



The Complete Guide to

Sony's A7r II

"Professional Insights for the Experienced Photographer"

by Gary L. Friedman

The Friedman Archives Press

The Complete Guide to Sony's Alpha 7r II

“PROFESSIONAL INSIGHTS FOR THE EXPERIENCED
PHOTOGRAPHER”

by Gary L. Friedman

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ON THE COVER

Shooting the Milky Way galaxy in Borrego Springs, CA, Ellwood Saurbaugh studies his telescope while standing (almost) perfectly still for 20 seconds at ISO 1600. This shot used a Minolta MC 21mm wide angle lens with adapter. And I used the little-known "Bright Monitoring" feature (Section 7.35.2) to help frame the shot in near-total darkness. Thanks to Sony Artisan Of Imagery Spencer Pablo for organizing the event!

FOR THOSE OF YOU WHO BOUGHT THE PRINTED OR E-READER EDITION

There are a LOT of demonstrative illustrations in this book that kind of lose their effectiveness when converted to black-and-white. And some are difficult to see on e-book reader screens like the original Kindle.

And so to offset these problems I'm offering a free, full-color, instantly-downloadable .pdf file of this ebook to all customers who bought printed books (be they color or black-and-white), or who purchased this work through the Amazon Kindle, Apple, Barnes and Noble, or any other e-reader store. (The original .pdf file really does offer a superior user experience. Think of it as the "director's cut" regarding how the author intended the work to be seen.)

To get your free .pdf file, just email me (Gary@FriedmanArchives.com) with a copy of your receipt and I'll send you a download link. Such a deal!

ABOUT THE PHOTOS

The photo pages preceding each chapter are images from the www.FriedmanArchives.com stock photo website, and were taken with a wide variety of different cameras over the past 30 years.

ABOUT THE AUTHOR



Gary L. Friedman is a professional photographer who has traveled the world with both film and digital cameras. He runs the stock image website www.FriedmanArchives.com, is associate editor of CameraCraft magazine (a thoughtful periodical which steers clear of gear and talks about what's *really* important in a photograph), and gives highly-acclaimed digital photography seminars worldwide for those who wish to improve their creative photography and learn the essentials in an intuitive manner. Because he teaches seminars

worldwide, Mr. Friedman stays in touch with the concerns and challenges of serious amateurs – the kinds of people who buy cameras like the A7r II.

Before graduating to photography he was a rocket scientist for NASA's Jet Propulsion Laboratory (you know, those guys who landed probes on Mars and sent robots like Pioneer, Voyager, Galileo, Pathfinder, Spirit, and Discovery to explore the outer solar system), where he patented the image authentication system used in high-end Canon and Nikon cameras. He has been published in books, newspapers and magazines worldwide, and was listed in the Guinness Book of World Records while in college (go ahead and search the FriedmanArchives.com website if you want to find out what he did to get included).

Despite his mastery of the technical background, Mr. Friedman has an approachable and easy-going teaching style that makes his books a pleasure to read. You can read more about his background at <http://friedmanarchives.com/bio.htm>.



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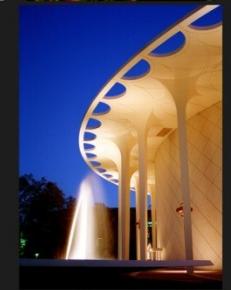
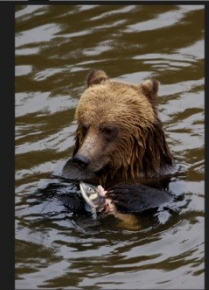
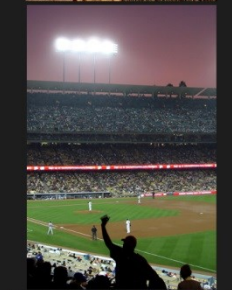
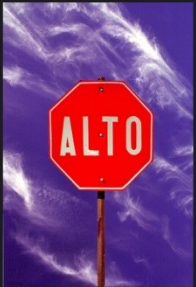
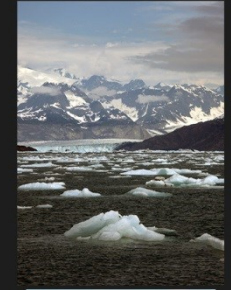
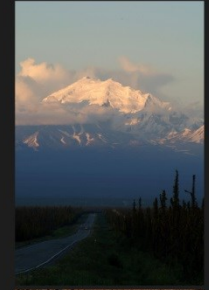
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Chapter 1 IN A NUTSHELL

Welcome to what I would call a miracle of engineering. Sony has taken the completely opposing requirements of high image quality, small size, computational power, tiny battery, high ISO, low noise, in-body stabilization, and low heat dissipation and created a camera whose image quality is so good that people are starting to sell all their Canon and Nikon gear to switch to this new, high-performing platform. Not an easy feat.

But you probably already knew all that. Let's get right to it then, shall we?

1.1 NOTEWORTHY FEATURES

1.1.1 LET'S START WITH THE SENSOR

It's not the highest megapixel chip on the planet. That award would go to the 50 megapixel Canon 5DS. But this A7r II has been making waves in the photographic world for its combination of resolution, dynamic range, and 4K video quality – 3 areas which are usually tradeoffs when you're designing a sensor. This sensor is so good that DxO (a lens testing website) says it's the best sensor it's ever tested! <http://www.dxomark.com/Cameras/Sony/A7R-II> And here's a similar accolade from DSLR magazine, saying "Sony A7rII JPG files are as good as the Canon 5DSr and Phase One XF RAW files!" - <http://bit.ly/1VR5VH5>

Your biggest challenge, then, is to come up with a compelling image that is worthy of 42 megapixels. ☺

(Scholarly note: Usually I ignore lens and sensor testing websites, since all cameras available today are excellent. But when a camera I'm already invested in gets high scores, my confirmation bias kicks in and I suddenly pay attention.)

If 42 megapixels is too much for shooting your child's birthday party, you can also use this camera in APS-C mode, attaching an older E-mount lens and getting great quality 18 megapixel images – essentially turning your

A7r II into NEX-6 (with a much better user interface). It's like having two camera bodies in one!

1.1.2 ON-SENSOR PHASE-DETECT AF

Sony has been toying with this capability ever since the A99, but were never able to solve all the technical problems associated with it until now. In all previous models, any on-sensor phase detect array would only kick in *after* the focus had been confirmed via other means. But with the A7r II, for the first time a large array of phase-detect AF points (more than any other DSLR) can be used to get focus, and to track moving objects. What's more, these same phase-detect pixels can now directly drive autofocus lenses from Canon (and soon Nikon) using an intelligent adapter, just as quickly as if they were on a native Canon body!

A Primer – Phase Detect vs. Contrast Detect

A lot of this “Contrast Detect” and “Phase Detect” stuff may sound very confusing. And really, why should you care about the technical details as long as the camera just does what it is supposed to do?

It's important to understand the differences because not all features involving Phase Detect will work with all lenses, and there are subtle interactions between features that won't make sense without this knowledge. Plus, from an engineering point of view, you can't help but be impressed at how Sony has merged these two fundamentally incompatible technologies.

So let's start with how Contrast Detect works. Contrast Detect requires no special hardware; essentially your camera just does a lot of hunting and guessing until it gets close, then it refines the hunt until it can see high contrast in adjacent pixels (the tell-tale sign that something is in focus!) In computer science terms it's doing what's called a binary search, and it works like the flowchart in **Figure 1-1**.

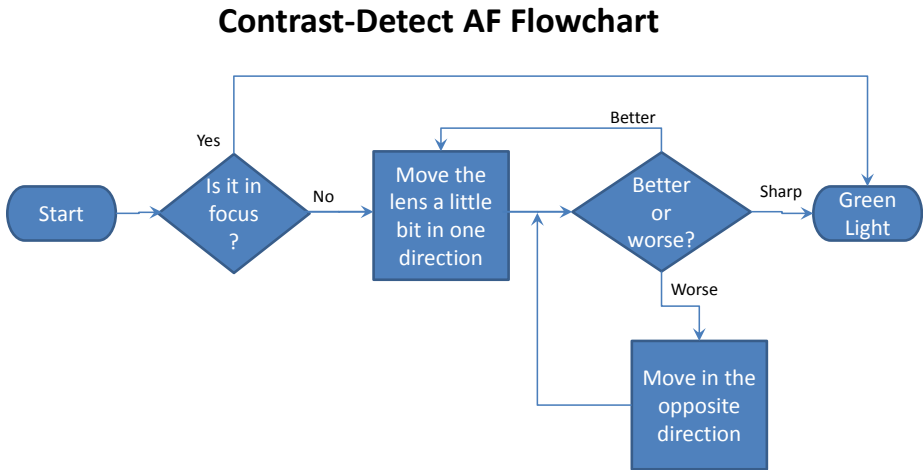


Figure 1-1: Here's how Contrast Detect AF works. It has no idea how much to turn the lens (or in which direction), so it goes by trial and error, essentially doing a binary search before converging on a sharp subject.

Contrast detect isn't bad if you have a wide-ish lens and your subject isn't moving. Its limitations can really be seen if you're using a telephoto lens and you're trying to track an Olympic athlete. That's why the original E-mount cameras used contrast-detect exclusively – it was easy to implement, and the casual snapshooters the platform was originally aimed at would be happy with the performance using their pancake or kit lenses.

