



The Newsletter of E.J. Peiker - Nature Photographer

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Oxbow Bend Sunset - Grand Teton National Park, Wyoming (Nikon D3x, 70-200mm)

Photokina 2016

It's September in an even numbered year so it must be Photokina time! Photokina is the photography industry's largest trade show and is held in Cologne, Germany every two years. In the couple of months leading up to Photokina, most camera gear manufacturers begin to announce a wide array of new products which are often first seen by the public at Photokina. Many new products are also introduced at the show. Here are some of the most notable new items that may interest my readers from the major players this year:

Canon:

The most popular line of full frame DSLRs in the world gets an update with the introduction of the EOS 5D Mk IV. Notable upgrades include a new 30 megapixel sensor with on-sensor A/D conversion promising improved dynamic range in the 5D series (the 5D Mk II and 5D Mk III Achilles Heel), a significantly upgraded wider coverage 61 point autofocus system, full 4K video, GPS, NFC, WiFi, dual pixel live view AF, upgraded RGB metering system, and touchscreen. Along side of the 5D Mk IV, Canon also introduced updated versions of their 24-105mm workhorse zoom lens, dubbed the 24-105mm f/4L Mk II and a new 16-35mm f/2.8L Mk III lens which promises to clean up the weak corner performance of the lens it replaces. Hopefully the 24-105 Mk II will address the horrible corner performance of the original 24-105 at wide angles. Canon's lenses of late have been nothing short of amazing so my hopes are high that this will be the case.

The 5D Mk IV has been dubbed a jack of all trades and master of none offering. This can be a good thing or a bad thing depending on your perspective. While it offers a lot, it inexplicably leaves out some things or intentionally dumbs down some features which it shouldn't given the competition and the \$3500 price point. For example, flash sync is just 1/200 sec, the video format, while 4K, uses a 17:9 aspect ratio which no TV on the market offers and it leaves out the much more common 16:9 UHD standard which 4K TV's on the market currently use. It also does not include an advanced CODEC and uses Motion JPEG instead resulting in file sizes that are 4 times as large as the competition



without really offering any benefit. There are no zebras or focus peaking. Finally, 4K is only available in a 1.74x crop mode which makes it very difficult to get wide shots and there is no log profile, something that some \$600 point and shoots have and it is mind boggling that there is no uncompressed HDMI out. Clearly Canon crippled this camera for videographers to try to get them to buy an EOS-Cinema camera. These exclusions break with the legacy of the 5D series as being exceptional video DSLR. At this price point and even significantly lower, as low as \$1000, there are dramatically better 4K cameras out there, even ones that can accept Canon lenses. The camera includes an anti aliasing filter, something that virtually no other manufacturer does in this class of camera which can be great for video shooters but reduces the resolution for still photographers. It is, however, a highly customizable camera with probably the best live view AF system in a DSLR on the market utilizing a second generation of Canon's dual pixel AF system. It also has an excellent but overly complex phase detection AF system and it has the best touchscreen implementation in a DSLR. In the end, you have a camera with just 30 megapixels while the competition has been at 36 and 42 for years with better dynamic range but it is a lot more efficient with storage space, especially compared to the 42mp Sony offering which does not have a lossless compressed RAW file option. The

Canon CR2 format is an excellent RAW format providing a very efficient file size without losing anything in the compression. It also offers less resolution than the similarly priced and slightly older 50mp EOS 5DS(R) offering (which has much worse dynamic range and noise than any other camera it competes with) and massive compromises for the videographer. But on the other hand it offers quite a bit of everything, it just isn't the best at anything thus the "jack of all trades, master of none" moniker. The 5D Mk IV will be a highly successful camera, especially among wedding photographers where it will literally own the market. Many of the shortcomings could be addressed with firmware if Canon chooses to but for now, the camera is receiving a bit of a cool reception from most pundits, especially on the video side. As is the case with most cameras, the Canon fanboy base is going crazy defending every decision, no matter how short sighted it might be. For most still photographers it is a great upgrade to the 5D Mk III although for a pure landscape photographer, the 5DSR might be a better choice, especially if willing to take a second overexposed shot for better and lower noise shadows in high dynamic range scenes and then combining the two shots in post processing. For the photographer that wants a single camera that can be pressed into service for both landscape and wildlife photography with the occasional video, there is a lot to like in the 5D Mk IV. I did get to spend a short amount of time with a production 5D Mk IV and for what I do with a camera like this, namely landscape photography, it is quite inferior to the 2.5 year old D810 but as a wildlife camera, it is superior to a D810 due primarily to the higher frame rate.

On the mirrorless camera front, Canon finally introduced a highly capable camera with the 24 megapixel APS-C EOS M5. The camera is a very well specified offering for the still photographer. It has a viewfinder bump which Canon hopes will attract more buyers. The downright awful autofocus, compared to the competition, of earlier EOS-M generations has been replaced by Canon's outstanding dual pixel CMOS AF. The latest image processing engine, the same one used in their high end professional bodies, has been included. The EVF is also first rate sporting 2.36 million dots; the fully functional tilt screen is a 1.62 million dot panel; there is WiFi, Bluetooth, 9 frame per second shooting and much more. The controls of the camera are well thought out making the M5 a photographer friendly body, even for the advanced photographer that wants a high level of manual controls. Unfortunately, Canon still seems to see this as a minor business that they don't want to impinge on their DSLR and video camera business. This is evidenced by the amateurish lens offerings despite the EOS M line being out for 4 years now. Also the lack of 4K video, which virtually every other camera in the class and many in a lower classification of cameras have, indicate a lack of seriousness. There are simply no serious lenses - they are plastic, slow aperture kit lenses so forget about shallow depth of field, portraiture, sports, etc. You can adapt Canon EF lenses but then you are hanging a huge lens out in front of a tiny APS-C mirrorless body with an adapter in between the lens and the camera. And quite frankly, if you really wanted to use Canon EF lenses with an adapter on a mirrorless camera, the Sony a7 series is vastly superior in every respect and you do not lose AF. One of these days Canon will get serious about mirrorless, for now, the M5 starts to delve into serious photography territory but the native EOS-M lens line needs some serious work. Speaking of lenses, the latest offerings introduced with the EOS M5 is the 18-105mm f/3.5-6.3 kit lens and a 70-300 f/4-5.6 which will provide quite a bit of reach in a native EF-M lens.

