded humpback whale,” Craig says. “Wildlife veterinarian Steve Van Mil quickly assessed the situation and contacted SeaWorld Marine Rescue and other key agencies to coordinate a

response. For 15 hours, rescue teams and the local community worked tirelessly in a unified effort to save her. Sadly, despite their dedication, she could not be saved. While the outcome was heartbreaking, witnessing the collaboration and compassion shown by multiple agencies and volunteers was incredibly moving - a powerful reminder of what can be achieved when people come together with a shared purpose.”

Craig is an award-winning Australian ocean and nature photographer and filmmaker, known for capturing powerful, intimate moments in the natural world. With a background in visual arts, his work spans aerial and underwater realms, focusing on wildlife, conservation, and remote landscapes. He collaborates with global brands and conservation groups to create emotionally resonant imagery that inspires deeper environmental connection and action. His fine art photography blends beauty and abstraction, portraying marine and landscape subjects in their natural settings with a unique perspective that invites viewers to see the world – and its fragility – through a more connected lens.

Originally from Brazil, but now living on the Bellarine Peninsula in Victoria, Marcia Riederer won the Fine Art category with her serene B&W image of dwarf minke whale taken on the Great Barrier Reef.

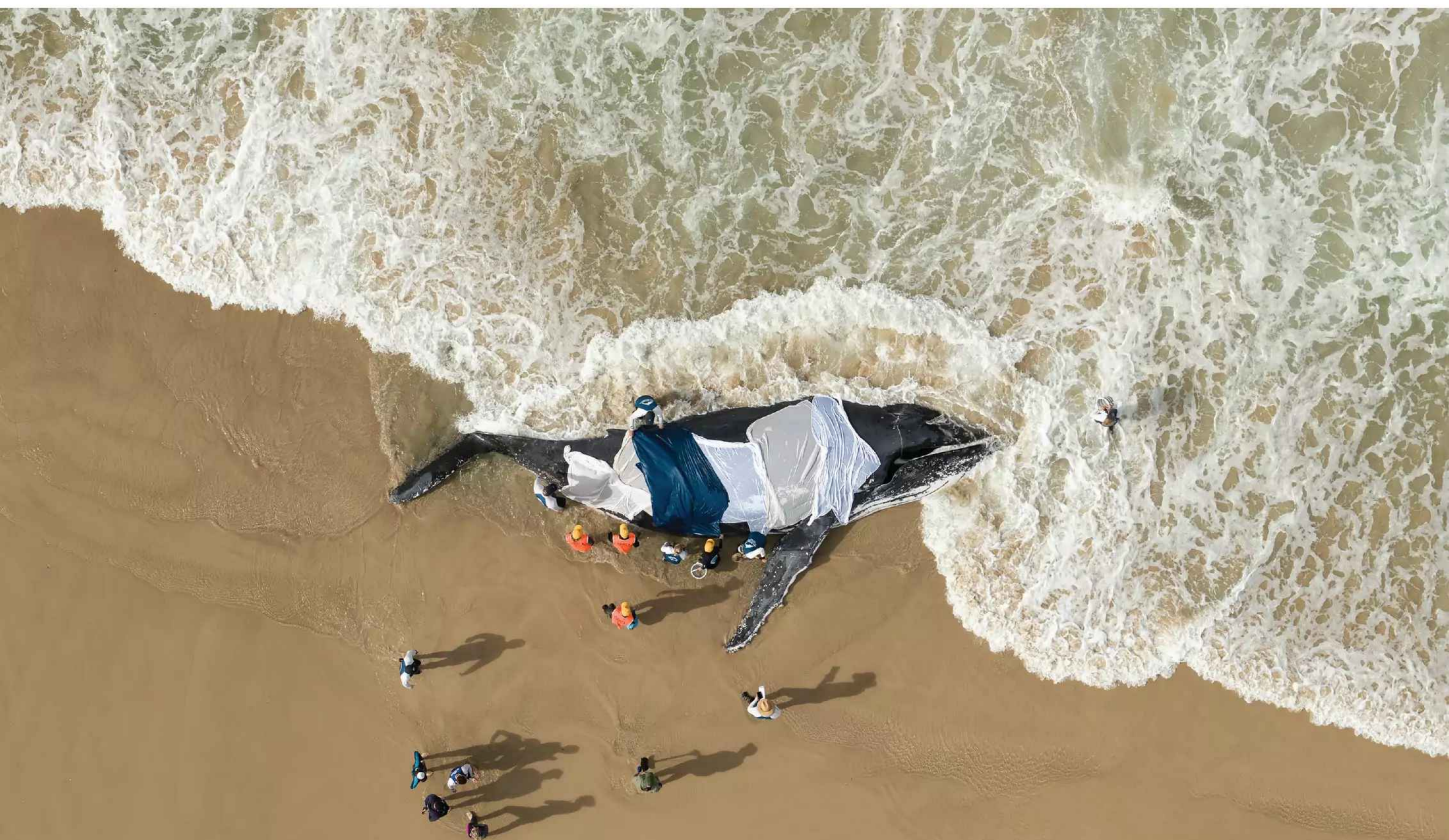
“Dwarf minke whales are known to visit the northern Great Barrier Reef during the winter, making it the only known predictable

aggregation of these whales in the world,” notes Marcia. “These curious giants approach swimmers with an almost playful curiosity. Floating in the turquoise water, watching a sleek, dark body glide effortlessly towards you, its eye meeting yours is a moment of connection. The whales, seem to acknowledge your presence, circling and interacting with you. It's a humbling experience, reaffirming the wonder of the ocean and its inhabitants, and the urgent need to conserve it.”

A biologist by training, Marcia developed a love for photography over 30 years ago, which deepened when she began bringing her camera underwater. Her passion for the ocean, inspired by childhood documentaries and *National Geographic* images, now drives much of her life. Marcia spends countless hours diving and snorkelling, capturing marine creatures and chasing underwater light. She also enjoys travelling to explore new dive sites, combining her scientific background with artistic storytelling to share the beauty and wonder of the underwater world.

All the winners and finalists in the Ocean Photographer of the Year 2025 competition are on show at the Australian National Maritime Museum in Sydney until 3 May 2026. For more information and to book tickets visit <https://www.sea.museum/whats-on/exhibitions>

▼ Photograph by Craig Parry (Australia), winner of the Human Connection Award: People And Planet Ocean category, Ocean Photographer of the Year 2025. Drone image of a rescue attempt for a stranded humpback whale on Seven Mile Beach, NSW.



COMPETITION



▲ Photography by Hugo Bret (France), winner of the Conservation (Impact) category, Ocean Photographer of the Year 2025. A long-finned pilot whale fetus lies lifeless under its mother's corpse in the Faroe Islands.

▼ Photograph by Takumi Oyama (Japan), winner of the Wildlife category, Ocean Photographer of the Year 2025. A female yellow pigmy goby releases newly hatched larvae into the water column from her mouth. The location is Japan.





▲ Photograph by Aaron Sanders (United Kingdom), winner of the Young Photographer category, Ocean Photographer of the Year 2025. Under the cover of night, two tiny Bobtail squid engage in an intimate display, their arms intertwined as they mate on the seabed.

▼ Photograph by Ben Thouard (France), winner of the Adventure category, Ocean Photographer of the Year 2025. The location is Nazaré, Portugal.

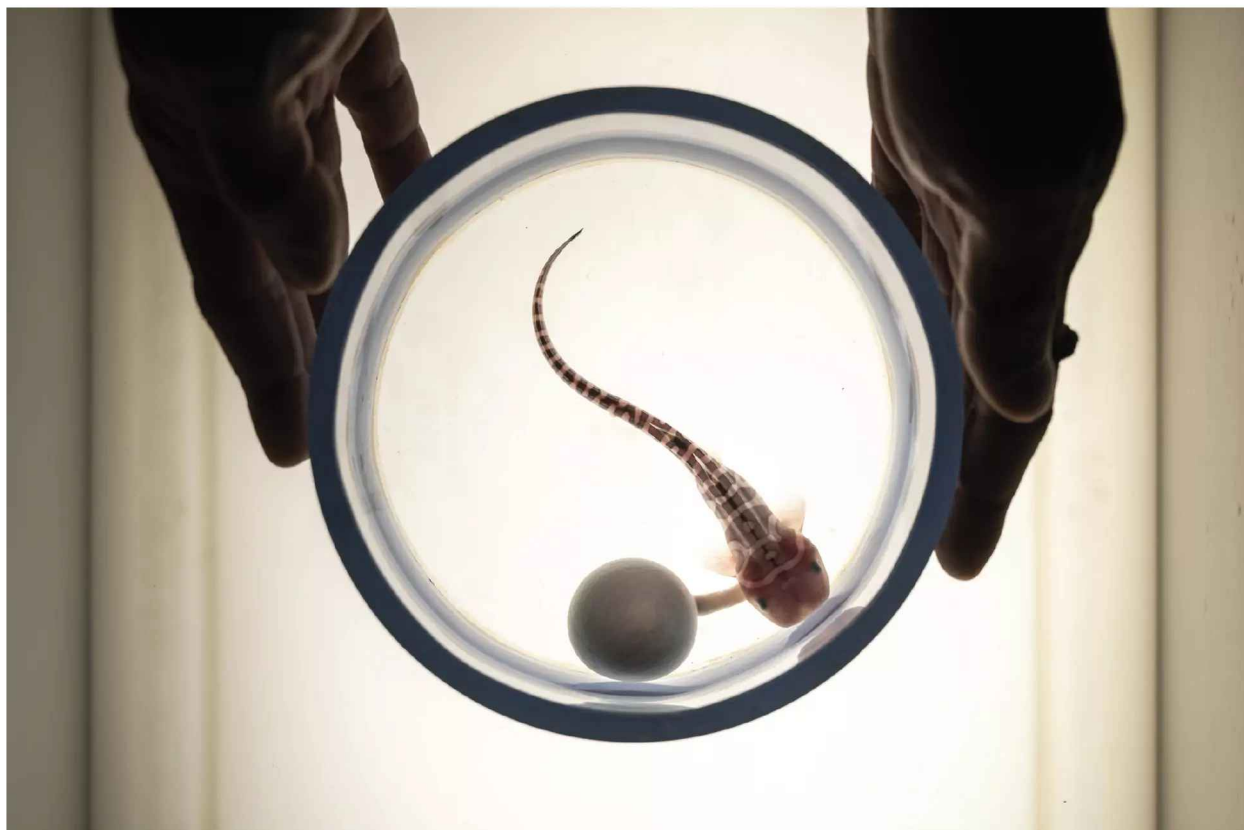


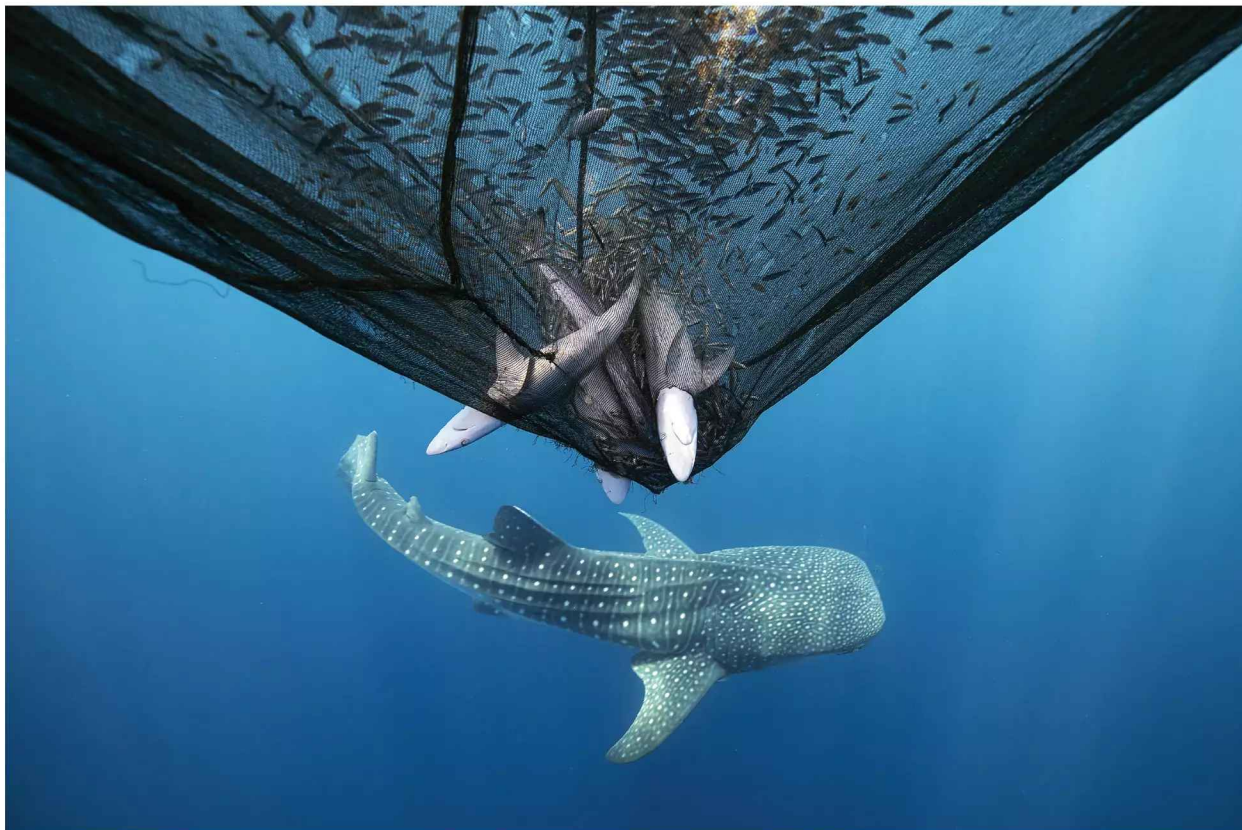
COMPETITION



▲ Photograph by Marcia Riederer (Australia), winner of the Fine Art category, Ocean Photographer of the Year 2025. Dwarf minke whale, the northern Great Barrier Reef, Queensland.

▼ Photography by Sirachai Arunrugstichai (Thailand), winner of the Conservation (Hope) category, Ocean Photographer of the Year 2025. An aquarist holds a glass jar with an early-stage embryo of an Indo-Pacific Leopard shark (*Stegostoma tigrinum*), its egg case removed for a rearing experiment at Aquaria Phuket, one of Thailand's largest private aquariums.



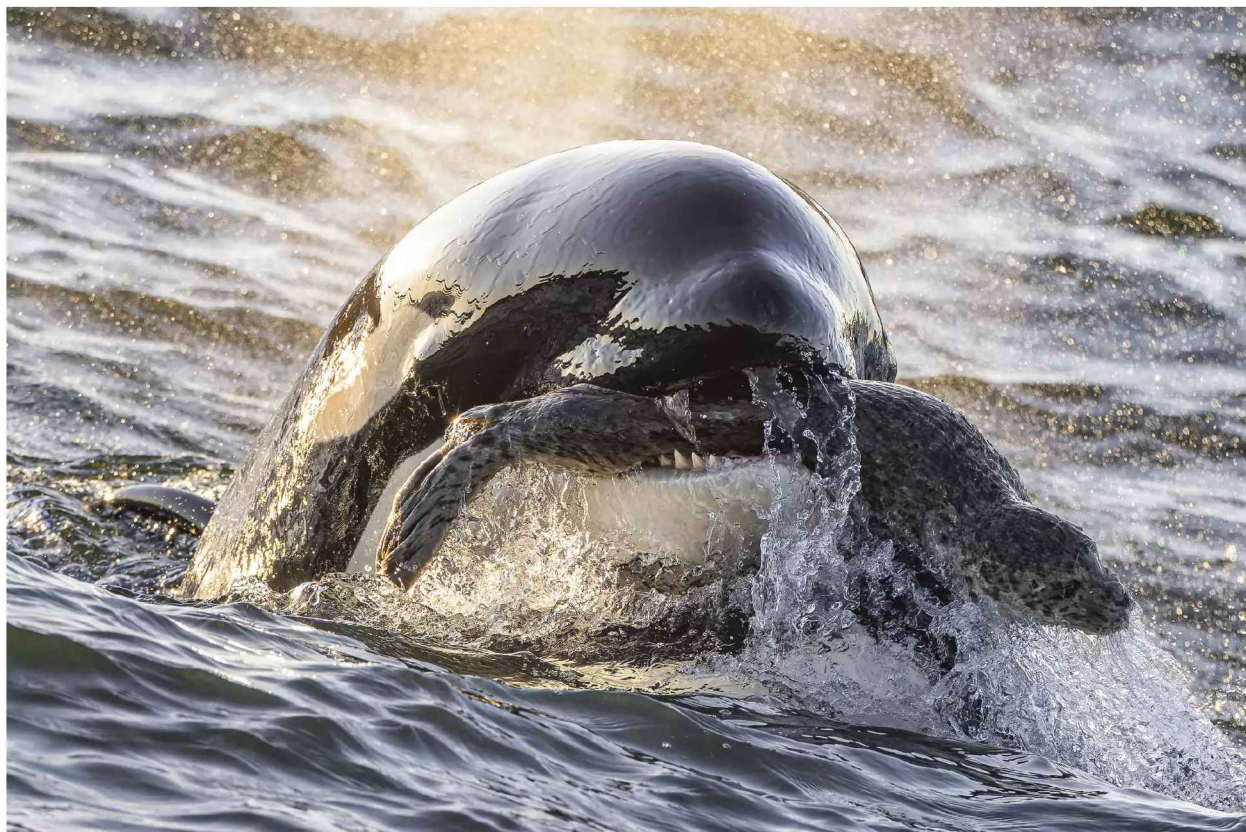


▲ Photograph by Daniel Flormann (Germany), second in the Conservation (Impact) category, Ocean Photographer of the Year 2025. More than 100 million sharks are killed each year by humans – many as accidental bycatch. The location is West Papua, Indonesia.

▼ Photograph by Claudio Moreno Madrid (Chile), second in the Conservation (Impact) category. Humpback whale hopelessly entangled in fishing nets and chased by sharks. The location is Turquoise Bay, Western Australia.



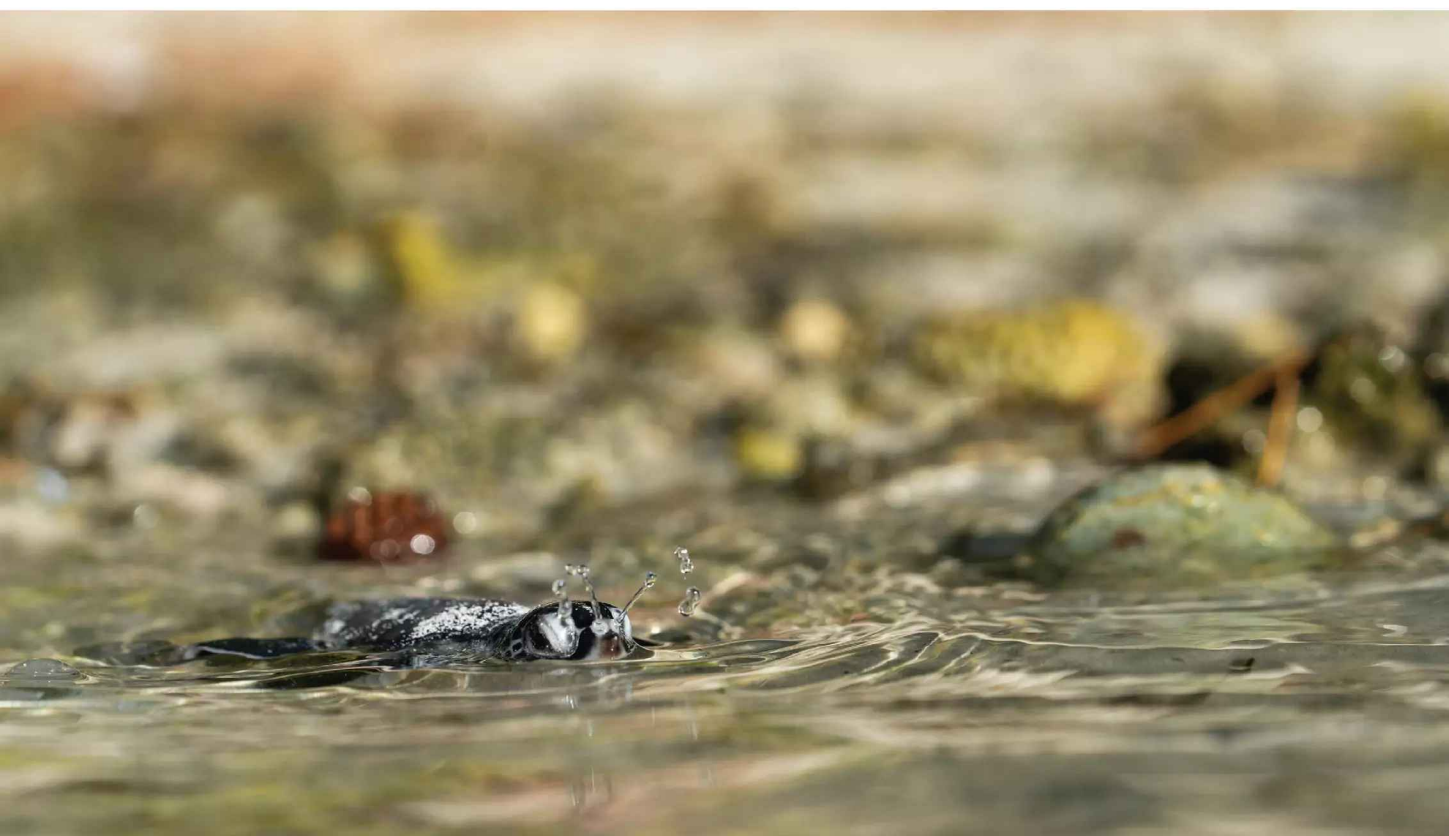
COMPETITION



▲ Photograph by Yifan Ling (China), second in the Wildlife category, Ocean Photographer of the Year 2025. A one-year-old Bigg's orca T065B3 – known as 'Rook' – photographed near Bird Rocks, Washington state, USA.

▼ Photograph by Alexis Chappuis (France), third in the Wildlife category, Ocean Photographer of the Year 2025. Thousands of Skeleton shrimps have entirely colonised a gorgonian coral in North Sulawesi, Indonesia.





▲ Photograph by Théo Guillaume (France), second in the Young Photographer category, Ocean Photographer of the Year 2025. Sea turtle hatchlings navigate the jagged “papa” rocks where waves pulse against the shore. The location is French Polynesia.

▼ Photograph by Yuka Takahashi (Japan), third in the Young Photographer category, Ocean Photographer of the Year 2025. A pair of synchronised Humpback whales, off the island of Mo’orea, French Polynesia.



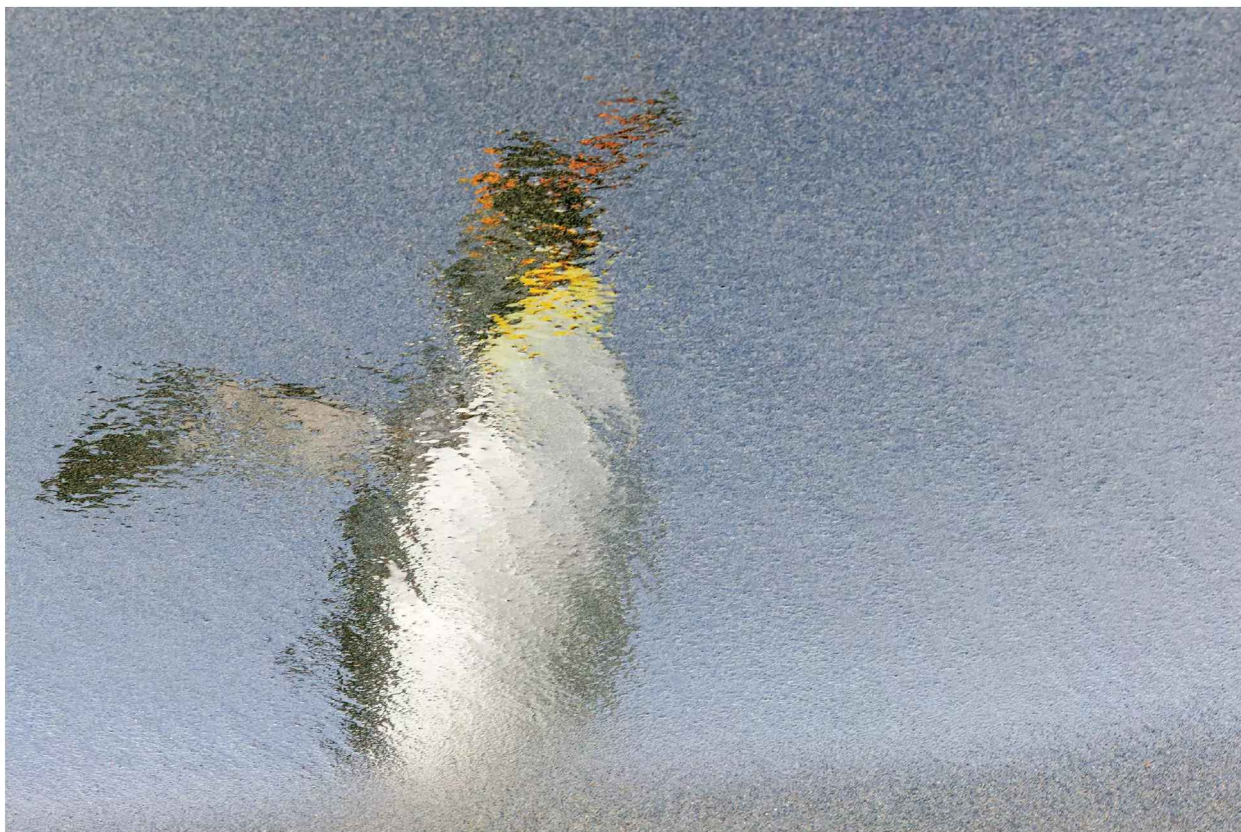
COMPETITION



▲ Photograph by Gergo Rugli (Hungary), second in the Adventure category. Captured on a crisp winter morning at Bronte Beach, Sydney. A powerful southerly swell meets strong offshore winds under a soft morning light.

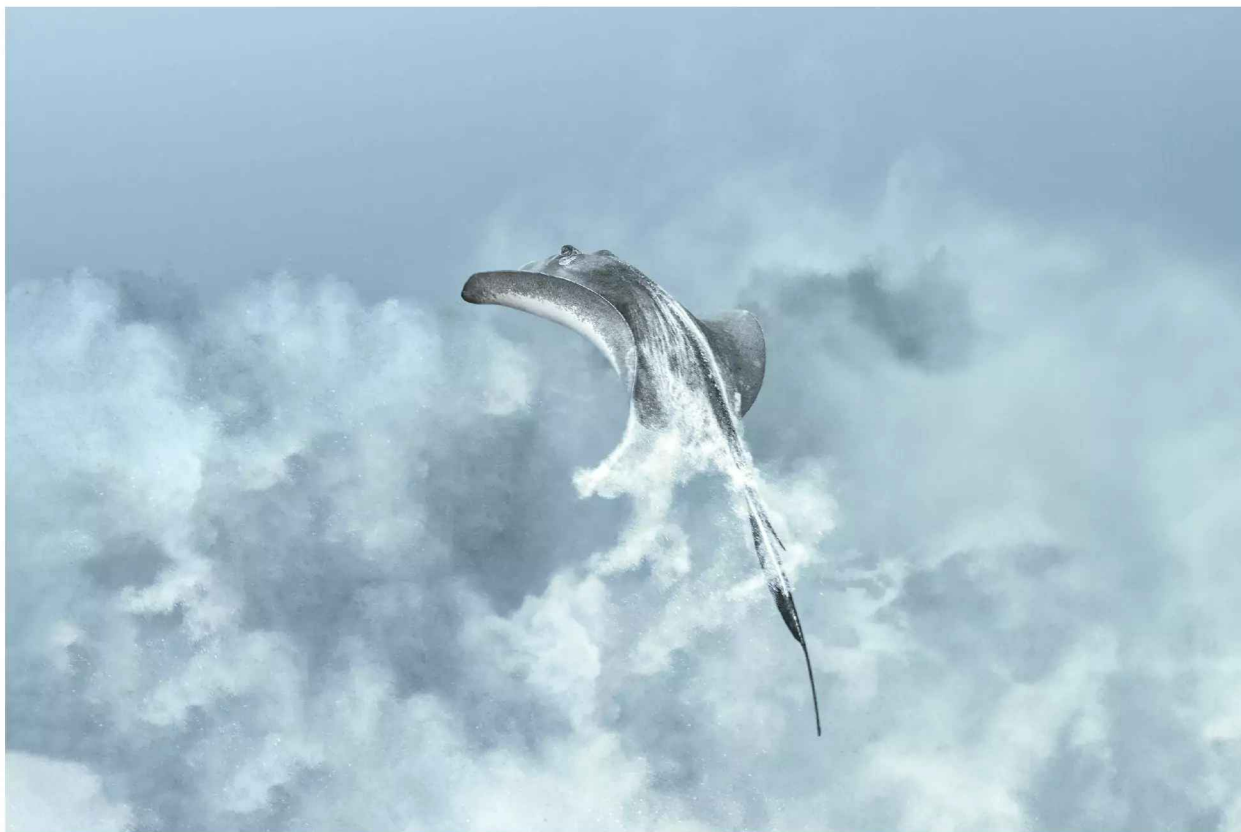
▼ Photograph by Alex Dawson (Sweden), third in the Adventure category. A unique cave in Mexico, called Yab Yum, is the largest water-filled sinkhole ever documented, close to 100 metres in diameter and more than 70 metres deep





▲ Photograph by Rafael Armada (Spain), second in the Fine Art category, Ocean Photographer of the Year 2025. A lone penguin is caught in a reflection created by receding waves across the black sand on South Georgia Island.

