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Demystifying Color Management

Hands On: 2016 MacBook Pro

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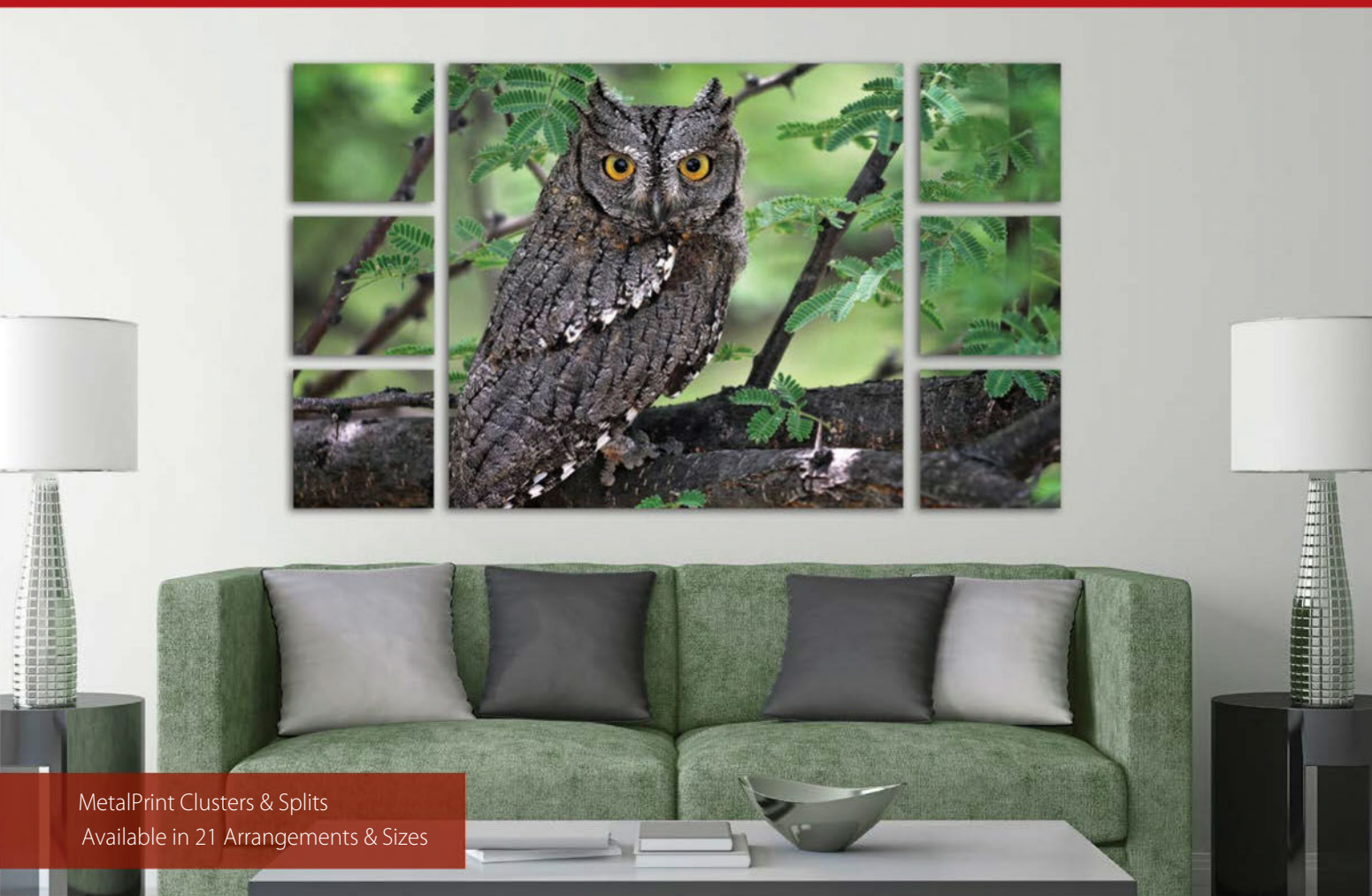Hiscox business insurance.
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Julia Dean

Editor's Note

I saw a cartoon recently that cracked me up. In the first panel, a green chameleon sits facing a dog, and the chameleon says, "Want to see something cool?" The dog says okay, and in the next panel, the chameleon turns red and says, "Ta-dah!" In the final panel, the dog responds, "What?"

The joke, of course, is that dogs are color-blind and are unable to appreciate the difference between a green and a red lizard—to the dog, it's all gray.

That's a bit of the problem with color—it's entirely subjective. There's no way to know if you and I both see the same thing when we look at a fire hydrant or a sky. In fact, if you got swept up in the social-media phenomenon of people arguing if a photo of a dress was white and gold or blue and black, you'll know for sure we all perceive colors differently.

It's hard, though, to imagine someone seeing black-and-white photos too differently. Sure, some of us are probably more sensitive to the differentiation between shades than others, but

monochrome images gain something from their lack of color. It's easier to see the composition, tonality and exposure of an image if you're not overwhelmed by its vibrant hues.

That's why I love monochrome photography and why I'm always so eager to produce this, our annual Black & White issue. It's a chance to think about the fundamentals of photography and appreciate the skills that are at the core of all good photographs.

In this issue, we look at photographer Julia Dean, a longtime photo-

journalist, former AP photo editor and the founder of the Los Angeles Center of Photography. Dean often turns to black-and-white for her iconic street photography, as the starkness of the format brings out more of the subject matter.

We also look at a day in the life of veteran combat photographer Stacy Pearsall. Now a portrait photographer working on a project documenting veterans, Pearsall enlisted in the U.S. Air Force at 17 and was a part of the 1st Combat Camera Squadron. Pearsall has won the Bronze Star and has twice been named NPPA Military Photographer of the Year—one of only two women who have received that award. Pearsall knows well how to convey mood and feeling with both monochrome and color images alike.

In this second issue to feature our integrated *HDVideoPro* magazine section, we talk about monochrome for motion, as well as all the new gear to move from still photography into video work. Whatever your creative imaging style, you'll find it here.

Of course, there's plenty here for those who like to work with hues and saturations, too, from understanding color management to a review of the new creative powerhouse MacBook Pro. Whether you're the chameleon or the canine, we've got you covered.

—David Schloss, Editor
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ON THE COVER: Kristen Bell. Photo by Sam Jones.
Our interview with Sam Jones begins on page 74.

New Products

Fujifilm X100F >>

The original Fujifilm X100 was one of the first compact cameras to really go after the professional market, with a small form factor, excellent optics and an APS-C sensor. Now, three generations later, the **Fujifilm X100F** is still a great camera for the pros, with some new added features. The X100F has a 24.3-megapixel Fujifilm X-Trans sensor and 23mm ƒ/2.0 lens (35mm equivalent in full-frame cameras) and has a better electronic viewfinder, a 1.04M-dot, 3-inch LCD screen and a new front-mounted control dial. Electronic contacts on the front of the lens detect when adapters have been connected and change settings to match the different focal lengths. The camera borrows some elements from the X-Pro2, including a joystick for selecting AF points. The 325-point AF system can detect images down to -3 EV. **Price:** $1,300. **Website:** fujifilmusa.com

Fujifilm X-T20 >>

Alongside the X100F, **Fujifilm** announced the **X-T20**, which replaces the popular X-T10. The X-T20 features a 24.3-megapixel sensor with the company's X-Trans pixel layout and a new processing engine for faster shooting times. The camera has a large 1.04M-dot touch-screen LCD that can be tilted for specialized shooting. The camera can capture 4K and Full HD video, and built-in WiFi connectivity allows for quick sharing between the camera and mobile devices. The X-T20 is available in black or silver and comes as a body-only or in a kit with the XF18-55mm or the XC16-50mm lens.
Price: $900 (body only); $2,000 (with XF18-55mm lens); $1,000 (with XC16-50mm lens). **Website:** fujifilmusa.com

<< Leica M10

The **Leica M10** is the latest in the company's M-series rangefinder-style digital cameras. The new M10 is smaller and lighter than the M9 and has a full-frame 24-megapixel sensor with an ISO range of 100-50,000. An improved buffer allows the camera to capture 30 RAW images or 100 JPEG images at a burst speed of 5 fps. The company redesigned the control surfaces, too, with a minimal array of buttons and a rear joystick. A new ISO dial on the top plate gives photographers the ability to control ISO, shutter speed and aperture quickly and easily. The camera has also gained WiFi transfer.
Price: $6,600. **Website:** leicacamerausa.com

Panasonic LUMIX DC-GH5 >>

Teased at the Photokina trade show way back in September of 2016, **Panasonic** released the full specs and launch date for the **DC-GH5**—a capable, video-centric Micro Four Thirds camera with weatherproof construction that features a 20.3-megapixel sensor, five-axis in-body stabilization, dual SD card slots and a 3.2-inch LCD screen. The GH5 can capture in a "6K Photo" mode, grabbing frames at 30 fps for 18-megapixel 6K stills. The camera also captures video at 5K 60P and records 10-bit 4:2:2 internally. The camera supports multiple video formats, has pro-level capture and synchronization features, and communicates with built-in Bluetooth 4.2 and WiFi. The GH5 will be available starting in March. **Price:** $2,000. **Website:** panasonic.com/us

Canon PowerShot G9 X Mark II

Canon's PowerShot line has always been popular with photographers looking to add a high-quality pocketable lightweight camera to their arsenal. The **PowerShot G9 X Mark II**, the latest addition to Canon's premium compact line, is a slim and lightweight point-and-shoot—7.3 ounces with battery and memory card—has a 1.0-inch, 20.2-megapixel CMOS sensor and Canon's latest image processor, DIGIC 7, which has improved subject tracking and scene detection. It features an ƒ/2.0-4.9, 3x Optical Zoom lens (28-84mm), a 3-inch touch-panel LCD and continuous shooting speeds of up to 8.2 fps in JPEG and RAW. Advanced features include in-camera RAW conversion and an improved Time-Lapse Movie Mode. It's also the first PowerShot to feature Bluetooth capability for pairing with a smartphone or tablet, plus built-in WiFi and NFC. **Price:** $530. **Website:** usa.canon.com

Panasonic Leica DG VARIO-ELMARIT 12-60mm F2.8-4.0 ASPH Power O.I.S. >>

The newest lens to come from the company's partnership with the optics masters at Leica, the **12-60mm** functions like a 24-120mm in the 35mm format and uses weather-sealed construction for shooting in well-below-freezing conditions. Smooth bokeh is a goal of this lens, with a nine-blade aperture, while the **Panasonic** Nano Surface Coating is designed to reduce ghosting and flares. With 14 elements in 12 groups and four aspherical and two ED elements, the lens is designed for a variety of shooting situations, from portraits to landscapes. This lens will ship in March along with the GH5.
Price: $1,000. **Website:** panasonic.com/us

<< Tokina FiRIN 20mm F2 FE MF

Tokina's **FiRIN line of lenses** is designed for the mirrorless market, and this new, first step for Tokina into that market is designed to provide edge-to-edge sharpness, with minimal falloff. The manual-focus, manual-aperture lens communicates with Sony cameras to transmit distance and aperture information, allowing Sony cameras to use features like image stabilization and focus assist. The company says the wide-angle **20mm lens** (which we're currently testing) is the first of many lenses to come in its mirrorless lineup. The launch date wasn't announced as of press time.
Price: Not announced as of press time. **Website:** tokinalens.com

Rokinon Digital Photo 20mm F1.8 and Cine DS 20mm T1.9 >>

Designed for photographers and videographers looking to capture unique perspectives, the full-frame **Rokinon Digital Photo 20mm F1.8** and **Cine DS 20mm T1.9** super-wide-angles feature fast apertures (to ƒ/22) to compensate for challenging lighting conditions, with a super-wide 94.8° angle of view. Both lenses feature 13 elements in 12 groups, with two Aspherical and three Extra-Low Dispersion elements to minimize aberration, reduce unnecessary light dispersion and deliver high resolution corner to corner. The lenses use the company's Ultra Multi Coating to minimize flare and ghosting, a non-rotating front lens design and circular 7-blade diaphragm for smooth bokeh. The photo version is available in Canon, Nikon, Sony E, Micro Four Thirds, Pentax K and Fuji X mounts.
Price: Digital Photo 20mm F1.8 ($600); Cine DS 20mm T1.9 ($800).
Website: rokinon.com

Cine DS 20mm T1.9

Metz Mecablitz M400 >>

The compact **Metz Mecablitz M400** strobe has a zoom-swivel head and a field of view that matches a 24-105mm full-frame lens, with a guide number of 40. Powered by four AAA batteries, the small unit comes in versions with TTL support for Canon, Nikon, Pentax, Sony and Fujifilm cameras. A built-in modeling light even makes the M400 suitable for light video work. The M400 features master/slave trigger support, high-speed flash sync, second-curtain sync and red-eye reduction, and uses a USB port for firmware updates.
Price: $280. **Website:** metz-mecatech.de/en

Epson SureColor SC-P5000

The newest member of the **Epson** wide-format professional printer line, the 17-inch-wide **SC-P5000** features a 10-channel ink system and a new ink-repellant coating that, combined with the improved dust and static control systems, should reduce nozzle-clogging issues. Epson has seriously revamped the tonality of output thanks to a denser, darker black and the use of Light Light Black ink (Standard Edition). The variable-size ink dots are as small as 3.5 picoliters, and the 360-nozzles-per-channel print head can perform borderless printing on sizes up to 17 inches. A full-color 2.7-inch LCD screen provides easy access to settings. The **SC-P5000** can auto-switch between photo black and matte black, and can switch between cassette feeding and a roll feeder.
Price: $1,995 (SureColor P5000 Standard Edition); $1,995 (SureColor P5000 Commercial Edition); $2,495 (SureColor P5000 Designer Edition). **Website:** epson.com

>> *For the latest product news and in-depth coverage of new announcements, visit* digitalphotopro.com/newswire

The Color Crisis

Why color management is so important, and why you probably aren't doing it right

By David Schloss

I was standing in the kitchen the other day with my mother and my 6-year-old son, and found myself—as I do so often—providing computer tech support for my mother. Stop me if you've heard this before, but my septuagenarian mother was having trouble with a computer concept, and I was getting frustrated trying to explain it to her.

My mother is a painter, and she recently purchased a discontinued-but-excellent large-format Canon printer so she can make prints of her work. Naturally, she wants accurate color reproduction, but unfortunately she's trying to get this accurate color with a 7-year-old Mac mini and a CRT monitor with an image burned into the screen.

Why, she lamented, did her inexpensive photo printer create the colors she expected without doing anything, while prints from her expensive wide-format printer are under-saturated and so dark as to be inaccurate?

This isn't the first time I've explained this; usually I explain these concepts to a class full of photographers who, presumably, have a better understanding of digital imaging than my mom, and yet, it's always the least-understood part of the digital workflow chain.

That's problematic, because accurate color in photography (or accurate tonality in monochrome work) is obviously a key goal of any creative professional. So why is color management so hard, and how can the process be simplified enough to not only make sense, but to implement easily?

The Language Of Color

Both of my mother's questions have to do with color spaces and the language of color. As a quick primer, there's a big range of colors visible to the human eye. Every imaging device reproduces some much smaller amount of those colors—there are no devices used photographically that reproduce every color humans can see. The colors they *can* reproduce are called their color space.

Different *types* of devices use different methods to create their colors. Monitors and digital cameras use red, green and blue to make the colors in their color space. Printers use cyan, yellow, magenta and black to represent their colors. A printer with an 11-color ink set can produce a wider range of colors than a four-color printer. A high-end monitor has a wider range of colors it can display than a cheap model.

Since color is described as language—made up of individual elements that work together to create a bigger picture—we can think about color management with the analogy of human languages.

It's particularly helpful to imagine colors as being language. In our analogy of languages, a camera and a monitor speak similar languages, since they both use the RGB color space. If we say they both speak English, then a monitor might speak American English while a camera speaks British English. Most of the descriptions are the same, but a few need a bit of simple translating. If you know that a "flat" in Britain is an apartment, then when you're listening to someone from England complain about their "flatmate," you simply internally translate what they're saying.

To simplify this analogy, we'll use 8-bit color where RGB is measured in values between 0 and 255, with a value of 255 meaning 100 percent of the color is present. In this system, something

perfectly red would be R=255, G=0, B=0, for example.

So let's pretend there's a square of pink paint, which you photograph with your camera and the camera records R=214, G=37, B=152. You open up that image on your monitor, but the monitor has a slight blue cast to it (something that's pretty common, so when it displays that pink color, some blue is unintentionally present). The result is that the camera's recorded value of R=214, G=37, B=152 ends up looking on your display like R=214, G=37, B=162. That's the difference between cotton-candy pink and a sultry lipstick.

Even a minor difference in settings can result in a big shift in color. In this example, a vibrant pink (left) is a completely different color on an un-calibrated monitor with a slight blue cast (right).

To return to our language analogy, if there isn't translation of these colors, when your camera says "display bright pink," the monitor will display instead a more intense pink with a bluish tone. If you've created a monitor profile, the operating system instead translates "display bright pink" from the camera to "display bright pink but reduce blue by 10" to the monitor, and now they have the same color.

I often say this is like translating things from different regions of the same country. For instance, where I live, squirrels are gray, but in some areas squirrels are brown. If I said, "It's the color of a squirrel," that could refer to two different colors depending on who I'm talking to. If I know I'm talking to someone from a region with brown squirrels, I would pick a way to describe gray that didn't involve a squirrel.

When an RGB device like a monitor talks to a CMYK device, though,

BenQ SW320 Photography Monitor

that's like English being translated to another language like Spanish. That requires a good bit more translation work, and both languages don't always have the same concepts. A color that's reproducible on a monitor (vivid pink, for example) might be difficult for a printer to create because no matter how you mix CMYK inks, it doesn't quite add up. To make that cotton-candy pink, a CMYK printer needs to use a value like $C=0$, $M=83$, $Y=29$, $K=16$. Notice that these values are all way lower than 255, so to create a *vivid* pink, the printer has to lay down *less* ink than for, say, magenta ($M=255$). To reproduce something very vivid, it has to use less color, so it's never going to be perfectly pink.

For instance, where these colors don't map correctly, most high-end printers add additional inks. When the computer says "print cotton-candy pink," instead of setting the printer value to $C=0$, $M=83$, $Y=29$, $K=16$, it knows to say "Set $C=0$, $M=0$, $Y=0$, $K=0$ and use the light, light magenta ink set to 255". (Yes, there *is* such a thing as light, light magenta ink.)

There are a few places where this color gets translated. The operating system plays a large role in this translation, acting like the United Nations of color management, but a printer can also manage color through its internal processor and the print dialog box, and photo-editing programs like Photoshop can also perform this translation.

This brings us back to the central question that confused my mother—why do cheap photo printers tend to reproduce colors well, but when you add a professional device to the mix, color goes haywire?

The first answer is that some time ago, many of the computer and office equipment companies got together and decided upon a standard color space called sRGB that describes how colors should appear in a standard office lighting environment using typical office-quality devices. Computer monitors, all-in-one printers, photo printers, scanners and more all speak the sRGB language, which means they don't have to do a lot of translations.

It's not that inexpensive photo printers happen to produce more accurate color; it's that they're designed to be used in an environment where devices speak the same language. Take an entry-level monitor and connect it to an entry-level printer, and you're standardizing the language and also the vocabulary.

When you add a professional device to the mix, or when you begin to calibrate your devices, the assumption

Datacolor Spyder5STUDIO

changes. Once you're using non-standardized devices with custom color profiles, the assumption is that you're familiar with the steps needed to perform the translations correctly.

The most common issue, and the one faced by my mom and by the many students I've met with the same questions, is that they only manage a part of the color chain. Printers (and other devices) use translations called ICC profiles to perform their color translations, and it's essential to select a profile that matches the paper being used. One of the first mistakes is using a printer with the incorrect profile. Print to Premium Photo Glossy paper while the print dialog box is set to Premium Photo Semi-Gloss paper, and the color will be incorrect.

But even if you have the right printer profile from the manufacturer, individual devices vary from unit to unit. The Premium Photo Glossy paper profile might not reflect what the head in your printer is capable of producing. That's why high-end printers create their own profiles for each batch of paper and each set of inks they use.

Another common mistake is not managing the lighting in your editing environment. The colors on your monitor (and on the printed page) look different depending on the ambient light. If you sometimes edit after dark with low ambient light in the room and sometimes during the day with light streaming through the window, your on-screen colors will look different, and so your adjustments will be different.

