

Tech Tips

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Q. I'm using an EOS 5D Mark II DSLR, but my thought is in general about future DSLRs. I read earlier in your *Tech Tips* that using video mode does not impact sensor longevity and that video recording uses the whole sensor surface. Considering those two facts, we can think a sensor won't be damaged if continuously exposed to light. I was wondering why camera manufacturers continue to use conventional focal plane shutters in HD-compatible digital SLR cameras. Can we imagine future generations of DSLRs without a mechanical shutter, replaced by an "electronic virtual shutter," only recording sensor data for the defined exposure time? It may enhance DSLR longevity by leaving the mirror the only moving mechanical part and permitting exposure times not available with mechanical shutters.

A. If the only usage of a camera like the EOS-1D Mark IV, EOS 5D Mark II or EOS 7D was video capture, it would stand to reason that focal plane shutters could be eliminated. However, the CMOS sensors used in these cameras still require focal plane shutters for conventional still captures. The reason for it has to do with the way the sensor data is "flushed" prior to exposure. I can't speculate on Canon's future plans or products, but it wouldn't surprise me if it turns out that the company's R&D engineers are already working on ways to overcome the limitations of the current technology. In the meantime, various independent videographers are already modifying HD-compatible EOS Digital SLRs like the 5D Mark II and 7D by removing the reflex mirror completely. This makes it much more practical to use those cameras with professional PL-mount video lenses, which protrude deeply into the camera body. Granted, this is not the same thing as removing the focal plane shutter, but it's a step in that direction.

Q. Is it my imagination, or has the new screen/finder system in the EOS 7D improved the compensation issue when using stopped-down metering below f/5.6 with manual diaphragm lenses?

A. I have not yet had an opportunity to test the 7D with non-coupled lenses, so I can't confirm that there's any difference in metering accuracy in that configuration compared to earlier EOS SLRs. However, it should be noted that this issue is essentially eliminated by using Live View with any EOS model that supports the feature, because the exposure measurement is taken directly from the CMOS sensor instead of passing through the focusing screen.

Q. I am using the EF24-105mm zoom lens on my EOS 5D camera. When I zoom to 24mm and AF on some very distant object, the camera sets the AF ring to something between the 5m mark and infinity, quite close to the 5m mark, actually. Is this normal?

A. On my samples of the original 5D and 24-105, I typically get a distance reading between 5 meters and the beginning of the infinity mark when I aim at a distant subject with the focal length set to 24mm and the AF mode set to One-Shot with a manually selected center focusing point. It's closer to infinity than 5 meters, but it's not all the way to infinity. If I zoom the lens to 105mm and refocus on the same distant subject, the focus index might move fractionally closer to infinity, but it never goes all the way to the end of the scale.

Q. When I then zoom to 105mm without re-focusing, the image in the viewfinder and the picture taken turn out clearly unsharp.

A. That's normal, because there's more depth of field at 24mm than there is at 105mm when the camera is positioned at a fixed distance from the subject.

Q. When I AF zoomed to 105mm the focusing ring will be set to infinity and the picture will turn out sharp, as it should be. Zooming to 24mm again and taking a picture without refocusing (i.e., still focused to infinity) will produce a picture virtually indistinguishable from the one focused to ~5m.

A. And that is as it should be, for two reasons:

1. There's a cam inside the 24-105mm lens that is designed to maintain an accurate focus when the lens is zoomed from tele towards wide;
2. You're starting from 105mm, a focal length with relatively shallow depth of field, and zooming to 24mm, which has greater depth of field as mentioned above.

Q. My question is this: Does the AF algorithm take the hyperfocal distance into account and does it set the focusing ring to the hyperfocal distance in order to achieve maximum DOF?

A. No, it does not. The focusing algorithm analyzes contrast in the subject and attempts to set the most accurate focus based on what it "sees."

Q. The AF behavior is interesting, though (at least for me). Does it also happen with other bodies and lenses or just with this particular combination?

A. It's a common characteristic for every EF zoom lens, regardless of the EOS camera model.

Q. I am about to buy a new Canon 70-200mm lens (either f/2.8 or f/4) and am trying to decide if I should buy the lens with IS. I have taken thousands of alpine ski race pictures with the 70-200mm f/4 without IS (using 20D and now 50D cameras). I am usually shooting with shutter speeds of 1/250 to 1/1000 depending on how much light I have. I also often pan the racers at two or three gates and with this high shutter speed I am

wondering if I should even use the IS feature. Can you comment on whether using IS would be beneficial for this high-speed sports photography?

A. You would be better off with the IS version for skiing photos, for a reason that might not be obvious at first glance. Although chances are good that you'll be using a shutter speed so fast that the IS system has no effect, use of IS will present a steadier image to the camera's AF detection system. Thus, if you're using predictive focus, the IS system may provide better data for the AF system to base its calculations on. However, if you're just zone focusing manually and waiting for the subject to pass through the area you've preselected, then you might as well shut off the IS function and save some battery power.

Q. I have two unrelated questions. First, there is a very well known bird photographer who has written that the IS on lenses like the 500mm f/4L IS should always be left on and in Mode two. He claims that mode two does everything that mode one does and has the benefit of the panning feature. I would like your opinion on this. My other question relates to the AI Focus option. I shoot mostly outdoors with a 5D Mark II. I like the AI Focus option, especially in unpredictable situations with wildlife where they may be stationary one minute and moving the next. Some people on forums have claimed that this is the least accurate AF mode. It seems to me that the camera is operating in either One Shot or AI Servo and that the only accuracy issue would be whether the camera detects motion accurately and makes the switch to AI Servo appropriately. So the question is whether there is any advantage in shooting AI Servo as opposed to AI Focus.

A. The bird photographer you're talking about is Arthur Morris, whose opinions I respect on the use of Image Stabilization for bird photography. In the particular case of using a long lens like the 500/4L IS on a tripod, I would agree that Mode 2 makes more sense than Mode 1. For further comments from me on this topic, please check the December 2006 edition of *Tech Tips*:

<http://digitaljournalist.org/issue0612/tech-tips.html>

My answer to your second question is that you should try both AI Focus and AI Servo for bird photography to see which AF mode you prefer. If I were photographing birds at rest, I would probably pick AI Focus, but if I were photographing birds already in flight, I would pick AI Servo.

Q. I have the 550EX and 580EX Speedlites. I would like to know the Kelvin color temperature rating of these flashes. J. Dennis Thomas in the Canon Speedlight Field Guide gives the Kelvin as 5500 for flash and daylight as 5500. Should I set camera Kelvin at 5500 to match the daylight setting? The default setting is 5200.

A. The Kelvin rating for Canon Speedlites such as the 550EX and 580EX varies from about 5200K to 5800K depending on the duration of the flash burst as well as the charge level of the battery pack. That's the main reason why Canon developed automatic color temperature compensation for the 580EX and all subsequent EX-series Speedlites. With this feature, the Speedlite uses a look-up table to apply color temperature modification for every shot based on real-time data, thus achieving better shot-to-shot consistency. As a result, you don't have to try

to outguess the system. Instead, you can leave the camera's white balance setting at Auto or Flash to get the benefit of the automation. Because it's an older model, Speedlite 550EX does not have automatic color temperature compensation. 5500K is a good average WB setting when using this flash, but you can tweak the camera's WB setting higher or lower based on ambient lighting conditions as well as personal taste.

Q. I have a question about the sensor cleaning in the 5D Mark II. Every once in a while I see the "cleaning sensor" screen come up on the back of the camera when the camera has been on for a while, without me having touched anything. Does the sensor cleaning kick in if the camera goes to sleep?

A. I have not seen that behavior on my sample of the 5D Mark II. And according to Canon's Service Department, sensor cleaning does not kick in automatically when the camera goes to sleep.

Q: I'm going to be photographing Yellowstone this February from a snow coach. The average temperature ranges from 13 to 34 degrees F. Extreme low temperatures can get to -20 to -40 F, although I'm guessing that we won't venture out when the temperature is much below -5 F. I have a 1D Mark II and a 5D. I've used both in the winter but never at these extremes. I plan to take the normal precautions such as keeping spare batteries in warm pockets, putting cameras into plastic bags when I get into the snow coach and go back to the motel. I have bought one new battery for the Mark II since the 5-year old batteries are pretty weak and only last for a few minutes in the cold. I have four spares for the 5D. Can you suggest anything else I ought to do?

A: You've got the most important issues (condensation, spare batteries) covered, but there are a couple of other tips worth considering for cold weather photography:

- Consider using a hand warmer to keep your hands and the spare batteries warm.
- Don't forget to check your cameras' histograms to ensure that your exposure level is accurate; it's sometimes necessary to apply exposure compensation, but not always. Consider using manual mode to keep your exposures consistent.
- Dress appropriately for the weather. Warm clothing including high-quality boots, a warm coat and scarf, and warm headgear is essential, and it's also a good idea to use customized gloves so you can still operate the camera comfortably. Here are some links to point you in the right direction for gloves:

<http://gizmodo.com/220182/photographers-gloves-keeps-your-fingers-toasty>

<http://products.lowepro.com/product/Photo-Gloves,1990.htm>

http://www.campmor.com/outdoor/gear/Product_88537

Q: How likely is it that Canon would respond if lots of EOS-1D(s), 7D & 5D users really supported the re-introduction of Eye Controlled Focus? Do you know the story behind its demise?

A: Eye Controlled Focus in future Canon products cannot be ruled out, but there is no evidence to support the notion that it will reappear anytime soon. In the meantime, Canon will continue to study the market and gauge the interests of its customers in all sorts of camera features including ECF.

Similarly, I can't provide details on why the feature was discontinued after the EOS Elan 7NE. But I can tell you that it was more advanced in that camera than any of its predecessors. By the time the Elan 7NE came around, ECF supported vertical as well as horizontal camera orientations; it was much faster than before, and it had the "self-teaching" function that allowed as many as 20 individual calibrations per user for horizontal and vertical orientations according to variations in light levels, for up to three users.

From that description, it's fair to say that the implementation of ECF had become rather complex and memory-intensive, and Canon had received reports indicating that many customers were not using it for various reasons such as:

- Their eyes did not move normally so the feature didn't work for them;
- Their eyeglass lenses were too thick or they habitually wore sunglasses, so the camera couldn't detect their eye movement;
- They didn't know it was necessary to recalibrate the system for each and every light level and/or camera orientation, so they couldn't understand why the system was only working every once in a while for them.

Finally, sales figures indicated that the majority of customers weren't willing to pay for ECF if they could buy the same camera, as in Elan 7N, without ECF for less. Considering all the obstacles, it's not too surprising to me that Canon eventually decided to drop the feature. But again, if you think ECF is worthwhile, then by all means make your wishes known. I am happy to pass them along, and you can also contact Canon's Customer Support Centers (e-Mail: carecenter@cits.canon.com) to let them know as well.

Q: This question is about using DOF preview with Live View on the 5D Mark II. In the instruction manual on page 110 it says, "The image brightness displayed will be close to the actual brightness of the resulting image." When I stop down to f/16, shooting outdoors or shooting out the window indoors, the Live View display is bright; however, when shooting indoors the display is a lot darker. It's as if I'm viewing thru the viewfinder. When I

called Tech Support, they found the same behavior, and they couldn't tell me why. I was wondering if you could provide a technical reason for this.

A: Based on your description, it sounds like you probably have the camera set to Manual rather than Aperture Priority, with Exposure Simulation turned off. With that combination, the LCD screen will brighten or darken when you press the Depth of Field Preview button depending on the light level vs. the shutter speed, aperture and ISO combination you've selected. If you leave the camera set to M, you can keep the screen at a usable brightness level under most lighting conditions during DOF preview regardless of the exposure settings by turning on Exposure Simulation in the Live View menu. Or, if you don't mind switching to an AE mode like Av, Tv or P, the screen brightness will be usable in almost all light levels, no matter how Exposure Simulation is set. It's your call. For what it's worth, I prefer to turn on Exposure Simulation so that the LCD screen will remain at a usable brightness level most of the time, even when using DOF preview in Manual mode.

Q: So there's nothing wrong with my camera; good. Yes, it is a normal viewable range indoors with low light on the LCD; looks like the view through the viewfinder. With good light, the LCD is nice and bright using DOF preview; MUCH better than the viewfinder. I'm still wondering, what is the technical reason for darker LCD images in low light? Maybe a future feature?

A: I haven't seen any technical documentation to support it, but here is my hypothesis: When Exposure Simulation is turned on, the 5D Mark II has to be using Auto ISO to control the brightness of the screen during DOF preview. (What else could it be? The aperture value is fixed and the low-end "shutter speed" of the LCD in Live View is limited during DOF preview.) Therefore, there's going to be a limit to how high the sensitivity can go at a fixed aperture value in low light. Once that limit is reached, the image has no choice but to become darker as light levels fall.

Q: I've been reading your columns for almost two years now. It's been a great time, and I've discovered lots of things about our cameras that I would never figure out by myself. But now I've been having a consistent problem with my EOS-1D Mark III. The camera does not let me use higher ISO speeds than 3200 - which, in Brazil, where I live, is really necessary to shoot soccer pictures for instance - and lower ISO than 200. I can't change that setting using the camera controls. I doubled-checked Custom Function I-3 for the lowest and highest ISO speeds. And it's adjusted for H - highest ISO - and L - for lowest. Do you have any suggestions or clues on that?

A: You'll need to shut off Highlight Tone Priority (C.Fn II-3) to regain the full ISO range of your EOS-1D Mark III. Check page 164 in the instruction book for details.

Q: Right after powering on my new EOS 7D camera, I've noticed some strange squeaking noise. After some investigation it turned out that this noise is coming from the "sensor cleaning mechanism." I've never noticed or heard this noise with any other camera I've used or owned before. After some searching on the Internet I found a forum where some people say that they can hear this "squeaking noise" in their cameras also. Even though some hear it on 1D Mark III or 40D cameras it seems that 7D camera is less silent in this matter. Please take look at this forum, where the audio file is also posted:

<http://photography-on-the.net/forum/showthread.php?t=760912>

Please give us a brief explanation of this phenomenon. Also, should we be concerned with this squeaking noise? Should the camera be repaired? If this is expected manner how come some percentage of the cameras have this and some do not?

A: The list of EOS models with self-cleaning sensor units now includes:

1. EOS Digital Rebel XTi (400D)
2. EOS Rebel XSi (450D)
3. EOS Rebel T1i (500D)
4. EOS Rebel XS (1000D)
5. EOS 40D
6. EOS 50D
7. EOS 5D Mark II
8. EOS 7D
9. EOS-1D Mark III
10. EOS-1Ds Mark III
11. EOS-1D Mark IV

All of these cameras use one or more piezoelectric vibrators to shake the front plate of the cameras' low-pass filter in order to dislodge dust particles. There have been several variations in the design of the piezoelectric components according to the vintage of the camera, but the operating principle is basically the same for all of them. There is nothing particularly unique about the self-cleaning sensor unit of the 7D; in fact, it uses the same hardware as the self-cleaning sensor unit of the 50D. With both of these cameras, the operating sound of the self-cleaning mechanism is audible, but the sound level is quite low. Many people can hear it, but for various reasons many others cannot. This may account for the variety of reports one can find on the Web concerning this topic. In any case, because it is a normal operational sound, it is not a cause for concern.

Q: I am trading my 50D for a 7D and would like to use the Lexar cards from the 50D. When I format the cards will the numbering sequence start at

**zero? I have several cards and would like to use them but start at zero.
Thanks.**

A: When you get your 7D, go to Setup Menu 1 (wrench icon with one dot) and change "File numbering" from "Continuous" to "Auto reset." This will reset the camera's file numbering system to "100-0001." Then format your CF cards. Once this task is complete, go back and set "File numbering" to "Continuous," load one of your freshly formatted CF cards, and start shooting. That's all there is to it!

Q: With the EOS 7D, is it possible to combine spot metering with focusing points other than the center one?

A: Spot metering is always linked to the center focusing point with the EOS 7D camera, but you can use AE lock or manual exposure control to hold the reading and recompose before capturing an image. Focusing point-linked spot metering is available with EOS-1 class digital SLRs.

Q: The data from turning on High ISO noise reduction isn't used by third party software like Lightroom, but what about Long Exposure NR? Does the long exposure noise reduction change the actual pixel data in the RAW file or is it separate data that isn't used by Lightroom?

A: Long exposure noise reduction applies to RAW data as well as in-camera JPEGs. Adobe software such as Lightroom and ACR (Adobe Camera RAW) will "see" it because it's already in the image data before RAW conversion.

Q: I've been a Canon shooter since the early '90s, and have been a digital user since '99 with the Kodak/Canon DCS 560. I currently use two EOS-1Ds Mark IIIs, and one EOS-1D Mark III. Here's my question. Is there anyway I could use a digital frame hooked to the camera to show clients what I've shot? Video output from small TV sets is poor plus it disables the camera's screen. Thanks for your input.

A: To the best of my knowledge there's no way to display high-res images on a digital frame that's connected to an EOS-1D Mark III or 1Ds Mark III. There are two connectors on those cameras: composite video and Hi-Speed USB. If you're not satisfied with the resolution of composite video, the only other option is the USB port. But there's not enough computing horsepower in most digital frames to run EOS Utility software, and you can't see images through the camera's USB port without it. So, the average digital frame is not a good choice for connecting to the camera.

Some additional thoughts: Most of the digital frames I've seen are limited to VGA resolution (640 x 480 pixels) or less, so you'll never get an image that's as sharp as the file that an EOS Digital SLR can produce. If your digital frame has a built-in CF or SD card reader, you might be able to display JPEG images directly from

the memory card after you remove it from your camera. However, even the smallest in-camera JPEGs are much higher in resolution than the average digital frame can display, so viewing files straight out of the camera is inefficient at best. It is far more efficient to download the images to your computer, then batch-process a set of JPEG copies at the maximum resolution that your digital frame can support, then transfer those files to the digital frame, either into its internal memory or via its built-in card reader. That's how I'm handling it with the digital frame I use at home, which has a roughly 6 x 8-inch screen that displays VGA. Keep in mind that you can get away with fairly high JPEG compression when you downsize the images to VGA for use in a digital frame. I typically set Level 6 in Photoshop for this purpose, and the resulting files are usually under 100KB apiece. That's roughly 1,000 images per GB, so it's easy to store as many images as you need on a relatively inexpensive memory card.

