

WHAT DIGITAL Camera

AUGUST
2016

WHAT TO BUY & HOW TO USE IT



Panasonic
TZ100 • 1in
sensor • 10x
zoom **p68**



Technique

Focus stacking,
for ultra-sharp
shots **p33**

Fujinon XF
100-400mm
f/4.5-5.6
lens **p72**



Full
test

Canon EOS 80D

24.2MP CMOS sensor • 45 AF points • ISO 100-16,000 • Fully articulated screen

Summer loving

The hardest
season to shoot?
Not any more!

Technique



The five best DSLRs under £1000



How to shoot
underwater
p17

Technique



Technique

Make depth
of field work
for you **p40**



The UK's most comprehensive listings

Wondering about the latest gear? Find out how we rate 536 cameras and lenses

shots worth
sharing wherever
summer takes you



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**Castle
Cameras**



Canon

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www.castlecameras.co.uk

prices correct as of 16/06/16, cashbacks have different end dates, prices may change, see website for current details.

p50 Summer loving



p17 Essential guide to underwater



p40 Technique: depth of field



Tests you can trust

To ensure the camera you buy doesn't disappoint, every camera that passes through the hands of *What Digital Camera's* technical team is put through a series of tests. From high-spec DSLRs through to entry-level compacts, they are subjected to a series of rigorous tests in our lab, with results analysed by the very best industry software. This makes our reviews the most authoritative in the UK. We test for colour – different sensors and camera image processors can interpret colour differently. We then get down to the nitty-gritty of resolution, with our lab tests showing us exactly how much detail each camera can resolve. Then we look at Image Noise. Finally, we get out and shoot with every camera and lens in real-world conditions just as you will, to find out how they perform.



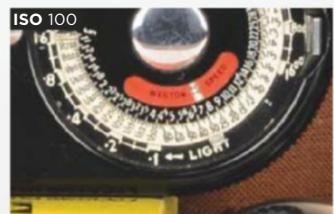
COLOUR

Subjecting each camera to our colour chart test reveals any variation and differences in colour between Raw and JPEG file formats.



RESOLUTION

Our resolution chart reveals exactly how much detail a sensor can resolve and it's measured in lines per picture height, abbreviated to l/ph.



NOISE

The diorama is used to ascertain how image noise is handled through an ISO range. Some cameras produce cleaner results than others.

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The Photographer

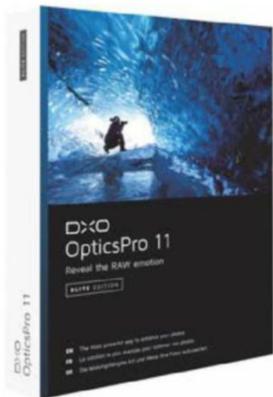
Shot in Iceland, 'The Photographer', by Austria's Nicholas Roemmelt, won second place in the Beauty category of the 2016 International Earth & Sky competition, organised by The World at Night. The contest aims to raise awareness of the world's last remaining natural night environments and night skies.

'It wasn't easy for my buddy Nikki Haselwanter to "freeze" for 15 seconds for the shot on the top of that sand dune,' says Roemmelt. 'Blizzards were hitting the coastline and it was a challenge not to be blown away. But during the clear gaps, which lasted a few minutes, we were able to witness the wonderful northern lights behind the Vestrahorn.'

TO SEE ALL THE WINNERS' IMAGES, VISIT WWW.TWANIGHT.ORG



1



2



© BRIAN HARRIS

3



4



5



1 DxO Optics Pro 11

£79 (ESSENTIAL EDITION) www.dxo.com

OpticsPro 11 boasts an enhanced version of DxO Prime, which also introduces new automated tools such as spot-weighted correction and auto red-eye. It's claimed to process Raw files up to four times faster and offers a new full screen mode that allows you to focus on selecting and rating your images.

2 Brian Harris book

£68 www.impress-publishing.com

The endlessly fascinating *'...and then the Prime Minister hit me...'* looks back at the career of press photographer Brian Harris.

3 Fujifilm 2x teleconverter

£349 www.fujifilm.co.uk

Fujifilm has added the XF2X TC WR to its range of teleconverters and it's compatible with the company's XF 50-140mm f/2.8 R LM OIS WR and XF 100-400mm f/4.5-5.6R LM OIS WR lenses. It's both weather and dust-resistant, like the Fujifilm X-Pro2 and X-T1.

4 Nikon D500 battery life

www.nikon.co.uk

Nikon has warned D500 users that some older EN-EL15 batteries may not be capable of the maximum number of shots as indicated in the camera's documentation. Nikon has

pledged to replace pre-modification EN-EL15 batteries free of charge for D500 users.

5 Rogue 32in reflector

£30 www.xpdistribution.com

The Rogue 32in 2-in-1 reflector features white and silver sides and collapses down to a third of its open size. A handy accessory for those starting out in the world of portraiture.

6 Sony Xperia XA Ultra

www.sony.co.uk

The new Xperia XA Ultra features a 16MP front-facing camera, low-light sensor, image stabilisation and battery life that lasts 2 days.

6



7



8



9



© MARK BENHAM

10



11



12



7 Lensbaby Circular 180+

£TBC www.lensbaby.com

The Lensbaby Circular 180+ is designed to attach to GoPro Hero action cameras. It creates a 185-degree field of view and a fully circular image in 16:9 wide recording mode. If its Kickstarter campaign is successful, it should be available to purchase in August this year.

8 Olympus TG-Tracker

£279 www.olympus.co.uk

The Tough TG-Tracker is a rugged camera featuring a 7.2MP 1/2.3in sensor, 204° f/2.0 ultra-wideangle lens and 1.5in tilting screen. It's waterproof to 100ft and has GPS/Wi-fi.

9 Food photography

pinkladyfoodphotographeroftheyear.com

Foodies will be glad to know that this year's Pink Lady Food Photographer of the Year results are now online. Mark Benham took the overall winning shot, 'Flour Frenzy'.

10 Pentax K-70

FROM £559 www.ricoh-imaging.co.uk

The K-70 is a new advanced entry-level DSLR. With an AA-filterless 24MP APS-C sensor, weather-resistant design, a maximum ISO of 102,400 and an 11-point AF system it looks promising on paper. It also becomes the first Pentax DSLR to offer Hybrid AF in Live View.

11 Voking waterproof cases

£350 www.amazon.co.uk

Waterproof case manufacturer Voking has produced a range of housings to accommodate Sony Alpha cameras, including the A6000, A6300, A7, A7II, A7S and A7SII. The houses are made from aluminium and can be used underwater up to a depth of 100m.

12 Pentax 55-300mm

£399 www.ricoh-imaging.co.uk

The HD Pentax-DA 55-300mm f/4.5-6.3 ED PLM WR RE features a new pulse motor (PLM) and rear-focus system to improve AF speed. It weighs just 442g too.

Sony Xperia X

SONY.CO.UK £459

As is typical with Sony, the headline of its new flagship phone is the camera. But in a year of fantastic cameraphones, it has a tough mountain to climb to become our pocket snapper of choice.

Sony has kitted the Xperia X out with a 23MP camera, complete with f/2 aperture and a new focusing system that does a fantastic job of locking on to



targets and not losing focus. We tested it out shooting sports and fast-moving vehicles, and it does an

excellent job. Blur is reduced and detail is kept.

The aperture isn't quite as wide as the Galaxy S7, so the depth of field isn't quite as good but it still allows for some nice-looking bokeh shots. On the front is a 13MP selfie camera that does a great job.

It's a wideangle lens, so you can cram lots of faces in and it matches skin tones well.

On the inside you've got the mid-range Snapdragon 650 CPU, 3GB RAM and 32GB of storage. These aren't overly high-end components, but they do get the job done and we didn't run into any slowdown when we were editing Raw photos.

The 5in display is superb, as you'd expect from Sony. It's 1080p, as opposed to quad-HD, but it's bright and vivid with accurate colours and ace viewing angles. **MP**



Garmin Vivosmart HR Plus

GARMIN.COM £170

Garmin's latest Vivosmart fitness band is one of the best we've ever tested, and we've used plenty.

Considering it's a manageable size, it packs a lot of tech inside. GPS is the best addition, accurately tracking your runs without the need for any phone attached. If you're serious about tracking your runs, you need GPS. Fitness tracking here on the whole is very accurate and it'll monitor your sleep too.

On the back is the heart-rate monitor, which again is accurate and automatically kicks into gear when it sees an upturn in movement.

It's water-resistant, too, down to 5m, and the rugged design means you won't be worrying about damaging it on your travels. The monochrome display isn't the best, but it's easy to read even in poor light which is what's important. **MP**

Huawei MediaPad M2 Premium

HUAWEI.CO.UK FROM £249

Huawei still isn't a household name in Britain, but it's hugely popular around the world and it's been churning out some fantastic products of late. The latest is the MediaPad M2, an affordable slate that looks to go up against Apple's iPad Pro.

It's a 10in tablet, with a bright 1080p display and Huawei even throws in a stylus. That pen is accurate for drawing and doodling, and feels great, too, while the display is accurate in its

colour representation.

The design will be familiar to anyone who has ever used a Huawei device before. It's constructed from metal and glass and feels solid and outguns its price-tag. There's a fast fingerprint scanner that unlocks the tablet almost instantly, but Huawei's version of Android is still a little on the overbearing side.

The battery will easily get you through the day, which isn't too much of a surprise, but the camera is. It's actually



really good for a tablet, capturing 13MP shots with an f/2 aperture. Shots are detailed and the shutter is fast, but you still might look a little silly walking around and taking pictures with a tablet. **MP**

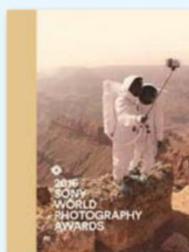
BOOK REVIEWS

SONY WORLD PHOTOGRAPHY AWARDS 2016

WORLD PHOTOGRAPHY ORGANISATION

The Sony World Photography Awards are a true hotbed of emerging and established talent.

Every year, the competition plays host to images that make many of us green with envy. While the professional categories are of course consistently fantastic,



it's the amateur images that hold the true appeal. Many of the amateur entrants are unbound by the self-conscious photography education that can mar so many photographers in their career, and as a result we have a collection that is not only unafraid to be experimental, but

also one that is thoroughly inspirational. This year was no different and features perhaps some of the competition's strongest images to date. If you'd like to purchase a copy of the book, visit www.worldphoto.org. **OA**

ANIMAL KINGDOM, STEREOSCOPIC IMAGES OF NATURAL HISTORY

By Jim Naughten

PRESTEL £24.99

Stereoscopy was invented in 1839 as a means to study binocular vision, that feat of evolution that allows many of the creatures of earth to determine distance and depth. Essentially, you take two photographs of the same object at



ever-so-slightly different angles, then place them beside each other. When viewed through a viewfinder, the images combine in your eyes to form a three-dimensional view. This book contains 50 images of marine life, reptiles, mammals, birds and primates. The photos are all by Jim Naughten, who is passionate about the natural world and has turned his

talents to photographing these incredible specimens that have been drawn from some of the world's finest museums. This is a truly beautiful book. **OA**



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Try this... Shoot a typical British scene

As of this issue of *What Digital Camera* going to press, there has been very little summer to speak of. However, there are always photographic opportunities to be had, as this image by Paul Anthony Wilson from the Brits On Holiday category of the British Life Photography Awards ably demonstrates. Why not make a list of quirks and characteristics that are considered typically British, and set yourself a project to shoot them in what remains of the 'summer'...?

TOP TIP

Be careful when metering a scene such as this one, as the bright highlights in the reflections might fool the camera into underexposing. Use spotmeter mode to take a reading from a midtone area.

Nikon D2X, 70-200mm f/2.8 at 78mm,

1/13sec @ f/8, ISO 200

www.blpawards.org



Try this...

Direct your model

Asking someone to stand in front of the camera can make them feel uncomfortable, so try to bring elements of the background into play. If your subject has something to hold on to or lean against, you'll soon find that their poses look a lot more relaxed and natural. Don't be afraid to direct them, either, telling them how you want them to pose, what you want them to do with their hands, how to angle their head, and in what direction you want their eyes to be looking. You'll give them confidence, and you'll get the shots you want.

TOP TIP

Flat, even light is particularly flattering when shooting portraits. But if it's looking a little too dull, introduce a reflector out of shot to introduce a catchlight in your model's eyes.

*Fuji X-Pro2, XF 90mm F/2 R LM WR,
1/250sec @ f/2, ISO 200*
www.philhallphotos.com





Try this... Capture avocets in flight

With its piebald plumage and upturned bill, the avocet is one of Britain's most photogenic birds. Once extinct, they now number some 1,600 pairs in the UK. Photographer David Tipling recommends photographing avocets from public hides on RSPB reserves, with Minsmere in Suffolk a particularly strong location. 'Avocet flocks in flight can be quite tightly packed when flushed by a predator,' he says. 'When they wheel round, it is the patterning on the upper wing that makes for a very attractive image.'

TOP TIP

Avocets aggressively defend their territories, even against harmless ducklings. So if your camera is focused on a breeding avocet, be ready if another bird approaches, as it is likely the avocet will chase it off, making for a good photo opportunity.

Nikon D7100, 400mm f/2.8, 1/1000sec @ f/11, ISO 400
www.davidthipling.com





Focal length: 15mm Exposure: F/8.0 1/40 sec ISO400

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* For F/2.8 ultra-wide-angle zoom lens for full-frame DSLR cameras
(As of November 2014. Source: Tamron)

** The Sony mount version does not include VC (SP 15-30mm F/2.8 Di USD)

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Beneath the waves

Whether you're setting out to capture lush coral formations deep underwater or looking for a simple waterproof compact you can take snorkelling, our guide to underwater photography has you covered...

WORDS ● AUDLEY JARVIS

At some point we've all thumbed through a copy of *National Geographic* magazine or tuned into a marine biology documentary on the Discovery Channel and stared in wonder at life beneath the sea. From eye-popping coral formations to rusting shipwrecks, and from schooling fish in the open ocean to your kids splashing about in the hotel pool, the ability to use your camera underwater provides you with an unlimited supply of interesting things to photograph.

In common with many other specialist genres of photography the transition from film to digital has made underwater photography considerably cheaper and more accessible than it once was. Sure, you can still spend huge amounts of money on professional-grade underwater rigs, but there are also plenty of relatively inexpensive

waterproof compacts on the market that are perfectly adequate for snorkelling in the shallows with. Likewise, while some of the best underwater housing units can cost as much as the DSLRs they are designed to keep dry, there are more cost-effective ways to take pictures underwater. Put simply, while your budget will largely dictate the quality of the equipment you can afford, it won't exclude you from shooting underwater altogether.

Of course, underwater photography comes with its own set of technical challenges and even with the best equipment money can buy, you'll still need to know a thing or two to get good results. For example, understanding how water affects ambient light and colour temperature are two critical things that stand between you and a decent image. Likewise,

shooting underwater also provides a different type of physical challenge to shooting on dry land. Suffice to say that if you're going to take a camera into open water then at the very least you'll need to be a strong and confident swimmer. And if you want to go deeper than you can while holding your breath then you'll need to learn to dive.

Over the next few pages, we'll look at all these issues in more detail and aim to provide you with a basic understanding of how to deal with them. We'll also point you towards some of the better specialist underwater photography brands, as well as some of the best waterproof compacts. Obviously, we can't hope to cover absolutely everything in the space we have, however, there are plenty of excellent online resources where you can learn more.

You'll need to overcome the technical challenges that come with shooting underwater

Swimming, snorkelling and diving

While taking pictures underwater presents its own set of unique technical issues, by far the biggest hurdle for most photographers is the physical challenge of shooting while suspended in water. Obviously, you'll need to be a good swimmer in order to manoeuvre yourself about and take underwater photographs safely. In addition, you need to familiarise yourself with local conditions beforehand, taking things like tides, currents and swell conditions into account. If you're swimming or snorkelling somewhere unfamiliar then try to seek out local advice, too, to ensure you're not inadvertently putting yourself in any danger. And if you're lucky enough to be snorkelling somewhere with strong sun, do apply plenty of high-factor sunscreen, or better still invest in a UV-blocking rash vest or snorkel suit – there's nothing worse than getting horribly sunburnt on your first day in the water!

If the conditions are right, then snorkelling and shallow freediving is a great way to view life underwater, especially in calm, clear water. There are numerous beach resorts around the world that have coral reefs or rock shelves located just offshore, and snorkelling is by far the easiest way to see them, though you should always be mindful of any local conservation issues. Arm yourself with a decent pair of diving fins, a snorkel vest and a half-decent waterproof compact and you'll be able to capture everything you can see underwater too.

If you're looking to shoot at deeper depths than you can manage with a mask and snorkel then you'll need to be able to use scuba equipment, which entails attending a course and gaining a certificate. There are a number of recognised diving bodies who award the required certification, and the best known of these is the Professional Association of Diving Instructors (PADI). The Open Water Diver Course is PADI's most basic diving qualification and completing it will allow you to rent scuba equipment from affiliated PADI dive centres. Holding a PADI certificate will also enable you to access specialist diving holidays where everything is put into place for you.

The Open Water Diver Course can be completed in four to seven days.



© WWW.JSTOCKPHOTO.CO.UK

To take decent underwater images like this one, you'll need to ensure your subject is sufficiently illuminated

There are numerous PADI diving centres in the UK where you can do the course, with international PADI centres also found near recognised diving sites worldwide. You'll need to pass some medical checks before you can enrol and you can expect it to cost about £400 should you choose to do it in the UK. In theory all PADI-affiliated dive centres have to conform to the same rigorous safety practices, but if you plan to take the course abroad then you might want to research your options beforehand and check out feedback from previous participants.

Underwater lighting

One of the biggest technical issues that you'll need to overcome is creating enough light to illuminate your subjects properly. This is basically because water blocks out sunlight. As you might expect, the amount of sunlight decreases the deeper you go. If you're snorkelling in bright sunlight in shallow, clear water then this isn't likely to be much of an issue. You might still have to raise your ISO settings to compensate for the loss of light, but your camera should be able to cope without utilising an artificial light source. Once you start diving deeper than five or six metres, however, you will probably need to employ an underwater strobe or video light. If you don't then your images are likely to come out with

a strong dull blue/grey tint and contain very little colour. There are plenty of specialist underwater strobes available at a wide range of price points. Which type is right for you will depend primarily on whether you want to concentrate on capturing still images or video. You can, of course, use the continuous light generated by video lights to capture still images with, however strobes of a similar size will generally produce more power.

In order to attach a strobe – or better still, twin strobes – to your camera you'll need to invest in a set of specialist cables or a wireless slave device. While most underwater housing systems designed for CSCs and DSLRs can use electronic sync cables to connect the strobe directly to the camera's hotshoe via a watertight connection to provide full TTL flash metering, this isn't always possible with compacts. If you want to connect a camera without a hotshoe to an external strobe, then a wireless optical slave arrangement is your best option.

You can, of course, use an optical slave system with a CSC or DSLR, too. Many of the better underwater strobes have optical sensors built-in, although if required you can buy a standalone sensor and connect it to the strobe. Either way, once in place the strobe will be triggered by the flash on your camera – in much the same way that Nikon's

“Once you start diving deeper than 5m or 6m, you may need to employ an underwater strobe or video light”

Creative Lighting System works.

Whichever lighting system you decide on, one common problem faced by divers using strobes is that of backscatter. This is when the light from your strobe illuminates particles in the sea, which show up in your image as unsightly small white dots – a bit like dust particles on the sensor. While the amount of backscatter is ultimately dictated by sea conditions and therefore out of your control, there are some steps you can take to minimise its appearance in your underwater images. The most common way to do this is to position your strobes to the side of your camera. If you've invested in a decent waterproof housing for your CSC or DSLR then it should have attachment points that allow you to place the strobes on external arms that can often be repositioned on the fly to allow for more creative lighting techniques.

Colour issues

In addition to blocking out sunlight, water also filters out certain colours – with red being the biggest victim, followed closely by orange and yellow. If you don't take any steps to

Using specialist underwater colour-correction filters will boost the vibrancy of your images

counter this effect, then depending on the kind of water you are in, your underwater images will display either a deep blue/grey cast (tropical blue seas) or a green cast (temperate waters). In addition, colours will be washed out and lacking in punch. There are three main ways you can fix this to get more vibrant and realistic colour from your images: using a custom White Balance setting, using a specialist underwater filter, and post-processing your images in Lightroom or suchlike. Professional underwater photographers often use a combination of them, or even all three. Ideally you should shoot in Raw as this will give you more control when post processing. While Raw capture comes as standard on CSCs and DSLRs, the Olympus TG-4 is the only off-the-shelf waterproof compact to offer Raw capture, with the rest being JPEG-only.

In terms of white balance, some waterproof compacts have a range of useful underwater presets. Failing this, the 'cloudy' setting is a useful alternative. Of course, if you are shooting Raw then white balance can be easily adjusted at post-

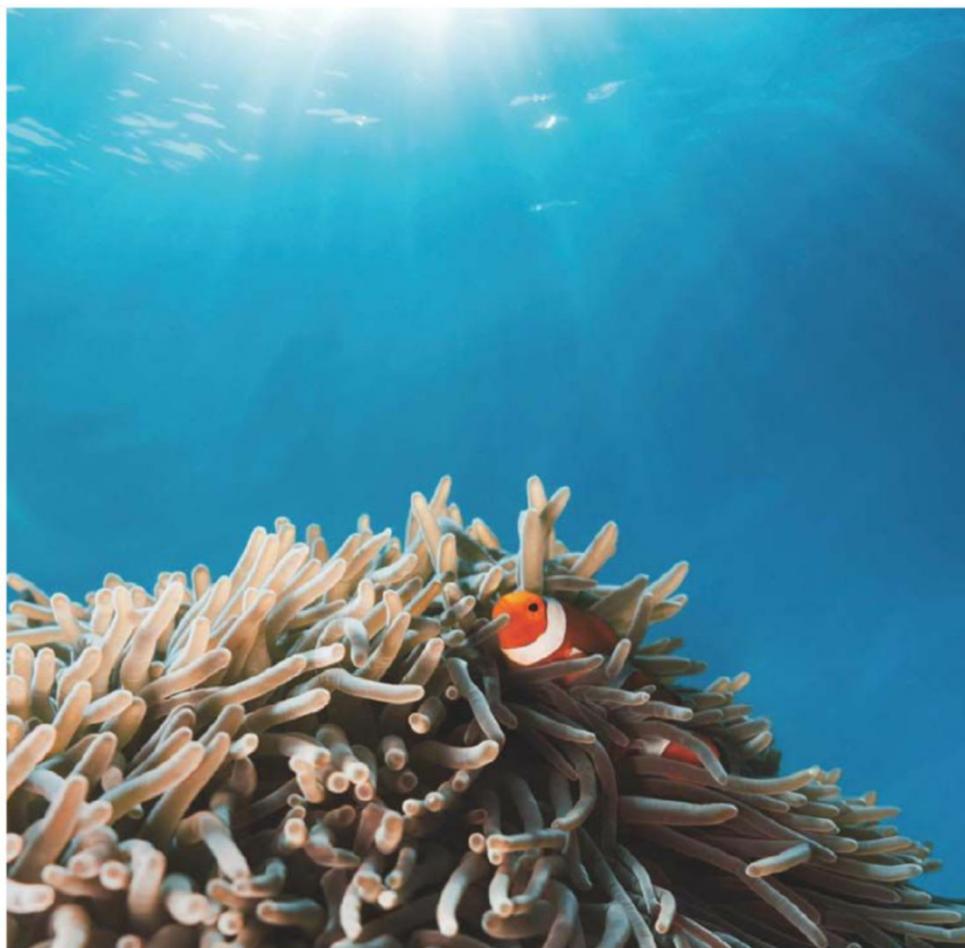
processing, however if you are shooting JPEGs you'll ideally want to get it as close as possible at the time of shooting. If your camera allows you to set a manual white balance and you are shooting in ambient light without flash, then this is a good practice to follow. Just remember to switch your camera back to its AWB setting if you want to use flash at any point – otherwise your images will look very red!

The use of specialist underwater colour correction filters is another way to boost the vibrancy of your images. Most of these are red in appearance and are designed to filter out the blues and greens that become dominant as you go deeper underwater. Because they block green and blue light (rather than add red) you will lose between one and 1.5 stops of light with one attached, which may require you to raise your camera's sensitivity. Used at depths of below 3m they will help to restore lost colour and will make images of colourful reefs pop with the same colours your eyes can see. Just be careful not to use flash with red underwater filters as this will produce a strong red tint in your image. The effect is not so pronounced when shooting at distance, but close up and reds will dominate the image.

Composition and general advice

Being able to hold your breath and freedive a metre or two will allow you to get closer to your subjects, which will often help you to get better images. One rule of shooting underwater is that subjects will look closer than they actually are. Even so, it's generally advisable to get as close as possible to your subject as this will reduce the amount of water between you and the subject, which in turn will increase the intensity of the ambient light (or the power of your strobe). Also, getting closer reduces the red-filtering effect of water, meaning your images will be more vibrant with truer colour.

Most professional underwater photographers tend to prefer using wideangle lenses as these enable them to get closer to their subjects and still fit them all into the frame. As a rule you should try to keep the sun behind you when you shoot too, to help illuminate your subject. That said, rules are there to be broken, so don't be afraid to experiment.



Waterproof cameras and housings

Most of the major manufacturers now offer a waterproof compact as part of their 'rugged' compact range. These cost between £200 and £350 and are usually waterproof to a depth of between 10 and 30 metres. There are a couple of exceptions, but most waterproof compacts are built around small 1/2.3in sensors. This does limit their performance somewhat, especially at higher sensitivity settings.

Compact System Cameras and DSLRs with larger sensors will invariably get better results at higher ISOs, however, you will need to invest in a waterproof housing unit (as well as a bespoke lens port to protect the lens) and these can be quite expensive. Ultimately, if you just want a camera to take into the sea, or for a bit of light snorkelling then a waterproof compact is the most cost-effective option.

On this page are some of the best specialist underwater photography brands, and opposite are some of the finest waterproof cameras.



Nauticam waterproof housings

WWW.NAUTICAM.COM

Based in Hong Kong, Nauticam is considered by many to be the Rolls Royce of underwater camera housing manufacturers. It makes waterproof housings to fit all types of camera – from advanced compacts to CSCs and DSLRs. Prices vary, though as a rule the bigger the camera, the more expensive the housing will be. For example, a Nauticam housing for the Sony RX100 VI will currently set you back £860, while one for the Canon EOS 5D Mk III will cost £3,543 – more than the 5D Mk III itself! In return you can expect a premium-grade aluminium housing that is water resistant to a depth of 100-150m and neutrally buoyant for easier handling underwater. Since each housing is tailor-made, you can also expect to operate all of the main external buttons on your camera while underwater. For more information on the Nauticam range check out its UK distributor at www.nauticam.co.uk



Ikelite waterproof housings

WWW.IKELITE.COM

Based in Indianapolis, USA, Ikelite is another company that specialises in underwater housing units for digital cameras. The company offers polycarbonate housings for all the major camera manufacturers, covering everything from cheap compacts to professional-grade DSLRs. Prices are much cheaper than for equivalent Nauticam housings: a Canon 5D Mk III housing, for example, costs £1,400. Note that when choosing a housing for CSCs or DSLRs you will need to add a dedicated Lens Port that's compatible with the lens you intend to use, which will cost you extra. The depth rating of Ikelite housings is 60m, which is slightly lower than Nauticam ones. That said, for most divers 60m is likely to be more than ample. Ikelite also offers a generous range of underwater flash lighting rigs. For more detail on the full list of cameras covered and UK prices go to www.camerasunderwater.co.uk



Sea & Sea YS-01 Underwater Strobe £360

WWW.SEAANDSEA.COM

Sea and Sea specialises in underwater photography equipment. It offers a limited range of waterproof housings for DSLRs, as well as underwater strobes that come highly recommended. Chief among these is the YS-01 (£360), which features a circular beam angle of 100° and a maximum guide number of 20. The YS-01 is triggered by built-in wireless optical slave technology which makes it compatible with compact cameras that lack a hotshoe. It can be operated in Digital Slave TTL mode, TTL mode or in a fully manual mode that offers ten graduated power settings. In addition to the main strobe, the YS-01 comes with a single LED target light that's useful for night diving or lighting up darker reefs. Sea and Sea also has the YS-03 (£270) that is TTL only, but delivers the same power and comes with all the accessories you need. Sea and Sea products are distributed in the UK by www.sea-sea.com



Magic Filters

WWW.MAGIC-FILTERS.COM

While your camera's white balance settings can be used to correct underwater colour temperature to a degree, at depths deeper than 2-3m you may benefit from using a lens filter. Generally red in appearance, underwater filters accentuate colour in things like coral reefs; and can also help turn washed out open ocean backgrounds into a pleasing deep blue. Magic Filters is a respected brand set up by two experienced underwater photographers that produces filters for use with compact cameras and DSLRs. Most of these are supplied as internally mounted gels that attach to the rear of the lens, though there are also some front-mounted acrylic filters that will fit 77mm filter threads. For best results you should ideally shoot at a depth of 3-10m with the sun on your back. Also, don't use a strobe and a Magic underwater filter together as this can affect colour temperature.



Fourth Element Hydroskin UV Rash Suit £75

HTTP://FOURTHELEMENT.COM

While swimming and snorkelling in warm seas as the sun beats down is undeniably pleasant, it's also a surefire way of getting yourself horribly sunburnt if you don't take precautions. This is because the salt in seawater reflects the sun's harmful UVB rays, essentially focusing them back onto your skin. Using a high factor sunscreen (SPF 50+) certainly helps to reduce the effects, however the sea combined with the sweat from swimming can soon wash it off, leaving you exposed. The Hydroskin UV rash suit covers the whole body and offers a SPF of 30 when dry and over 30 when wet. Constructed from high quality lycra, the suit allows for easy movement and also acts as a barrier to some stingers. The Hydroskin suit is available in a range of colours and in all sizes for both men and women.

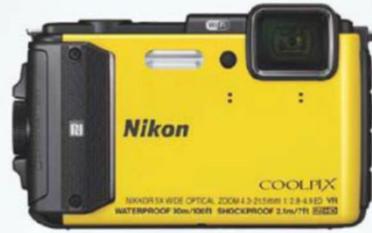


Olympus TG-4 £264

WWW.OLYMPUS.CO.UK

Waterproof to a depth of 15 metres, the excellent TG-4 is ideal for general snorkelling as well as freediving in shallow water. With a 16MP CMOS sensor the TG-4 features a 4x optical zoom lens (25-100mm equivalent), and a 3in 460k-dot LCD display. The TG-4 offers a host of automatic shooting modes including five distinct Underwater modes. Better still, it can also capture Raw images, which gives you greater post-processing potential. Olympus sells a range of accessories that can be used with the TG-4, such as the FCON-T01 fisheye attachment (£130) and the LG-1 Macro ring light flash (£30).

KEY SPECS	SENSOR	1/2.3in, 16MP CMOS
	LENS	25-100mm f/2-4.9
	SENSITIVITY	ISO 100-6400
	WATERPROOF DEPTH	15m
	DIMENSIONS	112 x 66 x 31mm
	WEIGHT	247g incl. battery and card

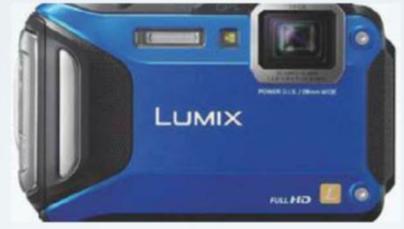


Nikon AW130 £200

WWW.NIKON.CO.UK

With a depth rating of 30m the AW130 is ideal for snorkelling, swimming and shallow water dives. It has a 16MP CMOS sensor and a 5x optical zoom with a 35mm focal range equivalent of 24-120mm. The 3in, 921k-dot OLED display on the rear is one of the sharper displays found on this type of camera. There's built-in Wi-fi and NFC connectivity that enable you to transfer images to a compatible smartphone or tablet, as well as control the camera remotely. The AW130 also has a built-in GPS and altimeter module that writes location and depth data directly to your images. Keeping this permanently switched on affects battery life, though.

KEY SPECS	SENSOR	1/2.3in, 16MP CMOS
	LENS	24-120mm f/2.8-4.9
	SENSITIVITY	ISO 125-6400
	WATERPROOF DEPTH	30m
	DIMENSIONS	110.4 x 66 x 26.8mm
	WEIGHT	221g incl. battery and card



Panasonic Lumix FT-5 £200

WWW.PANASONIC.COM

Launched in 2013, the FT-5 remains Panasonic's flagship waterproof compact. With a depth rating of 13 metres the FT-5 isn't designed for deep water diving, but is ideal for snorkelling, swimming and splashing around in the hotel pool with. It has a 16.1MP CMOS sensor and a 4.6x optical zoom (28-128mm equiv.). At f/3.3 the FT-5's maximum aperture is a little on the slow side though. It boasts a built-in GPS module that records location data as well as altitude/depth data, along with built-in Wi-fi and NFC connectivity so you can pair the camera with your smartphone or tablet to either transfer images or control the camera remotely.

KEY SPECS	SENSOR	1/2.3in, 16.1MP back-illuminated MOS
	LENS	28-128mm f/3.3-5.9
	SENSITIVITY	ISO 100-3200
	WATERPROOF DEPTH	13m
	DIMENSIONS	109.2 x 67.4 x 28.9mm
	WEIGHT	188g without battery and card



Canon D30 £180

WWW.CANON.CO.UK

Released in 2014, the D30 remains a competent little waterproof camera that, with a depth rating of 25 metres, can easily handle shallower dives as well as snorkelling and swimming. While there's no built-in Wi-fi or NFC connectivity, the D30 does have a basic GPS module that can tag images with location data. Unlike more modern waterproof compacts, its GPS functionality does not extend to recording depth or altitude data. The D30 benefits from large buttons for easy handling and a large – if not particularly sharp – 3in, 460k-dot LCD display. Overall, while it's starting to show its age, the D30 is still good value for money.

KEY SPECS	SENSOR	1/2.3in, 12.1MP back-illuminated CMOS
	LENS	28-140mm f/3.9-4.8
	SENSITIVITY	ISO 100-3200
	WATERPROOF DEPTH	25m
	DIMENSIONS	109.4 x 68 x 27.5mm
	WEIGHT	218g incl. battery and card



Nikon 1 AW1 £550

WWW.NIKON.CO.UK

Released in 2014, the Nikon 1 AW1 was the first Compact System Camera designed to withstand being fully submerged in water and is still the only waterproof CSC. Nikon offers two fully waterproofed lenses for it: a 11-27.5mm f/3.5-5.6 (30-74mm equiv.), and a 10mm f/2.8 (27mm equiv.). The lens mount can also take all the non-waterproofed Nikon 1 lenses. The AW1 has a 1in CX-format CMOS sensor – which is much larger than the sensors used in most waterproof compacts – and can record Raw as well as JPEGs. It also has built-in Wi-fi and NFC, plus a GPS module that measures depth/altitude as well as positional data.

KEY SPECS	SENSOR	14.2MP CX-format (1in) CMOS
	LENS	30-74mm f/3.5-5.6
	SENSITIVITY	ISO 160-6400
	WATERPROOF DEPTH	15m
	DIMENSIONS	113.3 x 71.5 x 37.5mm
	WEIGHT	356g incl. battery and card



GoPro Hero4 Silver £330

HTTP://SHOP.GOPRO.COM

As regular readers will know we like to throw a bit of a curveball in, and this month it's GoPro's Hero4 Silver. We've chosen the Hero4 Silver over the more expensive Hero4 Black because it has a built-in touchscreen that allows you to be much more precise when composing still images. If you want the more advanced video options of the Black edition, GoPro makes an optional LCD Touch BacPac display for around £65. The Hero4 Silver can capture 12MP still images and is waterproof down to 40m when placed in its protective housing. GoPro also offers accessories for its Hero4 cameras, including specialist underwater filters.

KEY SPECS	SENSOR	1/2.3in, 12MP CMOS
	LENS	14/21/28mm, f/2.8
	SENSITIVITY	ISO 100-6400
	WATERPROOF DEPTH	40m
	DIMENSIONS	71 x 71 x 39mm inside housing
	WEIGHT	147g including housing

Paul Mitchell

BURNHAM,
BUCKINGHAMSHIRE

Being a full-time graphic designer, I have been associated with photography in one way or another for over 30 years. It is only in the last 13 years or so that I have concentrated on my own photographic journey. I suppose it all started with my first DSLR (a Fuji S2 Pro) which freed me from buying film and having it processed and scanned etc.

Being a lover of the outdoors and the landscape, light is my biggest inspiration, be it the spectacular light at the beginning and end of the day, or even a drizzly, grey day in a wood. The gentle nuances created by light is my artist's palette. Other sources of inspiration come from the likes of Peter Dombrovskis, Christopher Burkett, Shinzo Maeda and Joe Cornish.

Some of my future plans include a couple of books, one featuring my other passion, which is pinhole photography, and a long-term project documenting the changing seasons in Burnham Beeches in Buckinghamshire, which is on my doorstep. I am also hoping to start running workshops this year with a view to passing on some of my passion and expertise.



WWW.PAULMITCHELLPHOTOGRAPHY.CO.UK

PAUL USES A

Nikon D810



My equipment consists of a Nikon D810 with the Nikkor 24-70mm f/2.8 and 70-200mm f/4, plus a Nikon D7100 with the Tokina 11-16 mm f/2.8 and Nikkor 17-55mm f/2.8. I have a full set of both the hard & soft Lee ND grads along with the Lee Polariser, and the Big and Little stopper. My favoured tripod is a Gitzo GT 3542 XLS.



1 Vale of Pewsey

One of my favourite locations is looking down on this wonderful part of Wiltshire from Martinsell Hill. This was my third early morning trip there, ever hoping that I would find mist... third time lucky as they say!

Nikon D7100, 70-200mm, 1/60sec @ f/11, ISO 100, Lee 0.6 soft grad

2 Floating Copper

While walking in my local woods, I spotted this tableau of two tree trunks accentuated by the dying bracken and copper leaves, which seemed to be floating in mid air.

Nikon D7100, 70-200mm, 1/10sec @ f/10, ISO 100

3 West Bay

A cold January morning saw me travelling down to Dorset to meet my good friend and current LPOTY holder Andy Farrer. He suggested

starting at West Bay. Strong winds combined with a high tide made for a dramatic result!

Nikon D810, 24-70mm, 0.6sec @ f/22, ISO 64, Lee 0.9 hard grad

4 Whitby Evening

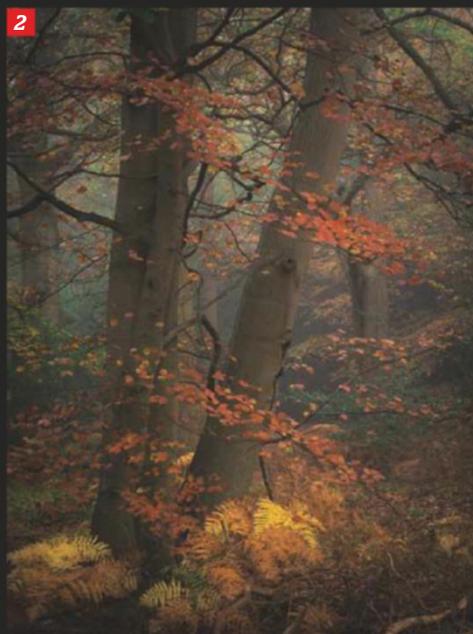
An image made in 2011 while on a visit to Whitby. I only had my compact camera with me but on reflection it did a sterling job.

Panasonic GF1, 20mm 1/13sec @ f/9, ISO 100, Lee 0.6 Soft grad

5 Dovercourt

I decided to visit one of my favourite haunts on the Essex/Suffolk coast to try out my new Nikon D810. My hoped-for colourful dawn didn't materialise, so I decided a long exposure would be the best option.

Nikon D810, 24-70mm, 129 seconds @ f/9, ISO 64, Lee 0.6 hard grad, Big Stopper





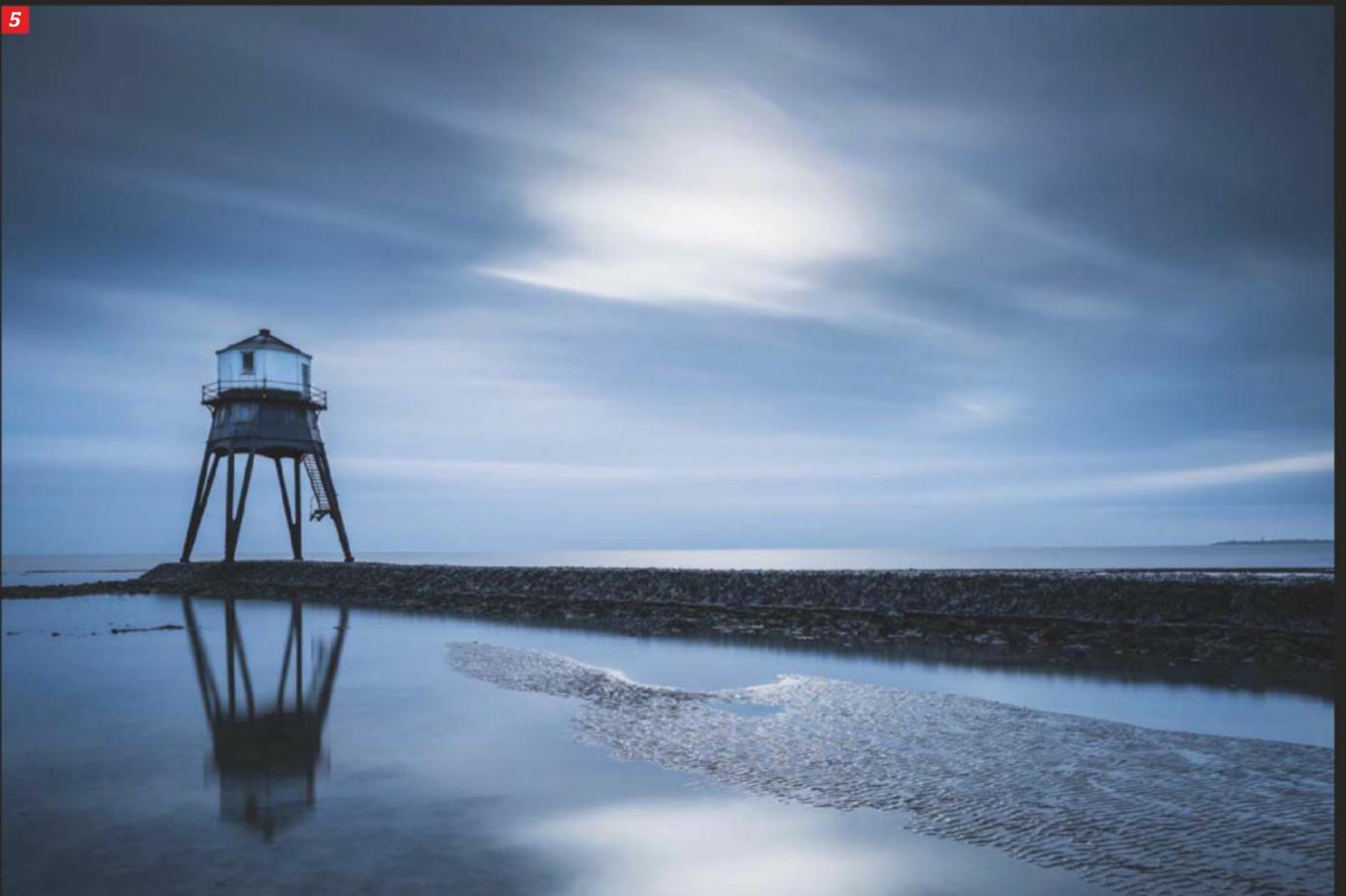
THE READER selected for 'Portfolio' will receive an ultra-reliable Samsung SDHC PRO 32GB Class 10 memory card. It has transfer speeds of up to 90MB/s and will withstand the harshest conditions. Visit: www.samsung.com



4



5



SONY



FE 85mm F1.4 GM

FE 70-200mm F2.8 GM OSS

FE 24-70mm F2.8 GM



Tomorrow's lenses today, from Sony

Lens standards are changing. Advances in camera performance and soaring creative ideals demand a new approach to lens technology.