Tools Of The (Color) Trade

The first thing that photographers should do is look for devices that offer as wide of a color "vocabulary" as possible. A new LCD screen will be more accurate than one that's several years old, and a device that's designed to have a wider range of colors is better than one with fewer colors. The new MacBook Pro has a display that uses Apple's Wide Color to display a wider color range than any previous Mac laptop screen, so using that MacBook Pro will result in more accurate color, if properly set up, than an older MacBook Pro. (For more on Apple's Wide Color, check out the article on our website, digitalphotopro.com/gear/imaging-tech/apples-wide-color/.)

High-end monitors can display even more colors, more accurately. For the desktop user, the 31.5-inch BenQ SW320 Photography Monitor is a 4K UHD display that produces 99% of Adobe RGB and 100% of sRGB color space, with a true 10-bit panel. At $1,400, the SW320 and monitors like it are some of the best investments you can make in an accurate color chain.

To ensure correct end-to-end color, you need to evaluate the color displayed or reproduced by each device. This is a generally straightforward process, though most people don't do it or don't do it correctly.

It starts with profiling and calibrating your devices using a color-management tool. We've used the X-Rite i1 Display line of tools and the Datacolor Spyder5ELITE, both of which provide excellent and simple color management in relatively inexpensive packages.

Both tools create profiles (check the color vocabulary) of your devices, calibrate them (bringing them back into a known range of performance), and then create the color translation table used by the operating system and programs to adjust colors. The process takes just a few minutes and is largely hands-off.

Both the i1 Display and the Spyder5ELITE have ambient light sensors, which can adjust screen brightness to compensate for changes in studio lighting, eliminating some of the

need for separate profiles for different lighting conditions.

Once monitors are profiled and calibrated, the operating system uses this profile to create more accurate colors on screen. This isn't the end of the color management chain, but it *is* where most people stop the color management process.

For those printing, it's at the very least necessary to download the ICC profiles for the type of printer and types of paper being used. Most printer manufacturers have ICC profiles available for download on their websites, and the paper manufacturers all maintain downloadable profiles on the currently popular high-end printers.

X-Rite and Datacolor make color-profiling bundles with the tools needed to calibrate and profile displays and printers; however, some printers include built-in color profiling and calibration, and many printers have built-in profiling tools and/or the ability to integrate with a hardware calibrator to create individual ICC profiles.

The ColorMunki Photo kit from X-Rite is a $500 bundle that includes a device that can calibrate and profile printers, displays and projectors. The single puck-shaped device measures both reflective and transmissive colors to evaluate a variety of different devices. A step-up solution, the i1Photo Pro 2 bundle also calibrates those devices but uses a more sensitive measurement device.

Datacolor's Spyder5STUDIO is another excellent bundled solution for calibrating every device in a studio and also costs $500. The kit includes the Spyder5ELITE, SpyderPRINT and SpyderCUBE, a small device useful for measuring white balance in a scene.

Regardless of the price or the package, having a complete color workflow management solution is essential. With a good color profiling and calibrating device, the imaging chain is able to be properly controlled, ensuring accurate color across the range of devices and from creative to client.

Of course, you could stick with low-end printers and uncalibrated monitors, but an end-to-end color management solution is probably a better idea.　　　　　　DPP

X-Rite i1Pro 2 Solutions
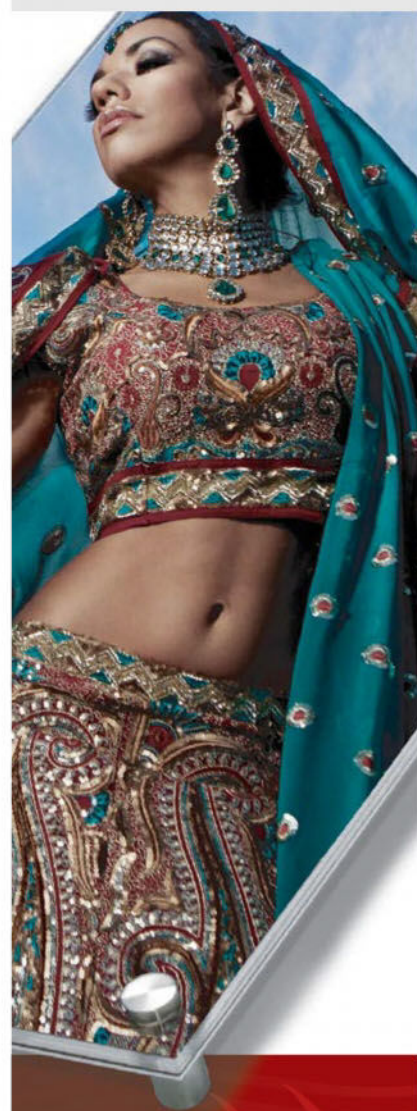
Equipment

USB-C Hard Drives

New standards promise increased hard drive speed and productivity, if you're willing to buy new gear   By David Schloss

As Apple takes aggressive steps in the computer market to foster the adoption of the new USB-C standard—abandoning all connectors on the new MacBook Pro aside from USB-C—photographers find themselves on the threshold of a new range of hard drive performance, but not without some confusion.

The USB-C connector combines a number of different technologies into a single, reversible plug. (See our explanation of the benefits and pitfalls of USB-C at digitalphotopro.com/gear/more-gear/behind-the-technology-pt-2). USB-C handles a number of simultaneous connection standards, including Thunderbolt 3, USB 3.x, video, audio and power.

Thunderbolt 3 provides an astounding 40 Gbit/second (5 GB/second) transfer speed versus the 20 Gbit/second speed of Thunderbolt 2 and the 10 Gbit/second speed of USB 3.x. Confusingly, while Thunderbolt 3 can operate using a USB-C cable rated for Thunderbolt 3, not all USB-C connectors are operating at Thunderbolt 3.

A Thunderbolt 3 hard drive will operate at Thunderbolt 3 speeds when connected to a Thunderbolt 3-capable USB-C port, using a Thunderbolt 3-capable USB-C cable, on a Thunderbolt 3-capable computer.

SanDisk Extreme SSD

Plug a Thunderbolt 3 hard drive into the new MacBook Pro and you can enjoy up to 40 Gbit/second throughput. Plug the same hard drive into the new Microsoft Surface Pro 4—which has USB-C ports that only operate at USB 3.x speeds—and that same drive operates at up to 10 Gbit/second. Likewise, if you take a USB 3.x drive equipped with a USB-C connector and plug it into a Thunderbolt 3-capable system, you only get a maximum of 10 Gbit/second speeds; there's no speed benefit to plugging that into a Thunderbolt 3-capable system.

There's also the confusing issue of the cables themselves—not every USB-C cable is compatible with Thunderbolt 3, nor are they all capable of supporting all the things that USB-C can do. In fact, most of them are definitely not Thunderbolt 3-capable and many aren't capable of providing power over the port or of sending audio and video signals. There are a limited number of computers on the market with USB-C, and right now the MacBook Pro is the main device to support all of the USB-C functionality. The overwhelming majority of cables aren't designed to handle the Thunderbolt 3 protocol, and they look identical to each other. When shopping for cables, be sure to make sure they support Thunderbolt 3 if you have a Thunderbolt 3 drive.

When The Speed Matters

Conventional hard drives max out at around 200 MB/second—way slower than Thunderbolt 3 or even USB 3.x. If you're shopping for a backup drive, portable drive or drive for non-graphics work, just about any USB-C drive will work. In these cases, Thunderbolt 3 would be overkill and wouldn't improve performance.

When using a multiple-drive RAID system, the performance of individual drives is surpassed as the drive's controller spreads smaller chunks of data across the units of the RAID. One of our test G-Tech Thunderbolt 2 RAID systems routinely clocks speeds above 450 MB/second, and that's just with a moderately priced unit. This is more than fast enough for HD video editing and not even close to the throughput of Thunderbolt 3.

**LaCie
Porsche Design**

For real 4K (and beyond) video editing, a high-end RAID system with Thunderbolt 3 can provide transfer speeds above 2000 MB/second, five times faster than our benchmark Thunderbolt 2 RAID, although it will set you back around $10,000.

Portable Drives

The most immediate benefit of the USB-C standard is that you don't have to carry around an extra power cord for devices that don't draw a lot of power. The USB-C bus is able to provide power to accessories, as was USB 3.x, though some users reported problems with power over previous flavors of USB not being enough for sustained data transfer.

One helpful tip is that it's possible to get a USB 3.x to USB-C cable and use any of the portable USB 3.x drives on the market. That allows you to keep using your existing USB 3.x drives with USB-C, which is helpful on the road, where carrying dongles around is cumbersome. Some of the best portable drives aren't yet available in USB-C or Thunderbolt 3. Good examples are the SanDisk Extreme SSD

Samsung Portable SSD T3

Siros L

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drives, solid-state drives that operate up to 850 MB/second and aren't yet available with the new connectors.

Portable USB-C drives come in two flavors—USB-C models operating at USB speeds and USB drives operating at Thunderbolt speeds. However, there may be no difference in speed depending on the hard drive used inside the portable enclosure.

The popular LaCie Rugged hard drives come in a USB-C version, which operates at the same 130 MB/second of the Thunderbolt version. Though the Thunderbolt model is also available with a solid-state drive, which can operate up to 387 MB/second, a USB-C model isn't yet available. The LaCie Rugged is available in capacities up to 4 TB.

The company's less rugged, but more attractive Porsche Design drives are also available in USB-C in capacities from 1 TB to 4 TB, and in addition to the silver enclosure, the drives also come in rose gold and gold, to match the different colors of the MacBook.

The G-Technology G-DRIVE mobile USB-C drive has an internal 7200 RPM drive and maxes out at 136 MB/second. The company doesn't currently offer a Thunderbolt 3 portable drive (and the drive labeled Mobile Thunderbolt is Thunderbolt 2) and is available in a 1 TB model.

Samsung isn't a particularly big name in the hard drive market, but the company makes a USB-C SSD drive called the Samsung Portable SSD T3, which comes in capacities from 250 GB to 2 TB.

Desktop Drives

When it comes to working in the studio, the need for speed and reliability overshadow compactness and portability, and this is an area where the performance of USB-C drives and particularly the Thunderbolt 3 versions comes into play.

It's also an opportunity for the full array of USB-C's features to come into play. You can use many of these drives to power your MacBook Pro or other portable system, and the multiple USB-C ports allow a computer to connect to multiple drives and up to two monitors with a single cable from the computer.

The LaCie Bolt3 has been billed by the company as the "world's fastest desktop drive," and the 2 TB drive operates at speeds up to 2800 MB/second. That's 10 times faster than most portable systems, and an incredibly fast speed for a drive priced (just barely) under $2,000.

If you need more capacity, the LaCie 6big features six drives, starts at 24 TB and runs to 60 TB, operating at speeds up to 1400 MB/second, while the 12-drive LaCie 12big offers capacities up to 120 TB and has speeds up to 2600 MB/second. That might seem overkill for photography, but for photographers or videographers capturing 4K (and soon 5K and 6K) video, those speeds are crucial for real-time video editing.

Similar to the LaCie 12big, CalDigit announced the T8 Extreme Thunderbolt 3 RAID with up to 48 TB across eight drives. When using SSDs, the T8 Extreme Thunderbolt 3 will have performance up to 1440 MB/second when it ships in 2017.

A name that will be unfamiliar to most users, AKiTiO, has released a Thunderbolt 3 drive with an interest-

CalDigit T8 Extreme

LaCie 6big

AKiTiO Thunder3 Duo Pro

ing twist. The AKiTiO Thunder3 Duo Pro also works as a connector to an attached display, thanks to the built-in DisplayPort connector and speeds up to 785 MB/second. It's fair to note, however, that we've never heard of this company, so can't vouch for the quality of the equipment.

The Seagate Innov8 8 TB desktop provides a quick-and-easy small desktop solution for photographers looking for a secondary drive or backup drive. With 8 TB of storage and power pulled from the USB-C connector, this is a great drive if you're looking to add a bit of storage without sticking a power adapter under your desk.

The Future Of Storage

As USB-C and Thunderbolt 3 have only started to land in desktops and laptops, it's going to take a while until they saturate the market. Thunderbolt 3, which might seem like a data-transfer overkill today, will be essential tech in just a few years.

Until they're ubiquitous, it's still possible to connect to USB-C drives with the right cable and to connect to Thunderbolt 2 drives with the right adapter, ensuring that the current crop of hard drives continues to integrate with a creative's workflow while newer, faster and more interesting drives start to come to market. **DPP**

Seagate Innov8

You can follow Editor David Schloss on Twitter and Instagram @davidjschloss

Black & White TRANSFORMATION

Try these conversions and adjustments for striking black-and-white images

Text & Photography By Tom Bol

Photography began with black-and-white images and the darkroom process, where images came to life. Today, photographers have many more choices. Some photographers still shoot black-and-white film and develop in the wet darkroom. But for most photographers, we capture in digital color and decide later if we want to convert to black-and-white. We have the best of both worlds, and our darkroom is a computer with Lightroom or Photoshop.

But here's the thing: Anyone can just click the Grayscale button in Lightroom and convert their color image to black-and-white. But is that really doing justice to your beautiful, hard-earned image? And what about Photoshop? What's the best way to convert an image to black-and-white inside Photoshop?

There are many paths to effective black-and-white conversions and adjustments, and which technique you choose will depend on the image and your creative vision. Some images may only require a few simple steps, while others

White Sands National Monument, New Mexico.

will require selective adjustments and multiple brushes. Let's look at converting your photo to black-and-white, and what adjustments you need to create an award-winning image.

Converting The Image To B&W
Before we even talk about converting your image, make sure you're shooting in RAW when black-and-white is your final goal. The benefits of RAW capture are well known, and many black-and-white adjustments can be made in Camera Raw. Don't shoot in black-and-white JPEG mode. Your camera is discarding all the color information, and you'll have less latitude to make adjustments on a processed JPEG.

Converting a color image to black-and-white is similar in Lightroom and Photoshop. Since we're shooting in RAW, the Camera Raw editor will open by default in Photoshop. If you're using Lightroom, Camera Raw is embedded in the Develop module and is what you use on all supported file types (RAW, JPEG, etc.).

The Camera Raw engine is the same in Lightroom and Photoshop. The sliders are oriented differently but perform the same functions, but in Lightroom I can go back and readjust the RAW file—in Photoshop the conversion is the first step and any later changes are performed from that starting point. Before I convert my image to black-and-white, I start with my basic image adjustments that I do on every image. These adjustments include setting the white point and black point, adjusting exposure, reducing highlights and often opening up shadows. I leave Saturation and Vibrance at zero. Increasing these would affect some tonalities in the black-and-white version, but I'll adjust this later after converting the image to black-and-white. I also apply Sharpening and Clarity at this point. The beauty of working in Camera Raw is that your adjustments are nondestructive. We'll revisit some of these sliders later to touch up our black-and-white image.

First, let's look at converting an image in Lightroom. Open your image and go to the Develop module. In the Basic Panel at the top, simply click Black and White as the treatment. Then scroll down and open the HSL/COLOR/B&W panel, and the various color channels will be displayed. You're ready to start making adjustments.

In Photoshop's Camera Raw, the conversion is similar. In the menu bar below the histogram, choose the HSL/Grayscale icon and click the Convert to Grayscale box. This converts the image to black-and-white with automatic adjustments applied.

Applying B&W Adjustments

Now that we've converted our image to black-and-white, the exciting "developing" process begins. But what makes a good black-and-white photograph?

First, look for an image that has a clean black and a clean white. You want to have a range of tonalities from black to white, including the full range of gray tones. Pure black and pure white anchor the black-and-white image, while shades of gray help define the subject. Contrast is a critical element in black-and-white imagery, and an important aspect when considering tonal range. Next, graphic shapes, patterns and textures are important in black-and-white imagery. Since color is absent, we rely on other graphic elements to create a dramatic shot. Finding scenes with depth and dimension also creates compelling black-and-white images. Knowing effective black-and-white image characteristics will influence the adjustments we make later.

Lightroom

Honestly, I create most of my black-and-white images in Lightroom. Lightroom offers the tools I need, and the Develop module has a few options Photoshop Camera Raw doesn't offer.

With my image already converted to black-and-white, my first step is to evaluate the auto adjustments that Lightroom applies. In the HSL/COLOR/B&W panel, you can see the slider values Lightroom has applied. One approach to tonal adjustment would be to move the individual sliders and watch what happens to the image. But a far more effective method is to select the Targeted Adjustment
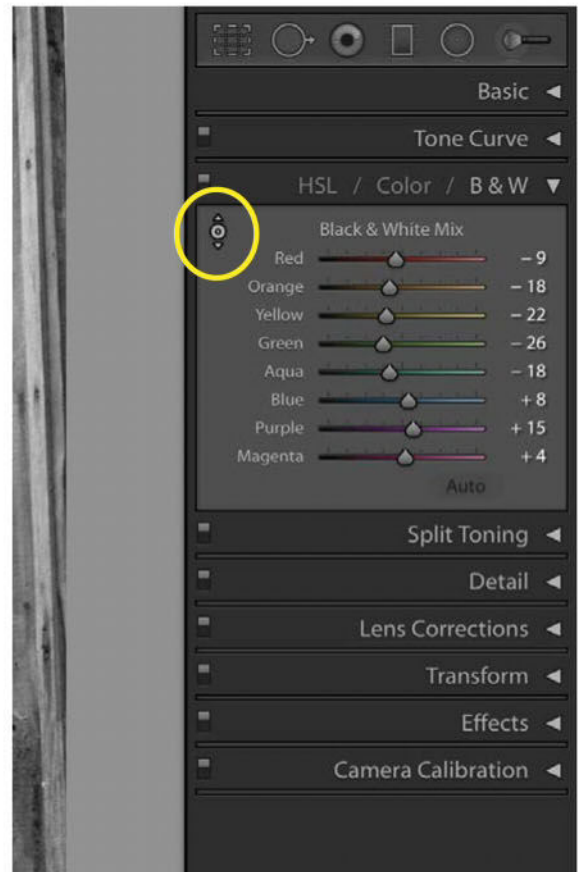
Converting images in Lightroom with the Targeted Adjustment Tool (circled above) makes for more dynamic adjustments, but you have to know it's there.

Tool (TAT) and click on the image area you want to adjust. This tool is located in the left corner of the HSL/COLOR/B&W panel. Place the TAT on the image area you want to adjust, click and move the tool up or down to lighten or darken this area. The beauty of the TAT is that it chooses the right mix of the color sliders to adjust the area you've chosen. You can build contrast into your black-and-white shot and increase tonal range using this technique.

After I've done my TAT adjustments, I focus on more specific areas I want to adjust. Specifically, I might want to dodge and burn certain areas, as well as increase texture and emphasize patterns, all elements critical to a successful black-and-white image. For these tasks, I use the Adjustment brush (located in the upper-right cor-

Death Valley, California.

ner below the histogram). First, I start by burning areas in my image to increase contrast and to create depth and dimension in the image. Hit the O key to show your mask as you brush, and brush over the areas you want to darken. I use the Exposure slider to darken the selected areas. Next, choose a new brush and dodge any areas you want to lighten, also using the Exposure slider to add light to the selected areas.

Next, I look for any texture or patterns I may want to enhance. Once again, I choose a new brush and brush over the areas I want to change. I then increase the Clarity to 100 and Contrast to 50, and see the effect. Often, Clarity brightens the area, so I'll reduce the exposure using the Exposure slider. Using this technique, I can also use similar but reduced settings to highlight leading lines, shapes and other important graphic elements in the image. Experiment with different values and other variables like sharpness to enhance structure in your image. I may also choose to add a slight vignette to my image to draw the viewer into the shot, especially with portraits.

Lightroom offers something else to help with your black-and-white adjustments: presets. In the Develop module, locate the Preset button on the left side of the screen, and click on the Disclosure triangle. Lightroom offers three sets of presets, including colored filters, contrast effects and toned effects. I'll sometimes choose one of these presets and see if I like the effect. But most of my adjustments are made in the HSL/COLOR/B&W panel using the TAT or the Adjustment brush.

Photoshop

Camera Raw is similar in Photoshop, and my workflow is initially the same. I start with basic image adjustments like Exposure, White Point, Black Point, Sharpening and Clarity. Next, I convert the image to black-and-white by checking the Convert to Grayscale box in the HSL/Grayscale panel. This converts the image

to black-and-white with automatic adjustment of the sliders. If you don't like the automatic result, just click the Default button. Now, I choose the Targeted Adjustment tool from the menu on the upper left of the window and select areas to adjust in the image. Unlike Lightroom, move the TAT left or right (not up or down) to change tonalities in the image. Finally, I use the Adjustment brush for selective image adjustments.