▼ Photograph by Ysabela Coll (Dominican Republic), third in the Fine Art category, Ocean Photographer of the Year 2025. With a powerful sweep of its pectoral fins, a stingray vanishes into the blue, leaving behind a swirling cloud of sand. The location is Mexico.

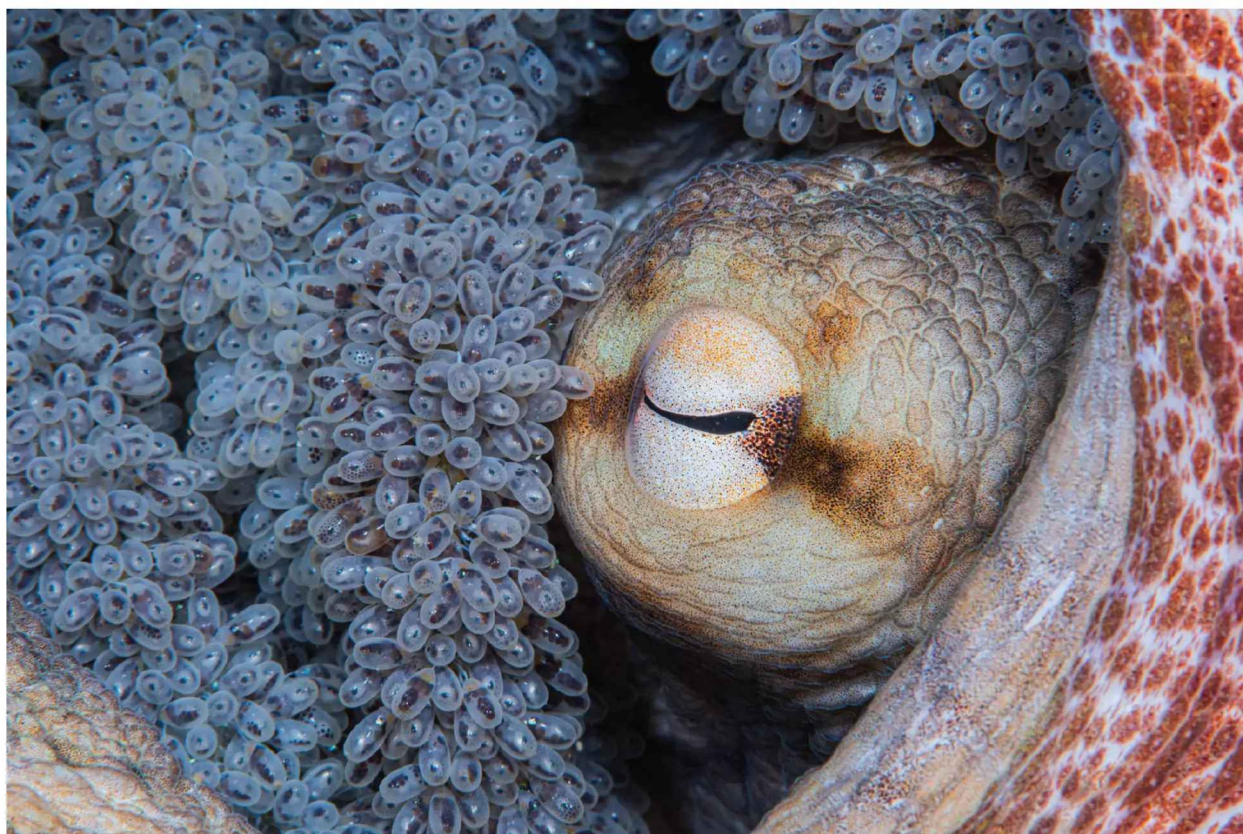


COMPETITION



▲ Photograph by László Földi (Hungary), second in the Conservation (Hope) category, Ocean Photographer of the Year 2025. Squid egg on the seabed, Gatto Island, the Philippines.

▼ Photograph by Théo Maynier (France), third in the Conservation (Hope) category, Ocean Photographer of the Year 2025. An octopus – known locally as ‘chatroux’ – and its eggs in the Kay Pothuau marine reserve, Martinique. It is becoming increasingly rare due to human overconsumption.





▲ Photograph by Yifan Ling (China), second in the Human Connection Award: People And Planet Ocean category, Ocean Photographer of the Year 2025. On 1 April 2024, more than 20 Bigg's orcas entered Puget Sound together. At Point No Point, T099C 'Barakat' – a male orca – began breaching repeatedly close to the beach.

▼ Photograph by Natnattcha Chaturapitamorn (Thailand), third in the Human Connection Award: People And Planet Ocean category, Ocean Photographer of the Year 2025. Each morning before sunrise at Tam Tien beach in Vietnam, the shoreline comes alive with a flurry of activity. Clusters of wooden fishing boats anchor offshore, forming a floating fleet.



HASSELBLAD

X2D II 100C



LOOKING ON THE BRIGHTER SIDE

The cool Swede is now a lot cooler... and way hotter too, as Hasselblad really starts to properly realise the potential of its mirrorless medium format platform.

REPORT BY PAUL BURROWS

Despite Hasselblad pipping it at the post (although just) with the first medium format mirrorless camera, you'd have to say that Fujifilm has made all the running in this category ever since. While the Hasselblad X1D was undeniably prettier and classier looking, Fujifilm's GFX50S was much better executed and subsequently significantly more workable and flexible camera. This has continued into the 100 megapixels models with the GFX100 II even having some sporting applications. But Hasselblad has been steadily making up ground, and the X2D 100C certainly realised more of the potential that had looked so promising back in 2016.

The X2D II 100C goes a whole lot further and really starts to look like a medium format camera that you might contemplate over a full frame model... which has undoubtedly been part of the GFX system's success. Yes, it's still more expensive than any GFX body, but tellingly, it's cheaper than

any Leica digital M. Just saying.

Not only does the Mark II X2D get up to speed with things like continuous autofocus – believe it or not, making its first appearance in a Hasselblad X mount camera – but there are some headline-making features such as ten stops of image stabilisation correction. Yep, ten stops and with a “44x33” size sensor too. Plus, there’s a twist which is both very Hasselblad and gives the new camera a notable selling point with an easy-to-appreciate benefit.

Hasselblad calls it “end-to-end HDR” which means that the camera’s default capture setting is for 10-bit HDR HEIF files – with the option of ‘Ultra HDR’ JPEGs – and it has a high-brightness and high-contrast monitor screen so you can see something of the extended dynamic range when viewfinding and the full range when replaying the HDR files in-camera. It’s probably worth noting at this point that we’re talking proper HDR single images here, and not the multi-shot capture modes which combined under- and overexposed shots to mimic HDR in a single frame that was still technically SDR.

Hasselblad says that the ‘Ultra HDR’ JPEGs have three stops more dynamic range compared to those using the sRGB colour space, and the extended brightness map is embedded in the file to maintain backward compatibility with any viewing screen but provide the extra dynamic range with devices that support HDR.

This is a smart move because these ‘Ultra HDR’ JPEG files immediately have more universal usability than HEIFs which, despite becoming more widespread as a capture option on mirrorless cameras, remain less convenient to share or display. Additionally, HDR capture is with the auto exposure control modes only and using what Hasselblad calls ‘Smart Metering’, which assesses a scene’s brightness levels and range and will automatically adjust the exposure accordingly to optimise the dynamic range.

However, it’s worth noting that, except with very contrasty scenes, the H2D II 100C isn’t simply underexposing to gain more tonality in the brighter highlights, but actually capturing additional highlight data (i.e. and extended highlight ‘headroom’) which is usually clipped with a standard JPEG output. In other words, the DR extension is only into the highlights, but since this has always been the most problematic area with digital capture (blocked-up shadows can always be lightened more easily), it makes a noticeable difference with scenes that have very bright highlights.

OUTER SPACE

In essence, the camera is using the P3 colour space – both for its monitor display and the new ‘Hasselblad Natural Colour



▲ Large monitor screen takes up a lot of the rear panel.

Solution with High Dynamic Range’ (HNCS HDR) image processing – which has a much wider gamut than sRGB and, tellingly, is why photos on a smartphone or a tablet screen always look so good. Bear in mind, we’re only talking about display colour spaces here.

With the H2D II 100C, this combines with the sensor’s ability to capture a wider range of tones, but the key thing here is that Hasselblad takes HDR capture a lot further in-camera by making it both more accessible and more workable in practical terms... because you can see what you’re getting and there’s enhanced flexibility with the outputs. Furthermore, the camera’s RAW files can be processed to take advantage of the P3 colour gamut and the HDR tonal range using the latest version of Hasselblad’s Phocus Mobile 2 app or the Phocus For Mac software. Notably, the app can also apply HNCS HDR processing to RAW files taken with the X2D 100C and the X1D II 50C along with the later CFV 100C and CFV II 50C digital capture backs.

We see the world in HDR – both in reality and now on screens big and small as HDR-optimised displays are starting to become more widely used – so the Hasselblad is enabling in-camera enhancements to colour and contrast that we normally have to do post-camera to produce an image that looks right. It’s why the X2D II 100C is attracting so much interest despite costing north of \$12,000 for the camera body and, while it’s likely others will follow with making HDR photography the standard, Hasselblad has again started something big just as it did way back with its first 6x6cm film format SLR in 1948.

However, it’s worth noting that the X2D II is actually less expensive than the original

X1D was when it was launched and also its predecessor... and it’s a significantly superior camera to either.

PICK THE CROP

The sensor is, of course, essentially the same Sony-made BSI-type CMOS imager that’s used across Fujifilm’s 102 megapixels GFX line-up, but here it’s tweaked for Hasselblad’s specific requirements. It employs a conventional Bayer filter pattern and goes without an optical low-pass filter (OLPF) to help optimise sharpness. As already noted, Hasselblad’s unique colour science gets to work downstream along with noise reduction processing and the like. As it is on the GFX cameras, the effective pixel count is actually 101.8 megapixels... actually closer to 102 MP than Hasselblad’s quoted 100 MP. No matter, you’re still getting the same resolution from either system.

The native sensitivity is equivalent to ISO 50 to 25,600 so the base setting is slightly lower than the previous model’s



THE X2D II IS ENABLING IN-CAMERA ENHANCEMENTS TO COLOUR AND CONTRAST THAT WE NORMALLY HAVE TO DO POST-CAMERA TO PRODUCE AN IMAGE THAT LOOKS RIGHT.”

HASSELBLAD X2D II 100C

► Top view shows just how shallow is the X2D II body, helped by not having a focal plane shutter (the system uses leaf shutters in the XCD lenses).

ISO 64 while the highest setting is a stop above the Fujifilm GFX cameras' top of ISO 12,800. Interestingly however, unlike Fujifilm, Hasselblad doesn't provide any extensions beyond ISO 25,600, opting not to push noise levels (or the effects of noise reduction processing with JPEGs and HEIFs) to a point which unduly compromises image quality. And, let's be honest, just how often do you shoot at sensitivity settings higher than ISO 25,600? Exactly.

There's a modest increase in the dynamic range compared to the X2D 100C, up to 15.3 stops – from 15 stops – with 16-bit RAW capture at ISO 50. More practically, such a wide DR also delivers benefits at the higher sensitivity settings and when shooting in the compressed image formats.

The maximum image size is 11656x8742 pixels – with a pixel pitch of 3.76 microns – at the standard aspect ratio of 4:3 which Hasselblad dubs '645'... as in the shape of a 6x4.5cm film frame (although this sensor is smaller than the true 645 imager that Phase One uses). There's a choice of crops which Hasselblad also equates with traditional film frame sizes. It's a nice touch which emphasises that the H2D II 100C is purely a stills camera and, like Leica's current M models, also one with a long and illustrious heritage in film photography.

As with Fujifilm's GFX100RF, there's an 'XPan' crop which gives a panoramic 65:24 aspect ratio (i.e. 2.7:1) as per the 35mm rangefinder camera that was another Hasselblad 'big bang'. The other crop options are 1:1 (of course, '6x6'), 7:6 ('6x7'), 5:4 ('4x5'), 11:8.5, 297:210 (which is A4 size), 3:2 ('6x9'), 3:2 Crop ('24x36'... i.e. 35mm or full frame), 16:9 (even though there isn't a video mode), and 2:1 ('6x12'). You can create a 'My Crop Modes' menu of favourite shapes – for speeding up selection – and adjust the opacity of the cropping mask depending on whether you like to see what's happening beyond the frame or find it a distraction.



Also similar to Leica, Hasselblad keeps the capture options to the bare essentials. Beyond the crops, there is only one image size with RAWs captured as uncompressed 3FR RAW files and both JPEGs and HEIFs with set compression ratios. The SDR colour space is sRGB. Lens corrections and noise reduction are all performed automatically by the camera which has no provisions for manual adjustments or to switch them off. There are no adjustable colour profiles either – or even a B&W mode – so here Hasselblad still has the post-production mindset that really held back the earliest X series cameras by compromising their in-camera functionality. That said, the HNCS HDR processing delivers exceptional out-of-the-camera results in terms of the colour rendition and the tonality so you're less likely to want to do very much in terms of any subsequent editing. It's worth noting that the 16-bit 3FR RAW files, in particular, also offer plenty of flexibility when it comes to adjusting exposures and colours. The Phocus software – which is a free download – is necessary to edit HDR HEIF files, but Photoshop and Lightroom can handle the HDR RAW and JPEG files.

Sensor shifting is used to provide the in-body image stabilisation which has five axes

of movement and, as already noted, with up to ten stops of correction for camera shake at the centre of the image frame, and eight stops at the edges. Fujifilm's GFX100 II was previous medium format camera IBIS king with 8.0 stops of correction.

Ten stops with such a big sensor is quite an achievement. However, just whether you can actually make full use of this capability in practice is debatable – as the theoretically-possible shutter speeds will likely be too long even for the steadiest of hands – but obviously it will extend the hand-holding possibilities with some lenses.

SEEING IN THE DARK

Aside from the HDR in-camera workflow, the other significant upgrade is to the X2D II 100C's autofocus which has hybrid phase/contrast-detection measurements that are now supplemented by Light Distance and Ranging (LiDAR). The LiDAR technology comes from Hasselblad's parent, dji, and is employed in drones as part of the collision avoidance measures. It's an active system which bounces pulsed laser beams off the subject to determine its distance, and it works in total darkness so it significantly enhances the low-light AF performance. However, the effective range is around five



▲ AF illuminator is part of the LiDAR system for low-light assistance. Smaller window closest to the lens mount is the colour temperature sensor which assists the auto white balance measurements.



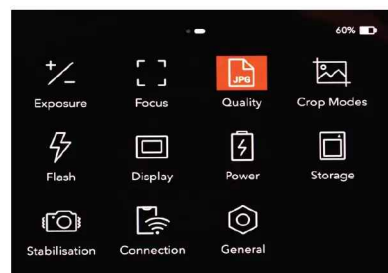
▲ Dedicated buttons for selecting exposure modes and ISO or white balance adjustments. These controls are customisable.



▲ Rear panel control layout now includes a five-way joystick-type controller.



▲ Monitor-based 'Control Screen' has 'quick menu' touch for the key capture-related settings such as white balance.



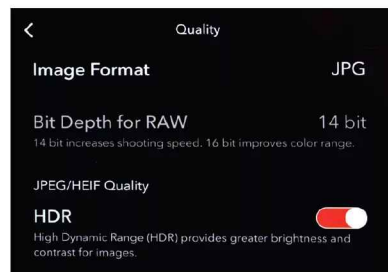
▲ Main menu is icon based.



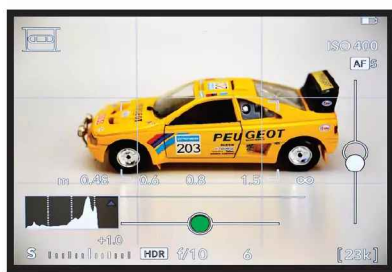
▲ Setting displays are big... very big.



▲ Crop options include, not surprisingly, the XPan's panoramic 65:24 aspect.



▲ HDR capture for JPEGs and HEIFs is the X2D II's default mode.



▲ Live view screen elements include a real-time histogram, 3x3 guide grid, dual-axis level indicator and a focus distance scale. You can have them displayed individually or, as shown here, all at the same time.



▲ Replay/review screens cycle through an info display, brightness histogram and RGB channel histograms.

metres.

There are now 425 PDAF points, giving nearly full frame coverage (97 percent to be precise) and there's also AI-based subject recognition for humans – with face- or eye-detection – pets (i.e. cats and dogs) and



IT'S PART RANGEFINDER CAMERA AND PART REFLEX IN TERMS OF THE DESIGN CUES, BUT SIGNIFICANTLY MORE COMPACT THAN ANY OF THE G MOUNT GFX BODIES."

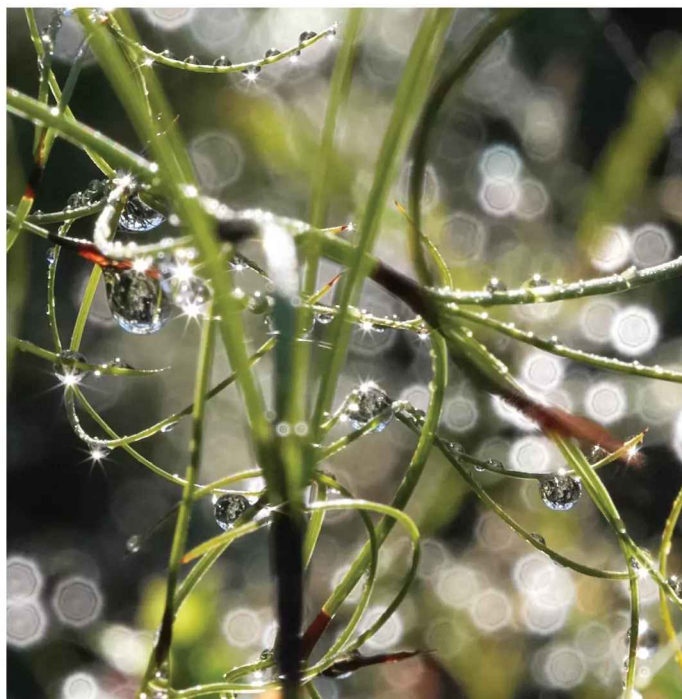
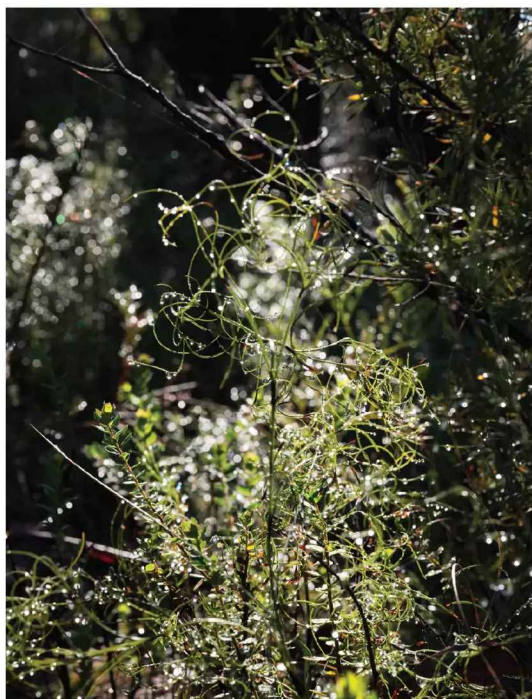
vehicles which includes motorcycles.

Also new is a choice of area modes called Spot, Extended Spot, Wide and Custom. The Custom mode allows for the adjustment of size and shape (i.e. square or rectangular) and has a 'Tracking Scope' option which limits the subject detection to within the specified zone. The Expanded Spot area mode – which moves the focus target as the subject moves – has 'Arbitrary Tracking' for subjects other than those covered by the AI modes. Obviously, all this is made possible by now having continuous autofocus operation. However, subject tracking is only possible with supporting lenses and only the new XCD 35-100mm f/2.8-4.0 E zoom – launched alongside the camera – can do it straight out of the box, but there's a bunch of primes that are also compatible once they've had a firmware upgrade. These are the XCD 38mm f/2.5 V, XCD 55mm f/2.5 V, XCD 25mm f/2.5 V, XCD 90mm f/2.5 V, XCD 28mm f/4.0 P and the XCD 75mm f/3.4 P.

There's a 100 percent zoom function for checking focus and a full-time manual override for fine-tuning. Alternatively, when focusing manually, AF can be momentarily engaged if the 'Touch AF in MF' function is preselected. Manual focusing is assisted by the magnified image, a focus distance scale and a focus peaking display which is available in a choice of orange, yellow, cyan or white colours, or as an inverse. Another option is a 'Focus Indicator' display in the live view screen which shows the difference between the lens's focus setting and the subject's actual distance along with the direction in which to turn the focusing collar to rectify matters. It turns green when you've nailed it.

Another X series camera first is focus bracketing which can be set for up to 1000 frames – however unlikely the need for this number might be – with the choice Extra Small, Small, Medium, Large or Extra-Large adjustment step sizes. You can also set an exposure delay from 1/8 to 16 seconds.





▲ As with any of the 100 megapixels mirrorless medium format cameras, there's huge scope for cropping without unduly compromising image quality. The image on the right is a huge crop to just 1612x1666 pixels from the original's 8742x11656 pixels – giving a 2.7 megapixels image size – but still has plenty of definition and detail.

Exposure control is based TTL metering with centre-weighted average, centre spot (which is more like a selective area measurement as it covers 25 percent of the frame) and spot. These drive a full set of 'PASM' exposure modes with the auto overrides being an AE lock, up to ± 5.0 EV of compensation and auto bracketing over two, three, five, seven or nine frames with up to ± 3.0 EV variation per frame. Exposure adjustments can be in $1/3$, $1/2$ or

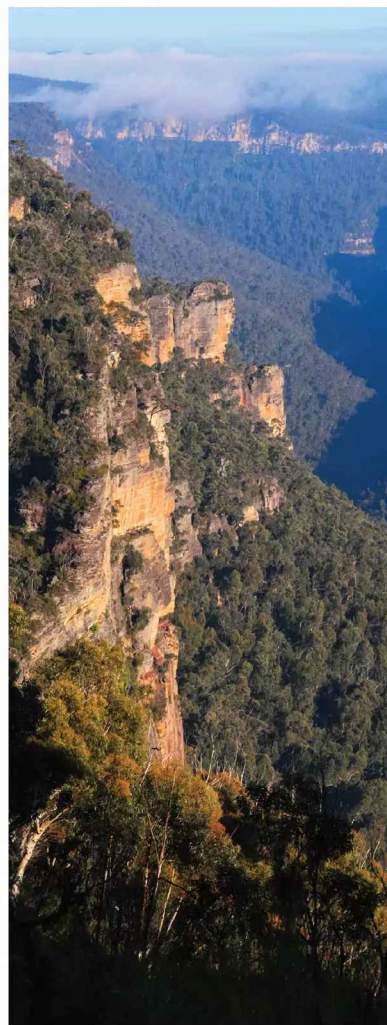
full stop increments except for, curiously, the ISO which is in full stops only.

Continuing a long Hasselblad tradition, the XCD lenses have leaf-type shutters, but the X2D II 100C also has a sensor-based shutter as an alternative. Both run to a timed maximum duration of 68 minutes while the leaf shutters have a top speed of $1/4000$ second and the sensor shutter of $1/6000$ second. However, the earlier XCD lenses have a top shutter speed of $1/2000$ second



▲► The 65:25 aspect crop mode mimics the XPan's double-35mm 2.7:1 aspect panorama frame. Image size is 11656x4304 pixels and the file sizes in the order of 20 MB depending on the subject content.

◀ Test images captured as 'Ultra HD' JPEGs with the Hasselblad XCD 35-100mm f/2.8-4.0 E zoom lens fitted to the X2D II 100C. Obviously, it's not possible to show with a printed image the extended highlights and generally brighter colours that would be evident on an HDR display. Nevertheless, the out-of-the-camera JPEG image quality is superb thanks to the 100 megapixels resolution and the 'Hasselblad Natural Colour Solution' (HNCS) processing. The finest details are still crisply rendered, the colours balance saturation and realism across the spectrum very nicely, and the tonal gradations are beautifully smooth, creating plenty of depth in an image. Not surprisingly, there's a very wide dynamic range. HDR JPEGs are also quite workable in terms of adjusting for highlight or shadow detail.





▲ The X2DS II 100C has a native sensitivity range equivalent to ISO 50-25,600. This highest setting is a one-stop extension – via increased gain – with the Fujifilm GFX cameras which use the same sensor, but push even further up to ISO 102,400. There's virtually no visible noise all the way up to ISO 3200 and only a minimal deterioration in either definition or saturation at the higher settings, even ISO 25,600. These images are 'Ultra HD' JPEGs captured in the aperture-priority auto exposure mode with the lens aperture set to f/11 – to optimise optical sharpness – so the exposure times vary to compensate for the adjustments to the ISO. There's no way to switch off any noise reduction processing which the camera is undoubtedly performing behind-the-scenes, but it doesn't appear to cause much of a drop in definition even at the highest sensitivity settings. Hasselblad XCD 35-100mm f/2.8-4.0 E zoom lens.

and, in some models, a slowest speed of 60 minutes. The main appeal of the leaf shutter is that it allows flash sync at all speeds, but they're also extremely reliable and comparatively quiet despite being mechanical (but, of course, electronically actuated and timed). Should one hour and eight minutes still not be long enough, the leaf shutter has both 'B' and 'T' long exposure timers.

The white balance control options comprise auto correction, a set of six lighting presets, manual colour temperature setting over 2000 to 10,000 degrees Kelvin (plus an adjustment for fine-tuning tint) and a 'WB Picker' which allows you to take a colour temperature measurement from a captured RAW image file.

IN THE HAND

With its one-piece machined aluminium alloy bodysell finished in a matte graphite grey, the X2D II looks cooler than cool. Hasselblad started whole hewn-from-the-solid body thing – and since it's been aped by the likes of the Leica T models, Sigma's BF and the Fujifilm GFX100RF – and the distinctive X series styling still looks very clean and crisp. It's part rangefinder camera and part reflex in terms of the design cues, but significantly more compact than any of the G mount GFX bodies. Etched on the top panel is "Handmade in Sweden" which arguably trumps Leica's "Made in Germany" for sheer kudos... although there's also "Made in Sweden" and "Medium Format" etched into the baseplate as well. There's weather sealing and insulation to enable operation in subzero temperatures down to -10 degrees Celsius.

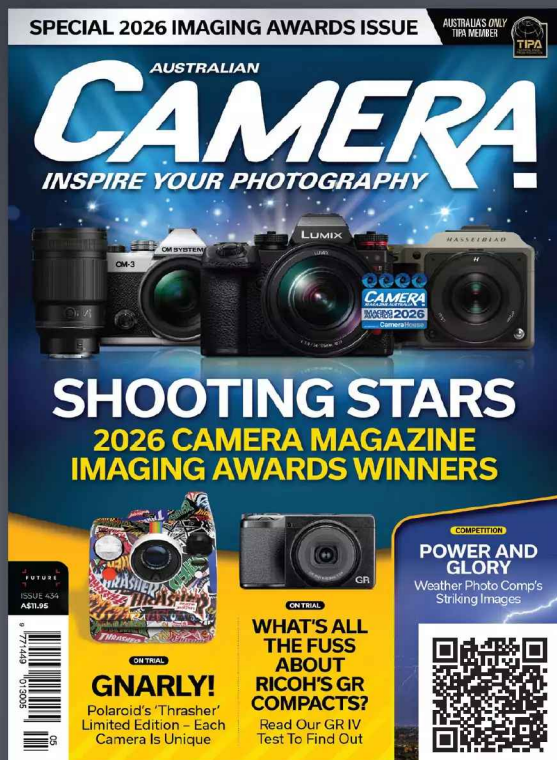
The reshaped and bigger handgrip is extremely comfortable to hold and allows for largely effortless maneuverability even with a bigger and heavier lens – such as the new XCD 35-100mm zoom – fitted. Hasselblad has been steadily refining the operability with each new X series model to provide a better balance between the touch screen and the physical controls which, on the X2D II, now include a joystick-type navigator. It has four-way movements plus a press-in action and, as with most other contemporary mirrorless cameras, it complements the front and rear input



**ETCHED ON THE TOP PANEL
IS 'HANDMADE IN SWEDEN'
WHICH ARGUABLY TRUMPS
LEICA'S 'MADE IN GERMANY'
FOR SHEER KUDOS...**

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HASSELBLAD X2D II 100C

► Mark II X2D is actually a bit lighter than its predecessor – and a bit cheaper too – but the machined aluminium alloy bodyshell is still exudes Scandi coolness and class.

wheels and can be used to navigate the focus points as well as the menus and a monitor-based 'Control Screen' which is part info display and part quick menu. However, Hasselblad still very much does things its own way so there's a learning curve for first-timers even if it really doesn't take all that long to get into the swing of things.