Sony now redefines the lens, with a clear vision of the future. The G Master revolution begins with three large-aperture lenses that achieve a supreme blend of high resolution and beautiful bokeh thanks to new XA (Xtreme Aspherical) lens elements with increased surface precision.

With these new additions, there are now 20 full-frame e-mount lenses available, giving you all the tools you need to capture the ultimate shot.

All lens availability is dependent on market release dates. Discover more at www.sony.co.uk

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Photographing a wedding can be an intimidating prospect, but as long as you're prepared, you should be able to capture some memorable shots

WORDS AND PICTURES **TOM CALTON**

For some, just hearing the words 'wedding photography' is enough to bring them out in a cold sweat. It's certainly not a job for the faint of heart, as it requires a multitude of skills, a fair amount of patience and the correct photographic equipment in order to do the job right. But just ask any seasoned wedding snapper and they'll tell you that there's no other photographic genre that's quite as exhilarating and rewarding. Being granted the privilege of capturing the happiest day of two people's lives is something that offers a buzz unlike any other and for those with the ambition and the creativity, it can be an opportunity to capture some truly stunning imagery along with crafting a longstanding and profitable career. That said, it's also something that shouldn't be

entered into lightly. As a wedding photographer it's your responsibility to ensure that every aspect of the day is captured immaculately – after all, there are no re-dos!

To give yourself the best chance of capturing some impressive imagery, it's firstly important to ensure that you have the correct equipment for the job. Starting with the obvious, you're going to need a camera that's up to the task of shooting hundreds, if not thousands, of photos across the day. A full-frame DSLR, such as the Canon 6D (£1,119 body only) and 5D Mark III (£2,178 body only), is often the preferred choice for professional wedding photographers as the larger sensor provides greater amounts of detail for the highest quality images. However, if your budget can't quite stretch to the glitz and glam of a full-frame

camera, then don't worry, as a mid-range APS-C sized D-SLR, such as the 80D (£999 body only), will still be able to cope with the fast pace of a busy wedding day.

All of these cameras are able to create 20-megapixel (or higher) resolution images, which means they are ideal for creating up to A3 sized prints without the need to interpolate the images in post production – handy for any clients who are looking to order large prints of your work.

The lenses in your camera bag are just as important as the camera itself. If you don't have a lens long enough to reach the action at a distance, or you're without a wide angle in order to fit everyone into the group shot then you're soon going to find yourself in hot water. Having a variety of lenses that cover most focal lengths is always the safest bet, though whether you decide to favour zoom lenses over primes, or visa versa, or both, is entirely down to your own personal preference. A medium zoom lens like the Canon 24-70mm f/2.8L II

Interaction with the couple is key to ensure they feel comfortable having their photo taken

❑ USM (£1,400) is a fantastic workhorse as not only does it provide a wide angle for group shots, the 70mm end is a perfect focal length for portraits. When opened up fully to the wide f/2.8 maximum aperture, this lens is able to let in much more light than most standard zooms, which is great for shooting dingy church interiors without having to crank the camera's ISO to a higher sensitivity and run the risk of having shots riddled with digital noise.

Sometimes the best shots are those that have been taken without the person even knowing, and the best way of doing this is by taking them at a distance with a telephoto zoom, such as the Canon 70-200mm f/2.8 L USM (£945). The 70-200mm focal length pairs

wonderfully with the aforementioned 24-70mm lens, meaning that between these two lenses you're covered for most types of photography.

Aside from zooms there's also the option to opt for prime lenses instead. Obviously the fixed focal length of a prime lens means that in order to get closer or further away from the action you'll need to physically move the camera, which some may find limiting compared to a zoom. However, on the plus side, prime lenses are notably lighter in weight and offer a much wider maximum aperture.

Changing back and forth between lenses can be a fiddly and time-consuming chore, especially at a wedding where seconds often mean the difference between capturing the shot or not. One

solution to this problem is to purchase a second camera body. If your pockets are deep enough to cover the expense, owning two camera bodies grants a number of benefits; firstly it means that you can attach a



The Canon EF 70-200 F2.8L IS II USM



Prime lenses are perfect for super-shallow depth-of-field effects



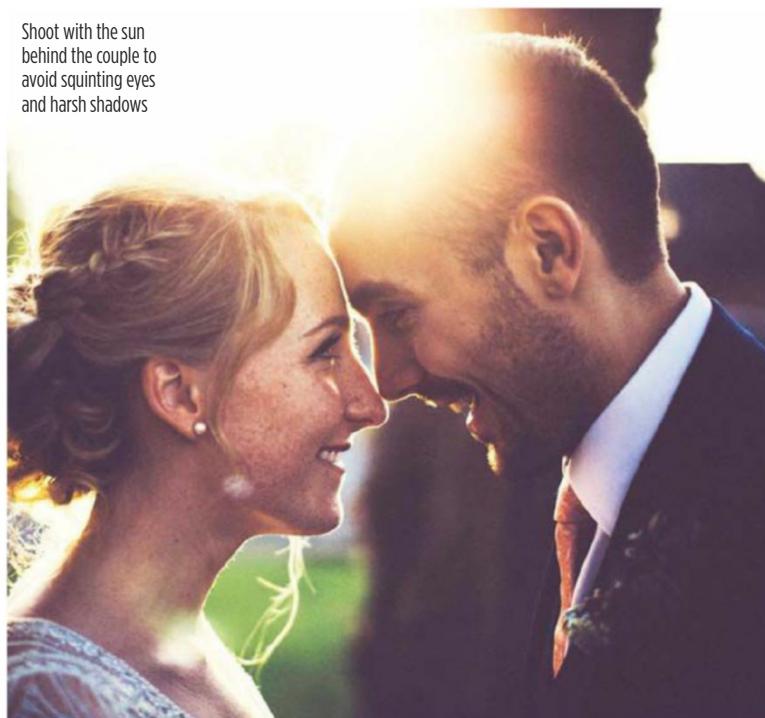
If bad weather is stifling your location choices, use off-camera flash for studio-quality portraits indoors

Organisation is key

The night before the big day, spare a few moments to make sure that you have packed everything you may need for the day ahead. You could always write a checklist of essential equipment you think you'll need and then go through it item by item to make sure that you have packed everything you require. As you're working your way through the list, it's also important to test each of the items to ensure that they are in full working order so that you don't get any nasty surprises when you come to use them on the day. Stock up on fresh AA batteries (you can never have too many!) and make sure that all of your camera batteries are fully charged and ready to go. If you have a lens cloth, give your glass a quick once-over to remove any dust or dirt build-up, too.

The secret to good preparation is to give yourself ample time to go through and pack everything instead of rushing it at the last minute and risk forgetting something. It's also vital not to over pack – it's good to cover yourself for every eventuality, but taking too much stuff may end up slowing you down.

Shoot with the sun behind the couple to avoid squinting eyes and harsh shadows



different lens to each body and have them available at all times. Also, the second body will mean that you always have a back up should the worst happen and one of your cameras ceases to function.

It's often the case that smaller accessories are quickly overlooked, but are actually vital pieces of gear that will make the entire shooting process a much smoother operation. Investing in a handful of additional camera batteries will ensure that your camera never runs out of juice at a vital moment. If you want to further reduce the time spent swapping over camera batteries then you could always look to purchase a battery grip for your camera. This unit slots on to the base of your camera and allows you to store multiple batteries at one time, dramatically extending the battery life of your camera.

Over the course of a wedding day it's not uncommon to take upwards of a few thousand images (depending on how snap happy you are), so you're going to need somewhere to store all of that data. Purchasing half a dozen high-capacity, high-speed memory cards will not only ensure that you have ample space for all those images, but will also keep your camera's buffer clear when shooting in continuous burst mode for uninterrupted shooting. Do bear in mind, however, that if you decide to shoot in Raw then your images will

BACK-UP AS YOU SHOOT

It's better to be safe than sorry. If you happen to own a laptop and an external hard drive, be sure to pack it with the rest of your camera gear as you can use it to back up your images on the day. Usually there will be a lull period while the bride and groom enjoy their wedding breakfast, so this is a good time to back up your shots onto your laptop for safe keeping. It'll also allow you to free up some space on your memory cards for further photos during the evening's celebrations.

be far larger in size than a standard JPEG, meaning you will need larger memory cards (or multiple smaller cards) to store them.

If you've been booked to photograph the wedding reception as well as the ceremony, then you'll also need to make **sure that you're well prepared for capturing images in low light.** Once the music starts blaring and the lights go down, it'll be up to you to create your own source of light or be faced with noisy images created by using a high ISO. Investing in a flashgun, such as the Canon Speedlite 430EX III-RT (£219), will allow you fire a powerful

beam of light at your target to illuminate them without relying on the ambient light.

It's also worth mentioning that the 'RT' in the 430EX III's name stands for Radio Transmitter, which means that the flash is able to be **fired remotely off-camera via compatible DSLRs** or with the aid of **the Canon ST-E3-RT Wireless TTL Flash Controller (£239).** This means that if you want to boost your creativity even further you could also look to invest in one or more light stands and flash brackets in order to fire the flash off camera for studio-style lighting effects.



Shoot with a wideangle lens to pack large groups of people into the shot



In order to work efficiently, AF systems need a reasonable amount of light; when levels are low it can help to prefocus the lens

Prefocusing with your **Nikon DSLR**

Separating the focusing from the picture-taking allows you to be ready for action in an instant

WORDS AND PICTURES **MARK HIGGINS**

Prefocusing, as the word suggests, means focusing the lens in advance of taking a picture. But in this instance we're not talking about the quick semi-depress of the shutter-release button before you press it all the way down, we're talking about separating the act of focusing from the act of picture-taking, allowing you to be ready for action in an instant. Imagine, for instance, that you've been waiting for a golden eagle to return to its nest for hours. As the bird approaches, you fire away hoping at least one of the shots will be sharp. But when you

review the images you are bitterly disappointed: the AF system couldn't keep up with the bird, and your pictures are out of focus. If you had prefocused, however, the AF system would have carried out its job in advance, leaving you with the sole task of releasing the shutter at the optimum moment.

And it's not just wildlife and sports photographers who benefit from this technique; it's also popular with landscape photographers, too. In order to work efficiently, AF systems need contrast, detail, and a reasonable amount of light. When one or more of these features is lacking, the lens whirs back and forward trying to 'lock on'. This 'hunting' can slow you right down, and stop you from taking a picture altogether. AF systems also struggle with highly reflective surfaces (such

as water), geometric patterns, overlapping elements, and off-centre subjects. So if you are a landscape photographer shooting water in misty (low contrast) conditions you might be in trouble if you fail to prefocus.

How to prefocus using Focus Lock

Now you have seen the advantages of prefocusing, it's time to look at how it's done. There are a number of ways to isolate the focusing from the picture taking, but the main ones are: Focus lock, Manual focusing, Back Button AF, and using a computer to control the camera (see box). The method you choose will depend on the subject and, ultimately, your personal preferences, but it's important not to confuse things by trying all the different options in one session.

Let's start with a method that most of us will be familiar with: Focus Lock. When we compose a picture we don't always want the subject to be in the centre of the frame. In fact, sometimes we want the subject so far off-centre that it isn't covered by any of the AF

points. On these occasions we can lock the focus by covering the subject with one of the AF points, pressing and holding the shutter-release button down halfway, and then recomposing. Alternatively we can press and hold the shutter-release button halfway, press the AE-L/AF-L button, and then remove our finger from the shutter-release button, before recomposing. (Note that AE-L/AF-L button will lock focus and exposure unless you change its function via the Custom Settings menu.)

How to prefocus using Manual Focus

Another popular way of prefocusing is to switch the lens and/or camera to Manual Focus, allowing you to

Switching to Manual Focus allows you to be extremely precise – perfect for close-up subjects where depth of field is limited

play a more active role in the process. If your lens features an A-M, M/A-M or A/M-M mode switch, slide it to the 'M' (Manual) position. If it doesn't, press the Info button on the camera, and scroll down the options until you reach the Focus Mode menu. Select MF (Manual Focus). At this point you need to decide whether to compose your pictures via the viewfinder or the LCD screen (using live view). Unless you happen to be shooting in extremely bright conditions where viewing the screen could be difficult, live view has the edge here.

For one, composing in live view allows you to enlarge an area of the frame to ensure that your focusing is spot on (this is known as Live View Zoom Preview). To select a



Using Camera Control Pro 2

If you're struggling to focus using the screen on your DSLR, how about using a bigger screen? Nikon's Camera Control Pro 2 software enables you to link your computer and camera via a USB cable or wireless technology. Once the devices are connected you can activate live view, zooming in and out, or making changes as required.

Using Camera Control Pro you can also adjust the ISO, shutter speed and aperture remotely, which is great for wildlife photographers trying to keep a low profile. The program also allows you to view, select and delete pictures prior to transferring them to a computer, which saves time. Also by not touching the camera you can reduce the risk of internal vibration, which is great for close-up images (where depth of field is very limited) and landscapes (which often need a combination of small apertures and long shutter speeds).

It's also worth experimenting with Nikon's SnapBridge app which allows for Bluetooth supported connection between your camera and a compatible smart device such as a mobile phone. Once the connection has been established, it's permanent, so there's no need to repeat the process.

Step by step

Using Back Button AF for a moving subject

ONE



Handhold the camera. Adopt a solid stance with one foot in front of the other (not on the same focal plane). Keep most of the weight in the back foot.

TWO



Press the Info button and scroll down the options until you reach the Focus mode menu. Select AF-C (Continuous-servo AF). Press OK.

specific area you simply move a rectangle around the frame using the Multi selector, and then press the Zoom button to magnify your chosen section (up to 11x on the Nikon D5, but less on older models). Now all that's left to do is to rotate the focusing ring on the lens until the area appears sharp. (A navigation window appears at the bottom of the screen to help you see where you are in the frame.) Alternatively, if you decide to use the viewfinder to focus you will need to look through the glass, adjust the diopter to suit your eyesight (see box), and then turn the focusing ring until the clear matte field appears sharp.

If you need some help to determine whether or not your subject is in focus via the viewfinder, you can activate the electronic Rangefinder (located in the Custom Settings menu). This tool uses the exposure indicator (the green lines along the bottom of the screen) to suggest whether or not the lens is correctly focused. When the lines are to the left of the '0' the focus point is in front of the subject; and when the lines are to the right of the '0' the focus point is behind the subject. When one line falls either side of the '0' the subject is in focus. You need to adjust the focusing ring on the lens until this last state has been achieved. (To use the Rangefinder feature you need to attach a lens with an aperture of at least f/5.6.)

How to prefocus using Back Button AF

Once you've familiarised yourself with Focus Lock and Manual Focus you might like to try a more

ADJUSTING THE DIOPTER

Before using the viewfinder for manual focusing, check that the screen is as clear as it can be for your eyesight. If you're shortsighted or longsighted you can compensate for this by looking through the lens and rotating the Diopter control until the AF brackets and text at the bottom of the screen are sharp. Most built-in diopters can correct eyesight from -1.7 to +0.5, but you can buy an Eyepiece Correction lens with strengths from -5 to +3. You can also improve focusing accuracy by using a Magnifier DG-2 (with Eyepiece Adapter DK-22), which magnifies the central area of the scene in the viewfinder.



Using Back Button AF enables you to switch between static and moving subjects without having to switch between AF-S and AF-C modes

advanced prefocusing option. Back Button Autofocus enables you to completely separate the focusing from the picture taking (using a different button for each job). It has two main advantages: it allows you to focus the lens in advance of firing the shutter (saving you time and improving accuracy), and it enables you to switch between static and moving subjects without having to physically switch between AF-S (Auto Focus Single Servo) and AF-C (Auto Focus Continuous Servo) modes. Fewer buttons to push means more time to concentrate on framing and the like.

But before you go looking for a dedicated Back Button AF control on your camera, read on. In short, it doesn't have one. What you will see is an AE-L/AF-L button (on older Nikon DSLRs) or an AF-ON button (on more recent models). If your camera has an AE-L/AF-L button you need to change its role from

locking focus to initiating focus. To do this you must open the Custom Settings menu and select AF-ON. Alternatively, if your camera has a dedicated AF-ON button you need to go into the Custom Settings menu, select Autofocus, and choose AF activation. In the submenu you then select AF-ON only. With this done, the AF-ON button is now entrusted with the sole job of focusing, and the shutter-release button has the sole job of opening the shutter.

Let's use the example of the golden eagle to demonstrate how Back Button AF can be helpful. As the bird comes into view you can hold down the AF-ON button and follow its path. As soon as it arrives at the nest you can lift your thumb off the AF-ON button to halt the focusing and hold down the shutter-release button to take a series of images. Seconds saved, shots secured. Simple.

THREE



Instruct the camera to shoot a burst of images by pressing the Release Mode button, and scrolling through the options until you reach Continuous H. Press OK.

FOUR



Place the focusing point over a part of the subject containing high contrast and/or fine detail. Activate Back Button AF by pressing (and holding down) the AF-ON button.

FIVE



Continue to hold the AF-ON button down while you follow the action. When you want to stop focusing, remove your thumb. When you are ready to shoot a series of images hold down the shutter-release button.

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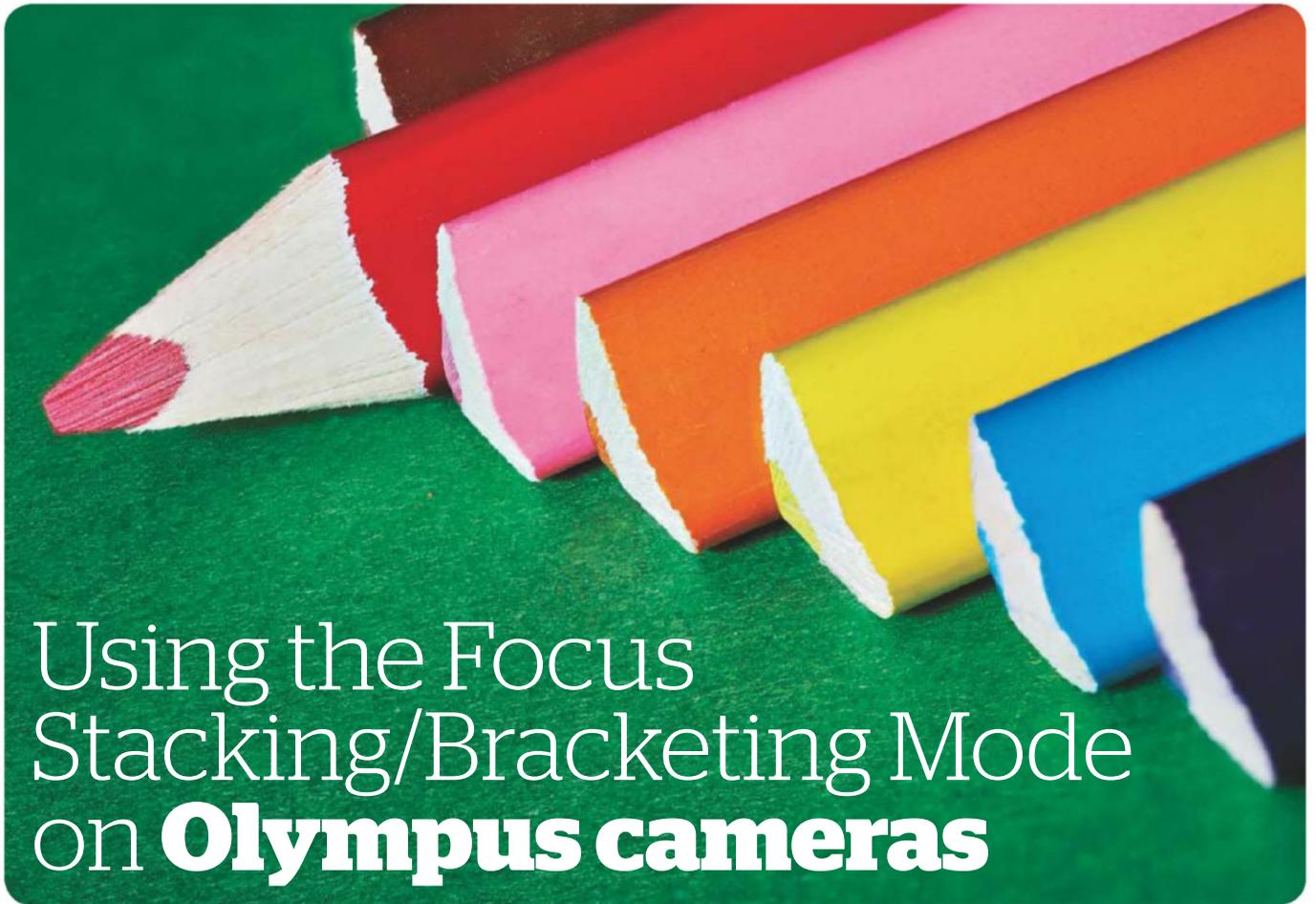
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Using the Focus Stacking/Bracketing Mode on **Olympus** cameras

Taking stunning close-up images is challenging, but the Focus Stacking mode makes it much easier

WORDS AND PICTURES **STEVE GOSLING**

Close-up and macro photography opens up access to a fascinating and interesting world not easily seen with the naked eye. By getting in close to our chosen subject, patterns, colours, textures and details can be revealed for the first time. And interesting subject matter can be found pretty much anywhere - items around the house or garden can be transformed into works of art once we move in close with our camera, add a measure of creativity and a sprinkling of imagination (see Box Copy).

But this is also a challenging area of photography to tackle - any deficiencies in composition, exposure or focus (particularly depth of field) will be immediately apparent. Potentially it is not only the subject that becomes magnified but also all the flaws in our technique as well! Shooting only close up and macro photographs for six months is a great way to

improve our technical skills.

Managing the inter-relationship between all the variables involved requires a good understanding of the relationship between aperture selection (and its impact on depth of field), shutter speed and ISO and their contribution to the look of the final image. For example, when working close with a macro lens, often a small aperture is required to maximise depth of field (assuming that the end result requires front to back sharpness as against a limited plane of focus where only one small part of the subject is sharp). A consequence of a small aperture is of course a slower shutter speed, to allow enough light to reach the sensor for an adequate exposure.

This in turn can lead to camera shake or blur from subject movement during the exposure. In the digital era an increase in ISO can help to negate these problems - a higher ISO allowing for a faster shutter speed (and thankfully the

days of moderately high ISOs having a detrimental effect on image quality are behind us). The blurring induced by camera shake can also be countered by using a tripod or relying on the camera/lenses image stabilisation function. But all of these factors need to be considered before firing the shutter.

And furthermore when working in close to the subject even a relatively small aperture will require accurate focusing and an understanding of depth of field and hyperfocal

When working up close there's plenty to photograph without straying far from home, as household items can become works of art. The images above and below have been Focus Stacked to ensure precise focus

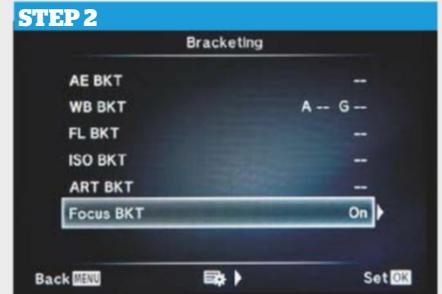


Step by step 1

Focus Bracketing



Access Shooting Menu 2 and turn on Bracketing. Note that this will automatically change the shooting mode to High Burst/Silent; this will be cancelled again when you turn Bracketing off.



Select Focus Bracketing Mode from the options on screen - Focus BKT.

distances to maximise sharpness. So yet something else to take into account. It's little wonder that many photographers have been deterred from undertaking close-up and macro work.

Those photographers who were not put off developed techniques to get around some of these problems. One of the solutions was focus bracketing, i.e. taking several exposures of the same subject at different points of focus and then blending these together in the computer using suitable software programmes (e.g. Adobe's Photoshop, Zerene Stacker and Helicon Focus). But taking the shots at different focus points can be time consuming (and not possible with subjects that might move or fly off during the process) and requires some expertise in judging just where to focus and how many shots to take. Still not a simple solution.

But then Olympus came along and introduced Focus Bracketing and Focus Stacking Modes to its OM-D cameras.

Focus bracketing

Focus Bracketing was first introduced to the OM-D range when the E-M10 II camera was launched, and was subsequently added to the E-M1 and E-M5 II by way of a firmware upgrade.

The Olympus Focus Bracketing mode allows the photographer to take up to 999 consecutive shots at focus differentials between 1 and 10 in a fast burst. The images still have to be merged in the computer using software but the mode does remove



The Focus Bracketing/Stacking modes can stimulate creativity and are a boon to those users wanting to try close-ups but were put off by the technical complexities

the time-consuming manual, multiple-shot approach that was previously required.

The Focus Bracketing mode does require some skill and experience, however (gained through experimentation), to determine the number of shots required and which focus differential to choose.

The focus differential is the distance between in-focus areas in

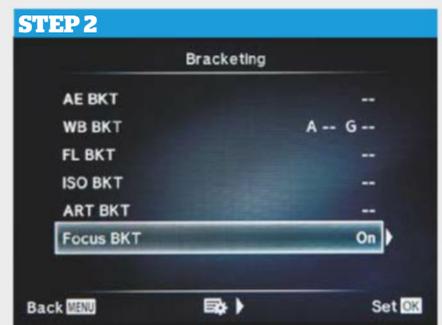


Step by step 2

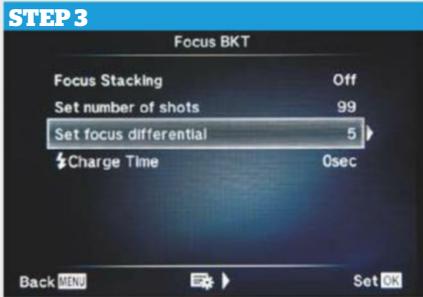
Focus Stacking



Access Shooting Menu 2 on the camera and then turn on Bracketing.



Now, select the Focus Bracket option and turn it on.



Then you simply need to set the number of shots and focus steps required.



Focus on the part of your subject nearest the camera (either by selecting the appropriate AF point or switching to Manual Focus).



Fire the shutter to take your shot (if you are using a tripod this is best done by using a cable release to minimise camera vibration).

the shot. If you choose too low a number, the result will be a large number of images with little difference between them; choose too high a number and there may be gaps of blurred areas between the in-focus bands.

The decisions about these settings will be determined by the number of subjects in the shot, your distance from the subject, how much of the subject you want to capture, and your chosen f-stop. Generally more shots will be required if:

- There are many subjects in the composition at varying distances from the lens
- You are very close to your subject
- You are using a longer focal length lens
- You want to cover a wide depth of field
- You are using a fast aperture.

But trial and error is the key to success initially.

This mode speeds up the process considerably, increases the chances of success (it's less likely to miss

areas of focus than the manual approach) and does enable handheld close-up photography to be done (great when photographing insects, for example). However for more critical work or macro (i.e. life size) photography I would advise using a tripod.

Flash can be used but with two limitations:

- The flash must be attached to the camera's hotshoe
- The maximum shutter speed is limited to 1/20sec.

Focus stacking

With the firmware upgrade to the EM1, Olympus went one step further and added Focus Stacking – with this mode the separate images are blended together in camera. Unlike the Focus Bracketing mode the photographer cannot choose the number of consecutive shots (the camera automatically fires eight frames) but can select the required focus differential.

There are some limitations with this mode:

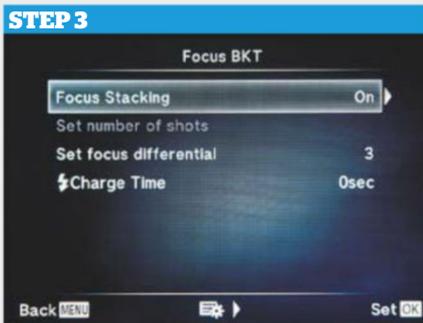
EXAMPLES OF POSSIBLE SUBJECTS

- Simple household items like cutlery.
- Objects from the home/office such as paper clips, pens and coloured pencils.
- More exotic possessions such as jewellery.
- If you're green-fingered, flowers and plants in your garden make lovely and usually colourful subjects, on their own or as a background for the insects they attract.

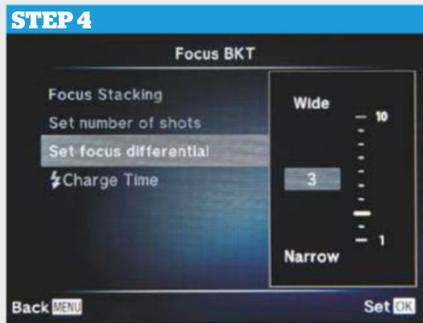
- At the present time Focus Bracketing is limited to the 60mm macro lens plus the 12-40mm and 14-150mm Pro zooms

- Whilst separate Raw files can be shot and saved the merged photograph is a combination of JPEG images
- The slowest shutter speed available is 1/8sec and the maximum ISO 3200
- The merged image crops off the edges of the composition so an allowance for this must be made in the framing of the shot.

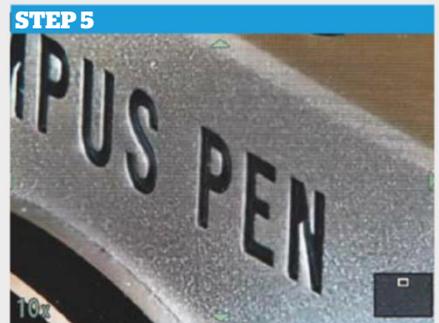
However, in spite of any limitations, these modes are undoubtedly a boon to photographers wanting to try their hand at close-up and macro photography but who have previously been deterred by the technical complexities. By opening up the world of close-up photography, encouraging experimentation and being fun and easy to use into the bargain, these modes can provide a great stimulus to our creativity.



Press > and turn on Focus Stacking.



Now you need to set the Focus Differential (in this example 3 has been set).



Take the shot (preferably with the camera mounted on a tripod and by using a cable release) and then review the merged image on the LCD to check that the subject is sharp and in focus.

Does the EOS 1200D still represent good value for money?

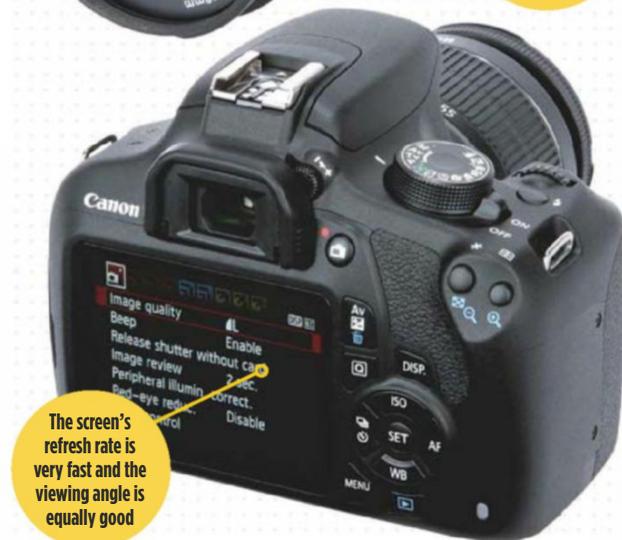
Canon EOS 1200D

WWW.CANON.CO.UK

Designed for entry-level DSLR users, the Canon EOS 1200D (otherwise known as the Rebel T5) arrived in March 2014, replacing the EOS 1100D (Rebel T3). Priced at just £449 (with 18-55mm kit lens) this lightweight camera offered plenty of bang for the buck with an 18MP APS-C CMOS sensor, Full HD video (1920x1080) and a 3in LCD. Now much cheaper, it's still an attractive proposition for users keen to learn the basics while being supported by a raft of automatic controls.

It has fewer dedicated external controls than many enthusiast models, but adjusting ISO, AF mode, White balance and Drive mode is simple enough using the directional buttons, while a Quick Control button allows you to select and set shooting options via the LCD. The EOS 1200D has a built-in Feature guide, which shows a brief description of the function you've selected. You can also take advantage of the EOS Companion - a smartphone app that explains the basics of photography and explores the camera functions.

The LCD resolution is a tad disappointing at 460k dots, but it's a step up from the 230k-dot version on the EOS 1100D. There is no touch functionality, and the screen is fixed, but at this price point it's hardly surprising. Perhaps more frustrating is the lack of an eye-sensor to switch between viewfinder and LCD - you have to press a button



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to change your preferences. Generally, the EOS 1200D is a solid performer, with a responsive AF system (albeit

a sluggish one in live view), well-controlled noise, and bags of detail in Raw files (the camera applies fairly aggressive sharpening to JPEGs). Niggles aside, it's a good first purchase for the budget-conscious beginner.
• Turn to p64 for a review of the new Canon EOS 80D

What our test said

'Compared to some of its competitors the specification of the EOS 1200D is somewhat underwhelming. However, the camera excels in key areas, such as AF accuracy and speed, even in low light. What's more, its performance at high ISOs is in keeping with many similar cameras, if not better.'

'So while it would be nice to have a higher burst speed and more autofocus points, these are arguably more important to the advanced photographer and, as such, the 1200D will no doubt prove more than capable for the beginner DSLR photographer.'

PROS

- Full HD video (1920 x 1080)
- Great performance at high ISOs
- Lightweight body (480g)
- Comes with EOS Companion app

CONS

- Burst rate • No wireless connectivity
- Fixed LCD with no touchscreen features
- No eye-sensor for EVF/LCD screen



How it stacks up today

Released in March 2016, the Canon EOS 1300D is a minor upgrade of the 1200D. The LCD screen boasts 920k dots (compared to 460k), the processor is a DIGIC 4+ (compared to a DIGIC 4), and the newer model offers Wi-fi connectivity. But the pixel count, autofocus system, and video specification remain the same. If you own the 1200D (and don't plan to use Wi-fi) there's little reason to upgrade.

Alternatives

With 24.2 megapixels, an ISO range of 100-12,800 (extendable to 25,600), and a continuous shooting speed of 5fps, the Nikon D3300 is certainly worth considering. Likewise, the Pentax K-50 is a solid contender with 16MP, an ISO range of 100-51,600, and a continuous shooting speed of 6fps.



In the range

How the Canon EOS 1200D fitted in the range



KEY SPECS

SENSOR 18MP APS-C CMOS
ISO 100-6400 (expandable to 12,800)
BURST MODE Up to 3fps
MOVIE Full HD 1920 x 1080
DISPLAY 3in, 460k-dot fixed LCD
DIMENSIONS 130 x 100 x 78mm
WEIGHT 480g

The Canon EOS 1200D Three users give their verdicts

Anjan Malik

KOLKATA, INDIA

My father was a photographer. When I was a boy I used to play with his camera, a Zenit 12 CA, when I was home alone, but my first DSLR was the Canon EOS 1200D. One of the reasons that I opted for Canon was so that I could use my Dad's old manual lenses (which are M42 mount). After carrying out a fair amount of research on the internet I discovered that Nikon bodies don't work quite as well as Canon's do with M42 manual lenses, mainly due to the greater flange focal distance (FFD).

In terms of subject matter, I am attracted to landscapes, macro and portraits. I love the limited depth of field you get with close-up work, and the bokeh in portrait photography can be dreamlike. The camera proved to be a great learning tool. It came with two kit lenses: the 18-55mm and 55-250mm, and was excellent value for money. It's relatively small and lightweight, and the image quality is good, the processing speed is impressive, and many of the settings can be adjusted. Buying a Canon DSLR also gives you access to a vast array of automatic lenses, while enabling you to use older manual lenses via adapters.

I shoot both Raw and JPEG, and I sometimes tweak my images in Photoshop, but for most purposes large JPEG files are sufficient. If I could change one thing about the Canon EOS 1200D it would be the lack of automatic sensor cleaning.

PermaJet says: 'PermaJet Titanium Lustre 280 would be an excellent choice for Anjan; the metallic surface would add a creative element and make the flames leap off the paper.'



WWW.FLICKR.COM/PHOTOS/NJANAM92/



1

2

3

1 Let's go

Fishtail Mountain (Mount Machhapuchchhre) as seen from Manakamana in Nepal. Canon EOS 1200D with 55-250mm lens, 1/640sec @ f/9, ISO 100

2 Eyelashes

I was experimenting with my camera when I caught this close-up of my sister's eyelashes. Canon EOS 1200D with 50mm lens, 1/200sec @ f/1.8, ISO 400

3 Many Manakamanas

Each of these oil lamps (or diyas) represent a wish – lighting them is a Hindu tradition. Canon EOS 1200D with 18-55mm lens, 1/500sec @ f/8, ISO 800

Mark Maden

GLASGOW

I've had an interest in photography since I was a child, but it was when I received a Fujifim FinePix F450 that my passion grew. Around 2008 I bought a Fuji FinePix S9600 bridge camera to help me take things to the next level. At the same time I started Urban Exploration [the study of abandoned manmade structures] and I saw what could be achieved with better cameras in low-light conditions. From here it was a natural progression to an SLR.

Ruined buildings no longer feature in my photography; this early passion has been replaced by a love of the landscape. I've always liked being outdoors, so whenever I get the chance I head out. I once owned the Canon EOS 1100D, but when my family and I moved to Finland I decided to upgrade to the later version, knowing that I would be just as comfortable with the controls. I also knew that my lenses would be compatible with this newer model.

When I'm out and about I tend to use Aperture Priority almost exclusively. I'm not fully comfortable with changing the shutter speed, ISO etc yet, so I like to let the camera do most of the work. I like HDR photography, so I tend to shoot everything in Raw so that I have plenty of detail to play with later.

With the Canon EOS 1200D you get a great camera for a great price. In my opinion it does everything I could ever wish for: it's easy to use, intuitive and you can pair it up with some great lenses that won't break the bank. I genuinely cannot think of anything to change.

PermaJet says: 'Mark's photos would stand out on PermaJet FB Gold Silk 315, a paper with a natural warm base tint which would beautifully emphasise the warm tones seen in his images.'



WWW.FLICKR.COM/PHOTOS/DEFQON



1 Trannon Valley

I was staying in a luxury lodge in Mid Wales, but I managed to drag myself out of bed to catch this view of the valley.

Canon EOS 1200D with 70-300mm lens, 1/250sec @ f/8, ISO 100

2 Kotka Marina, Finland

I was feeling particularly brave one day and decided to step onto the ice.

Canon EOS 1200D with 10-18mm lens, 1/200sec @ f/8, ISO 100

3 Aberystwyth seawall

I was attracted to the lines in this scene, and the contrast between the rock, wall and steps.

Canon EOS 1200D with 18-55mm lens, 1/100sec @ f/7.1, ISO 1060



Sam Budd

WARWICKSHIRE

I've been using compact cameras for years, but I made the transition to DSLR photography in 2014 when I bought a Canon EOS 1200D. I put a lot of thought into which camera I should buy, as I had quite a few requirements. I wanted a camera that would be easy to use, but as my main interest is in nature photography I needed it to be small and lightweight so I could get out and about easily. I wanted all of this at a price that wouldn't break the bank.

I decided to buy the Canon EOS 1200D as it ticked all the boxes. I liked the fact that the camera wasn't too intimidating. I also liked the way it had an 18MP CMOS sensor, 1080p HD video, and the capability to capture 3fps, which is useful for photographing fast-moving subjects. I started out using the camera on Program mode, but as it was so easy to use I soon began shooting solely in Manual.

Overall I was very pleased with my Canon EOS 1200D: it was intuitive to use, had a good-sized LCD monitor, and a good ISO range for low-light photography. More importantly, it produced fantastic images – particularly when you consider that it is an entry-level DSLR. The only addition I would have made is a touch-sensitive multi-angle viewing screen.

The Canon EOS 1200D is a fantastic DSLR and would make a great camera for someone making the step up from a compact or a bridge camera. Although I've moved on to other cameras in the Canon range, I have fond memories of using this model.

PermaJet says: 'PermaJet Oyster 271 has a subtle lustre surface which looks superb with all subjects, making it perfect for Sam's diverse range of images.'



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1 Autumnal feast

A sparrow making the most of the seed heads in the flowerbeds at Twycross Zoo in Leicestershire.

Canon EOS 1200D with 75-300mm lens, 1/800sec @ f/5.6, ISO 400



2 Kicking up dust

A Bowler off-road vehicle being driven around the track at Goodwood Festival of Speed 2014.

Canon EOS 1200D with 75-300mm lens, 1/1600sec @ f/4.5, ISO 125



3 Chesterton Windmill

This shot of Chesterton Windmill was taken during one of my first outings with the Canon EOS 1200D.

Canon EOS 1200D with 18-55mm lens, 1/125sec @ f/6.3, ISO 100

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Mastering depth of field

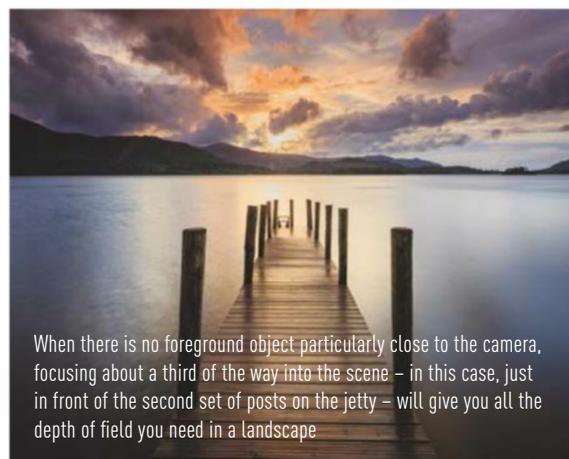
Mark Bauer shares his advice on this fundamental technique of creative photography

WORDS AND PICTURES **MARK BAUER**

Correct exposure and focusing are the cornerstones of good photographic technique. Related to focusing is one of the fundamentals of creative photography: depth of field. This is the zone of sharpness in front of and behind the actual plane of focus, and it has a huge impact on the character of an image. For example, you can enhance the feeling of depth in the scene by keeping everything sharp from foreground to background. Alternatively, a shallow depth of field can be used to blur distracting

backgrounds or force attention onto a particular part of the frame. But to achieve either of these effects, the obvious question is, how do we control depth of field?

There are three main factors that affect depth of field in images. Lens choice is the first one, as the wider the lens, the more inherent depth of field it has. Second is aperture, and the smaller the aperture (bigger f-number), the greater the zone of sharpness. Finally, choosing the correct point of focus is vital when you want to extend depth of field. You can shoot with an ultra-wide lens



When there is no foreground object particularly close to the camera, focusing about a third of the way into the scene – in this case, just in front of the second set of posts on the jetty – will give you all the depth of field you need in a landscape



An understanding of how your lens choice, aperture and focus will influence depth of field will help you produce images that are razor-sharp from foreground to background

“Focusing using the hyperfocal distance may seem complicated, but in fact it’s very easy”

precision, as it’s often difficult to exactly locate ‘a third of the way in’ – and it doesn’t take into account variables such as the focal length of the lens you’re using, or the aperture you’ve set. Nonetheless, it can work surprisingly well in many situations.

Where it does fail is when there is an object close to the camera that needs to be kept sharp along with the background. In these cases, a more accurate way of calculating and controlling depth of field is needed – namely, focusing using the hyperfocal distance.

You might think this is complicated but, in fact, it’s easy to use. Put simply, the hyperfocal distance is the precise focal distance at which depth of field is maximised for a given aperture and focal-length combination. While it can be tricky getting to grips with the principles, it’s perfectly possible to apply the technique without getting bogged down in the theory.