Phase Detect doesn't rely on guessing. Using special pixel pairs that are baked right into the sensor, the camera can know right away how much to move the lens (and in which direction) in order to achieve proper focus in the first try, providing significantly faster AF without hunting, and superior subject tracking ability. **Figure 1-2** shows a flow chart showing how Phase Detect AF works.

Phase-Detect AF Flowchart

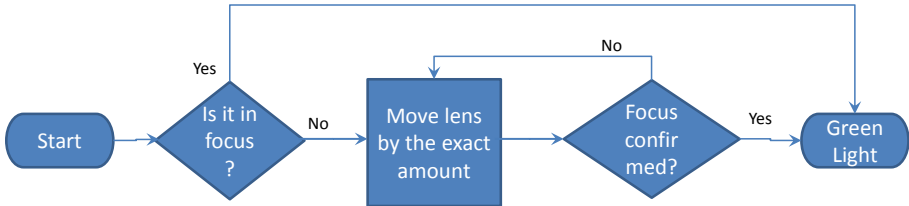


Figure 1-2: Phase Detect is MUCH faster, since it's less of an iterative process.

DSLRs all use phase-detect. But the implementation on the A7r II is superior for two reasons: 1) there are more phase detect AF points on the sensor than on any other DSLR ever, so you're not limited to keeping your subject in that clump in the center, and 2) unlike with DSLRs or SLT cameras, you will never have frontfocus or backfocus problems because the autofocusing array is on the same plane as the sensor – it's a closed loop system. (You can see a sample of the focus point distribution in **Figure 1-3**.)

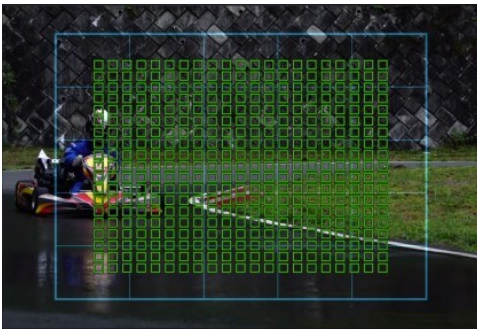




Figure 1-3: More phase-detect AF points than any other camera. (At least this week.)

Now here's where things get fun. Lenses that were designed with contrast-detect autofocusing in mind are driven very differently than lenses that are designed for phase-detect. Conversely, lenses designed only for phase-detect work pretty poorly when attached to a contrast-detect camera. As soon as I get back from Australia I'm going to create a Youtube video showing an A-mount lens (which is phase-detect all the way) attached to an NEX-7 camera body (contrast-detect AF all the way) using an LA-EA1 adapter and you can SEE

just how slow and jerky the autofocusing is. It's just tough to merge the two technologies.

That's why it's impressive to me that Sony has designed all of the FE (full-frame E-mount lenses) to work with both systems – you can have all the speed of phase-detect with all the extra features that contrast detect allows (like face detection and Eye AF).

So there may be times when you attach a lens designed for Contrast-detect only to your A7r II and certain features will suddenly not be available. For example, if you were to attach the “kit” lens for the original NEX-7 (officially known as the E 18-55mm f/3.5-5.6 OSS), you'll notice that some of the camera's menu items which rely on phase detect-capable lenses are suddenly greyed out, like **MENU →  4 → AF Drive Speed** and **MENU →  4 → AF Track Sense**.

And if you were to attach a lens that was Phase-detect only (like the A-mount lens and LA-EA3 adapter mentioned 3 paragraphs ago), you'll notice that certain features that require a lens to be CD-AF like (again, like the face recognition and Eye AF) suddenly don't work anymore.

So that's why this is called a “Hybrid AF” system – you get the benefits of both worlds and none of the drawbacks.

Try This: Turn your exposure mode dial to "A" aperture and set your f/stop to the largest number your lens supports. Then set the **Fn → Focus Mode → AF-C** and watch the camera start to "hunt" contrast-detect style as it tries to focus. What you've just done is disabled the phase-detect portion of the hybrid autofocus, allowing you to appreciate what an improvement PD-AF represents. This experiment works because phase detection requires an f/stop of f/9 or larger (lower number); so making the f/stop smaller defaults to CDAF.

Why does it have such difficulty focusing with small f/stops? My video from my blog explains it: https://youtu.be/QIBWL_UVUS8

1.1.3 5-AXIS IMAGE STABILIZATION

This goes against the original vision for the E-mount platform, which was to keep the stabilization in the lens to keep the body small and to thwart heat buildup issues.

BUT the legions of high-end shooters who want to use these tiny bodies to shoot with legacy glass (with no autofocus, and no built-in lens stabilization) have been clamoring for Sony to employ the sensor-shaking image stabilization method in their bodies anyway. And Sony listened. And amazingly, the body isn't that much bigger, nor has heat buildup posed a problem. I truly believe the A7r II represents the most sophisticated engineering ever to grace a camera.

The A7r II's built-in SteadyShot can correct for 5 (count 'em!) dimensions of shake: Roll, Pitch, Yaw, Vertical, and Horizontal. I could show you a complex diagram of what that all means, or I could show you this outstanding video from Sony when they introduced this improved sensor-based SteadyShot in the A7 II camera body: <https://youtu.be/svbUXedWsbA>

What if you attach a native "OSS"-type E-mount lens that already has image stabilization built in? Then the camera will make use of its capabilities, and augment it with corrections along the additional axes.

TIP: Want to see how Sony managed to squeeze all of that cutting-edge technology into such a tiny package? iFixit.com took apart an A7r II and showed you how they did it, step by step: <http://bit.ly/1PsetPz> Now you don't have to! ☺

1.1.4 INTERNAL 4K AND OTHER VIDEO FEATURES

4K Video is quickly becoming a thing. (Not every video advancement does. Remember the 3D TV craze from a few years back that never got traction?) (Heck, remember quadrasonic stereo from the 1970's?)

Anyway, word from Japan says young mothers just LOVE all the detail when watching 4K videos of their little babies. Cinematographers seem to be embracing it as well.

In the past, when you wanted to shoot 4K video on Sony's previous 4K-shooting E-mount (the A7s), you had to hook up an external digital video recorder, as pushing all that data onto the camera's memory card would fill up the buffers too quickly. Thankfully that problem has been addressed, and now you can save a compressed version of 4K video internally to the camera. (If you're a purist and want uncompressed 4K video, you'll still

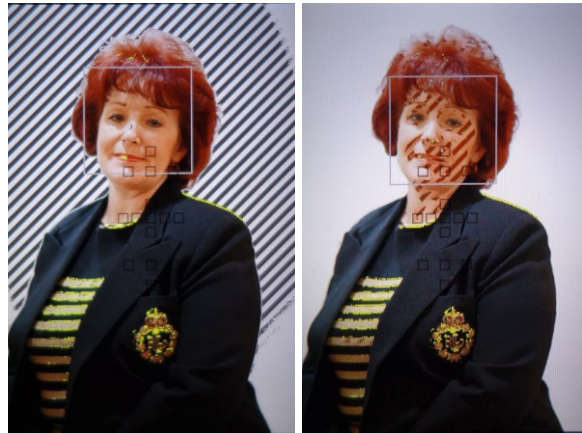


Figure 1-4: Zebra stripe example. It can either show you what's going to blow out (in video – stills have a greater dynamic range) or it can be set to show when a Caucasian face is properly exposed (right). More about this feature in Section 7.1.

Sensor size			
Type	APS-C	Super 35	35mm Full Frame
sensor w x h	22.2 x 14.8mm	24.89 x 18.66mm	36 x 24mm
sensor diagonal	26.7mm	31.1mm	43.3mm
sensor area	329mm ²	464.44mm ²	864mm ²
crop factor	1.62	1.39	1

Figure 1-5: While the A7r II is considered a "Full Frame" (35mm) camera, the best 4K video quality can be had when you grab your image from the center of the sensor.

need to hook up an external digital recorder to the camera's HDMI port. But now you have a choice.)

The Sony engineers have gone out of their way to mention just how this 42 MP sensor is optimized for superior 4K video shooting: To eliminate the artifacts that are common when shooting video with DSLRs (like "pixel binning" and/or "rolling shutter"), the camera by default draws its 4K pixels from the center area of

the sensor, officially referred to as the "Super 35" crop. (See **Figure 1-5**.) When in this mode the camera is actually sampling 5K pixels, and then downsampling it to 4K before saving it to memory.

There are a host of other features on this camera targeted specifically at video enthusiasts:

- There's also a XAVC S HD video format that records in HD (1920 x 1080) and a high bitrate (100 MB/s) and a high frame rate (up to 120 frames per second for NTSC), allowing for the creation of smooth slow-motion video.
- Picture Profiles are a series of settings designed for professional videographers who intend to post-process their video (usually referred to as 'grading' in the video world). This includes the famous S-Log 2 curve (which I explain thoroughly in Section 6.29).
- Zebra Stripes, a feature which professional videographers have been using for decades (**Figure 1-4**).

TIP: Worried about the camera's tiny battery dying in the field? I've always kept spare batteries in my pocket, which is still the easiest solution. You can also get the optional grip which has room for 2 extra batteries inside (and they switch automatically).

Since Sony has now seen fit to allow the camera to operate off of power applied to the USB port, a 3rd option is now available: External USB battery packs and a long cable. Keep the battery pack in your pocket and go around shooting all day. Here's the battery pack I personally use and like: The Anker Astro E5 1600 mAh battery – available here: <http://amzn.to/1JPliUr>.