If so desired, you can still drive the X2D II 100C almost entirely from the touch screen – which is arguably the most efficient way – but the hard controls give the same mix-and-match possibilities as most current-era mirrorless cameras. However, there are some distinct differences. The main menu is all icon-based with the submenus a little more conventional, but with most settings via virtual on/off switches. Everything is large – as you can do with a panel size of 9.1 cm – with the settings for things such as shutter speeds, apertures and ISOs in extra-large typefaces and highlighted in orange. The aforementioned 'Control Screen' is mostly all about exposure control, but you can change the white balance, focus settings and drive modes (which include the intervalometer, exposure and focus bracketing, and the programmable self-timer) here too. As has been the case right from the start, depending on the exposure mode, the auto setting is shown in grey digits while the changeable setting is in white. You don't even need to check the P, A, S or M indicators to immediately know what mode you're in. There is a dedicated button for the exposure modes, but they can also be set via the touch screen. On the screen's frame itself is a set of four keys with fairly cryptic markings, but it doesn't take too long to work out what they do. Also, on the camera's back panel are dedicated 'AE-L' and 'AF-D' buttons, the latter standing for

'AF Drive', but it's just a normal AF activation control. The main feature of the top panel is a colour LCD TFT info display which distills the key read-outs from the main panel and has the same grey/white regime for the auto/manual exposure settings. Alongside are the mode button and one for ISO/WB... press once for the sensitivity settings, twice for the white balance options. This pair are customisable as are dedicated multi-function buttons on the front and rear panels along with the press-in actions of the front and rear input wheels and the joystick controller. There's also a custom control ring on selected lenses (including the new 35-100mm zoom). Frankly, that's really as much customisation as anybody is likely to need and, in fact, the way the X2D II's controls are set up by default, you probably won't want to change anything. It works, full stop.

As was noted at the outset, the monitor screen is a high-brightness, high-contrast OLED display with the key numbers being, respectively, 1400 nits peak brightness and a 2,000,000:1 contrast ratio. The resolution is 2.36 megadots and there are tilt adjustments through 90 degrees upwards – i.e. to serve as a waistlevel finder – and 47 degrees down. A big plus is that the four keys related to the monitor's main functions

(i.e. replay, delete and the live view display configuration options) move with it.

The EVF is also a good size and is a micro-OLED display with 5.76 megadots resolution and 1.0x magnification so it's a real joy to use, but it doesn't support HDR viewing or image replay. Nevertheless, when you experience the size, everything else seems pokey in comparison. All the displays – including the one on the top panel – are adjustable for brightness while the monitor also has the option of setting automatic brightness adjustment according to the ambient light levels.

The live view displays – in both the EVF and monitor – include the options of including capture data, a real-time histogram, a focus distance scale, a 3x3 guide grid, dual-axis level indicators and a highlight warning. You can have each of the key elements separately or all combined in one screen which, because of the panel's size, still doesn't look especially cluttered.

Image replay/review comes with the choice of a brightness histogram or separate RGB channel graphs shown as overlays along the bottom edge.

Again, the touchscreen implementation is excellent so simple tapping on the lower part of the screen takes you through the info displays and histogram overlays, browsing is via swiping and zooming via spreading two fingers from the pinch position. The opposite action takes you progressively to nine- or 25-thumbnail pages, but you can use the joystick controller for browsing.

A pair of sturdy magnetic covers conceal the camera's connection bay and the memory card slot. The former comprises a high-speed, 10 Gbps USB Type C port and a 3.5mm minijack input for a wired remote trigger. The latter is for CFexpress Type B cards, but as before, there's a massive 1.0 TB of internal SSD memory which, given that you don't need to accommodate meaty video files, is decent amount of storage even when shooting 16-bit RAWs which can top 200 MB in file size... it's enough for somewhere in the region of 4000 shots says Hasselblad.

The battery compartment employs the





▲ Top panel colour display is adjustable for brightness and relays mostly exposure settings.



▲ Does "Handmade In Sweden" trump Leica's "Made In Germany"?

siveness when you hit the shutter button, including the autofocus.

With PDAF measurement now at work with continuous adjustment, the X2D II's autofocus is a marked improvement even over its predecessor. It's very fast and very accurate across virtually the entire frame, ensuring you can make the most of 100 megapixels resolution. The extended image stabilisation obviously also plays an important role here, especially with handheld shooting. The AF system's low-light performance is also excellent and the subject tracking is reliable, especially the eye-detection for humans. This really amps up Hasselblad's appeal for applications such as portraiture, weddings and fashion. Even with frame-by-frame shooting, having the AF immediately adjust to any small movement of the subject – or the camera for that matter – is a big plus. Yes, everybody else has been doing it for ages, but it's still a very significant upgrade here, and greatly enhances the X2D II's AF capabilities and performance overall.

The superlative image quality delivered by the sensor is already well proven in both the Hasselblad and Fujifilm 100 megapixels cameras, but the key point to make with the X2D II is that P3 is a display colour space so you're only going to notice the increased gamut and the brighter highlights with compatible HDR screens. You won't see anything different in a print, of course. What you will see, however, is phenomenal levels of detailing – even with very big enlargements – and still a very wide dynamic range which, as noted earlier, also makes for plenty of exposure latitude in the RAW files to allow for easy recovery of both shadows and highlights. In practice though, the HDR JPEGs also have plenty of editing flexibility too, and despite the compression. And they're also much more manageable in terms of file sizes.

Of course, as we've seen exploited with the GFX100RF, the 100 megapixels sensor provides plenty of scope for cropping without compromising image quality. Additionally, the inherently shallower depth-of-field with a sensor of this size, provides more scope for using selective focusing as a creative tool.

The high ISO performance is exemplary, essentially across the entire native ISO range so there's minimal visible noise up to ISO 3200 and only a small deterioration in the definition and saturation from here up to ISO 25,600. Better still, we're talking mostly luminance noise here which is more 'structural' than chroma (colour) noise – in other words, it's more uniform in size – and also more easily corrected post camera. What's more, the dynamic range is still commendably wide at the camera's highest sensitivity settings.

On an HDR display, the 'Ultra HDR'

HASSELBLAD IS STILL DOING THINGS ITS OWN WAY WITH THE DESIGN AND ERGONOMICS – A BIT LIKE THE LEICA SL SERIES FULL FRAME BODIES IN THIS REGARD – BUT IT REALLY WORKS."

same arrangement as Leica uses on the SL series mirrorless cameras and the latest M models, so the compartment cover is part of the battery and unloading is a two-stage process. A locking lever releases the pack, but it won't drop out of the compartment until you press on the cover back in slightly which depresses a sprint-loaded lug, enabling the battery to be fully withdrawn. The 3400 mAh 7.27-volt lithium-ion pack is good for around 325 shots, but you can configure the camera to run longer and certainly 450 shots is a possibility. In-camera recharging is available via the USB C port, but as always, investing in a second – or even a third – battery pack buys peace-of-mind for longer shoots.

The WiFi connectivity (the 2.4 GHz or 5.0 GHz bands) enables remote control with live view and file transfer via the Phocus Mobile 2 app which only runs on iOS 18 (or later) devices. In addition to the HDR image editing capability mentioned earlier, it also enables Hasselblad Natural Noise Reduction (HNNR) processing which is AI-powered and reduces noise in RAW files without affecting either sharpness or colour saturation.

SPEED AND PERFORMANCE

With a fastest continuous shooting speed of 3.0 fps, the X2D II 100C isn't going to challenge the write speeds of either a CFexpress Type B card or its SSD internal memory, even at 100 megapixels res. For the record, the SSD has a maximum write speed of 2370 MB/second. Clearly the Hasselblad isn't built for speed, but it is also worth noting that Fujifilm's 100 MP cameras are all quicker – 6.0 fps for the GFX100RF (also with a leaf shutter), 7.0 fps for the GFX100S II and 8.0 fps for the GFX100 II. Certainly, the two G mount bodies are able to shoot some types of sports action – not so long ago, 8.0 fps was considered fast – and Fujifilm actually promotes this capability so there's a clear difference in the two design philosophies here. Nevertheless, the Hasselblad is still quick in terms of its respon-

► Monitor tilts up through 90 degrees (and also down). Related controls move with it.



HASSELBLAD X2D II 100C

ON TRIAL

JPEG's simply jump out at you, especially on a bigger screen, so if this is going to be how your images are mostly used then the X2D II has obvious attractions. It seems inevitable that we will soon progress from SDR to HDR in photography – as in video with 4K HDR content, for example – and while Hasselblad is pioneering a full workflow from camera-to-display, others will surely follow especially with higher-end cameras. You may want to wait and see what happens, but HDR isn't the X2D II's only trick and it's undoubtedly the most user-friendly – and usable – X series medium format mirrorless camera to date... so it has a wider appeal more generally too.

THE VERDICT

It's hard not to end up being completely seduced by the X2D II 100C and not just because of the way it looks. Hasselblad is still doing things its own way with the de-

sign and ergonomics – a bit like the Leica SL series full frame bodies in this regard – but it really works. It doesn't take long to get into the groove with this camera and then it's super-efficient and surprisingly logical in all aspects of its operation. The big and bright monitor screen is simply addictive as is the in-your-face (in a good way) EVF. It all soon starts to feel like second nature, and then you don't really want to go back to a more conventional set-up which suddenly seems a bit archaic.

Less of a handful than any of the G mount GFX cameras and quite a few full frame bodies as well, the X2D II handles superbly, but the XCD 35-100mm zoom is one of the bigger 'Blad X mount lenses so this combination ends up being quite bulky. We were sent this lens because it's the only one that talks C-AF with the X2D II body at the moment, but with any of the V-series primes and the even more compact P series

models, you get a highly portable package for applications such as landscape or street photography. The GFX100RF is a smaller and lighter digital medium format option again, but the fixed lens configuration has both pluses and minuses.

On every level, the X2D II is a more versatile camera than any of its predecessors, and it's certainly now a lot easier to use in the field thanks to new features such as the joystick controller. Portability – especially with the more compact P series XCD primes – continues to be a major attribute of the Hasselblad X camera design, with the X2D II's revisions promoting even more comfortable and logical operation. Importantly, underneath the style is plenty of substance, including a very high IQ with, ahem, extra brightness. So, buy the X2D II 100C from the heart because your head will soon be nodding in agreement. 📷

VITAL STATISTICS



HASSELBLAD X2D II 100C \$12,650

body only,
recommended retail price

Type: Professional digital medium format mirrorless camera with Hasselblad XCD bayonet lens mount.

Focusing: TTL automatic via hybrid contrast/phase detection and LiDAR (Light Detection And Ranging) measurements with 425 focusing points with automatic or manual selection. 97 percent frame coverage. Touch AF point selection. AI-based subject recognition for humans (face/eye detection), cats and dogs, and vehicles. Single-shot and continuous AF modes. Spot, Extended Spot, Wide and Custom area modes. Custom area mode has a 'Tracking Scope' option for subject detection only within the specified zone. Expanded Spot area mode has 'Arbitrary Tracking' for subjects other than those covered by the AI modes. Full-time manual override of AF. 100 percent zoom function for focus assist via touch screen or joystick controller. Sensitivity range is EV 1 - 19 (ISO 100). Low light assist via built-in illuminator. Manual focus assist via magnified image, focus peaking display (choice of orange, cyan, yellow and magenta colours, or inverse), focus indicator display and focus distance scale.

Metering: TTL using the imaging sensor with 'Smart Metering' (intelligent exposure adjustment to optimise HDR), centre-weighted average (75:25), centre spot (25 percent of frame) and spot (2.5 percent of frame) measurements. Metering range is -3.0 – 20 EV (ISO 100).

Exposure Modes: Program, shutter-priority auto, aperture-priority auto, manual and TTL auto flash. Full auto mode sets exposure, ISO and white balance according to subject analysis. Exposure compensation up to +/-5.0 EV in 1/3, 1/2 or full stop increments. Aperture and shutter speed settings adjustable in 1/3, 1/2 or full stop increments. ISO in full stops only.

Shutter: Electronic, between-the-lens leaf type, 68 minutes to 1/4000 second plus 'B' and 'T' with XCD lenses. Flash sync at all speeds with the leaf shutters. Sensor-based electronic shutter has a speed range of 68 minutes to 1/6000 second.

Viewfinder: EVF, Micro-OLED panel with 5.76 mega-

dots resolution. 100 percent scene coverage and 1.0x magnification. Adjustable eyepiece strength. Auto or manual switching between EVF and monitor screen. Tilt-adjustable 9.1 cm wide-gamut (DCI P3 colour space) OLED monitor screen with 2.36 megadots resolution, 1400 nits peak brightness (HDR) and 2,000,000:1 contrast ratio. Touch controls, including Touch AF, Move AF Point and 'Touchpad AF' when using the EVF.

Flash: No built-in flash. External units sync via ISO-standard hotshoe (Nikon i-TTL exposure control).

Additional Features: Machined aluminium alloy body with weather sealing and insulation to enable operation down to -10 degrees Celsius, depth-of-field preview, three custom camera set-ups, AE lock, auto exposure bracketing (over two, three, five, seven or nine frames with up to +/-3.0 EV), programmable self-timer (2-60 seconds delay; one, three or five frames), timed auto power-off.

DIGITAL SECTION

Sensor: 102 megapixel pixels (effective), BSI CMOS with 32.9x43.8 mm imaging area. No low-pass optical filter. Sensitivity is equivalent to ISO 50-25,600.

Focal Length Magnification: 0.8x (35mm format), 1.3x (6x4.5cm format).

Formats/Resolution: 14-bit or 16-bit RAW with lossless compression in Hasselblad 3FR RAW format, 8-bit JPEG, 8-bit 'Ultra HDR' JPEG, 10-bit HEIF and 10-bit HDR HEIF. RAW+JPEG and RAW+HEIF capture also available. Images captured at 11656x8742 pixels in the 4:3 aspect ratio. Crop modes for 65:25 aspect ratio (i.e. XPan), 1:1 (i.e. '6x6'), 7:6 ('6x7'), 5:4 ('4x5'), 11:8.5, 297:210 (A4), 3:2 ('6x9'), 3:2 Crop ('24x36'... i.e. 35mm), 16:9, 2:1 ('6x12').

Video Recording: No video recording capabilities.

Recording Media: Built-in 1.0 TB SSD memory, CFexpress Type B memory card slot.

Continuous Shooting: Up to 3.0 frames per second (14-bit RAW, HEIF or JPEG).

White Balance: TTL measurement. Auto correction with six presets, manual colour temperature setting (2000 to 10,000 degrees Kelvin) with +/-100 tint levels, and WB Picker (select colour temperature and tint from a captured RAW image file).

Interfaces: USB 3.1 Gen 2 Type C (10 Gbps), 3.5 mm minijack for cable remote trigger.

Additional Digital Features: In-body five-axis image stabilisation with up to ten stops of correction at the centre of the frame and eight stops at the edges (Normal, Sport and Horizontal modes), sRGB and P3 colour spaces, intervalometer (up to 1000 frames or unlimited frames), focus bracketing (up to 1000 frames; Extra Small, Small, Medium, Large or Extra Large adjustment step sizes; exposure delay from 1/8 to 16 seconds), exposure scale and EV displays, real-time histogram, dual-axis level indicator, 3x3 grid guide, exposure simulation display, RGB/brightness histogram displays (in review/replay), nine and 25 thumbnails pages, replay/review zooming WiFi (2.4 GHz and 5.0 GHz bands), tethered shooting via USB C.

Power: Rechargeable 3400 mAh 7.27 volt lithium-ion battery pack. In-camera recharging via USB C.

Dimensions (WxHxD): Body only = 148.5x106.0x75.0 mm.

Weight: Body only = 730 grams (without battery pack or memory card).

Price: \$12,650 body only. XCD 35-100mm f/2.8-4.0 E zoom lens is priced at \$7199.

Distributor: C.R. Kennedy & Company Pty Ltd, telephone (03) 9823 1555, www.crkimaging.com.au or <http://hasselblad.com.au>



PIXUS DELUXE

Dual Lens Digital Camera



PANASONIC

LUMIX S1 II



THE ONE THAT YOU'LL WANT

Panasonic serves up another powerful Lumix S hybrid full frame flagship, but now it's speed that's the selling point to underpin extensive feature sets for both photography and video-making.

With the second generation of models, all the Lumix S1 series full frame mirrorless cameras are now full-on hybrid models with, as you might expect from Panasonic, impressive suites of video features. The choice is now whether you want high resolution with the S1R II, high speed with the S1 II or increased affordability with the S1 IIE. Each model's photo and video specs are dictated to some extent by their sensors, but the main shooting capabilities are pretty much

the same across the board so all three can be considered high-end hybrids. Notably, the S1R II and S1 II are priced within a couple of hundred dollars of each other so it really is a case of whether you want more resolution which delivers 44 megapixels stills and 8K video, or more speed for 70 fps continuous shooting at 24 megapixels and 4K video at up to 100/120 fps. Your call.

Otherwise, the S1R II and S1 II have a lot in common, but their sensor designs do deliver some key differences in performance which, depending on your priorities, will

definitely influence which one is right for your needs (see the Making Movies panel for a full rundown of the S1 II's video offerings).

Following Nikon's Z6III, the Lumix S1 II gets more speed – but not a much heavier price tag – by adopting a sensor architecture described as 'partially-stacked'. In fact, given the very similar specs, it's likely the sensors in the Panasonic and the Nikon aren't a million miles away from being pretty much the same. A partially stacked sensor is cheaper to manufacture than a

fully stacked (i.e. multi-layered) design but still delivers some significant performance enhancements due a much faster read-out than a conventional BSI-type CMOS imager. The key design aspect of a partially-stacked sensor is that the read-out and analogue-to-digital conversion circuitry – along with an integrated memory – are arranged along the top and bottom edges of the chip rather than in a completely separate layer. As Nikon also notes when comparing the Z6III sensor's read-out speed with that of the Z6II's, Panasonic says the S1 II's imager is 3.5x faster than the standard 24 MP BSI-CMOS chip used elsewhere in its Lumix S line-up (including the S1 IIE). This allows for continuous shooting at up to 70 fps with 'Speed Priority' checked or 60 fps with 'Image Priority'. Another benefit of the faster read-out is that rolling shutter distortion is greatly reduced. The faster shooting speed comes at the cost of a small reduction in image quality so, for example, 14-bit RAWs at 60 fps, but 12-bit RAWs at 70 fps. However, remarkably, even at 70 fps there's still continuous AF/AE adjustment and you can shoot full-size RAWs, JPEGs or HEIFs (a new capture mode on the S1 II). In comparison, Nikon limits the Z6III's fastest shooting speeds of 30 fps and 60 fps to JPEG capture only. The burst lengths are reasonably long too – up to 180 frames for RAWs or JPEGs (or, indeed, RAW+JPEG capture) and up to 170 frames for HEIFs and RAW+HEIF. Firmware Version 1.2 adds a 30 fps speed which plugs the previously big gap between 10 fps and 70 fps.

There's 'Pre-Burst' buffering at 60 fps or 70 fps – and now also at 30 fps – with the options of setting the recording period to 0.5, 1.0 or 1.5 seconds prior to full shutter release (i.e. when the shutter button is at the half-way position for metering and autofocus). Additionally, there's 'Pre-Burst' buffering at 60 fps or 70 fps with the options of setting the recording period to 0.5, 1.0 or 1.5 seconds prior to full shutter release (i.e. when the shutter button is at the half-way position for metering and



▲ Rear panel control layout includes a joystick controller and a control wheel with four-way navigational actions. Bodysell is magnesium alloy – covers and chassis – with weather sealing and insulation for shooting in subzero temperatures.

autofocusing). These pre-release frames are included in the total burst length so, for example, at 70 fps with the 1.5 seconds 'Pre-Burst' speed, you get 90 frames before and 90 frames after pressing the shutter button (or 90+80 frames with HEIF capture). Curiously though, 'Pre-Burst' shooting isn't available at any slower speed, but then there aren't really any slower but still fast speeds anyway – like 25 fps or 40 fps – as the camera goes straight from 60/70 fps all the way down to 10 fps. Apart from something in-between being all that's needed for some subjects, you're going to hit the buffer limits more rapidly at these fastest speed. All this is with the sensor-based shutter, but the S1 II's focal plane shutter delivers 10 fps along with an increase in the burst lengths, although these are modest in all capture modes except for JPEGs.

The sensor is matched with Panasonic's latest 'L2 Technology' processor which is the product of its tech tie-up with Leica and also does its part in delivering the S1 II's extra speed. The 10-bit HEIF capture uses the

HLG (Hybrid Log Gamma) profile that's also applied to the HDR video recording mode and allows images to be viewed on SDR screens. The various JPEG capture settings are also applied in the HEIF mode so there one of two compression levels and in four image sizes. Plus there's a choice of six aspect ratios – 3:2, 4:3, 16:9 and 1:1 along with the panoramic 65:24 and 2:1 – but the latter are available in the largest image size. Dual memory card slots are provided for data storage; one for CFexpress Type B and the other for SD devices with UHS-II and V90 speed support. Like the S1R II, the S1 II also allows for direct recording to an external SSD (solid state drive) via its USB C port which is particularly handy for the high bit-rate video recording modes (which are over 4.0 Gbps here).

The in-body image stabilisation (IBIS) has five-axis movements and correction for camera shake of up to eight stops at the centre of the frame and seven stops at the edges. In concert with an optically-stabilised lens – which Panasonic calls 'Dual IS 2' – the



▲ Trio of 'Holy Trinity' function buttons – for white balance, ISO and exposure compensation – is perfectly sited for quick access when shooting.



▲ Main mode dial is lockable via its central button. Note the five 'C' positions for storing customised camera set-ups.



▲ Drive mode dial also engages the self-timer and the multi-shot 'High Resolution' capture function.

PANASONIC LUMIX S1 II

correction range is up to seven stops across the frame, but there's added efficacy in the adjustments for pitch and roll, and with longer focal length lenses.

As on all the recent Lumix S bodies, sensor shifting is used to deliver multi-shot 'High Resolution' capture with the option of handheld or tripod modes. You can choose between 'LL' and 'XL' images sizes which, with the 3:2 aspect ratio, deliver 8496x5664 pixels (i.e. 48 MP) or 12000x8000 pixels (96 MP) respectively. The 4:3, 1:1 and 16:9 aspects are also available. In addition to the increased resolution, at 96 MP – which uses eight shots – full RGBG colour is recorded at each pixel point to enhance the accuracy of reproduction. A shutter release delay can be set from 1/8 second to 30 seconds. Conveniently, these frames are combined in-camera as either JPEGs or RAW files (or both). Motion blur processing is available to counter any slight subject movements, with the choice of two settings for prioritising either blur reduction or resolution (so some blurring will still occur with moving subjects such as water and which you might want to keep for effect).

LIKE YOUR STYLE

The in-camera processing options start with a selection of 21 'Photo Style' presets which includes a total for seven for video,



THE NEXT-GEN LUMIX S1 MODELS ALL SHARE THE SAME SMALLER AND LIGHTER WEIGHT BODY THAN THE PREVIOUS SERIES, BUT YOU STILL WOULDN'T CALL THEM COMPACT."



▲ Look at those lovely big dials. Control layout is busy, but well organised and promotes efficient operation.

including three Cinelike profiles – A2, D2 and V2. The photo profiles include L.Classic Neo – which is similar to Fujifilm's Classic Neg – and L.Monochrome S which has less contrast than the earlier L.Monochrome or L.Monochrome D options. Conversely, Leica Monochrome pumps up the contrast with brighter highlights and deeper blacks. There's the provision for creating up to ten customised 'My Photo Style' presets with adjustable parameters for contrast, highlights and shadows, saturation, hue, sharpness and noise reduction. The B&W profiles have specific adjustments for colour tone, contrast filters and grain effect.

Also included in the 'Photo Style' menu is the 'Real Time LUT'. LUTs (look-up tables) are used to create a particular 'look' in cinematography, but they're now finding their way into photography as an expansion of the more traditional film-based profiles which tend to be more pictorial than cinematic. Essentially, with the LUTs, the sky is the limit in terms of moods and magic that you can create. The S1 II allows for a total of 39 to be uploaded to the camera

from a memory card and sourced from the Lumix Lab app (although there are others such as Panasonic's Creator's LUT Website). With titles such as Faded Summer, Vintage Vibe, Gritty Cinema and Leafy Greens you can start get an idea of what can be created visually... think of them as more sophisticated filter effects. These LUTs are also adjustable in-camera for parameters such as sharpness and noise reduction. With video, a LUT is applied during V.Log recording so the grading for colour and contrast is performed in-camera rather than being applied in post-production which can represent big savings in both time and money with pro-level projects.

The camera's corrective measures include long exposure noise reduction and 'i.Dynamic Range' processing with the choice of auto or three manual settings while the lens corrections are for vignetting, diffraction and colour shading.

There's an intervalometer for shooting time-lapse sequences of up to 9999 frames and with exposure levelling. It can also be used to create stop-motion video clips. A



▲ As introduced on the S1R II, there's a dedicated switch for selecting the photo, video and 'Slow & Quick' (variable video frame rate) modes.



▲ Focus mode switch incorporates a button to select the AF area. 'AF On' button does what it says on the label.



▲ Front tally lamp and self-timer countdown indicator (which also serves as the AF assist lamp) are situated above the model number badging.

MAKING MOVIES

As for photographers, the choice for video-makers is between the S1R II's higher resolution and the S1 II's faster speeds. For many, the choice between having 8K at 25/30 fps and 4K UHD/DCI at up to 120/100 fps probably won't be all that hard to make. Otherwise, the two cameras share a very similar videography feature set with the key differences being in the specs related to the faster read-out speed of the S1 II's 'partially stacked' sensor. The bodies and control layouts are the same so the S1 II also has a built-in cooling fan to allow for longer clips lengths at the higher bit rates.

Internal recording in Apple ProRes RAW or RAW HQ is available at up to 5.8K and 17:9 (with a massive bit rate of 4.2 Gbps) or in ProRes 422 or 422HQ (at 1.9 Gbps), all at 24/25/30 fps and, not surprisingly, requiring the speed of a CFexpress memory card. However, 5.8K video can also be recorded at 48/50/60 fps with the H.265 codec and 4:2:0 colour. The full 3:2 aspect sensor area is available for 'open gate' recording at 6.0K (5952x3968 pixels) – down-scaled from the full resolution – for format flexibility (including vertical framing). There's also the option of 5.1K (5088x3392 pixels) at 3:2 if you want the faster frame rates of 48, 50 or 60 fps.

The full width of the sensor is also used for 4K UHD and DCI recording at up to 50/60 fps and with 10-bit 4:2:2 colour, and there's again the option here of using the ProRes 422 or 422HQ codecs also at up to 50/60 fps. Full HD recording is available in the ProRes, H.265 or H.264 and at fast frame rates up to 200/240 fps.

H.265 comes with the LongGOP interframe compression routine, but there's choice of this or All-Intra compression when using H.264. You can also opt for the MP4 format with 10-bit H.265 or 8-bit H.265 coding for 4K UHD up to 50/60 fps and Full HD up to 50/60 fps. Firmware Version 1.2 adds an MP4 Lite option which records at the 3:2 aspect 'open gate' and at 25/30 fps to give a much lower bit rate of 50 Mbps and consequently much smaller files.

The fastest video frame rates involve various crops depending on the resolution and frame shape – for example, 4K UHD at 100/120 fps is cropped at 1.24x and 4K DCI

at 1.17x. Notably though, the S1 II doesn't impose fps-rated crops as much as quite a few of its rivals. In practice, there's an almost bewildering choice of resolutions, aspect ratios, bitrates and codecs in various combinations running to a total of 17 pages of 'Rec Quality' menus (11 of these for the MOV options alone). No wonder then, there's a 'My List' custom menu for corraling the most-used quality settings into the one place. New is a 'Cinemascope' 2.4:1 widescreen aspect at 6K 50/60 fps or 4K 100/120 fps (without a crop). The full height of the sensor is used to deliver the 4:3 aspect ratio for use with anamorphic lenses and the camera will show a desqueezed preview.

The new 'partially stacked' sensor has Panasonic's 'Dual Native ISO' circuitry with the base ISOs set at 200 and 1600 for video using the Cinelike profiles and 640 and 5000 for V-Log recording. For video, the S1 II has 'Dynamic Range Boost' processing which, apparently, isn't the same thing as the GH7's 'DR Boost' and also works differently to the S1R II's 'Dynamic Range Expansion', but it gives a quoted 15 stops of dynamic range (compared to 14.2 stops otherwise). It gives an extra two-thirds of a stop at the highlight end with V-Log recording, but a slower sensor read-out speed means that it's only available at frame rates up to 30 fps.

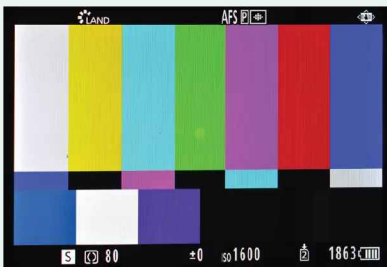
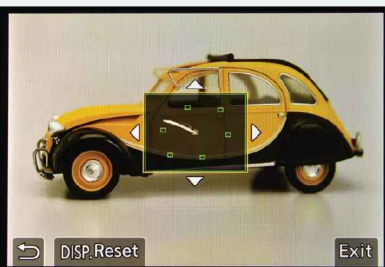
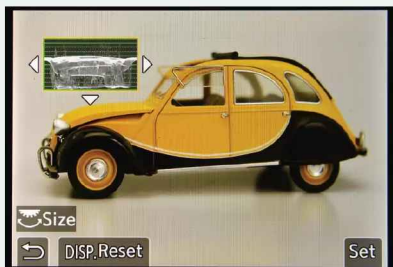
As noted in the main text, there's a choice of seven 'Photo Style' profiles for video; namely Cinelike D2, Cinelike V2, Cinelike A2, Like709, Like2100 HLG and Like2100 HLG Full Range plus the Real Time LUT option. This allows a pre-loaded LUT to be applied to V-Log footage as it's being recorded in-camera. Up to 39 LUTs can be stored in the camera which has the V-Log-to-Like709 conversion installed as standard. The new Cinelike A2 video profile is described as having a wide dynamic range and a rich gradation. It's also possible to add ARRI LogC3 support to the 'Photo Style' profiles via a paid upgrade software key.