Circle of confusion

For those keen to understand the theory, however, you need to start with the ‘circle of confusion’ (CoC) – and no, it’s not a group of photographers trying to understand hyperfocal distance! The circle of confusion is the maximum size at which an unsharp ‘blob’ will appear to the human eye as being indistinguishable from a perfectly focused point. For 35mm film or ‘full-frame’ sensors, this is usually stated as 0.030mm, and assumes a maximum print size of about 10x8in (about 8x enlargement for 35mm). Different formats will require more or less enlargement to achieve the same-sized print, and so different circles of confusion are used. The circle of confusion is part of the equation used to calculate depth of field and hyperfocal distance, so knowing what CoC has been used can be useful.

For once, practice is easier than theory, and there’s no need for complex calculations using the CoC, as there are many pre-prepared charts available, as well as several smartphone apps. To put hyperfocal distance into practice, just check the focal length and aperture you’ve

stopped down, but if you focus in the wrong place then either your foreground or background might end up not being sharp enough.

Front to back sharpness

One of the most commonly asked questions regarding depth of field is, ‘How do I get front-to-back sharpness?’ The usual advice for beginners is to focus a third of the way into the scene. This is because depth of field extends twice as far behind the point of focus as in front of it. However, this method lacks

KIT LIST

Prime lenses

To make setting the hyperfocal distance really easy, use prime lenses with clear distance scales – you won’t even need to use a chart.



Tape measure

Not everyone is good at estimating distance, so when accuracy is important a tape or laser measure can help you find an object at the hyperfocal distance.



Live view

Precise focusing is essential for getting the depth of field you want, so if your camera has a live-view facility, use it.



Hyperfocal distance chart or app

Unless you really enjoy complicated maths, use a chart or phone app to help you find the hyperfocal distance.



Tripod
A tripod not only helps you with setting precise composition, but also means you know exactly where the sensor plane is when calculating or measuring distances.

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When there is no foreground interest close to the camera, it's best to ignore the hyperfocal distance and focus on your main subject instead

Don't get carried away

Occasionally, those new to the technique will routinely set the hyperfocal distance for every landscape shot they take, even if there's nothing of particular interest in the immediate foreground. While this doesn't necessarily lead to bad results, it can mean that you're using depth of field where you don't need it – in the

foreground – and that the background, while acceptably sharp, could be sharper.

When there is no close foreground interest, it's better to check what the hyperfocal distance is and then, if the nearest object to the camera is beyond the hyperfocal distance, focus on that object, or just slightly beyond it.

set, find the hyperfocal distance from your chart or app and then manually focus on an object at this distance. (You could use the distance scales on your lens, but these are not always very detailed or accurate on modern zooms). Everything from half

Setting the hyperfocal distance allows you to maximise sharpness throughout the image

the hyperfocal distance to infinity will be within the zone of sharpness. For example, if you shoot with a full-frame camera at f/11 on a 20mm lens and set a hyperfocal distance of 1.2 metres, depth of field will extend from 60cm to infinity.

Before pressing the shutter, you'll need to check that your depth of field calculations are correct. Looking through the viewfinder won't show you the depth of field, as the aperture stays wide open until the shot is taken. Most cameras have a depth



Hyperfocal distance charts

Below are two sample charts. One for crop-sensor (APS-C) DSLRs and the other for full-frame DSLRs, showing hyperfocal distances for popular focal lengths.

Hyperfocal distance crop (APS-C) sensors

		FOCAL LENGTH										
		12mm	15mm	17mm	20mm	24mm	28mm	35mm	50mm	70mm	100mm	135mm
APERTURE	f/8	3.2ft	5ft	6.4ft	8.9ft	12.6ft	17ft	27ft	55ft	105ft	218ft	395ft
	f/11	2.3ft	3.5ft	4.5ft	6.2ft	9ft	12ft	19ft	39ft	75ft	155ft	280ft
	f/16	1.7ft	2.5ft	3.3ft	4.4ft	6.4ft	8.6ft	14.5ft	27ft	54ft	110ft	198ft
	f/22	1.2ft	0.9ft	2.3ft	3.2ft	4.5ft	6ft	9.5ft	19.2ft	38ft	77ft	140ft

Hyperfocal distance full-frame sensors

		FOCAL LENGTH								
		16mm	20mm	24mm	28mm	35mm	50mm	70mm	100mm	135mm
APERTURE	f/8	3.8ft	5.6ft	8.0ft	11ft	17ft	35ft	68ft	138ft	250ft
	f/11	2.6ft	3.9ft	5.8ft	7.8ft	12ft	25ft	48ft	98ft	178ft
	f/16	1.9ft	2.9ft	4.0ft	5.5ft	8.5ft	17.5ft	34ft	70ft	125ft
	f/22	1.4ft	2.0ft	2.9ft	3.9ft	6ft	12.5ft	24ft	49ft	89ft

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Tilt-and-shift lenses

With foreground interest close to the camera, sometimes the only way to get enough depth of field is to stop the lens right down, but the resulting image may end up soft due to the effects of diffraction. One way around this is to use a tilt-and-shift lens. These are specialist lenses, which have movements that allow you to tilt the plane of focus, thus extending depth of field. This means that you can shoot at the lens's 'sweet spot' of around $f/8$, while still obtaining front-to-back sharpness.



These two images show the difference between shooting at $f/8$ with no tilt (left), and at the same aperture and focused on the same point with tilt applied (right)

of field preview button, however, which enables you to manually stop the lens down to the shooting aperture. The problem is that with the aperture stopped down, there is less light coming through the lens and the viewfinder image might be too dark

to be useful. Live view works better as the screen brightens to compensate for lower light levels. Camera manufacturers implement live view in different ways, though, so check how yours works. For example, Canon's live view operates in the same way as

the viewfinder, with the aperture wide open. To check depth of field, press the depth of field preview button. With other makes, such as Nikon, the live view image is shown stopped down to the taking aperture, so there is no need to use the preview button.



There's no rule that says you have to have front-to-back sharpness in landscapes, so don't be afraid to experiment with limited depth of field. Use the depth-of-field preview button to see the effect before you take the shot

One superzoom or two separate lenses?

B. KNIGHT

Q I have a Panasonic Lumix G6 and have been very happy with it even though I only have the standard 14-42mm kit zoom lens. The main thing that I find limiting with the kit lens is not enough magnification. I find I am having to crop more than is ideal. So I am wondering if I need a new lens. On the other hand, I really don't want to end up carrying more bits and pieces. I am now debating whether I should trade in my kit lens for a superzoom, like the Lumix 14-140mm or Olympus 14-150mm, or keep my kit lens and add either the Olympus 40-150mm or Lumix G X 45-175mm?

A Firstly, a serious limitation of the Olympus lenses you have listed is that they don't feature optical image

stabilisation. Olympus Micro Four Thirds cameras are renowned for their in-body image stabilisation, so Olympus lenses generally don't feature in-lens IS, or optical IS (OIS). That said, the latest Olympus 300mm f/4 Pro does have OIS, which marks a new direction



for Olympus. The main issue with a superzoom is the optical compromise on image quality. A superzoom lens with a 10x range should, on paper, be optically inferior than a zoom lens with a shorter range. In practice there are some remarkably good superzooms and some disappointing shorter zooms. The Lumix 14-140mm is a respectable lens for its type and so is the Lumix 45-175mm. The latter also has a power zoom function which was implemented with video use in mind. If you need super-sharp images, then the 45-175mm will give you an edge. It's also slightly brighter at equivalent focal lengths than the 14-140mm. You can also save a fair bit by buying the 45-175mm and it has longer reach at 175mm than the 14-140mm. In the end it's your decision. **IB**

A camera or a 23mm lens?

BRIAN

Q I use a Fuji X-T1 with 14mm, 16mm, 35mm (f/2 version) and 56mm lenses. I also have the 18-55mm. But I'm hankering after a small lens in the 18-23mm range. However, the 18mm has a very mixed reception and the 23mm is too big. I might as well use my taped-up zoom. Another tempting option would be an X100T, or even the S version to save some cash.



A The 18mm (and 27mm) Fujifilm lenses are 'pancake' types. They are designed to be as physically short as possible. Although there are some exceptions, I have found that this does impose an image quality compromise on pancake lenses. With the 18mm it's all about the corners, which aren't as sharp as the centre area of the frame, but the centre is pretty good. It might be worth asking yourself if tack-sharp corners are that critical for the kind of use you have in mind for this lens. If it's street photography, say, I doubt there would be a problem, but it wouldn't be an ideal lens for landscapes or architectural photography. The idea of substituting a lens for a whole camera is interesting. The X100 does appear to fulfil your requirements, although the older S-version is lower in resolution than your X-T1. **IB**

Stick with Nikon or switch to Canon

GARBOURNE

Q Can you advise me about swapping from Nikon to Canon? I've had a Nikon D3200 for a few years and feel I've outgrown the body and want to up my photography game. I was looking at sticking with Nikon and going up to a D7200 but after comparing it to the Canon EOS 7D II, I'm edging towards that (mainly due to the 10fps it has over the Nikon's slower 5fps). My problem is I have a few lenses for my Nikon and would either have to start again (selling my lenses) or getting an adapter to attach them to the Canon. Are the adapters good enough for me to get good use out of my lenses or is it better to sell up and start

afresh? Or should I stick with Nikon and get the D7200? I don't need the faster 10fps for day to day stuff but it would be a nice feature to have for capturing action/motion shots.

A Forget the idea of using adapters. Lenses are finely tuned to work with their matching camera bodies and an adapter is a major compromise, especially in the area of focusing performance. Adapters are really only a measure of last resort. If you are very happy with your lenses and, as you

indicate, you aren't that desperate for 10fps shooting then the D7200 should be a fine choice. On the other hand, if you feel the lenses you currently have are the wrong choices for any reason then this could be a good reason to support starting from scratch. **IB**



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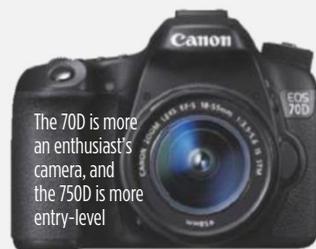
Help me choose my first DSLR

ROSS GARLAND

Q I'm a complete beginner with DSLR cameras. It's always been something I've been keen to get into, and now I've finished university and have a real job, I want to get started! I'm an avid hiker and plan on using the camera mainly for landscapes. Also, I'd like to eventually start astrophotography. I've been looking into various cameras and have narrowed it down to two (I think!). I'm tempted to get either the Canon EOS 750D or the Canon EOS 70D. I'd really like your thoughts on these cameras, and whether they'd be suitable for what I'm looking to do. Or if there are other cameras that would be better suited for my needs?

I've been to the shops and physically held both cameras. As things stand, I prefer the 70D, but I'm not sure whether it merits the extra £200 – or whether I would actually gain the benefit from it?

A The 70D is still available but has now been officially superseded by the 80D. The 750D is a couple of years newer than the 70D and has



The 70D is more an enthusiast's camera, and the 750D is more entry-level

a more up-to-date sensor, though it's not a game-changer. The 70D is a more solidly built camera that has weather-sealing and it has a faster sequential shooting rate. Canon itself rates the 750D as a beginners' camera and the 70D as more of an enthusiast camera. If you aren't that concerned about the extra cost, I'd recommend you go for the 70D. In DSLR terms if you look at the lab reports then Nikon has an edge in terms of sensor performance, but you'd really need to push the cameras hard to see significant differences. If you have looked at and handled models from both brands and prefer Canon, that's fair enough. **IB**

Camera choice advice

JAIDOR

Q I've been wracking my brains trying to decide which camera to get. I've got a trip to Japan coming up, and I'd like to take some great pictures and video while I'm there, so I thought I'd invest in a good camera and learn the ropes. I'd also like to start taking advantage of all the walks and weekend trips to the Peaks/Lakes and Snowdonia, so there will be a fair bit of landscape photography going on too. I'm a 3D graphic artist and want to delve a little into the field of capturing video and doing artistic work with 3D and effects. This is like the kind of stuff you see in movies with buildings toppling over or spaceships drifting into the

atmosphere etc. So above-average video capture would be great, but doesn't have to be 4K. My budget is £600-750 and so far the choices seem to include the Nikon D5500, Canon EOS 750D and the Sony A6000. Is there any other I should be considering?

A Panasonic's Lumix G mirrorless system camera range ought to be evaluated as Panasonic is a leader in the field of video and they now offer a number of Micro Four Thirds lenses aimed at videographers, meaning features like power zooming and autofocus optimised for video. Of the short list you have already drawn up the Sony A6000 has the best specification for video. However, Nikon and Canon can boast a considerably wider range of own-brand and third-party lenses. That said, very few of these lenses will autofocus acceptably when shooting video. **IB**



Consider Panasonic if you are keen on video as well as stills

Is there a battery grip for the Pentax K-m?

ANDYS74

Q I'm very limited on camera knowledge and I'm trying to help my daughter. The camera I bought her for Christmas is a Pentax K-m/K2000 and it uses AA batteries. I was wondering if there is a battery grip on the market?

A There was no official Pentax battery grip for the K-m because this was an entry-level DSLR. I have seen third-party battery grips for a few Pentax DSLR models that use AA batteries but, sadly, I can't find any aimed at the K-m, sorry. **IB**



Do I need a 'proper' camera?

ROB HO

Q I use a Samsung Galaxy Note 4 smartphone, which takes very good images. Photography is growing on me and I am wondering if I should get a 'proper' camera. I could do with more zoom, for example. What else might sway me to buy a camera and are there downsides?

A It's remarkable how the tiny camera modules in smartphones can take sharp, vibrant photos. However, one limitation for a creative photographer is depth of field. A popular effect is to deliberately limit the depth of field so you can blur the background to create a nice 'bokeh'. This is extremely hard to achieve with a smartphone camera, as the optics are so tiny. Other points in favour of a dedicated camera are ease of handling and access to controls. Some quite affordable cameras also let you capture Raw files for maximum quality, which only a very few smartphone cameras offer. Most conventional cameras are also more responsive than smartphone ones, with little, if any, shutter lag. Smartphone cameras do have advantages; GPS geo-tagging is normally very easy, it's simpler to upload your photos to social media. Most newer cameras now work with smartphones though, to access GPS and for posting photos online. We tend to have our smartphones most of the time and the best camera will be the one you have on you. My advice is – get a camera and find out for yourself! **IB**

Looking for a smaller, lighter DSLR alternative

JAGRIFFITHS

Q It's the usual story: my DSLR is heavy and I'm getting older so am looking for a compact camera to take with me on my travels. Requirements are a viewfinder (a must!), a zoom in the 18-110mm range and ideally a retro look and, within reason, price isn't an issue.

A We'll assume that you mean a zoom range of at least around 28-150mm, in standard full frame terms and that an electronic viewfinder is acceptable. If a compact mirrorless system camera is within your remit,

then the new Olympus PEN-F is a stylish retro look camera with a very high specification for its class. Mated with the Olympus m.Zuiko 14-150mm f/4-5.8 you have a 28-300 zoom camera that is substantially smaller and lighter than a typical DSLR equivalent. If you want to go even smaller, the fixed lens Fujifilm X30 is well worth considering. It has a great retro look, a very good viewfinder and versatile tilting screen. It's much smaller than even the most compact DSLRs. A possible weakness is the lens which is equivalent to 28-112mm, so that may not reach far enough for you. **IB**



How important is a constant aperture zoom lens?

STEVE MILNER

Q I am in the market for a telephoto zoom lens for my Canon EOS 7D Mk II – either the EF 70-300mm f/4-5.6 IS or the EF L-series 70-200 f/4 IS. The L-series lens is two and a half times more expensive. I understand some of the reasons; it's a sturdier build and it's weather resistant (which is a good match for the 7D II). But how important is the constant aperture aspect of L-series lenses?

A As you may have already noticed, not all L-series Canon zoom lenses are constant aperture. For example, there is a Canon 70-300mm f/4-5.6 IS L and it's similarly priced to the 70-200 f/4 IS L. It's

easier to design zoom lenses that have a changing maximum aperture throughout the zoom range as these lenses are less complex than constant aperture designs. They are also lighter and more compact than an equivalent zoom lens with a constant aperture. The lure of constant aperture lenses is not having to put up with less brightness as you zoom in, which compromises your shutter speed and erodes your ability to get really defocused background bokeh. There is also some truth in the thinking that a constant aperture lens will perform better as the constant aperture is more associated with premium lenses that have had more effort put into their designs. **IB**



Next month



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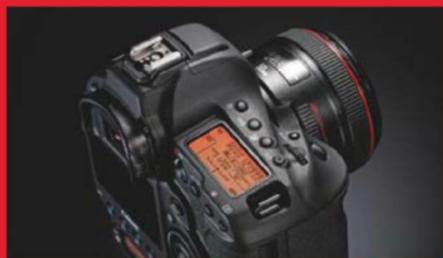
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Rabat, Morocco.
A perfect colour
scheme for summer!
Canon EOS 5DS,
24-70mm, 1/250sec @
f/13, ISO 200, polariser

Summer loving

Of all the seasons of the year, summer's perhaps the hardest to photograph well. Here are our top tips for success

WORDS AND PICTURES LEE FROST

Ask any decent photographer to nominate his or her favourite season and chances are not a single one will mention summer. Autumn, with its fiery colours and stormy light, is probably the firm favourite, followed by the lushness of spring and the drama of winter. Summer usually ends up bottom of the pile.

Given that summer is the season when we see the most sunlight, the days are at their longest and light levels are at their

highest, this may seem rather strange. While summer may seem like the perfect time of year for taking top-notch photographs, the reality is somewhat different. Harsh light, hazy weather, high contrast and black shadows are often what we get for days at a stretch. The sun is overhead for most of the day so the quality of light is poor. The landscape either looks scorched or postcard pretty and the sky characterless and bland. Sea frets roll in off the sea and cloak the

coastline in grey. Towns and cities become choked with heat and pollution. We're not painting a very good picture here, are we?

However, it's not all doom and gloom. You can take great photographs in summer just like any other season – you just need to accept the conditions you're forced to work in, choose your subjects more carefully and keep an open mind. To get your creative juices flowing and keep your shutter finger busy, here's a host of summer shooting ideas.

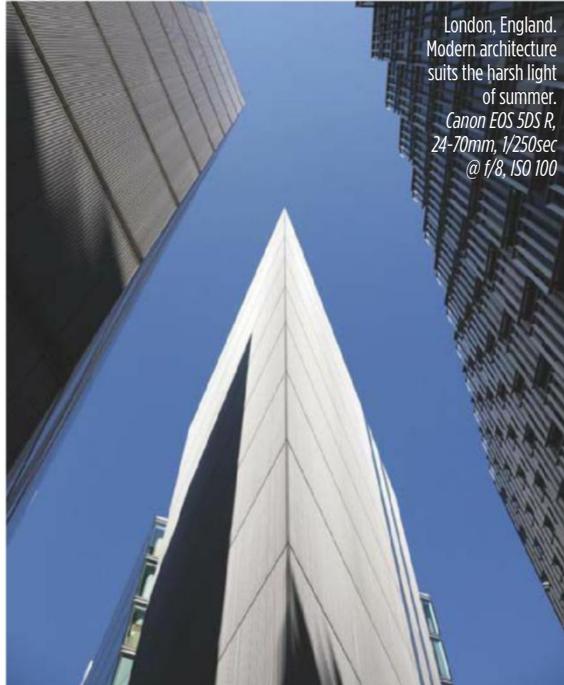
Tip 1 Set your alarm clock

Come early summer, the days are so long that if you want to catch sunrise (at 4.30am) it's hardly worth going to bed! However, it's worth sacrificing the occasional good night's sleep because a summer dawn can be amazing. Plan where you intend to go a day or two in advance. If you're away on holiday, make the most of your chance to shoot a new location while your family are in bed. If not, re-visit an old favourite. Locations that contain water are ideal for dawn photography because the water mirrors the colours in the sky. So consider heading to the coast, or check your map for the nearest lake, loch or reservoir. Arrive at least half an hour before sunrise so you can make the twilight glow in the sky.



Tip 2 Be bold

By 8am in summer, the sun will be heading to its highest point in the sky, where it remains until at least 5pm. In clear weather, the light can be very harsh and intense, and with the sun overhead, shadows are short and dense. Such conditions aren't particularly flattering or atmospheric, but if you like to shoot graphic images, strong sunlight is ideal. Buildings, bridges and other manmade structures look stunning on a clear summer's day against deep blue polariser sky, so head to the city and experiment with unusual viewpoints and wideangle lenses to create dynamic compositions. Look for simple, abstract details and make the most of colour contrasts such as yellow and blue or red and green.



London, England.
Modern architecture
suits the harsh light
of summer.
Canon EOS 5DS R,
24-70mm, 1/250sec
@ f/8, ISO 100

Tip 3 Use a polariser

A polariser is a must for giving your summer shots a boost. As well as deepening a blue sky and emphasising clouds, it will also eliminate reflections, reduce glare so colour saturation is increased and lessen the effects of haze. To get the best effect on the sky, keep the sun on one side of the camera, while to get rid of reflections the angle between the reflective surface and the lens axis needs to be around 30°. Polarisers lose two stops of light, so keep an eye on those shutter speeds if you're hand-holding – on a sunny day you'll be down to 1/30sec at f/11 at ISO 100. A tripod will be handy if you need to stop the lens down, or you could increase the ISO to 200 or 400 so you can use a faster shutter speed.



Mandalay, Myanmar.
Try shooting in the
shade to avoid
summer sunlight.
Canon EOS 5D Mk III,
70-200mm, 1/125sec @
f/4, ISO 400

Tip 4 Shoot in the shade

Summer light out in the open is harsh and unflattering, but if you step into the shade of a building or tree it's a different matter. There the light is soft, shadows are very weak and contrast is much lower. Portraits benefit greatly from being shot in the shade as you'll avoid ugly shadows being cast under noses and in eye sockets. Details and found still lifes also work much better in shade. If you're in the open and no shade is available, holding something above your subject's heads will work – a brolly, diffusing screen or sheet of card. This also works well for details and close-ups – try shooting a flower portrait in full sun, and then again with a sheet of card casting a shadow over the flower – there's no comparison.

Tip 5 Experiment with infrared

Summer's the best season for infrared photography. There's lots of lush green foliage and plant life everywhere, which reflects infrared, and you also get blue sky and fluffy white clouds, plus the harsh summer light creates high contrast and that suits infrared really well. Parks and gardens, woodland and riverside walks are ideal infrared hunting grounds. Also check out old buildings such as churches, castles, manor houses, ruins and abandoned cottages. If you don't have an infrared-modified digital camera, use an infrared transmitting filter on your lens, such as a Hoya R72 or cheaper alternatives available on Amazon and eBay.

Kew Gardens, London.
Summer is the perfect
season for infrared
photography.
Canon EOS 5D MK II
infrared, 17-40mm,
1/80sec @ f/11, ISO 200

Tuscany, Italy. Fields of flowers make great summer subjects.
 Canon EOS 1Ds Mk III,
 24-70mm, 1/15sec @
 f/16, ISO 100, polariser



Tip 6 Flower power

Gardens tend to be at their most photogenic during summer, with plants and shrubs creating a riot of colour in even the modest suburban plot. Hedgerows and roadside verges also come alive with poppies, ox-eye daisies, buttercups and other vibrant blooms. For simple close-ups, use a close-focusing zoom or, even better, a macro lens. Your telezoom will also be ideal for shooting large drifts of flowers – the compressed perspective will make the flowers appear crowded together, while shooting at a wide aperture will allow you to isolate one single bloom from its surroundings.

Tip 7 Striking silhouettes

Place a solid object between you and a bright background and you've got the makings of a great silhouette. The object could be any simple, easily-identifiable shape such as a person, tree, boat or building and the background could be anything from a fiery sunrise or sunset, the summer sun sitting low in the sky, or shimmering highlights on water. Mix and match as you like, but the result is always an eye-catching picture.

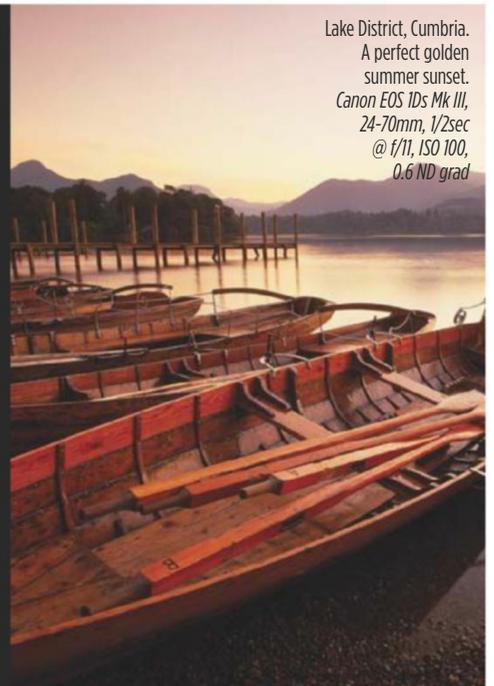


Tip 8 The golden hour

In the hour or so before sunset, the world is bathed in golden light. The light is often much warmer than at dawn because it's scattered and diffused by the thicker atmosphere – that's why the sun often looks bigger at sunset than at sunrise – and your photos will come out warmer than you expected as the colour temperature of the light is very low. Long shadows rake across the landscape, revealing texture and form, while the sun's golden orb slowly dropping toward the horizon looks magnificent. For a sunrise or sunset, use a telephoto or telezoom lens to exaggerate the size of the sun's orb – a 200mm or, better still, a 300mm, 400mm or 500mm.



Lake District, Cumbria.
 A perfect golden summer sunset.
 Canon EOS 1Ds Mk III,
 24-70mm, 1/2sec
 @ f/11, ISO 100,
 0.6 ND grad



Tip 9 Night patrol

The best time to take 'night' shots is during the 'crossover' period between sunset and darkness when there's still colour in the sky, and daylight and manmade illumination is in balance. During summer this period lasts upwards of an hour so you can cover a lot more ground than at any other time of year. The only downside is that you need to stay out later – sunset may not occur until after 10pm – but it's well worth the effort and you can always have a lie-in the next day.



British Museum,
London. Step inside to
avoid the summer sun.
Canon EOS 5D Mk III,
24-70mm, 1/200sec
@ f/11, ISO 1600

Tip 11 Inside job

If the light's too bland outside, why not take some interior shots instead? Churches, cathedrals and abbeys offer a welcome and cool respite from the summer heat. Many museums also allow handheld photography if you're discreet and whether they're in old buildings or ultra-modern, you'll still find some great photo opportunities.

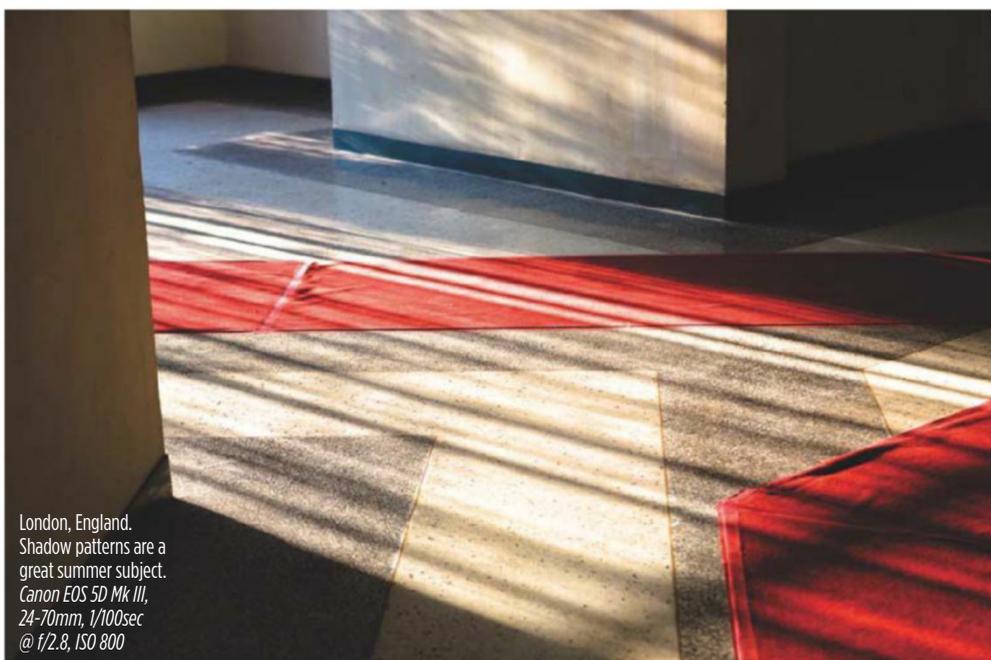
Tip 10 Storm warning

Although we expect blue skies and cotton wool clouds during summer, it can also be a season of storms due to the humidity and high temperatures and this can create amazing landscape opportunities – dark skies, colourful rainbows, shafts of sunlight illuminating the landscape, bolts of lightning flashing across the sky... So keep an eye on the weather forecast and if it looks like something interesting is likely to happen, grab your camera and head out.



Tip 12 Try something different

If all else fails, why not try a wacky technique that helps to overcome the fact that the light's not great? Have a go at panning the camera horizontally or vertically to produce a streaky image; create a zoomburst by zooming your lens while exposing a shot, or use an attachment like a Lensbaby to produce soft, dreamy effects.



London, England.
Shadow patterns are a
great summer subject.
Canon EOS 5D Mk III,
24-70mm, 1/100sec
@ f/2.8, ISO 800

Tip 13 Shoot shadows

Strong sunlight means strong shadows. When the sun's high they're short and dense or cast vertically down walls and doors. When the sun's low they rake across the landscape. Use a telezoom lens to fill the frame with shadow patterns and make them your primary subject, or use shadows as lead-in lines in wideangle shots.

Tip 14

By the seaside

Head to the coast on a sunny summer's day and you'll be spoiled for choice. Colourful beach huts against the blue sky, backlit deckchairs on the beach, piles of buckets and spades outside seafront shops, fairground rides on pleasure piers, boats and windsurfers on the sea... The list of subjects just goes on and on.

Brighton, England. If all else fails, head to the seaside to capture classic summer views.
*Canon EOS 5DS R,
24-70mm, 1/200sec
@ f/16, ISO 200*



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The **5 best** DSLRs under £1,000

While many Compact System Cameras now employ APS-C sized sensors and can hold their own against DSLRs in terms of critical image quality, many enthusiasts still prefer a DSLR. Part of the reason is the much larger range of lenses available for DSLRs, including many specialist optics that are not available for CSCs. Also, while they are larger and heavier than CSCs, DSLRs are designed to sit comfortably in the hand and feel purpose-built for serious photography. The good news for users looking to upgrade or invest in their first DSLR is all the major manufacturers now offer models to cover all price points and ability levels. We've gathered together five of the best DSLRs around, all of which will give you change from £1,000.

Turn over for our rundown of the **BEST 5** on the market...

Key points of a **DSLR**

Optical viewfinder

Electronic viewfinder technology has made huge strides, but most photographers still prefer optical viewfinders. Barring Sony, all DSLRs have optical viewfinders.

Lens mount

When you buy a DSLR, you also gain access to a large range of lenses. While Canon and Nikon currently offer the biggest choice of DSLR lenses, Pentax and Sony also have a very wide selection, including many specialist optics.



Physical controls

DSLRs are designed to sit comfortably in the hand and allow you easy access to a wide range of physical controls. These enable you to quickly change settings without having to scroll through the menu.

Sensor

Most sub-£1,000 DSLRs employ APS-C sensors that are about 13 times larger in surface area than the 1/2.3in sensors of most compact cameras. A larger sensor means increased dynamic range and superior image quality (less noise) at higher sensitivity settings.

P62 Accessories

- Billingham 25 and 35 rucksacks
- Manfrotto TwistGrip clamp
- 1901 Rodchenko Leather Camera Strap • Kenro Universal Charger
- Benro TMA28A Series 2 Mach3 Aluminium tripod

P64 Camera tests

- Does the **Canon EOS 80D** build on the excellent 70D? • We also review the **Panasonic TZ100** pocket travel camera



P70 Lens tests

- The **Sony FE 85mm f/1.4 GM** is a new telephoto for Sony Alpha 7 cameras
- We field test the **Fujinon XF 100-400mm f/4.5-5.6 R LM OIS WR**



5 Nikon D7200 £715 Body only



Introduced in 2015 to replace 2013's highly regarded D7100, the D7200 is near the top of Nikon's APS-C DSLR range, just below the recently released 20MP D500 (£1,730 body only), Nikon's flagship APS-C DSLR. The D7200 isn't hugely different from the D7100 in terms of headline spec, but it has a faster EXPEED 4 image processor that affords it some subtle improvements including a top burst speed of 6fps and a higher buffer capacity, a slightly higher native sensitivity range, and slightly snappier general operation. In keeping with other mid-range Nikon DSLRs, the D7200 has also had its anti-aliasing filter removed for better sharpness and

enhanced resolution of fine detail.

Elsewhere, the D7200 benefits from the same Multi-Cam 3500 II autofocus module employed by the much more expensive D810, which provides 51 AF points including 15 cross-type sensors for speedier AF performance regardless of camera orientation. A fixed 3.2in, 1.22m-dot LCD produces good contrast and detail, and is easily viewed in bright sunlight. Above this, the pentaprism viewfinder is bright and clear, and offers 100% coverage.

Build quality is solid, with the back and top protected by a magnesium alloy shell, while the rest of the camera is finished in tough polycarbonate plastic to produce a tough yet relatively lightweight camera. The D7200 is also sealed against dust and moisture.

The D7200 produces accurate, punchy and lifelike images, while the auto white balance provides true-to-life colour. As for exposure metering, the 2016-pixel RGB sensor gives consistently accurate results. Noise is also well controlled, especially at ISO 3200 and 6400.

KEY SPECS

SENSOR
24.2MP APS-C CMOS
SENSITIVITY
ISO 100-25,600
(exp. to ISO 102,000)
REAR DISPLAY
3.2in, 1.22m-dot LCD
VIEWFINDER
Pentaprism finder,
0.94x magnification,
100% coverage
DIMENSIONS
135.5 x 106.5 x 76mm
WEIGHT
765g with card
and battery

PROS

- NFC connectivity aids image sharing
- Wide range of control buttons
- AF system impresses

CONS

- LCD screen somewhat underspecified and lacking in articulation or touch functionality

FEATURES

PERFORMANCE

DESIGN

IMAGE QUALITY

VALUE

17/20

18/20

18/20

18/20

17/20



Verdict

If your budget won't stretch to the asking price of the newer D500, then the D7200 remains an excellent choice for anyone seeking a flexible and well-specced enthusiast-level DSLR. The D7200 packs plenty of functionality into a reasonably compact body along with a superb AF system. Most importantly, the D7200 is capable of consistently excellent image quality.

BEST FOR

- Enthusiast photographers wanting a flexible and well-specified DSLR that delivers excellent image quality



4 Pentax K-3 II £710 Body only



Launched in 2015 to succeed the widely acclaimed K-3, the K-3 II is Pentax's flagship APS-C DSLR, with only the full-frame K-1 positioned above it. With a 24.35MP CMOS sensor and Pentax's proprietary PRIME III image processor, the K-3 II offers a maximum continuous shooting speed of 8.3fps. As is the fashion these days, the anti-aliasing filter has been removed for enhanced fine detail, though in order to counter effects of moiré patterning this can lead to, the K-3 II has an ingenious anti-aliasing simulator. This uses the camera's built-in image stabilisation to mimic the effect of an anti-aliasing filter to minimise moiré in certain situations.

It can be employed in two strength levels or switched off altogether.

Whereas Nikon and Canon only equip selected lenses with image stabilisation, Pentax builds its Shake Reduction system into its camera bodies, meaning you can enjoy its benefits regardless of the lens you have attached. For the K-3 II, Shake Reduction now offers 4.5 stops of compensation compared to 3.5 stops on the K-3. While there's no built-in Wi-fi or NFC connectivity, the K-3 II can be used with Eyefi SD cards and Pentax flucards for full wireless functionality. Also, there's an integrated GPS module, and an electronic compass. As this is housed inside the camera's roof, the pop-up flash has been removed.

Finally, the K-3 II's Pixel Shift Resolution System can be used to reduce noise in high ISO images. It basically captures four consecutive images of the same scene, each of which is shifted by a single pixel. The four images are then synthesised into one composite image with enhanced colour and greatly reduced noise.

KEY SPECS

SENSOR
24.35MP APS-C CMOS
SENSITIVITY
ISO 100-51,200
REAR DISPLAY
3.2in, 1.23m-dot LCD
VIEWFINDER
Pentaprism finder, 0.95x
magnification, approx
100% coverage
DIMENSIONS
131.5 x 102.5 x 77.5mm
WEIGHT 785g with
battery and card

PROS

- In-body image stabilisation
- Quick AF system
- Pixel Shift Resolution feature

CONS

- No touch/articulation to LCD
- No Wi-fi/NFC
- Only 27 AF points

FEATURES

PERFORMANCE

DESIGN

IMAGE QUALITY

VALUE

18/20

18/20

17/20

18/20

19/20



Verdict

Pentax has gained a deserved reputation for well-made and generously featured DSLRs that offer excellent value for money. The K-3 II continues this trend and is one of the best DSLRs Pentax has ever made. Traditional Pentax DSLR features such as a metal chassis and weather sealing are complemented by a strong feature set and great handling. Well worth a closer look.

BEST FOR

- Discerning enthusiasts who are after good value and a superb feature set
- Those users keen on astrophotography, owing to the unique astrotracer feature



3 Sony A77 II £795 Body only



Released in summer 2014 to replace 2011's original A77, the Sony A77 II has a 24.3MP APS-C CMOS sensor and Sony's proprietary BIONZ X image processor. Its 12fps maximum continuous shooting speed and 79-point AF system still hold up remarkably well against more modern competitor cameras. If you regularly shoot fast-moving action, the A77 II's impressive AF tracking abilities and zippy burst speed mark it out as a strong candidate.

Elsewhere, the A77 II has built-in Wi-fi and NFC connectivity that allows you to pair the camera directly to a smartphone or tablet via Sony's free PlayMemories app for direct image transfer and remote

control duties. Unlike its predecessor, however, the A77 II doesn't have a built-in GPS module. On the back you'll find a tiltable 3in/1.23m-dot LCD, which is still one of the sharpest displays found on any consumer-grade DSLR. Above this sits a 2.39m-dot OLED electronic viewfinder that provides 100% coverage - its clear and bright window is a perfect example of how far EVF technology has evolved.

The body of the A77 II is encased in a magnesium-alloy shell and finished with tough polycarbonate. The body is also weather sealed against water and dust penetration, allowing it to be used with confidence in adverse weather. At around 647g (body only) the A77 II is by no means the lightest camera around. Image quality impresses, with the 1,200-zone metering system providing accurate exposures in a range of conditions as does the auto white balance. As you'd expect, colour can be adjusted to your preferences, however on the standard setting we found that it delivered punchy, rich images.

KEY SPECS

SENSOR
24.3MP APS-C CMOS
SENSITIVITY ISO 50-25,600
REAR DISPLAY
3in, 1.23m-dot tiltable LCD
VIEWFINDER 0.5in EVF type, 0.71x magnification, 100% coverage
DIMENSIONS
142.6 x 104.2 x 80.9mm
WEIGHT 647g with battery and card

PROS

- AF system • Easy, customisable menus
- Wi-fi/NFC • Effective five-axis stabilisation

CONS

- In-camera noise reduction can be harsh at high ISOs • No GPS • 0.3EV loss due to translucent mirror

Verdict

The A77 II offers solid build quality, great handling and is simple to use. Despite being one of the older models in this month's round-up, it remains an excellent interchangeable-lens camera that is particularly well suited to capturing sports and other fast-moving action. Its construction and weather sealing also make it an especially tough camera that can handle bad weather.



BEST FOR

- Those who regularly shoot fast-moving action
- Users wanting a tough, weatherproofed camera that can handle a few knocks while delivering great image quality



2 Nikon D610 £999 Body only



The D610 is the only camera in this month's Top Five that has a full-frame sensor. Released last year at £1,799 body only, it's now possible to buy a brand new D610 body for just under £1,000. While this is hardly an insignificant amount, it's worth remembering that only a few years ago you wouldn't get much (if any) change from £2,000 for a full-frame DSLR. If you have your heart set on a brand new DSLR and you're looking to make the move up to a full-frame sensor then the Nikon D610 is about as affordable as it gets. It is also an excellent camera in its own right.

Brought out to replace the Nikon D600 barely a year after its release,

the D610's headline specs are almost identical with the only major differences being a slightly faster maximum continuous speed and the addition of a 'Quiet' shutter mode. The D610's impressive specification includes a 24.3MP full-frame CMOS sensor and a native sensitivity range of ISO 100-6400, expandable to an ISO equivalent of 50-25,600. This is complemented by a 39-point AF system, that includes nine cross-type points in the centre for improved AF performance.

The optical viewfinder provides 100% coverage at 0.7x magnification, and there's a 3.2in, 921k-dot LCD. The D610 feels especially solid, thanks to its largely magnesium-alloy construction. While it doesn't quite have the same bombproof feel as the more expensive D810, it still offers weather-sealing to protect it from dust and moisture. Image quality is excellent, with accurate exposure metering and consistent white balance. Noise is also especially well controlled, even when shooting at higher sensitivity settings.

KEY SPECS

SENSOR
24.3MP full-frame (35.9 x 24.0mm) CMOS
SENSITIVITY
ISO 100-6,400 (exp. to ISO 50-25,600)
REAR DISPLAY
3.2in, 921k-dot LCD
VIEWFINDER
Pentaprism finder, 0.7x magnification, 100% coverage
DIMENSIONS
141 x 113 x 82mm
WEIGHT 850g with battery and card

PROS

- Sensor delivers excellent results • AF performance very good • Handling

CONS

- AF points grouped a bit too closely to the centre of the frame • 10-pin and sync socket missing

Verdict

While the reputation of the D600 was somewhat tarnished by reports of dust spots appearing on the sensor, there have been no such problems reported with the D610. It's an excellent camera that delivers plenty of flexibility and full-frame image quality at a very competitive price. If you're after a full-frame sensor DSLR on a budget the Nikon D610 is probably your best bet.



BEST FOR

- Those who would like a full-frame sensor for superb images in a very well made and high-performing DSLR





Canon EOS 80D £999 BODY ONLY

1

This well rounded and very capable DLR deservedly takes top spot

The 80D builds on the strengths of its excellent predecessor – the 70D. The 80D retains the innovative Dual Pixel CMOS AF technology of the 70D, whereby each individual pixel on the sensor is split in two, allowing each pixel to ‘double up’ as both a traditional light-registering photodiode and as an on-sensor phase-detection AF point. This results in greatly enhanced AF performance when the camera is used in Live View and video recording mode – especially when live view mode is engaged to track moving subjects across the frame. Continuous autofocus (AI Servo) in live view was first seen on the EOS 760D, but is more fully realised with the 80D as users are now able to determine the speed of focus transitions via the custom function menu. Also the 80D offers 45 AF points (the 70D offered 19 points) spread across the viewfinder, all of which are cross-type.

Effective resolution is boosted from 20.2MP to 24.2MP, giving you more freedom to crop images without sacrificing detail. Canon has paired the new sensor with the slightly older (yet still powerful) DIGIC 6 image processor. While the newer DIGIC 7 chip might seem a more natural fit on paper, the DIGIC 6 enables the 80D to offer a top burst speed of 7fps, along with a native sensitivity of ISO 100-16,000, expandable to ISO 25,600. Metering is taken care of via the same 7,560-pixel RGB+IR metering module

KEY SPECS

SENSOR 24.2MP APS-C CMOS
SENSITIVITY ISO 100-16,000 (exp. to ISO 25,600)
REAR DISPLAY 3in, 1.04m-dot touch-sensitive LCD
VIEWFINDER Pentaprism, 0.95x magnification, 100% coverage
DIMENSIONS 139 x 105.2 x 78.5mm
WEIGHT 730g with battery and card

found on the 750D and 760D, and improves on the 70D’s older 63-zone dual-layer metering sensor.