Fujifilm:

The much anticipated Fuji X-T2 was announced a couple of months ago and should be shipping by the time you read this. This is the much anticipated update to one of the few true traditional photographer cameras on the market. I have often written how incredibly good the handling of the X-T1 is for a photographer that started in the film days with full manual controls at their fingertips for everything. The X-T2 only makes this better while jumping from a 16mp APS-C sensor to a 24 megapixel sensor. It adds a new 325 point AF system of which 169 are phase detect and a joystick to quickly select them. The viewfinder is an upgraded and full featured 2.36 mega-dot OLED with a respectable refresh rate. The camera can shoot at 8 FPS without the optional battery grip and at 11 FPS with it. If the AF system passes muster, and so far it looks promising, this could be one of the best action oriented mirrorless cameras on the market. The X-T2 also

has dual SD card slots, something sorely missing from most competitor's mirrorless offerings. The screen is the articulating type but unfortunately does not offer touch controls. For the still photographer this is probably fine given the fully manual control dials offered in this camera but this camera significantly ups the game for video in a Fuji camera where touch screens are extremely useful. Video formats up to 4K UHD are offered including a log profile and uncompressed HDMI out. Price of the X-T2 is \$1600.



While I expected it, I am disappointed that the X-T2 still uses Fuji's X-trans filter array. X-trans offers some minor benefits and market differentiation for Fuji but I feel that these benefits are far outweighed by the difficulty that one can have in getting really good RAW conversions, especially at green/white edges. If only Fuji would also offer a Bayer array sensor version of this camera, I would immediately proclaim it to be the best APS-C camera in the world, bar none - well, at least to me. The controls are just a dream to work with, the lenses are outstanding, the body has all the features a serious photographer needs, it just uses this non-conventional filter array over the sensor.

In addition to the X-T2, Fuji also announced a relatively fast moderate wide angle 23mm f/2 lens which is approximately equal to a 35mm f/2.8 in the full frame world from an angle of view and depth of field perspective.

At the Photokina show, Fuji finally announced the worst kept secret in the industry, Fuji's entry into the integrated medium format digital camera arena previously occupied only by Phase One, Hasselblad and Pentax. The Fuji GFX 50S utilizes the same Sony 50 megapixel 44x33mm cropped medium format sensor announced by Hasselblad in the X1D (see below) and the Pentax 645z but its microlens design has been customized for Fuji. Both Phase One and Hasselblad also offer this sensor as their low end offering in their modular full feature medium format systems. Fuji has developed a new electronic mount called the G-mount for this camera. The body looks very much like a larger version of the X-T2 but with a top LCD. This is a very good thing as I've already described above. It offers many aspect ratios and crop modes from square to a 617 style wide panorama format and several in-between in a mirrorless design with a flange distance of only 26mm. It also has a focal plane shutter which makes it possible to adapt other medium format lenses. The viewfinder is interchangeable - you can shoot it without a viewfinder like a point and shoot utilizing the rear LCD, with a traditional prism shaped viewfinder with EVF or with a fully rotating viewfinder. A vertical grip for the camera was also announced. Fuji plans to ship the GFX in the first half of 2017.

In addition to the medium format GFX 50S camera, Fuji announced three G-mount lenses designed for resolutions beyond 100 megapixels in the 44x33 format available at launch. The lenses are a 63mm f/2.8 (52mm horizontal field of view full frame equiv), 32-64mm f/4 (26-52mm), 120mm f/4 macro (100mm) with a commitment to later introduce a 45mm f/2.8 (37mm), 23mm f/4 (19mm), and 110mm f/2 (91mm).

Hasselblad:

Prior to Fuji's launch, Hasselblad rocked the camera world with the introduction of the cropped medium format X1D mirrorless camera. This is a beautifully Swedish handcrafted 50 megapixel camera utilizing Sony's exceptional 44x33mm cropped medium format sensor (already in use by Phase One in the XF-

50mp, Hasselblad in the H6D-50, and Pentax in the 645Z) in a camera that is smaller than a traditional DSLR and only a little bigger than a full frame mirrorless camera like the Sony a7R Mk II. Up until now, medium format cameras have been nearly 2 times the size and weight of a traditional full-sized pro DSLRs like the Nikon D5 or Canon 1Dx Mk II. The camera will initially launch with 90mm and 45mm lenses (35mm full frame horizontal equivalent of 37 and 74mm) with a 30mm to follow (25mm equivalent). The camera will retail for \$9000; with one lens it will cost \$11,300 or one can get it bundled with both initial lenses for \$14,000.



The design of the X1D is a clean sheet design with a very logical, almost iPhone like, user interface which should make it very quick and easy to learn to use for most people. The overall fit and finish is like that of a very fine luxury car - everything fits perfectly and has a luxurious feel to it. The camera uses a large EVF or you can use the rear LCD to compose. The AF system is unfortunately just a slow, but accurate, contrast detect AF system as the sensor used does not employ phase detection AF points - no medium format sensor currently in production has on sensor PDAF. The camera also offers 1080P HD video and is compatible with H series lenses through an adapter opening up the focal length range dramatically. Finally, the camera utilizes the Nikon flash hot shoe and flash system. Overall, as a first integrated mirrorless medium format camera, the X1D appears to be a success but if they don't start shipping it in volume soon, the luster created by its announcement could wear off quickly as it is already a month late from the initial shipping date stated by Hasselblad - the very first handful of cameras are just starting to trickle out but the firmware still needs a bit of work.

Leica:

Leica announced the following new lenses for its 24 megapixel full frame sensor SL body which had just two zoom lenses for a total range from 24-280mm prior to this announcement. This rounds out the lens lineup nicely:

Leica Summilux-SL 50mm f/1.4 ASPH

Leica APO-Summicron-SL 75mm f/2 ASPH

Leica APO-Summicron-SL 90mm f/2 ASPH.