But what about converting and adjusting an image already open in Photoshop? One choice would be to desaturate the image, but then you lose control of specific color channels. A better choice would be to select a Channel Mixer adjustment layer. Check the Monochrome box, and your image is converted to black-and-white. You then can use the red, green and blue channels to adjust tones in your image, or select a Preset filter

B+W EXPOSURE
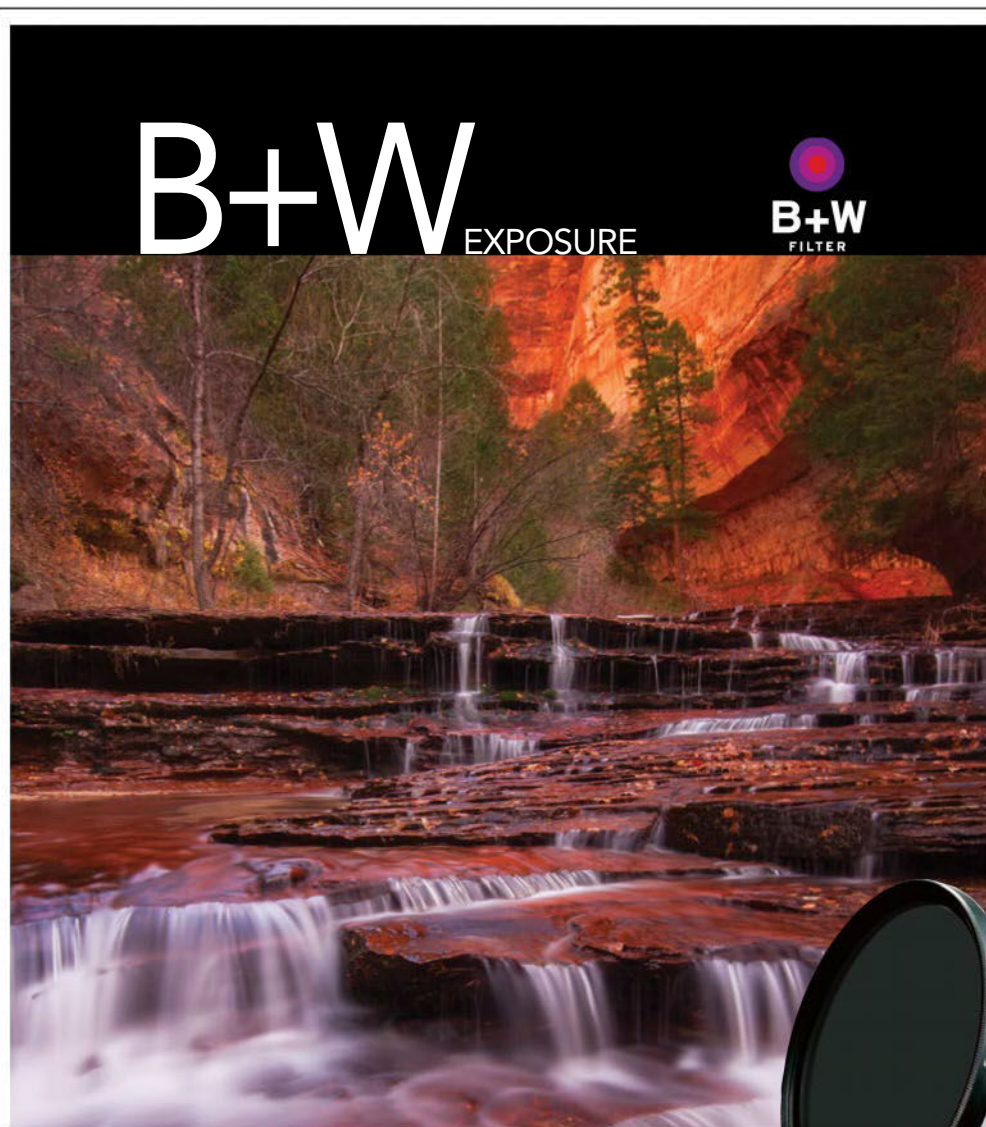
Ian Gaston • imagimagery.com

IAN GASTON CATCHES ZION'S SUBWAY WITH B+W

"The Subway in Zion National Park, Utah is a beautifully unique location that offers an abundance of photographic opportunities. Since this strenuous hike takes up most of the day, I had to shoot this scene in fairly harsh midday light. Luckily, I had my B+W MRC ND 3.0 which I paired with a Sony A7r and Canon 16-35mm. The 10 stops of exposure reduction allowed me to really slow down my shutter speed to achieve the desired effect I was after."

Alien Skin Exposure X2 provides a wide range of powerful presets and custom tools for monochrome conversions.

from the drop-down menu.

Another method, and the one I prefer, is to use a Black and White adjustment layer. When you choose this adjustment layer, you have more color slider options for better selective control. There are also more presets available in the drop-down menu. Most importantly, there's a Targeted Adjustment tool similar to Camera Raw in the upper-left corner of this panel. This tool works similar to Camera Raw. Select the tool, click on the area where you want to change the brightness, and drag left or right to change the value.

Third-Party Software

There are some terrific programs that create stunning black-and-white conversions. The beauty of these programs is that they give you previews of the black-and-white effect and the ability to fine-tune the adjustments. Some of the programs even offer border effects, lens flare and grain to create almost any style of black-and-white image you can imagine.

Here are a few of my favorites.

Alien Skin Exposure X2. Alien Skin has always been one of my favorite black-and-white plug-ins. Why? I started out as a black-and-white photographer using many popular films like Agfa APX 100 and Kodak T-MAX 100, and Exposure X2 labels its black-and-white conversions based on the black-and-white films they simulate. Want to get a T-MAX 100 look? Just click on that action in the black-and-white films folder. Exposure X2 also offers low-contrast, Polaroid and vintage film conversions, as well as RAW editing capability. The toolbar on the right offers full adjustment of the image, as well as creative flare effects and borders.

Topaz B&W Effects. Topaz offers a fine black-and-white conversion program, and takes a slightly different approach to adjusting the image. When you open your image in the program, you have Effects folders on the left. Folders are labeled according to their effect, such as the Traditional Collection or the Toned Collection, etc. When you open the folder, the various actions are listed, and by moving your cursor over the

action, you can see the effect. Once applied, you can adjust the conversion from the control panel on the right. At the top are traditional black-and-white filters you can apply, plus a variety of other tools to dodge/burn, apply grain and more.

ON1 Photo 10. ON1 has been busy adding new features to its software, including RAW editing abilities. ON1 Effects offers a folder with black-and-white conversions, and the ability to add colored filters, grain and tone adjustments. Combined with the extensive filter options, you have a wide variety of black-and-white adjustments. Try the Dynamic Contrast filter to add punch to your black-and-white images.

Experiment

Converting and adjusting black-and-white images has never been easier, with more options than ever before. Even if you're a color photographer, choose your most graphic shot and convert it to black-and-white—you just might like the end result. **DPP**

To see more of Tom Bol's photography, visit tombolphoto.com

Don't chase every social media audience; pick the ones that work to generate jobs   Text & Photography By DL Byron

Get them to sign on the line that's dotted. In an infamous scene in the movie adaptation of *Glengarry Glen Ross*, Alec Baldwin—while verbally "motivating" a group of real estate salesmen—drills into their head the phrase "always be closing." For photographers in the social media era, this is a worthwhile mantra as well. With so many hours in the day and a seemingly infinite number of social media channels popping up, it's important to figure out which ones will most benefit your business, focus on them, and let the others go.

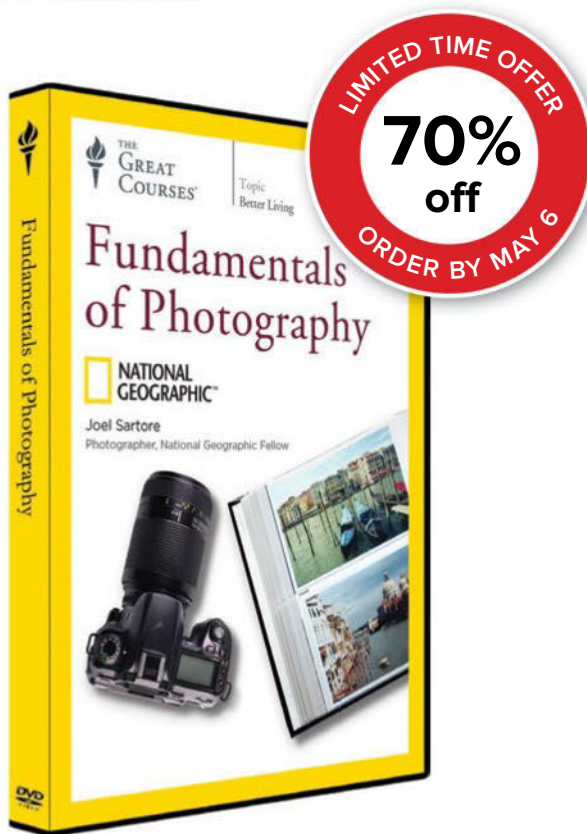After spending a good decade in blogging and now social media, I can tell you there's no real economy to likes or faves or blog comments. As I wrote in the article "Death Of The Influencer" (*Digital Photo Pro*, November 2016, digitalphoto pro.com/business/social-media-death-of-the-influencer), it's talent, hard work and promotion that matter—just like Alec Baldwin said.

The first important consideration is what platform best suits you. If you're trying to land photography work, then photography networks are obviously key, yet many photographers spend a lot of their time on photo tools like Instagram creating Stories. That's a bad strategy for all but the most personable photographers. But, you might say, there are a lot of photographers on Snapchat and Instagram who are building followers with quick video clips of themselves at work.

There's nothing wrong with connecting with an audience or potential clients by sharing behind-the-scene videos, but the majority of those making a living in this market are really selling lifestyle and branding, not photography. Take, for instance, Chase Jarvis, an *extremely* talented photographer with a huge YouTube following,

a podcast and series of creative workshops. Chase is fortunate enough to be funny, engaging and informative, and a natural video personality. He's not just a photographer who does videos and classes (though he was when he started); he's a media personality who started as a photographer.

While it's good advice to pick platforms that suit your style, the constant flow of new social media channels leads to FOMO—fear of missing out—and can lead a creative to rush to get their work on each new platform. You should absolutely get out there and promote your work wherever the audience is; just remember, audiences are very fickle and move from platform to platform, and sometimes the hit social media tool one day is a barren ghostland the next.

As it turns out, VC-funded startups are also fickle with their business plans, and they're always struggling with the mix of building a user base and sticking to their core mission. Sometimes that works (as is the case with Instagram), and sometimes that explodes, taking content along with it.

A good example is Storehouse, a photo-sharing tool based around small, easy-to-design, beautiful photographic stories, which imploded following a decision to abandon the discovery aspect of the service. By the time Storehouse launched, I had already decided to be cautious of new platforms that make a killing off of the content that I fed them, and I'm sure glad I didn't upload more than a handful of photos there.

Vine was a fun place to share what amounted to video versions of GIFs (short looping clips) and had good traction, but at the end of last year, Twitter announced it was shuttering it. And just as I was writing this in early January, my favorite place to write, *Medium*, laid off staff and is *rediscovering* its business plan. (Hint: That's Silicon

Valley speak for, "We're not making any money.")

Like anything else in photography, focus on what you do best, and don't spread yourself too thin. Here are some things to keep in mind.

Social Media Diet
I'm going to stop myself before this article turns into a self-help piece, but the decluttering tools found in books like Marie Kondo's *The Life-Changing Magic of Tidying Up* not only apply to your closet and your photo libraries, but to social media. There's no greater suck on productivity than determining, creating and consuming an endless stream of mediocre content. Instead, pick something with visibility and share only your best work—everything else is creative clutter. This year I removed a lot of apps from my mobile devices to end the constant distractions, including some of the previously hot social media channels, like Flickr and the defunct Storehouse.

Don't Be Johnny Appleseed
Don't spread your content around helping venture capitalists grow their stock valuation. Post and use metrics—including job leads—to see if it's worth the time. One of the biggest secrets of social media is how much time it takes. What's more productive, a witty tweet or learning a new lighting technique for a future gig?

It's also important to know the audience of your social media tools. Instagram, for example, sees 80 percent of its audience coming from outside the U.S. (just one interesting statistic in this excellent blog post blog.hootsuite.com/instagram-statistics). Is that mix useful for your career?

Landing a sponsored gig or launching a career as a brand promoter changes the emphasis to paying work versus sharing, but it's quality over quantity that matters most. Thanks to the algorithms
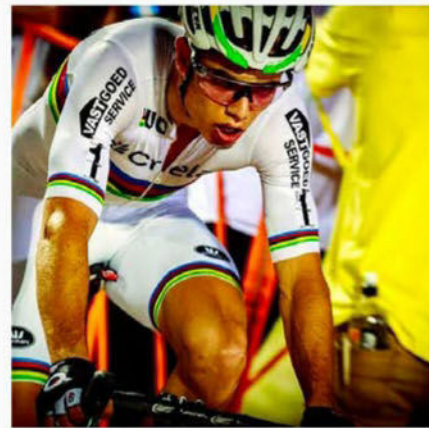
By cultivating a "look" and carefully curating your images, a single social media tool can be incredibly powerful.

used by social media tools, more posts don't guarantee more views. More *shared* posts do, and while sites like Instagram don't state publicly that they measure time spent by users viewing each image, we're sure they do. A captivating image gets more likes, more engagement and so more native sharing.

Be Your Own Brand
Being your own brand is crucial. Creatives used to spend much time and effort crafting physical portfolios and direct-mailing pieces. Today, you need websites that promote your work and funnel people to your social media channels, plus social media that channels people back to your larger online portfolios. If you're only going in one direction, you're losing leads.

If you're simply chasing a follower count to try and get noticed, remember that many of the superstars of the various platforms got their fame because they were onboard at launch, friends of the developers, and many others were celebrities first. Unless you're on the cover of *People*, you should consider social media just one of your many business activities, and just like any other activity, weigh the costs and benefits from the time spent chasing your goals.

And always be closing.   DPP

You can follow DL Byron on Twitter and Instagram @bikehugger

Day In The Life Of A Military Photographer

Two-time NPPA Military Photographer of the Year winner and recipient of the Bronze Star gets the job done, even when everything is falling apart

Text & Photography By Stacy Pearsall
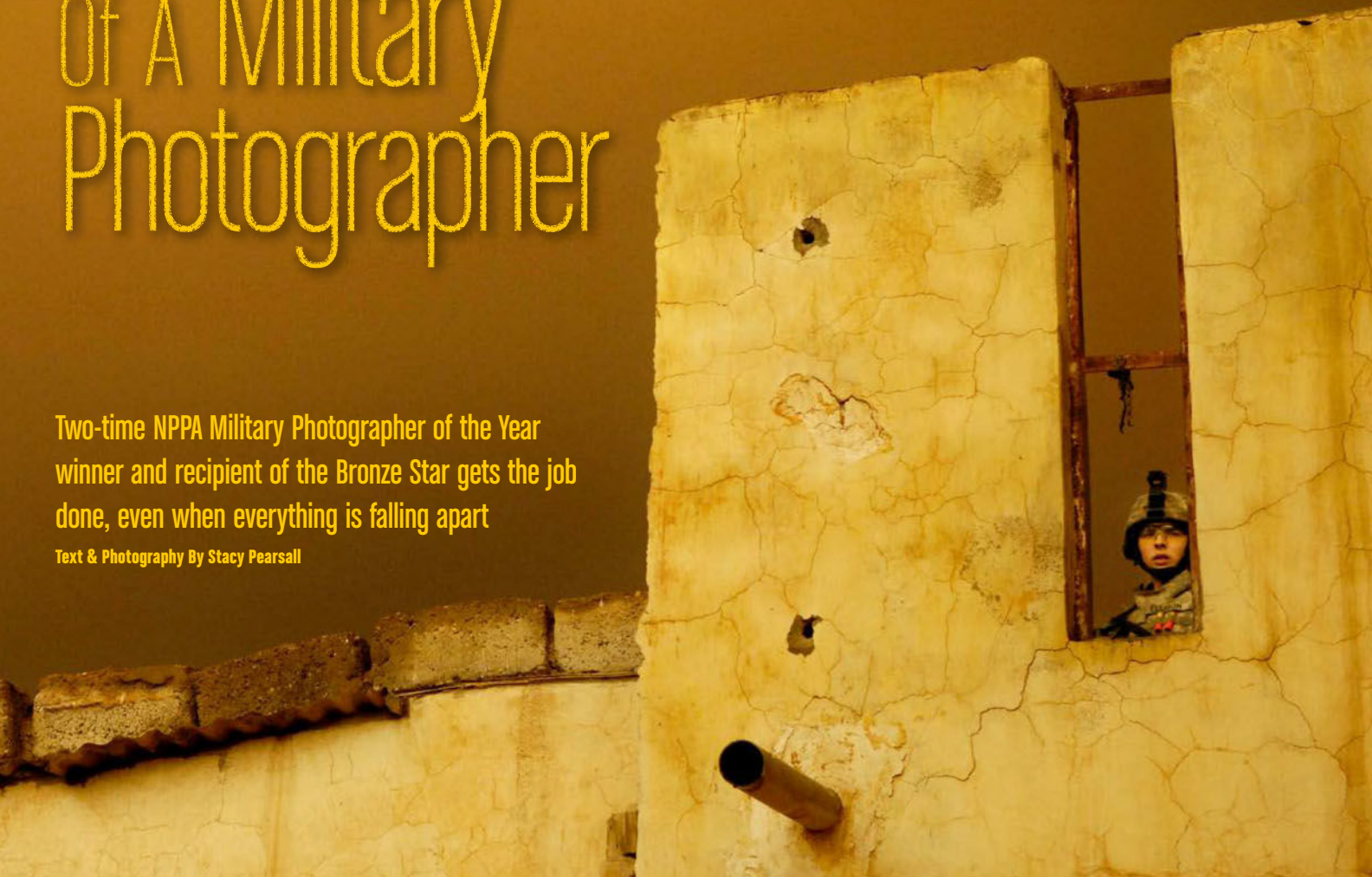
There's a good reason why I do what I do. I'm living proof there's truth in the old cliché "when one door closes another opens." Although I didn't always identify as a portrait photographer, I've been traversing the United States taking portraits of veterans for the past several years. It's quite a change from my time as an Air Force combat photojournalist, days when *shooter* was a double entendre.

I was a uniformed combatant, and a formally trained photojournalist, armed with two weapons—a gun and a camera. My job was to document stories in countries across the globe, get the story objectively, download the imagery, and caption and transmit the images back to the U.S. in a timely manner. From there, the Joint Chiefs of Staff, the Secretary of Defense and the President used my photographs for internal purposes. In some instances, my work was pushed on the wire and picked up by media outlets nationwide. You may recognize my pseudonym byline, DoD Imagery.

My jump from combat photographer to portrait journalist isn't so far afield if you know how it came about. It was my time in war that brought me to this point. Humor me. Here's the abbreviated version.

In The Combat Zone

It was nearly 10 years ago; the Surge in Iraq was well underway, and this was my umpteenth operation in my ninth year of military service. We were in an

Iraqi house we'd appropriated and it was pitch-dark, so I prepped for the pre-dawn patrol by the dim glow of my tiny red LED keychain flashlight, which I had clutched between my teeth. I began my morning ablutions with a cold moist baby wipe that sent shivers through my body from toe to sternum. The desert nights were frigid in the winter, and I couldn't get warm. Every layer of my clothes was soaked through with sweat from soaring desert temps the day before. On a scale of one-to-dead, this unpleasantness barley registered.

"Are you ready, Sgt. Pearsall?" asked the squad leader while picking up his rifle and slinging it across his chest. As the only woman on the operation, I was keenly aware that my every move was being examined. I worked very hard to build up my "tough-girl wall," and I'd since grown accustomed to the under-

current of sexual innuendo, profuse profanity and incessant browbeating that went along with infantry cohabitation. I never demanded respect from anyone, either—I earned it.

I could feel the squad leader's eyes on me, so I yelled, "Just a sec," without looking up. I grabbed my lens from my pile of gear and rotated it into place on my well-battered Nikon camera. It seated with a satisfying *click*.

I lifted my mud-caked, bloodstained shooter's vest, simultaneously slapping the excess sand off with my free hand, and began my ritualistic inventory. I groped blindly through the pockets: batteries, lenses, second camera body, CompactFlash cards, notepad, pen—all there. I belted my M9 pistol drop holster and snapped the fasteners tightly around my waist and right thigh.