The optical viewfinder now offers 100% coverage with 0.95x magnification, and there’s a 3in vari-angle, 1.04m-dot touchscreen. The ability to set the display at just about any orientation and then operate the camera using the touchscreen adds great flexibility in everyday use. While the 80D doesn’t offer 4K video capture, you can shoot Full HD video at up to 60 progressive frames per second in MP4 or .MOV format. Unlike the 70D the 80D includes a dedicated headphone socket for real-time monitoring of audio levels. The 80D also has built-in Wi-fi and NFC.

The 80D feels reassuringly solid, and despite the lack of weather sealing the 80D’s aluminium and polycarbonate resin construction feels tough enough to protect the camera from bumps and scrapes. Our only niggle is that Canon opted for a single SD card slot, as opposed to the twin slots more commonly found on DSLRs of this calibre.

Image quality is excellent. While Canon has opted to keep the anti-aliasing filter intact on the 80D its higher-resolution sensor resolves excellent levels of fine detail, especially at ISO 100-1600. Beyond this, noise begins to creep in, to the detriment of fine detail, but images are still usable straight out of the camera at ISO 3200 and ISO 6400.

• For our full review of the Canon EOS 80D, turn to page 64

Verdict

While the 80D isn’t quite as revolutionary as its predecessor, it certainly improves on the 70D in a number of key areas including AF performance and accuracy, effective resolution and video recording. Likewise, build quality remains excellent despite the lack of weather sealing. For advanced amateurs and enthusiast photographers, the 80D is a superb APS-C DSLR that’s well worth taking a closer look at if your budget will stretch that far.

BEST FOR

• Advanced amateurs and enthusiasts looking for a well-rounded and highly capable APS-C DSLR • Those who’d like to record full HD movies

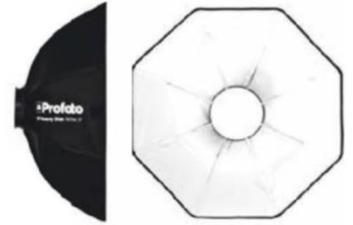
PROS

- Accurate 45-point AF system
- Servo AF in live view
- Responsive at focusing in low light
- Build quality
- Addition of a headphone port
- Fully articulated screen
- Buffer depth

CONS

- No dual card slots
- Lack of C-Log gamma, focus peaking or clean HDMI output for video professionals





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Billingham 25 £350 and 35 £250 rucksacks

WWW.BILLINGHAM.CO.UK

It's rare for Billingham to introduce a new bag, but this year the company has been unusually busy, first with a series of small S-series bags and now a pair of rucksacks. One of these, the larger 25, is a reworked version of a classic design first made in 1998 but which has been unavailable for years, while the smaller 35 is entirely new.

The two bags may look rather different, but they have a fair bit in common. Both are constructed of the same three-layer StormBlock fabric that includes a waterproof butyl rubber layer between the outer canvas and inner liner. The large main compartment is accessed from the front by a double zipper around the top and sides. There's also a separate zipped pocket on the front.

The shoulder straps are quite lightly padded and lined with a mesh material for breathability. As with many Billingham bags, the protective padding is completely removable, allowing the bag to be used as an everyday backpack. Four colour options are available: black, khaki, a dark olive green and burgundy.

Billingham 25

The Billingham 25 is the larger of the two bags and is very similar to its forerunner. However, the leather attachment points on the side are much deeper, so accessory pockets won't dangle at an angle when the bag is tilted. The capacious main compartment will swallow a full-frame DSLR and a maximum of five lenses, up to the size of a 70-200mm f/4. The front pocket is large enough to fit sandwiches and

a flask, or lightweight waterproofs. When fully loaded the bag can become rather heavy, and I'd have liked the option to add a waist belt to the harness.

Billingham 35

The Billingham 35 is a slimline backpack that seems best suited to CSC users. It uses a removable camera insert that's accessed from its top, and which was large enough to accept my Olympus OM-D E-M5 II with 7-14mm f/2.8, 12-40mm f/2.8 and 40-150mm f/2.8 lenses. The disadvantage of this design

Lid pocket

A slip pocket inside the lid will accommodate maps, documents or a 10in tablet.

Covered zips

All openings are shielded from the elements by protective flaps.

Adjustable straps

The shoulder straps can be adjusted across a generous range via an ingenious arrangement of two brass D-rings.



is that it's difficult to use the space above the camera compartment without compromising access to your kit.

The pocket on the front is rather smaller than the one on the 25, but still large enough to take personal items such as sunglasses or small accessories. Two brass D-rings underneath it can be used to attach optional tripod straps.

Billingham's bags are undeniably expensive but they provide exceptional protection for your kit and will last for years. Both the 25 and 35 offer the top-quality materials and flawless construction that are the company's hallmark, and are straightforward, easy-to-use designs.

If you like having lots of pockets for memory cards, batteries and filters, these bags probably aren't for you, but if you want to keep your kit safe and dry whatever the British weather throws at you, few bags will cope better.

PROS

• Exceptional quality • Easy to use

CONS

• Not as many pockets as some may like



“The bags may look different, but they have a lot in common”

MANFROTTO TWISTGRIP CLAMP £39.95

WWW.MANFROTTO.CO.UK

If you like to travel light, Manfrotto's TwistGrip smartphone clamp is worth a look. It allows you to clamp smartphones (with a width of 80mm or less) and mount them to any support or accessory that features a 1/4in thread connection. It's perfect for when you might like to try a time-lapse, long exposure or group shot. Made of aluminium, the TwistGrip features an easy-to-use twist movement and a locking knob to secure your smartphone – just make sure you don't unscrew the locking knob too far otherwise you'll find yourself picking it up off the floor. Slim, sturdy and well

made, the TwistGrip is essential for anyone wanting to take advantage of their smartphone's photographic capabilities.



1901 RODCHENKO LEATHER CAMERA STRAP £34.95

WWW.1901FOTOGRAFI.CO.UK

We see a lot of camera straps in the WDC office, including wrist straps, neck straps and shoulder sling straps in almost every colour and material. However, few offer quite the same quality and value for money as these British-made camera straps from 1901 fotografi. The Rodchenko is the company's latest offering. It's a heavyweight neck strap designed for larger cameras, with a 3cm-wide neck pad to help ease the load. The length is adjustable (83cm-137cm) using two sliding pewter buckles, and the strap is available in black, dark brown, Italian brown, merlot and tan. It will fit practically any camera, attaching either directly through slot-type lugs or to eyelets using the supplied split rings.



Kenro Universal Charger £23.94

WWW.KENRO.CO.UK

As its name suggests, the Kenro Universal Charger is designed to charge a wide range of different batteries. They include the popular AA and AAA batteries, as well as camera and video batteries. The Universal Charger also has a USB output port, so if you have the right cable for your camera/smartphone it can be used as a USB charger, albeit a rather complex one.

The device is compatible with 3.6-3.7V/7.2-7.4V Li-ion batteries, the type you'll find in many modern digital cameras including DSLRs and CSCs. We tested a few different styles of battery and found Canon LP-E6 batteries charged fine, as did the Fuji NP-W126. Olympus BLN-1 batteries don't tend to play nicely with anything other than the proprietary charger, however, and the Kenro is no different, as it failed to charge those. Other than the Olympus battery, it was able to charge everything including a mix of AA and AAA

batteries in both NiCd and NiMH varieties.

There's a built-in microprocessor that automatically detects the polarity of the batteries and adjusts itself to successfully charge them. This is particularly useful when charging block-style batteries where it can be difficult to see the polarities, or they are unspecified.

The Kenro Universal Charger is powered by an AC plug, and an in-car charger is also included.



PROS

- Built-in ability to detect battery polarity

CONS

- Doesn't charge Olympus BLN-1 (but that's not uncommon)



Benro TMA28A Series 2 Mach3 Aluminium tripod £119

WWW.BENROEU.COM

Benro has expanded its already broad range with the TMA28A Series 2 Mach3 Aluminium tripod. As the name suggests, the legs are constructed of strong, lightweight aluminium. The spider and upper leg locks are made of durable magnesium alloy. It weighs 1.76kg which, while not particularly heavy, isn't especially light, either. Benro quotes an impressive maximum payload of 14kg. Packed down, the tripod measures 52.5cm. That's reasonable, especially when you consider its maximum height is 155.5cm with the centre column extended.

With some tripods, the leg locks can be easily broken. Twist-lock legs are often reliable, though, and the Benro TMA28A's appear to be very good. They're

rubberised and easy to twist open and closed. They also boast a feature that stops particles jamming them, which is a big bonus.

The leg angle locks have three positions in which the tripod can be spread out. The last is very wide, making it well suited for uneven locations such as a rocky beach.

While the centre column can be turned upside down for low-level shooting, there is an additional small centre column that comes inside the tripod bag. This is intended for ground-level shooting.

It's not the lightest or most compact tripod, but it holds the middle ground in practically all areas, making it a solid all-rounder. What's more, it's steady, well made, has lots of extras as standard and does more or less everything an enthusiast photographer could ask of a tripod – all at a very affordable price.



PROS

- An excellent all-rounder
- Many extras

CONS

- Not particularly light or compact



The 80D's full HD (1,920x1,080) 60p offering will be welcomed by videographers wanting to capture fast motion or create slow-mo footage. The 80D adds a headphone port and features audio level adjustment.

The EOS 80D has a built-in intervalometer. The number of shots selectable ranges from one to 99, with the option to select unlimited.

The pop-up flash can be raised by hitting the small flash button above the lens release. It has a guide number of 12m @ ISO 100 and a recycle time of around 3secs.

Whereas some APS-C DSLRs have a dual SD card slot, the Canon EOS 80D only has a single bay to accept one SD card.



Canon EOS 80D £999 BODY ONLY

We test the new EOS 80D to find out how it improves on the EOS 70D that impressed us three years ago

WWW.CANON.CO.UK • TESTED BY MICHAEL TOPHAM

Comparing Canon's current DSLR line-up with what it was three or four years ago highlights how, today, the manufacturer offers a wider range of models catering for all types of photographer and sizes of budget. Canon once offered a couple of APS-C DSLRs for beginners, another couple for enthusiasts and two or three full-frame DSLRs for seasoned pros. By contrast, today's line-up features seven APS-C DSLRs and six full-frame models.

For the advanced amateur photographer, Canon's double-digit series of DSLRs has always been appealing, typically blending a comprehensive spec with a body-only price that falls just below £1,000. However, with competition in the high-end enthusiast DSLR segment intensifying, new models have needed to offer something new or unique to stay one step ahead. In the case of the Canon EOS 70D, the stand-out feature was its Dual Pixel CMOS AF system built into its 20.2-million-pixel sensor that redefined the speed of autofocus in live view and movie mode. This game-changing technology was always going to leave the 70D's

successor with big boots to fill and begs the question: Is the 80D another revolutionary DSLR or more of a modest update on what we've already seen before?

FEATURES

In the three years since Canon last released a double-digit DSLR, its engineers have been hard at work to develop a new 24.2-million-pixel CMOS sensor. Much like the 70D's 20.2-million-pixel CMOS sensor, this new chip benefits from Dual Pixel CMOS AF technology. To take it one step further, Canon has introduced continuous autofocus (AI Servo) in live view mode. This was first rolled out on the 760D. The difference with the 80D is that it has phase-detect pixels spread across the entire frame, which should offer superior performance. Photographers who like to track moving subjects will appreciate having the option to select AI Servo in live view mode. It's also good to see Canon adding extra control of the Dual Pixel CMOS AF sensitivity from the custom function menu. This allows users to adapt the focus to the shooting situation and create slow, natural or fast-focusing transitions.

KEY SPECS

SENSOR 24.2MP APS-C CMOS
OUTPUT SIZE 6,000 x 4,000 pixels
FOCAL LENGTH MAG 1.6x
LENS MOUNT Canon EF/EF-S
SHUTTER SPEEDS 30-1/8000sec, bulb
ISO 100-16,000 (exp. to 25,600)
METERING 7,560-pixel RGB+IR sensor
EXPOSURE COMP. 35EV in 1/3EV or 1/2EV steps
DRIVE 7fps
MOVIE 1,920 x 1,080 pixels at 60fps, 50fps, 30fps, 25fps, 24fps
VIEWFINDER Pentaprism, 0.95x magnification, 100% coverage
DISPLAY 3in, 1.04-million-dot vari-angle LCD touchscreen
FOCUSING 45 cross-type AF points (f/2.8 at centre)
DIMENSIONS 139 x 105.2 x 78.5mm
WEIGHT 730g with battery and card

The focusing improvements don't end here. When shooting using the viewfinder the 80D features a newly developed autofocus module that is a big upgrade on the 70D. There are 45 AF points compared with the 19 AF points on the 70D, and all these are the cross type. The AF system isn't too dissimilar from the Canon EOS-ID Mark IV, and out of the 45 AF points on offer 27 remain active when using a teleconverter and lens combination with a maximum aperture of f/8. Furthermore, the centre point is sensitive down to f/2.8, and the working range of the autofocus system (-3EV-18EV) is more in line with its closest rival, the Nikon D7200.

Rather than utilising Canon's latest DIGIC 7 image processor, the sensor teams up with the older, but still powerful, DIGIC 6 image processor. This pairing allows the 80D to shoot from ISO 100-16,000 (expandable to ISO 25,600), which works out to be a 1-stop sensitivity gain over the 70D. However, it's no faster at rattling out a continuous burst than its predecessor, at 7fps. There's also the option to shoot at 3fps in the 80D's silent shooting mode, and it's possible to rattle off a burst at 5fps in live view mode.



DUAL PIXEL CMOS AF

It's not uncommon to see features filter down from models higher up in a manufacturer's camera range. One example of this is the 80D's flicker-detection technology. This can detect flickering light and then time each shot to coincide with the peak brightness of the light source for more consistent results. The 80D also inherits Canon's 7,560-pixel RGB+IR metering sensor that impressed us on the 750D and 760D – yet another improvement on the 70D's older 63-zone dual-layer sensor.

Like the 70D, the 80D's viewfinder displays a camera-level indicator to avoid skewed horizons. Instead of 98% coverage, it now displays 100% of the frame with 0.95x magnification. In the past, full viewfinder coverage has been exclusive to the more expensive premium models, so it's great to see this finally filtering down to more affordable enthusiast DSLRs. Beneath the viewfinder, you'll find a vari-angle 3in, 1.04-million-dot touch-sensitive display that is identical to that in the 70D's.

To overcome slow-focusing speeds in Live view, Canon has implemented Dual Pixel CMOS AF that supports sensor-based, phase-detection autofocus. Improving where the 70D left off, the 80D's Dual Pixel CMOS AF now supports Servo AF when shooting still images in live view. This allows the user to select focus on a subject and track it through the frame while the shutter button is half depressed. It proved to be very effective for moving subjects and was used to maintain focus on the car in the shot above, which was travelling at roughly 30mph.

The 80D doesn't feature 4K video, but provides videographers with the option to shoot full HD movies up to 60p in the MP4 or MOV file formats. Full control of audio levels can be taken from the touchscreen and those who've been after a headphone socket will welcome the fact that one has been added below the mic port.

To speed up the connection speed between the camera and android devices, Canon has included one-touch NFC connectivity in addition to Wi-Fi connectivity. There's also the option to adjust exposure settings, fire the camera remotely, and transfer full-resolution JPEGs and MP4 movies to smart devices using Canon's free Camera Connect app. A new fine-detail effect has been added to the list of picture styles, which adjusts the sharpening and noise reduction to improve the rendition of fine textures in JPEG files. Finally, just like the 70D, the 80D accepts the widely used LP-E6N battery.

BUILD AND HANDLING

Canon has spent years refining the design of its enthusiast series of DSLRs and we seem to have



The 80D's new Servo AF mode allows you to continuously focus on moving subjects in live view

reached a point where each new model looks very similar to the last. The only significant change at the rear is an enlarged thumb rest that adorns the same rubberised grip as the front of the camera. Directly above the thumb rest, users have the option to take advantage of an AF-ON button – a feature exclusive to Canon's more advanced DSLRs. This can be used to separate AF activation from the shutter release, and perform back-button focusing.

To keep things uniform at the rear, the playback and quick menu buttons are now circular to match the menu, info and zoom buttons. Meanwhile, a glance above the on/off switch reveals you can now take control of creative filters and access a second custom setting (C2) direct from the mode dial. The LCD on the top-plate is also larger than that on the Canon EOS 760D, meaning there's more space to glance at what metering and drive mode you have the camera set to.

Videographers will be pleased to read that Canon has carefully considered the placement of the microphone and headphone inputs to ensure the screen can be fully articulated when audio components are plugged in. The same can be said for the cable-release input, which is located just beneath. Photographers and videographers looking at the 80D as a possible

upgrade option from the 70D will also appreciate that it's fully compatible with the Canon BG-E14 battery grip (£134).

The body is constructed from aluminium and polycarbonate resin with glass and conductive fibre. In the hand, it feels well built and reassuringly solid. However, Canon admits it's not constructed to the same weather-resistant standard as the EOS 7D Mark II. During my testing I was caught out in a few light rain showers, but these caused no issues with performance or operation, and I was surprised by just how well the touchscreen responded to wet fingers and water droplets across its surface.

One of my criticisms regarding the design of the 80D is Canon's decision not to include a dual card slot – an extremely useful storage feature for both back-up as well as overflow, should you reach a card's capacity. Those who feel this is a must-have feature will want to look at the 7D Mark II, which, at the time of writing this review, is only £79 more expensive than the 80D, with Canon's £100 spring cashback promotion (available until 18 June) taken into consideration.

PERFORMANCE

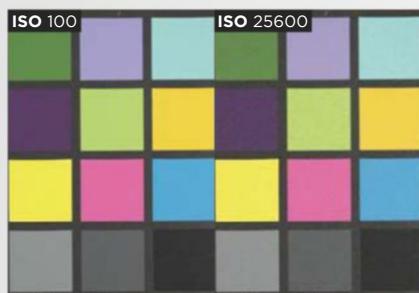
Unfortunately, Canon's new kit zoom, the EF-S 18-135mm f/3.5-5.6 IS USM and its clip-on PZ-E1 power

zoom adapter were not available to test with the 80D. Instead, the 80D was tested with the slightly older Canon EF-S 18-135mm f/3.5-5.6 IS STM lens as well as a selection of other optics, including the new Sigma 50-100mm f/1.8 DC HSM Art.

As mentioned earlier, the notable improvement on the 80D is the introduction of continuous autofocus (AI Servo) in live view. This is the first time we've seen the feature on a dual-pixel AF camera. To get an idea of how well it works, I tested it outdoors where I had the opportunity to continuously focus on subjects moving at slow and high speeds. Activating live view, and using the AF button on the top-plate, presents the option of selecting the AF method via the command dial on the top-plate and the AF mode with the scroll dial at the rear. After setting the AF method to FlexiZone Single AF, and the AF mode to Servo AF, I then utilised the touchscreen LCD to select my subject in the frame and kept the shutter half-depressed while panning.

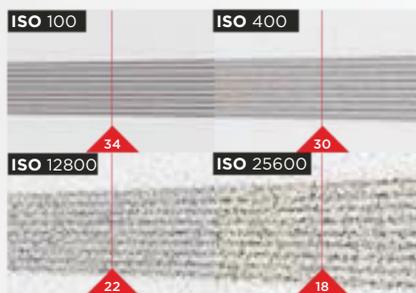
The 80D was quick at keeping up with ducks as they moved closer and farther away from the lens, and I found I was able to shoot a greater number of sharp shots in quick succession than was possible using one-shot AF. To photograph a moving car, I switched the AF

Image quality



COLOUR

The majority of our test images and shots that support this review were taken with the 80D's white balance set to Auto and the picture style set to Standard. The Auto white balance can generally be relied upon to produce accurate colour and faithful tones in a wide variety of lighting conditions. Colour saturation remains right high through the 80D's sensitivity range, but as you begin to encroach the five-digit ISO settings you'll notice an increasing amount of Chroma noise. Overall, there's very little to fault with the way the 80D renders colour in its images.



RESOLUTION

The 80D resolves an impressive 3,400 l/ph at ISO 100, which is higher than the 2,800 l/ph the 70D resolves at the same sensitivity setting. This improvement in resolution continues through the sensitivity range, with the 80D attaining 3,000 l/ph at ISO 400 and 2,800 l/ph up to ISO 1600. As you push the sensitivity higher, luminance noise starts to soften the finest details and reduces resolution. The sensor resolves 2,400 l/ph at ISO 6400, and there's a noticeable drop in resolution to 2,200 l/ph at ISO 12,800, ending up at 1,800 l/ph at its expanded ISO 25,600 setting.

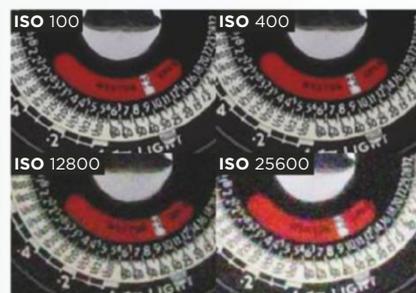
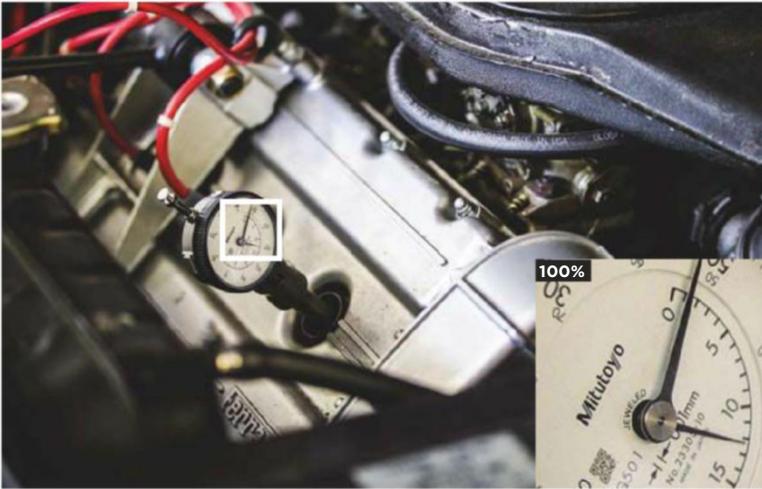


IMAGE NOISE

A study of our JPEGs between ISO 100 and ISO 400 revealed no signs of noise and a high level of detail. Luminance noise starts to make its presence known at ISO 1600 and is joined by chroma noise as you push towards ISO 3200 and 6400. Inspecting our Raw files revealed a strong set of results. Chroma noise is absent up to ISO 6400, and although luminance noise is evident at ISO 3200 and 6400, it's well controlled, allowing files to retain a high level of detail. Detail in Raw files beyond ISO 6400 takes a hit and the five-digit settings are best avoided.



The 80D resolves impressive detail, particularly at the low end of the ISO range

method to FlexiZone-Multi and pinpointed the subject centrally in the frame. Again, the 80D had no difficulty continuously focusing in live view as I panned and tracked the vehicle side-on. However, attempting to continuously focus on a group of fast cyclists heading directly towards the camera proved much more of a challenge for the camera, and resulted in a few out-of-focus frames.

The only other time when the camera struggled to find focus accurately with live view and servo deployed was when it was asked to focus in extremely low-light environments. Out of live view, the autofocus is snappy and responsive. It should be noted

that the 45 AF points do gather towards the centre of the frame, but the wide working range of the autofocus system (-3EV-18EV) sees the camera make light work of focusing when the light levels drop. It's noticeably more accurate in demanding lighting conditions compared to the EOS 70D, which could only focus down to a conservative -0.5EV.

In addition to the improvements to autofocus, the 80D boasts a higher buffer depth, meaning it can now record 110 JPEGs, or 25 Raw files, at up to 7fps. Those who shoot sports, action and wildlife are most likely to take advantage of this improvement. Something I noticed while rattling out a continuous burst

with the camera set to its silent mode is that although the slap of the shutter is dampened, it's not completely silent. Calling it a 'quiet' shutter mode, instead of 'silent', would be more accurate.

Canon's menu systems are extremely intuitive and the 80D's is no exception. The company is the pioneer of touchscreen control on DSLRs, and the way the 80D responds to light touches makes navigating its settings a breeze. Creative filters are available for those who'd like to experiment with the look of their images. Users can preview creative filters in Live View mode; however, it's not possible to record an uncompressed Raw file at the same time.

The viewfinder is the best we've seen on a double-digit Canon DSLR. It's great to know that what you see is exactly what the sensor records, thanks to its 100% field of view. I glanced at the electronic level overlay in the bottom corner on many occasions and found it particularly useful when setting up on a tripod that didn't have a bubble level.

In other areas, the metering system performed well, producing bright and accurate exposures that required little more than -0.3EV exposure compensation. Battery life was excellent, too, with just under 1,000 shots from a single charge.

Verdict

The 80D isn't as revolutionary as the 70D was when it was released. Nevertheless, it's better than its predecessor in a number of areas, including the accuracy of focusing both in and out of live view. The 80D is more responsive at focusing in low light than the 70D, and although it doesn't feature case studies in the AF section of the menu, like the 7D Mark II, it's good to see options being added to adjust the tracking sensitivity in the custom function menu.

Videographers who have been pleading for a headphone input have finally had their wish granted, and despite not featuring 4K the camera is equipped with all the advanced video functionality you need to shoot professional and smooth-looking movies at 60p.

The new sensor resolves more detail than the 70D. It doesn't match the resolution of the Nikon D7200 at high sensitivities, but users will find there's plenty of detail in images up to ISO 6400. There was more chroma noise in JPEG files at high ISO than I had anticipated, but the

accuracy of colour and exposure metering is just as good as we've come to expect from Canon, and is hard to fault. Canon hasn't cut corners with regard to build quality. The 80D feels well constructed and should survive the test of time in hands of those who care for it.

For amateurs and enthusiasts, the 80D is a well-rounded and highly capable APS-C DSLR that's worth a close look. Whether you settle for the 80D or 7D Mark II depends on what you shoot, but with £80 (at the time of writing) being all that separates them, it doesn't make it an easy decision.

If a fully articulated screen, higher resolution and a slightly smaller body are what you're after, the 80D gets the nod. However, if you shoot sports or action and would like your DSLR to shoot at up to 10fps with a highly sophisticated 65-point autofocus system and dual card slots, I would say it's worth spending the extra for Canon's rather excellent EOS 7D Mark II. **MT**

BEST FOR

• Serious photography enthusiasts and aspiring amateur photographers • Videographers looking for a good specification to record full HD movies

PROS

- Servo AF in live view
- 45-point (all cross-type) AF system
- Addition of a headphone port
- Buffer depth

CONS

- Lacks dual SD card slot
- No C-Log gamma, focus peaking or clean HDMI output for video professionals

FEATURES	18/20
PERFORMANCE	19/20
DESIGN	18/20
IMAGE QUALITY	19/20
VALUE	18/20
WDC RATING	Canon GOLD
★★★★★	



Panasonic Lumix DMC-TZ100 £530

Panasonic's pocket travel camera combines a 1in sensor and 10x zoom lens

WWW.PANASONIC.CO.UK • TESTED BY ANDY WESTLAKE

Perhaps because it was never a traditional film-camera company, Panasonic always tries to find ways of offering something beyond the ordinary with its Lumix cameras. With the TZ100, it has combined a relatively large 20-million-pixel, 1in sensor with a 10x zoom lens. Yet this fits in a body that's small enough to fit in a coat pocket or small bag.

It's safe to say that the TZ100 offers one of the richest feature sets of any pocket camera to date. First, there's that hugely flexible lens range, which covers a very respectable 25mm equivalent wideangle to a decently long 250mm equivalent telephoto. The price you pay is a pretty modest f/2.8-5.9 maximum aperture, which is less suited to low-light shooting. The sensor's native sensitivity range covers ISO 125-12,800, and is extendable to ISO 80-25,600. Continuous shooting is available at 10fps with focus fixed, or 5fps with focus adjustment between frames. Hybrid five-axis optical/electronic image stabilisation helps avoid image blur from camera shake.

Naturally, Wi-fi is built in, allowing you to control the camera remotely using your smartphone or tablet, and copy images to the device for sharing with friends and family.

With a metal body shell, the TZ100 feels sturdy and well made,

KEY SPECS

SENSOR
20.1MP, 1in MOS

OUTPUT SIZE
5,472 x 3,648

LENS
25-250mm (equiv.)
f/2.8-5.9

SHUTTER SPEEDS
60-1/2000 sec;
1-1/16,000sec
electronic

EXPOSURE MODES
PASM, iAuto, scene

METERING MODES
Multi,
centreweighted, spot

SENSITIVITY
ISO 125-12,800
standard, ISO 80-
25,600 extended

EXP COMP
35EV in 1/3 steps

BURST SHOOTING
10fps; 5fps with AF
tracking

DISPLAY
3in 1.04-million-dot
touchscreen LCD

VIEWFINDER
0.2in EVF,
1.16-million-dots

AF POINTS 49

VIDEO
4K (3,840 x 2,160),
30fps or 25fps

EXTERNAL MIC
No

MEMORY CARD
SD, SDHC, SDXC

POWER
DMW-BLG10E Li-ion

BATTERY LIFE
300 shots (LCD); 240
shots (EVF)

DIMENSIONS
110.5 x 64.5 x
44.3mm

WEIGHT
310g with battery
and card

as befits a £550 camera. However, the handgrip is rather small and slippery, making a wrist strap a necessity. For a camera that's aimed at enthusiast photographers, the control layout leaves a little to be desired, too, but it works OK and you can take as little or as much manual control as you please.

The built-in viewfinder is really quite small, but it's very useful when shooting in bright light, and a lot better than not having one at all. The rear screen is very good, giving a more accurate preview of the final image than the EVF, but I missed the additional flexibility offered by an articulated screen.

Autofocus is excellent, working quickly and accurately in almost any situation, and only showing any sign of failing in really dim light. The focus point can be placed anywhere in the frame using the touchscreen, and face-detection and subject-tracking modes are available. The metering handles most scenes relatively well, though I occasionally had to use exposure compensation to avoid losing highlight detail, or brighten images on dull days.

Low ISO images are packed full of fine detail, and I was quite happy shooting up to ISO 1600. Higher settings result in noisy images, but can still be usable especially when converted to black & white. Meanwhile, the lens delivers plenty of detail at wideangle and holds up well through to about 100mm equivalent, but gets noticeably softer beyond. The optical image stabilisation works well, too, although it's still best to avoid one-handed shooting.

Verdict

Let's get one thing straight – the Panasonic Lumix DMC-TZ100 is the best pocket travel camera money can buy right now. Its 1in sensor and 25-250mm-equivalent lens give a great combination of image quality and zoom range in a body that's still small enough to slip into a jacket pocket. I took it on a week-long trip to New York expecting to use it occasionally as a back-up to my 'proper' camera, but ended up carrying it all the time instead, and found it delivered fine results under almost any conditions. This is its purpose in life, and it fulfils it better than any of its peers. If you're looking for a small camera to take on holiday this summer, then the TZ100 should be right at the top of your shortlist.

BEST FOR

- Enthusiasts who want a pocket travel camera

PROS

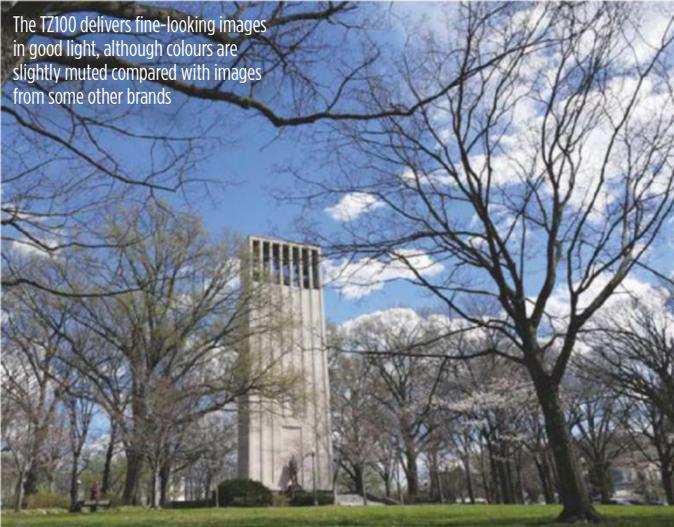
- Really useful zoom range
- Excellent image quality
- Pocketable design

CONS

- Tiny viewfinder
- Fixed rear screen limits compositional flexibility



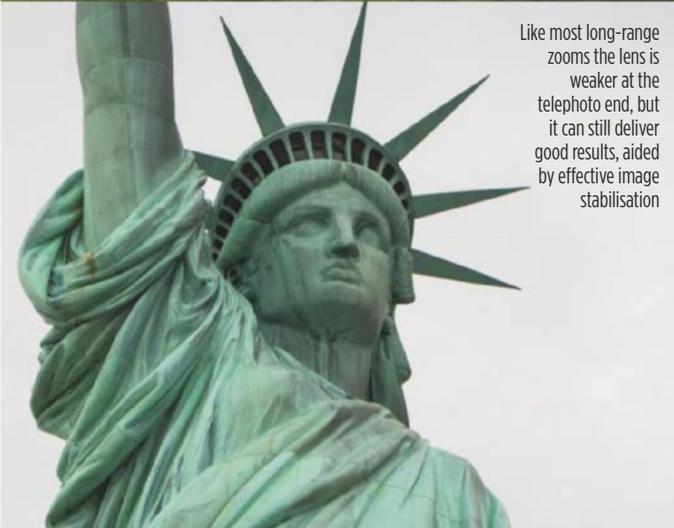
The TZ100 delivers fine-looking images in good light, although colours are slightly muted compared with images from some other brands



Low light image quality is very respectable. This was shot at ISO 6400



Like most long-range zooms the lens is weaker at the telephoto end, but it can still deliver good results, aided by effective image stabilisation



The TZ100's ability to record Raw files means you can be more creative with your processing after the event

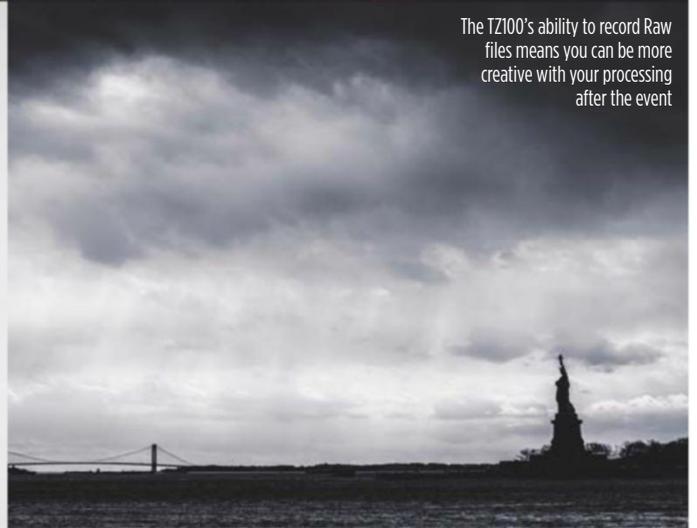
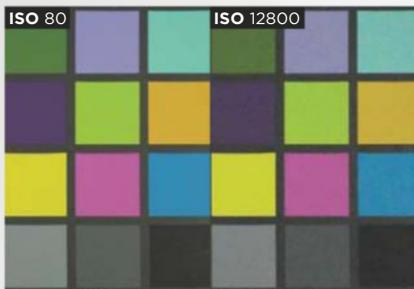
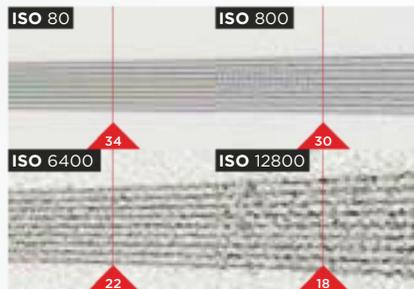


Image quality



COLOUR

Panasonic's standard JPEG colour rendition is accurate and perfectly pleasant, although not as punchy or crowd-pleasing as some other brands. The in-camera JPEG processing also does a great job of holding colour at high ISO settings, as can be seen from the ISO 12,800 test shot above. The TZ100 does tend to give slightly cool white balance in daylight, while erring to the side of warmth under artificial light, but it's not unpleasant. In-camera Raw development allows you to choose a more appropriate white balance on those occasions that the camera gets things wrong.



RESOLUTION

With its 20.1MP sensor, the Lumix TZ100 can record a whole lot of detail, and this shows in our resolution tests. As usual, it performs best in Raw, and here we see it achieving at least 3,400 l/ph at low ISOs with the lens set to 35mm (equivalent) and f/4, which is about as much as we could possibly hope for. Noise starts to have a clear impact on detail at ISO 800 and by ISO 3200 resolution has dropped to around 2,600 l/ph. At the top standard setting of ISO 12,800 and the extended ISO 25,600 setting in particular, resolution falls dramatically because of the impact of noise.

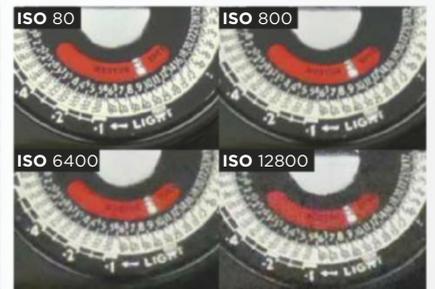


IMAGE NOISE

At low ISO settings, TZ100 files show lots of detail with just the barest hint of noise. At ISO 800, luminance noise is beginning to mask fine detail if you look at your images closely, but this is unlikely to show up in prints of 12x8in or smaller. By ISO 3200, however, there's a much greater impact on fine detail, but Panasonic's JPEG processing maintains colour well. ISO 6400 is about as high as you'll want to go, with little in the way of shadow detail remaining, and the higher settings are very noisy indeed. ISO 12,800 can just about be usable when converted to black & white, but I'd avoid ISO 25,600.

Sony FE 85mm f/1.4 GM £1,500

When shot at f/4, the lens gives impressive edge-to-edge detail, even on full frame



This new telephoto prime lens for Sony Alpha 7 cameras is ideal for portraits

WWW.SONY.CO.UK • TESTED BY RICHARD SIBLEY

When the Sony Alpha 7 cameras were first released in 2013 and 2014, there was criticism about the lack of available lenses. However, over the past few years Sony has gradually increased its range of lenses for its full-frame E-mount cameras, and at the time of writing it has just reached the 16 lens mark, alongside 1.4x and 2x teleconverters.

While there is still room for the Sony FE lens range to grow, particularly with affordable optics, most of the key lenses required by professionals are now available. This includes the recent Sony FE 85mm f/1.4 GM. This is part of Sony's new G Master (GM) series of lenses, which is a premium range of optics that's designed to sit above its existing G-series line-up. This new range promises to be compatible with the next generation of high-resolution Sony sensors and 8K video, which means that these lenses should be able to deliver top performance on the latest cameras well into the next decade.

Features

The 85mm lens will obviously be a popular choice for portrait photographers. The focal length is ideal for this subject on both full-frame and APS-C cameras, with a 135mm equivalent field of view on the latter. Moreover, the large f/1.4 aperture creates a shallow depth of field that will throw a background nicely out of focus.

The lens is constructed from 11 elements in eight groups, and

The lens has an aperture ring and, when filming, the clicks of the aperture ring can be switched off



contains one extreme aspherical (XA) lens element. The XA element is designed to create very smooth out-of-focus areas, as well as helping to reduce chromatic aberrations. At the press event for the new lens launch, Sony proudly told the assembled journalists that the surface tolerance of this element is just 0.01microns; in other words, it has an incredibly smooth surface. The company also claims that the machinery needed for such a high standard of production is currently used exclusively by Sony. Quite how much of this is fact, compared to marketing spin, is unknown, but the proof, as they say, is in the pudding.

In the lens arrangement there are also three extra-low dispersion (ED) elements that minimise axial chromatic aberrations. Key lens elements are treated with Sony's Advanced Nano AR Coating technology, which helps to suppress flare, reflections and ghosting, thereby improving clarity and contrast. In addition to this, the lens has 11 rounded aperture blades, which are designed to produce a

circular aperture, and consequently create smooth out-of-focus areas that will be particularly noticeable in the highlights.

Externally, the lens has dust and moisture resistance. Obviously this isn't full weather sealing, but it should be able to cope with the odd splash of rain. The lens barrel features an AF/MF switch for quickly changing between auto and manual focus. There is also a focus-hold button mounted on the side of the barrel, which can be easily accessed while handholding the lens. Photographers will love the fact that the lens has an aperture ring, while filmmakers will like the fact that the clicks of the aperture ring can be switched off to change aperture smoothly while filming.

Build and handling

One of the criticisms that's been levelled at the Sony Alpha 7 system is that the lenses are about the size of conventional DSLR optics, if you compare like-for-like. While this is true for the 85mm lens, which measures 89.5 x 107.5mm and weighs 820g, we should also note that different photographers will buy cameras for different reasons, and that size and weight aren't everything to everyone. In this regard, I had no problem handling and using the 85mm lens with the Sony Alpha 7R II. The combination felt comfortable, and I was actually glad I was saving a few grams compared to the extra weight of a DSLR. Did the combination feel unbalanced? No. This is a combination that you would always support with two hands: one is on the camera while the other is on the controls on the lens, which themselves are placed at points that feel natural and familiar. Again, the size and weight may not be an advantage over a DSLR, but it is certainly not a disadvantage, either.

Overall, the build quality is excellent, and it feels like you are using a premium product.

Image quality

The 85mm GM lens was obviously crying out to be used at f/1.4. It is probably between about f/1.4 and f/4 that this lens will see most of its use when shooting portraits, and you cannot help but be impressed with the image quality, particularly when paired with the Sony Alpha 7R II. The depth of field produced at

f/1.4 when shooting portraits is obviously very shallow, and when you combine this with a 42MP full-frame sensor, you need to make sure that your focusing is spot-on. It is the usual case that when shooting at f/1.4 the ends of the eyelashes can be sharp, but the eye itself is slightly out of focus owing to the limited depth of field. This happened a couple of times during the test, but it shouldn't be seen as a reflection of the camera or lens – more a case of sometimes needing to stop the aperture down a touch to create more depth of field.

When the shot is in focus, you really know about it. A 100% crop of a 42MP image is completely unforgiving, but the 85mm f/1.4 GM lens has nothing to hide. There is a staggering amount of detail. Every tiny texture of skin, every eyelash, the markings of pupils – everything is revealed crisply, even at f/1.4, which isn't even the sharpest point of the lens. A little colour fringing

from axial chromatic aberration is visible in out-of-focus areas, but it's not particularly intrusive.

Verdict

Costing around £1,500, the Sony FE 85mm f/1.4 GM is one of the most expensive 85mm lenses on the market, but it's also one of the best. Based on the evidence of using it on the 42.4MP Alpha 7R II, I see no reason why it won't meet the demands of even higher resolution sensors that may come on the market in the next few years, thus making it a reasonable investment. If you own an Alpha 7R II and portrait photography is your key subject, it is naturally a fine pairing. For everyone else, it is a premium lens at a premium price. But it provides a peek into what we may see trickle down in terms of image quality over the next few years. Hopefully, Sony will produce a more affordable f/1.8 version with much more mass-market appeal.

Lab Tests

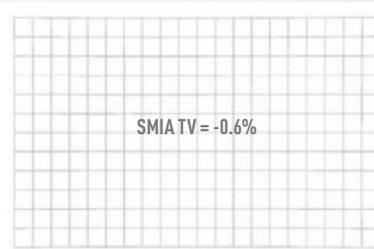
RESOLUTION

The lens is impressively sharp in the centre at f/1.4, and gives exceptional results on stopping down to f/2.8. The corners are weaker, and you'll need to stop down to f/4 if corner sharpness is desirable (it's not usually for portraits).