As introduced with the S1R II, there's a false colour display which uses a B&W preview with the different brightness levels (i.e. brighter highlights and darker shadows plus the mid-tones) shown in different colours for determining exposures. The rest of the video assists are zebra patterns

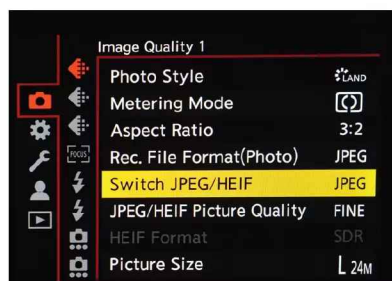
(with selectable thresholds), a wave form monitor, a vectorscope, colour bars and a 1.0 kHz test tone, a luminance spot meter, frame markers (a total of ten), and time coding (rec run/free run). On the audio side, it has built-in stereo microphones, a stereo audio input and an output (both standard 3.5 mm minijacks), manual levels adjustment (over an extended range of -18 dB to +12 dB), an attenuator and a wind-cut filter (with High and Standard settings). The S1 II records 24-bit 48 kHz audio via its built-in microphones and at the higher resolution 96 kHz with an external microphone, but there's now also 32-bit 'float' audio recording. This requires the DMW-XLR2 microphone adapter and is designed to eliminate clipped and distorted audio which often happens when there are sudden increases (or reductions) in the sound levels. It also eliminates the need to continually manually adjust the recording levels.

The image stabilisation options for video go beyond IBIS and OIS to add 'Electronic I.S.' which moves the image around on the sensor to counter camera movement. Additionally, there's a 'cropless' EIS mode which uses very edges of the frame that are cropped at output anyway to perform peripheral distortion correction so, in effect, there's no cropping associated with the electronic stabilisation. Also available is 'Boost I.S.' which is essentially designed to provide tripod-level stability when shooting handheld using a fixed view (i.e. not moving the camera). New is the addition of image stabilisation tuned to anamorphic lenses and, in fact, matched to the magnification with settings for 1.30x, 1.33x, 1.5x, 1.8x and 2.0x.

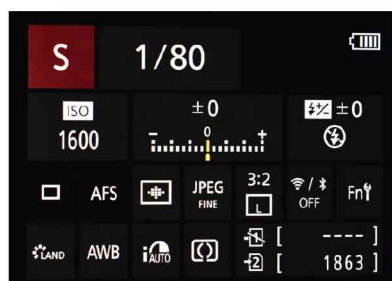
Is the S1 II an even better hybrid offering than the much-lauded S1R II? You'd have to say that it's more flexible in a number of areas given the still-limited applications for the R's 8K video capability. Besides, the 5.8 and 6.0K modes still deliver bags of image quality – but it's still outstanding with oversampled 4K – and there are just so many in-camera options for matching the recording set-up to the type of content and its end-use. Add in what can be done with cinematic looks – in-camera and custom-made – and the creative possibilities match the technical armoury.



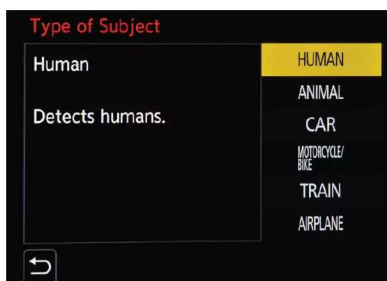
▲ Video displays include (from left) a waveform monitor which shows luminance values, a vectorscope which measures colour information, and a set of colour bars which are accompanied by a 1.0 kHz test tone.



▲ For the first time on a Lumix S model, the capture format options are expanded to include 10-bit HEIF files (using the HLG profile).



▲ Monitor-based control panel is extensive and has the convenience of touch control. Video mode has its own set of read-outs and function icons.



▲ AI-based subject detection covers six main categories, but many can multi-task. Animals, for example, covers dogs, cats and birds.



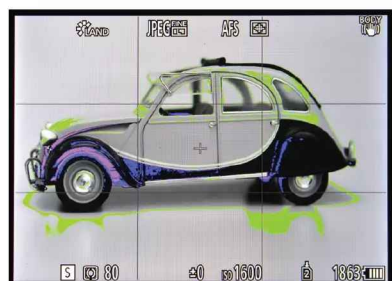
▲ Live view display is extensively customisable with elements such as a guide grid, level indicator, real-time histogram and Panasonic's 'I.S. Status Scope' which shows the degree of camera shake (the green dot is shown centred here because the camera is mounted on a tripod).



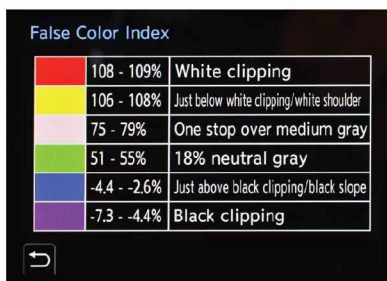
▲ 'Quick Menu' is fully customisable in terms of the 12 function tiles displayed.



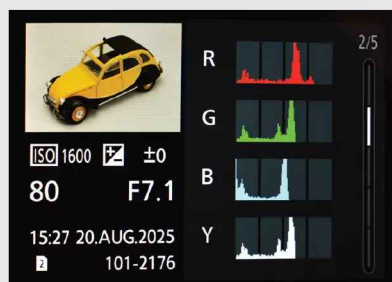
▲ 'Quick Menu' is fully customisable in terms of the 12 function tiles displayed.



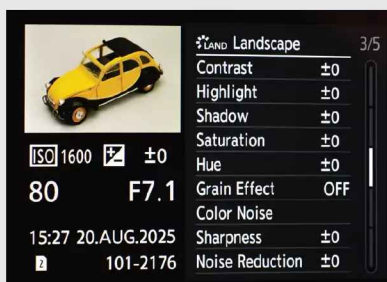
▲ As on the S1R II, a false colour display uses colours to represent the luminance levels in a scene and is another method of determining the best exposures. It can be used with both stills and video. Guide Index shows what the colours represent.



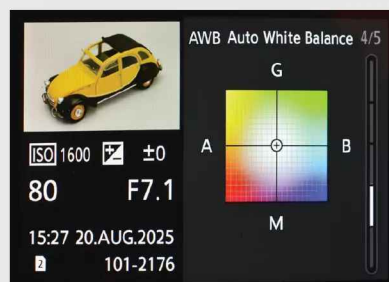
▲ Review/replay screen cycles through various sets of info in a panel at the right, including a full set of histograms, the JPEG processing settings, white balance adjustments and lens data.



multiple exposure facility allows for up to four images to be overlaid with an 'Auto Gain' function to adjust the overall exposure. Auto bracketing modes are available for exposure, aperture, focus, white balance and colour temperature settings. The exposure bracketing sequences can be



set to three, five or seven frames, while aperture bracketing is performed over three or five frames or you can select 'All' which then captures a shot at every one of the attached lens's full-stop settings. The focus bracketing is adjustable for the amount of shift (from one to ten steps) over sequences



of up to 999 frames which, of course, is likely beyond what you'll ever want. Focus stacking is now performed in-camera provided the camera has been updated with Firmware Version 1.1.

The S1 II also has the 'Live View Composite' function which is designed

THE S1R II AND S1 II HAVE A LOT IN COMMON, BUT THEIR SENSOR DESIGNS DO DELIVER SOME KEY DIFFERENCES IN PERFORMANCE WHICH WILL DEFINITELY INFLUENCE WHICH ONE IS RIGHT FOR YOUR NEEDS."

for low-light photography and has been on Olympus/OM System cameras for a very long time (where it's called 'Live Composite'). It combines a reference background exposure with subsequent multiple exposures that only add any bright light sources (such as stars) thereby avoiding any overexposure. It can run for up to three hours, and the 'Live' bit means it can be monitored in real-time in the monitor or the EVF. You can also use this procedure as a noise reduction measure when shooting with slow shutter speeds in very low light situations, and the multiple frames are subsequently merged in-camera.

Additionally, the S1 II has the 'Crop Zoom' and 'Hybrid Zoom' functions. These are a way of obtaining an effective increase in focal length – with both stills and video – by cropping the image progressively down to the medium, small and extra-small sizes at 1.4x, 2.0x and 3.1x respectively. However, it's not just a straight crop because interpolation and scaling are used to maintain resolution...which makes the feature quite useful. 'Crop Zoom' works with prime lenses while the 'Hybrid Zoom' combines optical and digital zooming into a single continuous action. After the end of the lens's optical focal range is reached, the digital 'zoom' automatically takes over.

THE EYES HAVE IT

The S1 II employs Panasonic's 'Phase Hybrid AF' autofocus and, as per the S1R II, there's 779 measuring points for phase-detection complements by 315 points for contrast-detection. The latter uses Panasonic's 'Depth-From-Defocus' (DFD) methodology, which is actually quite fast, but not as fast as PDAF which is what's needed for reliable subject tracking. The points coverage is across virtually the entire frame.

AI-based subject recognition is for humans, animals, cars, motorcycles and bicycles, aircraft, and trains. The detection for humans can recognise eyes, faces and bodies – or it can be fine-tuned to look for only eyes and faces – plus there's a new 'Urban Sports' setting which employs pose recognition for activities such as

skateboarding, breaking dancing or BMX bikes. The animal detection works with dogs, cats and birds; with the options of either eye detection or eye/body detection.

The low-light sensitivity extends down to EV -6.0 at ISO 100 and f/1.4. There's a big choice of area modes ranging in size from Pinpoint to Zone, the latter with the choice of vertical, horizontal, square or oval-shaped clusters of points which can be moved around the frame as desired. Additionally, the size of the Zones can be changed so, in the case of the oval-shaped pattern for example, it can be adjusted from just five points up to 97 points. Alternatively, a custom AF area shape can be created and up to four can be stored for future recall. The full set of 779 points is available with automatic point selection, but if you opt to do it manually, there's the choice of 1-Area or 1-Area+ modes, the latter enabling automatic point switching if the subject moves. Additionally, both the 1-Area modes can be adjusted to one of eight sizes to vary the selectivity.

When not using the subject-based tracking, an 'AF Custom Setting' menu enables fine-tuning of the tracking to suit the nature of the subject movement (i.e. speed, direction, etc.). It offers four scenarios (Set 1 to Set 4) with three adjustable parameters – AF Sensitivity, AF Area Switching Sensitivity and Moving Subject Prediction.

Manual focusing is assisted by a magnified image, a simple distance scale or a focus peaking display which has been expanded to offer a choice of ten colours and five levels of intensity. The magnified image is shown either full-screen (at up to 6.0x) or as a picture-in-picture inset panel (again up to 6.0x) and it's also available for focus confirmation when using the autofocus. Finally, 'AF+MF' operation provides a full-time manual override along with whatever means of assistance you've selected.

With supporting Lumix S lenses, the operation of the manual focusing collar can be switched between linear or non-linear. With non-linear adjustment, the amount of focus shift is governed by the rotation speed of the focus collar... in other words, if you turn it quickly, you'll make big adjustments, but turning it slowly allows for more precise control thanks to smaller degrees of adjustment. With the linear setting, the focus is shifted at a constant speed according to the rotational angle of the focus ring. In this mode, the sensitivity (i.e. the amount of focus shift per the rotational angle of the focusing collar) can be adjusted from 90 to 1080 degrees (in 30-degree increments up to 360 degrees) or set to 'Maximum'. In a nutshell, the latter allows for more uniformity of adjustment which is something video makers often require when using focusing creatively.

As across the entire Lumix S range, exposure control is driven by sensor-based metering which has 1728 measuring points with the choice of multi-zone, centre-weighted average, highlight-weighted average and spot measurements. The standard set of 'PASM' exposure control modes are supplemented by a fully automatic 'Intelligent Auto' mode which performs automatic scene detection for portraits, portraits with pets, landscapes, close-ups, night portraits, night scenery, food, sunsets and low-light situations.

The focal plane shutter has a speed range of 60-1/8000 with flash sync up to 1/250 second and a 'B' bulb setting for long exposures of up to 30 minutes. The sensor-based shutter extends the fastest speed to 1/16,000 second and enables totally silent and vibration-free operation. As always, there's the hybrid 'Electronic First Curtain Shutter' which starts the exposure electronically and finishes it with the FP shutter's second curtain. The fastest available speed with EFCS is 1/2000 second,



▼ Dual memory card slots are for CFexpress Type B and SD UHS-II speed devices.



TEST IMAGES

Test images captured as JPEG/large fine files, shutter-priority automatic exposure control, the Vivid 'Picture Style', Leica Monochrome and Real Time LUT (Like709 profile) presets, and ISO settings between 100 and 800. Lumix S 24-60mm f/2.8 and Lumix S 100-500mm f/5.0-7.1 OIS zooms.

The out-of-the-camera JPEGs exhibit accurate colours with good neutrality across the spectrum, including in the skin tones and the more subtle shades. Great definition ensures crisply rendered fine details and the tonal gradations are very smooth from the brighter highlights through to the darker shadows. The dynamic range is excellent and maintained at the higher ISO settings by the sensor's 'Dual Native ISO' circuitry

but it permits the use of electronic flash. Compared to using the FP shutter alone, it will also reduce both noise and vibration, but not completely. External units sync via a Hotshoe only.

The white balance correction options start with a choice three auto settings called AWB, AWBc and AWBw. The latter two either, respectively, reduce or maintain the warmer tones when shooting under incandescent lighting. Alternatively, there are five lighting presets, provisions for creating up to four custom WB measurements and for storing up to four colour temperature settings, selected from an adjustment range of 2000 to 10,000 degrees Kelvin. Fine-tuning is available for all WB settings and, as noted earlier, there is auto bracketing for both white balance and colour temperature. New to the S1 II is AI-assisted auto white balance control for RAW files processed in-camera (i.e. to JPEGs or HEIFs) which,

in particular, is designed to ensure more accurate colours in scenes with mixed lighting sources.

IN THE HAND

The next-gen Lumix S1 models all share the same smaller and lighter weight body than the previous series – closer now to the S5 II duo in size – but you still wouldn't call them compact. That said, they're certainly not the beefiest full frame mirrorless cameras on the market, and a bit of extra real estate works well in terms of both a well-spaced control layout and the handling with longer, heavier lenses. There's a well-sized handgrip which is very comfortable to hold and enables good manoeuvrability. All the dials and control wheels are a good size too, as are the main function buttons which, to Panasonic's credit, are also all well marked so you aren't left wondering – or, indeed, trying to remember – what does what.

The control layout is organised for optimum functionality and efficiency whether using the dials and buttons, the touch screens or a combination of both. As on all the S1 models, directly behind the shutter release is the all-important 'Holy Trinity' of function buttons for white balance, ISO and exposure compensation. They're perfectly placed for speedy on-the-fly adjustments as are both the front and rear input wheels. Video start/stop is via a dedicated button with an anodised red finish, and there's another one on the camera's front panel.

The top panel's main dials are for selecting the exposure modes and the drive modes which includes the self-timer options and the multi-shot high-res mode. Around the base of the latter is the selector – introduced with the S1R II – for quick switching between the photo and video modes and with a third setting for the 'S&Q' (Slow & Quick) variable frame rate video shooting... for slowmo or overspeed

sequences. Both these dials can be locked at their various setting positions.

The real panel controls are also mostly oversized and include a joystick-type controller – now eight-way in its operation rather than just four-way – and a combined control wheel/keypad. The focusing mode selector is another good-sized control has the AF area selector button set in the middle.

This being a Panasonic mirrorless camera, the customisation options are extensive with dedicated control set-ups for both capture and playback (and stills and video). A total of 20 external controls – or their various actions such as in the case of the multi-directional joystick and Control Dial – are customisable plus there's a set of five customisable 'Touch Tabs' located down the right-hand edge of the monitor screen. In most cases, the choice of user-assignable functions is extensive and it can all look a bit of a challenge at first, but most of the changes – if you make any at all – will be set-and-forget.

The monitor-based 'Quick Menu' is also extensively customisable with the 12 assignable function tiles again populated from a very long list of options. There are dedicated 'Quick Menus' for photo and video, plus the display style can either be full screen or combined with the live view image. The customisable 'My Menu' can be up to three pages (giving a total of 24 items), and five custom camera set-ups can be assigned to the C1-C5 positions on the main mode dial.

Furthermore, both the viewfinder and monitor displays can be customised with a number of elements, including a dual-axis level gauge, a real-time histogram, a grid guide (selected from a choice of three), a blinking highlight warning, zebra patterns for the same thing and Panasonic's 'I.S. Status Scope' display. This comprises two concentric circles in the middle of the

NO NEED FOR SPEED? TRY THE LUMIX S1 IIE

If you like pretty well all the features and functions that are on offer in the Lumix S1II, but really don't need 70 fps continuous shooting or the very high video bit rates, then take a look at the S1 IIE. The 'E' apparently stands for 'Essentials', but it could also stand for 'Economy' as you'll save over a grand on this model versus the S1 II. It has exactly the same bodyshell, rugged all-metal construction and control layout, but the sensor is a conventional BSI-type CMOS rather than a 'partially stacked' imager. The effective resolution is 24.2 megapixels – so high-res pixel-shifting capture still gives you a 96 MP file – but the top shooting speed is now 'only' 30 fps. That's still plenty quick enough for a great

many applications and it's available with full AF/AE adjustment and with RAW capture too. The S1 IIE also gets the 10-bit H1EF capture mode and the additional 'Urban Sports' AF subject recognition mode.

On the video side, you don't really lose out on too much with the top spec still being 6K 'open gate' recording at 6000x4000 pixels and 24/25/30 fps with 10-bit 4:2:0 colour. Again, up to 50/60 fps is possible with the 5.8K/5.9K cropped aspects and the S1 IIE also gets the extra-

wide 'Cinemascope' aspect ratio. There's the same choice of codecs – i.e. H.264, H.265 and ProRes 422/422HQ – plus internal 12-bit ProRes RAW/RAW HQ recording. The 4K DCI/UHD frame rates

also max at 50/60 fps, but for Full HD, the fastest speed for slowmo effects is 100/120 fps. The Firmware Version 1.1 upgrades for the S1 II are also available for the S1 IIE.

The price difference is quite significant so it's going to be worth carefully considering what you really need – versus what just might be nice to have – if you're looking at Panasonic's new full frame L mount offerings. The Panasonic Lumix S1IIE sells for \$4199 body only





ISO 50



ISO 100



ISO 200



ISO 400



ISO 800



ISO 1600



ISO 3200



ISO 6400



ISO 12800



ISO 25600



ISO 51200



ISO 102400



ISO 204800

ISO RANGE

The S1 II's sensor has a sensitivity range equivalent to ISO 100 to 51,200 with extensions either side to ISO 50 and 102,400 and 204,800. It has a dual-gain output – the low-gain for enhanced sensitivity and the high-gain for lower noise – with the base ISOs set at 100 and 800 for stills, 640 and 5000 for V-Log video, and 200 and 1600 for video with the Cinelike A2, D2 and V2 video colour 'Picture Style' profiles. As a result, noise levels are reduced at the higher ISO settings to the benefit of both sharpness and dynamic range.

These test images were captured as JPEG/large/superfine files with the aperture set to f/11 and the exposure time varied to compensate for the ISO adjustments. High ISO and Long Exposure noise reduction are switched off. Lumix S 24-60mm f/2.8 zoom.

screen within which a green dot jumps around to show just how much the camera is deviating from the lens's optical axis. Even when you think that you're holding the camera absolutely steady, you'll be surprised at how much the green dot is still moving around. There are also dedicated video displays including a waveform monitor, a vectorscope, colour bars a false colour image which is another way of determining exposure levels for video, but

can be equally useful when shooting stills.

A 'Night Mode' setting dims both the EVF and monitor displays by applying a red filter over everything so that your night vision isn't compromised. To achieve exactly the opposite, a 'Live View Boost' function brightens the monitor display so it's easier to see when shooting in very low light situations.

The touch screen implementation includes the 'Quick Menu' tiles, the main

menus, the replay/review functions, and various autofocusing operations, including direct point/zone selection and 'Touch Pad AF' to enable the same when using the EVF. This can be set to either Exact or Offset; the latter with a choice of seven settings enabling the AF point/zone to be moved via a dragging action within a prescribed area on the touch screen.

The monitor itself is a 7.62 cm TFT LCD panel with a resolution of 1.84 megapixels

and it's adjustable for both tilt and swing when flipped out from the camera back, but can also be tilted up and down on the camera back. The display is adjustable for Brightness, Contrast, Saturation, Red Tint and Blue Tint. You can also manually adjust the backlighting or set it to Auto so it will adjust itself according to the ambient light levels.

The EVF which is a 1.0 cm OLED panel with 5.76 megadots resolution and 0.78x magnification (with a 50mm lens). The refresh rate can be switched between 60 fps or 120 fps, but black-out free viewing is only available at shooting speeds up to 10 fps.

The review/replay displays include a split screen showing a thumbnail along with basic capture info on one side, and a set of five scrollable info panels on the other. These cycle through additional capture data (such as the white balance, image format and 'Photo Style' preset), a set of RGB and brightness histograms, the 'Photo Style' parameters, the white balance mode with any fine-tuning settings, and the lens details including any manually applied in-camera corrections.

Importantly for video users, the S1 II has a full-size (i.e. Type A) HDMI connection and a 10 Gbps-speed USB Type C port. Power comes from the 2200 mAh DMW-BLK22 battery pack (that's also used in the S5 II models) and which here is good for around 350 shots per charge. In-camera battery charging – and powering – via USB C is available, and the S1 II is compatible with DMW-BG2 battery grip which was introduced with the S1R II. This adds a second battery pack which can be 'hot swapped' as the camera will automatically switch to its battery.

The wireless connectivity options comprise both the 2.4 and 5.0 GHz WiFi bandwidths, and Bluetooth LE version 5.0: with the Lumix Lab app allowing for remote camera control from a smartphone or tablet as well as file transfers and now the post-camera application of LUTs. Additionally, the

S1 II also supports the 'Frame.io Camera to Cloud' cloud service so high-res images and video clips can be directly and immediately uploaded to Adobe's Frame.io software platform (but you'll need to create an account first).

Tethered shooting via USB C is enabled with the Lumix Tether app, but as with the S1R II, it's also possible using the Capture One image editing software which is a big plus for studio shooters in terms of a more efficient workflow. Via the Firmware Version 1.1 upgrade, tethering can also be wirelessly via WiFi or a USB-LAN adapter.

The sturdy body construction employs diecast magnesium alloy front and rear frames with sealing against dust or moisture, and insulation for shooting in subzero temperatures down to -10 degrees Celsius. And, as far as overheating is concerned, Panasonic taking no chances with its high-bit-rate hybrids, so the S1 II also has a built-in fan for sensor cooling during long video sessions. Similar to both the S1R II and S5 II, the fan is in front of the EVF housing with the inlet vent located above the lens mount and the outlet vents on either side.

Another commendable preventative measure enables the shutter to be set to automatically close over the sensor when the S1 II is switched off. This greatly reduces the likelihood of issues with dust getting into the camera body when you're changing lenses.

SPEED AND PERFORMANCE

Loaded with a SanDisk Extreme Pro 128 GB CFexpress Type B memory card and using the focal plane shutter, the S1 II captured a burst of 120 JPEG/large/fine frames in 11.3 seconds, giving a shooting speed of 10.6 fps. Switching to the sensor shutter – again at the JPEG/large/fine quality setting – a burst of 180 frames was captured in 2.577 seconds which works out at 69.85 fps. The test image files averaged 11.3 MB in size.

We've already seen the latest version of Panasonic's hybrid AF system at work in the S1R II and so, not surprisingly, it puts in a good performance here too, even at the faster maximum shooting speed.

Overall, the autofocus is responsive, lightning fast and a very accurate. The subject tracking is exceptionally reliable and can handle both smaller-sized objects and erratic movements in terms of



THE CONTROL LAYOUT IS ORGANISED FOR OPTIMUM FUNCTIONALITY AND EFFICIENCY WHETHER USING THE DIALS AND BUTTONS, THE TOUCH SCREENS OR A COMBINATION OF BOTH."

rapid changes in both direction and in speed. The low light/contrast AF performance is also excellent, maintaining responsiveness with fast, locked-on tracking. Aside from when using the useful list of recognised subjects, there's plenty of scope for fine-tuning the tracking in other situations and for tailoring the AF area to better suit a particular subject or situation.

Twenty-four megapixels on a full frame sensor is already proven to give a good balance of resolution, sensitivity and dynamic range. The bigger pixels have a higher signal-to-noise ratio which is always a good starting point for enhanced performance at higher ISO settings. The out-of-the-camera JPEGs from the S1 II deliver an accurate colour reproduction with good neutrality across the spectrum, including the skin tones and more subtle shades. There's excellent definition with crisply rendered fine details along with very smooth tonal gradations from the brighter highlights to the darker shadows. There's also lots of scope for playing with the visual dynamics of an image with the built-in 'Photo Styles' and the ever-expanding possibilities of the custom LUTs.

The dynamic range is also excellent and is helped at the higher ISO settings by the sensor's 'Dual Native ISO' circuitry. The dual base ISOs at 100 and 800 for still photography represent a three stops improvement in the noise characteristics at the higher sensitivity settings (i.e. above ISO 800). Consequently, there's very little fall-off in either the definition or the saturation up to ISO 12,800, and only slight falloffs at ISO 25,600 or even 51,200. In practice, the entire native sensitivity range is in play as the colour saturation remains good all the way through, as does the overall sharpness. Inevitably, the extensions to ISO 102,400 and 204,800 exhibit visible softening of the edges to the detriment of overall sharpness, although the colour reproduction still holds up pretty well. Overall, the noise reduction processing for JPEGs is well-judged, balancing sharpness and grain very nicely



▲ Monitor screen has tilt and swing adjustments.

PANASONIC LUMIX S1 II ON TRIAL

which is maintained through to the higher ISOs.

The extra dynamic range – especially at the base ISOs – ensures that the RAW files have plenty of exposure latitude so you can underexpose to preserve the highlights and the shadows can be subsequently brightened quite a bit with post-camera processing without noise becoming particularly noticeable.

THE VERDICT

With exactly the same body, control layout and base feature set along with very similar pricing, you might think that the Lumix S1R II and the S1 II are too close for comfort, but there are key differences which set them apart. There's no doubt both are power-packed hybrid mirrorless cameras which work effectively for photography and video-

making, but both have particular strengths.

It's tempting to assign the higher-res S1R II as being more photo-orientated and the faster S1 II as more suited to videographers by virtue of having higher frame rates and more aspect ratio options, including widescreen. Yet the 24 megapixels 'partially stacked' full frame sensor has notable benefits for photography too, even if 70 fps might be just a bit OTT for many users. It balances detailing and dynamic range, enhances high ISO performance and keeps file sizes more manageable. It is undoubtedly more of an all-rounder as a stills camera, but everybody benefits from the efficient ergonomics, logical controls, snappy autofocus and an ever-expanding choice of creative looks. There's also the growing system of L mount lenses with not just Panasonic's tastier recent offerings

– the compact 100-500mm telezoom, for example – but also those from Sigma and, if you have the budget, Leica too.

The trio of Mark II S1 models certainly put Panasonic back in the game in terms of top-end full frame hybrid mirrorless cameras and with some key features that the competition doesn't offer (especially for video). These cameras are premium priced too, but that fabulous old-school design, reassuringly solid construction and an unmatched feature set mean that you get a lot of camera for your money. The S1 II's sensor-related attributes – chiefly faster shooting with reduced rolling shutter artefacts for both stills and video – makes it even more of a value proposition. The Lumix S system is really coming of age. 📸

VITAL STATISTICS



PANASONIC LUMIX S1 II **\$5,299** body only, recommended retail price

Type: Enthusiast-level and semi-professional digital mirrorless camera with L bayonet lens mount.

Focusing:

- Automatic hybrid phase/contrast-detection system ('Phase Hybrid AF') with 779 PDAF points and 315 CDAF points.
- Contrast detection AF via Depth-From-Defocus (DFD) calculations.
- Manual switching between one-shot and continuous AF modes, the latter with auto tracking.
- Four 'AF Custom' sets for fine-tuning subject tracking with three parameters – AF Sensitivity, AF Area Switching Sensitivity and Moving Subject Prediction.
- AI subject detection for Humans (Eye/Face, Eye/Face/Body, Urban Sports), Animals (Birds, Dogs or Cats – Eye or Eye/Body), Cars, Motorcycles/Bicycles, Trains and Aircraft.
- Area modes for Zone (Vertical/Horizontal), Zone (horizontal/vertical/central), 1-Area, 1-Area+Supplementary and Pinpoint.
- Adjustable 1-Area point switching speed. 'AF Point Scope' for active point/zone enlargement (up to 6.0x).
- AF assist via magnified image (up to 6.0x), either full image or picture-in-picture.
- Sensitivity range is EV -6.0 - 18 (ISO 100 and f/1.4). AF assist provided by built-in illuminator.
- Manual focus assistance via magnification (either full image or picture-in-picture, up to 6.0x), distance scale and focus peaking displays (Light Blue, Dark Blue, Yellow, Orange, Light Green, Dark Green, Pink, Red, Violet, White; and five levels of intensity).
- Non-linear or linear manual focus control with supporting lenses.
- 'Touchpad AF' via the touch screen for AF point/zone selection when using the EVF.
- AF micro-adjustment for individual lenses.

Metering: 1728-point multi-zone, centre-weighted average, highlight-weighted average, spot and TTL flash. Metering range is EV 0 to 18 (ISO 100 and f/2.0).

Exposure Modes: Continuously variable program with shift, shutter-priority auto, aperture-priority auto, metered manual, 'Intelligent Auto' (with automatic scene detection (nine modes), TTL auto flash and TTL flash).