Q. I have just taken delivery of an EOS 7D, which has staggering performance and functionality for the price, along with the delightful (at last) fact that the BG-E7 grip has an AF-On button!!! I have been using the on-board flash in lieu of the ST-E2 wireless controller, which is super convenient, but I am finding that I don't get the rapidity of recycling that I can achieve otherwise. Is this because the on-board flash is sending out a pretty hefty pre-flash, and then needing to recharge? I was doing some high-speed flash work with several 580EXs dialed down to 1/16th power. When I hook these up to Pocket Wizards and Quantum Turbos, I can generally get a 10- or 12-frame burst at full speed on my 40D. Using the 7D on-board flash, I can only achieve about 3 frames on the 7D. I will do some more exhaustive tests in the lab tomorrow, but thought you may have some quick insight?

A. Adding wireless control features to the EOS 7D's built-in flash is a great new feature, but one of the definite trade-offs is slower recycling than an ST-E2 or 580EX II. Over half of the built-in flash's capacity is used just for firing the preflash that's used to control the off-camera Speedlites. Despite this limitation, you can usually fire off several shots in a burst, but after that you'll need to wait a few seconds for recycling to finish. To make the most of the built-in flash's limited capabilities, I would suggest the following:

1. Use higher ISOs, moderate apertures and short camera-to-subject distances to reduce the amount of light needed for a correct flash exposure, or disable the built-in flash in a multiple flash set-up. (In this case, the built-in flash will still fire a pulsed preflash to control the off-camera Speedlites.)
2. If you need to shoot rapidly, consider using the 7D's 3 fps Continuous setting as opposed to the 8 fps High-Speed Continuous setting.
3. Consider loading two LP-E6 batteries into your BG-E7 to increase the number of flashes you can fire before recharging the batteries.

Q. My question is specifically about the EOS 7D, but it could be generalized to any other time Canon has introduced a new AF system. Is there a definitive list anywhere of exactly how compatible the AF assist beams on Canon's various current and discontinued flash units are with this body's AF system? I'm currently using a 420EX with my 20D, and while the AF assist isn't perfectly matched, it usually works well enough in practice. But in planning for my upgrade to a 7D in a few months, I have yet to find any discussion anywhere of whether this, or any other, flash (including the current 430EX II and 580EX II) provides full AF assist for all of the 7D's points and the various other AF settings like AF zones. This makes it hard to plan on whether I can get by with just a body upgrade or if I have to budget hundreds of dollars more for a new flash as well, and if so, whether I have to go all the way up to a 580 or if the 430 would provide proper AF assist. Thanks in advance for any pointers you can provide.

To the best of my knowledge, Canon hasn't published any detailed information about the coverage of the AF Assist beams from various EX Speedlites with the EOS 7D camera. However, based on my own testing, I can confirm that Speedlite 580EX II's AF assist beam covers all 19 of the EOS 7D's AF points at focal lengths down to 15mm. (I tested with the EF-S 15-85mm lens.) Speedlite 430EX II's AF assist beam covers 15 out of the 19 AF points on the EOS 7D at 15mm, but all points are covered at focal lengths of 70mm and up. The AF points that don't get coverage at wider angles with Speedlite 430EX II's AF Assist beam are positioned to the left and right of the vertical center line in the row below the horizontal center line (2 to the left of center and 2 to the right.) The corresponding AF points above the center line are covered, even at 15mm, because Speedlite 430EX II's AF Assist beam coverage is slightly asymmetrical with respect to the EOS 7D's 19 AF points, i.e., it provides more coverage above the center line of AF points than below it. So the 580EX II is the best performer in this comparison, but the 430EX II will probably be fine for the vast majority of shooting conditions. Now that the EOS 7D is available through dealers, you can try it for yourself to see if it meets your needs.

Q. Can you explain the difference between the camera's standard fastest flash sync, and High-Speed sync?

A. You can see a very good illustration of the technical difference between standard electronic flash operation and Hi-Speed sync on this Web page:

<http://web.canon.jp/imaging/flashwork/ettl2/high/index.html>

In a nutshell, the flash fires in a single burst during standard operation vs. firing continuously at roughly 50,000 cycles per second in Hi-Speed sync mode. The advantage of standard flash operation is potentially greater light output levels, but the disadvantage is that shutter speeds are usually limited to the maximum X-sync speed of the camera, i.e., the fastest speed during which the image sensor

or film is fully exposed to light at the same time during an exposure. With focal plane shutters, higher speeds are accomplished by causing the second shutter curtain to follow the first curtain before the first curtain has completed its travel, thus creating a slit that moves across the image sensor or film during the exposure. Standard flash operation is not effective at high shutter speeds because the image sensor is always partially blocked by the shutter during the exposure, thus creating an uneven lighting effect. Hi-Speed sync gets around this problem effectively by turning the flash into a constant light source. The disadvantage of Hi-Speed sync, if you want to call it that, is that the maximum output of the flash is at best approximately half that of standard flash operation, and the effective output drops progressively as the shutter speed increases. This factor limits the usable distance range during Hi-Speed sync, making it primarily effective for portraiture, macro, and other close-range subjects. Nevertheless, within its usable range, Hi-Speed sync is a tremendously useful creative tool. Not only does it allow the use of large apertures for shallow depth of field, it also allows a great deal of control over ambient exposure levels. One of the best ways to take advantage of this feature is to underexpose the ambient light, thereby drawing the viewer's attention to the subject that has been accurately exposed by the flash.

Q. What would the practical consequences be of lower sync speeds as a standard, assuming one has a flash with High-Speed mode?

A. The lower the sync speed, the smaller the aperture that must be used to achieve an

accurate exposure of the ambient light in a brightly lit environment. The smaller the aperture, the greater the depth of field and the shorter the usable flash-to-subject distance range. Hi-Speed sync effectively returns creative control to the photographer, because shooting flash photos in a brightly lit environment at high shutter speeds allows the use of wider apertures to reduce depth of field.

Q. Also, is there a disadvantage to leaving the flash in High-Speed sync mode all the time?

A. It depends on the camera. In most cases, there is no disadvantage to leaving the flash in Hi-Speed sync mode all the time because it doesn't kick in until the shutter speed goes higher than the maximum X-sync speed. But if you are using an EOS 5D Mark II or 5D camera, Hi-Speed sync can kick in at maximum X-sync speed (1/200 with those cameras.) If you want full power from your flash at 1/200, be sure to shut off Hi-Speed sync with those camera models.

Q. I believe my 1D had 1/500 standard sync.

It did, because of its interline transfer CCD image sensor. With that camera model, the focal plane shutter never fired faster than 1/125, and higher shutter

speeds were controlled directly by the image sensor. All other EOS Digital SLRs use CMOS sensors which cannot control their own shutter speeds for conventional still photos. For still photos, the shutter speeds of all EOS Digitals with CMOS sensors are controlled either partially or completely by their focal plane shutters, thus their maximum X-sync speed never gets higher than 1/200, 1/250 or 1/300 depending on the camera model and flash unit in use.

Q. I've just discovered Hi-Speed sync, but there's one thing I can't figure out. If I put my 580EX II into manual mode, say 1/32 power, and my EOS 5D into Av mode, it shoots at 1/8000 every time! Is this supposed to happen?

A. The issue here is the combination of a Manual flash setting with Aperture Priority on a relatively older EOS camera. Hi-Speed sync is not directly involved. If you had used an EOS-1D Mark III, 40D or any other EOS model introduced since 2007, and set up the camera and flash the way you describe, the shutter speed would have been set by the camera to expose the ambient light properly. But, with any EOS camera introduced before 2007, including the original 5D which came out in 2005, manual flash settings should not be used in either Av or P modes. If you try to do so, the camera will set the shutter speed to either maximum X-sync if High-Speed sync is turned off, or the fastest shutter speed on the camera if High-Speed sync is turned on. This is what happened to you. If you stick with your original 5D, there are two alternatives to consider.

1. If you want to use Manual flash, you need to set the camera to Manual mode as well.
2. If you need to set an AE mode on the 5D, such as Aperture Priority, you need to set the 580EX II to E-TTL mode, i.e., automatic flash exposure.

Both methods will work with or without Hi-Speed sync. If you update your camera to any EOS model introduced since 2007, then you can combine Manual flash settings with AE modes on the camera.

Q. I was just asked to shoot a time lapse of our local stadium stage set-up and teardown (they want to be able to show clients how everything can be changed easily). Apparently, it will take all night (and I'm not sitting there for 10 hours to keep pushing the shutter release). Could I make this work using Canon EOS Utility software and a 5D tethered to a laptop? Is there a way to connect the 5D to a power source so the battery doesn't die? Once I have all the images, what software could be used to produce the movie?

A. EOS Utility does in fact support intervalometer functions during tethered operation with any compatible EOS Digital SLR including the 5D. Once you have the camera set up and connected, look for the clock face icon in the middle of EOS Utility's remote shooting menu screen on your computer. Click on the icon to display the intervalometer settings menu and take it from there. The EOS 5D can be connected to AC power via the optional AC Adapter Kit ACK-E6. If you're

using a Mac, iMovie can create a movie from the folder of stills created in a time lapse sequence. On Windows, try Windows Movie Maker.

Q. I have a Canon 5D and, it seems to me, the recent low-light images I've been making, with exposure times ranging from 1/8 second to 30 seconds or more, show more amplifier bloom and banding than similar images I took when I first got the camera. I don't have any controlled tests to base this opinion on; it's just a gut sense that I am dealing with retouching more of these issues than I used to. (Or, it could be I am just getting pickier as time wears on!) However, this does have me wondering, what should one expect in terms of sensor lifetime? Does the performance (particularly, noise performance) of the full-frame Canon CMOS sensors (and associated electronics) degrade over time? If so, is it a minor, moderate, or major effect? It is unreasonable to expect a FF DSLR to perform roughly the same as new for 5, 10 or even 20 years?

A. To the best of my knowledge, none of the major camera manufacturers has expressed an opinion on the subject, and personally I doubt that they ever would. There are several good reasons why:

1. Like many other types of electronic devices, the design of image sensors evolves over time. Therefore, what may be true for one particular sensor does not necessarily hold true for every sensor, even if it's the same brand. And for that matter, it doesn't make sense to generalize sensor longevity among different manufacturers.
2. When it comes to testing longevity, the proof is in the pudding, so to speak. It's possible to test sensors based on actual usage, but it's not possible to simulate the effects of time.
3. Quite bluntly, in an era where digital cameras are no longer repaired by manufacturers seven years after the end of production, there is no good business reason to claim sensor longevity beyond that point.
4. For what it's worth, Canon has not detected any deterioration in image sensor performance with any EOS Digital SLR since the company first started manufacturing its own sensors nine years ago with the EOS D30. In other words, the performance in terms of sensitivity and color values has remained stable over that period of time.

Q. I have a question regarding Canon's Picture Styles. What is the difference between Neutral and Faithful? Both are said to have post-processing in mind. I've read the descriptions at

<http://www.usa.canon.com/content/picturestyle/shooting/index.html>

and

<http://www.canon.co.jp/imaging/picturestyle/editor/understanding.html>.

These descriptions "sell" the style but don't plainly spell out the differences and why you might prefer one over the other. The Canon Japan site gave me the impression that Neutral emphasizes detail and Faithful emphasizes accurate color. Is this correct? Also, Faithful references accuracy under 5200K lighting, so how does this affect pictures with typical indoor lighting?

A. There's no difference in default sharpness settings between "Neutral" and "Faithful," so there would be no difference at all between them in terms of detail. The significant difference between these Picture Style settings is about the same as the difference between "Perceptual" and "Relative Colorimetric" rendering intents. If you are unfamiliar with those terms, please review the following Web page for a good explanation:

<http://www.cambridgeincolour.com/tutorials/color-space-conversion.htm>.

Of the two Picture Style settings, "Faithful" attempts to reproduce colors as accurately as possible (similar to "Relative Colorimetric"), as long as the colors are within gamut and the white balance is properly set. "Neutral" attempts to produce a pleasing color balance (similar to "Perceptual"). As long as the colors being compared are within gamut, "Faithful" and "Neutral" will be almost identical, but you may see some differences between them in terms of out-of-gamut color reproduction. The reason that Canon's documentation references 5200K for Faithful is to provide a clear definition of the shooting conditions under which accurate color reproduction is calibrated. Differences in color reproduction between daylight and indoor lighting are subtle at best as long as you establish an accurate white balance for each environment.

If you want to get a better feel for the similarities and differences between "Neutral" and "Faithful," there are a couple of ways to do it. One quick and easy way is to visit a Web site like DP Review and check out one of their SLR test reports. Taking the Rebel T1i as an example, look at the top of page 18:

<http://www.dpreview.com/reviews/canoneos500d/page18.asp>.

You can roll over the Picture Style settings below the color chart and see how (or whether) the color patches change for each setting. This is only a rough comparison, though, and it doesn't necessarily give you the whole picture, so to speak. In order to do that, you really need to make some high-quality prints using each Picture Style you're interested in. If you've got a photo-quality color printer with photo inks and papers, it's relatively easy to do this from a single RAW image using Canon's Digital Photo Professional software. If you're not using DPP, it might be better to work from in-camera JPEGs shot with each Picture Style to see the differences, because working from RAW files with independent software applications like Adobe Lightroom, Apple Aperture, etc., introduces a completely additional set of variables. To gain the most comprehensive

understanding of differences in Picture Style settings for printing, I would suggest experimenting with color space as well. Printing gives you a good opportunity to see the difference between the sRGB and Adobe RGB color space settings that you may not be able to appreciate any other way, since most computer monitors are incapable of displaying a color space as large as Adobe RGB.

Q. I was curious about how the video feature functions on the newer SLRs that Canon has released. "Full HD" being 1920x1080, that is much smaller than the normal resolution for, say, a 5D Mark II. So when you are capturing video, is the camera taking the full 21MP image and resizing/cropping it down to 1920x1080 or is it actually only capturing the HD-size resolution? And if it is ONLY capturing the HD-size image, is it only using a small portion in the middle of the sensor to do so? I guess this would be the same question as, what happens when you change the setting on your camera to "medium" JPEG instead of "large" JPEG? Is it capturing the large size and then resizing it down before it saves it on the memory card? The reason that I ask is because, if it is taking the full size and resizing it down, then I would guess that would greatly improve the noise performance. For instance, if I have a 15mp image that I shot at ISO 1600, and I resize it down to 1920x1080, I can't really see the noise that was in the original image.

A. Canon does not disclose a complete description of the methods used to produce Full HD movies with EOS Digital SLRs like the 5D Mark II, 7D and Rebel T1i/500D. But here is a brief description:

1. Original image data is captured by the entire image sensor, which has a 3:2 aspect ratio.
2. The image data is cropped to 16:9 to match the aspect ratio of Full HD (1920 x 1080) and HD (1280 x 720) movies.
3. The cropped data is downsampled to reduce resolution to either 1920 x 1080 or 1280 x 720 pixels, depending on the camera's feature set and the user's choice of camera settings.
4. The downsampled data is compressed according to an H.264 AVC data compression algorithm and written to the .MOV recording format.

The EOS camera's LCD screen displays the full image that the image sensor is seeing, but a semi-transparent overlay is superimposed at the top and bottom of the screen to indicate the portions of the original image that will be cropped out to change the aspect ratio from 3:2 to 16:9 for HD movies as indicated above.

Concerning your noise question, the data compression method for movies is different than it is for still photos. In other words, H.264 AVC uses a different algorithm than JPEG, so it does not necessarily follow that EOS HD movies have less noise than still images that have been downsampled. It would be more accurate to say that EOS HD movies have a different noise pattern than still images. Nevertheless, it's true that EOS HD movies have noticeably less noise at

comparable ISO speeds than HD footage from capture devices with smaller image sensors. And it is also true that EOS cameras with HD capability can shoot movies at very high ISO speeds that are often unavailable with other HD capture devices. For example, the 5D Mark II can shoot movies at ISO speeds up to 12,800. But the lower the ISO, the lower the noise, just like other HD capture devices.

Q. You touched some time ago on the question of flash duration for different Canon flash units but I would like to know if you could revisit this. Specifically, I sometimes mix 430EX (version I) and 550EX Speedlites in multi-flash setups for hummingbirds where I live and work in Costa Rica. I normally use 1/8 or 1/16 power in manual mode. Since the 550EX has a higher GN, does it stand to reason that it has a longer flash duration at, say, 1/16, than the 430EX does at the same power setting? If so, can you put a number of the different durations?

A. It does stand to reason that a 550EX or 580EX at 1/16 power would have a longer flash duration than a 430EX or 430EX II at the same power setting, but as I mentioned in the April 2009 *Tech Tips* response, Canon never provides official durations for fractional power settings. Also, the actual durations at lower power settings are not directly proportional to higher settings. (According to Wayne Schmidt: "*In the real world, as the flash duration for xenon flash lamps becomes very small their efficiency decreases. To compensate for this loss of light the flash is programmed to remain on long enough so that the output is what it should be.*") Therefore, it wouldn't make sense to apply a simple mathematical reduction factor to calculate the fractional power durations for smaller Speedlites like the 430EX or 430EX II. My best advice would be to test the equipment yourself to see which settings meet your needs. I suspect that if you use a higher power setting on the 430EX to match the output of the 550EX, the flash durations from both Speedlites will end up being very similar if not identical.

Q. I find Auto ISO to be a great feature on the latest Canon digital SLR cameras. My question is this, why has Canon limited Auto ISO while in Manual mode to ISO 400? Why have a limit at all especially as results on my 5D Mark II look great at high sensitivities? I would like to set a fast shutter speed to freeze action and shoot at the sharpest but largest aperture – i.e., f/2.8 on my EF 50mm f/1.4 lens. Surely a firmware upgrade could rectify this creative handicap.