CURVILINEAR DISTORTION

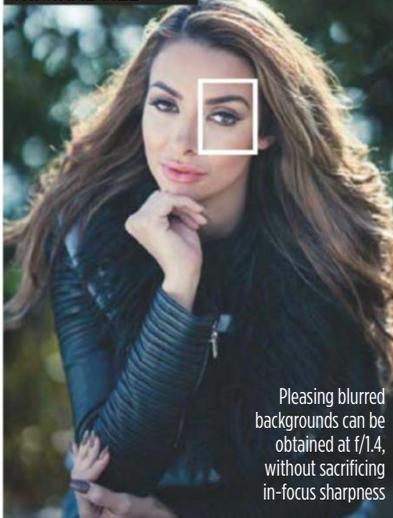
The 85mm is very well corrected for curvilinear distortion: just a tiny amount of pincushioning is detectable. This is exactly what we'd expect from a short telephoto prime, and it means subjects should be drawn in a very natural-looking way.



KEY SPECS

FILTER DIAMETER 77mm
LENS ELEMENTS 11
GROUPS 8
APERTURE f/1.4-f/16
MINIMUM FOCUS 80cm
LENGTH 107.5mm
DIAMETER 89.5mm
WEIGHT 820g
LENS MOUNT Sony E-mount

ORIGINAL SIZE



100% crop



Pleasing blurred backgrounds can be obtained at f/1.4, without sacrificing in-focus sharpness

PROS

- Excellent image quality and detail
- Wide f/1.4 aperture for blurred backgrounds
- Build quality

CONS

- High price will put it out of reach for many potential users





Back on track

Fujifilm users have been waiting patiently for a long telephoto zoom, and finally the Fujinon XF 100-400mm f/4.5-5.6 R LM OIS WR is here. **Michael Topham** reports on a full day's testing at the home of British motorsport

WORDS AND PICTURES **MICHAEL TOPHAM**

As photographers, we all like a challenge, so when I was asked if I'd like to attend the FIA World Endurance Championship at Silverstone in Northamptonshire, to try out the new Fujinon XF 100-400mm f/4.5-5.6 R LM OIS WR lens, I jumped at the chance. However, as I step out of the car into a deep puddle and glance up at dark clouds, I think, 'This isn't how I envisaged my day starting'. After donning my cagoule and making my way to the press centre, I decided to accept the conditions for what they are. Today's assignment is not only going to be a demanding test for the lens, but also for the Fujifilm X-series cameras in my bag, which I admit I've been slightly sceptical of using for motorsport and fast-paced action in the past. Would this be the day that

KEY SPECS

PRICE £1,399 (£1,499 with 1.4x teleconverter)
MOUNT Fujifilm X mount
LENS CONSTRUCTION 21 elements in 14 groups
DIAPHRAGM BLADES 9
MAX APERTURE f/4.5-5.6
MIN APERTURE f/22
MINIMUM FOCUSING DISTANCE 1.75m
FILTER SIZE 77mm
DIMENSIONS 94.8 x 210.5mm
WEIGHT 1,375g

changes my perception of the speed and response of autofocus on the X-series cameras?

After picking up my press tabard, I prepare to shoot the first practice session of the day by coupling the

lens to the front of my Fujifilm X-T1. Although I have an X-Pro2 at the bottom of my bag, I opt for the X-T1 because I find it handles better with larger and heavier lenses, and feels more DSLR-like when it's raised to the eye with its centrally positioned EVF.

The first advantage I become aware of is the weight saving. Compared to



After a few attempts, this panning shot was finally captured on the X-Pro2 with a shutter speed of 1/80sec at ISO 800



my Canon EF 100-400mm f/4.5-5.6L IS II USM that I typically use for motorsport, the lens is 265g lighter. This might not sound like a huge weight saving, but trust me every gram you can save is a bonus when you're lugging kit around a track all day. One way Fujifilm has managed to shed weight from the lens is to use high-quality plastic in the construction of the barrel, rather than metal. Needless to say, it doesn't feel quite as solid as a telephoto zoom with a metal body, and for the price I would have liked to see the switches made from metal rather than plastic. These points aside, it's a good-looking lens.

Prior to heading trackside, I attach my vertical battery grip to the X-T1, which improves the balance and handling of the lens when it's attached to such a compact body.



Zone AF is particularly effective on the X-Pro2. It produced sharp images of cars travelling towards the camera at 100mph

I take up my first vantage point close to the pit-lane entrance and use the next few minutes to familiarise myself with the position of the switches on the barrel. The lowest of the three is used to engage and disable the optical image-stabilisation system. Above it are two further switches. The first appoints manual aperture control via the aperture ring that's located behind the focal length markings. The aperture ring offers excellent feedback and notches into position when it's rotated. The switch above limits the focusing range, with the option to set it from the minimum focus distance (1.75m) to infinity or 5m to infinity.

Unlike many telezooms, there's no MF/AF switch on the barrel. Instead, single, continuous and manual focus modes are controlled via the body of the camera. After knocking back the zoom-lock switch, I attach and secure the plastic lens hood, which is large enough to prevent raindrops hitting the front element and locks with a reassuring click.

It's at this point I notice the hood is equipped with its own hood-release button and filter-slide window – the latter being a useful feature for those wishing to rotate polarising filters effortlessly without the need to remove the hood altogether. Setting the X-T1's drive mode to continuous, AF to continuous and the AF mode to zone, I'm all set up and ready to use the lens.

The finely grooved rubberised zoom ring is falling nicely to hand, and loosening off the tripod collar allows me to upturn the small mounting

plate and attain better purchase of the barrel. The zoom operates across its 100-400mm focal range (equivalent to 150-600mm in full-frame terms) in less than a quarter turn, and provided that your left hand supports the lens directly beneath it's possible to extend the lens to full telephoto with a short, sharp twist of the zoom ring. The motion is fluid across its extensive focal range, yet it requires some physical effort to shift the optics – the result of a complex lens configuration that's made up of 21 elements in 14 groups. A quick glance at the aperture in the viewfinder tells me it closes to f/5 at 200mm and continues to gradually close thereafter, operating at f/5.6 between 350mm and 400mm.

My first attempt at panning results in a few blurred frames, and the speed of the cars is taking time to adjust to. Refining the shutter speed to 1/125sec improves my success rate of pin-sharp shots, and to find out how well the X-T1 and lens can continuously focus on cars ▶



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Fujifilm's 1.4x teleconverter was used to gain extra reach and enlarge the subject in the frame

travelling directly towards the camera at over 100mph I relocate to a faster corner on the track. Even with the shutter speed set beyond 1/1000sec and the smaller central group of nine AF targets selected in zone AF mode, the subject is proving too fast for the autofocus to keep up. Inspecting a burst of 11 frames at 8fps reveals I'm getting one or two frames sharply in focus. This less-than-ideal rate forces me to prefocus on a precise area of the track in single AF before locking the focus to MF. Firing off another continuous burst at 8fps doesn't see my success rate improve. It's time for a rethink.

As I open my bag to find a lens cloth, I glance down at the X-Pro2. Would this be the answer to my focusing woes? It turns out that substituting the X-T1 for the X-Pro2 was the best decision I made all day. After setting the X-Pro2 to continuous focus, the focus range of the lens to 5m-infinity and setting up the central group of nine AF targets in zone AF mode, I rattle out another burst to capture cars travelling directly towards the camera. This time, I shoot 12 frames at 8fps. A quick magnified inspection on the screen reveals at least six are sharp and usable - a much better success rate. I'll admit the lens isn't handling as well with the X-Pro2, but for today at least this is a compromise I'm prepared to make.

In between races, I download my shots and inspect them closely on my MacBook. It doesn't take long before I realise the image quality produced by the lens is excellent. Sharpness from 100-300mm, even at the lens's widest aperture, is impressive across the frame. Towards the telephoto end of the zoom, some signs of softening

were noted at f/5.6, with diffraction also softening the finest detail beyond f/11. Vignetting is handled exceptionally right through the focal range, and the same can be said about chromatic aberrations, which were absent from all images on the day and subsequent test images I captured in brighter conditions a couple of days later.

In the afternoon, I spend a considerable amount of time testing the lens with Fujifilm's 1.4x teleconverter (£329), which effectively converts the lens into a 210-840mm telephoto zoom in 35mm-equivalent terms. The extra length enables me to fill the frame tightly with my subject for greater visual impact, but what with the converter reducing the maximum aperture of the lens to f/6.3-8 I have little choice but to push the X-Pro's sensitivity up to ISO 3,200 or beyond to achieve a fast enough shutter speed to freeze the cars in their tracks. I also find that the autofocus speed remains brisk with the 1.4x converter attached.

Final thoughts

After a full day's testing, I can say the XF 100-400mm f/4.5-5.6 R LM OIS WR is a lens that fulfils the appetite of those who've been waiting patiently for a longer zoom in Fujifilm's line-up of XF lenses. It doesn't have the metal build we typically expect to see from a zoom of its pedigree, but as I discovered, this plays a vital role in keeping it as light as possible. It can be carried over the shoulder for long periods without discomfort, and its image-stabilisation system is so effective that it doesn't always require the use of a monopod or tripod.

Image stabilisation

The OIS abbreviation in the lens name indicates it is equipped with an optical image-stabilisation system. This is controlled via the OIS switch on the barrel beneath the focus-limit and manual-aperture control switches. But unlike some telezooms that provide more than one mode to ensure intentional panning and tilting isn't mistaken for camera shake, there's no second mode on this lens - it's set to either on or off.

The image-stabilisation system is effective to 5 stops, and in between shooting I had the chance to catch up with Fujifilm's motorsport ambassador, Dirk Bogaerts, who uses the OIS system for every shot he takes, including panning shots. Dirk also recommends keeping the IS mode set to continuous from the camera's menu, which constantly stabilises the lens all the time OIS is on. Extending the zoom to 400mm and carrying out a test in between races confirmed the IS system's effectiveness. I was able to shoot sharp shots at as slow as 1/30sec handheld. Pulling back to 100mm and repeating the same test revealed it's possible to achieve sharp shots at a slower 1/8sec shutter speed, but you need a steady hand.



I went the whole day supporting the lens in the palm of my left hand and didn't need to use my monopod. The lens's weather resistance and fluorine coatings give you the confidence to use it without any form of protection, and it continued to work without fault after a drenching and many persistent showers.

My visit to Silverstone turned out to be a demanding workout, not only for the lens but also for my two Fujifilm X-series cameras. The lens handled superbly and looked the part coupled to the X-T1, but swapping to the X-Pro2 was the turning point of the day - the excellent response and accuracy of its autofocus system increased the number of sharp shots that I was able to capture in quick succession. If Fujifilm can combine the X-T1's handling with the hasty autofocus performance of the X-Pro2, then wildlife, action and sports shooters will certainly have the perfect partner for the XF 100-400mm f/4.5-5.6 R LM OIS WR.

Compact or System camera?

Which camera type is best for you? A simple compact that fits in a pocket, a premium or travel compact that's more advanced, or a system camera that has interchangeable lenses and more user control, such as a CSC or DSLR? We help you decide...

All digital cameras are based around the same theory; use a light-sensitive sensor to capture light, then process the result and save it onto a memory card. Beyond that, the functionality can vary wildly from model to model, from touchscreen controls to HD video and wide-aperture lenses differentiating one model from another.

Digital cameras fit into three distinct categories: compact camera, Compact System Camera (CSC) and Digital Single Lens Reflex (DSLR) cameras. All three have sub-genres within them, but there are other obvious qualities which set them apart.

Compact cameras have a fixed lens, which can't be removed and changed. This means that the lens becomes a feature in itself, with some of them starting at a particularly wide focal length, or reaching out much further than others (or both), and others having

wide maximum apertures which prove their worth in low light and for controlling depth of field.

Manual controls, the ability to record HD video and a large, high-resolution display or viewfinder are just a few of

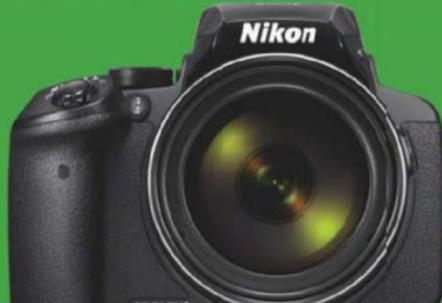
many other features that can be had when more money is spent.

Within the compact camera genre are the likes of bridge, or 'superzoom' models, which offer a far longer zoom lens and a body shape akin to that

of a DSLR, together with manual control over shutter speed and aperture. While they can be used more creatively than regular compacts, their small sensors (relative to DSLR and CSC cameras) place restrictions on

Compact

Small camera, generally pocket sized, with non-removable zoom lenses. Designed for convenience more than image quality, though some premium models feature larger sensors and manual controls.



PROS

Small, Affordable, No additional lenses required, Pocketable, Less intimidating to use than DSLRs

CONS

No option to change lenses for specific purposes, Small sensors not suited to all conditions

Bridge camera

Looks like a DSLR but is actually a compact with a high-magnification zoom lens in a DSLR-shaped body – usually incorporating a large hand-grip and often a viewfinder.



PROS

Long zooms, All-in-one design, Manual controls

CONS

Generally small sensors are no match to DSLR quality, Build quality can be more plasticky than a DSLR

Jargon Buster

Compact System Camera (CSC)

Cameras which offer interchangeable lenses while omitting the viewfinder and mirror box construction common to DSLR cameras. These include Sony's NEX series and Olympus's PEN range, as well as Nikon's 1 system and Samsung's NX line of models.

Digital Single Lens Reflex (DSLR)

A digital SLR camera, which is constructed around a mirror-box and pentamirror/pentaprism assembly, such as the Canon EOS 700D and Nikon D5300. These are popular among beginners, enthusiasts and

professionals, thanks to their wide compatibility with different lenses, manual control over exposure and ergonomics.

Compact camera

A small camera whose lens cannot be removed, in contrast to interchangeable-lens cameras such as DSLRs. These are often cheaper than CSC and DSLR cameras, although they usually have more limited functionality and smaller sensors.

Aperture

The aperture of a lens refers to the size of its opening which allows light through to the camera. This is created by a series of

blades inside the optic, and is usually regulated through the camera body, although some older lenses have physical aperture rings around their barrels. An aperture of f/2 or f/2.8 is classed as being large (or wide) because the opening itself is larger than those created by higher-number apertures such as f/16 or f/22.

Shutter speed

The length of time that the shutter inside the camera is open, exposing the sensor to light. Longer shutter speeds let in more light, and so are often required in low-light conditions, or when the intention is to blur certain elements in the scene. Faster shutter

speeds are ideal for freezing motion, such as when photographing sports.

Display

The rear panel on the back of a camera which shows captured images and videos, as well as the live feed from the sensor. These are usually TFT LCD types, although some cameras now make use of Organic Light Emitting Diode (OLED) alternatives. Resolution is usually specified in dots: compact camera displays often have 230k or 460k dots, while those displays that are on high-end enthusiast compacts, CSCs and DSLRs are usually 921k dots or even higher.

the kind of image quality that can be achieved.

CSCs

CSCs fit somewhere between compacts and DSLRs, with the benefit of a small-format body and interchangeable lenses. Due to their mirrorless designs, optical viewfinders are exchanged for electronic variants that continue to get better all the time in terms of their resolution and sharpness.

Due to the lack of an established form factor, unlike DSLRs, CSCs come in a wide variety of shapes and sizes. Most differences are aesthetic, but a fair few affect the handling quite significantly too. Some models have thin, wide bodies, while others are shaped like DSLRs to provide more to wrap your hand around.

DSLRs

DSLRs range from beginner models, such as the Canon EOS 1100D, up to professional level models, such as the same company's EOS-1D X. The body shape is similar throughout, with a large hand grip and dials on the top, although most professional DSLRs are more square than rectangular, with additional shutter release buttons and dials to make portrait-orientation shooting comfortable.

The addition of an optical viewfinder is one of the unique features that differentiates a

Optical viewfinder

A viewfinder which relies on an optical, rather than electronic, construction. DSLRs are equipped with optical viewfinders, which present the view through the lens. Those on cheaper DSLRs are constructed with a hollow chamber with mirrored sides (penta-mirrors) while those on pricier models feature a ground glass prism (pentaprism) which is brighter.

Electronic viewfinder (EVF)

An electronic alternative to an optical viewfinder. These are typically integrated into bridge cameras and some Compact System Cameras, where an optical

viewfinder is either not possible or less desirable. More recent EVFs are constructed from OLED panels rather than LCDs, and some of these are surprisingly detailed and bright.

Sensor size

The physical size of the sensor inside a camera. Cameras with larger sensors often produce better-quality images than those with smaller ones, as each photosite is larger. A larger capacity allows its signal-to-noise ratio to be higher; as a result images stand a better chance of having a wider dynamic range and of being less affected by noise.

ISO

Also known as 'sensitivity', the ISO range of a camera determines its latitude for capturing images in different conditions. For a given camera, images captured at lower sensitivities generally contain less noise than those captured higher up, as the signal from the sensor – which contains unwanted noise – requires less amplification.

Burstrate

The speed at which a camera can fire consecutive frames, given in frames per second (fps). Many recent cameras have a standard fps rate which captures at the sensor's full resolution, with further faster

options which output images at a reduced pixel count. Often a camera's fastest burst mode will only be possible with focus and exposure taken from the first frame.

Neutral Density (ND) filter

ND filters are commonly used with DSLR cameras, although some enthusiast compacts now have these integrated into their lenses. Their purpose is to reduce exposure times, so that longer shutter speeds can be used, with the 'neutral' part of their name signifying that they are designed to have no effect on the colour balance of an image.

CSC

An interchangeable-lens camera with no optical viewing assembly but either an electronic one, or just the LCD screen to shoot with. CSCs come in a wide variety of forms with a wide range of sensor sizes, so image quality varies greatly between models.



PROS

Typically smaller than DSLRs, HD video, Interchangeable lenses, Great image quality for the size

CONS

Optical viewfinders usually not available, Lens ranges, Premium models can be expensive

DSLR

The choice of professionals, a DSLR features interchangeable lenses, plus an optical viewfinder that sees what the lens sees thanks to a 45° mirror and prism assembly inside the camera. The bulkiest camera type, but the full frame models deliver the highest image quality.



PROS

Interchangeable lenses, Manual exposure control, HD video, Excellent ergonomics

CONS

Large and heavy bodies, Expensive, Poor-quality kit lenses often supplied as standard

DSLR model from most CSCs and compact cameras.

The only models that buck this trend, and as a result can't quite be described as true DSLRs, are those in the Sony SLT range, whose models include the A58 and A77. The SLT construction uses a translucent mirror which means it does not need to move in order for light to pass through to the sensor, in contrast to DSLRs which flip their mirrors up at the point of exposure. As a result the burst rate is faster; with the likes of the A77 able to shoot at up to 12fps. The disadvantage, depending on

your preference, is the presence of an electronic, rather than optical, viewfinder.

There are essentially two kinds of sensor used in DSLRs: APS-C and full frame, although full frame sensors are starting to creep into some CSCs such as the Sony Alpha 7 and 7R.

Full frame is described as such because it's roughly the same size as a 35mm negative. APS-C sensors are smaller, and as a result they only use the central part of a lens, which in turn increases their effective focal length (reducing the angle of view). This is known as a 'crop factor'. Full frame lenses

do not apply a crop factor to lenses, and so they maintain the same angle of view and focal length as if they were used on a film SLR.

DSLRs and CSCs also attract the attention of videographers, given the proliferation of HD video functionality and the range of lenses available. Many DSLRs – particularly those aimed towards a more discerning audience – also now incorporate ports for external microphones and have a full complement of options for different frame rates and output options as well as control over audio recording.

Camera Listings

If you want maximum control over your creative shooting options, you want an interchangeable-lens camera, whether a DSLR model or a Compact System Camera model. Here we list and rate all the models on the market

DSLRS

NAME & MODEL	RRP	TESTED	SCORE	SUMMARY	SENSOR	LENS	MAX ISO	VIDEO	SHOOTING			SCREEN		DIMENSIONS			Weight					
									AF Points	Burst mode (FPS)	Viewfinder (%)	Built-in Wi-Fi	Built-in GPS	Flash	Articulated LCD	Touchscreen	Battery life (Shots)	Width (mm)	Height (mm)	Depth (mm)		
Canon EOS 1200D	£450	06/14	4★	Entry level update to Canon's 1100D, the 1200D excels in the key areas of AF speed and accuracy while ISO performance is good	16MP	Canon	12,800	1080p	9	3	95			•	3in		500	129.6	99.7	78	480g	
Pentax K-500	£450	10/13	4★	Stripped-down version of K-50 without weather sealing boasts 100% glass prism viewfinder; uses AA batteries	16.3MP	Pentax	51,600	1080p	11	6	100			•	3in		410	130	97	71	646g	
Sony Alpha 58	£450	07/13	4★	Replacement for A57 boasts Bionz image processing engine, OLED viewfinder, plus 20MP sensor – up from 16MP	20.1MP	Sony	16,000	1080p	15	5	100			•	2.7in	•	690	129	95.5	78	492g	
Sony Alpha 68	£479	NYT		An A-mount camera with an APS-C sensor, the Alpha 68 uses a 4D focus system plucked from the Alpha 77 II	24MP	Sony	25,600	1080p	•	79	8	tbc		•	2.7in	•	tbc	142.6	104.2	82.8	675g	
Pentax K-S1	£550	03/15	4★	The fully-specified K-S1 boasts excellent image quality, while still being a lightweight, compact and portable option	12.1MP	Pentax	51,200	1080p	•	11	54	100		•	3in		tbc	92.5	120	69.5	498g	
Canon EOS 750D	£599	08/15	4★	A new addition to the EOS line-up, the 750D is designed for EOS newcomers, with a non-threatening layout	24.2MP	Canon	25,600	1080p	19	5	95	•		•	3in	•	•	440	131.9	100.7	77.8	555g
Nikon D3300	£600	04/14	4.5★	Nikon's new entry-level DSLR is smaller than previous offerings while a sensor with no anti-aliasing filter means detail is high	24.2MP	Nikon	25,600	1080p	•	11	5	95		•	3in		700	124	98	75.5	460g	
Pentax K-30	£600	03/14	4★	Stellar image quality make this a welcome alternative to Canon, Nikon and Sony offerings at the price	16.3MP	Pentax	25,600	1080p	11	6	100			•	3in		410	96.5	128.5	71.5	660g	
Pentax K-50	£600	10/13	4.5★	Replacement for K-30 offers 16MP sensor, weather sealing and improved processing. Still able to shoot up to 6fps	16.3MP	Pentax	51,200	1080p	11	4	100			•	3in		410	130	97	71	650g	
Canon EOS 760D	£649	10/15	5★	A new addition to the EOS line-up, the 760D leans towards the aspiring enthusiast photographer	24.2MP	Canon	25,600	1080p	19	5	100	•		•	3in	•	•	440	131.9	101	77.8	565g
Pentax K-S2	£649	Web	4.5★	Pentax's latest mid-range DSLR continues its tradition of offering affordable yet well-specified cameras	20.2MP	Pentax	51,200	1080p	•	11	54	100		•	3in	•	410	122.5	91	72.5	678g	
Canon EOS 100D	£650	07/13	4.5★	Billed as the world's smallest and lightest DSLR; kit lens is the company's EF-S 18-55 f/3.5-5.6 IS STM zoom. GPS optional	18MP	Canon	12,800	1080p	•	9	4	95		•	3in		380	117	91	69	407g	
Nikon D5200	£720	03/13	4.5★	Inspired by the D5100 and D7000, the D5200 has a vari-angle LCD, 24MP sensor and HD video. Wi-Fi & GPS optional	24.1MP	Nikon	25,600	1080p	•	39	5	95		•	3in	•	n/a	129	98	78	555g	
Nikon D5500	£720	04/15	4.5★	New DX-format DSLR in Nikon's 'advanced beginner' range, updating the impressive D5300 and adding a touchscreen	24.2MP	Nikon	25,600	1080p	•	39	5	95	•	•	3.2in	•	820	124	97	70	470g	
Canon EOS 700D	£750	Web	4.5★	Update to 650D comes bundled with a new 18-55mm STM kit lens, that promises improved movie AF. GPS & Eye-Fi optional	18MP	Canon	12,800	1080p	•	9	5	95		•	3in		440	133	100	79	580g	
Pentax K-3 II	£769	Web	4.5★	Ricoh has updated the Pentax K-3 with the K-3 II. The K-3 II is designed to be the flagship Pentax APS-C DSLR	24.3MP	Pentax	51,200	1080p	•	27	83	100		•	3.2in		tbc	131.5	102.5	77.5	785g	
Nikon D5300	£830	01/14	4.5★	Update on the D5200 with large sensor, larger screen, HD video, and long lasting battery, should appeal to videographers	24.2MP	Nikon F	25,600	1080p	•	23	5	95	•	•	3.2in	•	700	125	98	76	530g	
Pentax K-5 II	£870	03/13	4.5★	Latest update to K-5 promises improved AF performance in low light and subject tracking with moving subjects	16.3MP	Pentax	51,200	1080p	•	11	7	100		•	3in		980	131	97	73	760g	
Nikon D7200	£939	06/13	4★	Nikon's mid-range DSLR offers impressive new features over the D7100 it replaces at the top of Nikon's DX format range	24.2MP	Nikon F	25,600	1080p	•	51	6	100		•	3.2in		1,100	135.5	106.5	76	765g	
Pentax K-3	£950	01/14	4★	Upgrade from Pentax K-5. GPS optional. Impersonates a low pass filter. High FPS rate and is the first to carry Ricoh's name	24.2MP	Pentax	51,200	1080i	•	27	8	100		•	3.2in		560	131	100	77	800g	
Canon EOS 80D	£999	08/16	5★	Arriving two and a half years after the 70D, the 80D looks set to be an attractive offering for enthusiast photographers	24.2MP	Canon	25,600	1080p	•	45	7	100	•	•	3in	•	•	960	139	105.2	78.5	730g
Sony Alpha 77 MkII	£1000	09/14	4.5★	With the mkII Sony has brought built-in Wi-Fi, great handling and an enhanced AF that will suit sports and wildlife shooters	24.3MP	Sony	25,600	1080p	•	79	12	100	•	•	3in	•	480	142.6	104	81	647g	
Canon EOS 70D	£1100	11/13	4.5★	World's first DSLR to boast Dual Pixel CMOS AF technology, giving the best autofocus performance for a DSLR during live view	20.2MP	Canon	12,800	1080p	•	19	7	98	•	•	3in	•	920	139	104	79	755g	
Nikon D7100	£1100	05/13	4.5★	The D7100 updates the D7000 in several significant ways, and while not without fault it's still praiseworthy. Wi-Fi optional	24.1MP	Nikon	25,600	1080p	•	51	6	100		•	3in		950	135	106	76	765g	
Pentax K-1	£1599	NYT		The first full-frame Pentax DSLR is weather-sealed and stacks up well against the Nikon D810 and Canon EOS 5D Mark III	36MP	Pentax	204,800	1080p	•	33	44	100	•	•	3.2in	•	760	136.5	110	85.5	1010g	
Canon EOS 7D MkII	£1599	01/15	4.5★	A better sensor and improved AF over the 7D; this is one of the best APS-C DSLRs for enthusiasts and pros. Wi-Fi optional	20.2MP	Canon	51,200	1080p	•	65	10	100		•	3in		670	148.6	112.4	78.2	910g	
Canon EOS 6D	£1700	02/13	4.5★	Superb image quality from Canon's latest – and cheapest – full-frame DSLR. Also offers Wi-Fi and GPS connectivity	20.2MP	Canon	102,400	1080p	•	11	45	97	•	•	3in		980	145	111	71	755g	
Nikon D500	£1729	NYT		The D500 sits above the D7200 in Nikon's DX-format line-up and offers advanced features plus a smaller form factor and crop factor	20.9MP	Nikon F	1,640,000	3840p	•	153	10	100	•	•	3.2in	•	•	tbc	147	115	81	860g
Nikon D610	£1800	Xmas13	5★	Upgrade from D600: improved auto white balance, faster continuous shooting and a quiet continuous mode. GPS optional	24.3MP	Nikon	25,600	1080p	•	39	6	100		•	3.2in	•	900	141	113	82	850g	
Sony Alpha 99	£1800	Xmas12	4★	Sony's full-frame A99 offers translucent mirror technology allied to a 19-point AF system with 11 cross sensors	24.3MP	Sony	25,600	1080p	•	19	10	100		•	3in	•	500	147	111	78	812g	
Nikon D750	£1800	12/14	5★	The D750 is one of the very best all-round enthusiast DSLRs currently available, with an impressive performance	24.3MP	Nikon	51,200	1080p	•	51	65	100	•	•	3.2in	•	1,230	140.5	113	78	840g	
Nikon DF	£2600	02/14	4★	Nikon's retro-tinged full-frame DSLR has a solid spec although it lacks a video mode. Overall, its images are superb	16.2MP	Nikon	204,800	-	39	55	100		•	3.2in		1,400	143.5	110	66.5	765g		
Nikon D810	£2699	11/14	5★	Replacing the D800 and D800E, the D810 is a truly welcome upgrade and one of the very best DSLRs on the market	36.3MP	Nikon	51,200	1080p	•	51	12	100		•	3.2in		1,200	146	123	82	980g	
Canon EOS 5D Mk III	£2999	06/12	5★	An excellent full-frame sensor, fast burst rate, high ISO range and advanced AF make this an impressive piece of kit. Wi-Fi optional	22.3MP	Canon	102,400	1080p	•	61	6	100		•	3.2in		950	152	116	76	950g	
Canon EOS 5DS	£2999	NYT		New full-frame DSLR that builds on the great success of its EOS 5D Mk III, which sports a world-first 50.6MP full frame sensor	50.6 MP	Canon	12,800	1080p	•	61	5	100		•	3.2in		700	152	116.4	76.4	845g	
Canon EOS 5DS R	£3199	09/15		New 50MP full-frame DSLR, identical to the 5DS it was launched with except that it forgoes an optical low-pass filter	50.6 MP	Canon	12,800	1080p	•	61	5	100		•	3.2in		700	152	116.4	76.4	845g	
Nikon D5	£5199	NYT		The powerful D5 is Nikon's flagship FX-format DSLR and boasts a 20.8MP full-frame sensor and burst shooting up to 14fps	20.8MP	Nikon F	3,280,000	3840p	•	153	14	tbc		•	3.2in	•	•	tbc	160	158.5	92	145g
Canon EOS-1D X Mk II	£5199	NYT		Canon's impressive new sports and action flagship camera has a full-frame CMOS sensor with Dual Pixel AF. Wi-Fi optional	20.2MP	Canon	409,600	3840p	•	61	14	100		•	3.2in	•	•	1,210	158	167.6	82.6	1340g
Nikon D4S	£5290	Web	5★	Nikon's flagship DSLR, the D4S takes the best features of the D4 and improved the burst speed, AF and processing power	16.2MP	Nikon	409,600	1080p	•	51	11	100		•	3.2in		3,020	160	156.5	90.5	1300g	
Canon EOS-1D X	£5300	11/12	5★	A contender for the crown of best DSLR on the market, this camera is hard to fault. GPS & Wi-Fi optional	18.1MP	Canon	204,800	1080p	•	61	12	100		•	3.2in		1,120	158	163	82	1,100g	

COMPACT SYSTEM CAMERAS

NAME & MODEL	RRP	TESTED	SCORE	SUMMARY	SENSOR	LENS	MAX ISO	VIDEO	SHOOTING				SCREEN		DIMENSIONS			Weight	
									Stereo mic input	AF Points	Burst (FPS)	Viewfinder	Built-in Wi-Fi	Built-in GPS	Flash	Articulated	Touchscreen		Battery life (shots)
Samsung NX3000	£350	10/14	4★	This may well be the best-value NX camera yet	20.3MP	Samsung	25,600	1080p	21	5	•	•	3in	•	370	117.4	66	39	266g
Canon EOS M10	£399	N/A		Combines DSLR performance with effortless portability	18MP	Canon M	25,600	37	49	4.6	•	•	3in	•	255	108	66.6	35	301g
Panasonic Lumix GF6	£400	Web	4★	Newly developed Venus Engine and a 180° tilt screen	16MP	Mic4/3	25,600	1080p	23	20	•	•	3in	•	340	111	65	38	323g
Pentax Q7	£400	11/13	3★	Extra large sensor and improved AF	12.4MP	Pentax	12,800	1080p	25	5	•	•	3in	•	250	102	58	34	200g
Sony Alpha 5000	£420	Web	4★	Aims to compete with entry-level DSLRs	20.1MP	Sony	16,000	1080p	25	3.5	•	•	3in	•	420	110	63	36	296g
Panasonic Lumix GF7	£420	Web	4★	Compact, great image quality and good for selfies	16MP	Mic4/3	25,600	1080p	23	5.8	•	•	3in	•	230	106.5	64.6	33.3	266g
Nikon 1 S1	£480	Web	4★	User-friendly with an uncluttered interface	10.1MP	Nikon 1	6400	1080p	135	60	•	•	3in	•	220	102	61	30	197g
Olympus PEN E-PL7	£499	01/15	4★	High spec, compact size and superb image quality	16MP	Mic4/3	25,600	1080p	81	8	•	•	3in	•	350	114.9	67	38.4	357g
Nikon 1 J4	£499	11/14	4★	Excellent shooting speed and AF performance	18.4MP	Nikkor 1	12,800	1080p	171	20	•	•	3in	•	300	99.5	60	28.5	192g
Fujifilm X-T10	£499	09/15	4.5★	A more affordable version of the popular X-T1	16.3MP	Fuji X	51,200	1080p	77	8	•	•	3in	•	350	118.4	82.8	40.8	381g
Fujifilm X-A1	£500	12/13	4★	Virtually identical to X-M1, but with a standard sensor	16.3MP	Fuji X	25,600	1080p	41	5.6	•	•	3in	•	350	117	66.5	39	330g
Panasonic Lumix GX80	£599	Web	4★	Panasonic's best-judged CSC design for some time	16MP	Mic4/3	25,600	4k	49	8	•	•	3in	•	290	122	70.6	43.9	426g
Fujifilm X-A2	£529	05/15	4★	Similar to its predecessor the X-A1, it adds a tilting LCD	16.3MP	Fuji X	25,600	1080p	49	5.6	•	•	3in	•	410	116.9	66.5	40.4	350g
Samsung NX300	£530	06/13	4.5★	Company adds to its range of Wi-Fi-enabled cameras	20.3MP	Samsung	25,600	1080p	105	8.6	•	•	3.3in	•	320	122	64	41	284g
Sony Alpha 5100	£549	12/14	4★	One of the very best in class, in video and image quality	24MP	Sony E	25,600	1080p	179	6	•	•	3in	•	400	110	63	36	283g
Olympus OM-D E-M10 II	£549	12/15	4.5★	Boasts a raft of improvements over its predecessor	16.1MP	Mic4/3	25,600	1080p	81	8.5	•	•	3in	•	320	119.5	83.1	46.7	342g
Fujifilm X-E2S	£549	07/16	4★	Relatively minor update on the X-E2	16.3MP	Fuji X	51,200	1080p	49	7	•	•	3in	•	350	129	74.9	37.2	350g
Canon EOS M3	£599	07/15	4★	The M3 looks set to appeal to enthusiast photographers	24.3MP	Canon M	25,600	1080p	49	4.2	•	•	3in	•	250	110.9	68	44.4	366g
Samsung NX500	£599	07/15	4★	Great for travelling light without sacrificing image quality	28MP	Samsung	51,200	4096p	205	9	•	•	3in	•	370	119.5	63.6	42.5	292g
Panasonic Lumix GM1	£629	01/14	4.5★	Tiny, retro compact design is impressive	16MP	Mic4/3	25,600	1080p	23	5	•	•	3in	•	230	99	55	30	204g
Sony Alpha 6000	£670	06/14	4.5★	Class-leading AF and an impressive APS-C sensor	24MP	Sony	25,600	1080p	179	11	•	•	3in	•	310	120	67	45	344g
Panasonic Lumix G7	£679	08/15	4★	The G7 is Panasonic's fifth model to have video capture	16MP	Mic4/3	25,600	3840p	49	8	•	•	3in	•	360	124.9	86.2	77.4	410g
Fujifilm X-M1	£680	10/13	4★	Company's third CSC features X-mount lens mount	16.3MP	Fuji X	6400	1080p	54	5.6	•	•	3in	•	350	117	67	39	330g
Olympus OM-D E-M10	£699	05/14	4.5★	Maintains the high-end features of its OM-D siblings	16MP	Mic4/3	25,600	1080p	81	8	•	•	3in	•	320	119	82	46	396g
Panasonic Lumix GM5	£749	01/15	4★	Small CSC with an electronic viewfinder	16MP	Mic4/3	25,600	1080p	23	5.8	•	•	3in	•	210	98.5	59.5	36	211g
Nikon 1 AW1	£749	12/13	3.5★	High-end CSC is waterproof and shockproof	14.2MP	Nikon 1	6400	1080p	41	15	•	•	3in	•	220	113	71.5	37.5	356g
Olympus OM-D E-M5 mkl	£900	05/15	5★	Olympus's latest premium CSC boasts several improvements	16MP	Mic4/3	25,600	1080p	81	10	•	•	3in	•	750	123.7	85	44.5	469g
Panasonic Lumix GX7	£900	10/13	4.5★	With fast AF and tiltable EVF, delivers excellent results	16MP	Lumix G	25,600	1080p	23	40	•	•	3in	•	n/a	122.6	70.7	43.3	402g
Olympus PEN E-P5	£900	09/13	4.5★	No built-in EVF but has fast AF plus high quality images	16MP	Mic4/3	25,600	1080p	35	9	•	•	3in	•	330	122	69	37	420g
Samsung NX30	£900	Web only	4.5★	A DSLR-style CSC with a burst rate of up to 8fps	21MP	Samsung	25,600	1080p	247	8	•	•	3in	•	360	127	96	58	375g
Olympus PEN-F	£1000	5/16	5★	Olympus's latest high-end CSC model	20.3MP	Mic4/3	25,600	1080p	81	10	•	•	3in	•	330	124.8	72.1	37.3	427g
Panasonic Lumix GX8	£1000	10/15	4★	The highest resolution Micro Four Thirds camera yet	20.3MP	Mic4/3	25,600	3840p	49	8	•	•	3in	•	330	133.2	78	63.1	487g
Sony Alpha 6300	£1000	06/16	4.5★	Premium CSC that boasts fast AF tracking and 4K video	24.2MP	Sony E	51,200	3840p	425	11	•	•	3in	•	350	120	66.9	48.8	404g
Fujifilm X-T1	£1100	4/12	5★	One of the best premium CSCs on the market	16.3MP	Fuji X	51,200	1080p	49	8	•	•	3in	•	350	129	89.8	46.7	440g
Fujifilm X-E1	£1149	01/13	4.5★	Solid build, retro design and high image quality	16MP	Fuji X	25,600	1080p	49	6	•	•	3in	•	350	129	75	38	350g
Fujifilm X-E2	£1200	02/14	4.5★	Has over 60 improvements on the X-E1	16.3MP	Fuji X	25,600	1080p	49	7	•	•	3in	•	350	129	75	37	350g
Samsung NX1	£1299	02/15	5★	The first camera with an APS-C BSI sensor is impressive	28.2MP	Samsung	25,600	4096p	205	15	•	•	3in	•	tbc	138.5	102.3	65.8	550g
Panasonic Lumix GH4	£1300	07/14	4★	Both 4K video quality and still images are impressive	16MP	Mic4/3	25,600	4096p	49	12	•	•	3in	•	500	133	93	84	560g
Olympus OM-D E-M1	£1300	12/13	5★	Fully weather-proofed and Wi-Fi enabled	16.8MP	Mic4/3	25600	1080p	81	10	•	•	3in	•	330	130	93.5	63	497g
Sony Alpha 7	£1300	01/14	4.5★	One of the lightest, smallest full-frame cameras	24.3MP	Sony E	25,600	1080p	117	5	•	•	3in	•	340	127	94	48	474g
Fujifilm X-Pro2	£1349	Web	5★	The flagship X-series model is a stunning premium CSC	24.3MP	Fuji X	51,200	1080p	77	8	•	•	3in	•	250	140.5	82.8	45.9	495g
Leica T	£1350	08/14	4★	Excellent image quality	16MP	Leica T	12,500	1080p	195	5	•	•	3.7in	•	134	69	33	384g	
Fujifilm X-Pro1	£1430	05/12	5★	Offers innovations including a hybrid viewfinder	16MP	Fuji X	25,600	1080p	49	6	•	•	3in	•	300	139	81.8	42.5	450g
Sony Alpha 7 II	£1498	03/15	5★	The full-frame A7 II is at the top of Sony's CSC range	24.3MP	Sony E	25,600	1080p	117	5	•	•	3in	•	350	126.9	95.7	59.7	556g
Sony Alpha 7R	£1700	02/14	4.5★	One of the lightest, smallest full-frame cameras	36.4MP	Sony E	25,600	1080p	25	4	•	•	3in	•	340	127	94	48	465g
Sony Alpha 7S	£2099	09/14	4.5★	The Sony Alpha 7S is the latest Sony full-frame CSC	12.4MP	Sony E	409,600	1080p	25	5	•	•	3in	•	380	127	94.4	48.2	489g
Sony Alpha 7S II	£2500	Web	5★	An excellent camera, especially for low light and video	12.2MP	Sony E	409,600	3840p	169	5	•	•	3in	•	310		95.7	60.3	
Sony Alpha 7R II	£2599	11/15	5★	A big step up from the A7R; one of the best CSCs available	42.4MP	Sony E	102,400	3840p	399	5	•	•	3in	•	290	126.9	95.7	60.3	625g
Leica SL (Typ 601)	£5050	Web	4★	Extraordinary electronic viewfinder but large, heavy body	24MP	Leica L	50,000	4K	tbc	11	•	•	3in	•	tbc	147	104	39	847

Lens Listings

A DSLR or Compact System Camera is hugely affected by the lens attached to the front, as the light hitting the sensor impacts focus, exposure and image quality. Cast your eyes over our lens listings to find out which is best for you before you make a purchase

BUILT-IN FOCUS MOTOR

Some lenses incorporate a motor within the lens to drive the autofocus, while others are powered by motors within the camera. The former will focus quicker than the latter. Canon lens motors are USM (Ultrasonic Motor), Sigma HSM (Hypersonic-Motor).

FILTER THREAD

In order to correct for colour casts or create more contrast, a screw-in filter can be used. The thread at the front of the camera will have a diameter, in mm, which will allow you to attach a variety of filters or adapters to the lens.



35mm Compatibility
Most digital sensors are smaller than 35mm, which is why lenses designed for digital can be smaller.

Maximum Aperture
Wider apertures mean you can use faster, motion-stopping shutter speeds.

LENS MOUNTS

Each manufacturer has its own lens mount and most aren't compatible with one another. For example, a Canon DSLR can't use Nikon lenses, though you can use independent brands if you get them with the right mount.

MAGNIFICATION FACTOR

If you're changing from a 35mm SLR, your lenses won't provide the same field of view on a DSLR unless you have a "full-frame" model. So for Nikon, Pentax and Sony DSLRs, magnify the focal length by 1.5x to get a 35mm equivalent; for Canon 1.6x and Sigma 1.7x.

Lens types explained



Fixed focal length (PRIME)

Fixed lenses offer wider maximum apertures and superior image quality. A 50mm lens is perfect for low light, 85-105mm is ideal for portraits, while a 300mm+ tele is for sports shooters.



Telephoto zoom

Telephotos are great for sport and wildlife, while short teles are good for portraits. Telephoto lenses magnify camera shake, so look for one with Image Stabilisation to ensure you achieve the sharpest shots possible.



Standard zoom

Most DSLRs come with a standard zoom which spans from moderate wideangle to short telephoto. These 'kit' lenses are fine for most purposes, but there are alternatives that offer superior image quality.



Superzooms

While they rarely compare with shorter lenses in image quality, a superzoom offers convenience. Great for travelling when you're conscious of weight, don't expect pin-sharp, aberration-free images.



Wideangle zoom

Wideangle lenses make subjects seem further away, enabling you to get more into the shot – perfect for landscapes and architecture. The most popular wideangle zooms are the 10-20mm and 12-24mm ranges.