Leica Summicron-SL 35mm f/2 ASPH

Leica Super-Vario-Elmar-SL 16-35mm f/3.5-4.5 ASPH

By the way, the Leica SL is a gorgeous and exceptionally built camera but it isn't any more capable than cameras costing under \$2000 (Sony a7 Mk II) despite its \$7500 price tag.

Nikon:

This has been a quiet Photokina for Nikon having launched the D5 and D500 professional camera pair much earlier in the year. Apparently they exhausted themselves. A few weeks before Photokina Nikon introduced the low-end entry level D3400 which offers virtually nothing over its predecessor and is an incredibly disappointing offering. On the lens side, Nikon did introduce a really exciting lens for the portrait photographer - a professional grade 105mm f/1.4 lens that is simply phenomenal. They still aren't shipping the trio of DL compacts based on a 1" sensor. There's is also nothing on the serious mirrorless camera

front and the changeover from the mechanical aperture actuator to the electronic one that is so much more reliable also seems to have slowed as no new lenses were introduced. During Photokina itself, Nikon concentrated on some new action cams which had been intentionally leaked before the show, a segment that has been a dismal failure over the last couple of years after the initial GoPro novelty wore off.



Olympus:

Olympus updated its excellent OM-D E-M1 body with the OM-D E-M1 Mk II (that's a crazy complex product name). The OM-D E-M1 is probably the second best laid out camera on the market after the Fuji X-T series and the Mk2 keeps this alive. Unfortunately, like the Panasonic offerings below, it is saddled with the smallish micro 4/3 or m43 sensor which is already recording diffraction at f/5.6 and is stuck at 20 megapixels due to this. To go to a higher and more competitive pixel count would bring the diffraction limit even lower. This format is painted into a corner and must do tricks like pixel shift which only works well with still objects just to get to modern resolution

levels. The format is simply better suited for video. The Mk2 does offer 4K video and is a fully featured and specified body overall. Some key features include 18 FPS with full continuous AF and 60 FPS without AF, new AF system that covers nearly the whole frame with 120 on sensor cross-type Phase detect points, new 120 FPS EVF with just a 6ms delay and that runs slightly ahead of the shutter so that what is seen by the eye in the viewfinder is the same as what is being captured - a real innovation in EVF.

A new PEN low end m43 camera, the 16 megapixel E-PL8 was also introduced as was a 25mm f/1.2, a 12-100mm f/4 and 35mm f/3.5 were announced. Finally a high end flash, the FL-900R and an Olympus Pro Service program was announced.

Panasonic:

Panasonic has introduced a number of new products for its video friendly micro 4/3 line of cameras. As stated above, I feel that m43 is a dead end for still photographers as the sensor size is well into diffraction at f/5.6 on the 20 megapixel sensor and increasing resolution beyond 20mp just makes this worse and worse. If they were to put a 24 megapixel sensor into these cameras, even f/4 would be recording diffraction. I see it as mostly an excellent video sensor at this point. In summary Panasonic introduced a 16 megapixel G80/G85 with sensor based image stabilization (IBIS) and 4K video. Overall the camera lags much of the competition in just about everything except it's excellent touch-screen and IBIS. It is basically a re-housing of the rangefinder like GX80 into a weather sealed DSLR styled camera with some firmware updates that will come to the GX80. Panasonic also announced late stage development of the GH5, successor to what is probably the most successful video oriented m43 camera ever, the GH4, and that's where the G5 will find it's home, among video shooters. It offers 4K at 60FPS 10 bit video with 4:2:2 compression which should make it an incredible camera for 4K. There are still some questions on Panasonics claim of 6K but it seems it may just be a 6K still photo capture mode from the 4K video stream. Again, these are really cameras for the video market and I'll likely not cover Panasonic going forward unless they make a shift in their offerings. In addition to the cameras, three new Panasonic Leica lenses were announced, an 8-18mm f/2.8-4, a 12-60mm f/2.8-4, and a 50-200mm f/2.8-4. These look like exceptional lenses for the m43 shooter where the entire focal length spectrum from a full frame equivalent of 16mm to 400mm are covered by relatively fast,

high quality lenses. Do note that due to the small sensor size, for equivalent framing, you get twice the depth of field for a given aperture with m43 than you would with a full frame sensor camera.

Phase One:

The manufacturer of the very high end medium format Phase One system introduced a scaled down version of its 100 megapixel digital back in the IQ1-100. It removes things like WiFi, Live View, Power Sharing, HDMI Out, Electronic First Curtain, camera control from the digital back, and some display options. Another very significant difference is that it only comes with a 1 year warranty compared to a 5 year warranty for the IQ3-100 and there is no free loaner if there is a breakdown. Many accessories that come with an IQ3 system purchase are not included with an IQ1 system purchase including the choice of a lens from the blue ring lens lineup. Removing all of this drops the price of just the digital back (sans camera body) from \$44K to \$33K - add \$5K to either for the back with the new XF camera body. I think for the landscape photographer, the IQ1-100mp removes some features that you would want. For the studio shooter or the shooter or that does most of their shooting at faster shutter speeds where Electronic First curtain isn't a factor, this is a much more affordable solution. Phase One also beefed up their line of Schneider Kreuznach ultra high end "blue ring" lenses with the addition of a 45mm f/3.5 (30mm f/2 horizontal field of view and depth of field equivalent on a full frame DSLR) and a 120mm f/2.8 (80mm f/1.8 equivalent)



Samyang:

Samyang, also known as Rokinon and Bower continues to introduce lenses primarily for Nikon and Canon DSLR mounts and also for Sony E-mount with built in longer flanges on the retrofocus DSLR designs. The latest lenses announced right before Photokina are an 85mm f/1.2 lens and a 14mm f/2.4 lens and are marketed as part of a new premium line from the South Korean lens manufacturer. Both are a third to a half stop faster than the camera manufacturer's own lines. They are manual focus. A few weeks earlier they announced a true Sony FE design with autofocus - a 14mm f/2.8 lens. There is also 30mm f/1.8 as well as a 35mm f/1,2 lens designed for DSLRs with extended barrel models available for Fuji X-mount and Sony E-mount. Samyang lenses have garnered almost a cult following in the astro-photography world over the last couple of years due to very good control of coma. The price/performance ratio on these lenses tends to be very good. While they are usually not quite at the resolution level of the very best lenses, when factoring in the price and their maximum apertures, they are often one of the best values on the market.