1.1.5 14-BIT UNCOMPRESSED RAW

This section actually covers two separate but related features: The first is 14-bit RAW, which allows images to withstand extreme image manipulation a little better. The second is uncompressed RAW, which takes up considerably more space on your memory card in exchange for a complete lack of artifacts that you wouldn't see anyway unless you hang out on dpreview.com.

14-Bit RAW

Nikon and Canon have had this feature for years. More bits are better, right?

The truth is you may not notice any difference at all in normal shooting. (And when I say “Normal shooting” I mean “if you have good light and your exposure is right for that light”, which is much more important to good photography than noise performance at high ISOs). When Nikon first introduced this 14-bit feature back in 2008, many of their customers started looking for visible differences in the 14-bit mode, but visible differences proved elusive. The extra bits only matter if your exposure is off by *a lot* and you're trying to recover detail from the shadows. Most printers and LCD monitors can't show you the improved tonality, although in theory such images can withstand extreme manipulation a little bit better.

Just to show you how little difference this makes, you might wish to read these two articles written by a Nikon owner in 2008: <http://tinyurl.com/2e4nss> and <http://tinyurl.com/4enno8>.

It should be noted that there's no menu item to turn this feature on or off -- the A7r II goes into 14-bit mode automatically when you're shooting RAW in single-shot mode and goes back to 12-bit in any other drive mode, or when shutter speed is set to BULB, or Long Exposure Noise Reduction is employed.

Uncompressed RAW

So that's 14-bit RAW. But there's another improvement – on October 19, 2015, Sony released a new firmware update that allows you to save your RAW files as either compressed (which was the original version) or uncompressed. Why is this important?

We all know that lossy compression (like the kind used to create .jpps) brings with it the possibility of introducing compression artifacts, with some algorithms providing more artifacts than others. Well, it turns out that since the Alpha 900, Sony's RAW files have been compressed as well, just not as aggressively as .jpg and in a way that hardly anyone would notice. And when I say "hardly anyone", I'm referring specifically to Iliah Borg, a vocal internet citizen and author of the Libraw raw file decoder (<http://www.libraw.org>) who has started a vocal online campaign to shame Sony into offering the same 14-bit uncompressed RAW files that Canon and Nikon have offered for years.

Is compressed RAW a problem? Here is a real-world example posted to dpreview which demonstrates the compression artifacts pretty clearly: <http://www.dpreview.com/forums/post/52949203>. And here's one from Iliah's website: <http://bit.ly/1DRcCR6>. For those of you who are offline, I'll give you a verbal summary: Compression artifacts will only show up in areas where the image goes from extreme dark to extreme light (for example, fireworks or star trails) AND you pixel peep. (A lot.)

While I do think the world benefits from this kind of technical scrutiny (after all, how will the cameras ever improve if there weren't people out there looking for these things?), I also think that the vast majority of A7r II owners will not notice this compressed RAW "problem" in daily use. (I certainly didn't notice the problem in my star trail shots shown in my blog post here: <http://bit.ly/1JO6W6E>.) On the other hand, if I were using the camera for scientific pursuits instead of artistic ones, I'd probably start caring a lot since the camera is altering the reality it's supposed to be representing.

So the benefits, just like the demonstrated problem, may very well be imperceptible. Is there a drawback? Oh, yes! YOUR RAW FILE SIZE WILL DOUBLE, going from 42 megabytes to a whopping 84 MB per image! That's a pretty significant price to pay for a barely perceivable benefit.

So why am I treating this triumph of a vocal minority with such indifference? Maybe it's because I'm not an extreme manipulator of my images (instead I always strive for the best light – that has a bigger impact anyway). Or maybe it's because the size of my RAW files have just doubled and my hard drive space will now be eaten up much more quickly.

Regardless, while we can all applaud Sony for listening to its most vocal customers, I can't say this is a benefit that will affect any aspect of my photography.

1.1.6 CAN SHOOT 2 KINDS OF VIDEOS SIMULTANEOUSLY

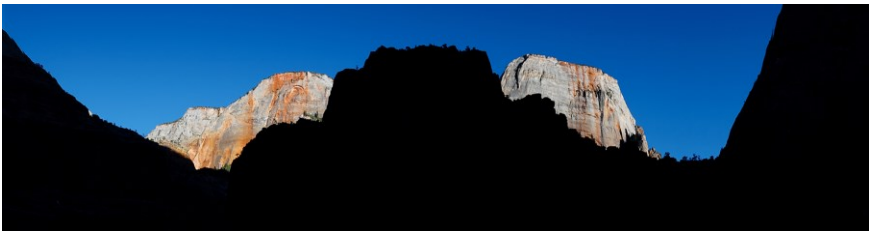
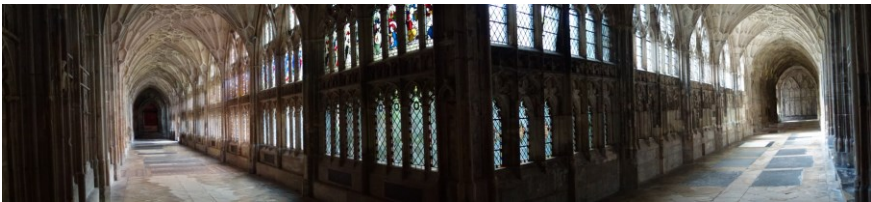
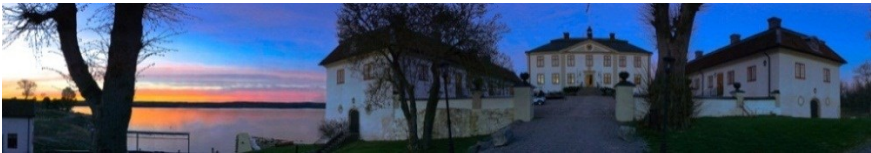
This is a feature made especially for videographers who are also social media moguls. It is designed to address this very scenario: You've just shot some cool high-res video and you want to share it on Facebook while still in the field. So you bump your phone to the Camera (using NFC) and transfer the video footage to the camera so that you may then upload it to Facebook. The problem is that the high-res video footage is LARGE, it takes up a lot of space on your phone and it uses eats up your data plan in the process. There's GOT to be a better way!

Leveraging the fact that Facebook just crappifies (that's a word!) video anyway, Sony has now given you the option of storing video in two different formats each time you shoot a video clip: The high-quality format (XAVC S 4K, XAVC S HD, or AVCHD), along with a [much] lower-quality .MP4 version which is the perfect size for uploading to social media in the field. (This is an even smaller size and lower quality than can be selected manually via the menus!)

You can enable Dual Mode via **MENU → 📷 2 → Dual Video REC → On**. See Section 6.8 for which Record Settings allow its use.



1.1.7 *SWEEP PANORAMA*

This feature is so common now that I considered taking out this chapter altogether - except I like showing off the panoramas I've made over the past 5 years. ☺ More information about Sweep Panorama can be found in section 6.5.



1.1.8 THREE DIFFERENT LOW-LIGHT MODES

These all can get kind of confusing since these three features are all advertised to do the same thing. The features are:

Function	How it's Invoked	What it Does
Multi-Frame Noise Reduction (MFNR)	Fn. → ISO → top-most option (Section 6.22.2)	Averages four sequential shots together. Gives you complete control over white balance, exposure compensation, creative styles, picture effects, ISO, etc. You can't turn it on while in RAW or RAW+JPG mode.
Anti-Motion Blur (AMB) 	Scene mode (Section 6.39.2)	Identical to MFNR above, except 1) you have no control over image settings like ISO, white balance, etc. 2) the camera analyzes the scene and doesn't merge parts of images that contain blurs. As a result, areas around things that move may appear noisier than surrounding areas. It also shoots at a faster shutter speed - if the camera decides that the shutter speed should normally be 1/10th of a second, the HHT function will take four images of 1/40th of a second and then add them all together, whereas HandHeld Twilight will take four pictures at 1/10 th second each.
HandHeld Twilight (HHT) 	Scene mode (Section 6.39.7)	This is like AMB above except there's no intelligent removal of moving artifacts, and it uses the slower shutter speed. Still no control over image parameters.

TIP: To invoke the Scene (SCN) mode, set the Exposure mode dial to SCN; rotate front dial until the setting you want is selected.



Figure 1-6: Handheld twilight allows you to take low-noise, low-light images without a tripod. This was taken from the inside of Los Angeles International Airport’s iconic “Theme Building”.

The first three features are designed for when you’re shooting in low light and don’t have a tripod handy. (And you just hate noisy pictures at high ISO.) For years, professional photographers (astrophotographers in particular) had a trick up their sleeves when it came to reducing noise in static images – they would take several different shots in succession, and then merge them all in Photoshop. The underlying principle was that each frame had the same subject but completely random noise, and by combining the images the noise would just get “averaged” away, while the subject, which appeared consistently in each shot, would be reinforced.

Using the same intelligence found in the panorama stitching algorithms, your camera can use this very same technique. Using either Handheld Twilight mode or the Multi-Frame Noise-Reduction function, the camera will take several handheld shots in rapid succession, line them all up (in

case your hand wasn't perfectly steady), merge them all together, and produce one high-resolution, low-noise, low-light image – all in-camera!