Shutter: Electronic, vertical travel, metal blades,

60-1/8000 second plus 'B' (up to 30 minutes). Flash sync to 1/250 second. Sensor shutter has a speed range of 60-1/16,000 second plus B (up to 60 seconds). Hybrid 'Electronic First Curtain' shutter has a speed range of 60-1/2000 second plus 'B' (up to 30 minutes). Shutter delay timer (1, 2, 4 or 8 seconds). Exposure compensation up to +/-5.0 EV in 1/3-stop increments. Shutter delay timer (1, 2, 4 or 8 seconds).

Viewfinder: OLED EVF type with 5.76 megadots resolution. Coverage = 100% vertical/horizontal. Magnification = 0.78x. Refresh rate switchable between 60 and 120 fps. Eyepiece strength adjustment built in. Auto/manual switching between EVF and monitor screen. 7.62 cm TFT LCD monitor with 1.84 megadots resolution, tilt/swing adjustments and touch controls. Monitor screen is adjustable for brightness, contrast, saturation, red tint and blue tint. Night Mode red 'filter' for both EVF and monitor.

Flash: No built-in flash. External flash units connect via Hotshoe or PC terminal.

Additional Features: Magnesium alloy body sealed against dust, moisture and sub-zero temperatures down to -10 degrees Celsius; AE/AF lock, auto exposure bracketing (three, five or seven frames and up to +/-1.0 EV adjustment per frame), multi-mode self-timer (2 and 10 second delays, one or three shots, or custom set delay time), shutter delay timer (up to eight seconds), switchable exposure adjust increments (0.3 or 1.0 EV), audible signals, silent mode, auto power-off, wired remote trigger.

DIGITAL SECTION

Sensor: 24.1 megapixels (effective) partially stacked BSI-type CMOS with 35.8x23.8 mm imaging area and 3:2 aspect ratio. An optical low-pass filter is fitted. Sensitivity equivalent to ISO 100-51,200 (extendable to ISO 50, 102,400 and 204,800).

Focal Length Magnification: None.

Formats/Resolution:

- Two compression settings for JPEG and HEIF (HLG) capture, RAW output (lossless compression) and RAW+JPEG capture.
- Four resolution settings at 3:2 aspect ratio: 6000x4000, 4272x2848, 3024x2016 and 1920x1280 pixels.
- Four resolution settings at 4:3 aspect ratio: 5328x4000, 3972x2848, 2688x2016 and

1712x1280 pixels.

- Four resolution settings at 16:9 aspect ratio: 6000x3368, 4272x2400, 3024x1704 and 1920x1080 pixels.
- Three resolution settings at 1:1 aspect ratio: 4000x4000, 2848x2848, 2016x2016 and 1280x1280 pixels.
- One resolution setting at 65:24 aspect ratio: 6000x2208 pixels.
- One resolution setting at 2:1 aspect ratio: 6000x3000 pixels.
- Four resolution settings with 'APS-C' format capture at 3:2 aspect ratio: 3984x2656, 2880x1920, 2064x1376 and 1920x1280 pixels (4:3, 16:9 and 1:1 aspect ratios also available).
- 24-bit RGB colour for JPEGs, 30-bit RGB colour for HEIF files, 42-bit RGB colour for RAW files.

Video Recording:

- MOV format (Apple ProRes RAW HQ/RAW) at 5760x3040 pixels (5.8K); 30, 25 or 24 fps (up to 4.2 Gbps) and 17:9 aspect ratio (requires CFexpress Type B memory card). At 4096x2160 pixels (4K DCI); 60, 50, 30, 25 or 24 fps (up to 4.2 Gbps) and 17:9 aspect ratio (requires CFexpress Type B memory card).
- MOV format with 10-bit 4:2:2 colour (Apple ProRes 422 HQ/422, and All-Intra compression) at 5760x3040 pixels (5.8K); 30, 25 or 24 fps (up to 1.9 Gbps) and 17:9 aspect ratio. At 4800x3600 pixels (4.8K); 30, 25 or 24 fps (up to 1.9 Gbps) and 4:3 aspect ratio (anamorphic). At 4096x2160 pixels (4K DCI); 60, 50, 30, 25 or 24 fps (up to 1.9) and 17:9 aspect ratio. At 3840x2160 pixels (4K UHD); 60, 50, 30, 25 or 24 fps (up to 1.8 Gbps) and 16:9 aspect ratio. At 1920x1080 pixels (Full HD) at 120, 100, 60, 50, 48, 30, 25 or 24 fps (up to 901 Mbps) and 16:9 aspect ratio
- MOV format with 10-bit 4:2:0 colour (HEVC/H.265 codec and LongGOP compression) at 5952x3968 pixels (6.0K); 30, 25 or 24 fps (200 Mbps) and 3:2 aspect ratio ('open gate' recording using the full frame area). At 5952x2512 pixels (6.0K); 60, 50, 30, 25 or 24 fps (up to 300 Mbps) and 2.4:1 aspect ratio ('Cinemascope' widescreen). At 5888x3312 pixels (5.9K); 60, 50, 48, 30, 25 or 24 fps (up to 300 Mbps) and 16:9 aspect ratio. At 5760x3040 pixels (5.8K); 60, 50, 48, 30, 25 or 24 fps (up to 300 Mbps) and 17:9 aspect ratio. At 5088x3392 pixels (5.1K); 60, 50, 48, 30, 25 or 24 fps (up to 300 Mbps) and 3:2 aspect ratio ('open gate' recording using the full frame

- area). At 4800x3600 pixels (4.8K); 60, 50, 48, 30, 25 or 24 fps (up to 300 Mbps) and 4:3 aspect ratio (anamorphic). At 4096x2160 pixels (4K DCI); 120, 100, 60, 50, 48, 30, 25 or 24 fps (up to 300 Mbps) and 17:9 aspect ratio. At 4096x1728 pixels (Cs4K); 120, 100, 60, 50, 48, 30, 25 or 24 fps (up to 300 Mbps) and 2.4:1 aspect ratio ('Cinemascope' widescreen). At 3840x2160 pixels (4K UHD); 120, 100, 60, 50, 48, 30, 25 or 24 fps (up to 300 Mbps) and 16:9 aspect ratio. At 1920x1080 pixels (Full HD) at 120 or 100, 60, 50, 48, 30, 25 or 24 fps (up to 150 Mbps) and 16:9 aspect ratio.
- MOV format with 10-bit 4:2:2 colour (MPEG 4 AVC/H.264 codec and ALL-Intra or LongGOP compression) at 4096x2160 pixels (4K DCI); 120, 100, 60, 50, 48, 30, 25 or 24 fps (up to 800 Mbps ALL-Intra, up to 200 Mbps LongGOP) and 17:9 aspect ratio.
 - At 4096x1728 pixels (Cs4K); 120, 100, 60, 50, 48, 30, 25 or 24 fps (up to 800 Mbps ALL-Intra, up to 200 Mbps LongGOP) and 2.4:1 aspect ratio ('Cinemascope' widescreen).
 - At 3840x2160 pixels (4K UHD); 120, 100, 60, 50, 48, 30, 25 or 24 fps (up to 800 Mbps ALL-Intra, up to 200 Mbps LongGOP) and 16:9 aspect ratio.
 - At 1920x1080 pixels (Full HD) at 240, 200, 120, 100, 60, 50, 48, 30, 25 or 24 fps (up to 800 Mbps ALL-Intra, up to 200 Mbps LongGOP) and 16:9 aspect ratio.
 - MOV format with 8-bit 4:2:0 colour (MPEG 4 AVC/H.264 codec LongGOP compression) at 4096x2160 pixels (4K DCI); 60, 50, 48, 30, 25 or 24 fps (up to 150 Mbps) and 17:9 aspect ratio. At 4096x1728 pixels (Cs4K); 60, 50, 48, 30, 25 or 24 fps (up to 150 Mbps) and 16:9 aspect ratio. At 1920x1080 pixels (Full HD) at 60, 50, 48, 30, 25 or 24 fps (up to 50 Mbps) and 16:9 aspect ratio.
 - MP4 format with 10-bit 4:2:0 colour (HEVC/H.265 codec and LongGOP compression) at 3840x2160 pixels (4K UHD); 60, 50, 30, 25 or 24 fps (up to 100 Mbps) and 16:9 aspect ratio.
 - MP4 format with 8-bit 4:2:0 colour (MPEG 4 AVC/H.264 codec and LongGOP compression) at 3840x2160 pixels (4K UHD); 60, 50, 30, 25 or 24 fps (up to 100 Mbps) and 16:9 aspect ratio. At 1920x1080 pixels (Full HD) at 60, 50, 30, 25 or 24 fps (up to 28 Mbps) and 16:9 aspect ratio. Unlimited clip durations.
 - 'APS-C' cropped shooting available in 3.3K 4:3 aspect (anamorphic), 4K DCI 17:9 aspect, 4K UHD 16:9 aspect and Full HD 16:9 aspect in MOV format and ProRes 422HQ, ProRes 422, H.265 and H.264 codecs; or in MP4 4K UHD (H.265/H.264) and Full HD (H.264).
 - Built-in stereo microphones with adjustable sound levels, level limiter, gain level adjustment and wind noise canceller. Stereo audio input (for mic-level and line-level) and output. 48 or 96 kHz 24-bit sound recorded in both the MOV format. Optional DMW-XLR2 microphone adapter provides two XLR microphone inputs (giving four channel audio) with 32-bit 'float' level adjustment with 48/96 kHz for two channel stereo and 48 kHz for four channel monaural.

Video Features:

- Built-in cooling fan, dual on/off record buttons, front and rear tally lamps, time lapse movies, stop motion animation, proxy recording (with MOV format and up to 4K DCI res),
- 'Crop/Hybrid Zoom' (up to 2.1x with 4K and 4.2x with 2K), external video recording to SSD via USB C (including Apple ProRes RAW HQ and RAW at 5.8K with 10-bit 4:2:2 colour up to 30 fps [up to 4.2 Gbps] and ProRes 422 HQ/422 at 5.7K up to 60 fps [up to 1.9 Gbps], and at 4K DCI up to 120 fps [up to 1.9 Gbps]);
- variable frame rates for 5.9K, 5.8K, 4K DCI/UHD

and FHD recording with 10-bit colour (5.9K = 60 fps maximum sensor output to 24/25/30 fps, C4K/4K = 120 fps maximum sensor output to 24/25/30/50/60 fps, FHD = 120 fps maximum sensor output to 24/25/30/50/60 fps),

- anamorphic recording with desqueezed previews, 'EIS' electronic image stabiliser, 'Boost EIS', anamorphic lens IS, red frame recording indicator, blue frame streaming indicator,
- Webcam video streaming (USB C up to 4K at 25/30 fps, WiFi up to FHD at 50/60 fps), USB tethering (up to 4K at 50/60 fps),
- 'Dynamic Range Boost' processing, master pedestal level (for setting black level, 31 steps), knee control (Like709 colour mode), luminance level adjustment (8-bit and 10-bit), wave form monitor/vector scope, false colour display, colour bars, luminance spot meter, synchro scan, time coding with Rec Run and Free Run modes,
- Atomos AirGlu wireless timecode sync support, colour bars (SMPTE, EBU and ARIB standards), 1.0 KHz test tone, SS/Gain (Shutter Duration/ISO, Angle/ISO, Shutter Duration/DB), zebra patterns (two types with adjustable thresholds), synchro scan, centre marker, V-Log/V-Gamut recording;
- 'Cinelike' A2, D2 and V2 gamma profiles; HLG HDR, Like709 – gamma curve/knee control,
- V-Log View Assist, HLG View Assist (for Like709), LUT View Assist,
- VariCam-style video info display, adjustable headphone volume.

HDMI Output: ProRes RAW HQ or RAW to supporting Atomos or Blackmagic external recorders, ProRes 422 HQ/422, H.265 and H.264 codecs. 6.0K 3:2 with 10-bit 4:2:0 colour and 30, 25 or 24 fps. 5.9K 16:9 with 10-bit 4:2:0 colour and 30, 25 or 24 fps. 5.7K 17:9 with 10-bit 4:2:0 colour and 60, 50, 48, 30, 25 or 24 fps, 4K DCI 17:9 with 10-bit 4:2:2 colour and 60, 50, 30, 25 or 24 fps. 4K UHD 16:9 with 10-bit 4:2:2 colour and 60, 50, 30, 25 or 24 fps. 4K UHD 16:9 with 10-bit 4:2:2 colour and 60, 50, 30, 25 or 24 fps. Full HD 16:9 with 10-bit 4:2:0 colour and 120, 100, 60, 50, 30, 25 or 24 fps.

Recording Media: Dual slots for CFexpress Type B and SD with UHS-II and Video Speed Class 90 support.

Continuous Shooting: Around 300 JPEG/large/fine frames, 200 RAW frames or 180 HEIF frames at up to 10 fps using the focal plane shutter with continuous AF/AE adjustment. Around 180 JPEG/large/fine frames, 180 RAW files or 170 HEIF files at up to 60 fps (image quality priority) or 70 fps (speed priority) using the sensor shutter with continuous AF/AE adjustment. A 30 fps shooting speed is available via Firmware Version 1.2. Medium speed continuous mode captures at 5.0 fps and low speed continuous capture at 2.0 fps using either the FP shutter or the sensor shutter. Pre-shot capture buffer using the sensor shutter at 30, 60 or 70 fps for 0.5, 1.0 or 1.5 seconds or shutter at 60 or 70 fps for 0.5, 1.0 or 1.5 seconds.

White Balance: TTL measurement. Three auto modes (neutral, maintain warmer tones or reduce warmer tones), five lighting presets and four custom WB settings. White balance compensation (amber-to-blue and/or green-to-magenta) in all presets, and white balance bracketing over three frames. Manual colour temperature setting from 2500 to 10,000 degrees Kelvin with four custom settings. AI AWB adjustment for in-camera RAW processing.

Interfaces: USB Type C (USB 10 Gbps), HDMI (Type A), 3.5 mm stereo audio input, 3.5 mm stereo audio output, 2.5 mm wired remote input.

Additional Digital Features:

- Sensor-shift five-axis image stabilisation with up to 8.0 stops of correction at frame centre (up to 7.5 stops with 'Dual I.S. 2' which operates along with lens-based optical stabilisation),

- four/eight-shot 'High Resolution' capture (JPEG, RAW or RAW+JPEG, 48 or 96 MP with hand-held or tripod modes, motion correction processing, shutter delay and in-camera compositing),
- tethered shooting via Capture One software,
- sensor cleaning,
- 'Light Composite' mode,
- dual-axis level display,
- grid guides (choice of three),
- digital zoom (up to 4.0x),
- Adobe RGB and sRGB colour spaces,
- 21 'Photo Style' presets (Standard, Vivid, Natural, L. Classic Neo, Flat, Landscape, Portrait, Monochrome, L. Monochrome, L. Monochrome D, L. Monochrome S, Leica Monochrome, Cinelike A2, Cinelike D2, Cinelike V2, Like709, V-Log, 'Real Time LUT' facility [up to 39 can be uploaded], Like2100 Hybrid Log Gamma, Like2100 Full Range),
- ten user-defined 'My Photo Style' presets, adjustable 'Photo Style' parameters (Contrast, Highlight, Shadow, Colour Saturation, Colour Tone, Hue, Filter Effect, Grain Effect, Colour Noise, Sharpness, Noise Reduction, Dual Native ISO, Sensitivity, White Balance and LUT, LUT 1, LUT 2), LUT Opacity, LUT Opacity 1, LUT Opacity 2),
- eight filter effects (Expressive, Retro, Old Days, High Key, Low Key, Sepia and Bleach Bypass), simultaneous recording with and without the filter effect, auto bracketing functions (exposure, aperture, focus – up to 999 frames – and white balance),
- focus stacking,
- 'Intelligent Dynamic' processing (Off, Low, Standard, High, Auto),
- intervalometer (up to 9999 frames), stop motion recording for animation,
- 'Crop/Hybrid Zoom' (up to 3.1x), 'Quick Menu' control screen with customisation,
- multiple exposure facility (with overlay and auto exposure adjustment),
- manual lens corrections (Vignetting Compensation and Diffraction Compensation),
- long exposure noise reduction (On/Off),
- customisable 'My Menu' (24 items),
- luminance/RGB histogram displays,
- highlight alert,
- adjustable image display time,
- auto image rotation, slide show (with variable display times and background music),
- playback zoom (up to 16x), zoom from AF point/zone, 12 or 30 thumbnail displays,
- thumbnail calendar display,
- in-camera editing/processing (RAW-to-JPEG and RAW-to-HEIF conversion),
- resize, rotate, rating, protect, video divide),
- picture sort modes (file name or date/time),
- WiFi (2.4 and 5.0 GHz bands) and Bluetooth 5.0 (LE) wireless connectivity,
- integrated Frame.io to Cloud support.

Power: One 7.2 volt/2200 mAh rechargeable lithium-ion battery pack (DMW-BLK22 type). In-camera recharging and powering is via USB C. Optional DMW-BG2E battery grip adds a second battery pack.

Dimensions (WxHxD): 134.3x102.3x91.8 mm body only

Weight: 718 grams body only (without battery or memory card).

Price: \$5299 body only. \$6799 with Lumix S 24-105mm f/4.0 Macro OIS zoom lens. Panasonic Australia offers an extended five-year warranty (two year standard warranty plus an additional three years) on Lumix camera bodies sold by an authorised Panasonic Australia reseller.

Distributor: Panasonic Australia, telephone 132 600 or visit www.panasonic.com.au

LEICA M EV1

REPORT BY PAUL BURROWS



VIEWING PLEASURE

It's happened. There's a Leica M camera without the M bit. The traditional messsucher has given way to an electronic viewfinder. The rest of the M EV1 is still a classic Leica M so how do the old and the new get along?

Here's a controversial thought to kick off with. Optical viewfinders really are a thing of the past, and the EVF is very much the present and also the future. OK, so the RF-OVF is now labelled an 'experience' because it's different – and, of course, Leica's famous viewfinder/rangefinder arrangement is truly a piece of photographic heritage – but it's nowhere nearly as convenient to use or as informative as a good, high-resolution EVF. Fujifilm

offers its hybrid arrangement on the X100 and the X-Pro series cameras, but it would be interesting to know how many users switch to the EVF and simply leave it there. You could be forgiven for thinking that Leica might have gone down the hybrid route which would probably been less controversial, but instead it's gone all the way with live view which is telling in itself.

If you've become accustomed to the luxuries of an EVF, the OVF 'experience' can be a strange one to say the least.

▲ External dimensions and classic styling are unchanged from the RF-equipped M11 models as is the construction which – like the other black paint versions – comprises a diecast aluminium chassis with milled aluminium top and bottom covers.

Leica devised – and then steadily refined – its *messsucher* rangefinder viewfinder to deliver something better than what was available at the time, but over time new technologies have also come up with something better... much better, especially for a camera like a digital Leica M. Of course, you're still going to be able to buy the rangefinder versions just as you can still buy a 35mm Leica M. It's worth remembering that Leica has kept building film models after the first digital cameras and, indeed, long before the M6 was revived. Right now you can choose from four M11 digital RF models and three 35mm film models... so the M EV1 certainly isn't the end of the world even if you are an out-and-out purist. What it is, though, is a way into the M system for people who aren't

out-and-out purists, but like the idea of the heritage and history mixed with just a little more modern-era convenience.

The biggest advantage of the EVF here is that you see exactly what the lens sees regardless of its focal length... which is a very big plus with M mount ultra-wides and telephotos. The optical viewfinder in the M11 bodies has a field-of-view just slightly wider than that of the 28mm focal length. The LED brightline frame pairs are for 35mm and 135mm, 28mm and 90mm, and 50mm and 70mm. Anything wider than 28mm requires a dedicated optical finder which is fitted to the hotshoe mount. In practice, this is a pretty awkward arrangement and, at the other end of the focal range, the frames for 90mm and 135mm are quite small which also makes framing and composition more of a challenge. With the exception of the M11-D, the M11s do have a live view feed to their monitor screens, but since this is a fixed panel it can be difficult to use in bright lighting conditions or when there are reflections. No matter which way you look at it – pun half intended – the M EV1's EVF makes a whole lot of sense on many levels.

Perhaps not surprisingly, the EV1's finder is the same 5.76 megadots resolution OLED panel as is used in the Q3 and SL3



THE RF-OVF IS NOW LABELLED AN 'EXPERIENCE' BECAUSE IT'S DIFFERENT, BUT IT'S NOWHERE NEARLY AS CONVENIENT TO USE OR AS INFORMATIVE AS A GOOD, HIGH-RESOLUTION EVF"



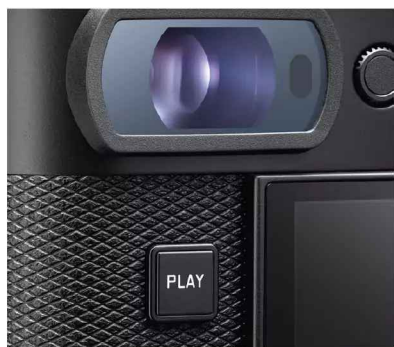
▲ Rear control panel is unchanged from the M11 and M11-P so it's simplicity itself. Monitor screen is fixed and has a toughened 'Gorilla Glass' anti-scratch faceplate.

models. It has a magnification of 0.76x, a refresh rate of 60 fps and is adjustable for brightness either manually or automatically based on the ambient light levels. As on any contemporary mirrorless camera, you can choose to use only the EVF, only the monitor screen or have the camera automatically switch between the two using a proximity sensor in the viewfinder's eyepiece (which is adjustable for sensitivity). The eyepiece also incorporates a strength adjustment accessed via a small pop-out wheel alongside and with a range of -4.0 to +2.0 dioptres.

Apart from the fact that the EVF relays the angle-of-view of any lens – a big advantage with one of our favourites, the Voigtlander Ultra-Wide Heliar 12mm f/5.6 – it also has the various live view display components that were previously only seen in the monitor. Leica calls them "Capture Assistants" and you can configure up to four 'Info Profile' screens with whichever set of elements you want, selected from an 'Info Bar', a guide grid (either 3x3 or 6x4), a highlight warning (with a selectable

clipping point), a focus peaking display (in red, green, blue or white and either low or high sensitivity), a dual-axis level indicator and a real-time histogram. You can have them all in one screen or, if you like a cleaner view, cycle through one or more displays as you've configured them. The EVF will also provide previewing of exposure, white balance and colour plus, of course, also a captured image for review or replay. What's more, given there's only manual aperture control on an M mount lens so it's always stop-down metering, you also get continuous depth-of-field previewing too. Additionally, the effects of any filters fitted to the lens can also be gauged.

The biggest change operationally is to the focusing which is still manual, but you're now guided by a magnified image or the just-mentioned focus peaking display. The monitor's touch screen allows you to pick a point on the subject on which to centre the magnified image, switchable between 5x and 10x. You can then move the focus point around in the EVF using the four-way navigator keypad on the camera's back



▲ Eyepiece is similar in design to the Q3's and incorporates a proximity sensor for auto switching between the EVF and the monitor. Strength adjustment applied via the pop-out wheel seen to the right.



▲ Classic shutter speed dial is also a milled metal component. Sensor-based shutter extends the fastest shutter speed to 1/16,000 second.



▲ Shutter release retains the traditional cable release socket.

panel. However, there's no 'touch pad' operability as such so you can't move the focus point or the magnified area from the touch screen while using the EVF. Electronic image stabilisation activates with the magnified image to keep it steadier and help make it easier to determine sharp focus, especially with longer focal length lenses.

While some people say the focus peaking display can be a distraction, it works well in any lighting – the red or white edging tends to be the most effective – and makes it a lot easier to gauge focus and, since you're seeing the whole frame, also the depth-of-field.

It's worth noting here that the M EV1 can recognise the attached lens via Leica's 6-bit optical coding system – read via a sensor in the camera's mount – and this information is recorded in an image file's metadata. It also has built-in profiles for both Leica M and R mount lenses (the latter fitting via an adapter) for applying selected in-camera corrections, most notably for vignetting.

NEW, BUT THE SAME

Wisely perhaps, apart from the EVF (which is, nevertheless, a very big change indeed), Leica hasn't messed with the rest of the digital M camera formula beyond some small revisions to the external control layout which we'll get to shortly. On the inside, though, virtually nothing changes from the standard M11.

Consequently, M EV1's sensor is the same 60.3 megapixels (effective) BSI-type CMOS used across the M11 family and which incorporates an ultra-thin dual-layer IR/UV filter glass designed to ensure the acute-angle light rays all pass through rather than being reflected, thereby enhancing both the corner sharpness and the colour reproduction.

The sensitivity range is equivalent to ISO 64 to 50,000 and the maximum image size is



▲ Accommodating the EVF module meant that the ISO dial – on the left side the RF models' top plate – had to go.

9504x6320 pixels for JPEGs and 9528x6328 pixels for RAW capture. There are two smaller image sizes, but no compression level settings which is Leica's way of asking do you really want less image quality? As always with all Leica's digital cameras, the RAW files are captured in the Adobe DNG format with 14-bit RGB colour. The sensor is mated with Leica's 'Maestro III' processor and a 3.0 GB buffer memory. Continuous shooting is at 4.5 fps for a burst of up to 100 JPEGs or 15 RAW files. There's a slow speed mode which runs at 3.0 fps. As per the rest of the M11 family, the M EV1 is exclusively a tool for photography.

As per the standard M11, the M EV1 has 64 GB of internal memory supplemented by a memory card slot for SD devices and which provides UHS-II speed support.

The exposure metering is sensor based and there's also the option of using a sensor shutter as well as the hybrid 'electronic first curtain shutter' configuration. There's a choice of four metering patterns – multi-zone, centre-weighted average, highlight-weighted average and spot. As since the film-era M7, the exposure modes are aperture-priority auto or manual with the overrides for the former being up to +/-3.0 EV of compensation which can be set in 1/3,

2/3 or full stop increments. The focal plane shutter has a speed range of 60 minutes to 1/4000 second plus 'B' and 'T' for even longer exposures (there's still a cable release socket in the shutter button). Flash sync is up to 1/180 second. The sensor shutter has a speed range of 60-1/16,000 second. Exposure bracketing is available over three or five frames again with up to +/-3.0 EV of adjustment, but you can shift it up or down to give either +6.0 EV or -6.0 EV and also

THE BIGGEST ADVANTAGE OF THE EVF IS THAT YOU SEE EXACTLY WHAT THE LENS SEES REGARDLESS OF ITS FOCAL LENGTH... WHICH IS A VERY BIG PLUS WITH M MOUNT ULTRA-WIDES AND TELEPHOTOS."



▲ Battery incorporates its own cover with the same safety release arrangement as on the SL and Q series cameras.



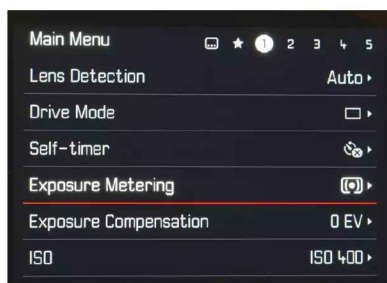
▲ Front panel still has the RF brightness window, but on the M EV1 it houses the self-timer's countdown LED. Smaller round window alongside is the ambient light sensor that determines the auto brightness adjustments for the EVF and the monitor display.



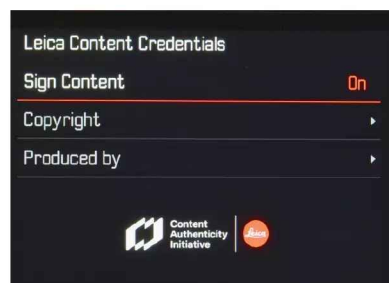
▲ Hotshoe has contacts for Leica's flash units but, logically, unlike with the M11, you now can't fit the Visoflex 2 accessory EVF.



▲ Monitor-based 'Quick Menu' display/control panel offers the speed and convenience of touch screen access for both the exposure settings and the function tiles.



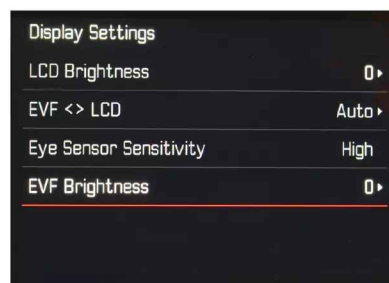
▲ Menu system is logically arranged and easy to navigate. With just five main pages, you won't get lost and everything is easy to find.



▲ Following the M11-P which introduced the feature, the M EV1 offers Content Credentials to encrypt metadata in an image file which confirms its authenticity. Subsequently, any changes to that file will also be recorded using technology created by the Content Authenticity Initiative (CAI).



▲ Five 'Film Style' profiles are available for JPEG capture. Adjustable parameters are for contrast, sharpness and colour saturation.



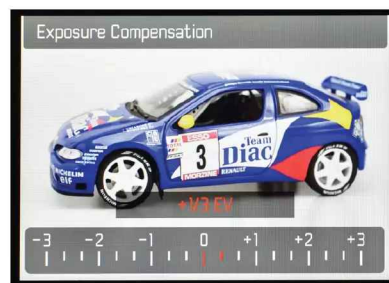
▲ EVF-related submenu settings are obviously new. You can use the finder and the monitor separately or set auto switching between the two.



▲ Live view screen elements include a real-time histogram, guide grids and dual-axis level indicator. You can have them all in one display or in separate displays and, of course, in both the EVF and the monitor. Focus peaking in red is also shown here.



▲ Review/replay screen includes a brightness histogram and basic capture info.



▲ Exposure compensation setting scale overlay is shown when this function is selected from the main menu. Adjustments can be in 1/3, 2/3 or full stop increments.

combine it with the exposure compensation setting so you can extend even further up 9.0 EV in either direction. Will you ever need this? Probably not.