Macro lenses

A true macro lens lets you reproduce your subject at life-size (1:1) or half life-size (1:2) on the sensor. Macro lenses come in various focal lengths and extension tubes can offer a greater magnification.

LENS SUFFIX GUIDE USED BY MANUFACTURERS

AD Tamron Anomalous Dispersion elements	DG Sigma's designation for all lenses	FE Tokina floating element lenses	N Nikon's Nano Crystal Coating	SWD Olympus Supersonic Wave Drive
AF-DC Nikon defocus feature	DI Tamron lenses for full-frame sensors	G Nikon lenses without an aperture ring	OS Sigma's Optically Stabilised lenses	SWM Nikon lenses with a Silent Wave Motor
AF-S Nikon lenses with Silent Wave Motor	DI-II Tamron lenses designed for APS-C	HF Sigma Helical Focusing	PRO Tokina's Professional range of lenses	TS-E Canon Tilt and Shift lens
APO Sigma Apochromatic lenses	DO Canon diffractive optical element lenses	HID Tamron's High Index Dispersion glass	RF Sigma & Nikon Rear Focusing	UD Canon Ultra Low Dispersion glass
ASL Tamron lenses featuring aspherical elements	DT Sony lenses for APS-C sized sensors	HLD Tokina low dispersion glass	SD Tokina's Super Low Dispersion element	VM Canon lenses with an Ultrasonic Motor
ASP Sigma lenses featuring aspherical elements	DX Nikon's designation for digital lenses	HSM Sigma's Hypersonic Motor	SDM Pentax's Sonic Direct Drive Motor	VC Tamron's Vibration Compensation
AT-X Tokina's Advanced Technology Extra Pro	ED Low Dispersion elements	IF Internal Focusing	SF Canon lenses with Softfocus feature	VR Nikon's Vibration Reduction feature
CRC Nikon's Close Range Correction system	EF Canon's full-frame lenses	IRF Tokina's Internal Rear Focusing lenses	SHM Tamron's Super Hybrid Mount	XR Tamron Extra Refractive Index glass
D Nikon lenses that communicate distance info	EF-S Canon lenses for APS-C sized sensors	IS Canon's Image Stabilised lenses	SIC Nikon's Super Integrated Coating	ZL Tamron's Zoom Lock feature
DA Pentax lenses optimised for APS-C sized sensors	EX Sigma's 'Excellent' range	L Canon's 'Luxury' range of lenses	SLD Sigma Super Low Dispersion elements	
DC Sigma's designation for digital lenses	FC Tokina's Focus Clutch Mechanism	LD Tamron Low Dispersion glass	SP Tamron's Super Performance range	
DF Sigma lenses with dual focus facility	FE Canon's fisheye lenses	M-OIS Mega Optical Image Stabilisation	SSM Sony/Minolta Supersonic Motor lenses	

CANON

LENS	RRP	TESTED	SCORE	SUMMARY	MOUNT							DIMENSIONS				
					Image Stabilisation	Sw/Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min Focus (cm)	Fiber Thread (mm)	Width (mm)	Length (mm)
EF 8-15mm f/4 L USM	£1499	N/T		Impressive-looking fisheye zoom lens from Canon								15	n/a	78.5	83	540g
EF-S 10-18mm f/4.5-5.6 IS STM	£299	11/14	4★	A superb ultra wideangle that's a must-have for anyone shooting landscapes and cityscapes	•	•						22	67	74.6	72	240g
EF-S 10-22mm f/3.5-4.5 USM	£990	9/09	4★	A good performer, with solid MTF curves and minimal chromatic aberration	•	•						24	77	83.5	89.8	385g
EF 11-24mm f/4L USM	£2799	N/T		Long-awaited by Canon full-frame users, this is the world's widest-angle rectilinear zoom lens							•	28	n/a	108	132	1180g
EF 14mm f/2.8 L II USM	£2810	7/10	4.5★	Impressive resolution at f/8 but less so wide open							•	20	n/a	80	94	645g
EF-S 15-85mm f/3.5-5.6 IS USM	£900	3/11	4★	4-stop image stabilisation and Super Spectra coatings, together with a useful range	•	•						35	72	81.6	87.5	575g
EF 16-35mm f/2.8 L II USM	£1790	6/10	4.5★	Mark II of above lens, and a good performer with strong results at f/8 in particular	•	•					•	28	82	88.5	112.8	635g
EF 16-35mm f/4L IS USM	£1199	9/14	4★	Versatile and with a useful IS system, this is a very good ultra-wideangle zoom for full frame cameras							•	28	77	82.6	111.6	615g
TS-E 17mm f/4 L	£2920	N/T		Tilt and shift optic with independent tilt and shift rotation and redesigned coatings							•	25	77	88.9	106.9	820g
EF 17-40mm f/4 L USM	£940	11/08	4★	Designed to match the needs of demanding professionals – and does so with ease							•	28	77	83.5	96.8	500g
EF-S 17-55mm f/2.8 IS USM	£795	2/13	4★	Very capable lens with three-stop image stabilisation, Super Spectra coating and a circular aperture	•	•						35	77	83.5	110.6	645g
EF-S 17-85mm f/4-5.6 IS USM	£600	11/08	3★	Doesn't really live up to its promises. The zoom range is excellent but there are better alternatives	•	•						35	67	78.5	92	475g
EF-S 18-55mm f/3.5-5.6 IS II	£220	11/08	3.5★	Given the low price of this zoom, its results are very impressive	•	•						25	58	68.5	70	200g
EF-S 18-135mm f/3.5-5.6 IS	£500	N/T		4-stop image stabilisation and automatic panning and tripod detection	•	•						45	67	75.4	101	455g
EF-S 18-200mm f/3.5-5.6 IS	£740	10/11	4★	Automatic panning detection (for image stabilisation) and a useful 11x zoom range	•	•						45	72	78.6	102	595g
EF 20mm f/2.8 USM	£610	N/T		Wideangle lens with a floating rear focusing system and a USM motor							•	25	72	77.5	70.6	405g
EF 24mm f/1.4 L II USM	£2010	N/T		Subwavelength structure coating, together with UD and aspherical elements							•	25	77	93.5	86.9	650g
EF 24mm f/2.8 IS USM	£750	05/13	4★	Small wideangle optic with image stabilisation	•	•						25	58	67.5	48.5	270g
TS-E 24mm f/3.5 L II	£2550	N/T		Tilt and shift optic with independent tilt and shift rotation and redesigned coatings							•	21	82	88.5	106.9	780g
EF 24-70mm f/2.8 L USM	£1540	7/09	4.5★	A solid performer with an excellent reputation that only years in the field can secure							•	38	77	83.2	123.5	950g
EF 24-70mm f/2.8 L II USM	£2300	XMAS 12	5★	Professional quality standard zoom lens with a fast aperture							•	38	82	88.5	113	805g
EF 24-70mm f/4 L IS USM	£1499	N/T		L-series zoom said to be compact, portable and aimed at both professionals and amateurs	•	•						38	77	83.4	93	600g
EF 24-105mm f/4 L IS USM	£1049	3/13	4.5★	An excellent all-round performer, and keenly priced too	•	•						45	77	83.5	107	670g
EF 24-105mm f/3.5-5.6 IS STM	£479	N/T		A versatile standard zoom lens that's an ideal route into full frame photography	•	•						40	77	83.4	104	525g
EF 28mm f/1.8 USM	£570	N/T		USM motor and an aspherical element, together with a wide maximum aperture	•	•						25	58	73.6	55.6	310g
EF 28mm f/2.8 IS USM	£730	05/13	3.5★	Lightweight and inexpensive lens, with a single aspherical element	•	•						30	52	67.4	42.5	185g
EF 28-135mm f/3.5-5.6 IS USM	£560	12/09	4.5★	Excellent optical performance, with the benefit of image stabilisation	•	•						50	72	78.4	96.8	540g
EF 28-300mm f/3.5-5.6 L IS USM	£3290	N/T		L-series optic with expansive range, image stabilisation and a circular aperture	•	•						70	77	92	184	1670g
EF 35mm f/2	£320	3/12	4.5★	A cut-price fixed focal length lens	•	•						25	52	67.4	42.5	210g
EF 35mm f/2 IS USM	£799	N/T		First 35mm prime from Canon to feature an optical stabilisation system	•	•						24	67	62.6	77.9	335g
EF 35mm f/1.4 L II USM	£1799	XMAS 15	5★	An outstanding addition to the L-series line-up	•	•						28	72	80.4	104.4	760g
EF 40mm f/2.8 STM	£230	N/T		A portable and versatile compact pancake lens. A fast maximum aperture enables low-light shooting	•	•						30	52	68.2	22.8	130g
EF 50mm f/1.2 L USM	£1910	N/T		Very wide maximum aperture and Super Spectra coatings, and a circular aperture	•	•						45	72	85.8	65.5	580g
EF 50mm f/1.4 USM	£450	2/10	5★	Brilliant performer, with a highly consistent set of MTF curves. AF motor is a tad noisy though	•	•						45	58	73.8	50.5	290g
EF 50mm f/1.8 STM	£130	09/15	5★	Lightest EF lens in the range, with wide maximum aperture and a Micro Motor	•	•						35	49	69.2	39.3	130g
EF 50mm f/2.5 Macro	£350	N/T		Compact macro lens with floating system	•	•						23	52	67.6	63	280g
EF-S 55-250mm f/4-5.6 IS II	£330	1/12	4★	Ideal budget addition to the 18-55mm kit lens, with image stabilisation and USM	•	•						110	58	70	108	390g
EF-S 60mm f/2.8 Macro USM	£540	8/06	4★	Great build and optical quality, with fast, accurate and near-silent focusing	•	•						20	52	73	69.8	335g
MP-E65 f/2.8 1-5x Macro	£1250	N/T		Macro lens designed to achieve a magnification greater than 1x without accessories	•	•						24	58	81	98	710g
EF 70-200mm f/2.8 L USM	£1540	N/T		Non-stabilised L-series optic, with rear focusing and four UD elements	•	•						150	77	84.6	193.6	1310g
EF 70-200mm f/4 L IS USM	£1450	11/11	5★	A superb option for the serious sports and action photographer	•	•						120	67	76	172	760g
EF 70-200mm f/2.8 L IS II USM	£2800	10/10	5★	A great lens but also a costly one. Peak resolution at 0.4 cycles-per-pixel is simply amazing	•	•						120	77	88.8	199	1490g
EF 70-200mm f/4 L USM	£790	N/T		A cheaper L-series alternative to the f/2.8 versions available	•	•						120	67	76	172	705g
EF 70-300mm f/4.5-5.6 IS USM	£470	11/10	4★	A great level of sharpness and only the small apertures should be avoided	•	•						150	58	76	143	630g
EF 70-300mm f/4-5.6 L IS USM	£1600	7/11	5★	An L-series lens with a highly durable outer shell	•	•						120	67	89	143	1050g
EF 70-300mm f/4.5-5.6 DO IS USM	£1700	N/T		3-layer diffractive optical element and image stabilisation	•	•						140	58	82.4	99.9	720g
EF 75-300mm f/4-5.6 III	£300	N/T		Essentially the same lens as the 75-300mm f/4.0-5.6 III USM but with no USM	•	•						150	58	71	122	480g
EF 75-300mm f/4-5.6 III USM	£350	9/07	2.5★	Good but not outstanding. The inclusion of a metal lens mount is positive, though	•	•						150	58	71	122	480g
EF 85mm f/1.2 L II USM	£2640	8/06	4★	A well-crafted lens, with fast and quiet AF with good vignetting and distortion control	•	•						95	72	91.5	84.0	1025g
EF 85mm f/1.8 USM	£470	2/11	5★	Non-rotating front ring thanks to rear focusing system, as well as USM	•	•						85	58	75	71.5	425g
TS-E 90mm f/2.8	£1670	N/T		Said to be the world's first 35mm-format telephoto lens with tilt and shift movements	•	•						50	58	73.6	88	565g
EF 100mm f/2 USM	£559	N/T		A medium telephoto lens with a wide aperture, making it ideal for portraits	•	•						90	58	75	73.5	460g
EF 100mm f/2.8 Macro USM	£650	11/09	4★	A solid performer, but weak at f/2.8 (which is potentially good for portraits)	•	•						31	58	79	119	600g
EF 100mm f/2.8 L Macro IS USM	£1060	1/13	5★	Stunning MTF figures from this pro-grade macro optic	•	•						30	67	77.7	123	625g
EF 100-400mm f/4.5-5.6 L IS USM	£1940	N/T		L-series construction and optics, including fluorite and Super UD elements	•	•						180	77	92	189	1380g
EF 135mm f/2 L USM	£1360	N/T		L-series construction with two UD elements and wide maximum aperture	•	•						90	72	82.5	112	750g
EF 135mm f/2.8 SF	£520	N/T		Soft-focus feature with two degrees of softness	•	•						130	52	69.2	98.4	390g
EF 180mm f/3.5 L Macro USM	£1870	N/T		L-series macro lens with inner focusing system and USM technology	•	•						48	72	82.5	186.6	1090g
EF 200mm f/2 L IS USM	£7350	N/T		5-stop Image Stabilisation with tripod detection and Super Spectra lens coatings	•	•						190	52	128	208	2520g
EF 200mm f/2.8 L II USM	£960	N/T		Two UD elements and a rear-focusing system in this L-series optic	•	•						150	72	83.2	136.2	765g
EF 300mm f/2.8 L IS II USM	£7500	N/T		4 stop Image stabilisation makes this lens perfect for action photography	•	•						200	52	128	248	2400g
EF 300mm f/4 L IS USM	£1740	N/T		Two-stop image stabilisation with separate mode for panning moving subjects	•	•						150	77	90	221	1190g
EF 400mm f/2.8 L IS USM	£9810	N/T		Super telephoto with ring-type USM, one fluorite element and image stabilisation	•	•						300	52	163	349	5370g
EF 400mm f/4 DO IS USM	£8000	N/T		Multi-layer diffractive optical element to correct for chromatic aberration	•	•						350	52	128	232.7	1940g
EF 400mm f/5.6 L USM	£1660	N/T		Super UD and UD elements, as well as a detachable tripod mount and built-in hood	•	•						350	77	90	256.5	1250g
EF 500mm f/4 L IS USM II	£5299	N/T		Full-time manual focus, a single fluorite element and dust and moisture protection	•	•						450	52	146	387	3870g

NIKON

LENS	RRP	TESTED	SCORE	SUMMARY	MOUNT							DIMENSIONS					
					Image Stabilisation	Sony Alpha	Canon	Four Thirds	Nikon	Rebux	Sigma	Full Frame Only	Min Focus (cm)	Fiber Thread (mm)	Width (mm)	Length (mm)	Weight
10.5mm f/2.8 G ED DX Fisheye	£678	N/T		DX format fisheye lens with Nikon's Close-Range Correction system and ED glass									14	n/a	63	62.5	300g
10-24mm f/3.5-4.5 G ED AF-S	£834	10/09	4★	MTF performance is good from wide open to f/11, only breaking down past f/22									24	77	82.5	87	460g
12-24mm f/4 G ED AF-S DX	£1044	9/09	4★	This venerable optic may be a little weak at f/4, but otherwise it's a good performer									30	77	82.5	90	485g
14mm f/2.8 D ED AF	£1554	7/10	5★	A really nice lens that handles well and offers excellent image quality									20	n/a	87	86.5	670g
14-24mm f/2.8 G ED AF-S	£1670	2/08	5★	A remarkable piece of kit, producing sharp images with little chromatic aberration									28	n/a	98	131.5	970g
16mm f/2.8 D AF Fisheye	£762	N/T		Full-frame fisheye lens with Close-Range Correction system and 25cm focus distance									25	n/a	63	57	290g
16-35mm f/4 G ED AF-S VR	£1072	6/10	5★	A fantastic lens that deserves to be taken seriously, with very little CA throughout									28	77	82.5	125	685g
16-80mm f/2.8-4E ED VR AF-S DX	£869	11/15	4★	This new standard zoom for DX-format users is designed as a travel lens for APS-C DSLRs									35	72	80	85.5	480g
16-85mm f/3.5-5.6 G ED VR AF-S DX	£574	3/11	4★	Boasting Nikon's second-generation VR II technology and Super Integrated Coating									38	67	72	85	485g
17-35mm f/2.8 D ED-IF AF-S	£1878	N/T		High-quality wideangle zoom for full-frame Nikon users									28	77	82.5	106	745g
17-55mm f/2.8 G ED-IF AF-S DX	£1356	3/07	4★	A higher quality standard zoom for DX-format DSLRs									36	77	85.5	110.5	755g
18-35mm f/3.5-4.5 G ED AF-S	£669	Xmas13	5★	Wideangle zoom with instant manual-focus override for full-frame DSLRs									28	77	83	95	385g
18-55mm f/3.5-5.6 G II AF-S DX	£156	12/08	3.5★	Entry-level standard zoom lens									28	52	73	79.5	265g
18-55mm f/3.5-5.6 G VR AF-S DX	£188	5/08	4★	An improvement over the above version, with excellent resolution and the benefit of VR									28	52	70.5	74	205g
18-55mm f/3.5-5.6 G VR II AF-S DX	£229	N/T		Popular 3x zoom lens that is remarkably compact and lightweight, offering great portability									28	52	66	59.5	195g
18-105mm f/3.5-5.6 G ED VR AF-S DX	£292	8/12	4.5★	Kit lens for Nikon D90 & D7000 with Silent Wave Motor and Vibration Reduction									na	67	76	89	420g
18-140mm f/3.5-5.6 G ED VR AF-S DX	£579	N/T		A compact and lightweight DX-format zoom, this lens is a great all-rounder									45	67	78	97	490g
18-200mm f/3.5-5.6 G IF-ED AF-S	£762	10/11	4.5★	4-stop VR II system, two ED and three aspherical elements in this DX superzoom lens									50	72	77	96.5	560g
18-300mm f/3.5-5.6 G ED-IF VR	£850	12/12	4★	DX-format zoom lens with wideangle to super-telephoto reach									45	77	83	120	830g
18-300mm f/3.5-6.3 G ED VR	£849	N/T		New DX-format 16.7x zoom with super-telephoto reach – a compact 'walkabout' lens									48	67	78.5	99	550g
20mm f/1.8 G ED AF-S	£679	N/T		A fast FX-format prime lens that's compact and lightweight									20	77	82.5	80.5	335g
20mm f/2.8 D AF	£584	N/T		Compact wideangle lens with Nikon's Close-Range Correction system									25	62	69	42.5	270g
24mm f/2.8 D AF	£627	N/T		Compact wide lens with Close-Range Correction system									30	52	64.5	46	270g
24mm f/1.4 G ED AF-S	£1990	8/10	5★	Nothing short of stunning. Aside from its high price there is very little to dislike about this optic									25	77	83	88.5	620g
24mm f/1.8 G ED AF-S	£629	N/T		Fast FX-format lens that aims to appeal to landscape, interior, architecture and street photographers									23	72	77.5	83	355g
24mm PC-E f/3.5 D ED PC-E	£1774	N/T		Perspective Control lens with Nano Crystal Coating and electronic control over aperture									21	77	82.5	108	730g
24-70mm f/2.8 G ED AF-S	£1565	7/09	5★	An excellent set of MTF curves that show outstanding consistency, easily justifying the price of this lens									38	77	83	133	900g
24-70mm f/2.8E ED VR	£1849	02/16	5★	Nikon's latest pro-spec standard zoom looks like its best lens yet									38	82	88	154.5	1070g
24-85mm f/3.5-4.5 G ED VR	£520	XMAS 12	5★	FX-format standard zoom with Auto Tripod detection and VR									38	72	78	82	465g
24-120mm f/4 G ED AF-S VR	£1072	5/11	5★	Constant maximum aperture of f/4 and the addition of VR makes this a superb lens									45	77	84	103	710g
28mm f/1.8 G ED AF-S	£619	4/13	5★	If you crave a wide aperture and prefer a single focal length then this Nikon prime delivers									25	67	73	80	330g
28mm f/2.8 D AF	£282	N/T		Compact wideangle lens with a minimum focusing distance of 25cm									25	52	65	44.5	205g
28-300mm f/3.5-5.6 G ED AF-S VR	£889	1/13	4.5★	Technical testing shows this zoom to be, as Nikon claims, the 'ideal walkabout lens'									50	77	83	114	800g
35mm f/1.8 G AF-S DX	£208	3/12	5★	Designed for DX-format DSLRs, a great standard prime lens									30	52	70	52.5	200g
35mm f/1.8 G ED AF-S	£1BC	N/T		Fast FX-format prime lens with bright f/1.8 aperture. Versatile and lightweight									25	58	72	71.5	305g
35mm f/2 D AF	£324	9/08	3★	At wide-aperture settings this optic achieves respectable resolution, which decreases with aperture									25	52	64.5	43.5	205g
35mm f/1.4 G ED AF-S	£1735	9/12	5★	A Nano Crystal-coated lens designed for the FX range									30	67	83	89.5	600g
40mm f/2.8 G AF-S DX Micro	£250	12/11	5★	A budget-priced macro lens that delivers the goods on multiple fronts									20	52	68.5	64.5	235g
50mm f/1.2	£855	N/T		Ultra-fast f/1.2 aperture prime lens									50	52	68.5	47.5	360g
50mm f/1.4 D AF	£292	2/10	5★	Entry-level prime puts in a fine performance while offering backwards compatibility with AI cameras									45	52	64.5	42.5	230g
50mm f/1.4 G AF-S	£376	2/10	5★	Internal focusing and superior AF drive makes this a good alternative to the D-series 50mm f/1.4									45	58	73.5	54	280g
50mm f/1.8 D AF	£135	N/T		Compact, lightweight, affordable prime, will stop down to f/22									45	52	63	39	160g
50mm f/1.8 G AF-S	£200	9/11	5★	A cut-price standard lens for FX shooters or a short telephoto on DX-format DSLRs									45	58	72	52.5	185g
55mm f/2.8 Micro	£625	N/T		Macro lens with 1/2 maximum reproduction ratio									25	52	63.5	62	290g
55-200mm f/4-5.6 G VR AF-S DX	£314	8/07	3.5★	Designed for DX-format cameras, with Vibration Reduction and SWM technology									110	52	73	99.5	335g
55-300mm f/4.5-5.6 G VR AF-S DX	£378	1/12	3★	Offers a wide telephoto coverage, but better options available									140	58	76.5	123	530g
58mm f/1.4 G AF-S	£1599	2/14	4★	FX-format full frame premium prime lens with large f/1.4 aperture									58	72	85	70	385g
60mm f/2.8 D AF Micro	£405	8/06	5★	Nikon's most compact Micro lens, with Close Range Correction (CRC) system									22	62	70	74.5	440g
60mm f/2.8 G ED AF-S Micro	£500	N/T		Micro lens with 1:1 repro ratio, as well as a Silent Wave Motor and Super ED glass									18	62	73	89	425g
70-200mm f/2.8 G ED VR II AF-S	£2085	10/10	5★	Very little to fault here, with stunning image quality and consistent results at different focal lengths									140	77	87	209	1540g
70-200mm f/4 G ED VR	£1180	7/13	5★	Latest 70-200mm offers third-generation VR and weight savings over its more expensive f/2.8 cousin									1000	67	78	178.5	850g
70-300mm f/4.5-5.6 G ED AF-S VR	£556	11/10	4★	Feature-packed optic, with a VR II system, 9-bladed diaphragm, SWM and ED glass									n/a	67	80	143.5	745g
80-400mm f/4.5-5.6 G ED VR AF-S	£1899	10/15	5★	Successor to the 80-400mm f/4.5-5.6 ED VR, focusing is excellent at tracking fast-moving subjects									175	77	95.5	203	1570g
85mm f/3.5 G ED AF-S DX VR	£522	N/T		DX-format Micro lens with a 1:1 reproduction ratio, VR II system and ED glass									28	52	73	98.5	355g
85mm f/1.4 G AF-S	£1532	2/11	5★	Fast mid-tele lens with an internal focusing system and rounded diaphragm									85	77	86.5	84	595g
85mm f/1.8 D	£385	N/T		Portable medium telephoto – ideal for portraits									85	62	71.5	58.5	380g
85mm f/1.8 G AF-S	£470	5/12	5★	Rear-focusing system and distance window in this medium telephoto lens									80	67	80	73	350g
105mm f/2.8 G AF-S VR II Micro	£782	11/09	4.5★	A very sharp lens, with swift and quiet focusing and consistent MFT results									31	62	83	116	720g
105mm f/2 D AF DC	£980	N/T		A portrait lens with defocus control									90	n/a	79	111	640g
135mm f/2 D AF DC	£1232	N/T		Defocus-Image Control and a rounded diaphragm in this telephoto optic									110	n/a	79	120	815g
180mm f/2.8 D ED-IF AF	£782	N/T		Useful telephoto length and internal focusing technology, together with ED glass									150	72	78.5	144	760g
200mm f/4 D ED-IF AF Micro	£1429	N/T		1:1 reproduction range in this Micro lens, with a Close-Range Correction system									50	62	76	104.5	1190g
200mm f/2 G ED AF-S VR II	£5412	N/T		A full-frame lens offering ghost-reducing Nano Crystal coating									190	52	124	203	2930g
200-500mm f/5.6 E ED VR AF-S	£1179	N/T		A super-telephoto zoom lens compatible with Nikon FX-format DSLR cameras									220	95	108	267.5	2300g
300mm f/4 E PF ED VR AF-S	£1230	08/15	5★	Light, compact AF-S full-frame telephoto lens with ED glass elements									140	77	89	147.5	755g
300mm f/2.8 G ED AF-S VR II	£5209	N/T		This lens promises fast and quiet AF, and is fitted with Nikon's latest VR II system									230	52	124	267.5	2900g

OLYMPUS

LENS	RRP	TESTED	SCORE	SUMMARY	MOUNT							DIMENSIONS					
					Image Stabilisation	Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
7-14mm f/4 ED	£1900	6/08	5★	An excellently constructed objective, with image quality to match				•					25	n/a	86.5	119.5	780g
8mm f/3.5 ED Fisheye	£930	NYT		Diagonal fisheye lens, offering a 180° view and a splash-resistant construction				•					13	n/a	79	77	485g
9-18mm f/4-5.6	£640	9/09	4★	Good results up to f/11, past which point resolution drops a little				•					25	72	79.5	73	280g
12-50mm f/3.5-6.3 ED	£370	5/13	4★	Offers electromagnetic zoom mechanism plus variable zoom speed				•					20	72	57	83	211g
12-60mm f/2.8-4 ED SWD	£1130	11/08	4.5★	While not quite as consistent as the 14-54mm, this optic is perhaps more versatile				•					25	72	79.5	98.5	575g
11-22mm f/2.8-3.5	£1020	NYT		Wide angle (2x) addition to Olympus E-System lens range				•					28	72	75	92.5	485g
14-35mm f/2 ED SWD	£2400	NYT		Pro lens with Supersonic Wave Drive AF system and dust and splashproof casing				•					35	77	86	123	915g
14-42mm f/3.5-5.6 ED	£285	NYT		Small, light lens especially designed for the compact Four Thirds system standard				•					25	58	65	61	190g
14-54mm f/2.8-3.5 II	£660	12/09	4★	An affordable lens with great resolution – only CA control lets it down a touch				•					22	67	74.5	88.5	440g
18-180mm f/3.5-6.3	£560	6/10	4★	A good performer everywhere except at 180mm, with a solid feel to it				•					45	62	78	84.5	435g
25mm f/2.8 Pancake	£270	9/08	3.5★	Excellent image quality from such a tiny optic, but the lens cap is a little fiddly				•					20	43	64	23.5	95g
35mm f/3.5 Macro	£270	NYT		Macro lens equivalent to 70mm on a full-frame camera				•					14	52	71	53	163g
35-100mm f/2	£2630	NYT		One Super ED and four ED elements inside this telephoto optic				•					140	77	96.5	213.5	1650g
40-150mm f/4-5.6 ED	£300	NYT		ED and aspherical elements in this optic, together with an internal focusing system				•					90	58	65.5	72	220g
50mm f/2 ED Macro	£600	8/06	3.5★	A fast, high-quality lens, with excellent MTF curves and low chromatic aberration				•					24	52	71	61.5	300g
50-200mm f/2.8-3.5 ED SWD	£1300	NYT		Supersonic Wave Drive focusing system and an equivalent focal range of 100-400mm				•					120	67	86.5	157	995g
70-300mm f/4-5.6 ED	£450	NYT		Three ED elements and multi-coatings feature in this popular tele-zoom optic				•					96	58	80	127	620g
150mm f/2 ED	£2650	NYT		Splashproof telephoto lens with a wide maximum aperture				•					140	82	100	150	1610g

PENTAX

LENS	RRP	TESTED	SCORE	SUMMARY	MOUNT							DIMENSIONS					
					Image Stabilisation	Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
DA 10-17mm f/3.5-4.5 smc ED IF	£590	NYT		Fisheye zoom lens with Super Protection coating and Quick Shift manual focus				•					14	n/a	71.5	68	320g
DA 12-24mm f/4 smc ED AL IF	£1050	NYT		Two aspherical elements, ELD glass and a constant aperture of f/4 in this wide zoom				•					30	77	83.5	87.5	430g
DA 14mm f/2.8 smc ED IF	£730	7/10	4.5★	Best performance lies between f/5.6 and f/11, but good results can be had at f/4 too				•					17	77	83.5	69	420g
DA 15mm f/4 smc ED AL Limited	£820	NYT		Limited edition lens with hybrid aspherical and extra-low dispersion elements				•					18	49	39.5	63	212g
DA* 16-50mm f/2.8 smc ED AL IF SDM	£950	1/09	3.5★	A nice balance and robust feel, but poor sharpness at f/2.8 (which significantly improves from f/4 onwards)				•	•				30	77	98.5	84	600g
DA 16-85mm f/3.5-5.6 ED DC WR	£600	NYT		Weather-resistant, this zoom features a round shaped diaphragm to produce beautiful bokeh				•					35	72	78	94	488g
DA 17-70mm f/4 smc AL IF SDM	£630	NYT		Featuring Pentax's Supersonic Direct-drive (SDM) focusing system				•					28	67	75	93.5	485g
DA 18-50mm f/4-5.6 DC WR RE	£230	NYT		Super-thin standard zoom that's weather-resistant and features a round shaped diaphragm				•					30	58	71	41	158g
DA 18-55mm f/3.5-5.6 smc II ED AL IF	£220	1/09	3.5★	Something of a bargain. Only the maximum apertures and awkward manual focusing really let it down				•					25	52	68	67.5	220g
DA 18-55mm f/3.5-5.6 smc AL WR	£229	NYT		A weather resistant construction and an aspherical element, as well as SP coating				•					25	52	68.5	67.5	230g
DA 18-135mm f/3.5-5.6 DA ED DC WR	£600	6/11	3.5★	A weather resistant mid-range zoom lens				•					40	62	73	76	405g
DA 18-270mm f/3.5-6.3 smc ED SDM	£699	NYT		15x superzoom for company's K-mount DSLRs featuring two extra-low dispersion (ED) elements				•					49	62	76	89	453g
DA 20-40mm f/2.8-4 ED Limited DC WR	£829	NYT		With state-of-the-art HD coating, a completely round-shaped diaphragm, and weather-resistant				•					28	55	68.5	71	283g
DA 21mm f/3.2 smc AL Limited	£600	NYT		This limited-edition optic offers a floating element for extra-close focusing				•					20	49	63	25	140g
FA 31mm f/1.8 smc AL Limited	£1149	NYT		Aluminium body; when used on a Pentax DSLR offers a perspective similar to that of the human eye				•					30	58	68.5	65	345g
FA 35mm f/2 smc AL	£550	NYT		A compact wideangle lens that weighs a mere 214g				•					30	49	64	44.5	214g
DA 35mm f/2.8 smc Macro	£640	9/08	4.5★	Despite slight edge softness, this lens performs excellently and is a pleasure to use				•					14	49	46.5	63	215g
DA 35mm f/2.4 smc DS AL	£180	3/12	5★	A budget price prime lens for beginners				•					30	49	63	45	124g
DA 40mm f/2.8 smc Limited	£450	NYT		Pancake lens with SMC coating and Quick Shift focusing system				•					40	49	63	15	90g
DA 40mm XS f/2.8 XS	£325	NYT		The world's smallest fixed focal length lens				•					40	N/A	62.9	9	52g
FA 43mm f/1.9 smc Limited	£729	NYT		Focal length is ideal for portraits as well as everyday use, and features an smc multi-layer coating				•					45	49	27	64	155g
FA 50mm f/1.4 smc	£399	NYT		High quality fast prime. The 'FA' indicates that its image circle covers the 35mm full-frame format				•					45	49	63.5	38	220g
DA 50mm f/1.8 smc DA	£249	08/15	4★	Affordable short telephoto lens ideal for portraits				•	•				45	52	38.5	63	122g
DFA 50mm f/2.8 smc Macro	£550	NYT		Macro lens capable of 1:1 reproduction and with a Quick Shift focus mechanism				•	•				19	49	60	67.5	265g
DA* 50-135mm f/2.8 smc ED IF SDM	£1200	11/12	4★	Constant f/2.8 aperture; well suited to portraiture and mid-range action subjects				•	•				100	67	76.5	136	765g
DA 50-200mm f/4-5.6 smc ED WR	£210	NYT		Weather-resistant construction, Quick Shift focus system and an SP coating				•					n/a	49	69	79.5	285g
DA* 55mm f/1.4 smc SDM	£800	2/10	4.5★	Even despite questions about the particular sample tested, this lens scores highly				•	•				45	58	70.5	66	375g
DA 55-300mm f/4-5.8 smc ED	£370	10/12	4★	The lens boasts a useful focal range, as well as a dirt-resistant SP coating				•					140	58	75	111.5	440g
DA 55-300mm f/4-5.8 ED WR	£399	NYT		Weatherproof HD telephoto lens featuring quick shift focusing system				•	•				140	58	71	111.5	466g
DA 60-250mm f/4 smc ED IF SDM	£1450	10/12	4.5★	With a constant f/4 aperture and an ultrasonic motor for speedy focusing				•					110	67	167.5	82	1040g
DA 70mm f/2.4 smc AL Limited	£600	NYT		Medium telephoto lens with an aluminium construction and a Super Protect coating				•					70	49	63	26	130g
D-FA* 70-200mm f/2.8 ED DC AW	£1850	NYT		New addition to Pentax's high-performance Star (*) series developed for best image rendition				•	•				120	77	91.5	203	1755g
FA 77mm f/1.8 smc Limited	£1050	NYT		With Pentax's Fixed Rear Element Extension focusing system for 'sharp, crisp images'				•	•				70	49	48	64	270g
D-FA 100mm f/2.8 Macro	£700	NYT		Designed for both digital and film cameras, this macro lens boasts a 1:1 repro ratio				•	•				30	49	67.5	80.5	345g
D-FA 100mm f/2.8 Macro WR	£680	11/12	5★	Street price makes this something of a bargain for a true macro offering full-frame coverage				•	•				30	49	65	80.5	340g
FA 150-450mm f/4.5-5.6 ED DC AW	£2000	NYT		Super-telephoto lens with weather-resistance, designed to produce extra-sharp, high-contrast images				•	•				200	86	241.5	95	2000g
DA* 200mm f/2.8 smc ED IF SDM	£1000	8/12	4.5★	SDM focusing system on the inside, and dirtproof and splashproof on the outside				•	•				120	77	83	134	825g
DA* 300mm f/4 smc ED IF SDM	£1300	NYT		This tele optic promises ultrasonic focus and high image quality thanks to ED glass				•	•				140	77	83	184	1070g
DA 560mm f/5.6 ED smc AW	£5999	NYT		Prime offering focal length of 859mm when mounted on Pentax K-mount DSLR. Treated with HD coating				•	•				560	112	130	522	3040g



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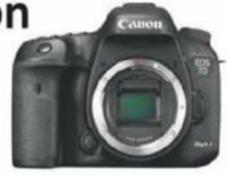
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SAMYANG

LENS	RRP	TESTED	SCORE	SUMMARY	MOUNT							DIMENSIONS						
					Image Stabilisation	Sony Alpha	Canon	Four Thirds	Nikon	Rebax	Sigma	Full Frame Only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight	
8mm f/3.5 UMC Fisheye CS II	£274	NYT		Wideangle fisheye lens designed for digital reflex cameras with APS-C sensors	•	•	•	•	•	•	•	•	•	30	N/A	75	77.8	417g
10mm f/2.8 ED AS NCS CS	£429	NYT		Features a nano crystal anti-reflection coating system and embedded lens hood	•	•	•	•	•	•	•	•	•	24	N/A	86	77	580g
14mm f/2.8 ED UMC	£279	NYT		Ultra wideangle manual focus lens; bulb-like front element means no filters can be used	•	•	•	•	•	•	•	•	•	28	N/A	94	87	552g
16mm f/2.0 ED AS UMC CS	£389	NYT		Ultra wideangle lens for digital reflex cameras and mirrorless compact cameras fitted with APS-C sensors	•	•	•	•	•	•	•	•	•	20	N/A	89.4	83	583g
21mm f/1.4 ED AS UMC CS	£499	04/16	5★	Manual-focus prime designed for mirrorless users comprising 8 elements arranged in 7 groups	•	•	•	•	•	•	•	•	•	28	58	54.3	67.9	290g
24mm f/1.4 AS UMC	£499	NYT		Fast ultra wideangle manual focus lens comprising 13 lenses arranged in 12 groups	•	•	•	•	•	•	•	•	•	25	77	95	116	680g
35mm f/1.4 AS UMC	£369	3/13	4.5★	While manual focus only, this prime impressed us in real-world use, making it something of a bargain	•	•	•	•	•	•	•	•	•	30	77	83	111	660g
50mm f/1.2 AS UMC CS	£299	05/16	5★	Fast prime for mirrorless cameras that's capable of stunning results with a super-shallow depth of field	•	•	•	•	•	•	•	•	•	50	62	67.5	74.5	380g
85mm f/1.4 IFMC	£239	NYT		Short fast telephoto prime, manual focus, aimed at portrait photographers	•	•	•	•	•	•	•	•	•	100	72	78	72.2	513g
100mm f/2.8 ED UMC Macro	£389	NYT		Full-frame compatible, the Samyang 100mm is a close-up true Macro lens	•	•	•	•	•	•	•	•	•	30	67	72.5	123.1	720g

SIGMA

LENS	RRP	TESTED	SCORE	SUMMARY	MOUNT							DIMENSIONS						
					Image Stabilisation	Sony Alpha	Canon	Four Thirds	Nikon	Rebax	Sigma	Full Frame Only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight	
4.5mm f/2.8 EX DC	£739	NYT		Circular fisheye lens designed for digital, with SLD glass and a gelatin filter holder	•	•	•	•	•	•	•	•	•	13	n/a	76	77.8	470g
8mm f/3.5 EX DG	£799	NYT		The world's only 8mm lens equipped with autofocus also boasts SLD glass	•	•	•	•	•	•	•	•	•	13	n/a	73.5	68.6	400g
8-16mm f/4.5-5.6 DC HSM	£800	10/10	4★	Excellent performance at 8mm which sadly drops at the 16mm end	•	•	•	•	•	•	•	•	•	24	72	75	105.7	555g
10mm f/2.8 EX DC	£599	NYT		A Hyper Sonic Motor (HSM) and built-in hood in this diagonal fisheye lens	•	•	•	•	•	•	•	•	•	13	n/a	75.8	83	475g
10-20mm f/3.5 EX DC HSM	£650	3/10	5★	An absolute gem of a lens that deserves a place on every photographer's wish list	•	•	•	•	•	•	•	•	•	24	82	87.3	88.2	520g
10-20mm f/4-5.6 EX DG HSM	£550	8/09	5★	A fine all-rounder, thanks to MTF curves which stay above 0.25 cycles-per-pixel down to f/16	•	•	•	•	•	•	•	•	•	24	77	83.5	81	470g
12-24mm f/4.5-5.6 EX DC HSM	£868	8/09	4★	A tightly matched set of MTF curves, but APS-C users are advised to look at the 10-20mm instead	•	•	•	•	•	•	•	•	•	28	n/a	87	102.5	600g
15mm f/2.8 EX DG	£629	7/10	4★	This fisheye optic puts in a very solid performance – not to be dismissed as a gimmick!	•	•	•	•	•	•	•	•	•	15	n/a	73.5	65	370g
17-50mm f/2.8 EX DC OS HSM	£689	NYT		FLD and aspherical elements, a constant f/2.8 aperture and Optical Stabilisation	•	•	•	•	•	•	•	•	•	28	77	83.5	92	565g
17-70mm f/2.8-4 DC Macro OS HSM	£449	NYT		Redesign of this well-received lens launches the 'Contemporary' range and sees it in more compact form	•	•	•	•	•	•	•	•	•	22	72	79	82	470g
18-35mm f/1.8 DC HSM	£799	11/13	5★	Said to be the world's first constant f/1.8 zoom; DOF equivalent of constant f/2.7 on full frame	•	•	•	•	•	•	•	•	•	28	72	78	121	810g
18-200mm f/3.5-6.3 DC	£349	3/08	3★	Good CA control at 200mm but otherwise an average performer	•	•	•	•	•	•	•	•	•	45	62	70	78.1	405g
18-200mm f/3.5-6.3 DC OS	£449	3/08	4★	Excellent resolution and consistent performance, but control over CA could be a little better	•	•	•	•	•	•	•	•	•	45	45	79	100	610g
18-250mm f/3.5-6.3 DC OS HSM	£572	1/10	4.5★	A very capable set of MTF curves that only shows minor weakness at wide apertures	•	•	•	•	•	•	•	•	•	45	72	79	101	630g
18-250mm f/3.5-6.3 DC Macro OS HSM	£500	NYT		Ultra-compact 13.8x high zoom ratio lens designed exclusively for digital SLR cameras	•	•	•	•	•	•	•	•	•	35	62	73.5	88.6	470g
18-300mm f/3.5-6.3 DC Macro OS HSM	£499	NYT		Compact and portable high ratio zoom lens offering enhanced features to make it the ideal all-in-one lens	•	•	•	•	•	•	•	•	•	39	72	79	101.5	585g
20mm f/1.4 DG HSM A	£799	02/16	5★	An outstanding wideangle fixed-focal-length lens	•	•	•	•	•	•	•	•	•	27.6	n/a	90.7	129.8	950g
24mm f/1.4 DG HSM A	£799	06/15	5★	The latest addition to Sigma's 'Art' line of high-quality fast primes	•	•	•	•	•	•	•	•	•	25	77	85	90.2	665g
24-35mm f/2 DG HSM A	£949	12/15	5★	The world's first large-aperture full-frame zoom offering a wide aperture of f/2 throughout the zoom range	•	•	•	•	•	•	•	•	•	28	82	87.6	122.7	940g
24-70mm f/2.8 EX DG IF HSM	£899	8/09	5★	Not perfect, but an excellent alternative to Canon and Nikon's 24-70mm lenses, with great MTF curves	•	•	•	•	•	•	•	•	•	38	82	88.6	94.7	790g
24-105mm f/4 DG OS HSM A	£849	3/14	4.5★	Serious full frame alternative to own-brand lenses at a lower price but with no compromises in the build	•	•	•	•	•	•	•	•	•	45	82	89	109	885g
30mm f/1.4 EX DC HSM	£490	9/08	3★	A consistent performer, with slightly weaker but not unacceptable performance wide-open	•	•	•	•	•	•	•	•	•	40	62	76.6	59	430g
35mm f/1.4 DG HSM A	£799	9/13	5★	Large aperture prime; first lens in company's 'Art' series	•	•	•	•	•	•	•	•	•	30	67	77	94	665g
50mm f/1.4 EX DC HSM	£459	2/10	5★	This lens may be priced above the norm, but it delivers results which are similarly elevated	•	•	•	•	•	•	•	•	•	45	77	84.5	68.2	505g
50mm f/1.4 DG HSM Art	£849	Web	5★	This lens is a unique design that pays off in truly excellent image quality	•	•	•	•	•	•	•	•	•	40	77	85.4	100	815g
50-100mm f/1.8 DG HSM Art	£779	NYT		This APS-C format lens aims to cover the focal lengths of three prime lenses in one	•	•	•	•	•	•	•	•	•	37.4	82	93.5	170.7	1490g
50-500mm f/4.5-6.3 DG OS HSM	£1499	4/11	4★	A 10x zoom range, SLD elements and compatibility with 1.4x and 2x teleconverters	•	•	•	•	•	•	•	•	•	50-180	95	104.4	219	1970g
70-200mm f/2.8 EX DG OS HSM	£1539	NYT		Two FLD glass elements, said to have the same dispersive properties as fluorite	•	•	•	•	•	•	•	•	•	140	77	86.4	197	1430g
70-300mm f/4-5.6 APO DG Macro	£235	NYT		A 9-bladed diaphragm and two SLD elements in this tele-zoom lens	•	•	•	•	•	•	•	•	•	95	58	76.6	122	550g
70-300mm f/4-5.6 DG Macro	£173	5/09	3★	Generally unremarkable MTF curves, and particularly poor at 300mm	•	•	•	•	•	•	•	•	•	95	58	76.6	122	545g
85mm f/1.4 EX DG HSM	£890	2/11	5★	The Sigma's resolution from f/4 to f/8 is excellent	•	•	•	•	•	•	•	•	•	85	77	86.4	87.6	725g
105mm f/2.8 EX DG OS HSM	£649	12/11	4.5★	An optically-stabilised macro lens	•	•	•	•	•	•	•	•	•	31.2	62	78	126.4	725g
120-300mm f/2.8 DG HSM	£3599	NYT		First lens in company's 'Sports' series; switch enables adjustment of both focus speed and focus limiter	•	•	•	•	•	•	•	•	•	150-250	105	124	291	TBA
150mm f/2.8 EX DG OS HSM	£999	NYT		A macro lens offering image stabilisation	•	•	•	•	•	•	•	•	•	38	72	79.6	150	950g
150-500mm f/5-6.3 DG OS HSM	£999	6/09	3★	Significant softness at wide maximum apertures for all focal lengths	•	•	•	•	•	•	•	•	•	220	86	94.7	252	1780g
150-600mm f/5-6.3 DG OS HSM S	£1599	1/15	4★	This portable, high-performance telephoto zoom from Sigma's Sports line is dust and splashproof	•	•	•	•	•	•	•	•	•	260	105	121	290.2	2860g
180mm f/2.8 EX DG OS HSM	£1499	4/13	5★	1:1 macro lens featuring three FLD glass elements and floating inner focusing system	•	•	•	•	•	•	•	•	•	47	86	95	204	1640g
300mm f/2.8 APO EX DG	£2899	NYT		Extra Low Dispersion (ELD) glass, multi-layer coatings and a Hyper Sonic Motor	•	•	•	•	•	•	•	•	•	250	46	119	214.5	2400g
300-800mm f/5.6 EX DG HSM	£6999	NYT		A constant aperture of f/5.6 throughout the expansive 300-800mm zoom range	•	•	•	•	•	•	•	•	•	600	46	156.5	544	5880g
500mm f/4.5 APO EX DG	£4799	NYT		Telephoto lens with multi-layer coatings to 'optimise the characteristics of DSLRs'	•	•	•	•	•	•	•	•	•	400	46	123	350	3150g