These are both very innovative features and you can see an example of Handheld Twilight in **Figure 1-6**.

Anti-Motion blur does the same thing but then analyzes each of the frames before merging, and *doesn't merge* anything that's blurred. The idea being that only the sharp parts of each of the four frames will end up in the merged shot.

TIP 1: *There's a fourth feature called "Night Scene" (Section 6.39.6) which is supposed to be for nighttime shots. But as far as I can see doesn't do anything different than AUTO mode with the flash disabled. You can safely disregard this feature.*

TIP 2: *Handheld Twilight (HHT) was Sony's first attempt to do multi-frame image merging. Since then they came out with AMB and MFNR, both of which do a better job. So in my mind there's no reason to use HHT. (I know, too many acronyms...)*

Three Low-Light Modes Compared

This seems like as good a place as any to compare the multi-frame low-light modes (MFNR, HHT, AMB). (**Figure 1-8**). (Mind you, none of these fancy modes are better than using a tripod at low ISO.)

I have to tell you that I've done this test many times on books with different cameras, and in the past the visible differences between these modes have been striking and apparent. In more recent cameras the differences are so subtle that I really have to pixel peep in order to see them. (And I believe that if you have to pixel peep that much to see a difference, then the differences are not at all meaningful.)



Figure 1-7: A musty old garage taken in Program Mode at ISO 3200. **Figure 1-8** shows comparison close-ups of the yellow square.

Bottom Line: While nothing beats a tripod, of all the low-light modes offered, Multi-Frame Noise Reduction really does the best job of reducing noise without degrading the detail (more info in Section 6.22.2). Next runner-up is good old Program mode ☺, followed by Anti-Motion blur, which works well with moving objects (and is described more in Section 6.39.2). Handheld Twilight (which I feel is now obsolete and doesn't really offer any advantages) is discussed further starting in Section 6.39.7.

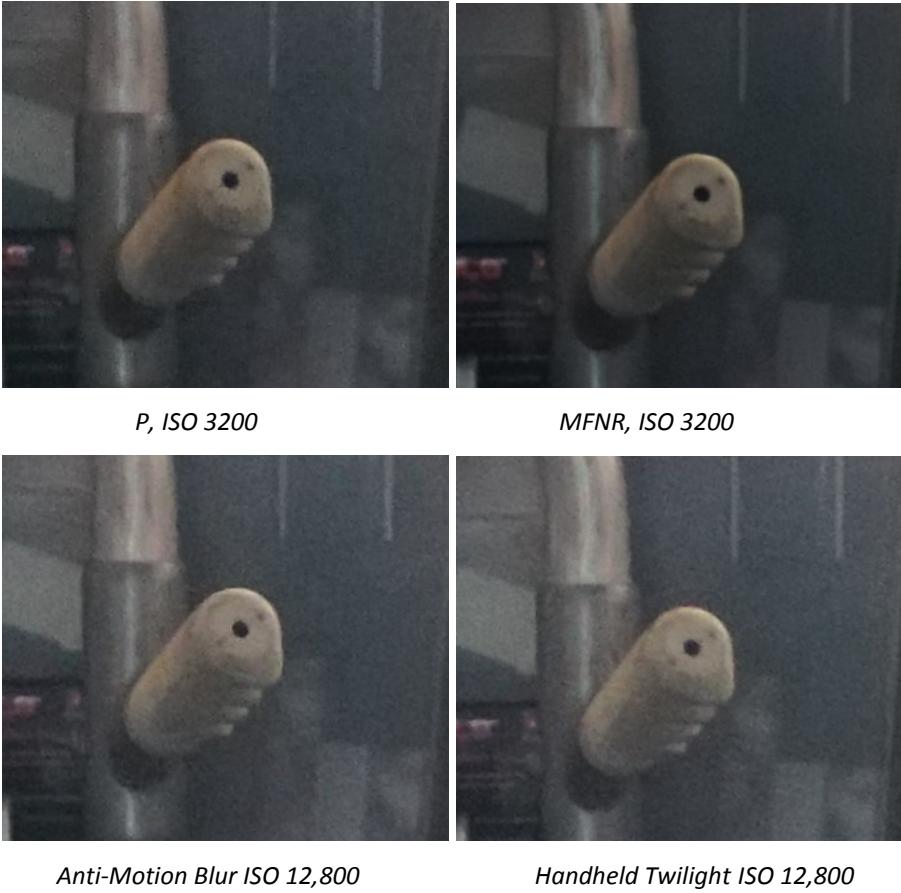


Figure 1-8: Pixel-peeping the yellow rectangle in the previous figure, comparing the three low-light exposure modes. The best images to my eye are Multi-Frame Noise Reduction and, ironically, plain old Program mode. (Wasn't expecting that.)

Another test showing the pronounced difference between Multi-Frame Noise Reduction and Anti-Motion Blur in a scenario where a tripod wouldn't have helped can be seen in **Figure 1-9**. Pretty significant.

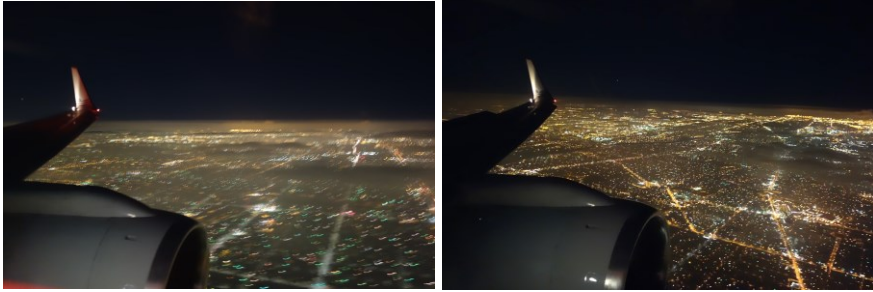


Figure 1-9: The ultimate challenge through an airplane window: A low-light shot with a moving subject. While Multi-Frame Noise Reduction will do a good job reducing the noise (left), Anti-Motion Blur pulls off a miracle by severely reducing the blur (right).

1.1.9 HANDHELD HIGH DYNAMIC RANGE (HDR)

In Appendix A, I talk about the limited dynamic range of the digital sensor, and how our eyes can see a significantly greater range of light (bright to dark) than what the camera can see. There have been lots of attempts to correct this intentional artifact of photographic representation of real light. The latest technique for trying to achieve this wider dynamic range comes in what's become known as High Dynamic Range (HDR) photography.

The time-honored way to create an HDR image is to put the camera on a tripod and take 3 (sometimes more) pictures of the same scene, each at different exposures – some darker, some lighter. Then, you merge them all in your computer so it sort of looks like the way you saw it in real life. An example of HDR photography appears in **Figure 1-10**.

Up until now, HDR photography was labor-intensive and unintuitive. But Sony's HDR feature tried to make it simple – without needing a tripod, the camera will take 3 pictures of different exposures, line them up (in case your hand was moving), and merge them so the brightest and darkest parts of all 3 come through.

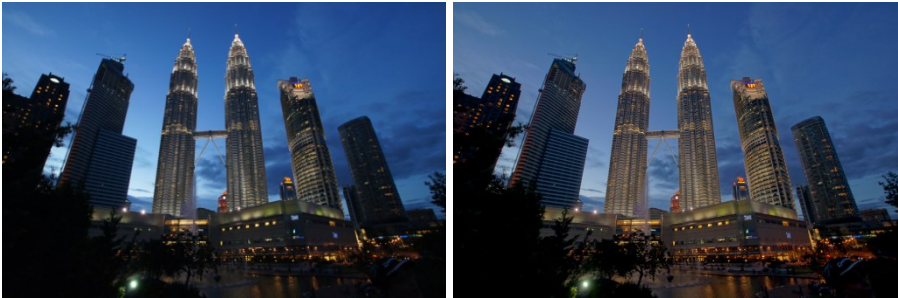


Figure 1-10: In-camera High Dynamic Range can turn difficult light with blown-out highlights and too-dark shadows (left) into something a little closer to the way you remember seeing it (right).

I should warn you, though, that this feature only covers the first step in traditional HDR photography, and skips entirely a 2nd important step called “Tone Mapping”. Therefore, you might look at your HDR images and conclude they appear kind of flat. This is normal, and in fact it’s the reason your sensor has reduced dynamic range to begin with. Do NOT expect this feature to produce these kinds of uber-extreme HDR effects like those at <http://tinyurl.com/7sjnd5n>. You’ll be disappointed. This feature is discussed more in Section 14.2.

1.1.10 PEAKING COLOR

This camera gives you TWO great manual focusing aids (compared to zero with most DSLRs). The first is the Focus Magnifier (which shows you a magnified area of the image so you can fine-tune your manual focusing), and the other is a very useful feature called “Peaking Level” (and its counterpart, “Peaking Color”). As you turn the manual focusing ring around your lens, areas that have high contrast (which equates to sharp focus) will be highlighted in the color of your choice.



Figure 1-11: Peaking Level and Peaking Color work together to make manual focusing easy again. Things that are sharp (= high contrast) are highlighted in the color of your choice.

Faster than using the ground-glass focusing screens! (**Figure 1-11.**)

This feature is insanely useful even if you don't focus manually. When combined with the DMF (Direct Manual Focus) feature, the peaking color can show you with greater clarity what the camera has focused on, so you can shoot with autofocus with greater confidence. I talk about that configuration at the end of Section 2.2, and about the Peaking Level in greater detail in Section 7.9.