I wore a sidearm everywhere at all

times in case things got really bad and, up to that point, I'd only drawn my weapon a handful of times. I always felt my primary focus should be taking pictures—my gun was just an unwanted distraction. That didn't deter people from trying to kill me. I just wouldn't see it coming.

I hoisted my sweat-stained body armor on, sealing it tightly. My breasts monopolized a lot of space inside the armor that was built for a man. I could scarcely breath. I could feel the hot spots where the armor rubbed me raw, and a painful burn where the salt from my sweaty shirt made contact.

Searching for any left-behind items, I flipped up last night's bed, which happened to be a luxurious three-inch pad of foam that was approximately three

feet wide by six feet long. Every Iraqi house had stacks of them, and they created an ideal buffer between you and the cold floor. I looked up and proclaimed, "Good to go," with an indiscernible grin to the waiting squad leader. Another day in paradise begins. I didn't remember yesterday ending.

After a quick mission brief in the house courtyard, the soldiers and I loaded into the waiting vehicles and made our way toward the new operation objective some 15 minutes away. We kept our minds off improvised explosive devices (IEDs) by filling the air with idle chatter. That was a hard task considering the bob-and-weave routine down the scorched, pitted, pot-holed road. I drifted off—until my chin hit my body armor, jolting me awake. Thank God, I had my helmet on as I clanked my nugget on the doorframe for the hundredth time. In an effort to stay alert, I took the opportunity to check over camera settings.

That had become "my thing"—taking portraits of the soldiers. Not good ones in every case, mind you, but something to remember them should the worst happen. I learned the hard way that I might not see them again, so I captured one portrait, good or not. It gave me comfort knowing I had something to gift to the families of those who gave everything. Something indelible.

I hit the camera's playback button and began thumbing through the pictures on my LCD screen. So many young faces weathered, hardened by the burdens of war. Some of the guys couldn't abide having their portraits taken alone, so they clung to their battle buddies and donned placid, stoic expressions in an attempt to disguise their true emotions underneath. I knew them too well, though, and the façade never lasted long. All I had to do was wait. In some cases, time wasn't a luxury we could afford, and I had to make do with the surface-insta-snapshots. Better than nothing.

As the vehicle slowed to a stop a fair distance from the objective, I took another look over my camera. The soldiers prepared their guns, and my camera was at the ready. Before opening the vehicle door, I recited my usual prayer and relinquished my life into God's hands.

We all exited the vehicle and the soldiers assumed their rehearsed positions. Enemy fighters got the drop on us. I could hear small arms fire coming from two directions. At a run, we made our way through the narrow, debris-riddled streets. I zoomed out my lens for a wide shot and held the camera over my head, pressing the shutter release button down for a rapid fire of frames. Maybe one would turn out.

As we came upon the objective, the soldiers made ready to break the front door down. I stepped back a safe distance to capture the initial entry, which often involved flying leaps, kicks or shoulder slams. I lay on the ground to separate my subject from the cluttered background and snapped away as kicking quickly became exhausted and futile against the impassable bolted metal door. Other than the surrounding external small arms fire, it seemed eerily quiet inside the house. The squad leader sent two soldiers to an alternate entrance while we waited in the courtyard. After a brief moment, the soldiers returned to inform us they'd gained entry but spotted a trip wire.

My heart skipped. My mind instantly thrust back three months at the

An Iraqi Army soldier covers his face to maintain anonymity within his community during routine foot patrols in New Baqubah, Iraq, on March 30, 2007.

moment I found out my friends were killed in a house-bourne IED explosion. They were my favorite guys. I didn't tell them. I should've. I was supposed to be with them that day. I should've been. As my consciousness straddled the present day and memory, the faces

of the fallen materialized and vanished. The familiar pain of regret rushed over me. Suddenly, I was overcome by the image of my best friend and battle buddy who'd been shot and wounded by a sniper in a courtyard similar to the one before me. The hair on my neck stood erect. I got an instinctive urge to run and moved with the squad toward the alternate entrance. As we rounded the side of the house, a tremendous rocket-propelled grenade explosion impacted where we were just standing. Thank you, I say under my breath, acknowledging the divine intervention.

As one soldier after another filed into the house, I took note of the dark room and again adjusted my ISO. Since I'd be in closer proximity to my subjects, and under less strenuous pace, I switched to Single Servo focus and readied myself

Paul A. Koshewa served in the Army Air Corps as a B-24 navigator during WWII, and later in Korea as a member of the U.S. Air Force. He also served in Vietnam as part of the Tet Offensive, retiring in 1982 with the rank of colonel.

The soldiers systematically cleared each room and eventually made it to the rooftop, where a firefight ensued. A cacophony of rifle fire was exchanged at a deafening decibel over the rooflines. Damn. I'd forgotten my earplugs again. A whistling high-pitched tone began ringing in my head.

Despite having a limited angle of view, I made the most of my position and covered the events as I witnessed them. The enemy fighters were just one or two houses over, nearly face-to-face. It took helicopter support to neutralize the nearby fighters. I saw the sunrise from that rooftop. I saw sunset, too. Like every other operation I went on, I documented the hell out of it. We made that house our home for the night, which meant another foam bed on the floor, another shift on the rooftop over watch position, another beef jerky dinner and then it all started again in the morning. Or you could say the day just continued to the next.

Veterans Portrait Project

This was my life as a combat photographer—every day somewhat the same, but no day identical. This went on and on until one day I found myself at a military hospital in Balad, Iraq. Too many hits to my head and neck left me crippled. Begrudgingly, I was sent home. Not only was my Iraq tour cut short, so was my entire military career. The severity of my neck injury disqualified me as a combat photographer, and I was faced with the ultimatum of reclassification or retirement.

I couldn't see myself as anything else but a photographer, so I took the medical retirement and began the long road to physical rehabilitation. Though I was surrounded by people who cared for me, including my amazing husband, Andy Dunaway, I felt isolated and alone. I grappled with survivor's guilt and my thoughts began to darken more and more. One day I'd hit an all-time low in my life. I found myself waiting for a doctor's appointment at the local VA hospital. The older veterans were scrutinizing me. I could

for room-to-room clearance. I'd photographed scenarios such as this many times before, so I anticipated where to be in order to capture the best images. Always staying ahead of the action.

Shooting into the shadows. Waiting for the right moments. Making 10 frames of each composition with varied action, if possible. Moving on to the next room. This all happened in a matter of minutes.

hear their thoughts, "Is she a nurse, a spouse or a volunteer?" I wanted to scream, "I'm a veteran, now leave me alone!"

I could see in my peripheral vision that one veteran nearest me was blatantly staring. Instead of giving him a piece of my mind, I asked him if there was something I could help him with. His face drew back in surprise and then a beaming smile. The man had to be in his 90s. He lifted his right hand and showed me his missing ring and pinky fingers, and explained that his impairment disqualified him from enlisting in WWII.

He made his hand in the shape of a pistol and bent his index finger to gesture pulling the trigger. "I don't need these two fingers to pull the trigger, see," he demonstrated animatedly. I nodded.

He went on to explain that as the Army increased its manpower in preparation for war, they needed more men. They loosened the restrictions on soldiers with finger amputations, which meant he could finally enlist. That he did. His tours included D-Day and the eventual liberation of a concentration camp. After the war, he came home and started a new life.

I was gobsmacked. I was sitting next to a national treasure and didn't know it. Then the thought occurred to me. There are over 22 million veterans in the U.S. How many of these men and women have extraordinary stories that go untold?

Unexpectedly, the door I'd been waiting for swung wide open before me, and my new mission came into sharp focus. I've walked in their shoes, so I can relate. I feel the same emotions, so I can be sympathetic. I speak the language, so they can speak freely. Who better to tell their stories than me?

So began the Veterans Portrait Project. It has been an emotionally cathartic and physically healing tool, and blossomed into a full-time endeavor. Since taking my first portrait in late 2008, I've conducted more than 100 portrait engagements, traveled to 65 cities in 27 states, and captured over 6,000 veterans' portraits, to date. In an extraordinary way, it's an extension of the soldiers' portraits I took while in Iraq—ensuring everyone's stories endure.   DPP

An independent photographer and founder of the Veterans Portrait Project, Stacy Pearsall won the National Press Photographers Association Military

Elizabeth Barker Johnson served as a Private First Class truck driver and postal clerk, as part of the U.S. Army's Six-Triple Eight Central Postal Battalion, an all African-American Women unit during WWII.

Photographer of the Year competition twice. During three combat tours, she earned the Bronze Star and Air Force Commendation with Valor for combat actions in Iraq. In Spring 2017, her work will be featured in a joint exhibition, "The Face of Battle, Americans at War 9/11 to Now," at the Smithsonian National Portrait Gallery. Visit stacypearsall.com and follow Stacy on Instagram @slpearsall.

Finding The Lost Angels

Photographic legend Julia Dean turns her eyes on a city—and people—in transition

By Mark Edward Harris >> Photography By Julia Dean

There are few people who have contributed more to the field of photography in the City of Angels than Julia Dean. The photographer, educator and executive director/founder of the Los Angeles Center of Photography began her career as an apprentice to the legendary Berenice Abbott. Dean eventually focused her personal photographic efforts on Los Angeles, revealing a vibrant street life that presents a different, sometimes unsettling view of Angelenos.

DPP: Why did you settle in Los Angeles? It's an interesting choice for a photographer particularly interested in street shooting.

Julia Dean: It is such a fluke that I found L.A. I had traveled through 41 states at that point but never to California. I came here because my old college friend, Ashley Rogers, moved from New York to L.A. and offered to pay my way to come see her. The minute my feet hit the Venice Beach Boardwalk with all its interesting characters, I knew where I must live. Six months later, three months away from turning 40, I moved to Venice with little money and no job.

DPP: What were you doing photographically up until that point?

Dean: My parents gave me a camera when I was in fifth grade, and I've been shooting ever since. When I went to the University of Nebraska in 1973, I took a photography class for the first time and learned that it could actually be a profession. I then transferred to the Rochester Institute of Technology, where I earned a bachelor's in photography. From there, I was an apprentice to pioneering photographer Berenice Abbott

for a year, followed by photographing people in action while whitewater rafting down the Gauley River in West Virginia. I landed a clerk position with the Associated Press during the 1980 Lake Placid Winter Olympics, which led to a photo-editing position with AP in New York. I left there to become a ski

photographer in Colorado for a season.

One day I got a call from George Tuck, my first photography teacher, who needed someone to teach his sum-

mer class. I was just finishing my job in Colorado, so I moved back to Nebraska, taught the class and loved it, and was offered a full scholarship to stay on for graduate school and a teaching position at the College of Journalism. This education trained me to write stories to accompany my photographs, which helped me to get freelance jobs.

DPP: What types of assignments did you do because of the marriage of the pen and the camera?

Dean: I was able to travel the world on a tight budget for various relief organizations and use my passion for photographing and writing about socially concerned topics. I didn't make much money, but it was monumental for a girl from Broken Bow, Nebraska.

At the same time, I continued to teach a variety of college classes, and in 1999, with a $15,000 loan, started The Julia Dean Photo Workshops, which evolved into the nonprofit Los Angeles Center of Photography in 2013.

When I started JDPW, I gave up my travels and photojournalistic missions to build a school. However, I managed to come up with a way to continue to see the world despite my many daily obligations—by taking people on travel workshops. We've shot on the streets of such fascinating cities as Budapest, Buenos Aires, Casablanca, Hanoi, Montevideo, Paris, Phnom Penh, Prague, Tijuana, Venice and Vientiane.

Once home from one of these trips, while longing for the next, I had a revelation. Why not shoot street photography in Los Angeles, a dynamic and fascinating city itself, a city with a downtown in major transition, and the second-biggest city in America? I wouldn't have to wait to go anywhere.

DPP: When you had this revelation,

how did you put it into action?

Dean: That decision was in November 2010, and I haven't been without a camera over my shoulder since. In 2011, I moved downtown with my partner, Jay Adler, so that I could be close to my project. We live on the corner of Broadway and 7th Street, right next to the famous Clifton's Cafeteria. I am inspired at this location, despite some surrounding urban problems. Every time I walk out the door, life's moments unfold in front of me. I have never been so visually stimulated in all of my life. My mentor, Berenice Abbott, told me that you must always have a personal project. I do, and it's for life—the streets of downtown Los Angeles.

DPP: What was your experience like with Ms. Abbott?

Dean: What I learned while with her in the late 1970s for a year is immeasurable. She was 80 at the time, and I was 23 and had only lived in Broken Bow and Lincoln, Nebraska, and Rochester, New York. I had everything to learn. Berenice had an extensive library, which I dove into.

I heard firsthand stories of what it

Legendary photographer Berenice Abbott, 1991. Early in her career, Julia Dean was an apprentice to Ms. Abbott.

was like to assist Man Ray and to live in Paris in the 1920s. I heard stories about Peggy Guggenheim, James Joyce, Ernest Hemingway and so many other expats of the time. I learned discipline and how to put in full days in my own home, without having to "go" to work. That was new to me. I had never known anyone who had worked at home. The usual routine at Berenice's was to go upstairs and work with her in the darkroom, printing from 8x10 black-and-white negatives of New York City in the 1930s on her 8x10 enlarger. I became a true apprentice to a master printer. The rest of the day I would wash, dry, flatten and spot the prints. She was a master printer. From her I learned to make a beautiful print.

DPP: What did you learn from Berenice in terms of making a beautiful print?

Dean: I didn't realize how little I knew upon my arrival for my apprenticeship, despite having just completed the photo program at the Rochester Institute of

Technology. My year with her in Blanchard, Maine, a town of about 50 people, brought my entire education together.

When I was at school, we used RC paper so that wash and dry time was quick. With Berenice, we not only used graded fiber-base paper, but we also mixed gold tone with nuggets of gold weighed on a scale. In the beginning of my yearlong stay, Berenice would work in the darkroom with me all morning. As I became a better printer, I would set up the darkroom and make the first print for her to inspect. Then she would finesse it, and together we would then make the final prints. More often than not, we were both dodging and burning simultaneously with all hands.

She used Agfa Brovira and taught me the importance of how the developer affects contrast and why you should vary your development times. She taught me what under-fixing and over-fixing will do. She taught me the importance of how to make a print archival, though the methods back then were different than today. For instance, she used two fixing baths. I learned how to care for the print from beginning until it was ready to be shipped off to the Museum of the City of New York. The way we treated prints felt like the reverence paid to religion.

DPP: What was the subject matter of the negatives?

Dean: Mostly, Berenice and I printed her 8x10 negatives of New York in the 1930s. One time while she was gone, I wanted to keep busy to impress her, so I contact-printed 350 medium-format glass plates taken in Paris during the 1920s. She liked my ability to keep busy on her behalf without her being there.

My History of Photography teacher at RIT encouraged me to keep a journal while I was with Berenice. Thirty years later, I pulled it out and produced a book called *The Last Apprentice: A Year with Berenice Abbott*.

A newly married couple sits at Traxx bar in Union Station and watches a football game in 2013.

DPP: Education has been such an integral part of your photographic life.

Dean: Sometimes I hear other teachers complain that teaching gets in the way of their own creative work. Though I totally understand, I don't feel that way. Teaching and photography go hand-in-hand with me.

For instance, I created a street shooting class at LACP. Over the years, the program has grown into three different street classes—Street 1, 2 and Street Collective. Between my own work, my adult street classes and my Boyle Heights Boys and Girls Club street class, which I've been doing for the past two

years and find very meaningful, I shoot every weekend.

DPP: What are the key elements for successful street shooting that you impart to your students?

Dean: I am asked by those who take my street shooting classes, "What am I looking for when I shoot a photograph?" Most importantly, it is the content. You will know when you see it if you open yourself up to opportunities. In my opinion, there are five elements to consider when editing your own work or the work by others. Does the photograph have compelling content and good composition, does it catch a moment or mood, does it capture great light? The best photograph delivers all five.

DPP: What equipment are you working with for your street photography?

Dean: I was a Leica Rangefinder user for 27 years. I loved shooting film and seeing through a rangefinder camera, but was forced to go digital in 2008

when my focusing knob broke on my Leica lens while in Peru. I had a Canon digital camera that the company had given me and returned home with two beautiful shots. All of a sudden, I was a digital shooter. Nowadays, I use a Canon 5D Mark II with a 50mm ƒ/1.4 lens when I'm on the street. Luckily, I have a lot of help with the processing of my images, as my time is limited. We have a large work-study staff at LACP, so I call on people who know Photoshop or Lightroom well. I also like to use Nik Silver Efex Pro.

DPP: In addition to Ms. Abbott and your instructors, Walt Whitman had a significant influence on your project.

Dean: I had been struggling with my vision of how to keep updating my *Street Shooting in DTLA*—Downtown LA—books after the first one was done, but it didn't come together until talking to my partner, Jay, who's a brilliant scholar and Eng-

lish professor. He said, "Why not do what Walt Whitman did with *Leaves of Grass?*" I researched it and learned that the first edition became a continual work in progress, with revisions and additions throughout Whitman's life. The first edition in 1855 included 12 poems, and the last, more than 400.

I, too, plan to continually update my street shooting in the *DTLA* book. This one is the First Take. The next will be the Second Take. Some images will come out, and more will go in. The idea is for the book to grow and to keep getting better. This is my project for life. DPP

See more of Julia Dean's photography at juliadean.com. You can find her book "Street Shooting in DTLA" at blurb. com/b/7647640-street-shooting-in-dtla.

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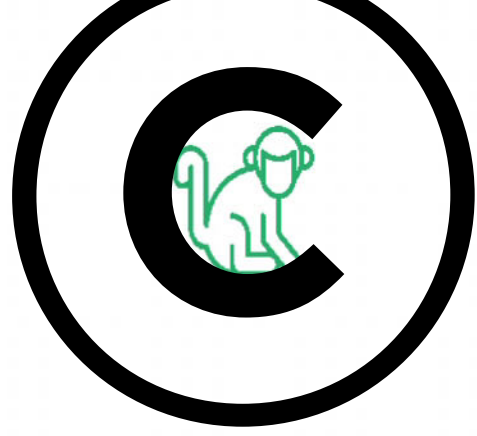
How a simian's selfie might change copyright law forever

By Samuel Lewis

How does a monkey own a copyright? While this may sound like the beginning of a bad joke, for UK-based photographer David Slater, the question is far from funny. In 2015, Slater and others were sued for copyright infringement on behalf of a monkey. A lawsuit was filed claiming that a monkey created a photograph and is therefore the owner of the copyrights to the image. To add insult to injury, the photograph that Slater and others are accused of infringing is one that Slater claims to own.

For Slater, what has become a long and arduous legal journey started with an assignment in Indonesia in 2011. Slater traveled to the Tangkoko Batuangus Nature Reserve in Sulawesi, Indonesia, to photograph the endangered Celebes crested macaques. In the course of Slater's interactions with the group of crested macaques, a crested macaque handled one of Slater's cameras and pressed the shutter release, resulting in the creation of the now-infamous "monkey selfie" image.

Using "selfie" to refer to the image may tend to imply ownership, but that question was far from settled at the time. Indeed, the jury is still out on whether Slater owns the rights to the "monkey selfie" image.

Monkey Ownership And Other Questions

Slater provided images of the crested macaques to Caters News Agency, and through Caters' efforts, Slater's images of the crested macaques, including the "monkey selfie," were initially published by *The Daily Mail*, *The Sun* and *The Daily Mirror*. One of those images came to the attention of Mike Masnick, the editor of the technology news blog Techdirt. Techdirt featured a brief article addressing Slater's images and questioning how the copyright to the "monkey selfie" could have been assigned to Caters. Along with the article, Techdirt published three of Slater's photographs, including the "monkey selfie" image and one featuring Slater himself.

Shortly afterward, the Caters News Agency sent Masnick a notice requesting that Techdirt remove Slater's images. Masnick promptly responded to the notice, questioning whether Slater owns the copyrights to the images. Masnick also argued that Techdirt's use was "quintessential fair use under U.S. copyright law." Ultimately, Masnick refused to take down Slater's images, and, instead, published Caters' efforts to cause Techdirt to take down Slater's images. In the days that followed, Masnick published two additional articles regarding the dispute. In one of his follow-up postings, Masnick conceded that "a photographer could potentially claim copyright on an image shot by someone else if they really were involved in 'setting up the pictures,' but that means actually setting up what the photo is about: the framing, the composition, the angle, etc."