A. It already has, at least to some extent. Whatever the reasons may have been for restricting the Auto ISO function in Manual mode on earlier EOS models, Canon seems to have reversed that trend with newer products. The first EOS with variable Auto ISO in Manual mode was the EOS 5D Mark II when updated to Firmware Version 1.1.0 and used in Live View or Movie Mode. The newly released EOS 7D goes one step further by making Auto ISO in Manual mode fully variable even when Live View is turned off.

Q. I would like to know what settings you recommend for shooting high-speed aircraft during air shows. I have problems with consistent sharp frames when using burst mode with AF on. I have tried several different settings, but lately I have switched to Tv (~1/1500th s or less if possible), IS off, manual focusing set close to infinity with better results. But I really would like to use AF because it is quite difficult to focus manually when [an] aircraft is coming towards you. Equipment used is EOS 40D and EOS 5D with EF 100-400 f/4.5-5.6L IS and EF 500 f/4L IS. I also use a monopod sometimes.

A. I recommend AI Servo AF for most kinds of ground-to-air photography. In the case of the 40D or 5D, select the center focusing point manually and try to keep at least part of the aircraft targeted with it at all times. With the 5D, you may want to experiment with Custom Function 17-1 to activate the invisible "Assist AF" points around the visible center point. It would be a very good idea to collect focusing data (i.e., start tracking the subject) by pressing the shutter button halfway for at least 1 second prior to pressing it all the way for the exposure. Try panning with the aircraft moving from left to right or vice versa rather than just straight-on shots. I would also suggest that you use Image Stabilizer Mode 2 for panning with both of your lenses. If the aircraft is relatively slow moving, you should try shooting one shot at a time rather than high-speed continuous bursts. But if you're dealing with a fast moving jet or group of jet planes, then high-speed continuous for a burst of 3 to 5 frames may be more productive. A few more tips:

- Try to fill the frame as much as possible before taking photos. There are few images more boring than a tiny aircraft against a huge expanse of sky, unless there's something particularly interesting about the cloud formation.
- Consider using the camera's spot metering function to isolate exposure metering to the aircraft itself. Use your histogram to determine a pleasing exposure level.
- Consider using manual exposure to keep your exposure levels consistent from shot to shot.
- If you're photographing propeller-driven aircraft, try using a relatively slow shutter speed such as 1/125 or 1/250 while panning with the movement to blur the propeller while keeping the fuselage and other portions of the airplane sharp.

Hope that helps!

Q. I bought a 7D the first day they were available here in Kansas City, and I have to say I love it. It's my seventh EOS DSLR, and by far my favorite. But there's one aspect of it that I wish was different, and that's the lack of interchangeable focusing screens. I have been using the Ef-S focusing screen in my 40D for about two years, and I like how it more accurately displays the true DOF of my fast lenses. The viewfinder in the 7D is big and bright, but the image on the focusing screen displays a depth of field of

about f/5.6, even when an f/1.4 lens is attached to the camera. This can make it hard for me to visualize how an image will really look. Does the transmissive LCD make a replacement screen impossible? Might a third party be able to market one, as they did for the 20D and 30D?

A. The actual DOF level of the 7D focusing screen is about f/4 rather than f/5.6, but I understand your point. There's no doubt that Canon's Service Department could replace a broken 7D focusing screen if they had to, so I wouldn't say that changing it is impossible. However, the LCD overlay and its supporting circuitry is positioned so close to the screen that I'm sure changing it is a very delicate and time-consuming job, whether it's done by Canon or a third-party screen manufacturer. That's probably the main reason why user-interchangeable focusing screens are unavailable for the 7D camera. As a workaround when using fast lenses, your best bet would be to use the camera's Live View function. This method will display the actual depth of field at all times, and it has the added benefit of being able to magnify any portion of the picture area, either 5X or 10X, for critical manual focusing.

Q. Question on Auto Exposure Bracketing (AEB): Both the 7D and 5D Mark II are limited to 3 frames per AEB sequence, whereas, the EOS-1D/1Ds models allow up to 5 frames. Do we just have to live with this 3-frame limitation on the lower models, or is there a remote control unit that will enable further adjustments without touching the camera and risk changing the composition slightly in between sets of bracketed shots? What other solutions or techniques would you suggest to get around this problem? Thanks.

A. The EOS-1D class cameras can set AEB sequences up to 7 frames. However, you can shoot up to 15 exposures per bracketing sequence with almost any EOS Digital SLR by using DSLR Remote Pro software from Breeze Systems for various flavors of Microsoft Windows or Mac OS X. See their Web site for details:

<http://www.breezesys.com/DSLRRemotePro/features.htm>.

Q: I'm interested in a technical explanation of one particular feature of constant aperture zoom lenses, e.g., EF 70-200/2.8L. Knowing that the aperture is a result of dividing the focal length with the physical diameter of the lenses, we calculate that the required lens diameter for 200mm/2.8 is approximately 70mm. OK. Now, let's assume that we zoom back to 70mm focal length. The physical diameter of the lenses is still 70mm. Why can't we have a lens that would now have f/1.0 (70/70)? In this manner, we would have a 70-200/f1.0-2.8 lens. Pro photographers prefer constant aperture for practical reasons, but is there a technical obstacle in producing such a lens? I'm sure there is, but I'm also sure there would be enough people who would appreciate such a lens.

A: For a simple lens, the definition of f/stop is focal length divided by the diameter of the front element. But SLR zoom lenses are far from simple, and there are many different types, such as wide-to-wide, wide-to-telephoto, and telephoto-to-telephoto. In all of these lenses, it's the apparent size of the aperture, i.e., the "virtual aperture" that counts, not the size of the physical aperture. In the case of a traditional telephoto zoom lens like the EF70-200/2.8L, you can see the virtual aperture change if you look through the front of the lens while you're zooming it. It increases in diameter as you zoom towards 200mm, and decreases as you zoom towards 70mm. But the size of the virtual aperture is directly proportional to the focal length setting, resulting in an effective aperture that's constant at all focal lengths. So an EF70-200/2.8L should really be thought of as a 70mm f/2.8 lens with a sort of "zoom teleconverter" in front of its iris diaphragm.

Wide-to-wide lenses like the EF16-35mm f/2.8L II are essentially inverted telephoto zooms, so they function basically the same as the EF70-200/2.8L except that the "zoom teleconverter" is behind the iris diaphragm. Wide-to-tele zoom lenses like the EF24-70mm f/2.8L achieve their constant aperture differently than either the wide-to-wide or tele-to-tele designs; in this case the iris diaphragm is "cammed" so that it changes its size as the lens is zoomed. You can see this if you look through the lens off the camera while you're zooming it. If the diaphragm was not cammed, the 24-70/2.8L would be revealed as a variable-aperture zoom with a maximum aperture larger than f/2.8 at all focal lengths under 70mm.

Q: Can you comment on "hyperfocal focusing" on digital zoom lens in general? I think there's just too much hype and myth on this subject. To me, it is not practical at all if I have to refer to a calculation/chart on location. Besides, I like shooting landscapes where I place some foreground subjects as close as possible and so having a tack sharp foreground becomes even more critical to me.

A: Setting a lens to its hyperfocal distance produces depth of field that extends from half the hyperfocal distance to infinity. This represents the greatest possible depth of field for any given combination of focal length and aperture value. Hyperfocal focusing is a popular technique when using wide-angle lenses. For instance, with a 24mm lens at f/11 on a full-frame digital SLR like the EOS 5D Mark II or the Nikon D3x, the hyperfocal distance is approximately 7 feet, based on a minimum blur circle diameter (aka, "circle of confusion") of 0.025 mm, which is a conservative value based on an 8x12-inch uncropped print at a viewing distance of 10 inches. Assuming the image format, focal length, aperture, print size and viewing distance listed above, depth of field extends from approximately 3.5 feet (half of 7 feet) to infinity. If any of the variables change, the depth of field will change, strictly speaking. Regardless of changes to the variables, sharpness in the resulting image will steadily degrade both in front of and behind the actual focusing distance, so you may find that you're better off shifting the focus closer to the camera to improve sharpness on foreground objects. Also, be careful

about stopping down too far, since optical diffraction may reduce the overall sharpness of the image.

Q: I've seen a few Web sites saying the new EOS 5D Mark II produces a much better printed image as compared to, say, my EOS 5D. Trying to be a good steward of my money, I couldn't really see the need to go from the 5D to the 5D Mark II other than greater pixel count, slightly faster FPS and marginally better low-light capture. I do not really have a need for the video ability, albeit that it is really fascinating what this camera can do! So bottom line, if I make an 18.2-inch print at 240 dpi using the 5D and another at 308 DPI using the MkII, will I really see a difference on paper due to this pixel count, or are they also talking about image quality aside from pixel count? Thank you so much!

A: If all other conditions including digital sharpening are equal, the answer will depend on the sharpness of the lens, the accuracy of the focusing, the elimination of motion blur, and the level of detail in the subject. The sharper the lens and the finer the detail in the subject, the more likely it is that you'll see a difference in favor of the EOS 5D Mark II, assuming the lens is focused accurately and motion blur isn't a factor. The 5D Mark II print will also show less noise than the print from the 5D, especially at higher ISO speeds. To get a feel for this, try printing some sample images shot under identical conditions with both cameras. The "Comparometer" at the Imaging Resource Web site is a good source for samples of this type:

<http://www.imaging-resource.com/IMCOMP/COMPS01.HTM>

Q: There are many 5DII sample videos on the Web and some are quite good. I would like to see more details on post-production techniques using software like Nero, Adobe, etc. This should include sound recording and editing. Still + video edits would be of interest. Where can you point me for such?

A: Professional-level HD video and audio editing is a rapidly evolving area of interest for many EOS 5D Mark II owners. Most of the online and recorded tutorials I've seen so far are centered on the use of Apple's Final Cut Pro software for Macintosh computers. Here are some examples of that kind of training:

<http://blog.planet5d.com/training/fcp-video-workflow/>

<http://www.idcphotography.com/kart/index.php?p=product&id=110&parent=16>

I haven't seen anything comparable yet in terms of canned tutorials for 5D Mark II audio/video editing on the Windows platform, but one of the more interesting

developments to emerge over the past several months is the availability of Neo Scene software for Windows and Mac by Cineform:

<http://estore.CineForm.com/neoscenev1winormac.aspx>

This application converts native movie files from the EOS 5D Mark II into Cineform .MOV files that are easier to edit with Windows video editing applications such as Adobe Premiere Pro and Sony Vegas Pro. Here are some links to DVD-based tutorials for these applications:

http://www.totaltraining.com/prod/adobe/premiereprocs4_ess.asp

<http://www.lynda.com/home/ViewCourses.aspx?lpk0=396>

<http://www.sonycreativesoftware.com/vegasbook>

In addition to recorded content, there are also various live seminars on 5D Mark II audio/video editing from a variety of sources. Enter "5D Mark II Seminars" into the search engine of your choice to see some of those offerings.

Q: I am trying to shoot tethered with an older PC laptop, using EOS Utility. I only have USB 1.1, so I don't want to be downloading RAW files every shot, but I want the RAW files for post-processing later. The Canon European Web site says, "Capturing RAW+JPEG gives you much more flexibility. You can download the JPEG files to your computer, while the RAW files stay on the CompactFlash card." However, I cannot figure out how to do this. I can't find any settings or preferences that allow me to select which type of images download from the camera in real time, and which ones don't. Is this really possible, or is the Canon Web site in error?

A: It's definitely possible to set up your camera to transmit only JPEG in real time when the camera is set for RAW + JPEG recording if you are using a Canon Wireless File Transmitter and EOS Utility software, but not for tethered shooting through the USB interface. The details vary somewhat depending on the camera model you're using, but here's the basic procedure for the 5D Mark II and 50D with their respective WFT units:

1. With the WFT unit mounted to the camera, go to Setup Menu 1 on the back of the camera. (The tab at the top of the screen looks like a wrench with one dot to the right.)
2. Scroll down to "WFT settings" and press the Set button. This will display the "WFT settings" submenu.
3. Scroll down to "Communication mode" and select "FTP." (This won't work in PTP or HTTP modes. Also, you'll need to go through another procedure to establish a communication link between your computer and the WFT unit, but that's a separate issue that I won't cover here.)

4. Once FTP has been set up, go back to the "WFT settings" submenu, select "Set up" and press the Set button. This will display the "Set up" submenu.
5. Scroll down to "Transfer type/size" and press the Set button. This will display the "Transfer type/size" submenu.
6. Scroll down to "RAW+JPEG transfer," select "JPEG only," and press the Set button.
7. Press the shutter button halfway to extinguish the LCD menu, and you should be all set.

Q: I love the sample photos of the new PowerShot G11 compact camera but STILL there is no 3:2 format. I really cannot understand this and I want to ask if there is a chance people at Canon realize their "blindness" and release a firmware with 3:2 option? Do you think this would be possible in the future? What is the technical background for the Canon policy?

A: As a point of interest, the PowerShot G11, like the G10, G9 and G7 cameras before it, is equipped with an optional 3:2 masking option for its LCD display. This feature is designed as a compositional aid for photographers who prefer the 3:2 aspect ratio over the camera's native 4:3 aspect ratio. The image files are still written in a 4:3 format, but it's a relatively simple matter to apply a 3:2 crop for printing or other forms of post-processing. 4:3 has been the dominant aspect ratio for compact digital cameras since the beginning of the market in the early 1990s with models like the Apple QuickTake 100, which had a 640 x 480 CCD sensor based on the technology in use at the time for standard definition video camcorders. As HD video begins to overtake SD in the market, it wouldn't surprise me to see future compact digital cameras changing their aspect ratios to keep up with the times, but they might skip 3:2 and go all the way to 16:9. This is my own personal observation, so please don't construe it as a comment on Canon's future plans or products.

Q: Canon shutters have been rated since the 30D with an "expected lifetime" of exposures. What is the basis for these ratings and now higher use ratings? Is Hardware, Software, and oil used really that different? What is expected life range for products before 30D (10D, 20D, 5D, etc.)?

A: Canon's durability ratings (they have never used the term 'expected lifetime') for focal plane shutters used in EOS cameras are based on exhaustive product testing in the company's R&D laboratories. The details of the testing procedures are confidential, but having worked at the R&D center in Tokyo, I can personally attest to the fact that Canon's testing procedures for shutter durability are quite stringent. Durability ratings are not published for every EOS model, but here is a listing of published ratings that I am aware of:

- EOS-1Ds/EOS-1D Mark III: 300,000 exposures
- EOS-1Ds/EOS-1D Mark II, Mark II N: 200,000 exposures

- EOS-1Ds/EOS-1D, EOS-1V, EOS 5D Mark II: 150,000 exposures
- EOS 5D, 50D, 40D, 30D, EOS 3: 100,000 exposures

All of these cameras use electronically controlled multi-bladed focal plane shutters, and several design improvements over the years have contributed to improved shutter longevity. For details about the shutter designs of specific EOS Digital models, I would suggest that you refer to Canon's White Paper documents, which are posted at the Canon Digital Learning Center here:

<http://www.usa.canon.com/dlc/controller?act=GetArticleAct&articleID=1787>

Q: Has anyone figured out why Canon named the EOS 7D as they did? I thought they had a theme going with the 1000D, then the 450D/500D, then the 40D/50D and then 5D and lastly the pro level 1D series? I'm not sure I understand why they named it 7D (and didn't Minolta once had a camera called 7D and then some other brand too?). Why not 60D?

A: There actually is some sense of continuity in the naming of the 7D if you look at the 22-year history of the EOS system. However, the reasoning might not be obvious at first glance.

In the film era, the basic idea for EOS model numbers was clear enough: the lower the number, the higher the ranking. The EOS-1 series ranked higher than the EOS 3, which in turn ranked higher than the EOS 5 (or A2E in North America), which in turn ranked higher than the EOS 7 series, etc.

In the digital era, after some initial models were named for their sensor resolution (as in D30 for 3 megapixel and D60 for 6 megapixel), Canon changed the model numbering scheme for consumer-grade digital SLRs to a chronological base, as seen in the xxD series, the xxxD series and the xxxxD series, with an initial model in each. For example, 10D through 50D are chronological, 300D through 500D are chronological, and 1000D is most likely the first of a series of entry-level models slotted a bit lower than the xxxD series.

But above the xxD series, EOS model numbers appear to honor the original film-based sequence where lower numbers signify higher rank. In this context, the 1D series ranks higher than the 5D series for obvious reasons, while the 5D series ranks above the 7D because of its use of full-frame sensors. It remains to be seen whether this numbering scheme (or feature differentiations) will continue in future models, but it wouldn't surprise me if it did.

Why wasn't the new camera named 60D? Because the 7D is considered to be the start of a new series in the EOS line-up. It ranks higher than xxD models like the 50D, just as the 50D ranks higher than the 500D even though both have APS-C sensors with the same resolution.

Q: Many a sports photographer switched to Canon [in the 1990s] because at that time their AF lenses were considered fastest. I think this may still be the case but wonder why [there is] no published spec data on how fast these lenses focus. Other brands do not publish these specs either. Why is that?

A: That's a good question. Perhaps the best answer is that a pure lens drive speed specification isn't very meaningful on its own. There can be differences in lens drive speed when the same lens is used on different cameras, or even on the same camera, as battery charge levels drop during the course of a game. Moreover, a complete AF sequence always consists of focusing calculations as well as lens drive. When it comes to focusing calculations, there are a lot of variables that affect AF speed, such as light levels, subject contrast, subject distance vs. lens focal length, subject speed and movement patterns, etc. Beyond the technical considerations of lens drive speed and AF performance, a professional sports photographer must also choose the right lens for the job. For instance, it may be true that a 300/2.8 lens autofocuses faster than a 400/2.8, but that doesn't mean much if you need the 400mm lens to make the shot.

Q: I am looking for the fastest memory cards the EOS 50D can take advantage of. For example, SanDisk® Extreme® III cards can be read and written at 30MB/s or 200x speed. SanDisk® Extreme® IV cards can be read and written at 45MB/s or 300x speed. I know these are quality cards. Given this example, if the 50D only reads/writes at 25 or 30MB/s I get the same results from either card so I can buy the Extreme® III cards and save some money. If, however, the 50D reads/writes at 40 or 50MB/s then the Extreme® IV cards are well worth the extra cost. So, concisely, at what speed does the EOS 50D camera read/write? Alternatively, what were the entire specifications of the 2GB card used in Canon testing for burst rates? Please advise me.