TIP: Peaking Color is now available when shooting movies! See Section 7.9.

1.1.11 FACE DETECTION / EYE AF

Your camera employs face detection to determine the subject far faster than was previously possible. (Assuming your subject is a person, that is.) Have a look at the example in **Figure 1-12.**

Keep in mind that I was always a “focus-lock-recompose-shoot” kind of guy, which is just completely incompatible with shooting kids. Using Face Detection changed all that -- it will find the face, focus on it, bias the exposure for the face, and then it's ready – all faster than my experienced skills could do. It's also much more accurate than the pure “wide-area AF” method, since in the old days there was no intelligent scene analysis going on – the camera would usually focus on whatever was closest.

You can also register a face so it can



Figure 1-12: Face recognition finds the subject quickly even though other objects may be closer. Had I used the focus-recompose-shoot method I would have missed this shot.

have focusing priority when it's amongst a group of other faces. Is it useful? Find out more about my experiences with this feature in Section 7.28.

The A7r II also has an improved Eye AF feature. Once it's been assigned to a button, pressing that button focuses on the closest eye. (The eye is the first thing YOUR eye goes to when looking at a portrait. It's human nature. Subsequently, the eye is the first thing you pixel peep on to ascertain the picture's sharpness. It's a good feature and works well when you have a native E-mount lens attached, and for the first time the feature now works in Continuous AF (AF-C) mode.

Much has been made of the new "Eye AF" feature online, but its implementation has me scratching my head. The camera has face detection, doesn't it? If the camera can recognize a face, then it can certainly recognize an eye on its own and focus just on that. Why is this even a feature that needs a button press?

Worse, if you use it often your brain now has one additional mental hoop to jump through when picking up your camera: You now have to think to yourself, "Am I shooting a person whose face is close enough for Eye AF to work?" If so, you can use Eye AF function to focus. If not, you'll have to press the shutter release button halfway. If you used Eye AF when there's no Eye to find, the camera will not find anything to focus on and (depending upon configuration) will refuse to take the shot. Yes, it's a very small thing to complain about, but as a person who used to shoot in high pressure situations (like weddings), *anything* that slows you down is a detriment. In my opinion this should have been implemented invisibly.

Anyway, Eye AF can now track an eye in AF-C focusing mode after focus has been acquired should the eye move across the screen.

TIP: *Eye-AF works with native E-mount lenses only. (Not even A-mount lenses with an LA-EA1 or LA-EA3 adapters will work.)*

1.1.12 DOWNLOADABLE APPS

You either love these or you hate these. Some people love them because they expand your camera's capabilities like a smartphone – just download

them when you're connected via Wi-Fi (or tethered to a computer that is). Others hate them because some of the features of paid apps are included for free in cameras by other manufacturers. Still a third set of people hate the fact that as of this writing, Sony has not allowed 3rd party programmers in to create truly useful or unusual apps – Sony insists on keeping this fiefdom to itself.

I talk more about the app ecosystem, how to use them and walk you through the available apps that are compatible with your camera in Section 5.5.

1.2 SOFTWARE FOR YOUR CAMERA

Sony cameras usually come with two programs to help edit and tweak your images: Image Data Converter and PlayMemories Home™. Historically, these programs have not been too popular among Sony's customers, but they *are* free and they have two things going for them:

- 1) I find the PlayMemories Home program handy because it can import both movies and pictures in one fell swoop (they're actually stored in different directories on the memory card, and different movie types are stored in different places).
- 2) It can also show me some of the more esoteric aspects of the camera's settings in the EXIF information (such as whether I had Multi-Frame Noise Reduction or Anti-Motion Blur turned on). This information is indeed embedded in the .jpg and RAW files but programs like Photoshop or Lightroom won't always show them to you.
- 3) As of this writing, the Image Data Converter software (which is actually quite capable) is the most universal way to open the new RAW file format, since not all popular image editing programs know how to read them). (IDC tends to be too aggressive in noise reduction in my opinion, though... See the section on Demosiacing in Section 15.3. The IDC software is available by download from Sony's Japan website:

For Windows:

<http://support.d-imaging.sony.co.jp/imsoft/Win/idc/us.html>

For Mac:

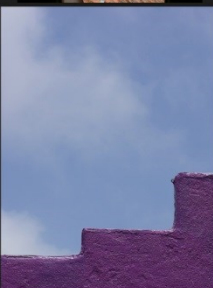
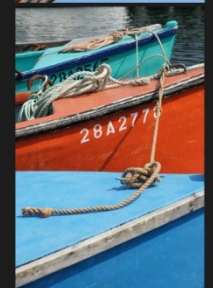
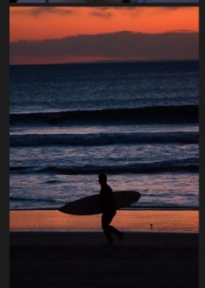
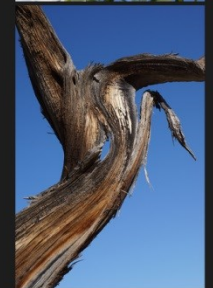
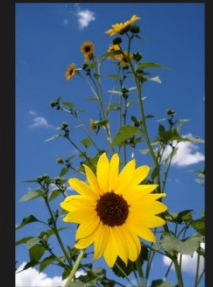
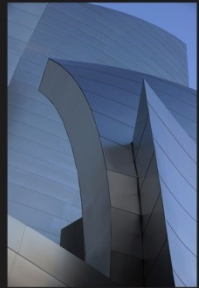
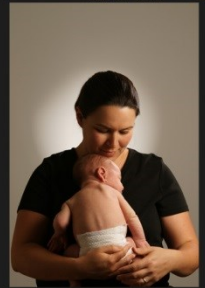
<http://support.d-imaging.sony.co.jp/imsoft/Mac/idc/us.html>

- 4) Sony is now providing you a FREE copy of The Capture One Express program by Phase One, a high-end, insanely capable image editing program that has a great reputation and normally sells for USD \$200. Sony has made an agreement with Phase One to provide a "lite" version of the software to all Sony customers for free, and a full upgrade price of USD \$50. This is a Really Big Deal. Go learn more and download your own copy at <https://www.phaseone.com/en/Imaging-Software/Capture-One-for-Sony.aspx>

1.3 "MY PICTURES AREN'T SHARP!"

I've been getting emails with that message ever since the Alpha 900 camera came out. I've blogged about it a few time too, here <http://bit.ly/1k8bMGW> and in more detail here <http://bit.ly/1G8cbTS> .

The upshot: If you want the sharpest pictures your equipment is capable of making, you have to work a little harder at it than you do with your smaller-sensor cameras. The key quote from the blog: *"In order to get sharp pictures you have to be firing on all eight cylinders: good light, good light, small f/stop, no movement, good light, detail in the subject, and good light."* Please read the 2nd blog post thoroughly for more details.



Chapter 2 ESSENTIAL CONFIGURATION

New owners of recent Sony cameras often experience “option shock” – so many menu items and customizations are available that it literally flummoxes (look it up) them. Where to start? This chapter is designed to address that very problem right away, so you can configure your camera in a way I’ve found to be useful. Short descriptions are followed by hyperlinks to Section numbers where you can delve deeper into a function’s settings and learn more about the options available.

First, let me take a minute and recommend some very quick function settings that will make the camera work better for you right out of the gate (or box). I know it’s a little rude to talk about camera settings before I actually talk about what these functions do; however this is supposed to be an “advanced” book. Some of these may already be the factory default; however just to make sure, here are my most-essential camera settings. (The end of this chapter contains ALL of my personal camera settings.)

Let’s start with the setting I get asked about the most.

2.1 THE FUNCTION BUTTON

The function button provides quick access to up to 12 of your favorite parameters, and you can assign all slots using the function **MENU** → **⚙️** **7** → **Function Button Set.** → **[Select Slot]** → **[Select from 1 of 35 options].**

The factory default function layout is so

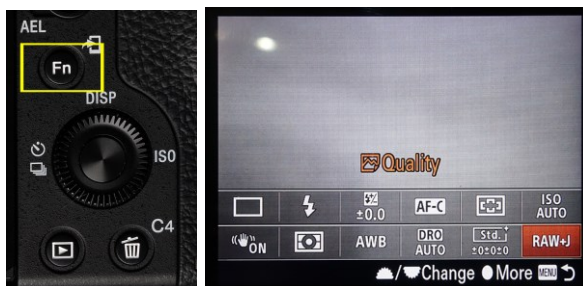


Figure 2-1: The Function button brings you to a screen where you can quickly change up to 12 of your favorite parameters.

useful that I've changed only one of the slots: Slot #12, which is initially set to "Shoot Mode", has been changed to "Quality" so I can switch between RAW and .jpg (or both) quickly in the field. (Shoot Mode is useless when you're shooting stills, but can be handy when you're in Movie mode since it allows you to quickly switch between the movie version of P, A, S, or M.) Everything else is the same, and I recommend that at least while you're reading this book you keep it that way as well so the **Fn.** shortcuts I mention in the book will work for you too.

2.2 REASSIGNABLE BUTTONS

The A7r II has a total of 10 reassignable buttons. And I've made a few reassignments that are ideal for the way I work. (Your mileage may vary, as everyone's needs are different. That's why there are so many options!)