Sigma:

The world's largest and best selling third party lens manufacturer introduced three new lenses in their outstanding Global Vision series. For sports and wildlife photographers, Sigma now has a more affordable alternative to Canon, Nikon with the new 500mm f/4 OS Sport lens. For Portrait shooters, the new 85mm f/1.4 Art lens is also a welcome alternative to the manufacturer's lenses. Finally a 12mm-24mm f/4 ultra wide zoom was introduced in the Art line. All of the lenses so far in the Sport and Art lens lines have been superior optically to what the actual camera manufacturers were offering at the time of introduction and a lot less expensive. I expect these new lenses to be at least as good but at a significantly lower price tag as well. The long awaited 24-70 f/2.8 and 70-200 f/2.8 Art/Sport lenses did not materialize unfortunately. Sigma also made a splash in the videography market with the announcement of a whole new line of cine-

lenses which are the aforementioned Art and Sport lenses re-housed with all of the external gearing needed for videography rigs.



Sony:

Sony hasn't abandoned the old Minolta Maxxum mount now called the A-mount or Alpha-mount after all despite mine and many pundits prediction of its demise in the modern world of mirrorless E-mount. They introduced the flagship pro grade Sony a99 Mk II utilizing their excellent 42 megapixel sensor with no AA filter and 5 axis in-body image stabilization (IBIS). The camera can shoot at 12 FPS, auto focus to Ev -4, full pixel read-out 4K video (1 to 120FPS) with full frame and Super 35 4:2:2 HDMI out, two different Log profiles, proper CODECs, Zebras, peaking, time code, etc... It is easily the best specified DSLR/DSLT camera on the market for video blowing away Nikon and Canon offerings. The higher priced Canon EOS

5D Mk IV, the line that created the video in a DSLR for production use category, offers almost none of these video features. The shutter is specified for over 300K actuations. The AF is a hybrid system that combines the 399 on sensor phase detection points with 79 cross type AF points in a traditional center weighted off sensor Phase Detect system. This promises to give DSLR like AF performance for moving subjects with on sensor like AF precision not possible in normal off sensor PDAF systems. As are all Sony A-mount cameras, It is a DSLT not a DSLR, meaning that the mirror does not go up and down, it is translucent (the T in DSLT) meaning it allows the image to pass through a fixed mirror to the sensor. Finally, the camera has a full-featured EVF and fully articulating rear LCD. I am happy to say that they listened to the many professional photographers that have been screaming for a more logical menu structure. Hopefully they can bring this to the other bodies via a firmware update.

While the a99 Mk II is an exceptional camera with a high level of capability, the Sony A-mount lens line-up is not as built out nor as well supported by third parties as the Nikon and Canon lens line-ups are. The longest lens available without going to a third party is 500mm compared to 800mm for brand C and N and a number of specialty lenses are missing or are in need of updating to more modern optics.

Sony was quiet on the E-mount front with just a 50mm f/2.8 Macro lens announced a few weeks ago.

Tamron:

Third party lens maker Tamron has introduced an upgraded version of its 150-600mm f/5-6.3 lens. The new model offers both improved optics and significantly upgraded build quality. Both were sorely needed as the original was easily outclassed on both fronts by the similar Sigma offerings. Testing will tell us for sure if the optics at the long end have improved as much as Tamron's MTF curves suggest. I've had several of the original lenses fail under very tame circumstances during my workshops so the improved build quality is also very welcome. Dedicated 1.4x and 2x teleconverters were also introduced for the 150-600mm lens. The 2x is a head scratcher since that results in a 1200mm f/13 lens on the long end - no autofocus system on the planet can focus that well and the viewfinder image is so dim that makes manually focusing it very difficult. I'm afraid that this will be a largely useless teleconverter that will cause Tamron

more customer support headaches than it will give them satisfied customers. Additionally Tamron introduced a cheap consumer grade 18-270mm f/3.5-6.3 all in one zoom.

Tokina:

Sony a7 shooters will find it exciting that Tokina has entered the FE lens market with a blazing fast professional grade 20mm f/2 lens that includes an aperture ring that can be declicked for video shooters. This is the first lens in a new line of mirrorless offerings under the FiRIN name. While the lens is manual focus, it does transmit EXIF data similar to the Zeiss Loxia offerings.

Zeiss:

Premium lens maker Zeiss rounded out their Milvus line of lenses by adding the 15mm f/2.8, 18mm f/2.8, and 135mm f/2 lenses. This completes the changeover from the older Canon mount (ZE) and Nikon mount (ZF2) lenses to the new "shapely" designs - a line of 9 premium prime lenses covering every major focal length from 15mm to 135mm. Most of the lenses in the Milvus line are optically the same as the older lenses but there are a couple of completely new optical designs in the revamped line-up. Of the three Photokina 2016 announcements, the 18mm f/2.8 is a completely new design replacing the older 18mm f/3.5 which was the weakest performer of the entire line. If it performs on par with the Batis 18mm f/2.8 for Sony FE, then this lens will solve the 18mm weakness in the Canon/Nikon mount line. All of the lenses in the lineup are manual focus with a butter smooth focus ring that provides positive feedback and a true infinity stop. If you plan to adapt these lenses to a mirrorless camera like the Sony a7 series, you should buy the Nikon version of the lenses since they have aperture rings. These are among the very best lenses you can buy for your Nikon or Canon DSLR.