A: The EOS 50D and 5D Mark II cameras are compatible with UDMA CF cards up to UDMA Mode 6, which represents a data transfer rate of 133 MB per second. That's megabytes, not megabits. Nobody is selling Mode 6 cards yet, but the 50D and the 5D Mark II will be ready when they do. Canon does not publish a specific speed rating for data transfer with EOS cameras, but you can find reliable independent test results on the Web. I would suggest checking Rob Galbraith's CF/SD database here:

http://www.robgalbraith.com/bins/camera_multi_page.asp?cid=6007-9672

From this, you can see that the 50D's effective throughput is less than the full speed rating of the Extreme IV cards (approximately 33MB per second vs. 45MB per second), but Canon anticipates that the camera will write data faster when faster UDMA cards show up on the market.

Q: While Canon's E-TTL II provides superb fill in and balanced lighting, it's also vulnerable to reflections and hot spots. As a wedding photographer, I'm always looking for a "sure-fire" way to obtain an acceptable exposure quickly especially when time is critical. With the bride coming down the aisle, I don't have the time for a trial and error FEC (flash exposure compensation) or for her dad to hold an 18 percent gray card while I do an FEL (flash exposure lock). Flash [exposure] bracketing is risky because the bride is moving. Some claim that diffusers help (I have the LumiQuest 80/20 and Gary Fong Lightsphere) but an unexpected metallic handbag, white dress or white shirt in a dark church has ruined a lot of important shots! Also, I've searched for an advanced class book on E-TTL II but haven't found anything except for a couple of very cursory books that offer little more than what is on Canon's technical help Web pages, the best of which is in Europe Any suggestions?

<http://cpn.canon-europe.com/content/infobank/flash.do>

A: Before answering your questions, I have some questions for you:

1. For your processional shots and other indoor flash photos, what's your typical ISO setting? How about aperture and shutter speed?
2. Which flash metering pattern are you using, evaluative or average? I am not talking about the ambient metering pattern set on top of the camera.
3. Are you willing to use a diffuser like the Fong sphere or similar?

Q: Thanks for the reply and I appreciate the help. I know I'm doing something wrong and I'm determined to get to the bottom of this problem.

1. I generally shoot at ISO 400 and generally in the Av mode, if not, manual. With my new 5D II, I'm slowly starting to trust the new ISO Auto selection. In Av, I set C.Fn I: (Exposure):7 at 1 (1/200 - 1/60 sec. auto) unless I have some difficult ambient light issues. Apart from full Auto and Creative Auto, I have worked with the other modes on the 5D II. Depending on ambient lighting, depth of field and distance, I usually work with an aperture range from wide open to f/8. I'm using the Canon EF24-105mm f/4L IS USM "kit" lens, which, in my opinion, is a superb piece of glass. My usual flash is the Canon 580EX II.
2. The reflection/underexposure problem I'm encountering seems to occur with the flash metering set for either Evaluative or Average. I use both. I find with white table cloths, white shirts, white wedding dresses, etc., that Average sometimes seems to be more forgiving but other times Evaluative works best even though both modes will be 1/2 to a full f/stop dark.
3. I do use the Gary Fong Lightsphere Diffuser. Specifically, the new Universal "Half-Cloud" (same material as the "Clear" model). I like the results and I think it's better than the LumiQuest diffuser most of

the time ... but ceilings and room vary so there are no hard rules. There's more than enough power in the 580EX II to handle the diffuser.

My current solution to the under-exposure problem is to simply pump the flash exposure compensation by about +1 to 1-1/3 but then kick and scream when I blow out a shot after forgetting to reset the FEC. Again, do you have any suggestions? Is there an ETTL-II textbook that you can recommend?

A: Thanks for the clarifications. It gives me a better idea of your workflow, even though I haven't seen any of your problem images. Based on your answers, here are a few suggestions that might be helpful:

1. Consider using a higher ISO for your indoor shots. I think this step alone would go a long way towards minimizing your exposure issues. If you're at ISO 400 and f/8 with a Fong sphere, you may be pushing your 580EX II harder than needed. I could understand those settings for a group shot to help you maintain sufficient depth of field for several rows of people, but not necessarily for processional or typical reception photos of couples or small groups. The multiple benefits to ISO 800 on your 5D Mark II for indoor flash shots would outweigh any perceived disadvantage in terms of noise. For example, you'd get a better exposure of the background areas that are not illuminated by the flash, and you would also get faster recycling in addition to more flashes per set of batteries.
2. Consider using a Compact Battery Pack CP-E4 or equivalent. In addition to eliminating recycling delays, this would also tend to make your flash exposures more consistent.
3. Stick with Average flash metering for your indoor flash shots, and expect to apply about a stop or so of flash exposure compensation when there's a lot of white material in the composition (table tops, bridal gowns, etc.). Evaluative flash metering is at its best for outdoor fill-flash shots, whereas Average usually works best indoors.
4. Consider registering your indoor settings and your outdoor settings to separate Custom modes on your 5D Mark II. This would make it quicker and easier for you to switch the camera to the optimum settings when you move from one set of lighting conditions to another. For instance, C1 could be your outdoor fill-flash setup with a low ISO and Evaluative flash metering; C2 could be your indoor flash set-up with ISO 800 and Average flash metering.
5. Don't forget that your 5D Mark II/580EX II combination can be adjusted very easily through the External Speedlite Control menu on the camera's 3-inch LCD screen.

Canon really doesn't publish much advanced information about E-TTL II flash photography beyond the content you mentioned on the CPN Web site, but there are some independent sources worth checking out:

- Bob Davis has a great DVD on wedding photography with Canon Speedlites called "A Master's Approach." You can order it from his Web site: <http://davisimpact.com/>
- Chuck Gardner also publishes some useful tutorials on the Canon Speedlite System at his Web site here: <http://super.nova.org/DPR/>
- Last but not least, you can get a good technical overview on the Canon Speedlite System from NK Guy here: <http://photonotes.org/articles/eos-flash/>

Q: Thanks very much for the very useful information. You have pretty much confirmed that I'm on the right track but I just need a little fine-tuning. I've used battery packs in the past but the wire makes me feel a little off-balance. I still use a flash bracket so I've got the curly cable to contend with. (Do you mount your flash on a handle/bracket? ... what make/model?) In addition to your suggestions regarding a higher ISO, Average vs. Evaluative flash metering and moving the FEC up a bit, I'm also hedging my bet by shooting most flash shots in RAW which allows me to adjust for problems after the fact even though the shooting time can be delayed and post processing time can take half of forever! Thanks again for your suggestions and links.

A: No problem, I'm glad the information was helpful. I don't use a flash bracket these days, but I know several professional wedding photographers who do. Brackets can get heavy, but they're great for positioning the flash above the camera and pointed down just a bit to control the direction of the shadow. You might want to check out some of the products from Custom Brackets:

<http://www.custombrackets.com/>

I like the way they let you flip the camera from vertical to horizontal without changing the position of the flash. There's also enough room on the bracket to mount an external battery pack so you don't have to contend with wires connected to your belt or vest.

Q: I use my EOS digital cameras for unusual photography (flying bats, star trails, etc.) and am wondering if long exposures or keeping the camera running for long periods (three hours) can damage the CMOS sensor or other parts of the camera. I used three of my cameras the other night and after several hours of use in the hot Arizona desert they failed to take some images. Could I have done some long-term damage????

A: Long exposures pose no threat to the longevity of Canon's CMOS sensors in EOS Digital SLRs, but they will run the camera's battery down. If the battery voltage falls below a prescribed limit, the camera will shut off and any image data in the buffer memory will be lost. I've commented on this topic several times in previous editions of *Tech Tips*, most recently in November 2008. Here is a relevant excerpt:

"Realistically, maximum bulb exposure time for an EOS Digital SLR is going to depend on the type of power supply and to some extent the ambient temperature conditions. By far the longest exposures are enabled when using the optional DC Couplers and AC Adapter Kits, since these accessories eliminate concerns about battery life. If you're doing astrophotography from your backyard or any other location where AC power is accessible, this is probably the most feasible solution. When AC power is not accessible, the next best solution is to use an optional battery grip and load it with two lithium-ion rechargeable battery packs. The battery grips and battery packs will vary according to the camera model involved, but in moderate temperatures it would be reasonable to expect no more than approximately 4 to 6 hours of battery life for time exposures with a two-battery power supply. In situations where only one battery pack is available, the total bulb exposure time in moderate temperatures will be somewhere in the range of 2 to 3 hours. Cooler temperatures down to the cameras' minimum rated operational range of 32 degrees Fahrenheit will reduce battery life somewhat. In answer to your second question, any image data in the camera's buffer memory will be lost if the camera loses power before the file is written to the memory card. Since long exposure noise reduction in the camera can last as long as the actual exposure, you'll need to factor that into your decision on setting the length of time exposures."

Q: I'm wondering what the attitude at Canon is regarding the so-called megapixel race. It seems many digital camera makers, Canon included, keep packing pixels into their cameras in an ever-escalating race to have the most. However, if you asked the average amateur photographer if they feel they need more pixels they would most likely tell you no. And what's funny is nobody really disputes the fact that sensors are reaching and sometimes exceeding the ability of lenses to provide detail and the fact that increasing pixel density, all else being equal, reduces the signal to noise ratio and increases noise in the images. Despite the fact that these things are known and not disputed, why are camera companies continuing to increase pixels with every new iteration?

I own a 20D, 40D and 5D Mark II and love them and their abilities but don't always have them with me. I would like to get a small point-and-shoot camera for convenience and have looked at them for years. I have not gotten one yet, and would prefer a Canon version but have not because with very little exception they all have very bad image quality at ISO 400 with noise that essentially ruins the pictures. I can't understand why

companies make these small sensor cameras and put 12 and 15 megapixels in them. I don't want or need that many pixels in a point-and-shoot camera. And I bet if the public were educated about this and realized how they actually use them they would be quite happy with 6-8 megapixel images. I would be very pleased with manageable noise in a 6-8 megapixel point and shoot at ISO 1600. I'm not sure any company is close to achieving this yet; instead they start with unusable ISO beyond 400 and increase pixels and maintain the bad high-ISO performance. It makes no sense to me.

And Canon seems to do this to a lesser extent with the EOS line. Instead of modest one-stop noise improvements from one generation to the next with large jumps in pixels, why not maintain the amount of pixels and give 2-3 stop noise improvements? I think photographers would be ecstatic over this. What could an improved 5D's 12-megapixel sensor look like with the latest sensor technology? Is it unreasonable to think it could be 2-3 times better at managing noise? And let's be honest, how many people will ever in their lifetime make prints that need more than 12 megapixels? Don't get me wrong, I love the 21 megapixels of the 5D Mark II but I'd gladly settle for 16-18 megapixels to get an improvement in noise.

A: First of all, thanks very much for sharing your thoughts with me. I'll be happy to pass along your requests to Canon's R&D group for consideration towards future products. In answer to your main question, I would say that Canon's primary concern in terms of new product development for digital cameras is the ongoing improvement of overall image quality. Image quality is judged not only by what can be seen on a computer monitor, but more importantly what can be seen on a high-quality print. That is one of the main reasons why Canon is so heavily invested in color printing technology, as seen with the imagePROGRAF line of large-format photo printers, as well as EF lenses, CMOS image sensors and DIGIC image processors for EOS cameras.

If the quality of the printed image is kept in mind, experience shows that an increase in sensor resolution can and often does result in an improvement in image quality at any given enlargement ratio, assuming that all other factors are equal. As a case in point, consider the 5D Mark II vs. the original 5D. In this case, most photographers who've used both cameras will agree that although the image quality of the original 5D is outstanding throughout most of its ISO range, the 5D Mark II is capable of producing prints with superior levels of detail and less noise, especially at high ISO speeds. It's understandable that some photographers would be willing to sacrifice increased resolution for reduced noise levels, but at some point the law of diminishing returns starts to kick in. The larger the print size, the sooner this point is reached.

In the realm of compact digital cameras, there is no question that the high end of the market is looking for better image quality than current cameras provide,

especially at high ISOs. But I'll bet that the eventual solution to that request is going to be larger image sensors with high resolution rather than small sensors with reduced resolution. Time will tell!

I am concerned about the potentially detrimental effects Movie Mode may have on my gear, specifically Lens IS and CF Cards. If Lens IS is running continuously for the duration of a movie, is that an issue for the lifespan of the IS unit? Do you recommend that IS should be turned off during Movie Mode to conserve its life? Also, my 5D Mark II makes CF Cards very hot, especially when using Movie mode. Is this likely to cut down the lifespan of the CF Cards?

According to Canon Inc., it's not a problem to run the Image Stabilizer function of an IS lens during movie recording. In fact, they encourage the use of IS for handheld shooting of movies and stills. And use of IS for movie recording has no significant effect on the lifespan of the IS mechanism. However, if you use a tripod while recording movie clips, in most cases you'll lose the benefits of image stabilization. Under those conditions, it's best to shut off the IS during tripod use. This will also reduce power consumption, thus extending battery life. Canon recommends that microdrives should not be used for movie recording because of heat buildup issues, but there are no recommendations against the use of chip-based CF cards, except the need to use a card that can write data at a rate of at least 8 MB per second. Canon does not manufacture its own CF cards, so you should consult your CF card manufacturer for official recommendations about their products.

I have found that while in Live View the 5D Mark II won't fire a strobe that is connected via a sync cable. I've tried all the different Live View settings but nothing seems to work. If I turn off Live View the strobe will fire. A hot shoe-mounted Canon flash also works fine. This is a feature I like to use a lot in the studio with my 1Ds III and sometimes I need to operate two studio sets at the same time so it'd be nice if both cameras worked the same. I posted this question on a photography forum and found other people had experienced the same problem. Am I doing something wrong or has Canon missed something when writing the firmware?

A note at the bottom of page 120 in the English edition of the EOS 5D Mark II Instruction Manual indicates that non-Canon flash units will not fire in Live View mode unless Silent Shooting is set to Disable. Please check your camera to ensure that you've adjusted this setting accordingly.

I received two questions from a chap who bought a Canon 5D Mark II and seems to be in way over his head. I referred him to some Web sites but he's still in the dark. He says:

- 1. When he transfers images to the DPP program it automatically erases them from his memory cards and he cannot find a setting to prevent this. I find this hard to believe as there must be some way to prevent this -- in fact I would think the default would be NOT to erase images on the cards.**
- 2. Next, he wants to know if there is some way to have the program correct his RAW images for peripheral illumination without forcing a conversion to TIFF. He wants to bring those corrected images into Lightroom without the increased TIFF file size.**

My take on this is that it is probably not possible because it would involve altering the RAW image itself, which probably cannot (and should not) be done. I would think since DPP does the correction, (and I'm assuming it cannot be done in Lightroom) then, if he wants that correction, the price he pays is ending up with large TIFF files to import into Lightroom. Anyway, if you would be kind enough to comment on the above, I'd appreciate it.

DPP is one of Canon's image editing software applications, but it does not have a downloading function. Canon provides EOS Utility software for downloading directly from the camera, and Camera Window/Memory Card Utility for downloading through a card reader. EOS Utility does not have an optional Preference for deleting images from the camera's memory card, but Camera Window/Memory Card Utility does. The next time the photographer runs Camera Window/Memory Card Utility, he can use this procedure to reset the Preferences: The ImageBrowser/ZoomBrowser Camera Window opening screen shows up when the memory card is recognized through the card reader. From this screen, select Preferences. This will display the Preferences dialog box. In the Preferences dialog box, look near the bottom for "Other Settings" and uncheck the Preference for "Delete images on memory card after download is complete." Then click OK to register the setting and close the Preferences. Just to reiterate, the "Delete images on memory card after download is complete" setting is not the default when the software is installed, so someone with access to the photographer's computer must have checked it off at some point.

When opening RAW image data, Adobe Lightroom does not recognize various camera settings such as Peripheral Illumination Correction, and it also does not recognize editing instructions from other software programs such as DPP, so essentially the photographer has several choices:

- Shoot in-camera JPEGs with Peripheral Illumination Correction turned on. This will keep the file size down and honor the correction.
- Shoot in RAW mode, and then process the images in DPP to either TIFF or JPEG to get Canon's algorithm for Peripheral Illumination Correction.
- Shoot in RAW mode, and then process the images in Adobe Camera RAW to either TIFF or JPEG to get Adobe's algorithm for Peripheral Illumination

Correction. (They offer a slider for Lens Correction Amount in the Vignette menu of the Develop tab.)

I use my EOS 5D Mark II mostly for outdoor portraits. In bright sunlight I have a problem reading the exposure data values below the picture area in the viewfinder. They are just not bright enough. With my former cameras (5, 3, 20D, 40D) I had no problems. From the handbook I know that there is the possibility to dim/brighten the external 3-inch LCD, but it has no effect on the internal LCD display. I have heard from other users in the German forum that they have the same problem. Could this be changed by service or firmware?

The EOS 5D Mark II's current firmware does not allow the service department to make the viewfinder exposure data any brighter than it already is. I'll be happy to forward your request to Canon's R&D Group for their consideration. For now, your best bet is to check the 5D Mark II's top LCD data panel for exposure settings if you find the viewfinder data display too dim to read.

I have an EF 24-70mm lens that started to back focus. Canon suggested that I send the lens in for service. I did that and it is working fine now but this issue got me curious about the Canon focusing system. I use the lens on either a 1Ds or a 5D. When it wasn't working properly the view thru the viewfinder didn't show the back focus problem. It was only when looking at the photos on the computer that the problem was evident. My question is, what does the lens have to do with whether the photo is in focus or not? Shouldn't it work like any control system? The controller, in this case the camera, sends a message to the lens and the lens simply responds until the controller gets what it wants which is a photo in focus. Because the lens caused my focus problem it seems like Canon has some type of feedback loop in the focusing system that can cause out-of-focus system. Why is this? And what advantage does it offer over a simple control system?