To assign a function to a button, just do **MENU → ⚙ 7 → Custom Key Settings → [Choose a button] → [Choose a function to assign to that button]**. Not all buttons have the same number of reassignable functions, and there are plenty of functions that provide capabilities not available in menus. (In other words, some useful features have to be assigned to a button first in order to have access to them.) I've compiled a massive table of all functions, what they do, and what keys they can be assigned to in Section 7.35. Jump there if you're wondering what some of those assignable options do.

Control Wheel – not set

C1 Button assigned to ISO. This keeps it consistent with most of my other Sony cameras.

C2 Button – Movie. A much more natural movie stop/start button than the red button which is intentionally placed so it's difficult to actuate accidentally.



Figure 2-2: You can re-assign these and six other buttons as well (7 others if your lens has a button on it).

C3 – Eye AF

C4 – Quality – lets me switch between X. Fine and RAW+Jpg quickly.

Center Button – "Standard" (This way I can go from AF-C and Wide AF to Center focus area and AF-S with the push of a button).

Left Button – Drive Mode (the factory default)

Right Button – Zoom (handy for smooth zoom during movies)

Down Button – Focus Magnifier





AEL button set to AEL Toggle





AF/MF button set to AF/MF Ctrl Toggle

Focus Hold button set to Focus Hold. (Focus Hold buttons appear on a small percentage of lenses.)

2.3 SOME ESSENTIAL CUSTOMIZATIONS



Here are several sets of customizations I've made which I think are essential. (I'll go over ALL of my menu settings at the end of this chapter.)

<p>MENU →  1 → Monitor Brightness → MANUAL → +1</p> <p>MENU →  1 → Viewfinder Brightness → MANUAL → +1</p>	<p>I find that the factory default for LCD and EVF brightnesses to be a tad too dark. (Section 11.1)</p>
<p>MENU →  2 → Auto Review → Off</p>	<p>Although being able to see the shot you just took is a GREAT idea ("Did that person have their eyes closed?"), when you're shooting kids it can mean missing the next great shot. So I make sure this feature is OFF and I'm always ready to take the next shot. (Section 7.7) (When not shooting kids I keep this set to "10 seconds" so I have enough time to turn the camera around and show my subjects without having to press any buttons.)</p>
<p>MENU →  2 → Mode Dial</p>	<p>I find those "help" screens annoying.</p>

Guide → Off	Therefore, you shouldn't want them either. ☺ (Section 11.8).
MENU →  1 → Playback → Display Rotation → Off	When playing back vertical images, I want the picture to fill the entire display (instead of looking at a correctly-oriented postage stamp). I'll happily rotate the camera 90 degrees if it means I can look at large versions of vertical images.
MENU →  3 → Focus Mode → DMF	After the camera autofocuses, it switches to manual focus automatically (I'll explain why in a minute) (Section 6.14)
MENU →  2 → Peaking Level → Mid MENU →  2 → Peaking Color → Yellow	When in Manual Focus mode, the "Peaking" function highlights the areas that are in focus using a bright color of your choice. (In my case, yellow.) (Section 7.9)

The last two settings, when combined, make for a wonderfully stress-free experience when you're shooting things quickly. Recall that the peaking function shows you what's in focus (or, more accurately, it shows you the high contrast areas which the camera uses to determine focus) when you're in Manual Focus mode. And the "DMF" setting tells the camera to immediately go into Manual Focus mode just as soon as it gets focus confirmation. With this setup, as soon as you do a focus lock, you see instantly what the camera decided to focus on. DMF + Peaking Color let me know very quickly if the camera got it wrong so I can re-focus and shoot if I need to.

Okay, one more:

Menu →  3 → Focus Mode → Continuous AF	Lock-on AF is a sophisticated feature where the camera will automatically lock-on and start to track to focused-upon object. When you invoke the "Lock-On AF" feature using the menu you can use the Right and Left arrow buttons to choose your focus area (Start with Wide to get a feel of how this works.) Again, this is great with the kids and
Menu →  3 → Focus Area → Lock-On AF (Wide)	

	you're not giving up Face Detection in order to use it!
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There are other settings as well that I personally use, and they're all listed at the end of this chapter, along with section references which provide a detailed explanation of what every feature does and why I prefer certain settings in different circumstances.

2.4 SUGGESTED CONFIGURATION FOR SHOOTING KIDS AND PETS

Here's a combination of settings that I use when photographing the grandkids (or their pets). This is the Friedman Archives equivalent of Sports Action mode but I can specify a low ISO value if I want to for higher image quality:

Program Mode with ISO Auto Min. SS = 1/125 th of a second	"P"rogram mode in low light will drop the shutter speed to 1/60 th of a second (sometimes slower), unacceptably slow for kids who don't pose. And so the new MENU → 📷 5 → ISO Auto Min. SS will specify the LOWEST shutter speed the camera is allowed to use in an auto exposure mode before raising the ISO. (Section 6.23)
Continuous autofocus (AF-C)	Menu → 📷 3 → Focus Mode → AF-C (Continuous AF)
Continuous Advance Low	Menu → 📷 2 → Drive Mode → Cont. Shooting (or via the Fn menu or via the left arrow button)
AF area = Wide	Menu → 📷 3 → Focus Area → Lock-on AF - Wide (or via the Fn menu)
ISO to something reasonable	Menu → 📷 5 → ISO → [800 or below if you can]. (or via the Fn menu)
Face Detection = On (and Smile	MENU → 📷 7 → Smile / Face Detection

Shutter = OFF)	→ Face Detection On
Eye AF assigned to the AF/MF button	MENU → ⚙ 7 → Custom Key Settings -> 2 → AF/MF Button → Eye AF
Silent Shooting OFF	MENU → ⚙ 5 → Silent Shooting → OFF (Because when it's ON there's about a 100ms additional delay).

2.5 SUGGESTED CONFIGURATION FOR VIDEO

Here it's tough to make general recommendations since everyone who wants to shoot video all have different levels of experience and need for automation. So what I suggest below is merely a starting point.

If you're shooting 4K:

- **MENU → 📷 2 → File Format → XAVC S 4K**
- **MENU → 📷 2 → Record Setting → 30p 60M**

If you're not shooting 4K:

- **MENU → 📷 2 → File Format → XAVC S HD**
- **MENU → 📷 2 → Record Setting → 60p 50M**

MENU → 📷 8 → Movie → (select P, A, S, or M for movie mode. I can't make all your decisions for you. ☺)

MENU → ⚙ 6 → APS-C / Super 35m = on (Best video quality when capturing the image from the center of the sensor)

MENU → ⚙ 3 → Zoom Setting → Digital zoom (I'll explain why in a minute)

Button Customization (via **MENU → ⚙ 7 → Custom Key Settings**):

- Custom Button 2 = "Movie" (Much easier to actuate than the red button built into the back corner of the camera)
- Right Button = Zoom. When enabled press the right button once again for a very smooth power zoom simulator while shooting. No image quality penalty with this trick.
- Left arrow - Focus Mode = set to either MF or AF-C

- Down – focus magnifier (for when you're focusing manually. Peaking level and peaking color will also be helpful here.)

Zebra stripes are optional

2.6 SUGGESTED CONFIGURATION FOR SHOOTING PORTRAITS

Here's an unobvious yet very useful configuration when shooting portraits. If you're like most users, you'll autofocus on the subject just before you take the picture – *each and every time you take a picture*. Kind of wasteful since the distance between the camera and the subject isn't changing. It makes sense to just focus once, and then you're always ready to shoot the instant the expression is genuine. Then you only need to focus again should the camera-to-subject distance change.

I find this combination of settings is great in this scenario:

- **Fn → Focus Mode → MF** (Manual Focus)
- **MENU → ⚙️ 7 → Custom Key Settings → AF/MF button → AF/MF Control Hold** (usually I set it to AF/MF Control Toggle)
- **Fn → Focus Area → Flexible Spot** (and choose an AF point closest to the eyes)

When you're ready to start shooting, move the AF point over the eyes and press the AF/MF button (make sure the lever is in the “up” position!) until autofocus is achieved. Then let go of the button and shoot away. Did the model move, or you change position? Just press the AF/MF button momentarily to re-focus again. This is much faster than any other AF/MF switching method I've ever used.

TIP: *I've used the above technique for years to get great portraits in the studio. Regretfully there's no way to have it work with Eye AF; however because you're using a small AF area and are telling the camera what to focus on, the results should be identical.*

2.7 SUGGESTED CONFIGURATION FOR LEGACY GLASS

I actually make these recommendations in Section 4.1.1 for manual focus legacy glass, and Section 4.1.2 for autofocus lenses.

But I will re-emphasize the usefulness of assigning the Focus Magnifier function to the DOWN arrow button – this way your thumb will be well-positioned to operate the arrows and center button once the function is invoked.

2.8 WHAT'S INCOMPATIBLE WITH RAW?

I give a good introduction to the benefits of shooting RAW in Chapter 15, but the A7r II offers many advanced bells-and-whistles which are incompatible with RAW mode. And some of them aren't invocable while in RAW, while others will silently switch to .jpg shooting while you invoke them and then switch back when you're finished. Which features are incompatible with RAW, and how does the camera behave for each? A comprehensive table appears below:

Function	The camera switches to JPG automatically	The camera prevents you from invoking it
Multi-Frame Noise Reduction (MFNR)		✓
High-Dynamic Range		✓
Handheld Twilight	✓	
Anti-Motion Blur	✓	
Soft Skin effect		✓
Auto object framing		✓
Sweep Panorama mode	✓	
Image Size		✓ (RAW only)
Picture effects (all of them)		✓
Clear image zoom / Digital zoom		✓

Long Exposure noise reduction		✓
High ISO noise reduction		✓ (RAW only)

(Items labeled “RAW Only” mean the feature is still selectable if you have RAW+JPG enabled, but the effect applies only to the .jpg.)