The white balance control options comprise auto correction, a selection of eight lighting presets, a custom measurement (which Leica calls a 'Grey Card'... as in the good old days of determining colour balance), and manual colour temperature setting over a range of 2000 to 11,500 degrees Celsius. However, there's a new option called 'White Balance

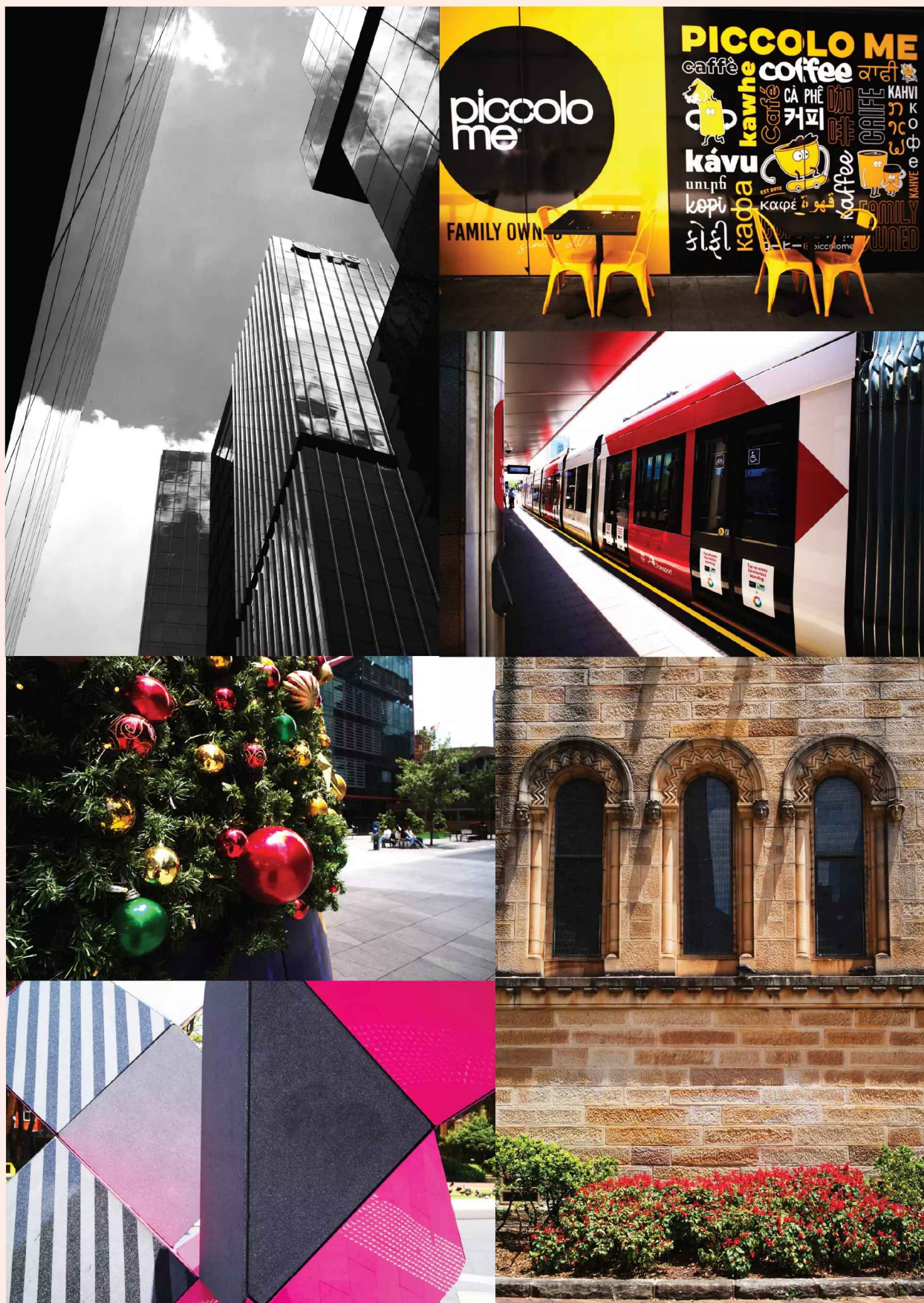
Adjustment' which allows for fine-tuning of the colour balance along the green-to-magenta and blue-to-yellow axes. Once set, this adjustment will apply to everything, but you can switch it on and off as desired.

ESSENTIAL ELEMENTS

In terms of the in-camera processing options, the M EV1 still adheres to Leica's das wesentliche philosophy... which essentially means just stick to the essentials. So, there's a choice of five 'Film Style' presets which are Standard, Vivid, Natural, Mono-

chrome and Monochrome High Contrast. The colour modes are adjustable for contrast, sharpness and saturation; while the B&W ones have the first two parameters. Perhaps deliberately, there isn't access to the 'Leica Looks' that are available for the Q3 and SL3 series models.

You can also adjust the noise reduction for JPEGs over three settings and, as mentioned earlier, there are three image size settings. One of these is obviously the full effective resolution of 60.3 megapixels, but the two smaller options employ Leica's





ISO RANGE

As with the previous colour M11 models, noise is very well managed up to ISO 12,500 and, although some chroma noise is evident at ISO 25,000, this setting is still useable and retains pretty good definition. These images are JPEG/large files taken using the aperture-priority auto exposure mode with the aperture set to f/11 so the exposure time varies to compensate for the ISO adjustments. Noise Reduction is switched off. Leica Summilux-M 50mm f/1.4 ASPH.

TEST IMAGES

Test images captured as JPEG/large files using the Vivid and Monochrome High Contrast 'Film Style' profiles, and with the Leica Summilux-M 50mm f/1.4 ASPH and Voigtlander Ultron 21mm f/1.8 Aspherical. With 60 megapixels of resolution on tap, there are exceptional levels of detailing with super-crisp definition and beautifully smooth tonal gradations. Vivid profile delivers a pleasing level of saturation while still maintaining the subtler shades.



'Triple Resolution Technology' to give a resolution of either 36.5 or 18.4 megapixels, but without a crop so there's no increase in the attached lens's effective focal length. It works by grouping sets of pixels together which also gives an increase in the dynamic range of up to one stop and a reduction in noise that's equivalent to two stops. Additionally, there's also the convenience of the small file sizes when it comes to image processing and storage.

Alternatively, there are two 'Digital Zoom' settings which equate to 1.3x or 1.8x and deliver, again, 36 or 18 megapixels, but now with a conventional crop of the full frame image so the effective focal length increases accordingly. These 'Digital Zoom' settings

are again available with either JPEG or RAW capture, but with the latter the full size image is still recorded (i.e. the crop is only tagged in the metadata for when the file is processed post-camera).

There's an intervalometer which can be programmed for up to 9999 frames, and the camera's self-timer has the option of either two- or 12-second countdowns. Additionally, the handy 'Perspective Control' feature from the original M11 is also on the menu, and corrects JPEGs in-camera for the converging or diverging verticals which occur when the camera is tilted up or down. This function generates a frame in live view which adjusts in real time to show you exactly how the image will be cropped as it's processed.

IN THE HAND

The replacement of the rangefinder viewfinder with the EVF brings a few visual changes – most notably the absence of the OVF window on the front of the camera – but the M EV1 still looks and feels very much like a classic Leica M camera. It's actually 45 grams lighter than the standard black M11, but still has the traditional heft and precision fit. As per the other models in a black finish, the construction combines a magnesium alloy chassis with machined aluminium top and bottom covers.

Accommodating the EVF has meant ditching the physical ISO dial so sensitivity adjustment is now only via the monitor's 'Quick Menu' control screen or the main menu. The lever on the front panel which allowed the brightline frame pairs to be previewed in the optical finder is retained, but now has different functions depending on whether it's flicked left or right. However, logically, Leica has kept the options here related to focusing and framing – namely the focus aids and the digital zoom settings... the latter with frame indicators that look exactly like the classic brightline ones which is a nice touch.

The rear panel control layout is unchanged from the RF models and comprises the aforementioned four-way navigator key pad with a centre 'enter' button, an input wheel – which also has a press-in action that serves as another multi-function control, but has exposure compensation as the default – and a trio of keys accessing the menu system, image replay and a third multi-function option. These can be used to assign the functions that's you'll most likely need in the field such as the ISO and WB settings. The 'Quick Menu' control screen comprises touch tiles for a total of 12 functions such as the metering patterns, white balance modes, drive modes (which include the self-timer, intervalometer and exposure bracketing),

capture settings and Leica FOTOS connection. It also displays all the exposure settings – again adjustable via touch controls – along with info such as the battery power level and the available data storage capacity.

The M EV1's monitor screen is again fixed with a resolution 2.33 megadots and, like the EVF, is adjustable for brightness with the option of an auto adjustment based on the ambient lighting conditions.

The replay/review image includes a brightness histogram and a highlight warning plus there's a zooming function and two thumbnail pages displaying either 12 or 20 images.

The USB C connection is tucked away at one end of the baseplate – alongside the battery/card compartment – and allows for in-camera battery recharging as well as direct access to the internal memory. It also serves as a wired connection to an Apple iPhone (or iPad) for remote camera control, image transfer and a live view feed using the Leica FOTOS app. Of course, you can also do this via WiFi – and the M11-P has both the 2.4 GHz and 5.0 GHz bands – but the hard-wired route is both quicker and more stable (although it requires a dedicated cable). Bluetooth 'always on' wireless connectivity is also available.

The M EV1's battery compartment arrangement is the same as that on the other M11 models (and also SL and Q series cameras) so the compartment cover is actually part of the battery and unloading is a two-stage process. A locking lever releases the pack, but it won't drop out of the compartment until you press on the cover back in slightly which depresses a sprint-loaded lug, enabling the battery to be fully withdrawn. The memory card slot is in the same compartment which means the battery always has to come out first. The 1800 mAh BP-SCL7 lithium-ion battery pack is now good for only around 245 shots as both the finder and the monitor chew up

WISELY PERHAPS, APART FROM THE EVF – WHICH IS, NEVERTHELESS, A VERY BIG CHANGE – LEICA HASN'T MESSED WITH THE REST OF THE DIGITAL M CAMERA FORMULA."

power. This is down from around 700 shots for the M11 and M11-P when using their optical viewfinders.

Following the M11-P, the M EV1 has 'Content Credentials' using the Content Authenticity Initiative (CAI) technology which encrypts digital provenance information in the image files captured by the camera. Subsequently, the authenticity of these images can be verified at any time using a freely-available, open-source CAI tool. This means that ownership and copyright details can't be tampered with and, any subsequent editing, is recorded so, for example, a photographer can prove that an image is exactly as it was taken by the camera (particularly important for some major photo competitions). Any changes made after capture – even basic edits such as cropping or exposure adjustments – is added to the secure CAI data and so is there for all to see. Leica was first, but more camera makers are getting on-board as well as organisations that use images such as newspapers and press agencies. Ultimately, the goal is that any image published online will have a traceable history which will show what, if anything, has changed since it was taken to reveal any alterations, manipulation or AI-generated elements.

SPEED AND PERFORMANCE

With a SanDisk Extreme PRO 64 GB SDXC UHS-II memory card loaded, the Leica M EV1 recorded a burst of 20 JPEG/large frames in 4.439 seconds which gives a continuous shooting speed of spot on 4.5 fps. The file sizes for this test averaged 24.5 MB.

Not surprisingly, the image performance is the same as that of the colour

M11s which means, at full resolution, exceptional levels of detailing with crisp definition and silky smooth tonal gradations. With JPEG capture, the Standard 'Film Style' profile delivers the classically Leica punchy contrast with true-to-life colours,



while the Monochrome High Contrast setting does exactly what it says on the label, again creating the distinctive Leica B&W 'look'. Of course, the unique optical quality of the Leica M lenses – a result of the carefully-curated in-house glass formulations – is also making an important contribution here.

The 'Film Style' parameters obviously allow for the adjustment of contrast and saturation, but we did most of our testing using the Vivid profile which gives a very pleasing colour reproduction across the spectrum without ever looking excessive.

Even at the two lower resolution settings – thanks to the pixel binning approach – the image quality remains truly excellent and here the definition further benefits from the inherent reduction in noise while the increased dynamic range is particularly noticeable in the enhanced shadow detailing.

The high ISO performance is excellent



so very nearly the full native sensitivity range is in play. The noise reduction processing for JPEGs balances sharpness and saturation very nicely all the way up to ISO 12,500. There's some chroma (colour) noise evident at ISO 25,000, but the definition is still good so this setting is still useable if you aren't planning to make very big enlargements (or are shooting in B&W).

The wide dynamic range delivers plenty of exposure latitude when shooting in RAW, giving plenty of scope for increasing detailing in the brighter highlights or the darker shadows without noise becoming an issue.

THE VERDICT

If you've never used a Leica M camera before, but really like the idea of being part of what is still a pretty exclusive family – with some very illustrious members over the decades – then the M EV1 is the one for you. It's still a distinctly Leica prestige camera in terms of its looks, build quality,

handling and largely manual operation, but it has all the EVF-derived user-friendliness when you hold it up to your eye.

Given how much of the heritage and mystique of the M series is tied up with the RF OVf, it was undoubtedly a brave move for Leica to produce a model with an EVF, but use the M EV1 and it quickly all makes sense. Far from detracting from the M camera experience, the EVF actually enhances it. The real essence of usage and operation are still there, but the enjoyment of the traditional elements is greatly enhanced by the conveniences and efficiencies delivered by the EVF.

Let's face it, the rangefinder viewfinder has been a bit of an anachronism since the popularisation of 35mm SLR with its through-the-lens viewing and focusing, hence its promotion ever since as an 'experience'. But if you want to experience what's really the most important aspect of a Leica M camera – the remarkable optical characteristics and performance of the lenses – the EVF provides a smoother and much more user-friendly route to this objective. Certainly, keep the *messsucher* for the film models, but a digital M simply works a whole lot better with an EVF. 📷

VITAL STATISTICS



LEICA M EV1 \$13,990

body only, recommended retail price

Type: RF-style full frame digital camera with interchangeable lenses using Leica M-bayonet mount (with contacts for 6-bit coding for lens ID).

Focusing: Manual via image magnification (5x or 10x) or focus peaking display (red, green, blue or white colours, and high or low sensitivity).

Metering: TTL using the image sensor with multi-zone, centre-weighted average, highlight-weighted or spot measurements, and TTL flash metering using the imaging sensor with centre-weighted average measurements.

Exposure Modes: Aperture priority auto and metered manual.

Shutter: Electronic focal plane, vertical travel, metal blades. 60 minutes to 1/4000 second plus 'B' and 'T' (up to 60 minutes). Flash sync up to 1/180 second. Sensor shutter has a speed range of 60-1/16,000 second. Hybrid 'electronic first curtain shutter'. Exposure compensation of up to +/-3.0 EV in 1/3-stop increments.

Viewfinder: OLED-type EVF with 5.76 megadots resolution, 0.76x magnification and 60 fps refresh rate. Adjustable for brightness manually and with auto brightness control. Auto/manual switching between EVF and monitor screen. Fixed 7.5 cm LCD monitor with 2.33 megadots resolution and scratch-resistant 'Gorilla' glass faceplate. Adjustable for brightness manually and with auto brightness control.

Flash: No built-in flash. External flash units sync via hotshoe.

Additional Features: Diecast magnesium bodyshell with aluminium top and bottom covers sealed for

dust protection and shower proofing auto exposure bracketing (over three or five frames, up to +/-3.0 EV adjustment), AE lock, dual-mode self-timer (two or 12 second delays), audible signals, auto power off, cable release socket.

DIGITAL SECTION

Sensor: 60.3 million pixels (effective) BSI-type CMOS with 23.9x35.8 mm imaging area. No optical low-pass filter. Sensitivity equivalent to ISO 64-50,000.

Focal Length Increase: None.

Formats/Resolution:

- Three JPEG resolution settings: 9504x6320, 7392x4896 and 5248x3472 pixels.
- Three RAW (Adobe DNG) resolution settings: 9528x6328, 7416x4928, 5272x3498 pixels. RAW+JPEG capture. 24-bit RGB colour for JPEGs, 42-bit RGB colour for RAW DNG files.

Recording Media: One slot for SD/SDHC/SDXC memory cards. UHS-II speed support. Internal memory has 64 GB storage capacity.

Video Recording: No video recording capabilities.

Continuous Shooting: Over 100 JPEG/large frames at 4.5 fps or 15 RAW DNG files. Low speed shooting at 3.0 fps.

White Balance: Auto correction with eight presets, one custom setting, white balance adjustment (green-magenta, blue-yellow), manual colour temperature setting (2000 to 11,500 degrees Kelvin).

Interfaces: USB Type C and flash hotshoe.

Additional Digital Features: Content Authenticity Initiative (CAI) secure metadata, live view, intervalometer (up to 9999 frames), five 'Film Style' presets (Standard, Vivid, Natural, Monochrome and Monochrome High Contrast), adjustable 'Film Style' parameters (Contrast, Sharpness and Saturation), digital zoom (1.3x and 1.8x, equivalent to 35mm and 50mm focal lengths), 'Extended Dynamic Range' dynamic range expansion processing for JPEGs (Off, Medium, High), Perspective Control (On/Off, with real-time framing), real-time histogram, highlight warning (with adjustable clipping), guide grid (choice of 3x3 or 6x4), dual-axis level indicator, automatic long exposure noise reduction, user-defined custom 'Favourites' menu, six 'User Profile' memories, battery power level display, card/internal memory space displays, brightness histogram with playback, adjustable image review time, 12/20 thumbnail displays, playback zoom, copyright information, sensor cleaning, WiFi (2.4 or 5.0 GHz bands) and Bluetooth 4.2 LE wireless connectivity, Apple MFi support via USB C (requires dedicated cable).

Power: One 7.4 volt, 1800 mAh rechargeable lithium-ion battery pack (BP-SCL7 type). In-camera recharging available via USB C.

Dimensions (WxHxD): 139.0x80.0x38.5 mm.

Weight: Body only = 413 grams body (without battery).

Price: Body only = \$13,990. Black finish.

Distributor: Leica Camera Australia Pty Ltd, telephone (03) 9248 4444 or visit <https://au.leica-camera.com> To purchase online go to <https://leica-store.com.au>



◀ Voigtlander Bessa (1937). The first Bessa model appeared in 1929 and there were subsequently many variants through to the early 1950s. The standard format was 6x9cm, but many models came with masks to give 6x4.5cm frames. Shown here is the basic model from a 1937 update and which was for the 6x9cm format only with a folding frame viewfinder.

The Voigtlander name is one of the oldest in optics and photography. It all began back in 1756 when Johann Christoph Voigtlander established a business in the Austrian capital, Vienna, to make precision instruments such as compasses and sundials. The son of a carpenter, Johann Christoph was born in the eastern German city of Leipzig in 1732, and his engineering skills earned him recognition from Austria's Empress Maria Therese, enabling him to operate under royal decree and hence largely without any competition.

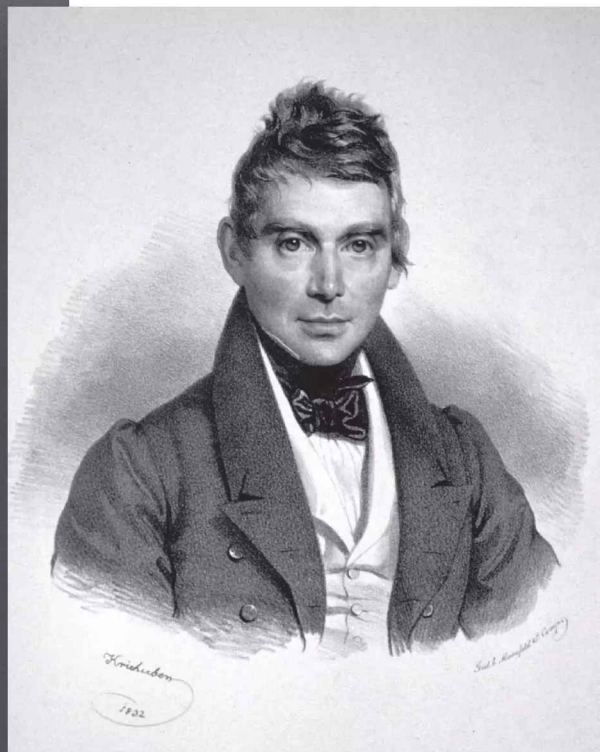
After Johann Christoph's death in 1797, his youngest son, Johann Friedrich (1778 – 1857), took the opportunity to tour the leading optical workshops in Germany and England, gathering ideas for new products and acquiring new skills. In 1808, he established Friedrich Voigtlander, Optik & Mechanik which made optical products – initially opera glasses and the lenses for spectacles and monoculars – proving to be a very successful enterprise.

▼ Johann Friedrich Voigtlander (1778 – 1857), portrayed in a lithograph by Josef Kriehuber from 1832.

THE NAME BEHIND THE CAMERA

JOHANN CHRISTOPH VOIGTLÄNDER

You know the brand name and you probably know some of the history behind it, but what about the people who made it happen? In this series we're looking at the personalities who, through often courageous decisions, got us to where we are in photography today. In this profile, three generations of the Voigtlander family built a company that became one of Germany's leading makers of cameras and lenses. Its origins date all the way back to the mid-19th century.





▲ Voigtlander Vitessa T (1956). The Vitessa line of metal-bodied 35mm rangefinder cameras was introduced in 1950 and the early models had a fixed 50mm lens, but the T introduced the DKL bayonet mount and there was a choice of four lenses – 35mm f/3.4, 50mm f/2.8, 100mm f/4.8 and 135mm f/4.0.



▲ Voigtlander Vitomatic IIa (1960). The Vitomatic models were compact, but very solidly-built 35mm rangefinder cameras and first introduced in 1958. The first models had a coupled selenium cell meter while later versions (from 1967) adopted a CdS meter. The IIa had a faster top shutter speed than the II (1/500 second versus 1/300 second) while there was also a run of models with a faster f/2.0 speed 50mm Ultron lens, but the camera shown here has the more common f/2.8 Skopar.

In 1837, Johann Friedrich handed the business on to his son, Peter Wilhelm Friedrich Ritter von Voigtlander (1812 – 1878), who moved the company's optical expertise into making binoculars, field glasses and telescopes. The third-generation Voigtlander was also keen to become involved in the new medium of photography which, in the early 1840s, was rapidly growing in popularity. Subsequently, he collaborated with the Hungarian mathematician Josef Petzval to produce the world's first "computer designed" lens (i.e. with an optical a design based on mathematical principles). Petzval's four-element 147mm portrait lens had a maximum aperture of f/3.6 which was incredibly fast for 1840... enabling typical exposure times to be reduced by a factor of ten to around a couple of minutes (although still a long time for a portrait sitter to keep still).

Voigtlander then devised an equally innovative camera to compliment it – the 1841 Ganzmetall Kamera – which was the world's first all-metal design – it was made from brass with a tube-like body design – and employed a rack-and-pinion focusing mechanism. It was also one of the very first Daguerreotype cameras outside of the famous Louis's own constructions. The Daguerreotype process was first demonstrated

in 1839, so Voigtlander was very quick off the mark.

Focusing On Optics

In 1849, Voigtlander opened a branch in the northern German town of Braunschweig (near the city of Hannover) – then one of the leading centres of technology in Europe – and subsequently relocated entirely there from Vienna in 1862. From around 1850, the emphasis at Friedrich Voigtlander & Sohn switched to exclusively making optical products, including cameras and lenses. In 1866, the company again earned royal recognition with Peter Wilhelm Friedrich receiving the Austrian equivalent of a knighthood, bestowed on him by the Emperor Franz Joseph I.

Over the following decades, Voigtlander expanded into one of the world's major manufacturers of cameras and lenses. The range of products was extensive and included 'folders' (i.e. bellows-type designs), rigid bodied models in many configurations, and stereo cameras. The famous Bessa name was first used in 1929 on a 6x9cm format self-erecting 'folder' model which could also take 6x4.5cm frames when a supplied mask was inserted – doubling the number of exposures obtainable from a 120 roll.

Extremely portable, but also very capable with a high-quality lens, the Voigtlander Bessa became immensely popular for applications from portraiture to landscapes. Indeed, its zone focusing had three settings – Landscape, Group and Portrait. Notably too, Voigtlander maintained metal bodies. In 1935, the Bessa RF was introduced with a couple rangefinder

for focusing, a choice of 105mm f/3.5-speed lenses and a Compur-Rapid shutter with a top speed of 1/400 second. The Bessa rollfilm line continued until 1956 over the 27 years of production there were numerous versions and it made Voigtlander one of the world's leading camera makers.

The first Brilliant series 6x6cm model

▼ Peter Wilhelm Friedrich von Voigtlander (1812 – 1878) portrait photo on daguerreotype by Swiss painter and pioneering photographer Johann Baptist Isenring, taken around 1843.



“The Voigtlander name is one of the oldest in optics and photography, and dates all the way back to 1756.”



▲ Voigtländer VSL 3-E (1978). After Voigtländer was acquired by Rollei, the name was used a number of 35mm SLRs which were built in the latter's Singapore factor. The VSL 3-E had much in common with the Rolleiflex SL 35 E (including the QBM bayonet lens mount) and the Voigtländer Color-Ultron 50mm f/1.8 standard lens was a rebadged Rollei HFT Planar 50mm f/1.8 made by Zeiss.



▲ The Bessa name was revived by Japanese camera-maker Cosina on a line of 35mm rangefinder cameras, firstly with the Leica L39 screw mount and then the M bayonet fitting as on the R2 model from 2002. Cosina has used the Voigtlander brand under licence since 1997.

Voigtländer And Rollei – The Tale Of Two Brands

When Voigtländer passed fully into the hands of Rollei-Werke Franke & Heidecke GmbH in 1974, it was more than just the completion of a business transaction. In 1920, a German engineer and inventor named Reinhold Heidecke set up a business in the city of Braunschweig with his business partner, Paul Franke.

This operation had the snappy title of Werkstatt für Feinmechanik und Optik, Franke & Heidecke, and its first product was a stereo camera designed by Heidecke. He'd also been working towards a twin lens reflex (TLR) rollfilm camera which finally came to fruition in 1929 as the first Rolleiflex. In many versions and variants, the Rolleiflex survived for 70 years, the camera of choice for countless amateurs and professionals. Yet it could so nearly have been a Voigtländer product.

Back in 1905, Heidecke joined Voigtländer to start a new camera design department and was keen to pursue some of his design ideas. In 1909, Paul Franke arrived at Voigtländer to work in the company's sales office, and became very interested in Heidecke's concept for a twin-lens camera... initially devised to work upside-down for photographing over the top of a wartime trench. However, after a couple of years Franke left Voigtländer to run a camera store – very successfully as it happens – and, as hard as he tried, Heidecke couldn't convince management to pursue his design. At the end of first World War, Heidecke redesigned his TLR for general photography and re-presented the idea to Voigtländer who again rejected it, this time because of the cost of the new tooling (a major concern in Germany's shattered post-war economy). Heidecke decided to manufacture the camera himself and, after his application for a loan was rejected by the bank, he wrote to Paul Franke requesting his help with funding. Franke invested 75,000 marks of his own money and attracted another 200,000 marks from investors, enabling the



▲ The Rolleiflex TLR stayed in volume production for over 50 years.



▲ Advertisement for Rollei cameras dating from the 1920s.

Rolleiflex to become a reality.

Neither man was alive to see Rollei acquire Voigtländer – Paul Franke died in 1950 aged only 60 and Reinhold Heidecke died in 1960 aged 79 – but no doubt they would have seen the irony of it. Rollei went on to fail financially as well, although the venerable Rolleiflex TLR carried on through various company rescues and restructurings and was still available new up until 2014. If Voigtländer had decided to put some faith in Heidecke's camera, things might have turned out very differently indeed.

“From around 1850, the emphasis at Friedrich Voigtländer & Sohn switched to exclusively making optical products, including cameras and lenses.”

appeared in 1931. It looked a lot like a twin lens reflex (TLR), but was actually essentially just a box camera albeit again with a metal body. From 1937, the Brilliant V6 had a Bakelite body – a material briefly popular with a number of camera makers, including Kodak – and, in 1938, the Focusing Brilliant was introduced which was now a proper TLR with a focusing lens coupled to the main lens via a gear wheel. The previous models all used zone focusing ‘guesstimation’.

Vito, Vitessa, Vitrona

The first Voigtländer compact 35mm camera was launched in 1939 and the Vito – now known as the Vito I – featured a collapsible, side-hinged lens mounted on bellows and with a Compur leaf shutter. The second World War limited production and the Vito I was subsequently re-issued in 1947, now with a Prontor shutter.

The Vito III from 1951 was the first model with an integrated rangefinder-viewfinder and had a drop-bed mechanism for the collapsible lens. Concurrently, there was a line of rigid-lens Vito 35mm models which ran from 1954 to 1968 and were designed either

▼ The Voigtländer brand lives on today on a range of high-quality, but comparably affordable manual focus prime lenses made by Cosina. Here is the super-fast Voigtländer Nokton 50mm f/1.0 Aspherical VM in the Leica M mount.



▲ The grave of Peter Wilhelm Friedrich Ritter von Voigtländer at Braunschweig in the German region of Lower Saxony. The Voigtländer company was based here from 1862 until it was taken over by Rollei – also based in the town – in 1974.