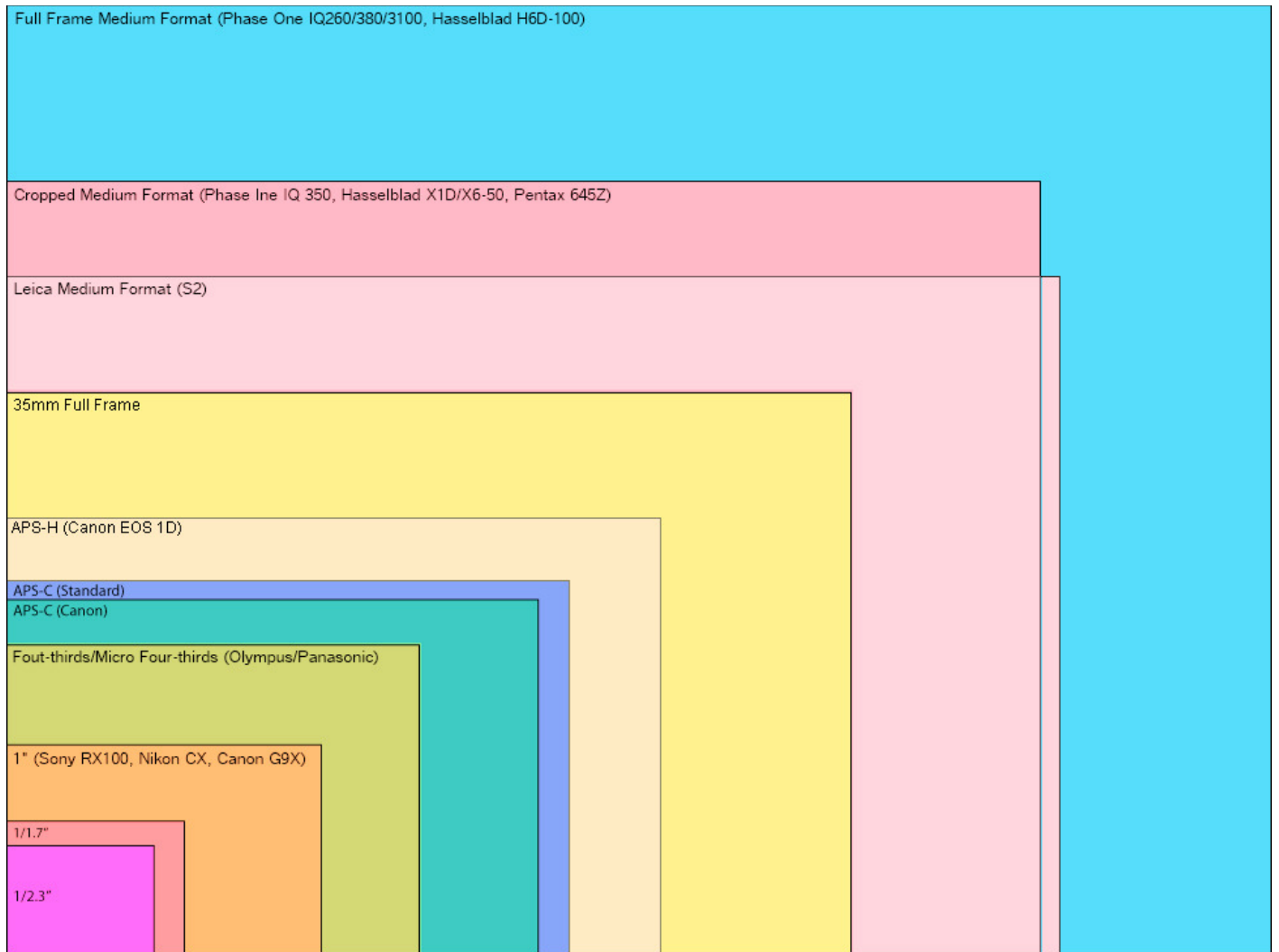
Skellig Michael - Ireland (Phase One XF-100mp, 40-80mm)

For the Sony full frame E-mount crowd, Zeiss introduced the 4th installment in the mind bogglingly good Loxia line - the 85mm f/2.4 Sonnar. Like the others, it is a very compact lens with a 52mm filter thread, buttery smooth mechanical focus with hard infinity stops, an aperture ring that is de-clickable and full

weather sealing. Image quality of this lens is absolutely out of this world and far outresolves any sensor currently available.

Sensor Size "Crop Factors"

In recent times, medium format has had a bit of a resurgence with the growth to four major players in this world - Phase One, Hasselblad, Pentax, and now Fujifilm. The Hasselblad X1D is smaller than the traditional DSLR and the DSLR sized Fuji GFX 50S pack a sensor that has 1.68 times the surface area of a traditional full frame 35mm sensor and has, therefore, sparked a lot of interest in medium format. On the compact side, the 1" sensor has gone mainstream with several manufacturers offering cameras with this larger compact camera sensor and offering similar or better image quality as APS-C from just a few years ago. Due to this, it is time we took another look at the various sensor sizes and their associated "crop factors". The so called crop factor is the multiplier required, relative to a full frame 35mm camera with a 24x36mm sensor to maintain the horizontal field of view. For example, if a full frame camera is used with a 50mm "standard lens", a traditional APS-C camera will require a focal length of 33mm and a full frame 645 medium format camera will require a focal length of 75mm to take a photograph with the same horizontal coverage of the scene if they are taken from the same location. Let's examine this further with an illustration of the relative sensor sizes:



Virtually every sensor size currently available in a camera, not including phone cameras which use even smaller sensors than what is depicted above, is represented. We will ignore the 1/2.3" and 1/1.7" sizes as they are relegated to the cheapest compact cameras which are quickly disappearing from the market and are being replaced by the camera in cell phones. There are two primary aspect ratios offered, the 4:3 in the micro four-thirds format and the larger two medium format sensors. Most of the rest use a 3:2 aspect ratio. This makes angle of view comparisons, which have traditionally been done diagonally difficult to compare. Recently, a horizontal angle of view has gained popularity which is a more real world measure. When figuring out which focal length lens will give a similar horizontal field of view, or coverage of the scene, this is what is important. Let's compare the focal lengths needed for some of the more popular lenses in the full frame 24x36 camera world to get the same horizontal coverage in your photograph. In the table below, the horizontal crop factor is in brackets after the sensor size followed by the sensor dimensions. The traditional 24x36mm full frame column is shaded in green:

1" (2.7X)	4/3 (2.1x)	Canon APS-C (1.6x)	APS-C (1.5x)	APS-H (1.3x)	Full Frame (1x)	Leica MF (0.8x)	Cropped MF (0.82x)	645 MF (0.67x)
13.2x8.8mm	17.3x13mm	22.3x14.8mm	23.6x15.6mm	27.9x18.6mm	36x24mm	45x30mm	44x33mm	53.8x40.4mm
3.0	3.8	5.0	5.3	6.2	8.0	10.0	9.8	11.9
4.4	5.7	7.5	8.0	9.2	12.0	15.0	14.6	17.9
5.9	7.6	10.0	10.7	12.3	16.0	20.0	19.5	23.9
6.7	8.6	11.3	12.0	13.8	18.0	22.5	22.0	26.9
7.4	9.5	12.5	13.3	15.4	20.0	25.0	24.4	29.9
8.9	11.4	15.0	16.0	18.5	24.0	30.0	29.3	35.8
10.4	13.3	17.5	18.7	21.5	28.0	35.0	34.1	41.8
13.0	16.7	21.9	23.3	26.9	35.0	43.8	42.7	52.2
18.5	23.8	31.3	33.3	38.5	50.0	62.5	61.0	74.6
25.9	33.3	43.8	46.7	53.8	70.0	87.5	85.4	104.5
31.5	40.5	53.1	56.7	65.4	85.0	106.3	103.7	126.9
38.9	50.0	65.6	70.0	80.8	105.0	131.3	128.0	156.7
50.0	64.3	84.4	90.0	103.8	135.0	168.8	164.6	201.5
74.1	95.2	125.0	133.3	153.8	200.0	250.0	243.9	298.5
111.1	142.9	187.5	200.0	230.8	300.0	375.0	365.9	447.8
148.1	190.5	250.0	266.7	307.7	400.0	500.0	487.8	597.0
185.2	238.1	312.5	333.3	384.6	500.0	625.0	609.8	746.3
222.2	285.7	375.0	400.0	461.5	600.0	750.0	731.7	895.5
296.3	381.0	500.0	533.3	615.4	800.0	1000.0	975.6	1194.0

Note that some of the values above might be a bit different from what you expect; that's because of the use of horizontal crop factor to insure that the same left to right field of view is photographed. Some sites and resources use a diagonal crop factor but that can be a bit misleading because it does not give you an accurate comparison in the side to side coverage when comparing sensors with different aspect ratios. The differences are slight in most cases except when moving from a 3:2 aspect ratio to a 4:3 aspect ratio. For example when moving from 35mm full frame to 645 full frame, the diagonal crop factor is 0.63 but the horizontal factor is on 0.67.

Only Micro 4/3, APS-C, and Full Frame systems actually offer all of the focal lengths depicted in the table above. All other formats cannot get as wide or as long. Medium format is restricted both on the wide end and the long end as the lenses would get enormous on either side of the focal length spectrum. It is possible to go as wide as a 15mm full frame equivalent in the medium format world but it requires the use of a technical camera and lens correction profiles.

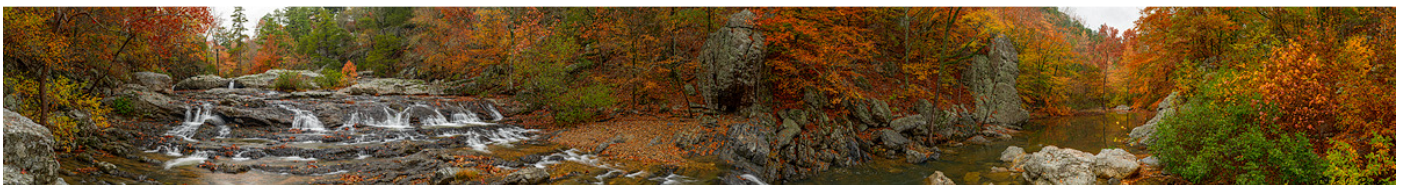
As we take more formats mainstream such as 1" (Nikon CX), APS-C (Nikon DX), Full Frame (Nikon FX), cropped medium format, and full frame medium format, it is becoming more complex to figure out what lenses will give equivalent coverage of a scene. Additionally, Canon complicates the scenario by using its own definition of APS-C which is different from all other manufacturers and Nikon uses its own naming convention. Hopefully this helps clear up some of the challenges associated with all of this.



Minard Castle Beach - Ireland (Phase One XF-100mp, 35mm)

Ten Quick Tips For Fall Color

Since this is the Autumn issue of the newsletter and since this is a Photokina year, the newsletter is even more equipment centric than it usually is so it's only appropriate that I share some tips for photographing fall color:



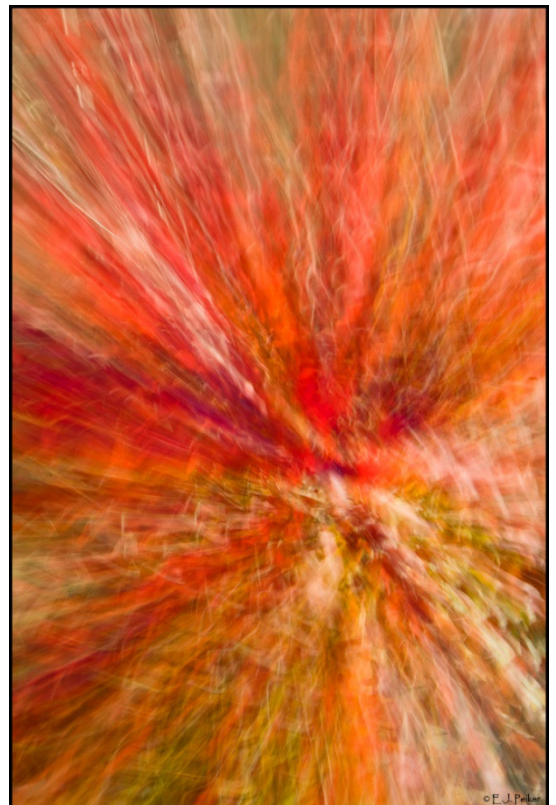
Little Missouri River Fall Panorama - Arkansas

1. Keep the shutter speed up - as the leaves dry out, they are even more susceptible to wind and even light breezes that cause them to move around a lot. By keeping the shutter speed up when winds are not completely calm, we can minimize motion blur. Speeds of 1/250 or faster are most effective
2. Slow the shutter speed down - if it's just too windy or overcast with a breeze and there just isn't enough light to get a good low noise image, perhaps slowing the shutter speed way down to give a more painterly look that conveys the motion is a solution as depicted in the photos below. Try 1/2 second to as much as 1 or 2 seconds.