I could spend an entire column discussing these issues and it still wouldn't cover the topic completely. One important concept to understand about the EOS autofocus system is that focus confirmation is based on successful completion of the lens drive command. This command originates in the camera body as raw data about the degree of defocus at the focal plane, but it is modified by the CPU of the lens that's mounted to the camera, based on a number of different factors. One consequence of the EOS design is that the resulting image may be out of focus if the lens is not operating completely within its design tolerances.

Recent EOS models including the 1Ds Mark III, 1D Mark III, 5D Mark II and 50D have AF Microadjustment settings that allow users to calibrate their camera according to the lens in use, but there is only one setting per lens. This is sometimes insufficient for zoom lenses since they may require multiple

calibrations according to focal length. When that situation occurs, the best remedy is to have the lens calibrated by a Canon Factory Service Center. The fact that Canon's Service Department was able to restore your equipment to proper working order provides solid evidence that the both the camera and the lens are capable of delivering consistently accurate focus when all components are working within their design tolerances.

I just bought the EF16-35mm 2.8L II USM and am confused about protecting the front element with a filter. There is an interesting forum discussion about using UV filters in general at the Arthur Morris site <http://birdphotographers.net/forums/showthread.php?t=36273>.

I believe that you are quoted as saying that you personally do not use protective UV filters unless there is a specific reason, such as with the 16-35mm. So my question is, would you use the UV or is there a different filter you would use instead? I understand that your reply would not be an official Canon position, but I would really appreciate some guidance.

If I knew I was going to be exposing the 16-35mm lens to a hostile environment such as rain, sea spray, car exhaust fumes, etc., I would use a good quality clear or UV filter to protect the front element. I would also consider using a thin-rim circular polarizing filter to cut glare, etc., if the shooting conditions called for it. But in most other cases where the lens is in no imminent danger, I would remove all filters for maximum optical performance, and use the supplied Canon lens hood to reduce flare and help prevent impact damage.

Is there a firmware update coming for manual video control on the EOS 5D Mark II?

On June 2, 2009, Canon posted firmware version 1.1.0 for the 5D Mark II.

<http://www.usa.canon.com/consumer/...>

Among other things, this update adds manual control of ISO, apertures, and shutter speeds in movie mode. The adjustment range for each setting is as follows:

ISO	100 – 6400 (12800 with ISO Expansion)
Shutter Speeds	1/30 – 1/4000 in ½ or 1/3 EV increments
Aperture Values	According to lens (no restrictions)

Here are some tips for making the most of this new manual control:

- With this update, Auto ISO is fully functional (i.e., ISO values vary automatically as per the chart above) in manual mode for still photos* captured during movies or in Live View mode as well as video recording with the 5D Mark II. This can come in handy when you want to maintain correct exposure in changing light conditions with the shutter speed and aperture manually set. If you want to try Auto ISO for stills or movies, be sure to pick a shutter speed and aperture combo that's appropriate for the lighting conditions at hand.
- Although it is now possible to select wide apertures in any lighting condition, you may find that high shutter speeds can cause a "staccato" effect to moving subjects. ND filters are still very useful in bright light for this reason.
- Consider setting the shutter speed to approximately 1/50 to achieve a more "filmic" effect for video recordings with the 5D Mark II camera.
- Consider setting the camera's exposure level increments to the default 1/3 steps for finer control. (Custom Function I-1.)
- Consider the use of Highlight Tone Priority (Custom Function II-3-1) to preserve more highlight detail, especially in high-key or wide dynamic range shooting conditions.

**The EOS 5D Mark II must be set to Live View/Still + Movie/Movie Display in order to access variable Auto ISO in the camera's Manual mode. When Live View is off, Auto ISO is locked in at ISO 400 in the 5D Mark II's Manual mode.*

For more detailed information on manual exposure control in movie mode on the EOS 5D Mark II, please visit the following Web page at the Canon Digital Learning Center:

<http://www.usa.canon.com/...>

My 5D is too loud! My 1D Mark II, the same! I have a "life-saving" PowerShot G10 which behaves perfectly for classical concerts where I have to shoot but the fact that I need to use ISO 800 or higher and no flash makes images rather grainy and the color range is limited. I'm considering the EOS 5D Mark II but does anyone know what is the quietest DSLR in the Canon line?

None of the EOS cameras can operate as quietly as a PowerShot G10, but the current models are very quiet when set appropriately as follows:

EOS-1Ds Mark III and EOS-1D Mark III: For quietest operation, select the Silent single shooting drive mode, identified by the letter S on the top LCD data panel. In this mode, the mirror makes a soft noise when it flips up, then the shutter fires very quietly. After the exposure ends, the camera remains totally silent with the

mirror up until the shutter button is released by the photographer. At that time, the shutter and mirror are reset at a slower speed than normal, resulting in quiet operation. Alternatively, both of these cameras can be set to fire the shutter repeatedly with the mirror locked up by selecting Custom Function III-15-2. This can be very effective in situations where it is unnecessary to monitor the subject through the viewfinder prior to exposure.

EOS 5D Mark II and 50D: For quietest operation, activate the Live View mode and select Silent Shooting Mode 2. This mode is similar to the Silent single shooting mode described above, but it is quieter because the reflex mirror has already been raised when Live View is activated. The first shutter curtain is electronically simulated in this mode, so the only noise you hear when shooting is the sound of the second shutter curtain closing the shutter to end the exposure. Once again, the camera remains silent until the shutter button is released by the photographer, at which point the shutter is quietly reset and Live View resumes.

EOS 40D: This camera has the same settings as the 50D for Live View and Silent Mode 2, but it resumes Live View after the exposure without the need to let up on the shutter button. However, the shutter is not reset until you do let up off the shutter button, and the reset sound is a bit noisier than the 50D.

I tend to shoot a lot of images in my EOS 5D Mark II's portrait orientation (i.e., the camera is positioned vertically). I would like to be able to have the camera display the image in portrait orientation during playback and review. From what I can determine, by default the camera will show the image briefly after capture in the portrait position but if you hit the play button, it will show the image in the portrait position with the screen in the landscape orientation, which really cuts down on the size. Isn't there a setting for the camera to allow it to show a portrait image in the portrait orientation on playback, but not force you to manually rotate the file in the computer?

Go to Set-up Menu 1 (look for the yellow tab at the top of the LCD screen with the wrench and 1 dot) and locate the Auto Rotate menu. Press the SET button and select the middle setting. It says "On" followed by an icon of a computer monitor. After you select the middle setting, press the SET button again to register the setting. This one will automatically rotate your portrait images in the computer when using Canon software and other applications that read the rotation flag in the image file, but not during review or playback on the camera's LCD screen.

I've been working in failing light with an EOS 30D, EF 70-200mm f/4L IS USM and Speedlite 580EX II. My question involves the remarkably accurate flash exposures that I seem to be getting while shooting in Aperture-Priority mode with evaluative metering. My understanding is the flash biases its exposures toward the selected focus point(s). With multiple

active focus points, those additional values are metered as well. Also, according to my understanding, flash exposure compensation and ambient exposure compensation can be adjusted independently from each other. Is this correct? I have to say that using the 580EX II in conjunction with the EF 70-200 provides magnificent results, and is incredibly easy to use. My hope is that one day Canon will bring out wireless-capable macro and ring lights that support E-TTL II as well.

Thanks for your message! It appears you have some misunderstanding of Canon's Speedlite System. Here are a few pointers:

1. It's the camera that determines whether E-TTL or E-TTL II is used, not the Speedlite. All EOS Digital SLRs released since 2004 use E-TTL II. This includes your EOS 30D, which was released in 2006.
2. The EOS 30D supports E-TTL II with all EX-series Canon Speedlites, including the MR-14EX Macro Ring Lite and the MT-24EX Macro Twin Lite as well as the 220EX, 270EX, 380EX, 420EX, 430EX, 430EX II, 550EX, 580EX and 580EX II.
3. The original version of E-TTL always based its flashmetering on the location of the active focusing points, but E-TTL II flashmetering has no direct relationship to the camera's focusing system.
4. With the EOS 30D, there are two user-selectable flashmetering patterns for E-TTL II: Evaluative and averaging. In evaluative flashmetering, flash exposure is primarily based on the camera's determination of the main subject's size, position and reflectivity. This determination is made by comparing preflash data to ambient metering data just after the shutter button is fully pressed. With this system, focusing data is ignored and the subject can be positioned anywhere in the area read by the 30D's 35-zone metering system. Depending on the size of the subject, anywhere from 1 to all 35 metering segments may be used. When the 30D is set for averaging in E-TTL II, all 35 segments are read equally.

I just bought, but haven't received yet, a new Canon EF 100-400mm f/4.5-5.6L IS USM lens to use with my EOS 50D. I've read a bunch of conflicting reviews. Some say the lens has a two-stop IS, and some say it has a three-stop IS. Could you tell me which is true? Also some reviews say that the IS must be turned off when used on a tripod; others say the lens has a sensor that automatically shuts the IS off if it senses you are using a tripod. Can you tell me the real answer?

As per Canon Inc.'s Web site, the EF 100-400mm f/4.5-5.6L IS USM lens can correct camera shake up to two full shutter speed steps:

<http://www.canon.com/camera-museum/...>

This lens shuts off its IS mechanism automatically when tripod use is detected, but I suggest shutting off the IS function with the switch on the lens under these conditions for the following reasons:

1. It saves battery power.
2. The IS mechanism is centered and locked when the IS switch is off; not so otherwise. I discussed this issue at greater length in the last Q&A of the June, 2008 edition of *Tech Tips*.

<http://www.digitaljournalist.org/issue0806/tech-tips.html>

Chuck, thanks so much for your time and insight. I have a question about the 5D Mark II AF system. I love shooting with the camera in most situations, but have difficulty getting focused shots when shooting sports. In fact, the AF system seems inferior to the 40D I've used. If I'm reading correctly the 40/50D have high-precision cross-type AF points at all 9 AF points while the 5D Mark II has cross-type only at the 1 center point. If this is true I can't understand why the 5D Mark II would have an inferior AF system to the lower end 40/50D cameras. Any insight?

All three of these models have 9 selectable AF points, but only the EOS 5D Mark II has an additional 6 Assist AF points surrounding the center focusing point. So, although it is true that the 8 outer points on the 40D and 50D are cross-type whereas the 8 outer points on the 5D Mark II are single-axis, it is also true that the center point on the 5D Mark II has extra capabilities for tracking moving subjects that the EOS 40D and 50D do not. And incidentally, the 8 outer points on the 40D and 50D are standard precision cross-type. Only the center point on those cameras is a high-precision type because of its longer baselength. For additional information on these cameras including a comparison of their AF systems, please check out Canon's EOS 50D & 5D Mark II White Paper document on the Canon Digital Learning Center Web site.

<http://www.usa.canon.com/dlc/...>

I recently received an EOS-1D Mark III from the newspaper I work for in Brazil and I have several questions about the noise reduction. When the newspaper bought the new camera, they did it because they wanted us to have a camera whose high ISO can be managed more easily and with more quality. The first question is, should I always turn the noise reduction CF on for using High ISO? Or should I use it on all the time? I'm asking because I have to shoot soccer pictures in terrible light conditions, and now I'm thinking about using the new lens I've received, the EF 400mm f/4 DO IS USM. Besides that, I love to shoot pictures in two different formats, using different memory cards. Yesterday, for example, I had to shoot pictures that way. Using ISO 1250, I could shot 1/500 at f/2.8 using a 300mm lens, recording both RAW and JPEGs. But the number of total files I can

shoot at once decreases dramatically to 14 when the noise reduction custom function is used. When the noise reduction is off I can shoot 22, which is way more acceptable than 14 for shooting this kind of sports. Can you help me decide what to do? Can you help?

When the EOS-1D Mark III was introduced in 2007, it had the lowest noise of any EOS digital SLR released up to that point. Its low noise performance at high ISO speeds has been surpassed recently by newer cameras, but it is still quite good. The 1D Mark III's custom function for High ISO Noise Reduction cuts noise even further, but it definitely reduces the number of frames that can be captured in a single burst. I would recommend leaving it on when burst rate is not an issue, but it's probably better to shut it off for sports photography. As I mentioned in last month's column, it's better to perform High ISO noise reduction during post-processing if possible, and it doesn't take very long.

I have a very quick question. I was hoping you could shine some light on the subject. Here we have a photo of the 400D auto focus sensor:

http://img.imaging-resource.com/PRODS/XTi/zafsensor_lg.jpg

Could you please explain how on this sensor and other similar sensors the two vertical bars on the left and right side of the sensor can combine to create a horizontal sensitive sensor? How exactly does that work? If we place a subject matter in the middle of those two sensors how is the proper focus detected? I'm not looking for a patent trade secret answer, more like I'd just like an understanding of the basic functions of these sensors. The topic is rather confusing to me and my readers.

Please take a look at the diagram of the TTL Secondary Image Registration Phase Detection AF system on this Web page:

<http://www.canon.com/bctv/faq/aft.html>

The optical path for an EOS Digital SLR is more involved than this, because incoming light passes through a series of mirrors after it exits the photographic lens on the front of the camera, but before it arrives at the field lens in the base of the mirror chamber. The concept of the secondary lenses splitting the incoming light into two beams and projecting them on a pair of linear arrays for each single axis AF point is the same for an EOS DSLR as shown in this diagram. The positioning of the linear arrays, as seen on the photograph of the AF sensor unit you supplied, corresponds to the position of each AF point in the viewfinder, but you have to use your imagination to conceptualize it. In the case of the extreme left and right focusing points for the Rebel XTi, for example, you can imagine taking the two pairs of long vertical black lines at the far left and right sides of the sensor, then superimposing them on each other, and moving the resultant single lines to a position that is midway between the centerpoints of each line. This

corresponds to the position of the right and left focusing points in the viewfinder. The fact that the sensor arrays for the left and right focusing points are vertical when the camera is held horizontally is the reason why those focusing points are said to be sensitive to horizontal lines in the subject matter, but the reality is that they are sensitive to all kinds of subject contrast other than that which is parallel to them.

Just a quick note before we begin to say that this month's edition of "Tech Tips" marks the 4th anniversary of the column here on The Digital Journalist. A hearty thanks to Dirck Halstead, Cecilia and Connie White, Mark Wilkie, and others who make this Web site possible month in and month out, and as always an especially warm thank you to all of our readers, especially those who have taken the time to send in their questions and comments.

Here's the (slightly comical) problem: I am sliding around in several inches of marshland mud with the EOS 5D Mark II. My feet are slipping, the tripod legs only work by splaying them out wide (as they just slide otherwise), the wind is blowing so my eyes are watering, the camera's at the wrong height to be able to see the top plate which I need my glasses to read but I have to take those off to see through the viewfinder - and the sun's setting fast. I am bracketing and changing modes (Custom to Av or M and back) furiously, and so finally I realize what live view is for! So my question raised by being in this situation is this: How can I get a large display on the back LCD screen of exposure mode, f-stop, shutter speed, metering mode and bracketing amount, ideally without lots of other irrelevant info? I don't mind if I have to get out of Live View to do it but it would be nice to stay in it.

Based on your description, the EOS 5D Mark II's new "Quick Control Screen" sounds like it might be nearly perfect for you. Here's a nice article about it:

<http://www.usa.canon.com/dlc/controller...>

You will have to exit Live View temporarily to use this feature, but it's worth it, especially when you're working from a monopod or tripod and find the top of the camera difficult to see.

The EOS-1D Mark III has both global and per-lens AF microadjustment. If they are both set, does that give the net effect of the sum of the two values? Example: global = -2, lens = -8. Is the net effect essentially the same as setting global = 0, lens = -10? If that were true, I would see a huge difference when I set both to -20, netting -40! However, I don't see this. The reason for my question is that I find after using LensAlign, all my lenses require at least -2, so I was wondering if I should globally adjust to -2, and then on a per-lens basis, adjust more if required.

Any AF Microadjustment value set for an individual lens in C.Fn III-7-2 on the 1D Mark III or 1Ds Mark III will override any AF Microadjustment value set in C.Fn III-7-1 when that lens is used. Conversely, any AF Microadjustment value set in C.Fn III-7-1 will be used if there is no AF Microadjustment value set in C.Fn III-7-2 for the lens in use.

I have a question about AF microadjustment on the EOS-1D and 1Ds Mark III. If you find that a lens is consistently front focusing (focus DOF more to the front of subject), do you adjust "+" or "-"?

Apply a "+" adjustment to correct for front focusing with any EOS camera that has an AF microadjustment function.

When looking at all the recommendations in Canon's recently posted online AI Servo AF manual for EOS-1D Mark III and EOS-1Ds Mark III cameras (<http://www.usa.canon.com/dlc/controller...>), I noticed that C.Fn III-8 [using adjacent (1) vs. surround assist (2) points] is changed from case to case. What are the disadvantages of using C.Fn III-8-2 for cases 4, and 6?

As a preface, please keep in mind that the suggestions provided in the online AI Servo AF manual are exactly that: suggestions, rather than absolute commandments. Anytime you're photographing moving subjects, there are always going to be trade-offs between one focusing technique versus another. The optimum combination of camera settings will vary according to the photographer's level of experience and judgment as well as the subject matter, camera-to-subject distance, lens selection, lighting conditions, etc. Generally speaking, when you're shooting fast-moving subjects at close range as illustrated in Case 004, C.Fn III-8-1 will reduce the chances of the camera picking a focusing point that is on a part of the subject that's closer or further than the area being covered by the manually selected focusing point, compared to C.Fn III-8-2. Keep in mind that depth of field is typically quite shallow when working at or near maximum aperture at close range, so the less opportunity you give the camera to pick a focusing point other than the manually selected one, the better off you'll be – that is, assuming you can keep the manually selected point on the subject throughout the shooting sequence. If you do a lot of work on the same kind of subject matter, such as the snow skiing example shown in Case 004, you should experiment with III-8-0, III-8-1 and III-8-2 to see which one works best for you. The main difference between Case 004 and Case 006 is that there are more "obstacles" temporarily obscuring the main subject in Case 006. That's why there are differences in the recommendations for C.Fn III-2, III-3 and III-4 compared to Case 004. But the similarity between the two cases is that the main subject is clearly identifiable and relatively easy to track with the manually selected focusing point. Therefore, III-8-1 may give you more consistent results than III-8-2 for the same reasons I explained in the previous paragraph.