Around the same time that Techdirt was questioning Slater's ownership of the images, a version of one of Slater's crested macaque images was uploaded to Wikimedia Commons. Slater discovered the upload in 2014 while searching for other images from his trip to Indonesia, and promptly requested that Wikimedia remove the image. Wikimedia refused. In a nutshell, Wikimedia did not agree with Slater that he owned the rights to the "monkey selfie" image. Wikimedia subsequently published a licensing reference with the image that explains, "[t]his file is in the public domain, because as the work of a non-human animal, it has no human author in whom copyright is vested."

Slater saw his licensing revenues experience a steep dropoff. In the first year after his trip to Indonesia, Slater received £2,000 in licensing fees for the images of the crested macaques. Once Wikimedia made the images available, claiming they were in the public domain, Slater saw has licensing fees for the photographs stop. For two years, Slater did not receive any licensing revenue for the images, and it was only after 2014 that Slater started receiving any additional licensing fees despite continued widespread use of the images.

Monkeying With The Law?

Contrary to the simplistic theories espoused by Masnick and Wikipedia regarding ownership of the "monkey selfie" image, the questions of who actually owns the copyrights to the image, and whether the image is truly in the public domain, are considerably more complex.

The U.S. Copyright Office publishes the *Compendium of U.S. Copyright Office Practices*, which addresses Copyright Office practices and policies. At the time Slater's images started to raise legal questions, the most recent edition of the *Compendium* was nearly 20 years old. However, the Second Edition

While this monkey is smiling, photographer David Slater certainly isn't after a copyright claim threw the ownership of this image into question.

of the *Compendium*, released in 1984, did briefly address the issue of works not originated by a human author. According to the *Compendium*, "[i]n order to be entitled to copyright registration, a work must be the product of human authorship. Works produced by mechanical processes or random selection without any contribution by a human author are not registerable."

In 2014, the Copyright Office released the Third Edition of the *Compendium*.

That updated edition expands on the subject of works lacking human authorship. Now, the *Compendium* explains that the "[Copyright] Office will not register works produced by nature, animals, or plants." The updated *Compendium* also includes a series of examples, including a "photograph taken by a monkey," a "mural painted by an elephant," and a "claim based on cut marks, defects, and other qualities found in natural stone."

Although the U.S. Copyright Office may not be willing to register works created by animals, that still leaves

unanswered the question of whether Slater owns the copyright to the "monkey selfie" image. In order to determine whether Slater owns the copyright, there must be a determination as to whether Slater or the monkey is the "author" of the image.

It is apparent from the positions and statements made by Wikimedia and Masnick that they believe the crested macaque is the author because it pressed the camera's shutter release. Implicit in this view is that copyright arose the moment the image was "fixed" in a tangible medium, namely the recording of the image on the memory card. However, the Copyright Act is not so rigid to foreclose other possibilities. Indeed, the current Copyright Act defines the term "fixed" to include the concept that the fixation be "by or under the authority of the author."

The U.S. Supreme Court has held that "[a]s a general rule, the author is the party who actually creates the work, that is, the person who translates the idea into a fixed, tangible expression entitled to copyright protection." However, even this rule has limits. When a person authorizes fixation, the process must "not require intellectual modification or highly technical enhancement…" In a case where a person provided specific direction to an artist, who actually drew a set of maps, a U.S. court determined that the person providing direction was entitled to be considered the author of the maps for copyright purposes (although the same court suggested that the artist who was following instructions might also be a joint author).

Since the image was created in Indonesia, and Slater is based in the UK, it is entirely possible that a nation's law other than the U.S. may ultimately supply the answer as to the identity of the author of the "monkey selfie" image. That fact alone may bode well for Slater.

In December 2011, the European Union Court of Justice determined that portrait photography was subject to copyright protection "if the author was able to express his creative abilities in the production of the work by making free and creative choices." As that court determined, "the photographer can make free and creative choices in several ways and at various points in its production." These creative choices could occur in the "preparation phase" involving selection of background, pose and lighting; they could occur when "taking a portrait photograph" through the selection of framing, angle of view and atmosphere created; and they could occur during post-production with the selection of various developing techniques or use of computer software.

Monkey See, Monkey Sue?

Just as Slater was preparing to take legal action against Wikimedia, he found himself embroiled in a lawsuit in the U.S. PETA, on behalf of "Naruto"—the 6-year-old crested macaque named as the plaintiff—sued Slater and others for copyright infringement.

According to the allegations of the complaint, crested macaques are "highly intelligent, capable of advanced reasoning and learning from experience. Like other primates, including humans, Naruto and all crested macaques have stereoscopic color visions with depth perception and are vision dominant." The complaint goes on to assert that "Naruto authorized the Monkey Selfies by his independent, autonomous actions in examining and manipulating Slater's unattended camera and purposely pushing the shutter release multiple times, understanding the cause-and-effect relationship between pressing the shutter release, the noise of the shutter, and the change to his reflection in the camera lens."

In a somewhat ironic twist, it turns out that the crested macaque in the "Monkey Selfie" is not actually Naruto. Says Slater, "I am being sued...by the wrong plaintiff."

Ultimately, it is simply the notion that Slater is being sued for copyright infringement by *any* monkey that allowed the court to reach a decision in the case. Earlier this year, Judge William H. Orrick dismissed the Naruto case because a monkey is not an "author" under the Copyright Act. Since animals cannot be "authors," and since the Copyright Office will not register works created by animals, the judge did not believe that Naruto had standing to sue.

The judge also suggested that if those arguing on behalf of Naruto sincerely believe that dismissal is "antithetical to the tremendous [public] interest in animal art," they should make that argument to Congress and the president, not to the court. "In light of the plain language of the Copyright Act, past judicial interpretations of the Act's authorship requirement, and guidance from the Copyright Office, they have not."

Monkey On Your Back?

The authorship questions raised in Slater's dispute with Wikimedia and in the Naruto case highlight the need for greater clarity within the law.

For example, there are strong arguments to be made that the involvement of non-human influences on the creation of the image should not detract from the photographer's role in making creative choices that help create the image. To suggest otherwise is to denigrate the creative role that photographers play simply because they used lightning-sensitive triggers to trigger landscape photographs or motion-sensing triggers to capture images of animals in the wild.

If the issue of authorship would be determined by application of a rigid test—e.g., the author is the person or thing responsible for triggering the camera—then under such a test, photographers who use assistants to trigger remote cameras will effectively relegate their own role while promoting their assistants to the status of author; even a somewhat less rigid test may result in the photographer and assistant being viewed as joint authors.

Since the Naruto case is presently focused on the issue of whether an animal has the right to sue for copyright infringement, it is unlikely that the case will shed any additional light on the issue of who actually owns the rights to the "monkey selfie." On the other hand, the case may provide momentum for legislative changes to copyright law. In the meantime, we will have to see how the case plays out. DPP

Samuel Lewis is a Board-Certified Intellectual Property Law specialist and shareholder at Cozen O'Connor in Miami, Florida, and a professional photographer who has covered sporting events for more than 30 years. He can be reached at slewis@cozen.com or slewis@imagereflex.com.

> ...the questions of who actually owns the copyrights to the image, and whether the image is truly in the public domain, are considerably more complex.

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TIPS & TECHNIQUES
From the Pros

1 Turn Any Bag into a Camera Bag with Lens Wraps

The venerable lens wrap is found in many professionals' kits, due to its ability to transform an everyday bag or backpack quickly and easily into something safe for your delicate camera equipment. Wraps are also great for street photographers and other shooters looking for a compact kit who just need to carry one or two spare lenses in their bag or pocket.

2 Expedite Your Photoshop Workflow with Actions

When working in Adobe Photoshop, Actions can be used to automate some of the most often used, menial tasks with a single click. By recording your own Actions for resizing files for various applications, converting color spaces for print or Web, or for applying sharpening for different image types, you can save time finalizing the output of your files. Additionally, Actions can be assigned to a keyboard command for even faster, easier use.

3 Pre-Focus to Be In-Focus

Pre-focusing is when you set your focus point to where you anticipate your subject to be when taking the exposure, prior to making the exposure. This saves time and increases the likelihood of capturing your moving subject in sharp focus, regardless of whether you're working with autofocus or manual focus.

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Apple's MacBook Pro

The newest pro laptop from Apple delights some, angers others

By David Schloss

Apple's MacBook Pro is the company's flagship portable computer, providing a nearly desktop-level of computing in a small, metallic enclosure that's easy to slip into a backpack.

Sure, the new 15-inch MacBook Pro (2016) is faster and lighter than the previous model (the two things most users want in an upgrade), but it's two design choices that seem to be drawing the most attention and sparking the most controversy. Apple's new use of USB-C ports and the touch-sensitive OLED bar called Touch Bar seem to have derailed any rational conversation about the most recent and most powerful Mac laptop.

Truth be told, in an era where each generation of computer is supposed to be faster and lighter, the new MacBook Pro is a complicated story to tell. To shave weight off of the MacBook Pro, the new models shave off a bit of the performance of a similarly equipped MacBook Pro 2015. The new Intel processors inside the MacBook Pro are smaller, and much more energy efficient than previous processors, but they're not as brawny. That means while the new MacBook Pro gets much longer battery life (up to 10 hours), it does so with slightly lower processor benchmark scores.

However, the main processor in a computer isn't the only workhorse; in fact, for photographers and video editors, the graphics card is as important as the processor, if not more important. Many imaging tasks in the Mac OS are handed off to the Graphics Processing Unit (GPU), and so a faster GPU means better performance using things like Photoshop or Final Cut Pro.

The GPU in the MacBook Pro is much improved over the 2015 model, though it's not the top-end portable graphics card on the market, but instead the largest, fastest model that Apple could squeeze under the hood.

Performance-wise, we found the 15-inch maxed-out MacBook Pro 2016 to be faster than its predecessor, though not so much as to knock your socks off. That said, I reached a point a few years ago where my computer is more powerful than the applications it runs. If I need to do high-end video editing on a regular basis, I'd turn to a desktop system like the Mac Pro (which also needs a good upgrade), as the multiple core processors make short work out of things like rendering video. When doing my daily work in Lightroom, Final Cut, Capture One Pro or Photoshop, I rarely find myself thinking "I wish I had more power."

More often I wish that I had more battery power, and the more efficient processor in the MacBook Pro might not be faster than the last generation, but it's less battery-draining. The MacBook Pro has a claimed runtime of around 10 hours performing general browsing tasks, and that has been pretty on-target for my tests.

Like its predecessor, the MacBook Pro is limited to 16 GB of RAM, which is non-upgradable. It would have been very nice to have seen a bump in the upper RAM limit. Thanks to the efficiency of the recent version of OS X, there really aren't any apps that run poorly with that amount of RAM—I edit videos all the time in Final Cut Pro without any issues—but creatives tend to have numerous applications open at once and tend to switch between them regularly, and more RAM would keep things humming along without any pause between applications.

Turning Hard To Port

Traditionally, the MacBook Pro has had a kitchen-sink assortment of ports and connectivity, designed to make the portable Macintosh able to handle anything it might encounter, regardless of the environment. The previous 2015 model of the MacBook Pro had USB 3, Thunderbolt 2/Mini Display, Ethernet, HDMI and a MagSafe power cord.

With the new MacBook Pro, the company flips this idea on its head, focusing instead on a single physical connection standard—USB-C—to act as the gateway to interacting with the outside world. While the MacBook Pro has WiFi and Bluetooth for wireless connections, for wired connections the new MacBook Pro is the USB-C way or the highway.

The USB-C standard is an electrical engineering marvel, packing video, audio, connectivity and, importantly, power into a single, small connector that can be inserted face up or face down, but they're the only connector to be found on the MacBook Pro, aside from a small audio port. The Swiss Army knife versatility of last year's MacBook Pro has been replaced with a machine that needs adapters or new cables to talk to just about anything. In a few years, the whole computer market will get on the USB-C train, so it will be easy to connect devices with USB-C ports, but today it requires some workarounds.

Online forums were so full of angry

comments about the need to purchase adapters to connect the MacBook Pro to everything from hard drives to, well, anything that Apple even reduced the price of its adapters to appease customers.

As with many things, the reality of this change is both easier and harder to deal with than you might think. Sure, you'll need to buy an adapter to go from USB-C to Thunderbolt or FireWire, but USB-C cables to many other connection types abound. That means that you can go directly from your USB-C port to your existing USB hubs with a simple, cheap cable or go from USB-C to your iPhone's Lightning port without an adapter.

Even a year from now the market will be flooded with drives sporting USB-C connectors, just as USB 3.x connectors are ubiquitous now. The primary user who will have to turn to adapters is one with an array of drives and peripherals with either Thunderbolt 2 or FireWire, and for them, plugging in a dongle isn't a big deal.

A better solution might be to use a USB-C hub, like those sold by Kensington and OWC. These devices connect a single USB-C cable to a box about the size of a power strip that has conventional ports like HDMI, Ethernet, USB 3 and more. This single connection is also enough to provide power for the MacBook Pro. USB-C has so much bandwidth that it can handle these multiple connection types across a single USB-C cable, with room to spare.

As of this writing, though, there are still some gotchas with these hubs. The OWC hub we received didn't work with the new MacBook Pro; external monitors refused to sync no matter what we did. OWC has a new USB-C hub coming out in February 2017, and we assume it will work as well as our previous Thunderbolt 2 hub did.

We also tested the Kensington USB-C hub and that works much better, though we tried, and failed, to connect a Thunderbolt 2 drive to the hub's additional USB-C port via a Thunderbolt adapter. The hub doesn't seem to be able to maintain all the multiple other connections and also work with an adapter. This issue may be addressed by firmware or by future models, however.

The workaround is to connect the Thunderbolt 2 drives to one USB-C port and the hub to another—with all the connections spanning from that, but instead of the promise of a single cable to serve all our needs, now we have two.

Further complicating things, it's not possible (at least in our tests) to put an adapter further down the chain. In other words, you can't go from USB-C to Thunderbolt 2 via an adapter and then from Thunderbolt 2 to FireWire 800 via an adapter; it just won't work. You can connect the FireWire to a USB-C adapter to another USB-C port, but then you have three cables instead of the promised single-cable solution.

So, yes, you'll need new cables or adapters to use the new Mac right now, and you're going to run into headaches until the hubs and peripheral makers of the world get the kinks worked out of this new standard. I'm old enough to remember the switch from SCSI connectors, so I've been down the disrupted workflow road before, and I'm willing to wait until this works out. For people who have to connect a wide variety of devices, the previous-generation MacBook Pro is still a better choice, at least for now.

One of the most promising things about the USB-C standard is that it provides power over the same cable used to connect to devices. Our test MacBook Pro is connected to the hub with a single cable that's powering the Mac, and also connecting it to a display and a USB hub. Apple "partner"

LG released a monitor that has native USB-C input for video, and that display powers the new MacBook Pro over that cable. It will be possible to do things like provide power to a Mac and several drives over the same connector, without any power bricks for the various accessories, and that's the main reason why I think Apple went all-in on USB-C. The only way to ensure the standard catches on is to make it necessary for peripheral companies to get onboard.

Touch Bar

I've rarely seen such a bashing of a useful technology as I've seen with Touch Bar, the new interactive, OLED, touch-sensitive strip that replaces the function keys above the number row on the new MacBook Pro. There are people who seem personally insulted by Apple's inclusion of this new technology, though it works as advertised. I rarely use my keyboard's traditional function keys as function keys, using them to control things like brightness and volume (which you can still do), and Touch Bar turns what I'd consider to be dead space into a useful, variable and dynamic tool.

Open Final Cut, and you can scrub through video with it. Open up Apple's Photos, and you can quickly select images and make adjustments. As software developers embrace the new tool, we're going to see any number of new functions possible with the Touch Bar. Imaging sliders can be programmed to control exposure or saturation or anything you'd like at the tip of your fingers.

Much of the criticism of Touch Bar seems to come from Apple's decision to promote it by showing off emoticons in Messages. Perhaps that wasn't the clearest demonstration of the professional applications it offers.

The main issue I have with Touch Bar is that I largely use my laptop tethered to a monitor and connected via an external keyboard. When the MacBook Pro sits next to the second display, it's well out of reach, making the Touch Bar inaccessible. In other words, my biggest issue is that I can't always get to it.

Another criticism is the built-in Siri button, but I'm also finding this to be an indispensable tool. I couldn't find an Excel spreadsheet I did sometime this month, and I asked Siri to find all the Excel documents made in the last two weeks, and there it was, where I put it, in the wrong folder. As Siri's power expands, it will make more sense to have that button handy. I'm looking forward to doing a lot of file management with that button.

Keyboard And Trackpad

As someone who has used the current-generation MacBook, I'm used to Apple's new "butterfly" springs that lie beneath the keys and the different feel the mechanism provides. The butterfly design is flatter than traditional springs, allowing the MacBook and now the MacBook Pro to be not only thinner, but making the keyboard action more precise, as well.

In the MacBook, this wasn't necessarily a good thing. The keys on the compact Mac felt stiff and difficult to actuate. Sure, they're less likely to, as Apple says, "wobble around the edges," but there wasn't enough vertical travel. For a longtime typist, the result is a bit of hand fatigue, as it takes a lot of finger force to press the springs. You can't, as you would on a more traditional keyboard, slide your fingers off the edges as you move from key to key. In other words, the wobble in most keyboards is part of what makes them feel good.

The MacBook Pro uses a second generation of the butterfly springs, and they're marginally improved, but it's still a hard keyboard to get used to. On my external keyboard, I can type for hundreds of words before my hands get tired, but on this keyboard, I have to take a break to stretch my fingers every few dozen words.

If you don't type for a living—perhaps you only press keys to activate shortcuts in Photoshop—or you're a bad typist, the keys will probably help quite a bit, as the stiffness makes it surer when a key has been pressed, but if you find yourself often typing, the keyboard is likely to disappoint.

I can't see Apple ever returning to the previous spring design, unfortunately, so I guess it's time to take my fingers to the gym.

The surface area of the trackpad has been significantly increased on the new MacBook Pro, though I'm not exactly sure why. I almost always use the trackpad in conjunction with the keys, and my thumbs simply don't have the need or ability to cover an area wider than the space bar or deeper than I can reach when turning my hand slightly to move the mouse.

Thankfully, the trackpad isn't mechanical—the click feeling is created via haptic feedback, so the trackpad can be clicked anywhere on the surface by pressing down on it, so it's not necessary to click the front of the trackpad (which is very far from the keyboard) to select something.

Display

Apple has recently championed a new color model it calls Wide Color (see our article in the December issue for

more information, www.digitalphoto pro.com/gear/imaging-tech/apples-wide-color/), and the MacBook Pro implements this. It also has a sharp, vibrant display, which means that the monitor on the MacBook Pro is one of the sharpest and most accurate around.

If you're doing mission-critical photography work, the display on the MacBook Pro won't let you down, and that's hard to overlook—though many of the online critics seem to have, in fact, missed the significance of the display.

I calibrated the display on the MacBook Pro, and when it sits beside the BenQ SW2700PT, a monitor designed for graphics professionals that displays 99 percent of Adobe RGB, it's generally impossible to see any difference unless performing detailed color work.

SD-Free
Another bit of controversy surrounds the removal of the SD card slot on the MacBook Pro. I'd hazard a guess that less than half of computer users used the SD card slot, but I'd also wager that those who used it, used it all… the…time. As a frequent camera tester, I used the SD card reader anytime the MacBook Pro left my house. While more and more cameras have wireless transfer, that's still not as fast as the integrated SD slot, nor is it as convenient. When moving images or videos from a camera over WiFi, the card is still in the camera so you can't shoot with one card while another card is in the SD slot transferring.

Naturally, you can bring along a card reader on your shoots, but it's one more bundle of wires and adapters for users to carry along while Apple talks about the stream-lined use of USB-C.

One saving grace for the removal of the SD slot is the upcoming battle between SD and the newer XQD and CFast standards. At some point, pro-level cameras will switch from SD to something else, rendering an SD card slot useless.

We are not, however, at that point, and a plethora of cameras use SD cards. It's sad to see that slot go.

Conclusion
We reviewed the 15-inch MacBook Pro with the fully maxed-out configuration. While the 13-inch model is excellent, we think the majority of photographers will opt for the 15-inch version, so buying recommendations are predicated on that setup. If you need the smaller size of the 13-inch laptop, then you're going to have to compromise a bit in the upper end of the configuration.

If you're using a MacBook Air or MacBook, the upgrade to the MacBook Pro will be well worth it. Likewise, if you're using a 2012 or 2013 MacBook Pro, there's enough bang in this update to make it worth your buck.