Same photograph at 1/250 sec and 1 sec - Coconino National Forest, Arizona

3. Watch the RGB histogram. The red channel has a tendency to blow out when shooting fall color even though the composite histogram looks good thereby causing a loss of detail in the leaves. Use the Red channel histogram as your guide.
4. Use a polarizer especially if the leaves are wet to take off the sheen and saturate the colors and to give your images punch, especially at the red or yellow to blue sky transitions. At higher elevations, be careful not to over polarize the sky as it can get unnaturally dark and even black if shooting above 8000 feet.
5. Try shooting straight up. Straight up or at extreme angles can yield very interesting shots of trees and their spectacular colors as the crowns of the trees converge - try super wide lenses or even fish-eye lenses.
6. Don't shy away from overcast days - overcast days are great especially when in the woods or when shooting water features like a waterfall with fall color. It eliminates the dappled light. It is even more important to use a polarizer under overcast to eliminate white reflections from the sky on the leaves.
7. Don't be afraid to try abstracts like zoom blurs where you adjust the zoom during the exposure or rotating the lens during the exposure to create colorful spirals.
8. Make sure you look down for subjects. The trees are great but often the leaves that have already fallen can enhance a scene that you might not otherwise photograph.



Zoom and shake blur - Maine



Straight up with a 15mm fisheye lens - Coconino National Forest, Arizona

9. Retake beautiful subjects that you may have shots of from other seasons but now framed by or enhanced by colorful fall leaves.

10. Finally, use your computer to find fall colors. Many states have fall color websites with up to date information on where the color is. Also, the National Forest service has a call line at 800-354-4595. You can find your regions specific number once you get into the hotline menu here: <http://www.fs.fed.us/fall-colors>

There you have it! Get out there, have fun and take some great fall color pictures!



Looking down I saw a leaf on a rock and added a second one...

Alternate Camera/Lens Support Sources (and a backpack)

Almost everybody that reads my newsletter is familiar with companies like ReallyRightStuff, Kirk Photo, Wimberley and to a lesser extent 4th Generation Designs. As I have explored other photographic formats like medium format or high end mirrorless cameras I have become familiar with other vendors of camera and lens support gear that make excellent specialty products for this gear. In many cases, these companies also make gear for traditional Canon and Nikon 35mm format cameras and their lenses. Often they are priced competitively and they are of equivalent or better quality and are available when some of the well known vendors may be sold out. And their eagerness to break into the higher volume 35mm market results in a much more personal shopping experience with better communication, better support, and a friendly human being on the other end of the phone if you have a question. Here are a couple that I have started doing business with and am elated with both the products and the customer experience:



Dunquin, Ireland (Phase One XF-100mp, 40-80mm)

ProMediaGear: ProMediaGear has a mind boggling array of products, many aimed at the videography market but since Canon, Nikon and Sony photo gear are now credible movie making gear, they have exceptional products for this equipment too. When I first got my Sony a7 Mk II and needed an L-bracket prior to a foreign trip, neither Kirk or Really Right Stuff even offered a product yet. Pro Media Gear had already announced theirs and since I was on a tight timeline I contacted them They had the factory that was just starting to make them overnight me one fresh off the production line for no extra cost. Communication was exceptional with constant updates to make me feel comfortable that I would be able to use my a7R Mk II in the way that I am used to. The quality of the product is outstanding and offers a number of features not found in some of the more usual places to shop for this sort of gear. Check them out at promediagear.com.

Hejnar Photo: Hejnar Photo is known in the medium format world for offering specialty products for medium format cameras including some exceptional lens support gear for the big heavy lenses in this arena where lens stability is so important. (especially in the new world of 100

megapixel 645 sensors). But surprise, they also have plenty of products for Canon and Nikon

cameras and lenses and they make some really good stuff for Fuji X-T shooters. Their lens support packages and macro offerings are outstanding. Visit hejnarphotostore.com to check it out!

Mindshift BackLight 26L: While in Ireland recently, where I was doing a lot of coastal photography and needing to set my backpack down in wet and mucky areas a lot. Every time I put the pack back on, the back was wet and often pretty gross and got my back all dirty and wet. I started realizing that I need a back loading backpack - one that opens on the back-side not the front side. Having a pack where you could

leave the rain cover on so that you could lay it down in the wet but still have access to your gear seemed like a much better way to go. Previously I was only aware of the F-stop bags that did that but also aware of the massive delivery problems, availability problems, and the poor company health that is being projected by F-stop. Virtually nothing that would work for my needs was in stock anywhere. Ironically, on the last morning as we were loading up to drive back to Shannon for flights home, my friend Steve Gosling (check him out at stevegosingphoto.co.uk) loaded up a backpack that opened from the back that looked absolutely perfect. It was a Mindshift BackLight 26L. Of course I am aware of Mindshift products as the founders of ThinkTank, who I have been a customer of since their inception, founded this company but I wasn't aware that they made a back-loader. It looked perfect in size and features and is lightweight with a good harness. It even allows you to swing it around to the front and open it to grab gear without taking it off. When I got home I immediately got one in green for my medium format gear. I liked it so much, I got a second one for my mirrorless kit in black. It is so versatile that it can be used for either but I didn't want to have to reconfigure between uses. This is where the F-stop bags have an advantage as you can use the same pack with different internal camera units but from a size and features standpoint, not to mention availability, the Mindshift BackLight 26L is a better fit for me. The pack also has a front laptop pocket for a computer up to 15" as well as a tablet pocket. I've now had them for a couple of months and my other packs are now in a closet with the other dozen or more backpacks that I don't use anymore. For my landscape photography, whether the Sony compact mirrorless system or the large Phase One medium format system, I have found my ideal backpack.