In Case #004, when you have a fast moving subject close to the camera the manual recommends using C.Fn III-4-0. To better understand the logic, why would you not use III-4-1? Seems that the closest subject with the servo speed (-2) set at medium slow and III-4-1 would be the best option.

In Case 004, there are no obstructions between the main subject and the camera, so III-4-0 will make AI Servo more responsive to rapid changes in camera-to-subject distance, especially at close range.

In poor lighting, say an exposure of f/1.2, 1/15 to 1/30 second, at ISO 800 in evaluative metering with an EOS-1D Mark III, selecting the center AF point manually, I'm observing a fairly significant difference in the AF sensitivity between One-Shot AF and AI Servo AF. In AI Servo mode, on an object with relatively decent contrast, the 1D Mark III is unable to lock focus. When I switch to One-Shot AF, the center AF point quite accurately focuses on the subject and gives a confirmation beep and I am able to capture the frame with extremely sharp accuracy handheld. It is almost as if in AI Servo mode, the AF sensitivity has suddenly switched "profiles" to a rather less sensitive "mode," so as to not be able to lock onto the subject in a fairly low-light situation, whereas One-Shot AF mode has absolutely no issues with that same situation and subject. Does my camera need to go back to Service or is the camera performing according to its design?

The light level you describe (ISO 800, 1/15 at f/1.2) is close to the threshold of the EOS-1D Mark III's low-light AF sensitivity. Without the use of flash under these lighting conditions, it would be very difficult to obtain sharp photos at f/1.2 unless the camera was steadied through use of a tripod, and also the camera's reflex mirror should be locked prior to exposure. Assuming that you're prepared to take those considerations into account, then your observation about the difference in focusing capability between One-Shot AF and AI Servo AF for the EOS-1D Mark III is correct. Focus will lock on a subject with readable contrast in One-Shot AF, but AF will fail under the same lighting conditions in AI Servo AF. That is completely normal and to be expected. It's due to differences in the amount of time that light is allowed to accumulate on each pixel in the AF sensor. That period of time, which Canon does not disclose, is longer for One-Shot AF than it is for AI Servo AF, and the result is superior low-light performance for One-Shot AF. This is essentially the performance level that the EOS-1D Mark III is designed to offer in extremely low light, so there would be no benefit in sending the camera in for service on this issue.

I have a question for you on the back button focus on 1D Mark II. The setting is AI Servo single AF point, * (AE lock button) to focus, 8 frame per second continuous mode. What I found is that the first shot is always sharp, while the following is unpredictable. But in most cases the following picture is out of focus. I do have C.Fn set to focus priority for the following shot. Here's my question: Is it possible that the lens element is adjusting

focus while shutter is released? In other words, does the focus freeze during shutter release?

The sequence control of the EOS-1D Mark II is consistent with other EOS cameras in the respect that lens drive is temporarily suspended during each exposure in a multi-frame burst. Therefore, to answer your question directly, the camera does not adjust the focus while the shutter is open. However, in a predictive AI Servo AF sequence, lens drive can resume as soon as the shutter closes. It can run from the instant that the reflex mirror is on its way back down until the instant that the shutter opens again for the next exposure.

Thanks for answering my question. It's good to know at least the design philosophy is sound. I'm just a little puzzled by the result. It could be just me. The experiment I've done so far includes using different lenses - 50L/85L/135L - using different aperture, changing AI Servo sensitivity standard/slow/fast, etc. But so far the result is consistent. Here I'll attach eight raw images taken just an hour ago. They're two series of four continuous shots. As I mentioned before, the first shot is in focus; the rest are not. Also I wanted to let you know that the camera performs flawlessly in default combined focus/shutter release mode, either in One-Shot AF or AI Servo AF.

Thanks for sending the shots. Very cute kid, by the way! Congratulations. After looking at these images, I would say that one issue you're facing is that the movement of the subject is too slow to cause the camera to go into predictive AF mode. Also, in the first sequence of four shots, the focus on the eye in the first frame is soft, which indicates that the AF system had not acquired focus before you started shooting. One thing that might improve your results is to start tracking the subject by pressing the AE lock button with the focusing point positioned where you want it for at least 1 second before you release the shutter. Additionally, the position of the focusing point in some of these shots appears to be almost completely on the dark part of the subject's eye, which may make it difficult for the AF sensor to see enough contrast to focus accurately. This is one of the inherent difficulties of using autofocus for close-up portraits, and I'm sure you did the best you could. But be sure to pay attention to the level of contrast that the camera is seeing at the focusing point you've selected if you want to minimize the number of soft photos. You could also improve the odds of getting sharper images for this type of subject by moving back just a bit and possibly selecting a moderately smaller aperture like f/2.8 instead of f/1.8. Each of these techniques would slightly increase depth of field, making it easier to keep the subject in focus without necessarily destroying the mood of the shots.

Could you specify how I can tell the AI Servo feature is tracking a moving subject for an EOS 40D? I am trying to test how well AI Servo works to "track" a subject. I place the center focus point over the subject in the viewfinder and press the shutter button down halfway to lock focus for

about 1 second before the subject moves. With focus maintained, if the subject moves from the center focus point to an outer point I expected the highlighted focus point (highlighted points enabled) to move with the subject but the center point I have selected always remains selected, no matter where the subject moves. If I use all nine of the AF points and let the camera select the point then it shows all points highlighted in the LCD review, no matter where the subject moves. I would have expected the focus point nearest to the subject to be the only point highlighted. This does not appear to be the case.

If you want the EOS 40D or any other EOS Digital SLR to track subject movement automatically using more than one focusing point, you must set the camera for the combination of AI Servo AF and automatic focusing point selection. See page 78 in the 40D instruction book if you're not sure how to set automatic focusing point selection. Please understand, if you manually select the center focusing point or any other individual focusing point, then that single point is the only one the camera will use. Assuming the 40D is set for the combination of AI Servo AF and automatic focusing point selection, none of the focusing points in the viewfinder will illuminate while you are shooting. Therefore, you will not be able to verify which focusing point the system is using. But you can tell if the camera is tracking your subject by observing the viewfinder data below the picture area. If the camera is tracking the subject, the focus confirmation light, which is a green dot on the right side of the Max. Burst indicator (see page 19 in the instructions) will not illuminate before you shoot. If the camera is not tracking your subject, the focus confirmation light will blink rapidly while you are trying to collect focusing data before you shoot.

Help me understand how custom white balance works when shooting JPEGs compared to manual color temp settings. On my EOS-1D Mark II, can CWB provide color accuracy not available in a manual color temperature selection or can I always rely on manual as long as I dial in the right K setting?

A custom white balance setting can differ from a manually set color temperature setting in two possible ways:

1. It can be set to a lower color temperature than a manual setting: The range for CWB in an EOS digital SLR goes down to 2000K, whereas the manual settings go down to 2500K at best (2800K for older models).
2. It can be shifted (tweaked) in the amber/blue and/or magenta/green axes, the same way that you could do it yourself with the camera's WB Shift menu.

Some EOS models like the 1D Mark III and 1Ds Mark III store up to five custom white balance settings that can be named directly in the camera. Others, like your 1D Mark II, can only store one.

I often use my EOS-1D Mark II in Av mode. If I dial in exposure compensation will my auto flash meter differently?

In the EOS system, flash exposure is measured and controlled independently from ambient exposure. Therefore, the level of flash exposure is not affected when you dial in ambient exposure compensation. Let me know if this answers your question.

I have seen several mentions on the Internet about using Live View to help in setting the exact position of a graduated filter since its position is dependent on the aperture. Yet I see no evidence that my EOS 5D Mark II stops down the lens during Live View. Does it only do it when depressing the DOF Preview button?

The Depth of Field preview button stops down the aperture during Live View on the EOS 5D Mark II camera, but the onscreen image will remain bright unless you activate Live View's Exposure Simulation function.

I have acquired an Ec-S focusing screen for my EOS-1V since I usually work at f/2.8 or wider. According to the camera's instruction manual, Custom Function 0 has to be set according to the focus screen in use. My question is this: Which setting should I use, since the manual doesn't list the Ec-S screen?

Unfortunately, the EOS-1V does not have an explicit custom function setting to adjust the camera's metering sensitivity for the Ec-S Ultra Precision Matte focusing screen because this accessory was developed about six or seven years after the camera. So, although the Ec-S screen is physically compatible with any EOS-1 series camera including the 1V model, you're on your own when it comes to exposure metering with cameras that were designed before the Ec-S was introduced. Since the Ec-S is a bit darker than most other Ec-series screens including the standard Ec-N screen that was supplied with the 1V, I would suggest trying to set Custom Function 0 to option 1 for laser matte screens. You should then take some test shots in AEB mode with the lenses and apertures you plan to use most, to determine if there's any need to apply exposure compensation. As long as the maximum aperture of the lens is f/2.8 or faster, I wouldn't expect much need for exposure compensation, but you may run into some metering issues with slower lenses.

I have been a happy user of the DEP feature on my film SLRs for quite a while; similarly I've been using it on my 20D. Recently purchasing the 5D Mark II, I have been unable to locate this feature; however, I can't believe Canon would take out such a feature, since the lenses don't have DOF markings. So the question is simple: Where and how can I locate a DEP mode (or similar) on my 5D Mark II?

Over the last 22 years, Canon has offered two types of "depth-of-field" exposure modes on EOS SLRs. The first type, called DEP, was originally introduced on the EOS 650 in 1987. The last time it appeared on a new EOS was in 2002 with the original EOS-1Ds. On the lower-end cameras, DEP was eventually replaced by A-DEP, which was a simplified version that required only one press of the shutter button to operate. This mode appeared in the early 1990s on Rebel-series cameras, and it's still available now on all EOS models from the Rebel series up to the EOS 50D. Your EOS 20D had A-DEP too, not DEP. Anyhow, Canon eliminated DEP and A-DEP modes from high-end DSLRs starting in 2004 with the EOS-1D Mark II, and it's not included on either the original EOS 5D or the 5D Mark II. Bringing DEP back is no trivial matter, and it most definitely cannot be done with a firmware update. Your best bet with the EOS 5D Mark II is to use Live View mode when possible, especially when the camera is mounted on a tripod. One nice feature that's available in Live View is the ability to preview depth of field without darkening the image, and another nice feature is the ability to magnify the screen image by a factor of either 5X or 10X to check critical focus.

With reference to the long exposure and high ISO noise reduction features: I use a 1Ds III and 1D III, and regularly make images at either long exposures (landscape) or high ISOs (documentary). Being obsessive about quality and exhibiting prints around 20 x 30 inches, I'm always trying to extract the maximum detail. If I read you correctly, I should shoot High ISO with the noise off, and landscape similarly, to preserve detail, then use Noise Ninja to fix the hot pixels that may arise. Does this then make the dark frame subtraction method used by the cameras less effective than NN? Am I better to leave it off and use DPP?

I'm glad to hear you found last month's column helpful, but you may have misinterpreted some of my remarks. I'm basically recommending the use of the camera's long exposure noise reduction whenever it's applicable. As I explained in one of the comments after the column, there are certain kinds of random noise that cannot be removed as easily in post-processing as they can by using the camera's dark frame subtraction capabilities. However, I feel that the camera's High ISO noise reduction capabilities are not as powerful or flexible as the tools that can be used during post-processing. So unless your workflow requires the convenience of in-camera High ISO NR, you're probably better off taking care of it in post. That said, in-camera High ISO NR is getting a lot better with newer EOS models like the 5D Mark II and the 50D.

I have a question about the Canon 5D (old model) and ISO settings. I heard rumors that ISO 50 is no 'real' ISO setting (not knowing what that means though) and that dynamic range is limited in this setting. ISO 100 is a better choice but still with smaller dynamic range and ISO 200 is the best setting. However, I don't understand what the background is. Which setting produces the best image quality/highest dynamic range/smallest amount of

noise? (I, personally, do notice an increase of noise between ISO 100 and 200.)

On the EOS 5D, the ISO 50 setting is only available when the camera's optional ISO Expansion setting is engaged. One reason for this is that ISO 50 is actually captured at roughly ISO 100 and then processed in the camera to achieve an effective sensitivity equivalent to ISO 50. As a result, there is less dynamic range in ISO 50 images compared to ISO 100 images from this camera. Incidentally, this is not "news;" Canon has acknowledged this right from the start. The main benefit of the ISO 50 setting is the flexibility it provides in terms of other camera settings like aperture and shutter speeds. This flexibility can come in handy in studio lighting situations as well as landscape photography. As for your second question, I've personally found that ISO 100 provides the best overall image quality from the EOS 5D in terms of noise and dynamic range. I'm aware of various individuals who feel otherwise, and they're entitled to their opinion, but I haven't seen any pictorial images from the 5D with lower noise or higher dynamic range than ISO 100. In all honesty, though, I find that I end up using much higher ISO settings like 400, 800 and 1600 for many of my images with the 5D because I like the look of those settings, especially for photos of people, even though the images have more noise.

Thanks! Two more questions:

- 1. What is the H (ISO 3200) Setting on the 5D? Is it anything different than an ISO 1600 picture with all values doubled? Hence, can I reach the same result regarding dynamic range and noise through raw development on my computer?**
- 2. Raw data is linear, as far as I know. Increasing the exposure by one stop improves tonal gradation, especially in the highlights. I obtain the best image quality if I slightly overexpose the picture just to the extent that no highlight detail is lost. However, I find it very difficult to decide how much overexposure to apply. The camera's metering functions are not very helpful for this. They are metering for a medium grey in the JPEG's dynamic range which is much lower than Raw. In many situations, I can overexpose by several stops. Can you advise how many steps of 'overexposure' would be a good starting point?**

H mode on the EOS 5D is basically an ISO 1600 image that's been intentionally underexposed by one stop and then processed internally by the camera to simulate ISO 3200. It's primarily convenient for in-camera JPEGs, but you could achieve the same effect in RAW mode by shooting at ISO 1600 and then applying exposure compensation in your RAW conversion software.

There is no hard and fast rule on how much overexposure to apply to RAW images for maximum image quality in terms of low noise and dynamic range.

This is partially because there are differences between various RAW converters in terms of how much highlight compensation they can handle. And then, once you start comparing RAW converters, there are many other differences to consider not only in terms of image quality but also in terms of speed, workflow, etc. The choice becomes a matter of personal taste. Therefore, my best advice on this question is to perform your own tests using the RAW conversion software you prefer. In most cases, you can safely overexpose by one full stop, but anything beyond that is up to you.

I have an EOS 5D Mark II (wonderful camera) and two questions:

- 1. I use a 580EX II Flash, but have noticed that if left to the camera, the picture is generally underexposed. If I set it to +2/3 it is OK, but not always. If the subject is close, I overexpose and if the subject is far I underexpose. For general indoor photography, I have been setting the camera to Manual and using a speed of about 125 (depending on the focal length and the subject motion) along with an aperture usually between 8-11 and ISO 400-800. The flash is set to E-TTL. Is this underexposure common with the 5D Mark II? Is there a better way to set the camera? Is this firmware-fixable?**
- 2. I try to use a white balance card with custom WB as much as I can, but sometimes I don't have my card with me. In such a case I try to match the WB with the pre-settings, or use AWB. Sometimes it works well, sometimes not. I'd try and tweak it in DPP, but my question is as follows: In DPP (as well as the Kelvin settings in-camera) there are only choices in 100K increments. I was wondering -- when I use the custom WB with the WB card, does the camera estimate the WB in 100 increments as well, or does the custom WB have an even more precise reading of the WB (thus giving me even more incentive to make sure to have my WB card with me at all times)?**

Based on testing I've performed with my own samples of the 5D Mark II and 580EX II, I am not seeing any specific problems with flash exposure accuracy as long as the photos are taken within a usable distance range, as determined by camera settings such as ISO and aperture as well as flash settings such as direct or bounce, flash exposure compensation, etc. It is not unusual to hear that some photographers prefer a higher flash exposure compensation setting than the camera's default; it really comes down to a matter of personal taste, assuming that you're using the flash properly. If you're going to shoot at small apertures like f/8 or f/11, it's possible that you might be getting close to the maximum distance range the flash can provide, even at ISO 400 or 800, especially if you're using a diffuser or reflector card. Maximum distance might be reduced even further if you shoot as soon as the ready light appears. You may find that your exposures become more consistent if you use a more moderate aperture like f/5.6, and it might also be worthwhile to consider the use of Compact Battery Pack CP-E4 to speed up recycling time.

Custom WB is the most precise way of setting a white balance in the field, but it's often better to adjust WB during post-processing, especially if you capture most of your images in RAW mode. For that purpose, it's a good idea to shoot a test photo with a known neutral target so you can use DPP's eyedropper effectively while editing your images. To answer your question directly, Custom WB sets WB values more precisely than the 100K increments in Manual WB mode, and it also covers a wider range of K values (down to 2000K for custom WB compared to 2500K for manual WB with the 5D Mark II).

I currently have the EOS 50D and like the Auto ISO function as it keeps the ISO values down. But, when shooting with wide-angle lenses in Av (Aperture Priority) mode shutter speeds can get very low, which is not always desirable (at least for moving subjects) especially with indoor/lowlight photography - like on EF 24mm f/1.4L it will mostly default to 1/30. If Auto ISO is set in Tv (Shutter Priority) mode, shutter speed is as selected but at the expense of depth of field as Auto ISO will always open the aperture to its widest to get the lowest ISO speed possible which again isn't always desirable (due to very thin depth of field) with fast wide-angle primes. So are there any custom functions or modes that I am unaware of that would help me with Auto ISO in this particular situation(s)? Or is there any other EOS camera system that has such options user configurable? I, however, very much enjoy Auto ISO with normal and telephoto IS lenses in daylight.

Auto ISO is a handy function, but as you've discovered, it's not ideal for every possible shooting situation. In the low-light conditions you've described, it might be better to specify the ISO manually and then in Shutter Priority (Tv) mode, set a shutter speed high enough to handle camera shake. Then you could activate Safety Shift (Custom Function I-6-1 on the 50D) to lower the shutter speed if the light level drops beyond the point necessary to maintain a correct exposure at the widest aperture of the lens.