However, if you're using the 2014 or 2015 MacBook Pro, there isn't yet a compelling reason to upgrade if you don't feel your system lagging. It's a bit thinner. It's a bit lighter. It has a bit better battery life (well, a lot better battery life). It's a bit faster. But it's also less able to connect to the physical world, and

it's a bit expensive, considering the degree of improvement you'd get.

This same thing happened when Apple introduced the first 5K iMac in 2014. To meet its goal of creating a 5K desktop system, it had to create a workaround to send video to the display—the video chips available at the time didn't handle the resolution of a 5K monitor.

The 2015 iMac increased the specs all around, making it much more suitable for high-end editing and for video work. Many would-be Mac Pro users turned to the updated 5K iMac instead.

I think the same thing will happen with this new MacBook Pro. Clearly, Apple has some goals in mind, and this is the first system to bridge from an older mindset of a Swiss Army knife design to one that's more like a Swiss watch. The USB-C port is going to change how we interact with computers, but we all might not be ready for that change.

It's very likely that in 2017, Apple will update the 15-inch MacBook Pro with the new Intel Kaby Lake processors (that have only recently come to market) and a faster video card. When that update happens, it will make the benefits of upgrading even more appealing. DPP

You can follow Editor David Schloss on Twitter and Instagram @davidjschloss

Emily Soto

Westcott Skylux

Dependable, transportable LED lighting in a compact package

By David Schloss

Westcott's Skylux is a deceptively small LED light that's bright, compact, versatile and continues in the company's tradition of making rock-solid photographic products with innovative design elements.

The Skylux looks for all the world like a traditional, small monolight. More accurately, it looks like a lunchbox that's capable of producing a blinding light—if photographic lighting were breeds of dogs, the Skylux would be a pug, with a short, flat face devoid of protruding flash bulbs. The squat design of the light makes it look less powerful than it is—inside the metal housing is a dimmable light source that uses new 94 CRI LED elements for brighter, more accurate color than many other units.

The external power supply provides consistent flicker-free operation and can even double as a light stand weight, thanks to the long strap. Designed to work with a variety of voltages, the Skylux can be used overseas simply by swapping out the power cord.

Any number of light modifiers can be attached to the Skylux, and it comes with its own simple reflector. The light from the Skylight is already diffuse and soft, thanks to the built-in frosted panel, and we often use the Skylux when shooting review videos with nothing more than a low-cost lighting umbrella—the output is bright enough and diffuse enough to cover a small room evenly, and the 5500K daylight output fills out the ambient light in our recording space perfectly.

The company measures the output at 8.490 lux at 1 meter, 945 at 3 meters and 371 at 5 meters. If you're not familiar with lux values, we measured the output as at least 1/160th at *f*/8 at ISO 100 from 1 meter away.

While the unit requires a built-in fan to keep it cool during operation, the fan is nearly silent, which is one of the reasons why we've been using the Skylux for our video studio. Unless you're standing directly at the unit, there's almost no discernable noise—certainly none a mic picks up a few feet away.

The Skylux costs $1,000, and the box contains the light, reflector, protective cap, external power supply/ballast and the connecting cables. Thanks to the simplicity of the design, there's no real setup—simply take the light out of its box, put it on the stand, plug it in, and go.

The unit is so simple and so powerful that there really are no drawbacks. Many LED lights are harsh, or have a loud fan, or are large and cumbersome, but the Skylux is none of those things. A photographer would be hard-pressed to find a better solution in a package this convenient. It's not the cheapest lighting solution available, but as is the case with many studio-quality tools, the price brings with it durability and dependable performance. It would be nice to have a Skylux with a tunable color output to go from daylight to tungsten, but if that meant any reduction in the light output, we'd rather keep the unit as it is and just use a color-balancing gel.

For photographers and videographers alike, the Skylux is a hard-to-beat lighting solution for any number of studio and location needs. **DPP**

You can follow David Schloss on Twitter and Instagram @davidjschloss

Sam Jones
Motion In Monochrome

HDVideoPro

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<< Libec Monopod

Libec's very affordable **HFMP monopod**, as in "hands-free," will stand on its own one foot. Featuring three foldable legs on a base that also rotates panoramically, the HFMP monopod can be locked into a standing position for tripod-like operation or for resting simply by stepping on it. The more advanced HFMP Kit at $340 adds a one-touch, quick-release plate that's also compatible with Manfrotto and Sachtler heads. The HFMP Kit includes a pan-and-tilt head with a dual-head design with 65mm bowl for use with pods, monopods, sliders, skater dollies and other equipment that can connect via 3/8-inch screws, as well.
Price: $200. **Website:** libecsales.com

Zacuto Baseplate

The **Zacuto VCT Pro Baseplate** is a quick-release system for camera rigs and support solutions that will work with compact mirrorless camera systems, but the 10 inches of sliding range also makes it versatile enough to accommodate much bigger and more advanced setups, including professional setups from DSLRs to Canon Cinema EOS, Blackmagic, Sony solutions and many others. The VCT Pro Baseplate is also available in kit purchases with the new Next Generation Recoil camera rigs from Zacuto that add accessories like EVF, optical viewfinder, front handgrip for shoulder operation and more to convert any number of camera systems into fully fleshed-out filmmaking systems.
Price: $650. **Website:** zacuto.com

<< Rokinon Cinema Lenses

Be Xeen. Joining a line of six other full-frame cinema lenses, the new **16mm T2.6 XEEN lens** by **Rokinon** joins a **14mm T3.1, 24mm T1.5, 35mm T1.5, 50mm T1.5, 85mm T1.5** and **135mm T2.2**. With oversized barrel, uniform 114mm non-rotating front diameter for easy use with matte boxes, consistent focus/aperture ring placement and standard 0.8 Cine Pitch gearing for fast lens swaps when using follow-focus devices, the 16mm T2.6 is available in PL mount, as well as Canon, Nikon, Sony E, and MFT and accessory mount kits. (Like most cinema glass, the Rokinon prime set of XEEN cine lenses are very affordable because they lack autofocus and the inner gearing and mechanisms that those designs entail.)
Price: Varies depending on model. **Website:** xeenusa.com

New Products

Profoto Lighting Adapter

The **Chimera Triolet Adapter** (model #9923) will convert **Profoto**'s highly regarded lighting modification tools and accessories to the Chimera Triolet continuous lighting system, which is available in tungsten, fluorescent and LED at up to 1,000 watts of output or at up to 750 watts when using a two-pin GY9.5 adapter for halogen or fluorescent bulbs. Pronounced "trio-lay," the Chimera Triolet Adapter also comes with quick-release for swapping between available accessories from Profoto like beauty dishes, reflectors and much more.
Price: $150. **Website:** chimeralighting.com

Manfrotto Tripods >>

Starting with a fluid head that weighs less than a pound while supporting up to 8.8 pounds, **Manfrotto**'s **BeFree line of travel tripods** are offered as very affordable support solutions for travel. The leg systems sport a unique, tightly wound folding design that make them extra-portable for the latest class of reportage videographers and photobloggers. With pan-and-tilt, the BeFree Live fluid head is available as a kit purchase with the lightweight $169 290 Light Alu 3-segment tripod legs or with the $239 Manfrotto BeFree Live Aluminum 4-Section Kit.
Price: $99. **Website:** manfrotto.us

<< SmartSound Sonicfire Pro 6

SmartSound's **Sonicfire Pro 6** software offers an extensive library of modifiable royalty-free tracks. Designed specifically for the needs of multimedia and editing, tracks can easily be searched by genre, instrumentation, mood and more. With everything from pop rock to heavy metal to electronica, songs can also be remixed, extended and customized to fit the needs of the soundtrack or for using the same track multiple times. New songs are added frequently to the SmartSound library and are available as singles or in bundled albums. The program comes with a Core Music Album that has 10 tracks to start you off. A free trial is available at the SmartSound website.
Price: $200. **Website:** smartsound.com

For daily updates on multimedia technologies, follow @HDVideoPro on social media at Facebook, Instagram and Twitter!

Think Tank Mirrorless Mover

Think Tank has updated its **Mirrorless Mover** line of low-profile camera bags. Starting at a street price of only $35, the Mirrorless Mover line tops off at $69 with the largest model, the Mirrorless Mover 30i. The Mirrorless Mover 30i has enough room for two to four lenses in addition to the camera, including a large telephoto-like common 70-200mm zoom. Think Tank's bags are designed to be discreet so as not to attract attention to cameras and contents. They also feature tough metal buckling and ballistic polyester.
Website: thinktankphoto.com

B+W XS-Pro Neutral Density

Available in densities of 0.6 (two stops), 0.9 (three stops), 1.8 (six stops), and 3.0 (10 stops), as well as sizes from 30.5mm to 95mm, **Schneider-Kreuznach** has expanded on the B+W line of professional optical filters with a new neutral-density model: the **XS-Pro Neutral Density**. With Schneider-Kreuznach claiming 99 percent of light transmission, the construction features finely cut and polished glass, as well as multiple full-spectrum coatings to ensure even light absorption across the optics. There's a front thread for a lens hood or lens cap, and the slim brass mounting ring is designed to be very thin to eliminate vignetting, even with wider lenses. **Price:** Starts at $55.
Website: schneiderkreuznach.com

Audio Assist

What Are The Best Audio Apps?

Using your smartphone as an additional sound tool for pro audio work   By Daniel Brockett

Professional sound mixers and audio engineers who use their ears to earn a living seem to be inexorably attached to their smartphones. But did you ever think that your smartphone could become a valuable tool for professional audio work? There are tens of thousands of apps out there, so how to narrow down the field to the best ones for those of us who care about sound?

Some audio apps are merely toys or are solely geared toward performing musicians, but we spent some time exploring the wilds of the Apple App Store and the Google Play Store, searching for the best, most helpful apps for the working sound mixer. The following is a list of some of the most useful apps we found.

AudioTools by Andrew Smith
Category: Serious Professional Tool
iOS: $19.99
AudioTools is a suite of professional-grade audio and acoustic analysis apps. It includes a base set of apps in the initial purchase price and then has a number of optional modules that you can purchase from within AudioTools at anytime as in-app purchases, including SPL Metering, Real Time Analyzer, FFT, Speaker Polarity Checker, Noise Generator, Line Level Tests, Audio Scope, Recorder, Speaker Distortion Measurement and several more. While it's not inexpensive, once you buy other in-app purchases, in comparison to purchasing the hardware that traditionally supports these functions, the overall package is a bargain.

Quiztones by Audiofile Engineering, LLC
Category : Prosumer Semi-Professional Tool
iOS and Android: $7.99
Quiztones is a frequency ear-training app for amateur and professional audio engineers, producers and musicians. It utilizes tones and frequency-altered noise and musical loops (including source material from your own music library) to train your ears and help develop more acute listening and frequency recognition skills. Audiofile Engineering claims Quiztones will sharpen your ears and frequency recognition skills, while improving your mixing and EQ chops. Based upon trying the app, it appears that if you use it, Quiztones really does help to train your hearing to better differentiate different frequency ranges. Nice touch is using the user's own music library, as well.
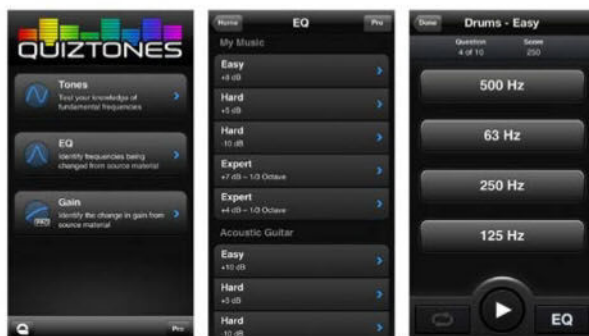
V-Control Pro by Neyrinck
Category: Serious Professional Tool
iOS only, compatible with iPad: $49.99
Control surfaces for professional digital audio workstations are typically large and expensive, costing many hundreds or even thousands of dollars. This app is simply a pro-level control surface for various digital audio workstations that works via your iPad. V-Control Pro provides a fully featured, multi-touch control surface for Pro Tools, Logic Pro X, Cubase/Nuendo and many more DAWs. V-Control Pro uses WiFi to control transport, editing and mixing functions. V-Control Pro provides advanced control of sends, automation, groups, auditioning, plug-ins, jog/scrub/shuttle, I/O assignment and other controls within an easy-to-use interface. V-Control can be used simultaneously with Ethernet controllers used by Pro Tools. The app provides limited features for free so you can test it out with your DAW and workflow before buying the license. Supported DAWs: Pro Tools; Logic Pro X; Cubase/Nuendo; Adobe Audition; Adobe Premiere Pro; Digital Performer; SONAR; Final Cut 7; Ableton Live; Avid Media Composer; MIO Console; Reaper; Reason; Presonus Studio One.

MultiTrack DAW by Harmonicdog
Category: Prosumer Semi-Professional Tool
iOS only, compatible with iPhone, iPad and iPod Touch: $9.99
MultiTrack DAW is a powerful audio recorder and audio editor for iOS devices. It provides up to 24 stereo tracks of better-than-CD-quality audio and the ability to play back

all of those tracks while recording up to 16 tracks simultaneously. MultiTrack also provides a suite full of editing tools, including EQ, Compressor, Reverb, Delay and many more. You have a fader, pan, mute and solo function for each track. Because of the screen size, MultiTrack DAW seems to work best on iPads, although it will run quite well on recent-model iPhones, as well. The app gives you a lot of power for such a small device and can interface in various ways with external audio interfaces.

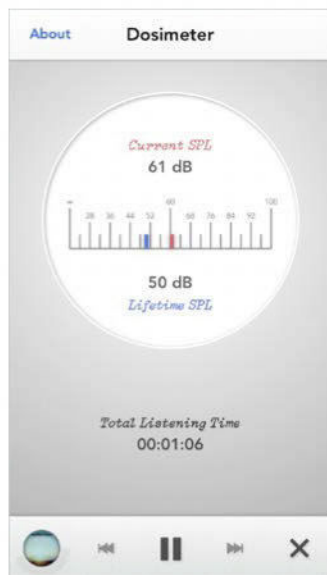**Can Opener by Good Hertz, LLC**
Category: Prosumer Semi-Professional Tool
iOS only: $2.99
Can Opener is an app designed to improve the experience of listening to an iOS device through headphones. The app's Equalizer allows you to dial in clarity, scoop or boost any frequency you would like. Can Opener has professional audio features built in, like a sample rate converter that allows iOS users to play back high-resolution audio up to 24-bit/192 KHz by real-time converting it to a resolution playable on iOS devices. The app also includes a built-in loudness meter and dosimeter, and supports lossless audio formats like FLAC and ALAC. Available as an in-app purchase, Speaker+ allows you to optimize your phone's speaker playback, noticeably improving speaker quality.

BBE SonicMax Pro by BBE Sound
Category: Consumer Tool
iOS and Android: $0.99
BBE SonicMax Pro is a music player that taps into your smartphone's music library and claims to restore the clarity, definition and natural sound quality that can be missing from digital music. The app adds warmth, presence and definition. Like any other app that purports to "improve" the sound, the actual improvement depends on the listener, since audio is so subjective. SonicMax Pro comes preloaded with presets finely tuned for the device you're listening through (earbuds, headphones, external speakers and a dock). But you can customize the sound to make your own presets by adjusting the parameters (Lo contour, BBE Process, iSet KHz, Sound Field, Mach3 Bass and Mach3 Gain) for your own listening device.

RTA Audio by New Ball s.r.o.
Category: Serious Professional Tool
iOS and Android: $6.99
This tool gives you the ability to analyze the quality of your audio system in an accurate way and to find out the sound intensity your system emits at different frequencies. Easily find frequency swings, then set up your equalizer to take them into account based on the information provided by the app. RTA
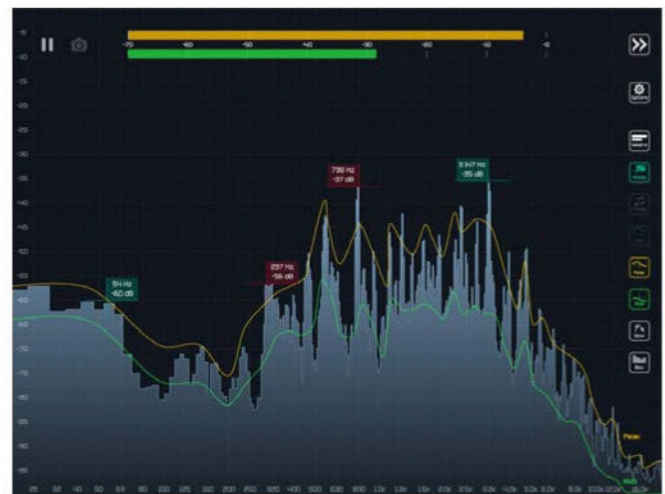
Audio analyzes the signal from a microphone or the line-in input. Some of the specifications of this app include: Resolution: 1/2 Octave; Logarithm frequency scale; Fixed frequency range (20 Hz - 20 kHz); Tone scale view C_0 - H_8 (A_4 = 440Hz);

Peak hold graph; Peak average graph; RMS average graph; Pointer function; Peak and RMS input meter; Freeze function; and Save screenshot function.

hearEQ by Ten Kettles
Category: Prosumer
Semi-Professional Tool
iOS only: $5.99

Much like Quiztones, hearEQ is an audio-training app designed to train your ears to better hear frequencies so you can more effectively apply EQ to your sound. The app has a learning mode that allows you to explore dif-

ferent EQ settings and learn about each. There are also custom exercises that let you train on a couple of frequencies to start, then you can work up to all 30 EQ bands in the app. Much like Quiztones, hearEQ also trains you with your own audio files, but you can also compare and utilize the app's built-in tracks, as well. This app costs two dollars less than Quiztones, and the interface is spare and clean.   **HDVP**
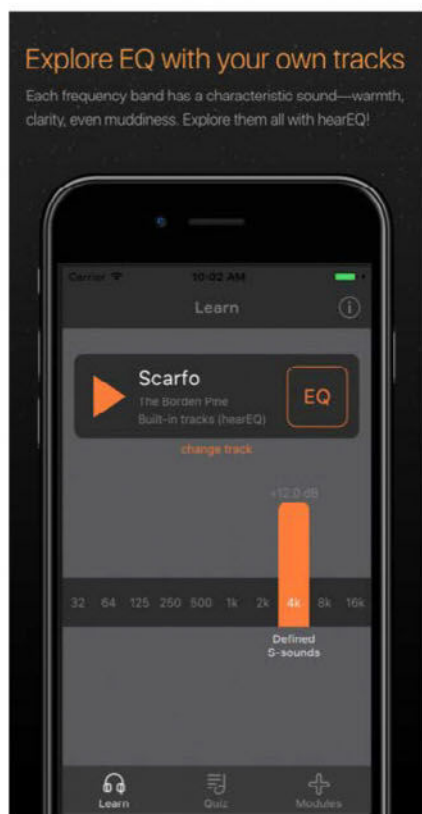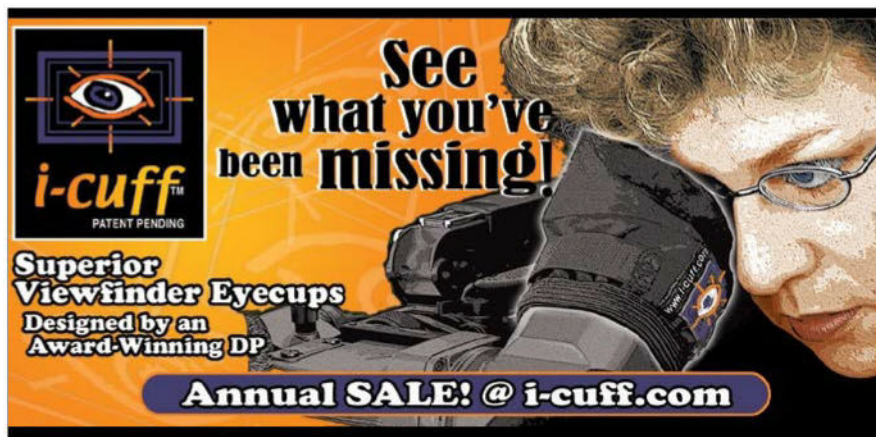
Still Photography Vs. Motion Capture

Kits for field work and prepping still cameras to work with video

By David Alexander Willis

While motion and stills capture are largely based on the same sensor technology, video gear has enhanced processing and storage needs because of the high volume of data generated during video capture. Dedicated camcorders and digital cinema cameras have the internal space and airflow design to support much more powerful internal processing, which allows them to have more powerful features. New top-shelf 8K cameras like the large-sensor Panavision Millennium DXL and RED's Super 35-sized Weapon Brain with Helium 8K S35 and Epic-W 8K S35 are already on the way, offering video capture at up to 8192x4320 and dynamic range of up to 16.5 stops with similar frame rates.