B or C series (from 1959), with the higher-end versions having a rangefinder and built-in metering (initially selenium cell and then, later, CdS). Other post-war camera lines were Vitessa (from 1953), Dynamatic (from 1960) and the Vitrona (1964) which was the world's first 35mm camera with a built-in electronic flash. It was powered by batteries housed in a pistol grip. Another notable first came in 1959 with the Voigtländer Zoomar 36-82mm f/2.8... the first commercially-available zoom lens for 35mm still cameras. It employed a 14 element/11 group optical design and was initially available in the Voigtländer Bessamatic and Exakta mounts, and later with the M42 screwthread fitting. Voigtländer built around 15,000 Zoomars over a period from 1959 to 1968.

The first Bessamatic 35mm SLR was introduced in 1958 and, like the rival Zeiss-Ikon Contaflex, employed leaf-type shutter located behind the lens in the camera's mount. This was a version of the Deckel DKL bayonet fitting also used by Kodak in its Retina Reflex models (which were also made in Germany) and by Braun in the Paxette Reflexes, but small mounting variations made them largely incompatible with each other. The first Bessamatics had a coupled selenium cell for metering which was replaced by a TTL CdS meter in the 1965 CS and Ultramatic CS models. The first Ultramatic model, which was introduced in 1961, had shutter-priority auto exposure control and also an instant-return reflex mirror which was dropped on the CS model due to reliability issues. However, the Voigtländer Ultramatic CS is an important camera in the history of the 35mm SLR, being one of the earliest models with TTL-metered automatic exposure control and also a full-information viewfinder display.

Changing Fortunes

After being listed as a public company in 1925, the majority of Voigtländer's

shares were acquired by the German company Schering which, in 1956, sold its shareholding to Carl Zeiss along with the Zeiss-Ikon business with the new operation eventually named Zeiss-Ikon/Voigtländer-Vertriebsgesellschaft. Production of Zeiss Ikon-Voigtländer cameras continued until the start of the 1970s, but with the highly-competitive Japanese brands on the rise, sales were steadily declining and the factory at Braunschweig was forced to close in August 1971. A year or so later it was sold to a joint venture of Carl Zeiss, Rollei and the state government of Lower Saxony, and then primarily made lenses for Zeiss Ikon and Rollei cameras. Rollei – which was also based in Braunschweig – took full control of the Voigtländer operation in 1974 and the marque was then used on a range of derivative 35mm SLRs and compact cameras which were made in Singapore.

In 1982 – after Rollei suffered the first of the many financial failures that dogged its last 25 years – the Voigtländer brand disappeared and wasn't revived until 1997 when it was acquired by Ringfoto GmbH and licensed to the highly-prolific Japanese camera-maker Cosina. Cosina also revived the Bessa name with a series of 35mm rangefinder cameras, firstly with the Leica L39 screwthread mount and then with the M bayonet. Affordable, but well-made, the Cosina-made Voigtländer Bessa bodies remained in production until 2015. The company's Voigtländer-badged L39 and M mount lenses – considered by some to rival Leica's – remain in production today along with models for a range of mirrorless mounts, including Nikkor Z, Canon RF, Fujifilm X, Sony FE and Micro Four Thirds. Thus one of the great names in photography lives on, albeit a long way from its German roots, but still with a nod to the brand's heritage of precision mechanical engineering and exceptional optical quality. 📷



CANON F-1 AND NEW F-1

These are the cameras that, in one way or another, had a significant influence on photographers and photography. Canon was late to the pro 35mm SLR party, but it soon made up for lost time and F-1 models put the brand on top in this sector, establishing a legacy which carried through the following decades to today.

Of all the major camera milestones in the 20th century 1959 and the Nikon F is certainly one of the biggest and, arguably, did as much for 35mm photography – especially among professional photographers – as Leica's 35mm rangefinder system. Nikon has the professional 35mm SLR all to itself for over ten years and was onto the second-generation F2 by the time Canon got into gear with a credible competitor. The cheekily named F-1 was unveiled at the 1970 Photokina and went on sale in March 1971, roughly six months before the F2 arrived.

Canon had had plenty of time to study the F system's strengths and weaknesses, and as would subsequently be the case in the future, decided to be a lot less conservative. There were similarities between the F-1 and the F2 – interchangeable viewfinders and focusing screens, for example – but while Nikon preferred to play it safe and give the market more of what it had traditionally wanted, Canon opted to show the market what is was likely to need. The new FD lens mount was designed to be future proof – for as far as could be seen ahead at the time – by enabling automatic aperture control when the rest of the camera industry was going down the aperture-priority auto exposure control path (i.e. auto shutter speed control). Cleverly, Canon kept the purists happy with a purely mechanical – and hence manual

control – camera body, but the progressives could add shutter-priority auto exposure control via the EE Servo Finder metering. With Canon's early emphasis on appealing to sports and action photographers – which has remained ongoing – shutter-priority AE had a lot more appeal than aperture-priority control. And right from the beginning there was an emphasis on speed, including ways of making the reflex mirror operate faster while also minimising shock and vibrations. The first motordrive unit delivered 3.0 fps, but 1972 Canon offered a special high-speed version of the F-1 using a fixed, semi-silvered mirror to enable continuous shooting at 9.0 fps – very fast for the day – and with the motorised film transport integrated into the camera body (which no longer had a film advance lever). The monster battery pack took 20 AA-size batteries and to make for an even bigger rig, there was a 250-exposure bulk film back.

In 1976 there was a small model refresh which is most commonly called the F-1n, but the new version never actually carried this model designation. Canon itself just calls it the "later version". Among the updates were a multiple exposure facility and an extended film speed setting range to ISO 3200 (from ISO 2000). A much more significant upgrade came in 1981 with the New F-1 – although still just marked 'F-1' on the camera and also known, confusingly, as the F-1N – which had a new body design, revised control layout and an electro-mechanical shutter with an

◀ Canon New F-1 (1981) fitted with the standard eye-level prism. In this configuration, the camera was fully manual. The AE Finder FN provided aperture-priority exposure control and the AE Power Winder FN or AE Motor Drive FN added shutter-priority exposure control.

extended range of slower speed settings. Curiously, the slower speeds – over 8-1/60 second – are electronically-controlled and the fast range – from 1/125-1/2000 second – are mechanically-timed. Of course, this meant that the camera could still operate without a battery if need be. The exposure control options are governed by the attached components – the AE Finder FN delivered aperture-priority auto and fitting either the Motor Drive FN or the AE Auto Winder FN added shutter-priority auto. The motordrive is good for 5.0 fps, and there was the option of longer-lasting NiCd battery packs as an alternative to the AA battery holder now slimmed down to take 12 cells. Again there was a dedicated high-speed version of the New F-1 – initially built for the 1984 summer Olympic Games in Los Angeles – with a pellicle mirror and now capable of very rapid 14 fps.

Metering was upgraded to the more reliable SPC measuring cells and the titanium-curtained shutter was rated to 100,000 cycles. All aspects of the construction were designed to maximise reliability and durability, and many areas – such as the shutter release and dial junctions – were weather-sealed well before such protection was even a thing. The body construction – a diecast metal chassis with machined brass top and bottom plates – was supremely rugged, but for this camera Canon also introduced new, more advanced manufacturing processes which greatly enhanced the precision of its build. With all the issues of the previous model now effectively addressed, the New F-1 established Canon's reputation for building professional cameras that were always just a little more technologically advanced without compromising the core values of reliability and durability. A few years later Canon again showed its capacity for making hard decisions, introducing a new all-electronic lens mount that would allow it to move ahead with technologies such as autofocus. Consequently, the New F-1 stayed in production for many years after the introduction of the EOS system in 1987, allowing professionals invested in big systems of FD lenses plenty of time to make the transition.

The New F-1 undoubtedly helped build the trust that allowed Canon to subsequently be more adventurous in its professional cameras – as evidenced by the first EOS-1 model in 1989 – and also established the brand's strong reputation in this category that endures to this day. 📸



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BACK TO BASICS

USING APERTURES AND SHUTTER SPEEDS FOR CREATIVE EFFECTS

Every few years we go back to... Back To Basics. Understanding the fundamental principles behind how your camera works is the key to achieving the results that you really want. Following on from their role in exposure control, we look at how apertures and shutter speeds also have pictorial effects so there's more to adjusting them than just brightening or darkening an image.

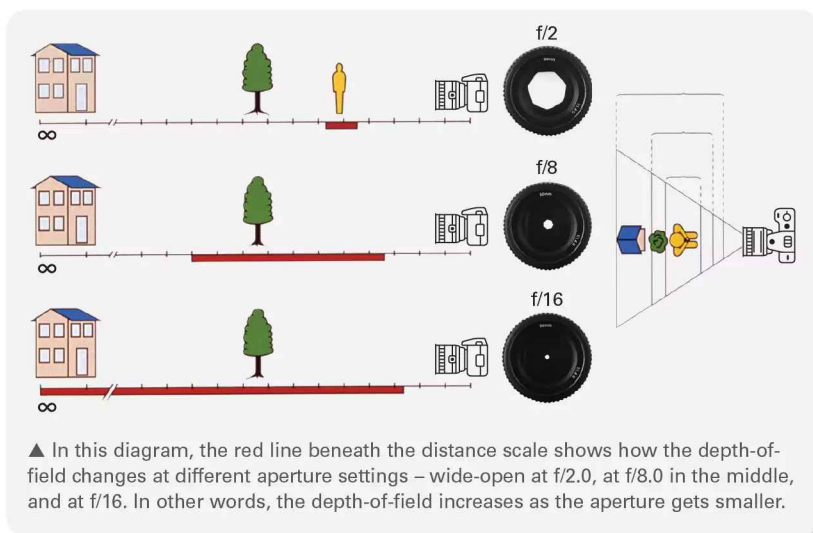
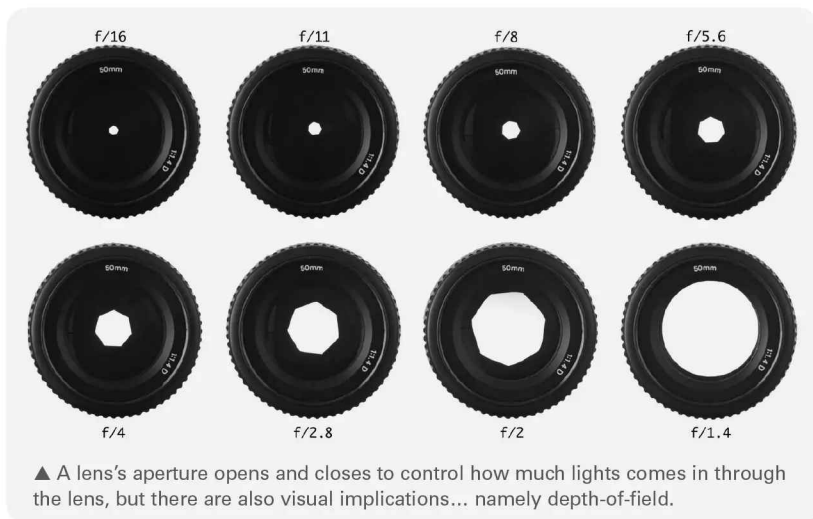
While the automation in today's cameras continues to become steadily more sophisticated – AI-based subject recognition to guide autofocus tracking is a prime example – there are still some very good reasons for taking control of things yourself. In terms of exposure control, for example, it's often not about getting it just right, but about creating a mood or message by deliberately making an image lighter or darker... in other words, *creative* exposure control. The amount of light reaching the sensor (or film) is regulated by the lens aperture and the camera's shutter speed with a third adjustment, sensitivity (expressed as an ISO value) providing subsequent brightening or darkening.

However, both apertures and shutter speeds have other effects of a more pictorial nature. Aperture adjustment is a way of controlling depth-of-field – although not the only influencing factor – while the shutter speed – i.e. the duration that the shutter is open – will determine how subject movement is recorded. Let's look at depth-of-field first.

Depth-of-field is often perceived as the photographic technicality that is the most confusing and the most difficult to comprehend, but once you grasp the basic principle, it's actually not all that mysterious and certainly very useful in all areas of photography and video-making. Importantly, depth-of-field may be one of photography's key technical considerations, but it also has many creative implications.

In a nutshell, depth-of-field is the area of an image that's sharply rendered from the foreground to the background or, more simply, the front-to-back depth of sharpness. In addition to the aperture setting, depth-of-field is also affected by lens focal length and also the subject or focusing distance.

You can increase the depth-of-field by using a smaller aperture setting (for



example, f/16 or f/22) or decrease it by using a larger setting (say f/2.8 or f/2.0 or f/1.4 with a 'faster' lens). Obviously, this requires the manual setting of the aperture, either in the aperture-priority auto exposure control mode – in which case the camera will automatically set the shutter speed needed to ensure a correct exposure – or in the fully manual exposure mode.

Selective Focus

Controlling the depth-of-field in this way has visual implications. A shallow depth-of-field is desirable if you want to throw the background out of focus so it doesn't create any distractions or conflict with the main subject in your picture. Alternatively, longer depth-of-field may be required if you want details in both the foreground and background to be in sharp focus such as may be required in landscape photography where both the details in the foreground and background are important.

A very shallow depth-of-field allows for selective focusing so the viewer's eye is only drawn to the very small area of the image that's sharp. This can be a compelling

way of telling a story, particularly if the lens's design gives a nicely progressive fall-off in sharpness. Very fast prime – or fixed focal length lenses – with a maximum aperture of f/1.0 or even f/0.95, will reduce the depth-of-field to mere sliver when shooting at these settings, giving the potential to create very dramatic visual effects contrasting the sharp with the blurred.

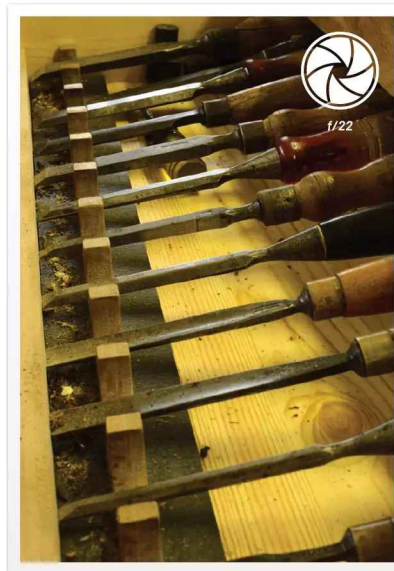
In terms of lens focal length, wide-angle lenses (which have a short focal length, typically in the range of 14mm to 28mm in

“Depth-of-field is often perceived as being confusing and difficult to comprehend, but once you grasp the basic principle, it's actually not all that mysterious.”

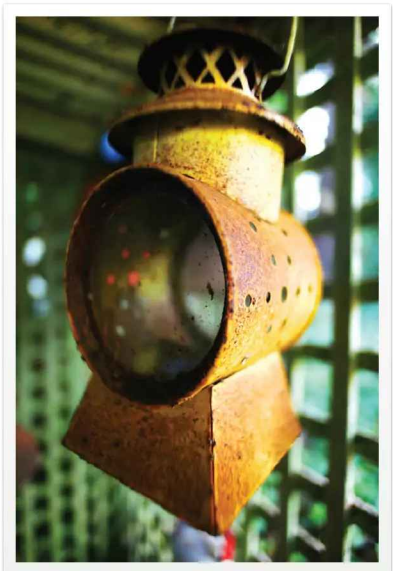


▲ The manual aperture control collar on Sigma's 14mm f/1.4 DG Art ultra-wide prime lens which allows for one-third stop settings. Many lenses no longer have aperture collars and f-stop setting is from the camera body and sometimes with provisions for even finer adjustments.

IN PRACTICE



▲ Here you can see the difference in visual terms with the same subject, focal length and focusing distance, but an aperture of f/2.0 on the left and f/22 on the right.



▲ Ultra-fast lenses deliver a very, very shallow depth-of-field at their maximum aperture which, here, is f/0.95.

full frame terms) have an inherently greater depth-of-field – at any given f-stop – than telephoto lenses (which typically have a focal length of 200mm to 600mm). Additionally, depth-of-field also decreases as the camera-to-subject distance decreases so with macro photography – where sharpness can be very important – it's often a challenge to obtain a wide enough depth-of-field.

Because changing the aperture also has an effect on exposure, it may not always be possible to just to select a larger or smaller setting without making other corrections. In very bright conditions, opening up the aperture may result in overexposure even when using a very fast shutter speed such as 1/4000 or 1/8000 second. In this situation, a neutral density (ND) filter may be needed on the lens to help reduce the amount of

light reaching the sensor by another means. These days ND filters are available in a variety of 'strengths' – some are even adjustable – reducing an exposure by as much as ten stops or more.

The alternative problem is the risk of underexposure if you're shooting in lower light conditions and still want to use a small aperture setting to maximise the depth-of-field. There is, of course, a limit to how much you can slow down the shutter speed – as a way of letting more light into the camera to compensate – before camera shake becomes an issue and you'll need to use a tripod. However, with in-camera image stabilisation systems becoming more effective – some now give up to five stops of correction – you may still be able to shoot hand-held in some situations.

Alternatively, you can increase the sensitivity or ISO setting as a way of increasing the exposure, but noise may become a problem at settings of ISO 1600 or above. If you want very fine details to still be crisply reproduced, you may still have to resort to

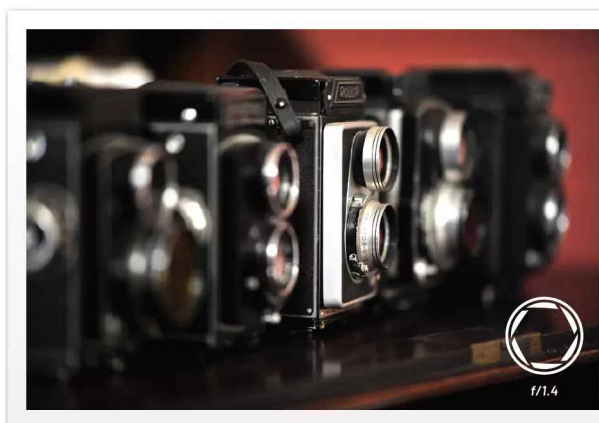
using a tripod to eliminate any risk of softening caused by the noise reduction process (or blur caused by camera shake).

Slow Time

A camera's shutter controls how much light reaches the sensor (or film) by how long it remains open. With a physical shutter – such as focal plane or leaf types – the opening is created by a set of blades and with the faster speeds this is little more than a narrow slit which scans across the front of the sensor. Pretty much the same principle is at work with a sensor shutter – which isn't really a shutter at all – except it's the rows of pixels that are being switched on and off in a scanning sequence.

In either case, a longer – or slower – shutter speed means that any subject movement will be recorded as blur. The longer the exposure time, the more pronounced the amount of blur although, of course, this is also dictated by the speed of the subject's movement. If you want to 'freeze' movement, then you need to use

▼ The depth-of-field decreases at longer focal lengths. Here is a comparison between the same image captured – with a 105mm short telephoto – at f/1.4 on the left and f/16 on the right.



“A longer – or slower – shutter speed means that any subject movement will be recorded as blur. The longer the exposure time, the more pronounced the amount of blur.”

a fast enough shutter speed to ensure that the subject doesn't move – in relation to the sensor – during the exposure. Subjects that are very fast-moving – such as a racing car or a fighter jet – will require the use of a very fast shutter speed in the order of perhaps 1/2000 second or even faster if you want to keep the subject sharply rendered. Of course, blurring can be used as a creative effect with the a classic example being using a long exposure so that moving water – such as a waterfall or waves rolling on to a beach – is reproduced as a misty whiteness.

In many instances, freezing the action, especially with many sports, helps emphasise its dynamic aspects and create visual impact, but so can introducing some blur which can quite compellingly convey a sense of movement. Experienced sports and adventure photographers will often experiment with faster and slower shutter speeds to find just the right balance of sharpness and blurring for a particular sport or activity.

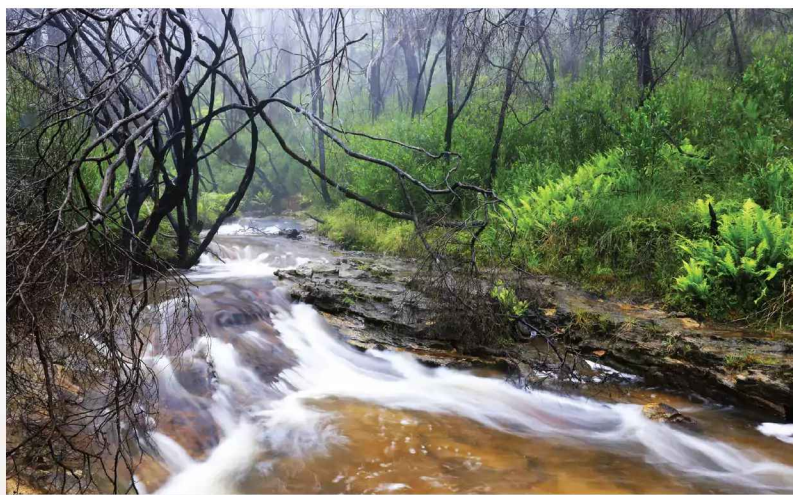
A technique which combines both



▲ The depth-of-field scale on the PC Nikkor 19mm f/4.0E ED perspective control lens. This scale allows you to quick see what the depth-of-field is at f/8.0, f/16, f/22 and f/32 – it's easy to see it increasing with the smaller apertures – in relation to focusing distance scale. The depth-of-field scale is also very handy for determining the hyperfocal distance in order to maximise the available zone of sharpness. Of course, a PC lens is designed to increase sharpness from near to far via its tilt/swing adjustments, but that's another story.



▲ Faster shutter speeds help freeze movement. This aerobatic aircraft was performing a low pass which was captured at 1/800 second.

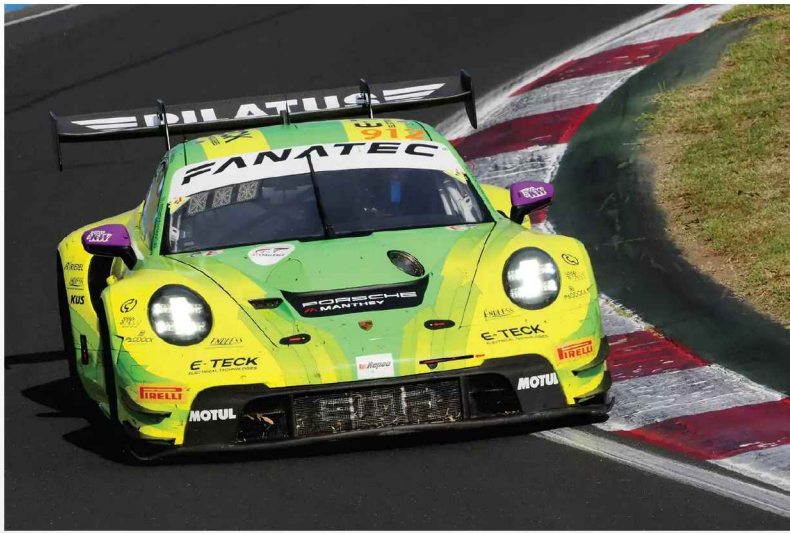


▲ Using a slower shutter speed means that subjects such as flowing water will move during the exposure, creating blur. It can be another means of more convincingly depicting movement. This exposure was at 0.6 seconds.



▲ Capturing the moment this surfer parted company with his board was done with a shutter speed of 1/2000 second. Using a fast continuous shooting speed – this was a frame from a 30 fps sequence – will also help with your success rate.

IN PRACTICE



▲ Subjects closing on you at high speed will also need a fast shutter speed – in this case, 1/1600 second – to ensure that they're pin-sharp.



▲ Although this racing car is accelerating out of a corner, it's still not travelling very fast so the shutter speed of 1/250 second still kept it sharp. This also meant that the ISO didn't have to be cranked up excessively despite the dull conditions. It was set at 800.



▲ Selecting the right shutter speed to balance sharpness and blur takes experience. Here 1/500 second stops the rally car, but the dust still blurs enough to add to the impression of speed.

sharpness and blurring in a shot is panning. It's particularly dependent on shutter speeds for effect and popular with sports photographers because it helps keep the subject sharp – which is often important – but blurs the background to create a convincing sense of movement.

Staying On Track

Panning is a comparatively straightforward technique to learn, but as in most things in photography, the devil is in the detail. In reality, panning takes quite a bit of practice to get absolutely right and plenty of experience to understand how it can be used to obtain a wide variety of blurring effects.

Put simply, panning involves moving the camera in order to track a moving subject in order that the speed difference between the two is very small or non-existent. This ensures that the subject is sharply rendered while the background – which, of course, isn't moving – is reduced to a blur. That's it... except that there are many variables involved which will have an impact on the outcome; shutter speed, aperture, lens focal length, the subject's speed, the subject's direction, the camera position, the characteristics of the background and, of course, the speed at which the camera is panned.

Theoretically at least, panning is possible using any focal length, but it's more of a challenge with a telephoto especially in terms of tracking the subject in the viewfinder and, of course, it's necessary to have an uninterrupted line-of-sight which potentially becomes more difficult when shooting over longer distances. Nevertheless, shooting from the infield of a race track is one possible scenario where using a telephoto lens for panning would make sense.

Ultra-wide-angle lenses may also be problematic with panning as it becomes necessary to get much closer to the subject... potentially good for more dynamic images, but perhaps not so good in terms of personal safety. Typically, then, focal lengths in the range of 35mm to 135mm (or around 22mm to 90mm with an 'APS-C' format camera) will often be the best suited to panning. In fact, it's a good idea to err towards a wider-angle view, firstly for compositional reasons and secondly because it's easier to keep the subject in the frame especially if its speed demands some rapid tracking with the camera. In compositional terms, it's better to leave some space in the frame – either ahead of the subject or behind it – to help give a better impression of the direction of travel. Additionally, having more of the blurred background in the frame – especially if it's markedly 'streaked' – will also better convey the impression of speed and movement.

Panning is certainly possible when hand-holding the camera, especially when using a wider-angle lens, but there are a couple of reasons why this might compromise the technique. For starters, it's important that the camera remain absolutely level throughout the process as any change in height relative to the subject may potentially introduce some unwanted blur in the subject, especially if using a slower shutter speed. Furthermore, at slower shutter speeds camera shake can be a problem and, again, the outcome will then be a less-than-pin-sharp subject. Image stabilisation will help to some extent, but needs to be switched to its panning mode otherwise it will try to correct for the lateral camera movement that you actually want.

Straight And Level

Even with image stabilisation at work, panning is often best performed with the camera on a tripod or a monopod. Both enable the camera be pivoted smoothly around a point while keeping it absolutely straight and level. If panning is performed even at a slight angle then part or all of the subject could end up being blurred.

Many sports photographers prefer to use a monopod because it's much easier to carry around and allows for more rapid tracking, plus the extra support of a tripod isn't really needed when panning. However, as with using a tripod, it's important to keep the camera level. That said, there may well be times when panning at an angle is required – i.e. either moving the camera up or down rather than in a straight line – and that's either when the subject is actually travelling along an incline or the picture is deliberately framed at an angle. This will introduce diagonal blur lines and, in compositional terms, diagonal lines are more suggestive of movement and can result in a more dynamic-looking image.

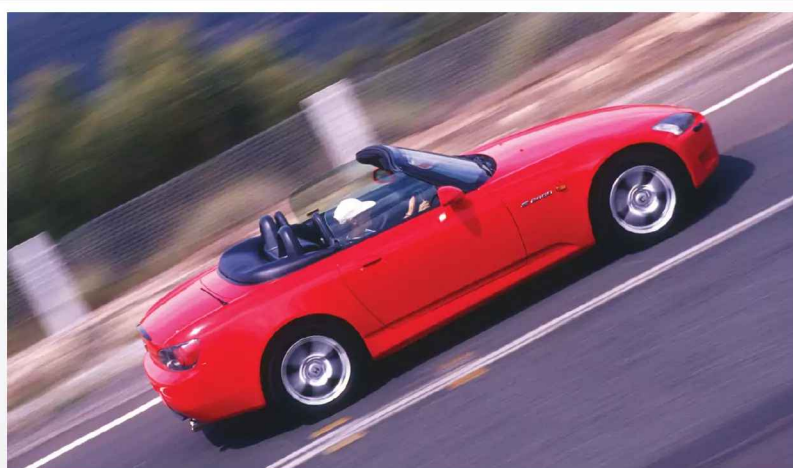
Check Your Speed

Shutter speed selection is a key aspect of panning with the main dictating being the subject's speed and just how much background blurring is desired. With fast-moving subjects, there will be quite a bit of background blur even when

“Panning is a comparatively straightforward technique to learn, but as in most things in photography, the devil is in the detail.”



▲ Panning is a simple technique in theory, but in the practice there are many variables at play relating to both the subject and the camera set-up.



▲ Smoothness is the key to a good result. The camera needs to be kept absolutely level and the tracking speed precisely match the subject's speed. In this shot, the camera has been tilted to create diagonal lens which are even more suggestive of dynamic movement, but this can add to the challenge of achieving a smooth pan.



▲ Experimenting with slower shutter speeds will introduce longer blurs in the background, but may also result in all or part of the subject becoming blurred.



▲ A fast-moving subject such as a racing car will often require a much higher shutter speed than expected in order to ensure it's sharply rendered. This is where practice and experience will prove invaluable.



▲ You can use foreground or background features to help emphasise the blurring effect. The shutter speed for this shot was a fairly fast 1/200 second to keep the car sharply rendered, but the foreground still blurred nicely.



▲ Deliberately blurring a subject can also create a convincing impression of speed. The shutter speed here was 1/50 second, but the racing car was going very fast so it was still slow enough to give a good effect. Whether blurring or freezing, setting the shutter speed in respect to the subject's speed is the key.

Shutter speed selection is a key aspect of panning with the main dictates being the subject's speed and just how much background blur is desired."

using a reasonably fast shutter speed of, say, 1/60 second. However, when panning more slowly, a shutter speed of 1/60 second may be too fast to create any noticeable blurring in the background.