Last Wednesday I used my two EOS 5D Mark IIs in a three-camera music video shoot. The third camera was a Sony PMW-EX1. Audio was recorded on two additional devices. One audio recording device was an Edirol R4 Pro. The other audio recording setup was a Tascam USB Interface to a MacBook Pro. The Sony Camera, Edirol, and Tascam/MacBook Pro devices all synced sound perfectly over the full duration of the shoot (just over 20 minutes). To clarify - once the different sources are sync'd quickly and easily to the slate clap on the waveform at the beginning of the shoot, they all stayed perfectly in sync for the rest of the video. Both Canon cameras audio and video sync'd perfectly to each other but drifted significantly from the other three devices even over a 3-minute segment. This is a very serious problem for me and one that introduces significant post-production trouble and expense.

This issue was so unexpected (I haven't run into this in years of working with a range of equipment) that I performed three subsequent tests to confirm that the 5D Mark IIs run too fast. The results from the tests show both of my 5D Mark IIs run about 14 frames too fast in 10 minutes. Audio that is 1 full frame out of sync is noticeable on sharp sounds, causing an echo. Audio that is 2 or 3 frames out of sync causes echo on any sound and looks odd in terms of lip sync. That the two Canon cameras audio sync'd OK to each other tells me that the cameras can be calibrated to a standard. Evidently they are just calibrated to an incorrect standard. Anybody else experience this? Does anybody really know if this is likely a chip issue or a firmware issue? Does anyone know an easy, reliable way to get the clips to conform to the standard without time-consuming constant tweaking?

As you point out, the two 5D Mark II cameras sync perfectly with each other, but not with your other capture devices. The technical issue here is that the EOS 5D Mark II captures video clips (HD or SD) at a true 30.00 fps, while your other A/V devices record and playback at 29.97 fps, which is the standard for video in North America. This difference eventually results in a loss of synchronization when combining the EOS 5D Mark II video with your other content. You can transcode the EOS 5D Mark II footage to 29.97 fps, but it will take a long time. Alternatively, you can make a 29.97 timeline, drop the 29.97 footage on it, then add the EOS 5D Mark II footage. You will have to adjust the start of each take to audio match. This can be done in video editing software such as Apple's Final Cut Pro, Adobe Premiere Pro or Avid Media Composer. It may be inconvenient, but at least it's doable, and it's the best workaround you're going to find for the time being.

I am having a problem with the file numbering of my 1Ds Mark II. The shutter was replaced by Canon Philippines as I had a bright banding on the top of the frame when shooting in landscape. The banding has gone but the file numbering (which is set to continuous) has jumped from 2000+ to 9000+. I don't know why that is and I did not get a reasonable explanation from Canon. Also, I don't know whether it can be put back to resume counting from the number it was before the shutter got replaced. I could of course just reset it to 0, but I would like to avoid that as it would prevent me from using the whole numbering I had left from 2000+ to 9999. Many thanks for any help you may be able to provide.

This usually happens when another memory card is used after the first shot was taken, and the second card has digital images with higher file numbers on it. Every EOS Digital SLR looks to two things before establishing a file number -- it already knows the most recent number assigned by the camera (whether it was a moment ago, or months ago), and it also examines the contents of the active memory card to see if it detects any files on the card. If so, it compares the highest file number on the card to the most recent file number assigned by the

camera, then selects the higher of the two and adds "1" to it. And be aware, regardless of whether your system is set to Continuous file numbering or Auto Reset, in the scenario I mention here, every subsequent number would be in sequence with the suddenly-higher sequence, even if you changed back to a card with lower numbers you'd shot moments before. The system is designed this way to prevent the possibility of writing duplicate file numbers on the same memory card. If you have a card reader, there is a way to restore your previous numbering sequence. Here's how:

Let's review the order of events:

- * An initial file numbering sequence is established by shooting a set of photos.
- * Subsequently, a memory card with a higher file numbering sequence is used. The EOS digital SLR resets its internal file numbering system to the new numbering sequence.
- * The user wants to revert to the initial file numbering sequence.

If this is the case, then the correct procedure to get back to the original file numbering sequence is going to depend on a couple of conditions.

CONDITION A: The user still has a memory card with images that are exclusively from the initial file numbering sequence, ideally from the end of that sequence. In this case, use the following procedure:

1. Find a spare memory card that you don't mind formatting.
2. Set the EOS camera's file numbering setting to Auto Reset.
3. Format the spare memory card. This resets the file numbering sequence to 100-0001.
4. Set the EOS camera's file numbering sequence to Continuous.
5. Replace the spare memory card with the memory card that has the last image from the initial file numbering sequence. The camera will resume file
6. numbering from that point.

CONDITION B: The user no longer has a memory card from the original file numbering sequence. In this case, use the following procedure: (Please note, this procedure requires a card reader.)

1. Find a spare memory card that you don't mind formatting.
2. Set the EOS camera's file numbering setting to Auto Reset.
3. Format the spare memory card. This resets the file numbering sequence to 100-0001.
4. Set the camera's file numbering sequence to Continuous.
5. Take a photo on the spare memory card.

6. Remove the memory card from the camera and mount it on your computer's desktop via the card reader.
7. Open the DCIM folder and locate the folder named 100CANON. Open this folder to locate the image named IMG_0001.JPG. (If you are using an EOS-1D/1Ds Mark II or Mark III, the first 4 characters in the filename will be different.)
8. Rename the image to the desired sequence number, i.e., one number higher than the last image from the original file numbering sequence. For example: IMG_0238.JPG.
9. Rename the 100CANON folder to the desired folder name. For example: 204CANON.
10. Place the newly renumbered memory card in the EOS camera and take at least one shot. The camera's file numbering sequence is now reset as originally intended.

A few other tips: All of this is unnecessary if you decide to rename your files with Canon software such as EOS Utility, DPP or 3rd-party software with file renaming capabilities. If you really want to keep the camera's file numbering sequence intact, be very careful to control exactly which memory cards you are using. Only use your own cards with the desired file numbering sequence. As a matter of general "good housekeeping," consider following this procedure:

1. Start by locating the memory card that has the most recent image from the file numbering sequence you wish to preserve. Put this card in a safe place and don't lose it.
2. Gather all the rest of your memory cards in one place.
3. Set camera to auto-reset.
4. Format all the rest of your memory cards.
5. Set camera file numbering back to continuous.
6. Reinsert the card that you saved with the desired file numbering sequence.

This way, you'll ensure that you don't end up losing your place, so to speak, by using a card with a higher numbering sequence.

I own the EOS 30D, 40D and 50D cameras. Incredible value cameras and I just can't bring myself to get rid of any so I just use them all. I always use DPP and think it's an awesome program. I just got Photoshop CS4 and am considering its RAW converter. My question is, will Adobe Camera RAW support my Picture Styles, or will it throw out that information and just convert the files as plain RAW, like Neutral Picture Style? Could you please explain to me what happens to that info if I use a RAW converter other than DPP?

Adobe Camera RAW 5.2 in Photoshop CS4 has a feature that attempts to emulate some of the Picture Style settings available in recent EOS cameras with

that feature. You can access Adobe's 'Picture Style' support by clicking on the Camera Calibration icon (7th icon in from the left; looks like an SLR camera) in the toolbar below the histogram in the upper right corner of the ACR 5.2 window. Click on the pulldown menu in the 'Camera Profile' window to see the available settings. I don't know when Adobe added this feature, but it must have been relatively recently. You could check with them for details if you're interested. Also, you'll note that I refer to Adobe's 'emulation' of Canon's Picture Styles, because strictly speaking, only Canon software like DPP and RAW Image Task can truly be said to support the camera's Picture Style settings as faithfully as possible. This is because Picture Style settings by themselves are basically processing instructions for the RAW image data -- they are not part of the image data itself. Moreover, Adobe's RAW conversion software algorithms are different than Canon's. Therefore, Adobe's interpretation is their own, just as Canon's interpretation is ultimately proprietary. I am not sure whether any of the other independent RAW converters (such as Capture One, Bibble, Aperture, etc.) emulate Canon Picture Styles in their current versions, but it wouldn't surprise me if they eventually did.

I took delivery of my first 5D Mark II this week and have two questions. I have previously been using a couple of 5D bodies for reference. The first question is about the RAW and sRAW1 load times in DPP. Counterintuitively, the big RAW files load pretty fast in DPP at about 4 seconds. But the sRAW1 will take anywhere from 16 seconds to 26 seconds depending on ISO. Up to ISO 800 it is around 16 seconds; at 1600 and 3200 it is 26 seconds. Why is this, and can I do something to optimize the load time?

The slower loading time for 5D Mark II sRAW1 preview images in the edit image window of DPP 3.5.2 is a known issue. It has already been reported to Canon Inc., and we'll have to wait and see if there's anything they can do about it. I suspect the longer loading times have something to do with fix for vertical banding noise in 5D Mark II sRAW1 images that was resolved with version 1.0.7 firmware for the 5D Mark II camera. The loading time can also be affected by the speed of your computer. On my 2.5 GHz Intel Core2 Duo MacBook Pro, I'm getting a load time of 7 seconds for these images, in Windows XP (via Boot Camp) as well as Mac OS X 10.5.6. There is no ideal solution yet, but here are a couple of things you may want to consider:

- If you want to continue using DPP and wish to speed up your workflow with 5D Mark II images, consider going back to full-resolution RAW files rather than sRAW1.
- If one of your goals is to browse your images at a reasonable viewing magnification, consider using DPP's Quick Check tool, which is available in the Main Window of the program (i.e., thumbnail view). This will be much quicker than viewing the files in the Edit Image window, and it will

also allow you to rank your images with checkmarks so you can sort them more easily when it's time to work on your selects.

I have a remote flash control (3rd party), a Canon Speedlite 580EX II, and a Canon Speedlite 430EX II. I can use the flash control to fire the 580EX II via the PC Sync cable. It works flawlessly. I can set the 580EX II to use its internal meter and still be fired remotely. What I want to do is use the 580EX II in an umbrella and the 430EX II as a background or secondary light. When I put the 580EX II into master mode, it will no longer fire from the PC cord. Is this user error?

I'm not so sure I would call it user error, but there is definitely an equipment limitation here. The issue is that once you set the 580EX II for external flash metering (auto or manual), it can no longer be set to Master mode to control another flash. Or conversely, you have to set the 580EX II to ETTL, M or Multi in order to access its wireless features. In your case, I would recommend using either a Speedlite Transmitter ST-E2 or another 580EX II in the camera's hot shoe as a master unit, then set up your 580EX II and 430EX II off camera as slave units. If your lighting set-up is static, as it appears to be, I would further recommend setting both of the off-camera flashes to Manual flash mode and adjusting their power settings along with the camera's ISO and aperture settings as necessary to get a correct exposure.

I have Canon ImageBrowser software installed on my Mac's hard drive, but I don't use it for downloading CF cards. I prefer to use Adobe Lightroom, as it will embed keywords and it lets me save the image in a second location. But whenever I insert a card into my reader, the Memory Card Utility automatically opens. Is there a preference to turn this off? I would like to keep IB ready to use, but hate to always have to stop the Memory card utility.

On your Mac, navigate to the Applications folder and launch Apple Image Capture. From the Image Capture menu, open Preferences and change the setting for "When a camera is connected" to the application of your choice, or "none."

Why does Silent Shooting cause incorrect or irregular exposures in some cases? Are these peculiarities of metering (since this is normally done via the viewfinder light path) or of the electronic first curtain? Is there any reason to disable silent shooting when not using vertical shift or extension tubes?

Any time you take a picture without looking through the camera's optical viewfinder, the eyepiece should be covered. If you don't, the exposure may be thrown off. This is mentioned in the instruction books for cameras with a Silent Shooting mode, like the 5D Mark II and the 50D. (See page 100 in the 5D Mark II

instructions, page 105 in the 50D instructions.) An eyepiece cover is built into the neckstrap that's supplied with the camera.

A question about AEB sequence: If I understand correctly it is not currently possible to set AEB to make the first exposure the "+" exposure. Why I would want this: As I tend to expose for the land at the "+" point, perhaps with just half-stop lift, and strongly underexpose for the sky and sun at the "-" and "0" points, the "0" EV shot may be several stops underexposed. When looking at images (in Adobe Lightroom) it would be much easier for me to have the shot closest to 0 EV on the land portion of the image (which would actually be the "+" exposure of a sequence of exposures) at the beginning of that sequence, not at the end as it currently always is. This would help me enormously as a reference point for that shot to assess composition, organize, etc. So my question may be a request to have some way, if there isn't already, to assign the "+, 0, -," sequence to AEB. I hope I have made sense, thanks.

The feature you're requesting is already available in the 1D/1Ds class cameras, and it's been there since the beginning. In the Mark III series, you can select from the following options for AEB exposure sequence:

Custom Function I-5

0: 0, -, +
1: -, 0, +
2: +, 0, -

With these cameras, you can also specify the number of shots in an AEB sequence at 2, 3, 5 or 7 via Custom Function I-6; and you can keep the mirror locked while conducting an AEB sequence via Custom Function III-15. I can understand that you may want to see some or all of these Custom Functions in cameras like the 5D Mark II or 50D, but the chances are good that Canon will restrict them to the 1D/1Ds series for marketing differentiation reasons.

I have two EOS 40Ds, neither of which will allow ISO expansion to 3200. Also, one of them has "lost" the last three menu tabs. Any ideas? Thanks.

There are easy explanations for both situations:

1. On the EOS 40D, the ISO range is restricted from 200 to 1600 when Highlight Tone Priority (HTP for short) is turned on (Custom Function II-3-1). See the note on page 157 of the EOS 40D instructions. This is true regardless of the Custom Function setting for ISO expansion. You can tell when HTP is on by observing the ISO display in the viewfinder data display and the camera's top LCD data panel because the last two digits of the full-stop ISO settings show up as "oo" rather than "00."

2. The last three tabs on the LCD menu screen are unavailable whenever the EOS 40D is set to a Basic Zone shooting mode like Full Auto, Portrait, Landscape, Close-up, Action, Night Portrait or Flash-Off. This is because Custom Functions, My Menu settings, and certain Camera Setup adjustments cannot be set in Basic Zone modes. You can see all of the menu tabs in Creative Zone modes such as P, Tv, Av, M and A-DEP as well as C1, C2 and C3.

I bought an EOS-1D Mark III and I wonder if it is better to use in-camera noise reduction instead of no NR and do it later during post-processing. Having your appreciated attention, I also would like to ask you which setting is favorable for AI Servo sports shoots: using all the focusing points or using the center one following the object?

There are two kinds of in-camera noise reduction with the EOS-1D Mark III camera: High ISO noise and long exposure. If you're concerned about long exposure noise reduction, I recommend using the camera for that purpose because it's more effective than trying to resolve the issue in post-processing. On the other hand, unless you use an in-camera JPEG workflow such that you must deliver images to clients straight out of the camera, I would recommend performing noise reduction during post-processing. The reason is that you'll have more control over individual types of noise reduction, including chrominance and luminance. If maximum image quality is the goal, then consider capturing RAW image data and performing noise reduction in your computer.

As for your second question, the best choice for focusing point selection in AI Servo AF (automatic vs. manual) depends on the subject matter, the shooting conditions, and your personal preferences. Generally speaking, it's usually better to select focusing points manually when you know in advance where the subject will be when you shoot. It is also very important to begin collecting subject tracking data by starting the AF system with the manually selected point positioned over the subject for about one second before releasing the shutter.

I have a question about the way exposure works with the newer EOS cameras in the Live View mode. I understand that for Live View to work, the mirror must flip up and the shutter must open and remain open. My question is, what happens when you make the exposure? I suspect that the exposure is completely electronic and that once it's complete, the (mechanical) shutter closes. Or does closing the shutter end the exposure? And what happens at higher speeds where the mechanical shutter would normally be only a traveling slit?

Thanks for the excellent questions! There are actually several different camera settings in Live View that determine how exposures are made. Let's take a closer look:

- When Silent Shooting is disabled in Live View, the camera's mechanical focal plane shutter controls the beginning and the end of every exposure. When the shutter button is fully pressed, the focal plane shutter closes to suspend Live View. Then it operates normally to capture one or more images, depending on whether the camera is set for single-frame or continuous shooting. At the end of the last exposure, the shutter reopens to resume Live View.
- In Silent Mode 1, the CMOS image sensor begins the exposure by electronically simulating the first curtain of the mechanical shutter. The mechanical shutter closes to end the exposure. This is quieter because the mechanical shutter has less work to do. (There is only one shutter click instead of two.) Silent Mode 1 works for continuous shooting as well as single-frame exposures. At the end of the last exposure, the shutter opens again to resume Live View.
- Silent Mode 2 only works with single-frame shooting. In this mode, the exposure is controlled in the same way as Silent Mode 1. However, the mechanical shutter is not reopened to resume Live View until the photographer lifts his or her index finger off the shutter button or remote switch. This is by far the quietest way to capture a still image during Live View. It's ideal for situations when silence is essential, because it allows the photographer to control when to resume Live View.

The EOS 5D Mark II camera supports video capture during Live View. In this mode, the CMOS image sensor controls the beginning and end of each individual frame, and the framing rate is 30 fps. The mechanical shutter remains open at all times, so operational noises are kept to an absolute minimum.

Because still image captures in Live View are at least partially if not fully controlled by the camera's mechanical shutter, the entire range of the camera's shutter speeds remains available, typically from Bulb up to 1/4000 or 1/8000 depending on the camera model. However, during movie mode with the EOS 5D Mark II, shutter speeds are limited to 1/30 on the slow end, and the Bulb setting is unavailable.

Recent Canon EOS cameras have both Highlight Tone Priority and Auto Lighting Optimizer settings. What is the difference between them and when would I use each? It seems to me that they both address high dynamic range situations.