With high-end digital cinema cameras capable of true DCI 4K (Digital Cinema Initiatives) at 4096x2160, there are also a number of other resolutions available during capture like full 2K and 6K. In post-processing, these additional pixels can help to achieve several benefits in editing, like enhanced image stabilization through cropping or reframing of compositions. These large-resolution palettes are also available because filmmaking sensors must cover a variety of available aspect ratios.

Anamorphic lenses, for example, are captured at a special "squeeze" ratio, and require "desqueezing" to achieve projection in a theater. Because of their unique capture format, they're able to

achieve an incredibly wide aspect ratio of 2.40:1, while most DSLR systems capture in either widescreen at 1.78:1, more commonly referred to as 16:9, or standard full screen at 4:3 at an aspect ratio of 1.33:1. Canon recently introduced anamorphic capabilities to its lines with the flagship Cinema EOS C700.

Other lens mounts available directly or through mount adapters include Super 35 at roughly the same dimensions as APS-C, Super 16 at half that, and, of course, full frame. The use of

MOTION GRAPHICS
COLLABORATION
mixing
scoring
lighting
HDR
WORKFLOWS
AR/VR
VFX
8K
STORYTELLING
AERIAL VIDEOGRAPHY
360°

FILM
VIDEO
MOBILE
GAMING
TELEVISION
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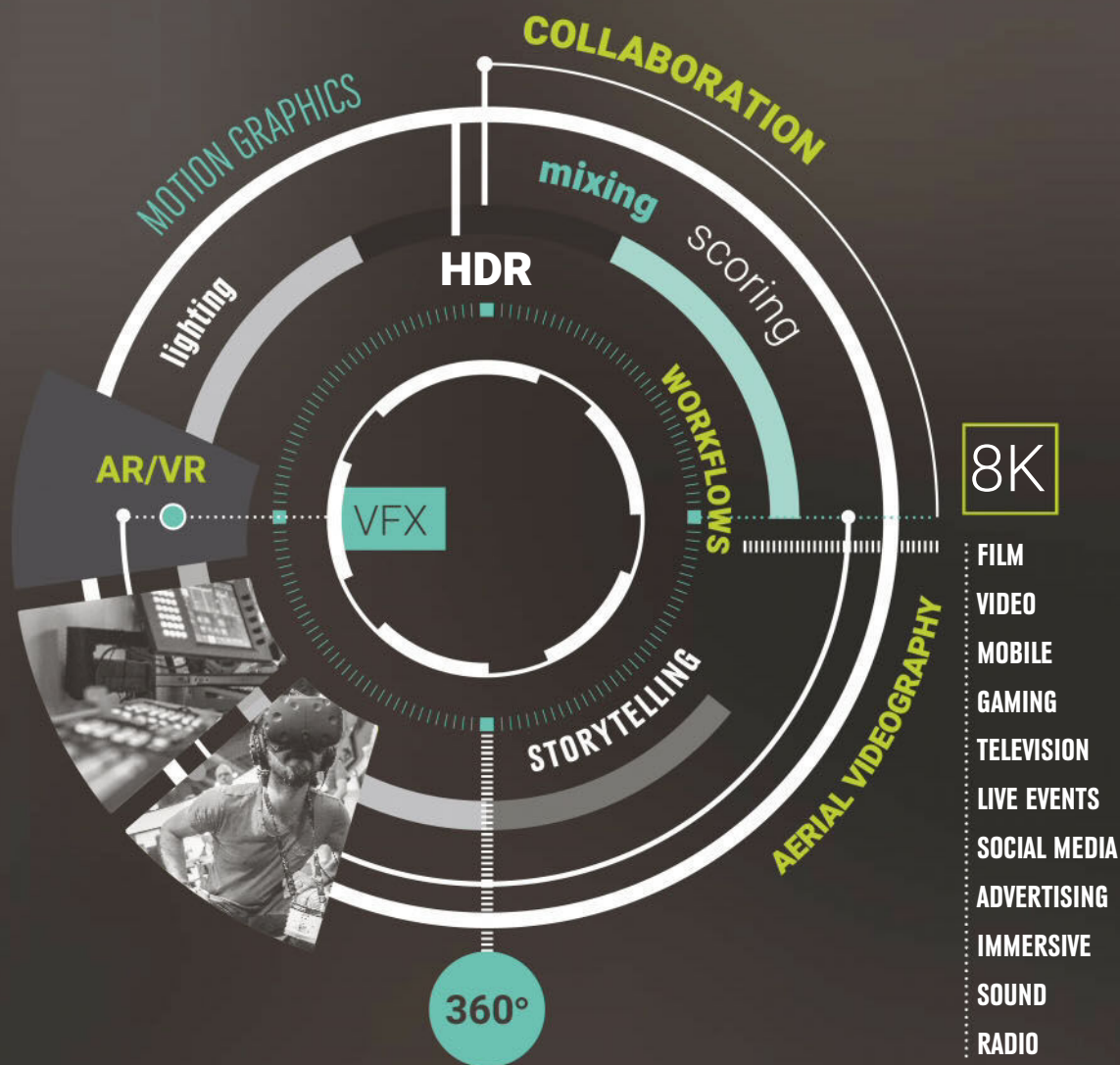
THE **M.E.T.** EFFECT℠

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full-frame sensors for image captures has made the Canon EF mount popular in the filmmaking industry for the availability of lenses that will cover both full frame and APS-C with a variety of focal lengths. Blackmagic, Olympus, Panasonic and other manufacturers that employ the Micro Four Thirds mount, or MFT, have been fighting back for market share with lenses that are much lighter and more compact thanks to the smaller sensor requirements of MFT at half the size of the traditional film plane.

Because of the 2.0x crop when using Micro Four Thirds compared to full-frame, wide-angle lenses are the Achilles' heel of the MFT movement, though today lenses are available as wide as the Rokinon 7.5mm *f*/3.5 fisheye, measuring in at 15mm in 35mm equivalence. With a huge amount of filmmaking accessories available, Sony's E-mount line of lenses and cameras like the a7 series have also proven very successful because of the

camera's small form factor, S-LOG and external recording.

There are also a number of new cine lens systems in both full frame and APS-C from Sigma, Tokina, Rokinon and Canon that feature the design of traditional cinema lenses from the golden era of Hollywood. These lenses have oversized barrels with luminescent markings that can be seen in the dark to avoid adding extra light during filming. The markings are also useful for performing repeatable focus throws in a scene when an actor or a subject must hit two or more spots.

Cine lenses also measure the absolute light passing through the iris instead of the theoretical amount of light for the aperture rating. This more accurate measurement, which is labeled in T-stops, measures the exact amount of light passing through the lens. The iris in a cinema lens is also declicked, which means it has silent operation, without the hard stops found in still lenses, and can be opened or shut during a take for

exposure effects. For DSLR or mirrorless users, follow-focus units and lens gearings provide the same kind of meticulous focus rotations. There are also a variety of useful accessories for DSLR rigging, like large matte boxes, for example, which can be used to block out the sun and any extraneous light or flares, or monitoring systems.

Camera support systems not seen in photography are also going to come into play. Rail systems give horizontal or vertical movements while jibs, dollies and cranes can provide movements like camera pushes and pulls or sweeping overhead or underhand shots, as well as combinations of all of the above. Many rails and support systems are motorized or controllable via remote, which makes them doubly useful for time-lapse photography. Rail systems can also be laid as track for long takes

Redrock Micro makes a variety of innovative accessories that can convert camera systems into filmmaking machines, including the Scout.

when using advanced support systems like camera dollies. Zacuto, ikan, Cinevate and many others make a number of camera rigs and support systems, with advanced motorized models also available from Redrock Micro, which is known for creating accessories that can convert DSLR systems into filmmaking machines.

Handheld video is often very shaky, especially when using still camera systems. (Most camcorders are weighted evenly to be used as shoulder-mount solutions when handheld.) Stabilization systems like the new Glidecam Centurion and Tiffen's Steadicam Solo and Steadicam Merlin2 are unique in that they provide "floating" footage—

video that seems to have been shot by a camera suspended in the air.

Finally, while tripods and monopods are absolutely necessary gear solutions, just like with stills, ideal models for video will have fluid heads or bowl heads for smooth movements during motion capture, as well as sturdy tripod legs that are capable of supporting the camera and lens with microphones, lights and even larger accessories like matte boxes. Professional tripods use bowl systems rather than the columns found in most photography tripods, which are more prone to vibration during camera movements.

While professional systems have a number of "ins and outs" like HD-SDI for channeling high-frame rate, high-quality video with minimal compression, most DSLRs and mirrorless

systems top off with an HDMI connection for monitoring. HDMI is most commonly known as the connection for HDTV sets, but it can be used to preview footage or to capture "clean out," which is a way for the camera to capture better color fidelity and heightened sharpness with an external video recorder like those available from Blackmagic Design, Atomos, ikan, Convergent Design, Video Solutions and numerous other companies. Larger screens are also available for detailed monitoring of footage in studios from companies like SmallHD, Sony and Marshall, with many of the more advanced models in both categories incorporating advanced filmmaking image-quality control options like peaking, zebra, histogram, audio meters and a lot more. **HDVP**

How To Capture The Best Video Possible

From codecs to streaming the postproduction chain, and a look at the best possible video compression settings from input to output

By David Alexander Willis

The video imaging chain is complex and getting more complex all the time, yet advances in technology are allowing companies like Sony and Panasonic to squeeze immense editing capabilities into tiny still camera-style bodies. These cameras are able to achieve similar features as much more advanced professional video and filmmaking camera systems because they employ heavy compression and a variety of other internal processing tricks that also allow them to capture to consumer-grade CompactFlash and SD media cards. The same compression methods make DSLR and mirrorless systems susceptible to issues in editing and color grading, however.

Even with today's still camera models, if capturing video internally, there's a sacrifice to color fidelity and sharpness right off the bat, as the codec—the method of compressing video to fit on a storage device—must be able to squeeze data to write it to CF and SD cards. These cards have fundamental limitations in the amount of data they can process, and so data must be compressed to 8-bit. Compressed 8-bit files utilize chroma sub-sampling as their principal method of compression. Chroma sampling works by tossing out some chroma (color) to reduce a file and is analogous to JPEG in comparison to a TIFF file.

To express the amount of chroma sampling, companies use a format with three numbers separated by colons, like 4:4:4. While there's a good deal of color science behind this representation, it simply means that out of 4 bits of information (the first number) how many are used in the final file (the next two numbers). The 4:4:4 is the best as it means all the color infor-

mation is present. The 4:2:2 skips recording some of the color data, while 4:2:0 skips recording a lot of it. As you'd expect, a 4:2:0 file is much smaller than 4:4:4.

A 4:2:2 is well respected for its ability to keep the weight of video bandwidth down and quality up. You'll see it often with edit-ready codecs or proxy-editing codecs like ProRes and DNxHD and all of their assorted flavors. Adobe's Premiere Pro and After Effects, as well as other NLE software, as in nonlinear editing, can work with these file types, so they're often used for proxy edits or as ready-to-go deliverables for editors.

A 4:2:0 is the quality of compression you find in DSLR and mirrorless systems unless you use an external capture device, but there's good news. To meet the needs of all these options, video is hungry for disk space. For 4K and high-frame-rate material, newer cards like CFast, the next generation of CompactFlash, have been in use for quite some time, as they're able to meet sustained levels of data capture without any dropped frames even with 4K. Unlike CF or SD cards, they can also finally record 4:2:2.

Extrapolating further, just like with photography, RAW video is also available, sometimes slightly processed and some-

times unprocessed depending on manufacturer and camera. With any camera, raw video footage must be saved to an external digital recorder through connections like HDMI or HD-SDI—there's just no way to get this data stored to a CF or SD card fast enough.

A few of the current RAW-capable options include Sony's 12-bit PXW-FS7 and the Panasonic DC-GH5 with 10-bit output. The Sony a7S II can also output in edit-ready Apple ProRes and Avid DNxHD with 4:2:2 color accuracy and 10-bit color resolution. Several dedicated video cameras have internal RAW, as well, including models from Blackmagic Design, which employ Adobe's open-source CinemaDNG RAW format for up to 12-bit RAW capture.

Before your eyes glaze over with all of these letters and numbers, the number of bits in a video file simply refers to the number of colors capable of being captured. The 8-bit represents a bit-depth with 256 possible variations in color for each of the three RGB channels. That translates to 16.777 million possible colors, or 256x256x256. Stepping up to 1,024 possible colors per channel, 10-bit is a surmountable jump in smooth color gradation with 1.07 billion potential color combinations. The 12-bit rings in with a massive 68 billion, while 14-bits ups the ante to 4 trillion. For practical reference, 10-bit is enough to cover high-dynamic-range video color spaces.

Bit-rate applies to both capture and output, like on a television, for example. There's a constant battle in video and filmmaking between maintaining consistent input values, i.e., the image information of the frame when it's captured by the cameraperson, with the output destinations, i.e., the compression

and file uniformity that cable, broadcast or Internet channels must utilize to play back to a variety of display devices from iPhones to massive outdoors displays. These include common video playback "container" formats like avi, mov, flv and mp4.

So, while "bit-depth" is the amount of possible color information that can be captured at the sensor, there's also, confusingly, "bit-rate," often available through two or three selectable compression schemes. Measured in Mbps (megabits per second), bit-rate refers to the sustained amount of data (the total number of bits) that can be pumped through internal processing every second. The Canon Cinema EOS C300 Mark II has 50 Mbps Long GOP, 35 Mbps Long GOP or 24 Mbps Long GOP, depending on the needs for video file sizes and media capacity.

Bit-rates will also come into play, literally, when streaming to display devices like TVs, computers and mobiles, as the amount of data must stay below the speed of Internet or cellular connections.

There are several codecs available for universal playback, most often called MPEG-4, also known as H.264, the same kind of file you see on DVDs or online. Cam manufacturers have their own unique proprietary blend of internal capture in these codecs. Canon's XF-AVC employs the MPEG-4 AVC/H.264 video compression format, as does Panasonic's AVCHD and Sony's XAVC.

There are also a number of compression techniques that can be used, like Canon's IPB Interframe, which will use a particular frame to judge movements and contrast to compress image information on something like the background

of a scene, for instance, where very little color or contrast will change throughout a scene. The above-mentioned LongGOP, also known as Interframe compression, subtracts the differences from a group of frames to compress image information.

Whether shooting with dedicated video cameras or still cameras, to manage all of this data and to do things like shooting unprocessed, RAW video, HDR video or high-frame-rate video, dedicated video recorders will be necessary for most systems. Many external video recorders these days also come with a monitor with a number of modes for certifying critical picture functions like exposure, focus and dynamic range. Atomos has become a leader in the field for its top-notch series of monitors and recorders at $500 or less. Its Shogun Blade series is available at only $175. Other companies like AJA, Blackmagic, Cinedeck and Convergent Design also make a number of monitors that can function as recorders. **HDVP**

Bruce Bramelin

LIGHTING LEGACY

With three decades of work behind the camera lens, Nancy Schreiber, ASC, continues to inspire the next generation of DPs By Sophia Stuart

As only the fourth female member in the history of the American Society of Cinematographers, out of only 15 total, Nancy Schreiber, ASC, has forged a singular path in the industry. A member of The Academy of Motion Picture Arts and Sciences, she's an Emmy and Independent Spirit award nominee who will receive the 2017 American Society of Cinematographers Presidents Award at the 31st ASC Awards gala this February. Her career has been filled not just with talent and persistence, but also visibility and a willingness to take on positions of responsibility. With nearly three decades behind the lens, her body of work is an absolute legacy. She has helmed classic films like *Your Friends and Neighbors* for director Neil LaBute, as well as historic documentaries and music productions like *The Celluloid Closet* and the Dixie Chicks' *Shut Up & Sing* for directors Barbara Kopple and Cecilia Peck. In addition to plentiful commercial work, Schreiber's camera work can be seen on network and cable television shows like ABC's *The Family*, HBO's *The Comeback* and FX's *Better Things*.

The historic director of photography has also served on the ASC's Board of Governors and the Women in Film foundation board, as well as on several festival juries, including Sundance, the L.A. Film Festival and the Spirit Awards. Not one to rest on her laurels, Schreiber is well known for mentoring many up-and-coming DPs, and also plays an active role in the ASC's new Vision Committee, which promotes diversity and gender parity. Recently, the Vision Committee hosted an event at the ASC's Hollywood Clubhouse and 140 women, all working in the tech fields of film and television, attended to listen to the panel of cinematographers talk about their achievements and challenges, inspiring those making their way up the ladder.

Cinematographer Kira Kelly, from the five-time Emmy-nominated Hulu show *East Los High*, was on the panel, along with Schreiber, at the Vision event. We spoke to Kelly afterward, and she paid tribute to Schreiber.

"The panel included her and about six other ASC members," says Kelly. "It was extremely intimidating for me because I was the only non-ASC person up there. Nancy went out of her way before everything started, to check in with me and assure me that it would all be fine. The whole day she was funny, a little irreverent in the best way imaginable, and encouraging to every woman in that room. It's a challenge being a woman

in our industry, but I can only imagine how tough and determined women like Nancy had to be to create the path for us. My career is possible because of Nancy Schreiber."

I spoke with Schreiber recently to cover the highlights of her career and find out what kind of advice she has been giving a new generation of content creators.

"I have had interns work with me becoming loaders, first and second ACs, or electricians, and moving up to operating for me. I always support their career decisions as it is so important to give back," she says. "I also like to shoot with first-time directors, as they can be quite inventive and break the rules, keeping me on my toes. I like to advise young people to study painters and photographers. When I was a junior in high school, I was an exchange student in Holland, able to immerse myself in the museums of Amsterdam. I'm certain my exposure to the Dutch masters, reveling in the light of painters such as Rembrandt and Vermeer, affected my career path as a gaffer and cinematographer. So I tell students and younger cinematographers to visit museums and galleries in between jobs—keep your eye fresh and inspired."

Her career all started when she answered an ad in the *Village Voice* to be a production assistant. "The crew was fairly small on my first-ever production job," she points out, "so it was an incredible place to learn. The gaffer taught me a lot, and I found I had an aptitude for this path and was bumped up to best-boy-electric quite quickly. A year or so later, I joined the union in New York, and that's how my career began."

Working in the electrical department kept her steadily employed, but Schreiber was always looking for a break into creating the visual beauty onscreen itself. She had grown up in Detroit and remembered being excited by *Lawrence of Arabia* and *Doctor Zhivago*, as well as seeing art house films such as *A Man and a Woman* directed by Claude Lelouch.

Although she didn't go to formal film school, Schreiber did get a cinematic education at the Elgin Theater in Chelsea, New York, as well as taking a short course with Jim Pasternak, who got his start in movies as Otto Preminger's assistant. Her first serious exposure was at the University of Michigan. By day, she studied psychology and the history of art while taking a few photography courses. By night, she programmed and ran the Alley Cinema, part of the film cooperative in Ann Arbor, alongside co-programmer and projectionist Jay Cassidy, ACE

(now a renowned editor, best known for the David O. Russell films *Silver Linings Playbook* and *Joy*).

"We showed a different film every night," she recalls, "from foreign films to edgy gems from the American Underground. But just Monday through Friday, because on the weekend the venue became a blues club. This was my film school: Truffaut, Renoir, Godard, all the Italians, Kenneth Anger, Maya Deren. The most money we ever made were on nights we showed Ingmar Bergman films with Sven Nykvist's haunting cinematography. Or the Marx Brothers.

"For me," she continues, "light is where so much emotion can be communicated. I still use some conventional lights, such as HMIs and tungsten Fresnels, but I also use the newer LEDs. I love the versatility of dialing in whatever color you want without needing to use gels, and the consistency in color in the LEDs is much improved in recent years. But there is one drawback, which we are seeing in our cities. The available exterior light, which has been sodium or mercury vapor, is being replaced by cool LEDs, which are wonderful for saving energy but render our night palettes bland and monochromatic. Now we need to put our own color back in, should we desire varied color."

Schreiber keeps abreast of all the latest camera and lighting gear. Having shot 16mm and 35mm film on ARRI and Panavision cameras, as well as digital on Panasonic, Sony, Red, Canon and each of the digital ARRI cameras, and while she admits that she prefers digital despite being "camera agnostic," Schreiber is also looking forward to shooting with the new 65mm ARRI Alexa 65 and Panavision DXL cameras very soon. "On LaBute's *Your Friends and Neighbors*, we fought to shoot anamorphic, but the producers and studio were against it, citing extra costs, critical focus and the need for additional light. Back then, anamorphic lenses were not as prolific as today. So we ended up shooting widescreen in Super 35. Neil invited me into the extensive rehearsal period, where I was able to study how best to shoot and light the actors, to portray the true depth and complexity of human nature."