SONY

LENS	RRP	TESTED	SCORE	SUMMARY	MOUNT						DIMENSIONS					
					Image Stabilisation	Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min Focus (cm)	Fiber Thread (mm)	Width (mm)	Length (mm)
11-18mm f/4.5-5.6 DT	£609	9/09	3★	A solid overall performance that simply fails to be outstanding in any way	•	•						25	77	83	80.5	360g
16mm f/2.8 Fisheye	£709	N/T		Fisheye lens with a close focusing distance of 20cm and a 180° angle of view	•							20	n/a	75	66.5	400g
16-35mm f/2.8 ZA SSM T*	£1729	9/09	4.5★	High-end Zeiss wideangle zoom lens ideal for full frame Alpha DSLRs	•							28	77	83	114	900g
16-50mm f/2.8 SSM	£569	4/12	4★	Bright short-range telephoto lens	•							100	72	81	88	577g
16-80mm f/3.5-4.5 ZA T*	£709	4/09	4.5★	Carl Zeiss standard zoom lens	•							35	62	72	83	445g
16-105mm f/3.5-5.6 DT	£559	3/09	3★	An ambitious lens that is good in parts. Quality drops off at 105mm	•							40	62	72	83	470g
18-135mm f/3.5-5.6 DT SAM	£429	N/T		A versatile zoom with Direct Manual Focus	•							45	62	76	86	398g
18-200mm f/3.5-6.3 DT	£509	4/08	3★	While the focal range is certainly useful, the lens is an overall average performer	•							45	62	73	85.5	405g
18-250mm f/3.5-6.3 DT	£559	1/10	3.5★	Good overall, but performance dips at longer focal lengths	•							45	62	75	86	440g
20mm f/2.8	£559	9/11	3.5★	Wideangle prime lens with rear focusing mechanism and focus range limiter	•							25	72	78	53.5	285g
24mm f/2 ZA SSM T*	£1119	N/T		An impressively bright wideangle Carl Zeiss lens	•							19	72	78	76	555g
24-70mm f/2.8 ZA SSM T*	£1679	7/09	5★	Carl Zeiss mid-range zoom lens with superb optics ideal for full frame Alpha DSLRs	•							34	77	83	111	955g
28-75mm f/2.8 SAM	£709	N/T		A constant f/2.8 aperture and a Smooth Autofocus Motor (SAM) in this standard zoom	•							38	67	77.5	94	565g
30mm f/2.8 DT SAM Macro	£179	3/12	4★	Macro lens designed for digital with 1:1 magnification and Smooth Autofocus Motor	•							12	49	70	45	150g
35mm f/1.4 G	£1369	N/T		With an equivalent focal length of 52.5mm, a wide aperture and aspherical glass	•							30	55	69	76	510g
35mm f/1.8 DT SAM	£179	N/T		Budget price indoor portrait lens	•							23	55	70	52	170g
50mm f/1.8 DT SAM	£159	3/10	4.5★	A very useful lens that performs well and carries a rock-bottom price tag	•							34	49	70	45	170g
50mm f/1.4	£369	2/10	5★	While this lens performs well overall, performance at f/1.4 could be better	•							45	55	65.5	43	220g
50mm f/1.4 ZA SSM	£1300	Web	4★	Carl Zeiss design said to be ideal for quality-critical portraiture and low-light shooting	•							45	72	81	71.5	518g
50mm f/2.8 Macro	£529	N/T		A macro lens with a floating lens element	•							20	55	71.5	60	295g
55-200mm f/4-5.6 DT SAM	£219	N/T		Designed for cropped-sensor DSLRs, with a Smooth Autofocus Motor	•							95	55	71.5	85	305g
55-300mm f/4.5-5.6 DT SAM	£309	N/T		Compact, lightweight telephoto zoom offering smooth, silent operation	•							140	62	77	116.5	460g
70-200mm f/2.8 G	£1889	N/T		Super Sonic Wave motor and a constant f/2.8 aperture in this pro-grade tele zoom	•							120	77	87	196.5	1340g
70-200mm f/2.8 G SSM II	£TBC	N/T		High-performance G Series telephoto zoom lens	•							120		87	196.5	1340g
70-200mm f/4 G OSS	£949	10/14	4★	Compact, lightweight telephoto zoom lens for full-frame E-mount bodies	•							100	72	80	175	840g
70-300mm f/4.5-5.6 G SSM	£869	12/10	3.5★	G-series lens with ED elements, Super Sonic wave Motor and a circular aperture	•							120	62	82.5	135.5	760g
70-400mm f/4-5.6 G SSM II	£1799	N/T		Redesign of original features a new LSI drive circuit and promises faster autofocus	•							150	77	95	196	1500g
75-300mm f/4.5-5.6	£219	8/12	3★	Compact and lightweight zoom with a circular aperture	•							150	55	71	122	460g
85mm f/1.4 ZA Planar T*	£1369	N/T		Fixed focal length lens aimed at indoor portraiture	•							85	72	81.5	72.5	560g
85mm f/2.8 SAM	£219	N/T		A light, low price portraiture lens	•							60	55	70	52	175g
100mm f/2.8 Macro	£659	N/T		Macro lens with circular aperture, double floating element and wide aperture	•							35	55	75	98.5	505g
135mm f/1.8 ZA Sonnar T*	£1429	N/T		A bright, Carl Zeiss portrait telephoto lens	•							72	77	84	115	1004g
135mm f/2.8 STF	£1119	N/T		Telephoto lens with defocus effects	•							87	80	80	99	730g

TAMRON

LENS	RRP	TESTED	SCORE	SUMMARY	MOUNT						DIMENSIONS					
					Image Stabilisation	Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min Focus (cm)	Fiber Thread (mm)	Width (mm)	Length (mm)
10-24mm f/3.5-4.5 SP AF Di II LD Asph. IF	£511	2/10	3.5★	Good consistency at 10mm and 18mm, but a steep decline at 24mm	•	•						24	77	83.2	86.5	406g
14-150mm f/3.5-5.8 Di III	£370	4/16	4★	The first Micro Four Thirds lens from Tamron, for compact mirrorless interchangeable-lens cameras	•			•				50	52	63.5	80.4	285g
15-30mm f/2.8 SP Di VC USD	£950	7/15	4★	Excellent value, this is the only wideangle zoom with image stabilisation and an f/2.8 aperture	•	•						28	N/A	98.4	145	1100g
16-300mm f/3.5-6.3 Di II VC PZD Macro	£600	8/14	4★	Versatile megazoom, a very good all-in-one solution, as long as you won't need to enlarge to A2 size	•	•						39	67	99.5	75	540g
17-50mm f/2.8 SP AF XR Di II LD Asph. IF	£450	2/09	4.5★	Very good optical performance, which peaks at f/5.6-8	•	•						27	67	74	81.7	434g
17-50mm f/2.8 SP AF XR Di II VC LD Asph. IF	£541	4/10	4.5★	Very strong performance at longer focal lengths but weaker at the other end	•	•						29	72	79.6	94.5	570g
18-200mm f/3.5-6.3 AF Di II VC	£169	5/16	4★	Lightweight all-in-one lens for APS-C DSLRs with Vibration Compensation	•	•						49	62	75	96.6	400g
18-270mm f/3.5-6.3 AF XR Di II LD Asph. IF Macro	£613	1/10	4.5★	Much better results at shorter focal lengths than longer ones, but still impressive	•	•						49	72	79.6	101	550g
18-270mm f/3.5-6.3 AF Di II VC LD PZD IF Macro	£663	10/11	3★	The next-generation incarnation offers a new form of ultrasonic engine	•	•						49	62	74.4	88	450g
24-70mm f/2.8 SP Di VC USD	£1099	10/12	5★	Fast zoom with image stabilisation for both full-frame and APS-C cameras	•	•						38	82	88.2	116.9	825g
28-75mm f/2.8 SP AF XR Di LD Asph. IF Macro	£460	N/T		Standard zoom with constant f/2.8 aperture and minimum focusing distance of 33cm	•	•						33	67	73	92	510g
28-300mm f/3.5-6.3 AF XR Di LD Asph. IF Macro	£664	N/T		A useful 10.7x zoom range and low-dispersion elements in this optic	•	•						49	62	73	83.7	420g
28-300mm f/3.5-6.3 Di VC PZD	£529	N/T		A new, full-frame, high-power zoom incorporating PZD (Piezo Drive)	•	•						49	67	75	99.5	540g
45mm f/1.8 Di VC USD	£580	1/16	4.5★	A lens that rewrites the standard focal length	•							29	67	80.4	89.2	940g
60mm f/2 SP AF Di II LD IF Macro	£550	12/10	5★	Macro lens designed for APS-C sensor cameras, with 1:1 reproduction ratio	•							23	55	73	80	400g
70-200mm f/2.8 SP AF Di LD IF Macro	£817	10/09	4★	No image stabilisation and no advanced AF system, but at this price it's a steal	•	•						95	77	89.5	194.3	1150g
70-200mm f/2.8 Di VC USD	£TBC	N/T		Compact yet full-size telephoto zoom with vibration compensation	•	•						130	77	85.8	188.3	1470g
70-300mm f/4-5.6 SP VC USD	£300	1/12	4★	Ultrasonic Silent Drive (USD) technology for focusing and Vibration Compensation	•	•						150	62	81.5	142.7	765g
70-300mm f/4-5.6 AF Di LD Macro	£170	11/10	3.5★	Low dispersion glass and compatible with both full-frame and cropped-sensor DSLRs	•	•						95	62	76.6	116.5	435g
85mm f/1.8 Di VC USD	£TBC	N/T		The first full-frame 85mm f/1.8 lens with vibration compensation that's also moisture resistant	•	•						80	67	85	91	700g
90mm f/2.8 SP AF Di Macro	£470	11/09	4★	A very nice macro lens that is capable of producing some fine images	•	•						29	55	71.5	97	405g
90mm f/2.8 Di Macro 1:1 VC USD	£TBC	N/T		Redesign of the 90mm f/2.8 SP AF Di Macro; comes with vibration compensation	•	•						30	58	115	76.4	550g
150-600mm f/5-6.3 SP VC USD	£1150	6/14	4★	Longest focal length of any affordable enthusiast zoom on the market and produces excellent results	•	•						270	95	105.6	257.8	1951g
180mm f/3.5 SP AF Di LD IF Macro	£896	11/10	5★	Two Low Dispersion elements and internal focusing system in this 1:1 macro lens	•	•						47	72	84.8	165.7	920g
200-500mm f/5-6.3 SP AF Di LD IF	£1124	6/09	4.5★	A well-matched and consistent set of MTF curves, with good performance at f/8-11	•	•						250	86	93.5	227	1237g

TOKINA

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation											
					Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight	
AT-X 107 (107-17mm) f/3.5-4.5 AF DX Fisheye	£550	NYT		Fisheye zoom lens with Water Repellent coating and Super Low Dispersion glass		•						14	n/a	70	71.1	350g
AT-X 116 (11-16mm) f/2.8 PRO DX	£515	6/12	4.5★	Wide zoom with a One-Touch Focus clutch mechanism and a constant f/2.8 aperture		•						30	77	n/a	89.2	560g
AT-X 12-28mm f/4 PRO DX	£529	NYT		Replacement for 12-24mm F4 wideangle zoom; for Nikon DX DSLRs		•						25	77	84	90	600g
AT-X 16-28mm f/2.8 PRO FX	£757	6/11	5★	A pro-end wideangle zoom aimed at full frame cameras		•						26	n/a	90	133	950g
AT-X 17-35mm f/4 PRO FX	£830	11/12	5★	One of the most capable super-wide zooms available, though only available in Canon and Nikon mounts		•						28	82	89	94	600g
AT-X 16.5-135 (16.5-135mm) f/3.5-5.6	£610	9/11	3.5★	Three aspherical and two SD elements, together with a useful focal range		•						50	77	84	78	610g
AT-X M100 (100mm) f/2.8 AF PRO D Macro	£360	11/09	4★	Some weaknesses wide-open, but reasonable MTF curves make this a decent optic		•						30	55	73	95.1	540g

ZEISS

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation											
					Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight	
18mm f/3.5 ZF.2	£1150	8/10	5★	No AF, but the optical and build qualities of this lens are nothing short of stunning								30	82	84	87	470g
21mm f/2.8 Distagon T*	£1579	NYT		A wideangle lens that doesn't compromise on optical quality		•						30	82	87	84	510g
25mm f/2 Distagon T*	£1350	NYT		A landscape lens with a fast aperture		•						25	67	71	95	570g
28mm f/2 Distagon T*	£850	NYT		For low light shooting the 28mm lens has plenty of potential		•						24	58	64	93	520g
35mm f/1.4 Distagon T*	£1600	NYT		Promises to produce some stunning bokeh effects		•						30	72	120	122	850g
35mm f/2 Distagon T*	£940	NYT		A lens with a fast f/2 aperture		•						30	58	64	97	530g
50mm Milvus f/1.4	£949	3/16	5★	An exceptionally good portrait lens offering sharpness, detail, clean edges and a great user experience		•						45	67	82.9	94	922g
85mm Milvus f/1.4	£665	4/16	5★	Fast 85mm prime lens that's perfect for portraiture		•						80	77	90	110	1210g
100mm f/2 Makro-Planar	£1399	NYT		A rapid-focus portrait lens		•						44	72	76	113	680g

CSC Lens Listings

The range of lenses for CSC models is constantly evolving, so you have a fairly good choice when it comes to lenses for your CSC

CANON CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation													
					Canon M	Micro 4 Thirds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fuji X Mount	Full Frame only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight	
EF-M 18-55mm f/3.5-5.6 IS STM	£269	NYT		Compact and versatile zoom lens	•	•								25	52	61	61	210g
EF-M 11-22mm f/4-5.6 IS STM	£355	NYT		Ultra-wideangle lens with a compact, retractable lens design	•	•								15	55	61	58.2	220g
EF-M 22mm f/2 STM	£220	NYT		Small and bright wideangle pancake lens	•	•								15	43	61	23.7	105g
EF-M 55-200mm f/4.5-6.3 IS STM	£330	NYT		Telephoto zoom that takes you closer to the action	•	•								100	52	60.9	86.5	260g

FUJI CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation													
					Canon M	Micro 4 Thirds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fuji X Mount	Full Frame only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight	
XF 10-24mm f/4 R OIS	£849	NYT		Ultra wideangle lens, minimal ghosting with Fujis HT-EBC multi-layer coating	•									24	72	78	87	410
XF 14mm f/2.8 R	£729	7/13	5★	Ultra wideangle prime, high resolution to all corners, performance justifies price tag										18	58	65	58.4	235g
XF 16mm f/1.4 R WR	£729	10/15	5★	Weather-sealed fast prime for X-system users										15	67	73.4	73	375g
XC 16-50 f/3.5-5.6 OIS	£359	NYT		Lightweight lens for mirrorless X-series offers 24-75mm equivalent zoom range	•									30	58	62.6	98.3	195g
XF 16-55mm f/2.8 R LM WR	£899	6/15	5★	A flagship XF standard zoom lens with a constant f/2.8 aperture and weather-resistance										60	77	83.3	106	655g
XF 18mm f/2 R	£430	6/13	4★	A compact, wideangle lens with a quick aperture										18	52	64.5	40.6	116g
XF 18-135mm f/3.5-5.6 R LM OIS WR	£699	Xmas14	4★	Weather-resistant zoom for Fujifilm X mount, designed to be the perfect partner for the Fujifilm X-T1	•									45	77	75.7	97.8	490g
XF 18-55mm f/2.8-4 R	£599	NYT		Short zoom lens with optical image stabilisation										18	58	65	70.4	310g
XF 23mm f/1.4 R	£649	NYT		Premium wideangle prime lens with fast maximum aperture										28	62	72	63	300g
XF 27mm f/2.8	£270	NYT		A high-performance single-focal-length lens										60	39	23	61.2	78g
XF 35mm f/1.4 R	£439	6/13	4★	Shallow depth of field and bokeh effects are simple to achieve with this lens										28	52	65	54.9	187g
XF 50-140mm f/2.8 R LM OIS WR	£1249	NYT		A telephoto zoom with a constant maximum aperture and weather-resistance										100	72	82.9	175.9	995g
XC 50-230mm f/4.5-6.7 OIS	£315	NYT		The XC lens range is designed to suit Fuji's mid range CSCs, and this lens has optical image stabilisation	•									110	58	69.5	111	tbc
XF 55-200mm f/3.5-4.8 R LM OIS	£599	11/13	4★	Telephoto with built-in optical image stabilisation plus aperture control ring	•									110	62	118	75	580g
XF 56mm f/1.2 R	£899	9/14	4★	This wide-aperture portrait lens for X series cameras has great sharpness and detail and is great value										70	62	73.2	69.7	405g
XF 60mm f/2.4 XF R Macro	£599	NYT		A short telephoto lens perfect for macro work										26.7	39	64.1	70.9	215g
XF 90mm f/2 R LM WR	£699	11/15	5★	A classic portrait lens that's sharp, with gorgeous bokeh										60	62	75	105	540g

NIKON CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Mount	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
6.7-13mm f/3.5-5.6 VR 1	£459	NYT		Compact, lightweight, ultra-wide-angle zoom lens with Vibration Reduction for Nikon 1 system	•	•	25	52	56.5	46	125g
10mm f/2.8	£229	2/12	4★	A wideangle lens for Nikon's 1 series of Compact System Cameras	•	•	20	40.5	55.5	22	77g
10-30mm f/3.5-5.6 VR	£149	NYT		Nikon's kit lens for the 1 series of CSC models	•	•	20	40.5	57.7	42	115g
10-100mm f/4.5-5.6 VR PD-ZOOM	£679	NYT		A powered zoom lens aided by the VR image stabilisation system on 1 system compacts	•	•	300	72	77	95	530g
10-100mm f/4-5.6 VR 1	£499	NYT		CX-format zoom lens with focal length range of 10-100mm (27-270mm 35mm equivalent)	•	•	35	55	60.5	70.5	298g
11-27.5mm f/3.5-5.6	£179	NYT		Compact standard zoom for Nikon 1 system	•	•	30	40.5	57.5	31	80g
18.5mm f/1.8	£179	NYT		Nikon's 1 series gains a traditional fast prime	•	•	20	40.5	56	36	70g
30-110mm f/3.8-5.6 VR	£229	NYT		A longer zoom lens, with image stabilisation, for the Nikon 1 series	•	•	100	40.5	60	61	180g
32mm f/1.2	£799	NYT		First 1 system lens to offer a silent wave motor and nano crystal coating	•	•	45	52	66	47	235g
70-300mm f/4.5-5.6 VR	£TBC	NYT		CX-format super-telephoto lens with a surprisingly compact body	•	•	7	62	73	108	550g

OLYMPUS CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Mount	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
7-14mm f/2.8 ED Pro	£999	Web	4.5★	Super-wide-angle zoom lens that is dustproof, splashproof and freeze-proof	•	•	20	n/a	78.9	105.8	534g
8mm f/1.8 Pro Fisheye	£799	Web		Fisheye lens with impressive image quality that's dustproof, splashproof and freeze-proof	•	•	12	n/a	62	80	315g
9-18mm (Micro) f/4-5.6 ED	£630	NYT		This super wideangle lens offers an equivalent focal range of 18-36mm in 35mm terms	•	•	25	52	56.5	49.5	155g
12mm (Micro) f/2.0 ED	£739	1/12	5★	A wideangle fixed lens for the Micro Four Thirds system	•	•	20	46	56	43	130g
12-40mm f/2.8	£899	NYT		Weather-resistant wideangle zoom with a constant aperture of f/2.8	•	•	20	62	69.9	84	382g
12-50mm (Micro) f/3.5-6.3 ED EZ	£349	NYT		A reasonably-priced MFT zoom lens	•	•	20	52	57	83	211g
17mm M.Zuiko f/1.8 MSC	£450	7/13	5★	Wide-aperture, wide-angle prime boasting excellent peak sharpness and no colour fringing	•	•	25	46	57	35	120g
17mm (Micro) f/2.8 Pancake	£300	5/10	4★	Results are impressive across the most-used apertures given the wide angle of view offered	•	•	20	37	57	22	71g
14-42mm (Micro) f/3.5-5.6 ED	£300	5/10	4★	Generally a good performer, but control over chromatic aberrations could be a little better	•	•	25	40.5	62	43.5	150g
14-42mm II R (Micro) f/3.5-5.6	£269	NYT		A redesigned variation of the standard kit lens	•	•	25	37	56.5	50	112g
14-150mm (Micro) f/4-5.6 ED	£630	NYT		Plenty of focal range is offered by this MFT lens	•	•	50	58	63.5	83	280g
14-150mm II f/4-5.6	£550	NYT		High-powered zoom for all your needs - from wideangle to telephoto - plus weather-resistance	•	•	50	58	63.5	83	285g
25mm f/1.8	£370	NYT		Compact prime lens with ultra-bright f/1.8 aperture	•	•	25	46	57.8	42	137g
40-150mm f/2.8 ED	£1299	3/15	4★	This powerful 80-300mm 35mm equivalent focal length lens offers amazing portability for this pro class	•	•	70	72	79.4	160	760g
40-150mm R (Micro) f/4-5.6	£309	NYT		This middle-distance zoom lens has an 80-300mm 35mm equivalent focal length	•	•	90	58	63.5	83	190g
45mm (Micro) f/1.8	£279	2/12	5★	Fast-aperture lens for taking portrait shots proved to be sharp, quiet and without colour fringing	•	•	50	37	56	46	116g
60mm f/2.8 Macro	£450	NYT		High-precision macro lens that's dustproof and splashproof	•	•	19	46	56	82	185g
75-300mm II (Micro) f/4.8-6.7	£499	NYT		Update featuring Zuiko Extra-low Reflection Optical coating said to reduce ghosting	•	•	90	58	69	117	423g
75mm f/1.8 ED	£799	8/13	5★	Ultra-fast prime lens ideal for portraits and action shots	•	•	84	58	64	69	305g

PANASONIC CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Mount	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
G 7-14mm f/4	£1300	5/10	5★	For a wideangle zoom, the overall level of resolution is very impressive	•	•	25	-	70	83.1	300g
G 8mm Fisheye f/3.5	£730	NYT		The world's lightest and smallest fisheye lens for an interchangeable lens camera	•	•	10	22	60.7	51.7	165g
G 12mm 3D Lens f/12	£320	NYT		Allows compatible cameras to shoot 3D images	•	•	60	-	57	81.8	45g
G 12-32mm f/3.5-5.6 MEGA OIS	£270	NYT		Very compact with a versatile zoom range and 3 aspherical lenses	•	•	20	37	55.5	24	70g
G X 12-35mm f/2.8 X PZ POWER OIS	£1095	10/12	5★	Fast, high-quality standard zoom for Micro Four Thirds cameras	•	•	25	58	67.6	73.8	305g
G Vario 12-60mm f/3.5-5.6	£439	NYT		Incorporates a stepping motor for a smooth, silent operation and features a dust and splashproof design	•	•	20	58	66	71	210g
G 14mm f/2.5	£249	NYT		Wideangle pancake lens which should suit landscape photographers	•	•	18	46	55.5	20.5	55g
G 14-42mm II f/3.5-5.6 MEGA OIS	£375	NYT		Addition of two aspherical elements helps make this lens smaller than previous version	•	•	20	46	56	49	110g
G X 14-42mm f/3.5-5.6 X PZ POWER OIS	£369	2/13	4★	Powered zoom; impressive results in terms of both sharpness and chromatic aberration	•	•	20	37	61	26.8	95g
G 14-45mm f/3.5-5.6 MEGA OIS	£189	NYT		A lightweight and compact standard zoom featuring MEGA O.I.S. optical image stabilisation	•	•	30	52	60	60	195g
G 14-140mm f/3.5-5.6 POWER OIS	£599	NYT		Metal-bodied zoom featuring company's POWER O.I.S. optical image stabiliser	•	•	30	58	67	75	265g
DG 15mm f/1.7 Leica DG SUMMILUX	£549	NYT		High-speed prime with a compact metal body and includes 3 aspherical lenses to cut down distortion	•	•	20	46	36	57.5	115g
G 25mm f/1.7 ASPH	£159	3/16	5★	Inexpensive fast normal prime for Micro Four Thirds	•	•	25	46	60.8	52	125g
DG 25mm f/1.4 DG SUMMILUX	£550	2/12	5★	A fast-aperture fixed focal length standard lens from Leica	•	•	30	46	63	54.5	200g
G 30mm f/2.8 Macro MEGA OIS	£300	7/15	3★	Compact lens offering true-to-life magnification capability for better macro images	•	•	10	46	58.8	63.5	180g
35-100mm f/4-5.6 ASPH MEGA OIS	£300	NYT		Telephoto zoom equivalent to 70-200mm on a 35mm camera	•	•	90	46	55.5	50	135g
G X 35-100mm f/2.8 POWER OIS	£1099	NYT		Telephoto zoom with Nano Surface Coating technology for dramatic reduction of ghosting and flare	•	•	85	58	67.4	100	360g
42.5mm f/1.2 Leica DG POWER OIS	£1399	Web	5★	Mid-telephoto high-speed LEICA DG NOCTICRON lens with 2 aspherical lenses and ultra-wide aperture	•	•	50	67	74	76.8	425g
G 42.5mm f/1.7 POWER OIS	£349	NYT		Mid-telephoto lens with a 35mm equivalent of 85mm, its f/1.7 aperture promises a beautiful bokeh effect	•	•	37	31	55	50	130g
G 45-150mm f/4-5.6 MEGA OIS	£280	2/13	4★	Compact, lightweight telephoto zoom comprising 12 elements in 9 groups	•	•	90	52	62	73	200g
G X 45-175mm f/4-5.6 X PZ POWER OIS	£400	7/12	4★	A powered long focal length zoom lens	•	•	90	46	61.6	90	210g
G 45-200mm f/4-5.6 MEGA OIS	£330	7/12	4★	Superzoom lens with three ED elements and Mega O.I.S. technology	•	•	100	52	70	100	380g
G 100-300mm f/4-5.6 MEGA OIS	£550	7/11	4★	Long zoom lens offering optical image stabilization	•	•	100	52	70	100	380g

PENTAX CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Mount	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
3.8mm-5.9mm (Q System) f/3.7-4	£429	NYT		Super-compact, ultra-lightweight wide zoom, equivalent to 17.5-27mm in the 35mm format	•	•	25	49	38	54	75g
8.5mm (Q System) f/1.9 AL [IF]	£149	NYT		Standard prime lens in the Q system	•	•	20	40.5	45.5	23	37g
6.3mm (Q System) f/7.1	£129	NYT		A wide lens for the Q system	•	•	N/A	40.6	25	21g	
11.5mm (Q System) f/9	£49	NYT		Extremely thin Mount Shield Lens equivalent to 53mm in the 35mm format, offering a distinctive, velvety image	•	•	30	N/A	6.9	40.8	8g
18mm (Q System) f/8	£129	NYT		A telephoto lens for the Q system	•	•	N/A	40.6	19.5	18g	
3.2mm (Q System) f/5.6	£149	NYT		A fisheye lens for the Q system	•	•	90	N/A	40.6	30.5	29g
5-15mm (Q System) f/2.8	£279	NYT		A short zoom lens for the Q system	•	•	40.5	45.5	23	37g	
5-15mm (Q System) f/2.8-4.5	£299	NYT		A standard zoom lens for the Q system equivalent to 27.5-83mm in the 35mm format	•	•	30	40.5	48.5	48	96g
15-45mm (Q System) f/2.8	£279	NYT		A telephoto zoom lens for the Q system that's super-compact and ultra-lightweight	•	•	100	40.5	56	50	90g

SAMSUNG CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation							Min Focus (cm)	Filter Thread (mm)	DIMENSIONS			
					Canon M	Micro Thirds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fujifilm X Mount			Full frame only	Width (mm)	Length (mm)	Weight
12-24mm f/4-5.6 ED	£480	N/T		Portable ultra-wideangle zoom lens with i-function									24	58	63.5	65.5	208g
16mm NX i-Function f/2.4	£299	N/T		A pancake lens with a wide angle of view									18	43	61	24	90g
16-50mm f/2-2.8 Premium S ED OIS	£999	N/T		Bright-aperture zoom lens made of metal, with quiet AF performance whether shooting stills or video	•								30	72	81	96.5	622g
18-200mm NX i-Function OIS f/3.5-6.3	£649	9/12	4.5★	A mid-range zoom lens aimed at movie making	•								50	67	72	105.5	549g
20mm NX i-Function f/2.8	£229	2/12	5★	Wideangle pancake lens									17	43	62	25	89g
30mm NX i-Function f/2	£249	9/10	4★	This pancake optic exhibits very impressive peak sharpness at around f/4-5.6									25	43	61	21	85g
45mm NX i-Function f/1.8	£249	N/T		Fast f/1.8 aperture produces a shallow depth of field making it ideal for portraiture									45	43	62	44.5	115g
50-150mm f/2.8 S ED OIS	£1199	N/T		Premium zoom lens with advanced OIS, constant f/2.8 aperture, and dust and splash-resistant	•								70	72	81	154	915g
60mm NX i-Function Macro ED SSA OIS f/2.8	£499	2/12	5★	This prime lens with macro capability should be useful for portraiture	•								18	52	73.5	84	389g
85mm NX i-Function ED SSA OIS f/1.4	£849	4/12	5★	This prime lens is missing image stabilisation, but should still perform well									82	67	79	92	714g

SIGMA CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation							Min Focus (cm)	Filter Thread (mm)	DIMENSIONS			
					Canon M	Micro Thirds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fujifilm X Mount			Full frame only	Width (mm)	Length (mm)	Weight
19mm f/2.8 DN A	£189	N/T		Metal-bodied high-performance wideangle prime lens		•							20	46	60.8	45.7	150g
30mm f/1.4 DC DN C	£300	07/16	4★	A prime for Micro Four Thirds and Sony E-mount users, it's impressively sharp even at f/1.4		•							30	52	64.8	73	140g
30mm f/2.8 DN A	£189	N/T		Uses a high-quality double-sided aspherical lens for expressive performance worthy of Sigma's 'Art' line		•							30	46	60.8	40.5	140g
60mm f/2.8 DN A	£189	N/T		Latest addition to Sigma's 'Art' range is a mid-range, high-performance telephoto lens with metal body		•							50	46	60.8	55.5	190g

SONY CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation							Min Focus (cm)	Filter Thread (mm)	DIMENSIONS			
					Canon M	Micro Thirds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fujifilm X Mount			Full frame only	Width (mm)	Length (mm)	Weight
E 10-18mm f/4	£750	8/13	4★	Super wideangle zoom with Super ED glass and Optical SteadyShot image stabilisation	•			•					25	62	70	63.5	225g
E 16mm f/2.8	£220	2/12	4★	Pancake lens for NEX system, with a circular aperture and Direct Manual Focus				•					24	49	62	22.5	67g
FE 16-35mm f/4 ZA OSS Vario-Tessar T*	£1289	1/15	5★	Zeiss full-frame wideangle zoom lens									28	72	78	98.5	518g
E 16-50mm f/3.5-5.6 OSS	£299	N/T		Compact lens with Power Zoom, ED glass and Optical SteadyShot image stabilisation	•			•					25	40.5	64.7	29.9	116g
E 16-70mm f/4 ZA OSS Vario-Tessar T*	£839	N/T		A lightweight, versatile mid-range zoom with a constant f/4 aperture	•			•					35	55	66.6	75	308g
E 18-55mm f/3.5-5.6 OSS	£270	N/T		Optical SteadyShot, said to be silent during movie capture, and a circular aperture	•			•					25	49	62	60	194g
E 18-105mm f/4 G OSS	£499	N/T		Sony G lens for E-mount cameras with a constant f/4 aperture	•			•					45	72	78	110	427g
E 18-200mm f/3.5-6.3 OSS LE	£489	N/T		Smaller and lighter than comparable lenses, this is an ideal high-magnification travel lens	•			•					50	62	68	98	460g
E 18-200mm PZ f/3.5-6.3 OSS	£999	N/T		Boasts powered zoom and image stabilisation with Active Mode, making it ideal for movies	•			•					30	67	93.2	99	649g
E 20mm f/2.8	£309	N/T		Pancake wideangle lens promises to be the perfect walkaround partner for E mount cameras				•					20	49	62.6	20.4	69g
E 24mm f/1.8 ZA Sonnar T*	£839	N/T		Top quality Carl Zeiss optic ideally suited to the NEX-7				•					16	49	63	65.6	225g
FE 24-240mm f/3.5-6.3 OSS	£929	N/T		Ideal for travel, landscapes and more, with built-in stabilisation and also dust and moisture resistant	•			•					50	72	80.5	118.5	780g
FE 24-70mm f/2.8 GM	£1799	7/16	5★	This pro grade standard lens for the Sony full-frame FE mount gives exceptionally sharp results				•					38	82	87.6	136	886g
FE 24-70mm f/4 ZA OSS Vario-Tessar T*	£1049	N/T		Compact lens with an f/4 maximum aperture across the zoom range and built-in image stabilisation	•			•					40	67	73	94.5	426g
FE 28mm f/2	£419	N/T		This full-frame wideangle prime with a bright f/2.0 maximum aperture promises excellent sharpness				•					29	49	64	60	200g
FE 28-70mm f/3.5-5.6 OSS	£449	N/T		Built-in Optical SteadyShot image stabilisation, lightweight, and a popular zoom range	•			•					30	55	72.5	83	295g
FE 28-135mm PZ f/4 G OSS	£2379	N/T		High performance G Series standard zoom lens, constant f/4 aperture, built for high quality moviemaking	•			•					95	95	162.5	105	1215g
E 30mm f/3.5 Macro	£219	N/T		A macro lens for the NEX Compact System Cameras				•					9	49	62	55.5	138g
FE 35mm f/1.4 ZA Distagon T*	£1559	N/T		Full-frame ZEISS Distagon lens with large, bright f/1.4 aperture				•					30	72	73	94.5	630g
E 35mm f/1.8	£399	N/T		Lightweight versatile prime with Optical SteadyShot image stabilisation				•					30	49	62.2	45	155g
FE 35mm f/2.8 ZA Sonnar T*	£699	N/T		When coupled with a full-frame Sony E-mount camera, this prime lens promises to deliver				•					35	49	61.5	36.5	120g
E 50mm f/1.8 OSS	£219	N/T		A handy, low price portrait lens for the NEX range				•					39	49	62	62	202g
FE 50mm f/1.8 OSS	£240	N/T		Features a new optical design with a single aspherical element	•			•					45	49	68.6	59.5	186g
FE 55mm f/1.8 ZA Sonnar T*	£849	N/T		35mm full-frame prime lens with wide aperture allowing good images indoors or in low light				•					50	49	64.4	70.5	281g
E 55-210mm f/4.5-6.3 OSS	£289	N/T		Lightweight telephoto zoom lens for the NEX range	•			•					100	49	63.8	108	345g
FE 70-200mm f/4 G OSS	£1359	10/14	4★	G Series telephoto zoom lens, dust and water resistant, with built-in image stabilisation				•					100	72	80	175	840g
FE 70-300mm f/4.5-5.6 G OSS	£1150	N/T		Sony has added this lens to its growing range	•			•					90	72	84	143.5	854g
FE 90mm f/2.8 Macro G OSS	£1049	09/15	4★	The first dedicated macro lens for Sony's full-frame E-mount cameras	•			•					28	62	79	130.5	602g

ZEISS CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation							Min Focus (cm)	Filter Thread (mm)	DIMENSIONS			
					Canon M	Micro Thirds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fujifilm X Mount			Full frame only	Width (mm)	Length (mm)	Weight
12mm f/2.8 Touit Distagon T*	£959	5/14	5★	Designed specifically for Sony NEX and Fujifilm X-series CSC cameras. Very impressive performance		•		•					18	67	82	68	270g
18mm f/2.8 Batis	£990	N/T		The Batis range is for mirrorless full-frame system cameras from Sony				•					25	77	78	95	330g
25mm f/2 Batis	£980	12/15	5★	A wideangle lens for Sony full-frame users offering unrivalled quality				•					20	67	81	92	356g
32mm f/1.8 Touit Planar T*	£700	7/14	4.5★	Optimised for use with APS-C format sensors, a fast standard lens for Fujifilm X-series cameras				•					23	52	72	76	200g
50mm f/2.8 Touit	£589	N/T		Macro 1:1 lens for extreme close ups, as well as shooting portraits or panoramas as a light tele-lens				•					15	52	75	91	290g
85mm f/1.8 Batis	£909	Xmas15	5★	A high-quality medium prime for wedding and portrait shooters, developed for Sony's Alpha-7 series				•					80	67	78	105	475g

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AF-S Nikkor 24mm f/1.4G £1,379.00	AF-D 135mm f/2.0 £1,029.00	AF-S 18-35mm f/3.5-4.5G £519.00
AF-D 28mm f/2.8 £245.00	AF-D 180mm f/2.8 IF ED £695.00	AF-S 18-105mm VR £204.00
AF-S 28mm f/1.8G £495.00	AF-D 200mm f/4D IF ED £1,179.00	AF-S 18-140mm ED VR DX £429.00
35mm f/2 AF Nikkor D £255.00	AF-S 200mm f/2G ED VR II £4,099.00	AF-S 18-200mm ED DX VR II £534.00
AF-S 35mm f/1.8G ED £399.00	AF-S 300mm f/2.8G ED VR II £3,999.00	AF-S 18-300mm f/3.5-6.3 VR £549.00
AF-S 35mm f1.8G DX £151.00	AF-S 300mm f/4 D IF ED £999.00	AF-S 24-85mm VR £359.00
AF-D 50mm f/2.8G ED £199.00	AF-S 300mm f/4E PF ED VR £1,499.00	AF-S 28-300mm ED VR £699.00
AF 50mm f/1.4D £244.00	AF-S 400mm f/2.8 FL ED VR £8,999.00	AF-S 55-200mm f/4-5.6G VR II £229.00
AF-S 50mm f/1.4G £349.00	AF-S 500mm f/4G ED VR £5,849.00	AF-S 70-200mm f/2.8 VR II £1,679.00
AF-D 50mm f/1.8 £109.00	AF-S 500mm f/4E FL ED VR £8,149.00	AF-S 70-300mm IF ED VR £429.00
AF-S 50mm f/1.8G £169.00	AF-S 600mm f/4E FL ED VR £9,649.00	AF-S 200-400mm VR II £5,199.00

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14mm f/2.8L II USM See Web	200mm f/2.0L IS USM £4,350.00	EF-S 18-135mm IS STM See Web
20mm f/2.8 USM See Web	200mm f/2.8L USM/2 £569.00	EF-S 18-200mm f/3.5-5.6 See Web
24mm f/1.4L Mk II USM See Web	300mm f/2.8L USM IS II £4,799.00	24-70mm f/2.8L II USM See Web
24mm f/2.8 IS USM See Web	300mm f/4.0L USM IS II See Web	24-70mm f/4.0L USM IS II See Web
EF-S 24mm f/2.8 STM £127.00	400mm f/2.8L USM IS II £7,698.00	24-105mm f/4.0L IS USM £727.00
28mm f/1.8 USM See Web	400mm f/4.0 DO IS II £6,999.00	24-105mm f/3.5-5.6 IS STM £375.00
28mm f/2.8 IS USM £389.00	400mm f/5.6L USM See Web	28-300mm f/3.5-5.6L IS £1,795.00
35mm f/1.4 USM See Web	500mm f/4.0L IS MK II £6,899.00	EF-S 55-250mm f/4-5.6 IS STM £199.00
35mm f/1.4L II USM £1,799.00	600mm f/4.0L IS MK II £8,895.00	70-200mm f/2.8L IS II USM See Web
35mm f/2.0 IS USM See Web	800mm f/5.6L IS USM £9,899.00	70-200mm f/2.8L IS USM See Web
40mm f/2.8 STM See Web	TSE 17mm f/4.0L See Web	70-200mm f/4.0L IS USM See Web
50mm f/1.2 L USM See Web	TSE 24mm f/3.5L II £1,479.00	70-200mm f/4.0L USM See Web
50mm f/1.4 USM See Web	TSE 45mm f/2.8 See Web	70-300mm f/4.0-5.6 IS See Web
50mm f/1.8 STM £97.00	TSE 90mm f/2.8 £1,124.00	70-300mm f/4.0-5.6L IS USM See Web
EF-S 60mm f/2.8 Macro See Web	8-15mm f/4L Fisheye USM See Web	70-300mm DO IS USM See Web
MP-E 65mm f/2.8 See Web	EF-S 10-18mm IS STM See Web	75-300mm f/4.0-5.6 III £188.00
85mm f/1.2L II USM £1,499.00	EF-S 10-22mm f/3.5-4.5 £377.00	75-300mm f/4.0-5.6 III See Web
85mm f/1.8 USM See Web	EF 11-24mm f/4L USM £2,799.00	100-400mm L IS USM II £1,799.00
100mm f/2 USM £349.00	EF-S 15-85mm f/3.5-5.6 IS See Web	200-400mm f/4.0L USM £8,598.00
100mm f/2.8 USM Macro £373.00	EF 16-35mm f/2.8L II USM £1,060.00	1.4x III Extender £314.00
100mm f/2.8L Macro IS See Web	16-35mm f/4.0L IS USM £582.00	2x III Extender See Web
135mm f/2.0L USM See Web	17-40mm f/4.0L USM £549.00	EF 12II Extension Tube £79.99
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Speedlite 270EX II £135.00	BG-E13 (6D) £174.00	LP-E6N (5D III, 7D II, 6D) £69.00
Speedlite 320EX £185.00	BG-E14 (70D) £149.00	LP-E8 (700D, 600D) £35.00
Speedlite 430EX III-RT £189.00*	BG-E16 (7D Mark II) £249.00	LP-E10 (1300D, 1200D) £39.99
Speedlite 600EX-RT £429.00	BG-E18 (7D Mark II) £115.00	LP-E17 (760D, 760D, M3) £44.00

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24.3 MEGA PIXELS | Wi-Fi/NFC

Body only + 16-50mm **£439.00** **£499.00**

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Sony a6300

24.2 MEGA PIXELS | 4K

Body only + 16-50mm **£999.00** **£1,099.00**

Add a Sony NP-FW50 spare battery for £64.95

Sony a7S II

12.2 MEGA PIXELS | IS

Body only See in store for trade-in bonus! **£2,499.00**

Add a Metabones Canon EF to E-mount T.Vi Adaptor for only £200

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18.2 MEGA PIXELS | 30x

In stock at only **£289.00**

Add a Sony HWA case for £39.99

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20.1 MEGA PIXELS | 2.9x

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Sony RX10 III

20.1 MEGA PIXELS | 25x

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Try this camera out in store!