Again, experimentation is the key, but an important point to always remember is that the camera is panning in an arc whereas the subject is most likely travelling in a straight line which means that the camera-to-subject distance is actually always changing, but at the point of capture point it's going to be comparatively slight. However, at slower shutter speeds and/or bigger apertures (which, as we now know, give a shallower depth-of-field), these variations could cause blurring which will be more pronounced either side of the capture point (when the camera-to-subject distance variations are, of course, also much greater). Having said all this, the 'perfect pan' – a pin-sharp subject set against a nicely streaked background – isn't always required and varying degrees of subject blur can also add to the impact of the image. Use a slow enough shutter speed and the whole subject will blur which can create an abstract effect, but this can also equally look like a mistake if the subject is merely slightly soft rather than obviously deliberately blurred. Selective blurring will occur with the parts of the subject that are moving faster relative to the camera's panning speed – which will be accentuated by using a slower shutter speed – and this can also be a very effective way of creating an impression of great speed.

Needless to note, the faster continuous shooting speed that you can use, the higher your success rate is likely to be. Similarly, AI-based subject recognition is also very helpful as it will keep the autofocus locked on throughout the panning sequence and also quickly adjust for any small variations in the camera-to-subject distance. However, any AF system with a wide frame coverage (and with phase-detection measurement in the case of mirrorless cameras) will be of assistance with panning when using the tracking mode.

So, while blur can be a big failure in photography if it's unintentional, when deliberately applied it can be a powerful creative tool. 📸

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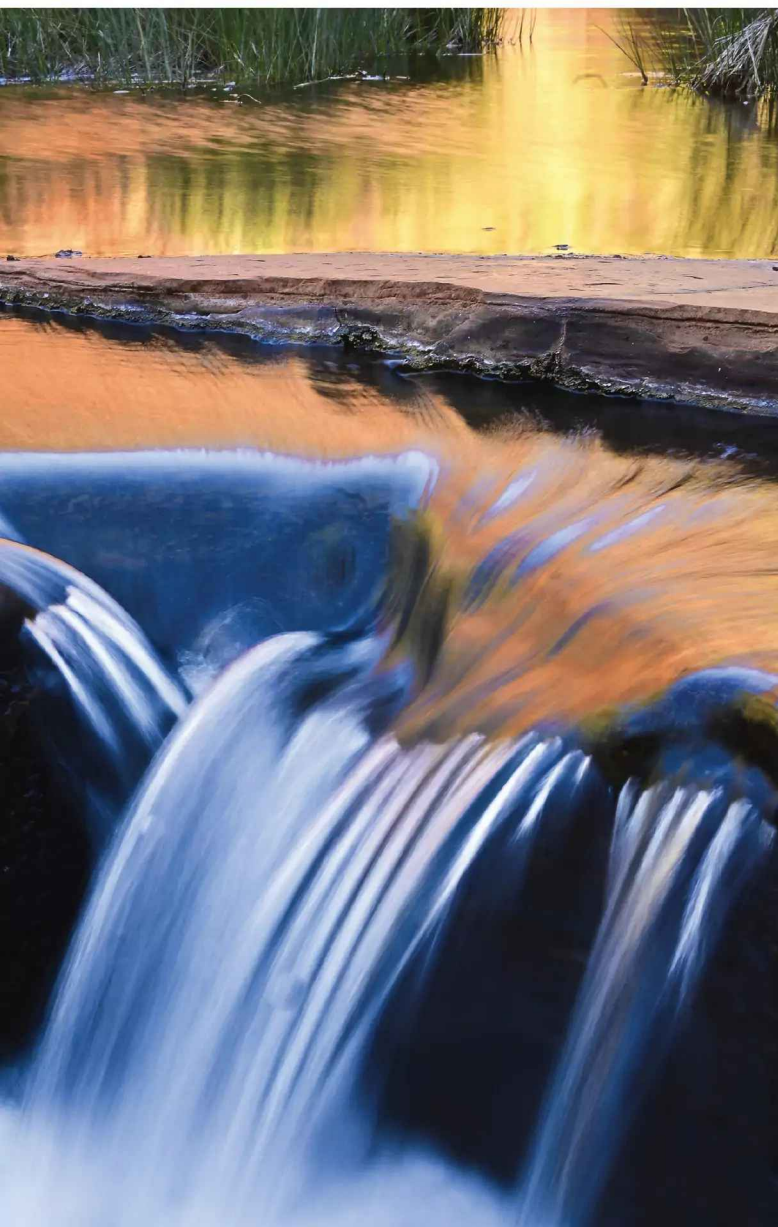
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2025 SIGMA SHOWCASE FIFTH ROUND WINNERS

WINNER

A few techniques are skilfully combined here to create this dramatic study... the framing and composition, using a long shutter speed to blur the waterfall, and a nice contrast between the warmer tones reflected in the smooth water and cooler tones of the shadow areas. It was captured by **Chris Carter** using a Nikon Zf with an 18-50mm zoom lens and mounted on a tripod. The location is Dales Gorge in Karijini National Park, Western Australia.

HIGHLY COMMENDED

A very well-spotted visual pun... well, it's actually a double pun if you notice the 'Tow Away Zone' sign as well. Photographer **Lynne Alderton** has also wittily titled this image *Optimism*, and it was taken with a Canon EOS R6 fitted with the Canon RF 24-105mm f/4.0L IS USM zoom.



Tell us how you did it! When you enter the Sigma Showcase, remember to explain any tips and techniques you used to achieve the result. Also, let us know the type of camera and lens. Enter by email (see next page).

1. Title _____ Camera _____ Lens _____

2. Title _____ Camera _____ Lens _____

3. Title _____ Camera _____ Lens _____

4. Title _____ Camera _____ Lens _____

Name _____ Telephone _____

Address _____ State _____ Postcode _____



WINNER

You can almost feel the chill thanks to the moody lighting while the small convoy of 4WDs adds some interest – and intrigue – to the foreground. The green also really stands out from the essentially monochrome surrounds. The location is the Maelifell Volcano in Iceland and this image, titled *Icelandic Adventure*, was shot by **Genny May** using an OM System OM-1 Mark II with the M.Zuiko Digital ED 12-100mm f/4.0 IS PRO zoom.

2025 SIGMA SHOWCASE SIXTH ROUND WINNERS

HIGHLY COMMENDED

Snow and ice help create great macro photos and here regular entrant **John Walker** has captured the first drip forming as the ice begins to slowly melt. He has aptly titled this picture *The Thaw* and it was shot with a Nikon D800 with an AF Nikkor 28-105mm f/3.5-4.5D zoom. As John comments, “There’s something about melting ice and the afternoon sun”.



2026 SIGMA SHOWCASE – OPEN FOR ENTRIES

Sigma lenses is the sponsor for our Showcase competition, made possible through the generosity of the Australian distributor C.R. Kennedy & Company Pty Ltd. The grand prize for the 2026 Sigma Showcase is a Sigma lens to the value of \$1000 and the winner can pick the

model and the mount that they want. The winner of the grand prize for the 2025 competition will be announced in the next issue (number 436).

Additionally, the winner of each round receives a complimentary six-issue subscription to *Australian Camera* magazine. If you already subscribe, your prize subscription will commence upon the expiry of your paid one. You can enter the Sigma Showcase as many

times as you like during the year, submitting up to four photographs each time. The entries received after the 2025 competition’s closing date of 31 December 2026 will be automatically entered in the 2027 Sigma Showcase which kicks off on 1 January 2027.

Note that it is not a requirement that entries to the Sigma Showcase be taken with a Sigma camera or lens. Read the accompanying rules carefully and get snapping.

ENTRY GUIDELINES

You can enter the Sigma Showcase by emailing your entries as attachments to camera@futurenet.com. Please note that we are no longer accepting physical entries.

The requirements for submitting digital files are as follows.

300 dpi resolution, and at a file size which enables a reproduction of up to 20x15 cm. Please avoid submitting overly large file sizes, especially when emailing the images. Up to 2.0 MB in file size is more than sufficient.

- Digital retouching and manipulation is permitted, but the judges will continue to reward good in-camera techniques.

- Full details of the camera, lens and any retouching must be supplied with the image. Images can be titled if you wish, but this isn’t essential.
- Up to four images may be permitted per entry.

What We Need To Know: We’d like to know a bit about your entries, so supplying the details below will help the judges better assess your images. Please feel free to add any other information that you feel is important.

- | | |
|--|-----------------------------------|
| • Title (optional) | • Location and/or situation |
| • Camera | • Post camera processing (if any) |
| • Lens | • Additional Comments |
| • Exposure - shutter speed, aperture and ISO | • Your mailing address |

THIS CHECKLIST is designed to allow direct comparisons between different camera models, listed here in price order within each brand. The published prices are mostly supplied by the distributors as recommended retail prices (RRPs). However, some distributors no longer supply RRP's to the media, so it has become necessary to determine an 'estimated street price' derived from the range of prices for a model published by retailers. Where this has been necessary, the letter 'E' appears at the start of the entry.

A dot appearing in a column indicates that the feature is available on the camera model listed. Where a specification or product detail hasn't yet been published or confirmed, the letters TBA (to be announced) or TBC (to be confirmed) are used. If a feature is irrelevant to a particular model – such as mirror lock-up for compact system cameras – then n/a (not applicable) is used. Every effort is made to ensure accuracy; please send any corrections to camera@futurenet.com.



				Sensor Size	Sensor Type	File Formats	Memory Cards					Exposure Modes					Features															
Model	Price (Body Only Unless Noted With Asterisk *)	Megapixels (Effective)	Full-Frame	APS/DX	Four-Thirds	CMOS	Foveon	TIFF	JPEG	Memory Stick	SD/SDHC/SDXC	Continuous Shooting Speed (fps)	Buffer Length (Unlimited) Max. Resolution	Autofocus Points	Metering Pixels/Zones	Program	Subject Programs	Aperture Priority	Shutter Priority	Manual	Shutter Speeds	Built-in Flash	Anti-Dust	FHD Video	4K Video	Anti-Shake In Body	Wi-Fi	Live View	Weather Proofing	Monitor Size (cm)	Weight (Body Only)	Review Issue
Canon EOS 3000D*	\$699	18	•	•	•	•	•	•	•	•	•	3	110	9	63	•	•	•	•	•	30-1/4000	•	•	•	•	•	•	•	•	6.8	436	Jul/Aug '18
Canon EOS 1500D*	\$849	24.1	•	•	•	•	•	•	•	•	•	3	150	9	63	•	•	•	•	•	30-1/4000	•	•	•	•	•	•	•	•	7.62	475	Jul/Aug '18
Canon EOS 90D	\$2,099	32.5	•	•	•	•	•	•	•	•	•	10	58	45	220K	•	•	•	•	•	30-1/16,000	•	•	•	•	•	•	•	•	7.7	701	Nov/Dec '19
Canon EOS 5D Mark IV	\$3,699	30.4	•	•	•	•	•	•	•	•	•	7	U	61	150K	•	•	•	•	•	30-1/8000	•	•	•	•	•	•	•	•	8.1	890	Jan/Feb '17
Nikon D7500	\$1,599	20.9	•	•	•	•	•	•	•	•	•	8	100	51	180K	•	•	•	•	•	30-1/8000	•	•	•	•	•	•	•	•	8.1	640	
Nikon D780	\$3,599	24.5	•	•	•	•	•	•	•	•	•	7	100	51	180k	•	•	•	•	•	900-1/8000	•	•	•	•	•	•	•	•	8.1	755	Jul/Aug '20
Nikon D850	\$4,549	45.7	•	•	•	•	•	•	•	•	•	7	200	153	180K	•	•	•	•	•	30-1/8000	•	•	•	•	•	•	•	•	8.1	915	Nov/Dec '17
Nikon D6	\$10,699	20.8	•	•	•	•	•	•	•	•	•	14	200	105	180K	•	•	•	•	•	900-1/8000	•	•	•	•	•	•	•	•	8.1	1270	Nov/Dec '20
Pentax KF	\$1,299	24.24	•	•	•	•	•	•	•	•	•	6	40	11	77	•	•	•	•	•	30-1/6000	•	•	•	•	•	•	•	•	7.62	625	
Pentax K-3 Mark III	\$2,995	25.73	•	•	•	•	•	•	•	•	•	12	37	101	307K	•	•	•	•	•	30-1/8000	•	•	•	•	•	•	•	•	8.1	735	Issue 423
Pentax K-1 Mark II	\$3,399	36.4	•	•	•	•	•	•	•	•	•	4.4	70	33	86K	•	•	•	•	•	30-1/8000	•	•	•	•	•	•	•	•	8.1	925	
Pentax K-3 II Monochrome	\$3,499	25.73	•	•	•	•	•	•	•	•	•	12	55	101	307K	•	•	•	•	•	30-1/8000	•	•	•	•	•	•	•	•	8.1	735	

DIGITAL RANGEFINDER CAMERAS

Leica M EV1	\$13,990	60.3	•	•	•	•	•	•	•	•	•	4.5	100	MF	TBC	•	•	•	•	•	•	•	•	•	7.5	413	Issue 435
Leica M11	\$15,190	60.3	•	•	•	•	•	•	•	•	•	4.5	100	MF/RF	TBC	•	•	•	•	•	•	•	•	•	7.5	455	Mar/Apr '22
Leica M11-P	\$15,890	60.3	•	•	•	•	•	•	•	•	•	4.5	100	MF/RF	TBC	•	•	•	•	•	•	•	•	•	7.5	455	Issue 425
Leica M11-P Safari	\$16,390	60.3	•	•	•	•	•	•	•	•	•	4.5	100	MF/RF	TBC	•	•	•	•	•	•	•	•	•	7.5	565	
Leica M11-D	\$16,590	60.3	•	•	•	•	•	•	•	•	•	4.5	100	MF/RF	TBC	•	•	•	•	•	•	•	•	•	457		
Leica M11 Monochrome	\$16,790	60.3	•	•	•	•	•	•	•	•	•	4.5	100	MF/RF	TBC	•	•	•	•	•	•	•	•	•	7.5	461	

MIRRORLESS CAMERAS

Canon EOS R50*	\$1,399	24.2	•	•	•	•	•	•	•	•	•	15	28	4503	384	•	•	•	•	•	•	•	•	•	7.5	328	Issue 423
Canon EOS R50 V	\$1,169	24.2	•	•	•	•	•	•	•	•	•	15	28	4503	384	•	•	•	•	•	•	•	•	•	7.5	323	
Canon EOS R10*	\$1,649	24.2	•	•	•	•	•	•	•	•	•	23	123	4503	384	•	•	•	•	•	•	•	•	•	7.62	429	Issue 419
Canon EOS RP	\$1,819	26	•	•	•	•	•	•	•	•	•	5	U	4779	384	•	•	•	•	•	•	•	•	•	7.62	440	May/June '19
Canon EOS R7	\$2,299	32.5	•	•	•	•	•	•	•	•	•	30	184	5915	384	•	•	•	•	•	•	•	•	•	7.62	612	Jul/Aug '22
Canon EOS R8	\$2,599	24.2	•	•	•	•	•	•	•	•	•	40	1000+	4897	384	•	•	•	•	•	•	•	•	•	7.5	414	Issue 423
Canon EOS R6 Mark II	\$3,299	24.2	•	•	•	•	•	•	•	•	•	40	190	4897	384	•	•	•	•	•	•	•	•	•	7.62	588	Issue 421
Canon EOS R6 Mark III	\$4,299	32.5	•	•	•	•	•	•	•	•	•	40	330	6097	384	•	•	•	•	•	•	•	•	•	7.62	609	
Canon EOS R5	\$4,799	45	•	•	•	•	•	•	•	•	•	20	350	5940	384	•	•	•	•	•	•	•	•	•	8.1	650	Sept/Oct '20
Canon EOS R5 Mark II	\$6,699	45	•	•	•	•	•	•	•	•	•	30	760	5850	6144	•	•	•	•	•	•	•	•	•	8.1	588	Issue 428
Canon EOS R3	\$8,199	24.1	•	•	•	•	•	•	•	•	•	30	540	4779	384	•	•	•	•	•	•	•	•	•	8.1	915	Jan/Feb '22
Canon EOS R1	\$10,990	24.2	•	•	•	•	•	•	•	•	•	40	500	4368	6144	•	•	•	•	•	•	•	•	•	8.1	920	
Fujifilm X-T30 Mark III	\$1,679	26.1	•	•	•	•	•	•	•	•	•	20	127	425	256	•	•	•	•	•	•	•	•	•	7.62	329	
Fujifilm X-M5	\$1,449	26.1	•	•	•	•	•	•	•	•	•	20	127	425	256	•	•	•	•	•	•	•	•	•	7.62	307	Issue 430
Fujifilm X-S20	\$2,299	26.1	•	•	•	•	•	•	•	•	•	20	256	425	256	•	•	•	•	•	•	•	•	•	7.62	410	Issue 424
Fujifilm X-T50	\$2,399	40.2	•	•	•	•	•	•	•	•	•	20	168	425	256	•	•	•	•	•	•	•	•	•	7.62	389	Issue 428
Fujifilm X-E5	\$2,699	40.2	•	•	•	•	•	•	•	•	•	20	168	425	256	•	•	•	•	•	•	•	•	•	7.62	396	Issue 433
Fujifilm X-T5	\$2,899	40.2	•	•	•	•	•	•	•	•	•	15	119	425	256	•	•	•	•	•	•	•	•	•	7.62	476	Issue 422
Fujifilm X-H2	\$3,399	40.2	•	•	•	•	•	•	•	•	•	13	1000+	425	256	•	•	•	•	•	•	•	•	•	7.62	579	Issue 420
Fujifilm X-H2S	\$3,999	26.1	•	•	•	•	•	•	•	•	•	40	1000+	425	256	•	•	•	•	•	•	•	•	•	7.62	579	Jul/Aug '22
Leica SL3-S	\$9,190	24.6	•	•	•	•	•	•	•	•	•	30	175	779	TBC	•	•	•	•	•	•	•	•	•	8.1	768	Issue 433
Leica SL3	\$12,190	60.3	•	•	•	•	•	•	•	•	•	15	70	315	TBC	•	•	•	•	•	•	•	•	•	8.1	769	Issue 429

IT'S TIME FOR FILM



Introducing the first film camera released by PENTAX in over 20 years.

The PENTAX 17 is a unique half-frame film camera that captures two 17mm x 24mm images on a single 35mm frame. With vertical-format photos, it offers a smartphone-like aspect ratio but with the timeless charm of film. Featuring manual controls like zone focus, film winding, and customisable dials for exposure and ISO, the PENTAX 17 gives you full creative control. Perfect for both seasoned film enthusiasts and newcomers, it delivers a nostalgic, hands-on photography experience in a modern package.

PENTAX 17

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				Sensor Size	Sensor Type	File Formats	Memory Cards					Exposure Modes					Features															
Model		Price (Body Only Unless Noted With Asterisk*)	Megapixels (Effective)	Full-Frame	Four Thirds APS/DX	Foveon CMOS	RAW	TIFF	JPEG	Compact Flash	Memory Stick	SD/SDHC/SDXC = microSD	Continuous Shooting Speed (fps)	Max. Resolution	Autofocus Points	Measuring Zones	Subject Programs	Aperture Priority	Shutter Priority	Manual	Shutter Speeds	Built-In Flash	Anti-Dust	FHD Video	4K Video	Anti-Shake In Body	Wi-Fi	Built-In Viewfinder	Weather Proofing	Monitor Size (cm)	Weight (Body only)	Review Issue
* single lens kit ** twin lens kit																																
Leica SL3 Reporter		\$12,890	60.3	•		•	•		•	•	•	•	15	70	315	TBC	•		•	•	•	3600-1/16,000	•	•	•	•	•	•	•	8.1	769	
Nikon Z30*		\$1,549	20.9		•	•	•		•			•	11	71	209	TBC	•	•	•	•	•	30-1/4000	•		•	•		•		7.5	350	
Nikon Z50II		\$1,599	20.9			•	•		•			•	30	200	231	TBC	•	•	•	•	•	900-1/4000						•	•	8.1	495	
Nikon Zfc*		\$2,049	20.9		•	•	•		•			•	11	71	209	TBC	•	•	•	•	•	30-1/4000	•		•	•		•	•	7.5	390	Nov/Dec '21
Nikon Z5		\$2,399	24.3			•	•		•			•	4.5	100	273	TBC	•					30-1/8000		•	•	•		•	•	8.1	590	Jan/Feb '21
Nikon Z5II		\$2,699	24.5	•		•	•					•	30	120	299	TBC	•		•	•	•	900-1/8000		•	•	•		•	•	8.1	620	Issue 431
Nikon Z6II		\$3,699	24.5	•		•	•		•	•	•	•	14	200	273	TBC	•					900-1/8000		•	•	•		•	•	8.1	615	May/June '21
Nikon Zf		\$3,499	24.5	•		•	•	•	•			•	30	120	273	TBC	•		•	•	•	900-1/8000		•	•	•		•	•	8.1	630	Issue 425
Nikon Z6III		\$4,499	24.5	•		•	•		•	•	•	•	60	1000+	299	TBC	•		•	•	•	900-1/16,000		•	•	•		•	•	8.1	660	Issue 429
Nikon Z7II		\$5,549	45.7	•		•	•	•	•	•	•	•	10	200	493	TBC	•		•	•	•	900-1/8000		•	•	•		•	•	8.1	615	
Nikon Z8		\$7,449	45.7	•		•	•	•	•	•	•	•	20	1000+	493	TBC	•		•	•	•	900-1/32,000		•	•	•		•	•	8.1	820	Issue 424
Nikon Z9		\$9,899	45.7	•		•	•	•	•	•	•	•	30	1000+	493	TBC	•		•	•	•	900-1/32,000		•	•	•		•	•	8.1	1160	Jan/Feb '22
Olympus OM-D E-M10 IV		\$949	20.3			•	•		•			•	15	49	121	324	•	•	•	•	•	60-1/16,000	•	•	•	•		•	•	7.62	335	Nov/Dec '20
OM System OM-5		\$1,499	20.4			•	•		•			•	30	20	121	324	•					60-1/32,000		•	•	•		•	•	7.62	366	Issue 421
OM System OM-5 Mark II		\$1,699	20.4			•	•		•			•	30	TBC	121	324	•					60-1/32,000		•	•	•		•	•	7.62	370	Issue 433
OM System OM-1		\$2,699	20.4			•	•		•			•	120	92	1053	324	•		•	•	•	60-1/32,000		•	•	•		•	•	7.62	511	Mar/Apr '22
OM System OM-3		\$3,199	20.4			•	•		•			•	120	90	1053	324	•		•	•	•	60/1/32,000		•	•	•		•	•	7.62	413	Issue 430
OM System OM-1 Mark II		\$3,599	20.4			•	•		•			•	120	219	1053	324	•		•	•	•	60-1/32,000		•	•	•		•	•	7.62	511	Issue 427
Panasonic Lumix G100V*		\$1,299	20.3			•	•		•			•	10	480	49	1728	•	•	•	•	•	60-1/16,000	•	•	•	•		•	•	7.62	303	
Panasonic Lumix G85*		\$1,449	16			•	•		•			•	9	100	49	1728	•	•	•	•	•	60-1/16,000	•	•	•	•		•	•	7.62	453	Jan/Feb '17
Panasonic Lumix G95		\$1,599	20.3			•	•		•			•	9	300	49	1728	•	•	•	•	•	60-1/16,000	•	•	•	•		•	•	7.62	484	Nov/Dec '19
Panasonic Lumix G9		\$1,599	20.3			•	•		•			•	20	600	225	1728	•		•	•	•	60-1/32,000		•	•	•		•	•	7.62	579	Jan/Feb '18
Panasonic Lumix G90*		\$1,699	20.3			•	•		•			•	9	300	49	1728	•		•	•	•	60-1/16,000	•	•	•	•		•	•	7.62	481	
Panasonic Lumix GH5 II		\$2,099	20.3			•	•		•			•	12	999	225	1728	•		•	•	•	60-1/16,000		•	•	•		•	•	7.5	647	Sept/Oct '21
Panasonic Lumix S9		\$2,699	24.2	•		•	•		•			•	30	36	779	1728	•		•	•	•	60-1/8000		•	•	•		•	•	7.62	403	
Panasonic Lumix S5		\$2,799	24.2	•		•	•		•			•	7	999	225	1728	•		•	•	•	60-1/8000		•	•	•		•	•	7.5	630	Jan/Feb '21
Panasonic Lumix S5II		\$3,199	24.2	•		•	•		•			•	30	300+	779	1728	•		•	•	•	60-1/8000		•	•	•		•	•	7.62	657	Issue 422
Panasonic Lumix G9 II		\$3,299	25.2			•	•		•			•	75	225	779	1728	•		•	•	•	60-1/32,000		•	•	•		•	•	7.62	575	Issue 427
Panasonic Lumix S5IIX		\$3,499	24.2	•		•	•		•			•	30	300+	779	1728	•		•	•	•	60-1/8000		•	•	•		•	•	7.62	657	
Panasonic Lumix S1		\$3,599	24.2	•		•	•		•			•	9	999	225	1728	•		•	•	•	60-1/8000		•	•	•		•	•	8.1	899	
Panasonic Lumix GH6		\$3,699	25.5			•	•		•	•	•	•	75	200	315	1728	•		•	•	•	60-1/32,000		•	•	•		•	•	7.5	739	Issue 419
Panasonic Lumix GH7		\$3,899	25.2			•	•		•			•	75	260	315	1728	•		•	•	•	60-1/32,000		•	•	•		•	•	7.5	721	
Panasonic Lumix S1 IIE		\$4,199	24.1	•		•	•		•			•	30	300	779	1728	•		•	•	•	60-1/8000		•	•	•		•	•	7.62	712	
Panasonic Lumix S1 II		\$5,299	24.1	•		•	•		•			•	70	300	779	1728	•		•	•	•	60-1/16,000		•	•	•		•	•	7.62	718	Issue 435
Panasonic Lumix S1R		\$5,299	47.3	•		•	•		•			•	9	50	225	1728	•		•	•	•	60-1/8000		•	•	•		•	•	8.1	898	Sept/Oct '19
Panasonic Lumix S1R II		\$5,499	44.3	•		•	•		•			•	40	80	779	1728	•		•	•	•	60-1/16,000		•	•	•		•	•	8.1	712	Issue 432
Panasonic Lumix S1H		\$5,999	24.2	•		•	•		•			•	9	999	225	1728	•		•	•	•	60-1/8000		•	•	•		•	•	8.1	1052	Mar/Apr '20
Sigma BF		\$3,995	24.2	•		•	•		•			•	8	1000	49	TBC	•		•	•	•	30-/25,600		•	•	•		•	•	8.1	388	Issue 431
Sigma fp L		\$3,899	61.2	•		•	•		•			•	10	14	49	TBC	•		•	•	•	30-1/8000		•	•	•		•	•	8.1	375	
Sony Alpha ZV-E10		\$949	24.2		•	•	•		•		•	•	11	99	425	1200	•	•	•	•	•	30-1/4000		•	•	•		•	•	7.5	343	
Sony Alpha 6400		\$1,249	24.2		•	•	•		•		•	•	11	115	425	1200	•	•	•	•	•	30-1/4000	•	•	•	•		•	•	7.5	403	Sept/Oct '19
Sony Alpha ZV-E10 II		\$1,549	26		•	•	•		•			•	11	1000+	759	1200	•	•	•	•	•	30-1/8000		•	•	•		•	•	7.5	292	
Sony Alpha 6700		\$2,199	26		•	•	•		•			•	11	143	759	1200	•	•	•	•	•	30-1/8000		•	•	•		•	•	7.5	409	
Sony Alpha 7 III		\$2,199	24.2	•		•	•		•		•	•	10	163	693	1200	•	•	•	•	•	30-1/8000		•	•	•		•	•	7.5	650	Sept/Oct '18
Sony Alpha ZV-E1		\$2,699	12.1	•		•	•		•			•	10	1000+	759	1200	•	•	•	•	•	30-1/8000		•	•	•		•	•	7.5	400	
Sony Alpha 7C II		\$2,999	33	•		•	•		•			•	10	88	759	1200	•		•	•	•	30-1/8000		•	•	•		•	•	7.5	429	
Sony Alpha 7 IV		\$3,299	33	•		•	•		•	•	•	•	10	1000+	759	1200	•		•	•	•	30-1/8000		•	•	•		•	•	7.5	658	
Sony Alpha 7CR		\$4,299	61	•		•	•		•			•	8	48	693	1200	•		•	•	•	30-1/8000		•	•	•		•	•	7.5	430	
Sony Alpha 7R IV		\$3,799	61	•		•	•		•		•	•	10	68	567	1200	•		•	•	•	30-1/8000		•	•	•		•	•	7.5	665	Jan/Feb '20
Sony Alpha 7S III		\$4,399	12.1	•		•	•		•	•	•	•	10	1000+	759	1200	•		•	•	•	30-1/8000		•	•	•		•	•	7.5	699	Mar/Apr '21
Sony Alpha 7 V		\$4,699	33	•		•	•		•			•	30	185	759	1200	•		•	•	•	30-1/16,000		•	•	•		•	•	8	610	
Sony Alpha 7R V		\$4,999	61	•		•	•		•			•	10	1000+	693	1200	•		•	•	•	30-1/8000		•	•	•		•	•	8	638	
Sony Alpha 9 II		\$5,790	24.2	•		•	•		•		•	•	20	361	693	1200	•		•	•	•	30-1/32,000		•	•	•		•	•	7.5	678	May/June '20
Sony Alpha 1		\$6,999	50.1	•		•	•		•	•	•	•	30	165	759	1200	•		•	•	•	30-1/										



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