Black Mindshift BackLight 26L in black for my Sony mirrorless kit and a green one for my Medium Format kit

The Best Lenses For Your Nikon DSLR, Canon DSLR, and Sony (FE) Cameras

I am very fortunate to get to try a lot of gear and from this I keep the table below of the best lenses for the Canon EF, Nikon F and Sony FE mount systems up to date and include the latest version in every newsletter. There are of course other great lenses but these are the best of the best. A trend over the last couple of years, with the increasing ascension of Zeiss and the incredible Sigma Art line, is the slow disappearance of Canon and especially Nikon lenses from the best lenses available list. The OEM's still dominate in the telephoto arena but in the wide to standard arena, they are getting beat handily. A few additions and changes were made this quarter especially on the ever growing Sony FE front.

Lens Category	Canon EF Mount	Nikon F Mount	Sony (F)E Mount
Ultra Wide Prime	Zeiss 15mm f/2.8 ZE Canon TS-E 17mm f/4	Zeiss 15mm f/2.8 ZF.2	Zeiss Batis 18mm f/2.8 Voigtlander 15mm f/4.5
Extra Wide Prime	Zeiss Milvus 21mm f/2.8 Sigma 20mm f/1.4	Zeiss Milvus 21mm f/2.8 Sigma 20mm f/1.4	Zeiss Loxia 21mm f/2.8
Standard Wide Prime	Zeiss Otus 28mm f/1.4 Zeiss Milvus 25mm f/2 Sigma 24mm f/1.4 Art	Zeiss Otus 28mm f/1.4 Zeiss Milvus 25mm f/2 Sigma 24mm f/1.4 Art	Zeiss Batis 2/25 Sony 28mm f/2
Moderate Wide Prime	Sigma 35mm f/1.4 Canon 35mm f/1.4L II	Sigma 35mm f/1.4 Zeiss Milvus 35mm f/2	Sony-Zeiss 35mm f/1.4 Zeiss Loxia 2/35
Standard Prime	Zeiss 55mm f/1.4 Otus Sigma 50mm f/1.4 DG Art	Zeiss 55mm f/1.4 Otus Sigma 50mm f/1.4 DG Art	Sony-Zeiss 55mm f/1.8 Zeiss Loxia 2/50
Portrait Prime (short telephoto)	Zeiss 85mm f/1.4 Otus Canon 85mm f/1.2L II	Zeiss 85mm f/1.4 Otus Nikon 105mm f/1.4E	Sony 85mm f/1.4 GM Zeiss Batis 1.8/85
Medium Telephoto Prime	Zeiss 135mm f/2 Apo Sonnar ZE Canon 135mm f/2L	Zeiss 135mm f/2 Apo Sonnar ZF.2 Sigma 150mm f/2.8 Macro OS	N/A
200mm Prime	Canon 200mm f/2L Canon 200mm f/2.8L II	Nikon 200mm f/2G Nikon Micro Nikkor 200mm f/4ED	N/A
300mm Prime	Canon 300mm f/2.8L IS II	Nikon 300mm f/2.8G VR Nikon 300mm f/4 PF	N/A
400mm Prime	Canon 400mm f/2.8L IS II Canon 400mm f/4 DO II	Nikon 400mm f/2.8E VR	N/A
500mm Prime	Canon 500mm f/4L IS II	Nikon 500mm f/4E VR	N/A
600mm Prime	Canon 600mm f/4L IS II	Nikon 600mm f/4E VR	N/A
800mm Prime	Canon 800mm f/5.6L IS Sigma 800mm f/5.6APO DG	Nikon 800mm f/5.6E VR Sigma 800mm f/5.6APO DG	N/A
Wide Angle Zoom	Canon 11-24mm f/4L Canon 16-35mm f/4L IS	Nikon 14-24mm f/2.8G Tamron 15-30mm f/2.8 Di VC	Sony-Zeiss 16-35 f/4
Standard Zoom	Canon 24-70mm f/2.8L II Tamron 24-70mm f/2.8 Di VC	Tamron 24-70mm f/2.8 Di VC Nikon 24-70mm f/2.8E VR	Sony 24-70 f/2.8 GM
Telephoto Zoom	Canon 70-200mm f/2.8L IS II Canon 70-200mm f/4L IS	Nikon 70-200mm f/4G VR Nikon 70-200mm f/2.8L VR II	Sony 70-200 f/4 G Sony 70-300 f/4.5-5.6G
Super Telephoto Zoom	Canon 200-400mm f/4L 1.4x Ext Canon 100-400 f/4.5-5.6 II	Sigma 150-600 f/4.5-6.3 Sport Nikon 200-500 f/5.6 VR	
Macro	Sigma 150mm f/2.8 Macro OS	Nikon Micro Nikkor 200mm f/4	Sony 90mm f/2.8 Macro



Quiraing - Scotland (Phase One 645DF+, 55mm)

Workshops

All of my group workshops are run through NatureScapes Certified Workshops. Please check out all of the great offerings from NSN here: <https://www.naturescapes.net/workshops/>

Private instruction in landscape and wildlife photography are also available as well as image processing training. To learn more click here: http://www.ejphoto.com/duckshop_private.htm

Facebook Page

<http://www.facebook.com/pages/EJ-Peiker-Nature-Photographer/150804446733>

Newsletter Info

This is the 15th year of my quarterly Newsletter. I try to cover the wide array of digital imaging and products from mirrorless to medium format and everything in between. Throughout the years, the information contained herein has always been free and will continue to be free despite the many hours it takes to put it together and significant equipment and travel expenses. Most of the products I have tested and reviewed, I have purchased myself; some have been made available to me for review and evaluation by loyal readers and a few have also been made available to me by the manufacturers themselves. While the newsletter is free either via eMail subscription or via accessing it on my website at <http://www.ejphoto.com/newsletter.htm>, if you find the information useful to you and you do wish to donate for my continuing efforts, you may do so via PayPal and sending the funds to ejpeiker@cox.net.

Disclaimers

E.J. Peiker conducts consulting services and product design services for a number of photographic product companies. Those that know me know I would not endorse a product even for compensation if I did not feel it were a superior product.

E.J. Peiker is a member of Nikon Professional Services and receives some services free of charge from Nikon USA www.nikonpro.com

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Tempe Town Lake (Phase One XF-100mp, 40-80, multi-frame pano)