Auto Lighting Optimizer (ALO) analyzes contrast in captured images and modifies both shadows and highlights via tone curve adjustments to minimize loss of detail in contrasty lighting conditions. Current EOS models including the EOS 50D and 5D Mark II provide four settings for ALO: Off (Disable), Low, Standard and Strong. ALO can be used at any ISO speed setting. Sample images showing the effect of ALO can be seen here:

<http://web.canon.jp/imaging/eosd/eos50d/01.html#03>

Highlight Tone Priority (HTP) is available with all current EOS models excluding the Rebel XS/1000D. HTP has no effect on the actual dynamic range of the image sensor. It's just an alternative method of image processing that preserves more highlight detail than Canon's standard processing, without significantly altering midtones or shadows. The effect of HTP is enhanced by Canon's 14-bit A/D converter, which provides finer tonal gradations than the previous 12-bit system. HTP is a Custom Function with a simple on/off setting, and the available range of ISO speed settings is slightly limited when it is on. Take a look at the following Web page for some sample images that show the capabilities of Highlight Tone Priority:

http://www.imaging-resource.com/PRODS/E1DMK3/E1DMK3EXPOSURE_HTPMODE.HTM

ALO does not affect RAW image data. It is at its best for in-camera JPEGs shot in extremely contrasty lighting conditions. Examples would include backlit portraits and urban landscapes on sunny days, where the tops of buildings are brightly illuminated by the sun but subject matter at street level is in heavy shadow. HTP affects RAW data as well as in-camera JPEGs. It is very useful in high-key shooting conditions such as wedding photography and certain kinds of sunsets. ALO can be combined with HTP with cameras that have both features.

I saw your comment on sRAW1 with the EOS 5D Mark II, and I understand that the smaller file size would be good for storing more photos on the memory card. I was also wondering if the speed of the camera could become faster than 3.9 fps when using the sRAW1 setting. After all, the files are smaller.

The framing rate of the EOS 5D Mark II cannot be increased by setting the camera to produce smaller file sizes. Keep in mind that all captured images start out as full-frame data, which is then downsampled and compressed according to the user-selected image quality setting. Therefore, the amount of data coming in to the processor is always the same; it's only the size of the output file that changes.

A lot of people are maligning the low-light AF capability of the EOS 5D Mark II, particularly relative to the EOS-1Ds Mark III. I do not find AF on the 5D Mark II to be a problem in low light with static objects. In fact, properly used...or at least used the way I use it...I find that it will AF in light lower than I can expect exposures with reasonable image quality using high ISO speed settings. I know the 1Ds Mark III has a lot of AF functionality, particularly with moving objects and off-center points. However, I believe I remember (please correct me if I am wrong) a past discussion of yours where the wider 5D (or xxD) AF point(s) were better in low light than the

narrower 1D/1Ds points. Could you comment on how each of these (5D Mark II, 1Ds Mark III) will do in low light using center point only and/or exterior points?

Thanks for the question. I wonder how many of the people who are maligning the low-light AF capability of the EOS 5D Mark II camera have actually tried it! I've received a large number of comments from 5D Mark II owners stating that the all-around AF performance is much better than that of the original EOS 5D, which is interesting since the Mark II uses the same hardware components for autofocus as the 5D. That being the case, it's clear that at least some of the AF performance improvements on the 5D Mark II can be attributed to a faster signal processing circuit. Also, I think the availability of AF microadjustment on the 5D Mark II is a big improvement over the original 5D because it allows users to maximize the performance of their Canon EF lenses.

When comparing the low-light AF performance of the 5D Mark II to the 1Ds Mark III, which is a much more expensive camera, I'd like to make several points. First, my statement comparing the low-light sensitivity of the 1D-class cameras to the original 5D, 20D, etc., models was made before the 1Ds Mark III and 1D Mark III models were introduced. Although the statement was accurate at the time, it should be noted that one of the significant improvements of the Mark III AF system vs. the 1D/1Ds Mark II series is its low-light sensitivity, together with a significant increase in the quantity of high-precision cross-type AF points throughout the cameras' AF pattern. So, my old statement no longer applies when comparing the 1Ds Mark III to the 5D Mark II. As it happens, the low-light sensitivity of each of these cameras is actually quite similar. In fact, Canon rates the low-light sensitivity threshold for the 1Ds Mark III at EV -1 versus EV -0.5 for the 5D Mark II, i.e., a half stop better. Performance at the center point is also quite similar, although the 1Ds Mark III again has the edge because it maintains its high-precision cross-type detection capability with maximum apertures as small as f/4, compared to f/2.8 for the 5D Mark II. AF performance with the off-center AF points is also going to be better with the 1Ds Mark III, partially because there are 18 such points versus 8, and partially because all 18 of the 1Ds Mark III's off-center AF points are high-precision cross-types versus standard precision single-axis for the 5D Mark II. Let me know if this answers your question.

I have a question about my new EOS-1Ds Mark III. I am told you can enter your name into the camera's data via the supplied USB cable, also that it's possible to access some camera functions via the cable and computer. I did not see any info in the User's Manual or software on how to do this.

Some of the features you're describing are accessible through EOS Utility, a software program that is supplied on the EOS Solutions Disk CD that came with your EOS Digital SLR. Detailed instructions for EOS Utility are supplied in PDF format on another CD that came in the box. Look for the "*EOS Digital Software*

Instruction Manual" disc, or you can download the manuals from our Web site here:

<http://www.usa.canon.com/consumer...>

Locate the Drivers and Downloads tab, then scroll down that page until you find the instruction manual for EOS Utility 2.5 for Windows or Mac, according to your computer's operating system. The instructions for uploading Owner's Name, Copyright Notice and Date/Time information from your PC start on page 12 in the Windows edition. Older cameras like the EOS-1Ds and EOS-1Ds Mark II also had Personal Functions that could be uploaded to those cameras via EOS Utility, but all available Personal Functions were added to the Custom Function menu on the Mark III cameras, so they're already in the camera and do not need to be uploaded.

I'm using an EOS-1Ds Mark II with an EF16-35mm f/2.8L lens. In many situations I feel that the standard focusing screen is not satisfactory for two reasons:

1. **It's impossible for me to judge accurate focusing of the lens.**
2. **It's very hard to keep horizon lines straight (without mounting the camera on a tripod and using a bubble level).**

The obvious solution for both problems would be a focusing screen with a split-image prism in the center AND grid lines. However, Canon offers either one or another and not both in the same screen. Moreover, the only screen I've seen with both was a custom-made Beattie screen, which is no longer in production. (They still make such screens for Nikon, but not for Canon.) Is there any logical reason why Canon does not make such a nice focusing screen? Is there any chance to be able to get one someday?

I cannot rule out the possibility that Canon might eventually offer a focusing screen that combines grid lines with a split-image focusing aid, but in my personal opinion the chances of this product being developed are virtually nil. The best workaround is to use one of our current models like the EOS 5D Mark II or the EOS-1Ds Mark III, because these cameras are equipped with a Live View function that enables the use of grid lines on demand, together with the option of on-screen magnification up to 10X for critical manual focusing. In addition, the EOS 5D Mark II provides contrast-based autofocus during Live View, using a movable focusing frame for greater flexibility. Both of these cameras have the added benefit of better image quality than earlier models like the EOS-1Ds Mark II.

I have a Canon EOS 50D. I understand that picture quality is somewhat dependent on pixel pitch and stray light/light interaction between sensor sites. If I dial down the resolution of the camera from 15MP to 8 MP, does

that mean that only every other pixel is "hot"? Does that mean that there is less light interaction between pixels, and that my picture is cleaner? Please provide some impressions.

Canon has not disclosed the exact methods it uses to reduce resolution for sRAW (small RAW) images and Medium or Small in-camera JPEGs, but each of these recording formats involves downsampling from the original full-resolution raw image data. In tests I've performed at various EOS 50D image quality settings, I have come to the conclusion that there is no significant change in noise at pixel level caused by downsampling alone. However, at any given print size, images captured by the EOS 50D will look their best (cleanest) when working from full-resolution files.

Is there any reason I should consider reducing the quality level of Large JPEGs from 10 on my EOS-1D Mark II? I'm surprised the SI Photo Web site recommends a quality level of 6. My newspaper doesn't want RAW files shot, so a maxed-out JPEG quality setting seems to make sense unless I'm missing something.

Sports Illustrated's recommendation of Level 6 compression for Large JPEGs from the EOS-1D Mark II was most likely based on testing that showed no visible difference in image quality on the printed page for higher JPEG quality settings. As long as that's the case, the benefit of Level 6 over higher JPEG quality settings like the camera's default Level 8 or your preferred maximum quality Level 10 is smaller file sizes, which result in longer bursts at 8.5 fps, more images per memory card and faster per image transmission times. It is true that there are fewer JPEG compression artifacts in Level 10 images compared to lower image quality settings, but it's also true that Level 10 results in significantly larger files on the memory card. This is not a big deal for most shooting situations, but it could become problematic for the burst mode shooting that is quite common in professional sports photography.

What is the "Native" ISO sensitivity of the 40D sensor? By native I mean the ISO setting that does not require any signal amplification or reduction to the sensor data, or at least the minimum setting of either amplification or reduction. I would assume that this native ISO would provide the best Signal/Noise ratio for pictures.

Your logic is sound, but Canon does not publish any specifications for the native sensitivity of its digital camera image sensors. Generally speaking, you'll find that S/N ratios with EOS digital SLRs are at their best in the lower ranges, and any differences in noise levels and dynamic range from ISO 100 to approximately ISO 200 are so minimal that they're not worth worrying about. If this matter truly concerns you, my best advice is to take some sample photos at each ISO speed setting and examine the resulting images to see which setting you prefer.

On a certain online forum there is a long-standing argument about the EOS 5D's auto-focus (and now the EOS 5D Mark II) that comes from the fact that the white papers are a little ambiguous. The problem is that some people claim that the autofocus calculations are performed by a separate processor that is independent of the DIGIC processor.

With EOS Digital SLRs, AF calculations and lens drive commands are typically executed by dedicated CPUs rather than the DIGIC processor itself. However, the overall speed of the AF system and many other camera functions depends on the speed of the DIGIC processor, or dual DIGIC processors in the case of the EOS-1Ds Mark III and EOS-1D Mark III.

I have been looking for some advice concerning back button focusing. I am shooting with a Canon EOS 30D and have 3 "L" series lenses. I primarily shoot my teenage daughter's competitive cheerleading competitions which are usually very poorly lit with the EF70-200mm f/2.8L IS USM zoom lens. What is the difference between Custom Functions 4-1 and 4-3? Do I need to hold the AE Lock [*] button constantly? Is there anything else I need to know? I thank you in advance for any help/guidance.

I wrote the following information for the EOS-1 class cameras, but it applies equally to the EOS 30D: Custom Function 4 allows the photographer to control which button on the camera is used to start or stop AF. It also ties in with AE Lock when the camera is set to an AE mode.

- C.Fn 4-0 (the default setting) starts AF and AE when the shutter button is pressed halfway. AE Locks automatically upon focus completion when the camera is set for the combination of One-Shot AF and Evaluative Metering. With other AF modes or metering patterns, AE Lock can be initiated manually by pressing the AE Lock button on the back of the camera.
- C.Fn 4-1 switches AF start to the AE Lock button, and starts AE Lock in AE modes with any metering pattern when the shutter button is pressed halfway. This mode is popular with sports photographers and some photojournalists, especially those who originally learned photography with manual-focus SLRs. It works particularly well with USM lenses that have distance scales, because such lenses feature full-time manual focusing even when the lens is set for AF. With C.Fn 4-1, the photographer can manually focus such a lens at any time, and then start or stop AF independently from shutter release simply by pressing or lifting the thumb off the AE Lock button.
- C.Fn 4-2 keeps AF start on the shutter button, but allows the photographer to stop AF temporarily by pressing the AE Lock button. AE Lock is unavailable in this mode, but it doesn't make any difference when the camera is set for manual exposure as it often is for professional sports photography.

- C.Fn 4-3 is almost the same as C.Fn 4-1, except that there is no AE Lock. This mode is useful when shooting sports photography in changing light situations, because it updates the exposure automatically in AE modes as the subject moves from shadow areas to sunlit areas or vice versa.

Based on this information, the choice between C.Fn 4-1 and C.Fn 4-3 with the EOS 30D depends on the following conditions:

1. Manual exposure: If you set the camera for manual exposure mode, there's no functional difference between C.Fn 4-1 and C.Fn 4-3. Choose whichever one you like.
2. Auto exposure:
 - (a) In an AE mode like P, Tv or Av, C.Fn 4-1 will lock the exposure in any metering pattern as soon as you touch the shutter button. This is great for One-Shot AF with stationary subjects, because it lets you focus and recompose without losing the meter reading.
 - (b) In P, Tv, or Av, C.Fn 4-3 updates the meter reading constantly wherever you aim the camera. For this reason, it's a good fit for sports photography with moving subjects in AI Servo AF.

You definitely don't need to keep AF active all the time, even for sports photography. With either 4-1 or 4-3, the more you practice, the better you'll get at judging when to activate AF with the AE lock button and when to suspend AF by lifting your thumb off the AE lock button. During a typical shooting sequence, you'd want to keep the AF going as long as you've got a clear view of your subject, and you'd want to suspend AF temporarily if an object, for instance another athlete, gets between you and the subject.

Last but not least, if you're stuck with poor lighting as you mentioned, you'll probably be best off to limit yourself to the center focusing point on the 30D. It's the most sensitive one, and it's cross-type which will make it easier to work with low-contrast subject matter.

One other question, which metering mode should I use – center-weighted average, evaluative, or spot? What about exposure modes?

For indoor sports in a gym, I would suggest manual exposure mode with center-weighted average metering. Take a reading off the floor and then take a test shot. Check the histogram to see if you're satisfied with the exposure accuracy. If not, adjust your shutter speed, aperture or ISO and make more test shots until you're happy with the exposure. In your case, I'd set the ISO to 1600 immediately and open the lens to f/2.8. Hopefully, you'll end up with a shutter speed that's at least 1/250 or faster. If not, you might want to consider a newer camera like the

EOS 50D for its higher ISO settings, and/or a faster lens like the EF135mm f/2L USM.

AEB with MLU and Timer question: On the original EOS 5D I have my custom setting permanently set to Mirror Lock, AEB, 2 second timer, because I use this setting a lot. It is a complete PITA [pain in the ass] to have to press the shutter three times when you want one bracketed exposure because there's more chance of camera vibration or movement. On the new EOS 5D Mark II is there a facility to set mirror lock with auto bracketing and timer (or remote) where the camera will fire the three shots of AEB from ONE press of the shutter button? If not, why not?

You can get three consecutive AEB frames in one shutter press with the EOS 5D Mark II with mirror lock by setting the camera to Live View mode with continuous advance. For best results, use a remote switch like the RS-80N3 or TC-80N3 to eliminate camera shake. The 5D Mark II fires at 3.9 fps in continuous mode, and the interval between shots is not adjustable. If for some reason you want to shoot at a slower rate, you can fire one frame at a time with the remote switch. There's no need to set a self-timer delay in Live View, because the mirror is already locked up.

I have optional focusing screens for EOS-1Ds Mark III bodies. I am changing them out, and can't keep up with which is which. I have two screens and on the little tab it says: "CIV," where IV appears to be Roman numeral. The 4x5 black crop screen says "CIII." Are these screens marked in any other way to know if they're Ee-A or Ee-S?

EOS-1Ds Mark III focusing screens are "Ec" series, as opposed to EOS 5D focusing screens, which are "Ee" series. It sounds like you have the Ec-C IV, which is the standard screen for the 1Ds Mark III, while your crop screen is a custom modification of the slightly older Ec-C III, which was the standard screen for the EOS-1Ds Mark II. The Ec-C IV is a touch brighter than the Ec-C III, but otherwise they're basically similar. The Ee-A is the standard screen for the original EOS 5D, and other than the body compatibility, it is basically the same as the Ec-C III. If you wanted to try one of the Super Precision Matte screens for manual focusing with large-aperture lenses, here's a list of what you would need according to the camera body in question:

EOS-1 class (any vintage): Ec-S

EOS 5D: Ee-S

EOS 40D/50D: Ef-S

EOS 5D Mark II: Eg-S

Here is my issue: I have owned the EOS-1Ds Mark II and now the EOS-1Ds Mark III. During the 1Ds II period, I bought these EEs and 4x5 screens. I guess I thought they were compatible with the 1Ds III. I have changed them

out so much I don't know which is which. The "extra screen" in that plastic case with tweezers has marking on the tab: "CIV." The screen I just pulled out of the 1Ds III is marked the same way: "CIV." Plus now, I have to make sure I have the Custom Function set right, for the appropriate screen. I hope I have not totally messed up here. I'm having focus issues with the EF50/1.2L, so I'm testing everything – both bodies.

The "Ee" screens are not compatible with EOS-1 class cameras, so unless you've got an original 5D, you should sell them or return them for credit. The screen with CIV on the tab is the Ec-C IV, which is intended for use with the 1Ds Mark III and 1D Mark III. If you install this one to your 1Ds Mark III, set C.Fn IV-11 to 0, the default. If you install the Ec-C III (the screen with CIII on the tab) to your EOS-1Ds Mark III, set C.Fn IV-11 to 1.

I appreciate your technical insight into the EOS system. It's certainly helpful! I have a question that's been on my mind for a while. I've often wondered how long my Canon EOS 5D can keep using the same Compact Flash cards. Do CF cards ever wear out? Are professional photographers expected to recycle their CF cards every few years? I'd hate to have my card unexpectedly fail on me during an important event!

According to ePHOTOzine:

Apart from the fact that technology leads us to ever growing capacities and speeds and, therefore, sometimes rendering certain card sizes [i.e., storage capacities] such as 16MB or 32MB obsolete, it is worthwhile to note that memory cards have a limited life expectancy. Again there is a difference; single layer cards may allow in excess of maybe 100,000 read-write actions, whilst multi-layer cards may only allow around 10,000 to 15,000.

Based on this information, I would agree that it is a good idea for professional photographers to replace CF or SD flash memory cards, especially high-capacity versions, at least once every couple of years, depending on the frequency of usage.

Is there a preferred way to pack a camera/lens combo in a camera bag? Is it more desirable to have the lens mounted on the body or to keep them apart? This question revolves around the issue of being able to arrange a given set of lenses and camera body in a camera bag.

It's always safer to pack bodies and lenses separately, especially when multiple cameras and lenses are stored in the same gadget bag. However, keeping a lens mounted to the camera is also OK as long as you're absolutely sure there won't be any strain on the lens mount.