Schreiber is somewhat "old school" in preferring to operate through a viewfinder, even though early digital cameras weren't great in this respect. She likes to block out everything but the action in the frame and tries to avoid operating off a monitor as much as possible. As for lighting, she says that sometimes less is more. "I once filmed Steven Spielberg filming Dustin Hoffman at Willem de Kooning's studio in the Hamptons, and they were discussing when a painter such as de Kooning will know when the work is finished," she explains. "I think about that when I tell the AD that I'm ready. Given all the time in the world, I might tend to keep tweaking the light. One thing I

Nancy Schreiber, ASC, received the 2017 American Society of Cinematographers Presidents Award in February, in recognition of her contributions to the art of cinematography.

learned early on between takes is that actors really don't appreciate our running in to make changes. Be sure you are ready to roll when you let the AD know you are ready. Unfortunately, too many of us are asked to roll on rehearsals and are not able to make necessary fixes once the stand-ins leave and the actors come on set. So I push for a semi-rehearsal, where actors go through their positions by the numbers, without emoting.

"Don't lose your sense of humor—that's important," she continues, when asked about some of the advice she must give her many mentees over the years. "Stay conscious of what's going on around you. Some DPs are just so focused on getting the shot, without keeping open communication with production. Don't forget to look out for your crew. My background in psychology has probably kept me in good stead, and because I started out in the electrical department, I can 'talk the talk,' which has helped, especially when I have traveled and picked up local crews.

"Within the first hour, I had a crew testing me to see if I knew what I was doing. By being knowledgeable, while staying open and respecting their expertise, mutual respect was established, along with camaraderie," Schreiber concludes. "Back in the day, when there weren't as many female DPs, I suppose I was a novelty. I kept focused on the job at hand, however, staying confident, but being kind to all. Running a crew requires people management skills as well as, of course, making what's on screen as beautiful and appropriate to the story as possible. If you have the passion, nothing can keep you from succeeding in the best career imaginable. I feel so lucky to have found this fulfilling creative life as a cinematographer." **HDVP**

Sophia Stuart writes about movies for Cinema Thread, Esquire, International Cinematographers Guild Magazine *and Ziff Davis'* PCMag.

Going Off Camera

With an ongoing television show for DirecTV, where he interviews many of the celebrities he has photographed, Sam Jones is leveraging digital imaging technologies for all they're worth

By David Alexander Willis >> Photography By Sam Jones

Sam Jones says that his sober and yet utterly charming approach to celebrity portraiture has the singular goal of telling the story of his subject with only a single capture. As a photographer, he has captured hundreds of these single-image stories for an award-winning roster of top-shelf talent that has included everyone from George Clooney to Jeff Bridges to Matt Damon. The dedicated storyteller doesn't stop there, either. As a master documentarian and commercial filmmaker, he's nearing his 90th episode of "Off Camera," a weekly broadcast that he has been helming for DirecTV since 2013.

With a show featuring informal, hour-long chats that dig far deeper into the lives of his subjects and their creative processes, Jones purposefully created the look to be absolutely minimal in design to avoid detracting from each interview, going so far as to capture directly in black-and-white through the Epic-M RED Dragon monochromatic camera, which eschews the Bayer-array of RGB pixels in a standard color sensor to capture an extra one-and-a-half stops of dynamic range. With recent chapters on Michael Shannon, Rachel Bloom, Will Ferrell and Jake Gyllenhaal, Jones laughs that the laissez-faire discussions often devolve into fairly uncertain territory. We sat down for an interview, the entirety of which you can find on the hdvideopro.com website. What follows is an excerpt of that longer conversation.

HDVP: What was the first that you would consider an "Off Camera" interview?

Sam Jones: "Off Camera" started very deliberately at the end of 2013 with a test with a friend of mine who is a studio musician and has played with everybody from Jackson Browne to John Lennon. I thought his life story was really interesting and, since I knew him already, it would be a good experiment to see if the format worked. I just asked him to come down to the studio. That was our first "Off Camera" conversation that we ever filmed. It's funny, but the decisions we made on that first one all ended up being exactly what we do on the show to this day. It has changed a little bit, but for the most part it's still just an hour-long, non-agenda conversation about creativity, the process and whatever else comes up. We try to make it very honest and authentic, and we don't really plug things. We just try to make it the kind of conversation you would hope to someday find yourself involved in. If you're a fan of somebody and you like their work, the idea is that you could sit in their living room and have a talk about their approach to their craft. That's what the show is.

HDVP: You already tell such a great visual story with each of your still images for celebrities, but "Off Camera" is filling in the gaps between those still images.

Jones: I've made a few documentary films and done a lot of work in the commercial arena, too. I've done a lot of interviewing. The thing that I think is different between an interview and a conversation is that when you're interviewing somebody for a documentary, the person asking the question isn't on-camera. You're digging for something. There's a little more manipulation, almost like a journalist writing a lead for a story and then trying to support his theme. I thought that if we set it up more like a conversation, then it would be more inviting for a viewer, whereas I think a documentary interview is more stylistic than what we do on "Off Camera."

Coming from photography, a great conversation with somebody interesting is a portrait in a lot of ways, more so than a photograph. That was the goal. The people that I grew up loving, like Irving Penn and Richard Avedon, extrapolated from a single image of somebody what that person was like. Could we do that with a moving frame? That was the initial impetus for filming the conversations: Can we make a portrait come to life? That's also why we chose to do it in black-and-white with a white background, because we didn't want any distractions. A couple of years before "Off Camera," I interviewed Tom Petty and The Heartbreakers for about four days. For the interviews, I stuck them on white, and I shot it in black-and-white. When we were editing the footage, I said, "Wow, the absence of color and the absence of background really make you just feel like you're inside their brain."

HDVP: Well, your body of work has such a remarkable pedigree. It's gorgeous work visually, and wholly engrossing, whether still or video. For photography, what's your system?

Jones: It depends on what the project is. A lot of the time it's the Canon 5D Mark III. I love that camera, because it's just small and it does the job. I've used the Hasselblad and the Phase One, and I keep wishing that I could continue to use those cameras because the images they make are great. When you put a Canon image up next to the IQ back on the Phase One camera, the Phase One is just beautiful. But if you can only

RIGHT: Jessica Chastain.

take one picture a second, and the camera is heavy, and really hard to focus, then what's the point? Canon has done a really good job of getting closer to the film look in terms of the way focus falls off. One thing I noticed as a photographer, when digital came around, is that focus falls off very differently. Those medium-format cameras like the Phase One and the Hasselblad, digitally, they fall off in a weird way that doesn't look as much like photography to me. I was one of the last people, I think, to switch over from film. It got to be a problem for a while where people just didn't want to hire me if I was shooting film.

HDVP: You've used a lot of motion camera systems on commercials and things like that. What was it about the RED system that made you decide on "Off Camera" to go with that?

Jones: The monochrome chip was really interesting to us because when you talk about range of stops, I think by using only a monochrome chip you get almost a 15-stop range. And when we're shooting something that has a white background, white is the hardest thing to make look good on digital, and in black-and-white. In film, even in the white there's grain, but in digital, there's no grain in the white. It looks more harsh and digital. The last two values before pure white; those seem to be hard to attain. With the exposure curve more on the white end, it just blows out later. It's like working in Photoshop and going over the limit of what the screen can handle, and then it just goes to pure white, whereas when you take a scan in of a piece of film and there's still grain in the white that has a value to it, rather than just pure light.

Also, the interesting thing about the RED, too, is that we're able to edit in RAW. We don't have to convert to edit. For this show, that's so helpful because there are five cameras running. With Adobe Premiere Pro and the RED plug-in, we can work directly with raw footage that we don't compress until we have an edited show to send out. We did the Bob Dylan documentary for Showtime on REDs. We had so much footage. We had three cameras going 12 hours a day, so we had 36 hours of footage a day. That's when we got into the whole Adobe Raw process, and it changed our lives. **HDVP**

To read our full interview with Sam Jones, visit hdvideopro. com. Visit the "Off Camera" website at offcamera.com

CES 2017: The New Camera Roundup

The consumer video market matures at this year's Consumer Electronics Show

By Daniel Brockett

Buried within the dozens of acres of booths and thousands of new products on display at CES 2017, we discovered some interesting and compelling higher-end prosumer video cameras from both the usual suspects, as well as some unexpected players. Here are some of the more interesting products that we looked at.

Panasonic

CES 2017 saw the official unveiling of full specs for the long-awaited LUMIX GH5 digital stills/video camera. The GH5 now features a full-sized HDMI port, is freeze-, dust- and splash-proof, features 5-axis in-body stabilization and got a bump in resolution from the GH4 to 20.3 megapixels. Most interestingly, the GH5 can shoot 4K video at up to 60 frames per second and 1080p HD at up to 180 frames per second. It can even record 10-bit 4:2:2 video internally.

Panasonic also announced two new entry-level cameras. There's the $399 FZ80, featuring a 1/2.3-inch image sensor and a 20-1200mm (35mm equivalent) lens. It shoots 4K video at 30 frames per second, 18-megapixel stills, and has a 1.04-million-dot, 3-inch touch screen. There's also the interchangeable-lens GX850, which will run $599 and has a 1.04-million-dot LCD touch screen that flips up 180 degrees.

Kodak

Kodak? At CES? With a film camera? The new Super 8 camera is a hybrid of old tech, film and new state of the art with its digital interface. It uses 8mm film cartridges, totaling 50 feet in length. The Super 8 camera can shoot at 18, 24, 25 or 36 fps. The "viewfinder" is a 3.5-inch LCD, which provides a live view image, via a split-prism behind the attached C-mount lens. The Super 8 is a true "hybrid" device. While the film records the images, sound is recorded to an SD card, via an external microphone. This new camera defines the term "retro/futuristic."

Ricoh

At the other end of the technology spectrum from film, Ricoh showed the Ricoh R Development Kit, a 24-hour Spherical Live Streaming Camera. Designed for event live streaming, the camera is capable of streaming 1920x960 Equirectangular Projection at 30 fps by real-time stitching the camera output of two fisheye lenses for up to 24 hours. The

spherical video can also be recorded to an internal micro SD card. The camera captures audio with a built-in monaural microphone.

Canon

Canon introduced three new VIXIA HF R Series personal camcorders, the VIXIA HF R82, HF R80 and HF R800. Each is equipped with a 57x Advanced Zoom, SuperRange Optical Image Stabilizer, a 3.28-megapixel Full HD CMOS Canon Image Sensor, DIGIC DV4 Image Processor and a 3.0-inch capacitive touch-panel LCD. So, what are the differences? The HF R82 camcorder offers 32 GB of internal storage for recording up to 12 hours

of video, and the HF R80 camcorder offers 16 GB of internal storage for recording up to 6 hours of video. New features include Flexible Slow and Fast motion recording, and backlight correction when in Highlight Priority mode.

Nikon

Nikon's D5600 DSLR was originally announced in Europe and Asia late last year, but with its debut at CES 2017, it will now be available in the USA. The D5600 sports a fully articulated rear LCD screen, and while it isn't 4K-capable, it can capture 1080p HD at up to 60 frames per second. The D5600 is perfect for the Nikon photographer who still has Nikon lenses and perhaps older Nikon bodies and

would like to branch into video shooting without spending thousands to upgrade to a high-end body.

In A Nutshell

CES 2017 was all about spreading out emerging technology across dozens of different platforms more than a showcase for new prosumer video cameras, but our tour of the show floor revealed some interesting discoveries that fore-

tell a bright future for video shooters.

The Ultimate Hybrid: Canon's New Compact Servo 18-80mm T4.4 EF Lens

Canon's new 18-80 Compact Servo lens is unique for several reasons, but primarily because no other company has ever made a lens like it before. Canon took the best features from three of its other lens lines and blended them together into something incredibly useful. If you're new to video shooting, it goes something like this. Traditional video camera users who shoot with smaller 2/3" sensor broadcast cameras use B4-mount lenses. The better B4 lenses sell for upwards of $50,000 to $100,000. Most of these lenses have a power servo that allows for smooth, variable-speed zooms, a very handy tool for any shooter to have. But B4 lenses are designed for 2/3" imagers, not for larger Super 35 imagers like those found in Canon's EOS Cinema line of cameras. The competing digital cinema cameras from Sony, Panasonic, Blackmagic Design and so on also utilize Super 35-sized sensors, and with lens mount adapters, many non-Canon camera users utilize Canon lenses.

These digital cinema camera users typically mount Canon's still lenses from the EF or EF-S series, which are high quality and relatively affordable but have no cinema markings, measurements or servo zoom controls, but some models have features that are handy for video like IS (image stabilization) and autofocus. Or, if the user has a decent-sized checkbook, they can buy or rent Canon's CN-E line of cinema zoom and prime lenses

and expensive, third-party lens servo motors and controllers. But Canon's cinema zooms begin in the $25,000 range for a shorter-range zoom lens and go to well over $100,000 for the top-of-the-line lenses. Most documentary, reality and event shooters don't have the kinds of budgets it takes to buy or rent Canon's CN-E zooms, and even if they did, these zoom lenses are large and heavy, designed for narrative filmmaking, not a practical tool for run-and-gun-style shooting.

Clearly, someone at Canon saw an opportunity to create a lens that would perfectly serve the documentary, event and ENG handheld shooter, and the end result is unique and interesting. The $5,500 list price Canon 18-80mm Compact Servo

zoom lens is definitely compact. Without the optional ZSG-C10 grip, the lens itself only weighs 2.7 pounds and is surprisingly small when you unbox it and hold it in your hands before mounting it to the camera. So, let's keep a running total of the features this lens includes. It has a modest but very useful 18-80mm focal range. Rated at T4.4 (this lens is rated in T-stops like Canon's cinema lenses; actual light transmission, not arbitrary F stops), it's not a fast lens, but most modern S35 cameras this lens will be used with can easily increase their gain a bit without having the picture fall apart.

The 18-80 also has Canon's Image Stabilization (IS) and Dual Pixel Auto Focus (DPAF) technology built in. Lastly, the lens features a cinema-like 180-degree, smooth, manual-focus ring so you have a much larger focus scale to create smoother rack focuses than you could with a typical still lens.

We recently had a chance to put a production 18-80 Compact Servo lens through its paces, mounted to a Canon EOS Cinema C300 Mark II, and we were impressed with how usable this lens is if you want to shoot run-and-gun style. Images were crisp and pleasing, distortion was minimal, and flare resistance was good, even when shooting directly into late-afternoon sun. The lens was parfocal, holding focus from one end of the zoom range to the other. Distortion was minimal. Chromatic aberration wasn't visible in the images we shot. The autofocus is responsive, and of most interest, the servo zoom is smooth and well modulated. Besides all of the other features, this lens is the only way to achieve smooth-as-silk servo zoom moves at a reasonable cost.

The 18-80 is a truly hybrid lens with the best features from Canon's still lens, broadcast and cinema lens lines at a reasonable cost for what it offers. This lens should be a top seller for Canon.

While $5,500 is by no means inexpensive, if you examine the value, features and build quality of the 18-80 T4.4 compact servo zoom, the value equation makes total sense for pro documentary, event, reality and other run-and-gun shooters. Canon has stated that we'll see other upcoming models in this product line, and we're eager to see which other focal lengths, speeds and features they introduce. Kudos to Canon for building a useful, much-needed lens that none of its competitors offers or has even conceived. **HDVP**

You can read a longer review of the new Canon Compact Servo 18-80mm T4.4 EF lens on the HDVideoPro website at hdvideopro.com.
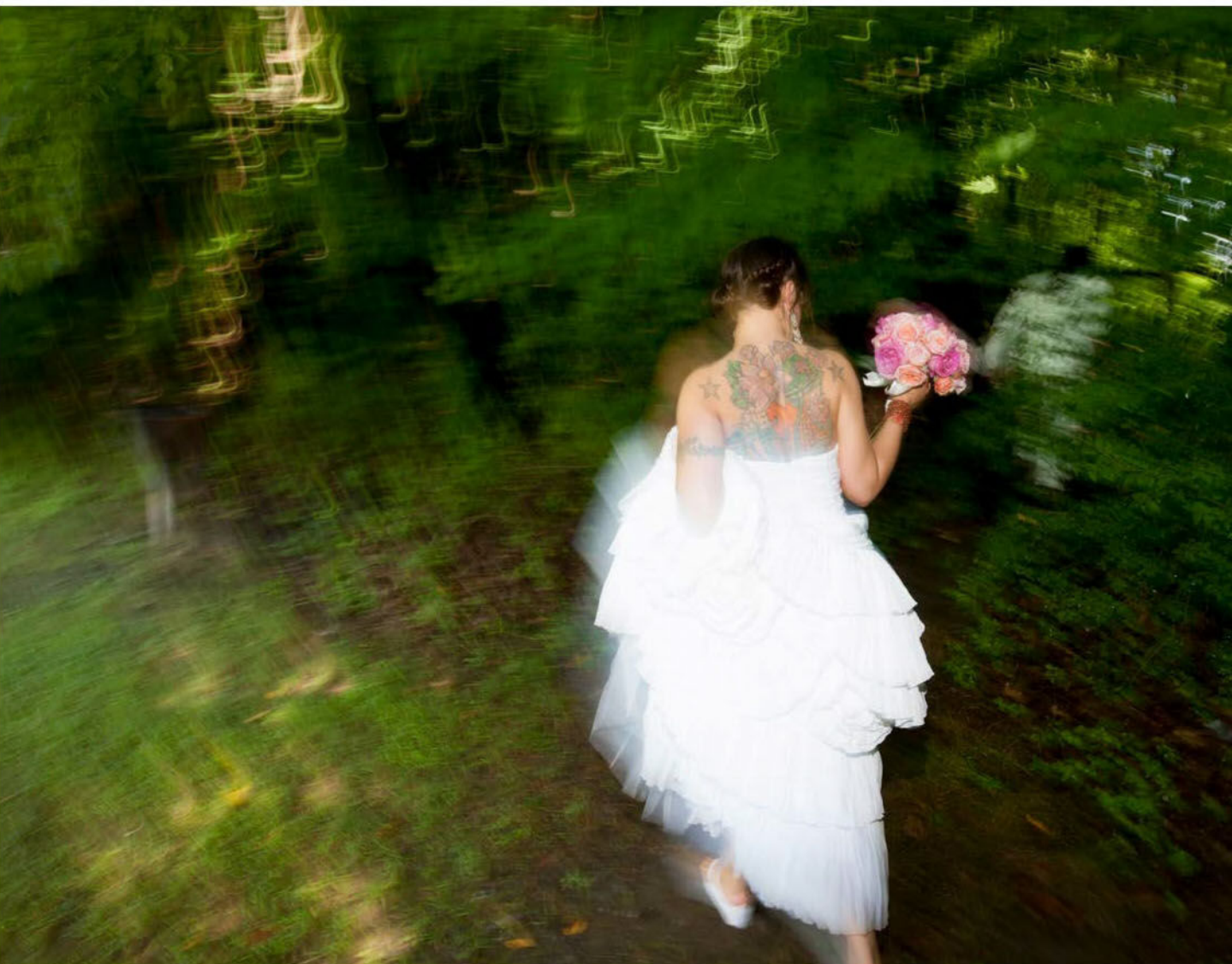
By David Schloss

David Schloss

...**And** here comes a wedding photographer, a second shooter and a rather late addition, the videographer, right behind her.

Our next issue celebrates wedding (and event) photographers, possibly the hardest-working shooters in the business. Having shot a few weddings myself, I'm keenly aware of the full-body, full-mind workout that shooting an all-day-long ceremony provides. Not only do you have to be ahead of every significant event in a carefully scripted ceremony, but you also have to turn out unique, beautiful and purchase-worthy photos. Hats off to you.

Just in time for wedding season, our May/June issue will cover the photographers who excel at shooting weddings and large events, along with the tools and the techniques they use, plus we'll tell you how to break into the business if you've never shot a wedding before.

For those looking to streamline their studio management (even if you're not a wedding photographer), we'll also talk about the best plans to keep your clients happy, your books in shape and your invoices flowing.

So, save the date, and join us for our wedding and event issue—formal attire not required. **DPP**

You can follow Editor David Schloss on Twitter and Instagram @davidjschloss