2.9 MY PERSONAL CAMERA SETTINGS



I know there are a lot of features to absorb and settings to understand with this camera. And I’ll try to explain each one to you properly throughout the course of this book. But, I know from history that the most often-referenced part of my previous books has been “My Personal Camera Settings”, and so I’m including them up front here just to give you a jump-start and help walk you through some of the features at the same time. Of course I change these settings a lot depending on what I’m shooting, the light level, and the effect I want to achieve. But these represent my “standard” configuration.

Recording Menu 1

Function	Setting
Image Size	L: 42 M (It’s always best to shoot at the highest quality and resize later) (Section 6.1)
Aspect Ratio	3:2 (I’d shoot 16:9 if I knew my work would only be seen on an HDTV. But 16:9 actually chops off part of the picture. More is better.) (Section 6.2)
Quality	Usually RAW+JPG (although for casual shots I’ll shoot X.FINE whose quality is amazingly good. (Section 6.3).
Panorama: Size	Wide. (Available only when Panorama mode is selected on the mode dial.) (Section 6.5)
Panorama: Direction	Either Right or Down depending on the aspect ratio I’d like to get. (Available only when Panorama mode is selected on the exposure mode dial.)

	(Section 6.5)
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Recording Menu 2

Function	Setting
 File Format	This lets you select which of three movie formats to use. If I'm not shooting 4K my everyday video mode is now XAVC S HD. (Details and tradeoffs explained in Section 6.5)
 Record Setting	This lets you choose more detail for the "(Movie) File Format" setting above. If I have XAVC S HD selected, then I choose "60p 50M" (Section 6.7)
Dual Video REC	If you have the (Movie) File Format set to either AVCHD or XAVC S (4K or HD), then this feature will record TWO video clips to the memory card: one high quality, one low quality for uploading to social media. (Section 6.8)
Drive Mode	"Single Shooting", unless I'm shooting either sports or children, in which case it's "Continuous Lo" (with a lot of image deletions afterward). (Section 6.9)
Bracket Settings	Lets you invoke self-timer when shooting in a bracketing mode (mine is OFF), and also specifies bracketing order (I have it set to "0" first.) (Section 6.10)

Recording Menu 3

Function	Setting
Flash Mode	"Fill-Flash" serves 99.999% of my onboard flash needs. (Wireless flash serves the other 99.99%. 😊) (Section 6.11)
Flash Compensation	I keep this set to "0" most of the time, but sometimes when I don't want the fill flash to call attention to itself I might set it to -1. (Section 6.12)
Red Eye Reduction	I hate this feature. "Off". (Section 6.13)

Focus Mode	I usually keep it set to DMF (which confirms focus using Peaking level, as described in Section 2.3 and also in Chapter 3). If I'm shooting anything that moves, such as kids or pets (or even sports), I set it to AF-C (Continuous). (Section 6.14)
Focus Area	Lock-on AF - Wide. With Face Detection enabled, it does an outstanding job of being a point-and-shoot. When I'm making a more careful composition, I'll switch to "Center" and use the old Focus-Lock-Recompose-Shoot method. (Section 6.15)

Recording Menu 4

Function	Setting
Focus Settings	This is just another way to get to the Focus Area function above. When you get there you adjust the Focus Area rotating the controller wheel rather than pressing the 4 arrow keys. When assigned to a button this feature does different things when you switch to Manual Focusing mode or if you have legacy glass attached. (Section 6.16)
AF Illuminator	This specifies whether the red/orange lamp in front of the camera should turn on when the ambient light is too low for focusing. I keep it set to AUTO. (Section 6.17)
AF Drive Speed	When shooting video, do you want a slow AF that doesn't call much attention to itself, or a fast that might be visually distracting? I choose "normal" most of the time. (Section 6.18)
AF Track Sens	Tells the camera how aggressive it should be in tracking moving subjects in movie mode. I choose "Normal" unless I'm shooting sports. (Section 6.19)
Exposure Comp.	I don't know why this is in a menu – the camera has a dedicated exposure compensation knob right on top! Anyway, Exposure Compensation is usually

	set to zero and I change it based on the effect I'm trying to achieve. (Section 6.20)
Exposure Step	When adjusting the exposure compensation via the menu (not the dedicated dial), do you want each wheel click to change by 0.5 stops or 0.3 stops? I choose 0.3 EV (personal preference) (Section 6.21)

Recording Menu 5

Function	Setting
ISO	My default setting is usually Auto (with boundaries set from 100 to 3200), then that's one of the first things I'll change in the process of making the shot better. (Section 6.22).
ISO Auto Min. SS	When in "P" or "A" modes and ISO is set to AUTO, lets you specify the slowest shutter speed the camera is allowed to use before starting to bump up the ISO. I have mine set to "Std". Sometimes I'll bump it to 1/125 th when shooting the kids indoors. (Section 6.23)
Metering Mode	Multi (short for "Multi-Segment Metering"; akin to Nikon's Matrix Metering or Canon's Evaluative metering). If the lighting is tricky and the Multi meter gets the exposure wrong, I'll lock the exposure via AEL Toggle button and then make it brighter or darker via the exposure compensation wheel. (Section 6.24)
White Balance	I keep this on AWB as my default. If the lighting is tricky, I'll just shoot in RAW and fix it later. (or use Custom White Balance if you don't like RAW processing. ☺) (Section 6.25)
DRO / Auto HDR	My default setting is D-Range Optimizer Auto ("DRO", which is the factory default). (Chapter 14 talks about this topic in detail.)
Creative Style	I keep mine set to Standard. My preference is to do any image tweaking by computer rather than

	using these Creative Style settings. (Section 6.27)
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Recording Menu  6

Function	Setting
Picture Effect	“Off”. (See above explanation for “Creative Style”). (Section 6.28)
Picture Profile	Analogous to "Creative Styles", Picture Profiles contain a collection of tweaks for video. This is where the camera's most noteworthy video feature, the "S-Log2 Gamma curve", resides. (Section 6.29)
Zoom	This feature does a “digital zoom”, cropping away valuable pixels in order to simulate zooming in, then it upsizes them back to 42 megapixels. I never use this feature in taking stills, but it provides a penalty-free smooth zoom feature when shooting movies. (Section 6.30)
Focus Magnifier	This isn’t a parameter, it’s a command and it’s only available in Manual Focus or DMF mode. It tells the camera to magnify the image so you can do critical manual focusing. Ideal for using legacy glass. (Section 6.31)
(Picture) Long Exposure NR	Reduces noise for exposures longer than 1 second using a technique called Dark Frame Subtraction. On, unless I’m shooting fireworks. (Section 6.32) (This item is greyed out if Continuous shooting or other multi-shot modes are selected.)
(Picture) High ISO NR	This function applies some noise reduction to .jpg images when the ISO is above 1600. I keep mine set to Low because too much NR results in a “watercolor” effect. (Section 6.33)

Recording Menu  7

Function	Setting
Center Lock-on AF	This is a feature which can track brightly-colored objects that move slowly across the screen. Unlike Lock-On AF in the Focus Area menu, this works in movie mode but requires some manual intervention to make it work properly. (Section 6.34)
Smile / Face Detect.	Face Detection On (This is a useful feature!) (Section 6.35) You can also enable the Smile Shutter from this menu, which is something I never use.
(Picture) Soft Skin Effect	Off. This is designed to help smooth over blemished faces in-camera. Try keeping it "on" if you're shooting teenagers. (Not available when continuous shooting or other multi-shot modes are selected) (Section 6.36)
(Picture) Auto Object Framing	Off. (Menu item only available when Autofocus Area = Multi and Drive Mode = Single Shooting). This saves two pictures on the memory card: Your original composition, and one that the camera tries to crop, applying some intelligence to place the subject according to the Rule of Thirds. Do I really want my camera composing for me too? (Section 6.37)
Auto Mode	When the exposure mode dial is set to the green AUTO position, this lets you choose between "Intelligent Auto" and "Superior Auto". Although I don't use AUTO much, I keep this on "Intelligent Auto" for times when I hand the camera to someone to take our picture. (Section 6.38)
Scene Selection	Allows you to change the scene selection when in SCN mode. (Is greyed out unless the Exposure Mode dial is set to "SCN".) (Section 6.39)

Recording Menu  8

Movie	(Available when the exposure mode dial is set to  (Movie) mode). Lets you choose between P, A, S, or M when shooting video. (Section 6.40)
SteadyShot	ON unless my camera's on a tripod. (This setting applies to stills only.) (Section 6.41)
Steadyshot Settings	These features tweak the behavior of the In-Body Image Stabilization, especially when using legacy glass. (Section 6.42)
Color Space	sRGB. AdobeRGB is for experts who expect their images to be printed via a CMYK print process. (Section 6.43)
(Movies) Auto Slow Shut.	Enables a slower shutter speed when shooting movies in certain situations. I keep it set to "On". (Section 6.44)
Audio Recording	Do you want audio with your video? I choose "On". (Section 6.45)