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24mm f/2.0 Carl Zeiss T* £949.00	50mm f/1.4 Carl Zeiss £1,099.00
50mm f/1.8 OSS £199.00	11-18mm f/4.5-5.6 DT £509.00
55mm f/1.8 FE Sonnar T* ZA £618.00	16-35mm f/2.8 Carl Zeiss T* £1,399.00
90mm F2.8 Macro G FE OSS £969.00	24-70mm f/2.8 II Carl Zeiss T* £1,799.00
10-18mm f/4 OSS £629.00	55-200mm f/4.0-5.6 SAM DT £179.00
16-50mm f/3.5-5.6 OSS £259.00	70-200mm f/2.8 G SSM II £2,199.00



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OLYMPUS E-M5 Mark II

When it comes to capturing fine details, the higher the resolution, the better. That's why the E-M5 Mark II comes with new 40M High Res Shot. By capturing eight shots sequentially and then combining them into one, it is ideal for photographing works of art, landscapes or more of an amazing 40 megapixels.

16.1 MEGA PIXELS | 10 FPS | 3.0" | IS | 1080p

Body only **£749.00** +12-50mm **£879.00**

Panasonic LEICA DG SUMMILUX 12mm f/1.4 ASPH

This new lens enables you to capture dynamic landscapes with rich perspective across a wide angle. It also allows indoor shooting in low lighting & produces an impressive, natural defocusing effect with its f/1.4 high speed aperture. Further, this lens boasts a rugged, splash/dust-proof design to meet the needs of a wide-range of photographic situations.

Expected this Summer!
See website for details.

Olympus E-M10 Mark II

16.2 MEGA PIXELS | 8 FPS

Body only +14-42 +14-140
£449.00 **£649.00**

Add an Olympus ECG-3 Handgrip for only £59.99

Olympus PEN-F

20.3 MEGA PIXELS | IS

Body only +17mm f/1.8
£999.00 **£1,199.00**

Add an Olympus ECG-4 handgrip for the PEN-F for £109.99

Olympus E-M1

16.3 MEGA PIXELS | IS | 1080p

Body only +12-40mm
£849.00 **£1,233.00**

Claim a FREE Olympus HLD-7 batt. grip from Olympus! Ends 30.09.16

Panasonic GX8

20.3 MEGA PIXELS | 4K | 11 FPS

Body only +14-60mm
£649.00 **£819.00***

*Price includes £50 cashback from Panasonic. Ends 05.09.16.

Panasonic GX80

16.0 MEGA PIXELS | 10 FPS

Body only +12-32mm Twin kit
£549.00* **£679.00***

*Prices include £50 cashback from Panasonic. Ends 05.09.16.

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14mm f/2.5 II Pancake **£299.00**
 20mm f/1.7 II ASPH **£269.00**
 45mm f/2.8 Macro **£498.00**
 42.5mm f/1.2 O.I.S **£1,099.00**
 7-14mm f/4.0 ASPH **£739.00**
 12-60mm f/3.5-5.6 ASPH **£359.00**
 14-140mm f/3.5-5.6 **£405.00**
 35-100mm f/2.8 O.I.S **£798.00**
 45-175mm f/4.0-5.6 O.I.S **£279.00**
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 100-400mm f/4.0-6.3 **£1,349.00**

See website for even more lenses!

Olympus 300mm f/4.0 IS PRO

SRP £2,199**

See website for latest information on availability!

Eligible for 12 months interest free credit. Call 01444 23 70 65 for details

OLYMPUS LENSES

12mm f/2.0 **£549.00**
 17mm f/1.8 M. ZUIKO **£349.00**
 25mm f/1.8 M. ZUIKO **£279.00**
 45mm f/1.8 **£179.00**
 60mm f/2.8 Macro **£349.00**
 7-14mm f/2.8 PRO **£837.50**
 12-40mm f/2.8 PRO **£719.00**
 14-42mm f/3.5-5.6 II R MFT **£239.00**
 40-150mm f/4-5.6 R M. ZUIKO **£149.00**
 40-150mm f/2.8 PRO + 1.4x **£1,249.00**
 75-300mm f/4.8-6.7 ED II **£349.00**

See website for cashback on selected lenses!

Olympus TG-870

16 MEGA PIXELS | IS | 1080p

In stock at only Available in black, white or green
£249.00

Add an Olympus Li-50B spare battery for only £44.99

Panasonic LX100

12.8 MEGA PIXELS | 10 FPS

In stock at only Add the MS2E mic for £279
£499.00

Add a Panasonic DMW-BLG10 spare battery for £59.99

Panasonic FZ330

24x | 10 FPS

In stock at only Add the BLC12 batt for £49
£499.00

Add a Sandisk 64GB Extreme Pro UHS-I SDXC Memory Card for £56

Panasonic TZ80

30x | 10 FPS

In stock at only Add the BLC12 batt for £49
£329.00

Add a Sandisk 64GB Extreme Pro UHS-I SDXC Memory Card for £56

PENTAX K-70

24.2 MEGA PIXELS | 6 FPS | 3.0" | IS | 4K | Pro Video

The K-70 has a compact body for easy carry-along to any outdoor shooting. Its outstanding weather-resistant performance & enormous imaging power, combining true-to-life image description and high-sensitivity shooting, make it extremely reliable, even in most demanding shooting conditions.

Body SRP £559**

Expected this Summer! See website for details.

LEICA SL (typ 601)

The Leica SL-System marks the beginning of a new era of professional photography. As the first mirrorless system camera of its kind, it offers an impressive range of innovative features & sets entirely new standards with regard to versatility & handling - and rugged resilience.

24 MEGA PIXELS | 11 FPS | 3.0" | 4K

Limited numbers available in our London or Burgess Hill stores, or online at www.parkcameras.com/ap

£5,299.00

Pentax K-S2

16.1 MEGA PIXELS | 8 FPS

Body only +18-50mm WR
£469.00 **£529.00**

Add a Pentax remote control F for only £21.90.

Pentax K-3 II

24.3 MEGA PIXELS | IS | 1080p

Body only +18-135mm WR
£709.00 **£1,009.00**

Add a Pentax D-BG5 battery grip for only £149.00.

Pentax K-1

36.4 MEGA PIXELS | IS | 1080p

Limited stock now available!
 Body only **£1,599.00**

Add a Pentax D-BG6 battery grip for only £229.99

Leica Q (typ 116)

24.2 MEGA PIXELS | 10 FPS

Limited stock available!
£3,230.00

For the range of accessories available, see in store or online

Leica M 240

24 MEGA PIXELS | 1080p

Limited stock available!
£4,778.00

For the range of lenses available, see in store or online

LEICA M LENSES

28mm f/1.4 Summilux-M **£3,799.00**
 28mm f/2 Summicron-M **£2,560.97**
 35mm f/2 Summicron-M **£1,799.00**
 35mm f/1.4 Summilux-M **£3,247.00**
 35mm f/2.4 Summarit **£1,255.00**
 50mm f/1.4 Summilux-M **£2,495.00**
 50mm f/2 Summicron-M **£1,394.97**
 50mm f/2.4 Summarit **£999.97**
 75mm f/2 Summicron-M **£2,159.97**
 75mm f/2.4 Summarit **£1,124.97**
 90mm f/2 Summicron-M **£2,499.00**
 90mm f/2.4 Summarit **£1,199.97**

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Tamron SP 35mm f/1.8 Di VC USD In stock at only £424.00* *Price includes £75 cashback from Tamron. Ends 31.07.16.	Tamron SP 45mm f/1.8 Di VC USD In stock at only £424.00* *Price includes £75 cashback from Tamron. Ends 31.07.16.	Tamron SP 15-30mm f/2.8 Di VC USD In stock at only £724.00* *Price includes £75 cashback from Tamron. Ends 31.07.16.
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SIGMA LENSES

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Sigma MC-11 Mount Converter Limited stock now available! £199.00 Use your Canon / Sigma lenses with a Sony E-mount camera	Sigma 50-100mm f/1.8 DC HSM ART Limited stock now available! £829.00 Available in Canon, Nikon or Sigma fits. See website for details.	Sigma 150-600mm f/5-6.3 Sports + TC-1401 Kit (£1,428 when bought separately) £1,299.00 Available in Canon, Nikon or Sigma fits. See website for details.
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SP 35mm f/1.8 Di VC USD £499.00	SP AF 10-24mm f/3.5-4.5 Di-II £349.00	SP 24-70mm f/2.8 Di VC USD £679.00	4.5mm f/2.8 Fisheye EX DC £599.00	300mm f/2.8 APO EX DG £2,199.00	70-200mm f/2.8 OS £729.00
SP 45mm f/1.8 Di VC USD £499.00	SP 15-30mm f/2.8 Di VC USD £799.00	SP 28-75mm f/2.8 XR Di Macro £319.00	8mm f/3.5 Circ. Fish EX DG £599.00	500mm f/4.5 APO EX DG £3,599.00	70-300mm f/4.0-5.6 Apo Macro £99.00
60mm f/2 macro £299.00	16-300mm Di II VC PZD £399.00	28-300mm Di VC PZD £499.00	15mm f/2.8 Diag F/eye EX DG £499.00	8-16mm f/4.5-5.6 DC HSM £499.00	70-300mm f/4.0-5.6 Apo Macro £149.00
SP 85mm f/1.8 Di VC USD £749.00	SP 17-50mm f/2.8 XR Di II VC £329.00	SP 70-200mm f/2.8 Di VC USD £929.00	19mm f/2.8 DN £119.00	10-20mm f/3.5 EX DC HSM £299.00	120-300mm f/2.8 DG OS HSM £2,499.00
SP 90mm f/2.8 Di VC USD £579.00	SP AF 17-50mm f/2.8 Di II £249.00	70-200mm f/2.8 Di LD (IF) £475.00	20mm f/1.4 DG HSM £629.00	12-24mm f/4.5-5.6 II DG HSM £529.00	150-500mm f/5-6.3 DG OS HSM £494.99
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SP AF 90mm f/2.8 Di Macro £259.97	18-270mm f/3.5-6.3 Di II VC £269.00	70-300mm f/4-5.6 Di LD Macro £89.99	30mm f/1.4 DC HSM £299.00	17-70mm f/2.8-4 DC OS £319.00	150-600mm Cont. + 1.4x £849.00
			30mm f/2.8 DN £119.00	18-35mm f/1.8 DC HSM £549.00	150-600mm f/5-6.3 DG S £1,199.00
			35mm f/1.4 DG HSM (Art) £579.00	18-200mm f/3.5-5.3 DC OS HSM £249.00	150-600mm Sport + 1.4x £1,299.00
			60mm f/2.8 DN £119.00	18-250mm DC Macro OS HSM £279.00	300-800mm f/5.6 EX DG HSM £5,498.00
			85mm f/1.4 EX DG HSM £519.00	18-300mm f/3.5-6.3 DC Macro £349.00	1.4x Teleconverter APO EX DG £179.00
			105mm f/2.8 EX DG OS HSM £329.00	24-35mm f/2 DG HSM Art £699.00	1.4x Teleconverter TC1401 £229.00
			150mm f/2.8 OS Macro £649.00	24-70mm f/2.8 IF EX DG £549.00	2.0x Teleconverter APO EX DG £199.00
			180mm f/2.8 EX DG OS HSM £1,099.00	24-105mm f/4 DG OS HSM £599.00	2.0x Teleconverter TC2001 £269.00
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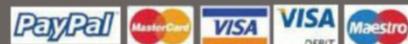
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45-90mm F4-5.6 PE..... E++ £399 - £449	55-200mm F4.5-5.6 USM II..... E++ £69	380EX Speedlite..... E+ £39	60mm F2.8 AE Macro..... E++ £299
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150mm F3.5 PE..... E+ / E++ £119	70-200mm F2.8 L IS USM II..... Mint-£1,189 - £1,239	430EZ Speedlite..... E+ / E++ £25 - £29	85mm F1.4 MM..... E++ £349
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200mm F4.5 E..... E+ / E++ £89 - £179	70-300mm f4.5-5.6 IS USM..... E+ £199	550EX Speedlite..... E+ £85 - £89	100mm F3.5 AE..... E+ £179 - £199
200mm F5.6 E..... E++ £89	70-300mm F4.5-5.6 DO IS USM..... E+ £299	580EX MkII Speedlite..... E+ £179	100mm F3.5 MM..... E+ £199
250mm F5.6 E..... E+ / E++ £89 - £139	75-300mm F4-5.6 EF III..... E+ £59	580EX Speedlite..... E+ £109 - £139	100mm F4 S Planar..... E++ £699
250mm F5.6 PE..... E+ £99	75-300mm F4-5.6 IS USM..... E+ / E++ £189 - £199	600EX-RT Speedlite..... E++ £349	135mm F2 (60 Year Edition)..... Unused £2,399
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220 E Mag..... E++ £15	80-200mm F4.5-5.6 EF III..... E+ / E++ £39 - £49	Metz 50AF1 Digital..... E++ £79	180mm F2.8 AE..... Unused £599
220 Ei Mag..... E++ £25	80-200mm F4.5-5.6 USM..... E+ £49	Nissin Di622 Speedlite..... E+ £59	180mm F2.8 MM..... E++ £349
Polaroid Mag E..... E+ / E++ £25	85mm F1.2 L USM..... E+ £799	Sigma EF-610 DG ST Flash..... E++ £49	200mm F3.5 AE..... E+ / E++ £149
Extension Tube E14..... E+ / Unused £29 - £79	85mm F1.2 L USM MkII..... E++ £949	Sigma EM-140 DG Macroflash..... E++ £199	200mm F4 AE..... Unused £449 - £499
Pro Shade E..... E+ £25	85mm F1.8 USM..... E+ / Mint-£179 - £219	ML3 MacroLite..... E++ £49	300mm F4 AE..... E++ £299
Speed Grip E..... E++ £35	100mm F2.8 L Macro IS USM..... E++ £489	MR-14EX Macro Ringlite..... E+ / Mint-£189 - £219	Yashica 75-200mm F4.5 MC..... E+ £25
	100mm F2.8 USM Macro..... E+ / E++ £239 - £289	NT-24EX Macro Ringlite..... E++ £489	Yashica 100-300mm F5.6 ML..... E+ £25
	100-400mm F4.5-5.6 L IS USM..... E+ £679	ST-E2 Transmitter..... E++ £59 - £69	Yashica 135mm F2.8 ML..... E++ £39
Bronica SQA/Ai/B	200mm F2.8 L USM II..... E++ £399	Rode Stereo Videomic Pro..... Mint-£89	Yashica 300mm F5.6 ML..... E++ £59
SQA Complete + Grip..... E++ £299	300mm F2.8 L IS USM..... Exc £1,789	Technical Back E with Keyboard..... Unused £49 - £75	Yashica 500mm F8 Reflex..... As Seen £49
65mm F4 PS..... E++ £129	300mm F4 L IS USM..... E++ £649	Tripod Mount Ring A II W..... E++ £49	TLA20 Flash..... E+ / E++ £15 - £39
135mm F4 PS..... E++ £229	400mm F2.8 L IS USM..... E+ £3,949	Tripod Mount Ring B (B)..... E++ £49	TLA280 Flash..... As Seen / Unused £39 - £149
150mm F4 PS..... E+ / E++ £99 - £129	400mm F2.8 L USM..... E+ £1,749		TLA30 Flash..... E+ / Unused £19 - £49
500mm F8 S..... E+ £299	400mm f5.6 L USM..... E++ / Mint-£699 - £729	Contax 645 Series	TLA360 Flash..... E+ / E++ £79
SQ 120 Back..... E+ £35	600mm F4 L USM..... Exc £2,489	645 Complete..... E++ £1,789	TLA480 Flash..... E++ £129
SQA 120 Mag..... E+ £39	Contax 35-70mm F3.4 MM..... E++ £279	35mm F3.5 Distagon..... Exc / Mint-£399 - £949	
SQA 220J Mag..... E+ £75	Contax 35-135mm F3.3-4.5 MM..... E++ £429	45mm F2.8 Distagon..... E+ / E++ £399 - £699	
SQAi 120 Mag..... E++ £59	Contax 100mm F2 MM..... E++ £699	45-90mm F4.5 Vario..... E+ / E++ £1,399 - £1,599	
Polaroid Mag S..... E+ £25	Sigma 12-24mm F4.5-5.6 EX DG HSM..... E+ / E++ £259 - £299	120mm F4 Apo Macro..... E+ / E++ £549 - £899	
AE Prism Finder S..... E+ £79	Sigma 15-30mm F3.5-4.5 EX DG..... E+ £179	140mm F2.8 Sonnar..... E+ / Unused £349 - £689	
Prism Finder S..... As Seen £29	Sigma 17-70mm F2.8-4 DC OS Macro HSM..... Mint-£219	210mm F4 Sonnar..... E+ / Mint-£389 - £499	
Proshade S..... E++ £29	Sigma 28mm F1.8 AF..... Unused £99	350mm F4 Tele Apo Tessar..... E++ £3,999	
Speed Grip S..... E++ £35	Sigma 50mm F2.8 EX DG Macro..... E++ £149	1.4x Mutar Converter..... Mint-£499	
	Sigma 70mm F2.8 EX DG Macro..... E+ £179	220 Vacuum Film Insert..... E++ / Mint-£89 - £99	
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EOS IV + BP-E1 Battery Grip..... E+ £219	Sigma 70-210mm F2.8 Apo..... E+ £99	Cable Switch LA50..... E++ £25 - £29	
EOS IV Body Only..... E+ £199 - £329	Sigma 100-300mm F4 Apo EX HSM..... E+ £249	GB71 Hood..... E+ / E++ £49 - £79	
EOS 1N Body Only..... E+ £79 - £89	Sigma 105mm F2.8 Macro EX DG OS HSM..... E++ £259	GB72 Hood..... E+ £59	
EOS 1 + E1 Booster..... As Seen / E+ £79	Sigma 120-300mm F2.8 EX DG OS HSM S..... E++ £1,599	GB73 Hood..... E+ £49	
EOS 1 Body Only..... E+ £79 - £89	Sigma 135-400mm F4.5-5.6 Apo..... E++ £1,179	GB74 Hood (210mm)..... E+ £39	
EOS 3 Body Only..... E+ £99	Sigma 150mm F2.8 EX DG Macro HSM..... E++ £299 - £319	H10 Digital Back..... As Seen £499	
EOS 30 Body Only..... E++ £59 - £119	Sigma 150-500mm F5.6-6.3 APO DG OS HSM..... E+ / E++ £399 - £439	Large System Bag..... E++ £179	
EOS 30 Date Body Only..... E+ £69	Sigma 170-500mm F5-6.3 Apo..... E+ £149	Mag + 220 Insert..... E++ £129	
EOS 30E Body Only..... As Seen £39	Sigma 300mm F2.8 Apo..... Unused £299	MFB-2 Polaroid Mag..... Exc / Mint-£35 - £99	
EOS 5 + 35-80mm + VG10 Grip..... E+ £49	Sigma 300mm F2.8 Apo DG HSM..... E++ £1,289	MSB1 Flash Bracket..... E++ £149 - £199	
EOS 5 Body Only..... E+ £59	Sigma 300mm F2.8 Apo EX DG HSM..... E++ £1,499		
EOS 50E + BP50 Grip..... As Seen £39	Sigma 300mm F4 Apo..... E+ / E++ £149 - £159	Contax G Series	
EOS 50E Body Only..... E+ £49	Sigma 400mm F5.6 Apo..... E+ £79 - £125	G1 Body + GD1 Back..... E+ £169	
EOS RT Body Only..... Unused £149	Sigma 500mm F4.5 Apo EX HSM..... E+ £1,739	G1 Body Only..... E+ £169 - £179	
10-22mm F3.5-5.6 EFS IS..... E+ / E++ £249	Tamron 10-24mm F3.5-5.6 Di II LD Asph..... E++ £249	G1 Body Only + GA1 Adapter..... E+ £199	
14mm F2.8 L USM..... Exc £539	Tamron 14mm F2.8 Asph (IF) AF SP..... E++ £349	21mm F2.8 G + Finder - Black..... E+ £589	
14mm F2.8 L USM II..... E+ / E++ £1,079 - £1,089	Tamron 28-75mm F2.8 XR Di..... E++ £189	35-70mm F3.5-5.6 G Vario..... E++ £399	
15mm F2.8 EF Fisheye..... E++ £379	Tamron 35mm F1.8 Di VC USD..... E++ £379	90mm F2.8 G - Black..... E++ £299	
15-85mm F3.5-5.6 IS USM..... Mint-£389	Tamron 70-200mm F2.8 SP LD..... E+ £299	16mm Viewfinder..... Mint-£199	
17-40mm F4 L USM..... E+ £329 - £339	Tamron 70-300mm F4-5.6 Di VC USD..... E+ £189	GC11 Case (G1)..... E+ £39	
17-55mm F2.8 EFS IS USM..... E++ £349	Tamron 90mm F2.8 SP AF Macro..... E+ / E++ £159 - £219	GC21 CASE (G2)..... E+ £69	
17-85mm F3.5-5.6 IS USM..... As Seen £79	Tamron 180mm F3.5 Di Macro..... E+ £299	Samsung NX10 + 18-55mm OIS..... E+ £159	
18-55mm F3.5-5.6 EFS..... E+ £49	Tokina 10-17mm F3.5-4.5 DX Fisheye..... Ex Demo £469	Samsung NX11 + 18-55mm OIS..... E++ £169	
18-55mm F3.5-5.6 EFS III..... E++ / Mint-£59	Tokina 12-24mm F4 ATX PRO SD..... E++ £219	TLA140 Flash..... As Seen / Mint-£49	
18-55mm F3.5-5.6 EFS IS..... E++ £59 - £79	Tokina 17mm F3.5 RMC..... E+ £139	TLA200 Flash..... E+ £79	
18-55mm F3.5-5.6 IS STM..... Mint-£89	Tokina 28-80mm F2.8 ATX Pro..... E++ £179	TLA200 Flash (Black)..... E++ £129	
20mm F2.8 USM..... E+ £199	Tokina 35mm F2.8 Macro DX ATX..... E++ £245		
22mm F2 STM..... E++ / Mint-£89	Tokina 50-135mm F2.8 DX ATX..... E++ £299	Contax SLR Series	
24mm F2.8 IS USM..... Mint-£299	Tokina 300mm F2.8 ATX SD..... E+ £599	N1 + 24-85mm..... E++ £449	
24mm F3.5 L TSE..... E+ £699	Walimex 14mm F2.8 Pro..... Mint-£199	N1 Body Only..... E++ £249	
24-70mm F2.8 L USM..... E+ / E++ £579 - £689	Zeiss 21mm F2.8 ZE..... E++ £169	NX Body Only..... E++ £169	
24-70mm F4 L IS USM..... Mint-£489 - £579	Zeiss 28mm F2 ZE..... Exc / E+ £399 - £469	AX Body Only..... E+ £199	
24-105mm F4 L IS USM..... E++ £399 - £429	Sigma 1.4x AF Tele Converter..... E+ £59	RTS3 Body Only..... E+ £299	
28mm F1.8 USM..... E++ £279	Sigma 1.4x Apo EX DG Converter..... E++ £99	ST Body Only..... E+ £199	
28-70mm F2.8 L USM..... E+ £369	Kenko 1.4x Converter DGX Pro300..... E++ / Mint-£79	Arja Body Only..... E++ £129	
28-80mm F2.8-4 L USM..... E+ £349	1.4x EF Extender..... E++ £119	RTS2 Body Only..... E+ £229	
35-350mm F3.5-5.6 L USM..... Exc / E+ £499	1.4x EF II Extender..... E++ £179	16MT Body Only..... Exc £39	
45mm F2.8 TS-E..... E++ £799	1.4x EF MkIII Extender..... Mint-£249	137MA Body Only..... E+ £69	
50mm F1.0 L USM..... Mint-£2,750	2x EF Extender..... As Seen / E++ £79 - £129	137MD Body Only..... E+ £35	
50mm F1.2 L USM..... E++ £769		28-70mm F3.5-5.6 MM..... E++ £249 - £259	

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Sigma 10-20mm F4-5.6 EX DC HSM.....	E+ £159
Olympus 11-22mm F2.8-3.5 Zuiko.....	E+ / Mint- £199 - £249
Olympus 12-60mm F2.8-4 ED SWD.....	E+ £259 - £349
Panasonic 14-150mm F3.5-5.6 Asp.....	E++ £489
Olympus 14-35mm F2 SWD.....	E++ £889
Olympus 14-42mm F3.5-5.6 Zuiko.....	E++ £59
Olympus 14.45mm F3.5-5.6 Zuiko.....	As Seen £29
Panasonic 14-50mm F2.8-3.5 OIS Asp.....	E++ £149
Olympus 14-54mm F2.8-3.5 Zuiko.....	E+ / E++ £129 - £149
Olympus 18-180mm F3.5-6.3 Zuiko.....	E++ £219
Olympus 35mm F3.5 Macro Zuiko.....	E++ £129
Olympus 40-150mm F4-5.6 ED Zuiko.....	E+ / E++ £39 - £49
Olympus 50-200mm F2.8-3.5 SWD.....	E+ / E++ £419 - £449
Olympus 50-200mm F2.8-3.5 Zuiko.....	E++ £299
Olympus 50mm F2 ED Macro Zuiko.....	E++ £219 - £249
Sigma 70-200mm F2.8 Apo EX DG HSM.....	Mint- £349
Olympus 70-300mm F4-5.6 ED Zuiko.....	Mint- £199
Olympus EC-14 Tele Converter.....	E++ £199
Olympus EC20 2x Tele Converter.....	E++ £229

Micro 4/3rds Lenses

Samyang 7.5mm F3.5 UMC Fisheye.....	E++ £179
Panasonic 12-35mm F2.8 G Vario OIS.....	E++ £499
Olympus 12-40mm F2.8 M.Zuiko.....	E++ / Mint- £469 - £499
Olympus 12-50mm F3.5-6.3 M.Zuiko.....	E+ £139
Panasonic 12.5mm F12 G 3d.....	E++ / Mint- £59 - £79
Olympus 12mm F2 ED M.Zuiko.....	Mint- £429
Panasonic 14-42mm F3.5-5.6 Asp OIS.....	E++ / Mint- £69 - £79
Olympus 14-42mm F3.5-5.6 EZ M.Zuiko.....	Mint- £129
Panasonic 14-45mm F3.5-5.6 Asp.....	E++ £129 - £149
Olympus 17mm f1.8 M.Zuiko Black.....	Mint- £279
Olympus 17mm F2.8 M.Zuiko.....	E++ £129
Sigma 19mm F2.8 DN.....	Mint- £89
Voigtlander 25mm F0.95 Nokton.....	E+ £439
Panasonic 25mm F1.4 DG Summilux.....	E+ £269
Panasonic 35-100mm F2.8 GX OIS Vario.....	Mint- £649
Panasonic 35-100mm F4-5.6 OIS Asp G.....	Mint- £179
Panasonic 45-200mm F4-5.6 OIS.....	E++ £159 - £169
Panasonic 45mm F2.8 DG ASP Macro.....	Mint- £349
Olympus 75mm F1.8 ED Silver M.Zuiko.....	E++ £479 - £499

Sony NEX Lenses

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18-200mm F3.5-6.3 OSS.....	E++ £369
18-55mm F3.5-5.6 OSS.....	Mint- £89
24-70mm F4 FE ZA OSS.....	Mint- £599 - £629
28-135mm F4 FE PZ OSS.....	Mint- £1,349
30mm F3.5 E Macro.....	Mint- £109
35mm F2.8 FE ZA.....	Mint- £389
50mm F1.8 OSS.....	Mint- £139
55-210mm F4.5-6.3 OSS.....	E++ / Mint- £119
Sigma 19mm F2.8 DN.....	Mint- £89
Zeiss 32mm F1.8 Touit E.....	Mint- £269

Digital SLR Cameras

Canon EOS 1DX Body Only.....	E+ £2,989
Canon EOS 1D MKII Body Only.....	E+ £1,349
Canon EOS 1D MKIII Body Only.....	E++ £579
Canon EOS 1D MKIII Body Only.....	As Seen £249
Canon EOS 1D MKII Body Only.....	As Seen £199
Canon EOS 5D MKIII Body Only.....	Mint- £1,599
Canon EOS 5D MKII Body Only.....	As Seen £499
Canon EOS 5D Body Only.....	E+ £279
Canon EOS 7D Body Only.....	Mint- £399
Canon EOS 60D Body Only.....	E++ £299
Canon EOS 50D + BG-E2 Grip.....	E+ £249
Canon EOS 50D Body Only.....	As Seen £129
Canon EOS 40D + BG-E2 Grip.....	E+ £99
Canon EOS 30D Body Only.....	As Seen / E++ £79 - £99
Canon EOS 20D + BG-E2 Grip.....	E+ £89
Canon EOS 100D Body Only.....	E++ / Mint- £189 - £219
Canon EOS 300D Body Only.....	As Seen £49
Canon EOS 350D Body Only.....	As Seen £49
Canon EOS 500D Body Only.....	As Seen / E+ £119 - £169
Canon EOS 700D Body Only.....	Mint- £299
Canon EOS M + 18-55mm.....	Mint- £199
Canon EOS M2 + 18-55mm STM.....	E++ £219
Canon EOS M3 + 18-55mm + DC1 Finder.....	Mint- £399
Canon EOS M3 + 22mm.....	E++ £339

Nikon D3S Body Only.....	E+ / E++ £1,749
Nikon D3X Body Only.....	E+ £1,189
Nikon D3 Body Only.....	As Seen / E+ £399 - £749
Nikon D2X Body Only.....	E++ £325
Nikon D2HS Body Only.....	E++ £299
Nikon D800E Body Only.....	E++ £1,179
Nikon D800 Body Only.....	E+ / Mint- £989 - £999
Nikon D610 Body Only.....	E++ / Mint- £699 - £839
Nikon D300 + MB-D10 Grip.....	E+ £249
Nikon D300 Body Only.....	E+ £199
Nikon D200 Body Only.....	E+ £129
Nikon D90 Body Only.....	E++ £179
Nikon D80 Body Only.....	Exc £99
Nikon D70 Body Only.....	As Seen / E+ £79
Nikon D50 Body Only.....	E++ £79
Nikon D7000 Body Only.....	E+ £289
Nikon D5500 + 18-140mm.....	Mint- £559
Nikon D5300 Body Only.....	E++ / Mint- £289 - £319
Nikon D5100 Body Only.....	Mint- £179
Nikon D5000 Body Only.....	E++ £129
Nikon D3300 Body Only.....	Mint- £179
Olympus E1 + HLD-2 Battery Grip.....	Mint- £189
Olympus E420 + 14-42mm.....	E+ £149
Olympus E450 + 14-42mm.....	E+ £129
Olympus E600 + 14-42mm + 40-150mm + Grip.....	E+ £259
Olympus E600 Body + HLD-5 Grip.....	Mint- £299
Olympus E620 + 14-42mm + 40-150mm.....	E++ £339
Pentax K3 + 18-55mm WR.....	Mint- £569
Pentax K3 Body Only.....	Mint- £529
Pentax K5 Black Body Only.....	E++ £219
Pentax KX + 18-55mm.....	E+ £139
Pentax K100D Body Only.....	E++ £89
Pentax 'sT DL Body Only.....	E+ £79
Pentax 'sT D + 18-55mm.....	E++ £99
Samsung GX10 + 18-55mm + Grip.....	E+ £89
Sigma SD1 Merrill + 105mm + EF610 Flash.....	Mint- £849
Sony A230 + 18-55mm.....	E+ £129
Sony A3000 + 18-55mm.....	Mint- £149
Sony A390 + 18-55mm.....	As Seen £99
Sony A450 Body Only.....	E+ £119
Sony A58 Body Only.....	E+ £189
Sony A700 Body + VG-C70AM Grip.....	E++ £269

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H4D Complete (60MP).....	E++ £11,499
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H4D Complete (40MP).....	E+ £4,999
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H3DII Complete (50MP).....	E++ £5,499
H3DII Complete (39MP).....	E++ £3,900
H3D Complete (39MP).....	E+ £2,099
H2 Complete.....	E+ £1,789
H2 Body + Prism + Mag.....	E++ £1,250
H1 Body Only.....	E+ / E++ £689
28mm F4 HCD.....	E++ / Mint- £1,989 - £2,450
35mm F3.5 HC.....	Exc / E+ £999 - £1,199
50mm F3.5 HC.....	E+ / E++ £1,199 - £1,299
50-110mm F3.5-4.5 HC.....	E+ £1,499
120mm F4 HC Macro.....	E+ / E++ £1,449 - £1,589
150mm F3.2 HC.....	E+ / E++ £989 - £1,199
1.5x HTS Tilt/Shift Converter.....	Mint- £2,495
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Cable Release H.....	E+ £19
Extension Tube H 13mm.....	E++ £125
Extension Tube H 26mm.....	E++ / Mint- £129 - £149
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HVM Magnifying Hood.....	E+ £189
Release Cord H.....	Mint- £39

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M Monochrom Black Body Only.....	E++ / Mint- £3,489 - £3,889
M-P Black Body Only.....	Mint- £3,989
M-P Chrome Body Only.....	Mint- £4,299
M (240) Black Body Only.....	E+ / E++ £3,099 - £3,399
M (240) Chrome Body Only.....	E+ / E++ £3,349
M-E Anthracite Body Only.....	E++ / Mint- £2,489 - £2,789
M9P Black Body Only.....	E++ £2,499
M9 Black Body Only.....	E+ / E++ £2,099 - £2,299
M8 Chrome Body Only.....	E+ £699

M6 Platinum + 50mm F1.4.....	Mint £6,449
M6 TTL Millennium + 35mm F2 + 50mm F1.4.....	E++ £5,489
M6 Titanium + 35mm F1.4 + 50mm F1.4.....	E++ £4,489
M6 Titanium + 35mm F1.4.....	E+ £3,449
M6 Historica Edition.....	Mint £3,799
MP 0.72x Black Body Only.....	E++ £2,595
M7 0.72x Chrome Body Only.....	E++ £1,499
M6 TTL 0.58x Black Body Only.....	E+ £749
Konica Hexar RF Limited Edition.....	Mint £2,489
Konica Hexar RF + 50mm F2 + Flash.....	E+ / E++ £749 - £799
16/18/21mm F4 Tri Elmar + Finder.....	Mint- £2,989
21mm F2.8 Asp M Black.....	E++ / Mint- £1,399 - £1,499
21mm F2.8 Asp M Black 6bit.....	E++ £1,499
21mm F2.8 M Black.....	Exc / E++ £849 - £1,199
21mm F3.4 Black.....	E+ £599
21mm F3.4 Super Elmar.....	Mint- £1,799
21mm F4 Chrome + Finder.....	E+ £1,149
24mm F2.8 Asp M Black.....	Exc / Mint- £949 - £1,349
24mm F2.8 Asp M Black 6bit.....	E++ £1,489
24mm F3.8 Asp M Black.....	Mint- £1,189 - £1,199
28/35/50 F4 Tri Elmar.....	E++ £2,399
28mm F2 Asp M Black.....	E+ £1,399
28mm F2 Asp M Black 6bit.....	E+ / E++ £1,449 - £1,589
28mm F2.8 Asp M Black 6bit.....	Mint- £1,129 - £1,149
28mm F2.8 M Black.....	E+ £689
35mm F1.4 Asp M Black.....	E+ £1,689
35mm F1.4 Asp M Black 6bit.....	E++ / Mint- £2,439 - £2,749
35mm F2 Asp M Black 6bit.....	E++ £1,449
35mm F2 Asp M Chrome.....	E+ £1,289
35mm F2 Black.....	E+ £799
35mm F2 M Black.....	E+ £949
35mm F2.4 Asp M Black 6bit.....	Mint- £1,149
35mm F2.5 M Black 6bit.....	E++ / Mint- £739 - £779
50mm F0.95 Asp M - Black.....	Mint- £6,399
50mm F0.95 Asp M 6bit - Black.....	E+ £5,989
50mm F1.4 Asp M Chrome 6bit.....	E++ £1,889
50mm F1.4 Black.....	E+ £1,299
50mm F1.4 Chrome.....	E+ £689 - £799
50mm F1.4 M Black.....	E++ £1,399
50mm F2 Collapsible.....	As Seen £289
50mm F2 M Black.....	E+ / E++ £549 - £599
50mm F2 M Black - Anniversary Edition.....	E+ £949
50mm F2 M Black 6bit.....	E+ / Mint- £1,049 - £1,149
50mm F2 M Chrome.....	E++ £989
50mm F2.4 M Black 6bit.....	Mint- £999
50mm F2.8 M Black.....	Mint- £599
50mm F2.8 M Chrome.....	E++ £549
65mm F3.5 Elmar.....	E+ / E++ £249 - £299
65mm F3.5 Elmar + 16464k Tube.....	E+ £349
75mm F2 Apo M Black 6bit.....	E++ £1,749 - £1,789
75mm F2.5 M Black 6bit.....	E++ £729
75mm F2.5 M Black 6bit + Hood.....	E++ £749
90mm F2 Apo M Black.....	E++ £1,699
90mm F2 Apo M Black 6bit.....	E++ £1,749 - £1,879
90mm F2 Black.....	E++ £639
90mm F2 M Black.....	E++ £799 - £999
90mm F2 M Chrome.....	E++ £949
90mm F2.4 M Black 6bit + Hood.....	Mint- £1,049
90mm F2.5 Black 6 BIT + Hood.....	E++ £799
90mm F2.5 M Black 6bit.....	E++ £749
90mm F2.8 Black.....	As Seen £199
90mm F2.8 Chrome.....	As Seen / E+ £179 - £299
90mm F2.8 M Black.....	E+ / E++ £699 - £799
90mm F4 Elmar.....	E+ £199
90mm F4 Collapsible.....	As Seen £159
90mm F4 Collapsible.....	E+ / E++ £249 - £299
90mm F4 Elmar.....	Exc / E+ £149 - £199
90mm F4 Elmar E39.....	E+ £199
90mm 14 M Rokkor.....	E+ / E++ £189 - £249
90mm F4 Macro M Set 6bit.....	E+ / Mint- £1,649 - £1,949
135mm F2.8 Black.....	Exc / E+ £199 - £269
135mm F2.8 M Black.....	E++ £399
135mm F3.4 Apo M Black.....	E+ £1,489
135mm F4 Black.....	E+ £289 - £349
135mm F4 Chrome.....	E+ £249
135mm F4.5 Hektor.....	As Seen £45
135mm F4.5 Hektor + Tubes.....	As Seen £119
1.25x Viewfinder Magnifier.....	E+ / Mint- £119 - £139
1.4x Viewfinder Magnifier M.....	Mint- £149
18mm Chrome Viewfinder.....	E++ £379

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7 Gadgets to make photography more fun

Are you hankering after something to spice up your photography? Here's how to inject the fun back into your hobby with a few creative gadgets.

1 iON SnapCam

One of the sleekest and most sophisticated wearable cameras around, the iON SnapCam is a perfect way to produce images with a different perspective to the usual. Simply clip it onto your clothes (it's 1.5in square and weighs less than an ounce, so you'll barely feel it) and you're ready to shoot – tap once to take an instant still or twice to start recording HD video. You can easily pair it with your smartphone to download and share your shots.

2 Fuji InstaxShare SP-1

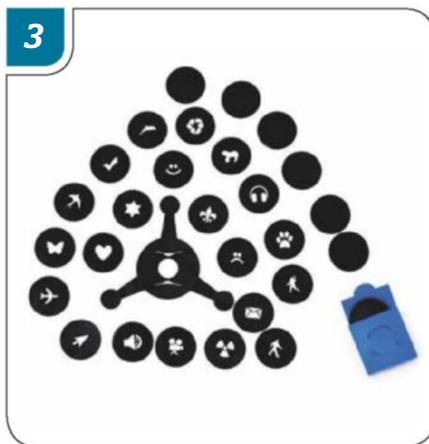
A perfect way to make your smartphone memories more tangible, the Fuji InstaxShare SP-1 is an instant printer that can connect wirelessly to your phone and produce small prints of your favourite shots. It's compact enough to carry everywhere with you, and the prints it produces are of surprisingly decent quality considering its small size.

3 Bokeh Masters Kit

A fun creative project from the folks at PhotoJoJo, the Bokeh Masters kit provides a selection of templates with which you can shape the bokeh (out-of-focus areas) in your night shots. Add sparkling hearts, faces or other shapes to the background of your images for a surreal, dreamlike quality – the kit contains more than 20 different shapes, allowing you to experiment to your heart's content.

4 Fisheye lens

If you feel like your images are getting a little samey, shooting with the exaggerated perspective of a fisheye lens could be just what you need to start thinking creatively and get out of the rut. The strong visual distortion can be tough to get used to, but once you master it you'll be producing some seriously interesting and different images.



5 Pixelstick

Ever tried light painting? Using long exposures and lights to create unique patterns and shapes in your images is not nearly as difficult as it looks, especially once you get yourself a product like a Pixelstick. Its 200 LEDs provide you with an incredibly versatile tool to create innovative light-painting images. Plus when you're using it you can pretend you're holding a lightsaber, which is everyone's dream. Admit it.

6 Rogue FlashBender

A flashgun for extra illumination is an incredible tool that can offer a new lease of life on your photography, but you have to know how to use and control it. The Rogue Flashbender is an awesome tool which allows you to do exactly that – essentially it's a malleable light modifier that you can fit over a flashgun to control the shape and power of the light. It's easy to get used to, and the best way to get to grips with one is to try it out for yourself. The experimenting is the most enjoyable part!



7 Peak Design Capture Lens

Having to change lenses is a fiddly process that can really suck the fun out of a shoot, especially when it causes you to miss a crucial moment. The Peak Design Capture Lens system is designed to make this process as easy and streamlined as possible, essentially functioning as a spare lens holder and allowing you to perform lens changes one-handed. Holding your spare lens securely and making you feel somewhat cool to boot, the Capture Lens is a perfect roaming photography companion.



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