Recording Menu  9

Audio Rec Level	This brings you to a screen that lets you set audio levels for an external microphone (Not available unless the exposure mode dial is set to "Movie"). (Section 6.46)
Audio Out Timing	This one's a tough one to explain. It's useful when you're shooting a music video and the actors are lip syncing and you're monitoring the audio using a headset. Just set it to "Live", the factory default. (Section 6.47)
Wind Noise Reduct.	Cuts out the lower frequencies where wind noise usually occurs. Usually I set this to OFF unless it's actually windy, since it can make the sound track sound a little "tinny" by taking away all the bass. (Section 6.48)
Memory Recall	Only active when the exposure mode dial is set to

	"1" or "2". It shows you which of six memory locations you're using, and then lets you change to another one. (Section 6.49)
Memory	Stores the current camera configuration into one of six memory slots (two of which are stored in the body). (Section 6.50)

Custom Menu 1

Function	Setting
Zebra	This feature is a handy way to know ahead of time what's going to blow out, or whether a Caucasian face is well-exposed. I keep it OFF most of the time but it can be a handy feature in situations with a lot of backlight. (Section 7.1)
(Picture) MF Assist	When you're in Manual Focus mode, this tells the camera to magnify the viewfinder so you can more easily perform critical focusing. I keep this set to On. (Section 7.2)
Focus Magnif. Time	For how long do you want the magnification in the MF assist feature (above) to stay on? I choose 5 Sec. (Section 7.3)
Grid Line	You can have a compositional aid grid appear superimposed over your live view image. I personally prefer "Rule of 3rds Grid". (Section 7.4)
(Movie) Marker Display	Enables or disables video compositional aids as specified by the "Marker Settings" feature below. (Section 7.5)
(Movie) Marker Settings	Selects one of several video compositional aid overlays to be shown when "Marker Display" is enabled. (Section 7.5)

Custom Menu 2

Function	Setting
Audio Level Display	Do you want the audio levels to show on your LCD display during recording? In my case “On”. (Applies only when the exposure mode dial is set to “Movie”.) (Section 7.6)
Auto Review	Do you want the camera to show you the image you just took? I keep it “Off” when shooting kids, and you can’t be ready for the next shot if you’re looking at what you just took. For all other situations I keep this set to 10 seconds because I’m an instant-gratification kind of guy. (Section 7.7)
DISP Button	Lets you specify which of several information screens to cycle through on the LCD each time you press the “DISP” button. (Section 7.8)
Peaking Level	A great manual focusing aid – all the areas that are in focus are “lit up” in Live View. I keep this set to “Mid”. (Section 7.9)
Peaking Color	Used in conjunction with Peaking Level above. Specifies which color to display when things are in focus. I prefer Yellow unless my subject is yellow. (Section 7.9)
Exposure Set. Guide	This determines whether a fancy ribbon display appears when you change things like shutter speed and f/stop in certain modes. It doesn’t do anything useful but it does look pretty. I keep it OFF because when I’m in manual exposure mode and adjusting the f/stop and shutter speed, this ribbon blocks the histogram so I can’t see what I’m doing. (Section 7.10)

Custom Menu 3

Function	Setting
Live View Display	Do you want live view to show you how your image will look before you shoot? Turn “Setting Effect

	ON". (The main reason to turn it OFF is if you're shooting with studio strobes.) (Section 7.11)
Disp. Cont. AF Area	Lets you see the individual phase-detect AF points at work when the camera's focusing mode is set to AF-C. (Section 7.12)
Phase Detect. Area	This shows you a large set of brackets indicating where all of the camera's phase-detect pixels reside. I keep it "off" because if I'm going to be tracking a moving subject I'm going to naturally keep the subject more-or-less centered anyway. (Section 7.13)
(Picture) Pre-AF	Do you want the camera to start focusing even before you press the shutter release button halfway? I actually keep this ON (again, because I shoot family members). Yes, it uses a little more battery power but it's a trivial amount compared to what the camera does to create the Live View image. (Section 7.14)
Zoom Setting	Lets you choose between optical zoom and 2 kinds of digital zoom. I'm not a snob; I have this set to "On:ClearImage Zoom" because when used with the "Zoom" feature this can provide a smooth zoom during movie making. (Section 7.15)

Custom Menu 4

Function	Setting
Eye-Start AF	[This only works when you have an A-mount lens attached via the LA-EA2 or LA-EA4 adapter.] Do you want the camera to start finding focus as soon as you bring the viewfinder up to your eye? I disable this feature because the extra battery drain can be excessive. (Section 7.16)
FINDER / MONITOR	This setting determines whether you let the camera switch between the EVF and the LCD automatically or not (Section 7.17). Having it set to

	“Viewfinder” can be a nice battery saving technique – no displays will be on unless there’s something close to the eyepiece. But most of the time I have it set to Auto.
Release w/o Lens	“Enable” because I like watching the shutter work with the lens removed. ☺ Also it will allow the camera to work with a non-native lens attached via a "dumb" adapter (Section 7.18)
Release w/o Card	Do you want the camera to take a picture if there's no card inserted? I recommend "Disable" unless you’re writing a book on the camera. (Section 7.19)
Priority set in AF-S	Lets you select between “Only take a picture if the camera thinks the subject is in focus” and “Take the picture NOW, damn you!!” I prefer "Release" (Section 7.20)
Priority Set in AF-C	Same as above, except it specifies the behavior for AF-C focusing mode. (Section 7.20)

Custom Menu 5



AF w/ Shutter	Should pressing the shutter release button halfway lock the focus? I like mine “On”. (Section 7.21)
(Picture) AEL w/ Shutter	Should pressing the shutter release button halfway lock the exposure as well as the focus? I like mine “On”. (Section 7.22)
Silent Shooting	Do you want the camera to take a picture without using the mechanical shutter (so it's more quiet?) Off when timing is crucial; on when discreetness is crucial. There are more tradeoffs. (Section 7.23)
e-Front Curtain Shutter	Long story on this one. Keep this set to “On” unless you’re experiencing occasional mysterious overexposures with non-native lenses. (Section 7.24)
S. Auto Img. Extract	When in Superior Auto mode, gives the camera permission to throw away all but the “good shot”

	when it decided to shoot multiple exposures on its own. I tend to never use Superior Auto mode, so I never bothered changing this setting from “Auto”. (Section 7.25)
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Custom Menu 6

Exp.comp.set	Do you want the exposure compensation function to adjust for ambient light only, or ambient and flash together? I prefer “Ambient Only” and I’ll control my flash intensity using the “Flash Exposure Compensation” function. (Section 7.26)
Reset EV Comp.	This is an obscure one. You know how you can change the exposure compensation using either the dedicated dial or one of the menu functions? This says “If you change it via the menu, to you want it to reset to 0 every time you turn the camera on, or keep it where it was?” This setting doesn’t matter to me because I only use the dial; however in theory there will be less potential for confusion if this were set to “Reset”. (Section 7.27)
Face Registration	Tells your camera to give AF preference to the 8 faces you can register with this function. (Section 7.28)
APS-C / Super 35mm	Lets you force the camera to shoot either full-frame or in cropped mode (ideal when shooting 4K videos or attaching APS-C sized lenses). (Section 7.29)
AF Micro Adj. (LA-EA4 adapter only)	Invokes a feature which can correct for focusing problems when using certain A-mount lenses via an LA-EA2 or LA-EA4 adapter. (Section 7.30)

Custom Menu  7

Lens Comp.	Allows you to enable or disable corrections for known deficiencies in certain lenses. I keep all 3 settings set to "Auto". (Section 7.31)
AF System	Lets you choose between Phase Detect only, or Contrast Detect only, when you've attached an A-mount lens using an LA-EA1 or LA-EA3 adapter. (Section 7.32)
Video Light Mode	Dictates how and when certain accessory Video Lights will illuminate when mounted on the MIS hot shoe. I choose "REC Link" for family movies. (Section 7.33)
Function Menu Settings	This lets you change the 12 functions in the Fn menu. (Section 7.34)
Custom Key Settings	This lets you assign different functions to the camera's reassignable buttons. (Section 7.35)
Dial Setup	This function lets you swap the roles of the front and rear control dials. I prefer  SS  F/no. (Section 7.36)

Custom Menu  8

Dial EV Comp	This lets you reassign the front control dial to "Exposure compensation", a customization which helps me work very fast with all of my other cameras. However, the A7r II has a dedicated exposure compensation dial! So I keep this set to OFF. (Section 7.37)
Zoom Ring Rotate	When a power zoom lens is attached, you can change whether the lens zooms in or out when you rotate the zoom ring. The factory default is most natural to me. (Section 7.38)
MOVIE Button	When set to "Movie Mode Only" it can help prevent accidental movies. I never hit that red button accidentally and so I keep this set to

	"Always" (Section 7.39)
Dial / Wheel Lock	"Unlock". Lets you lock the rear wheel so as to prevent accidental changing (to be frank, this can sometimes be a legitimate problem.) (Section 7.40)

Wi-Fi Menu 1

Function	Setting
Send to Smartphone	Not a setting; this initiates sending a photo (or photos) to your smartphone via Wi-Fi (Section 8.1).
Send to Computer	Not a setting; this initiates sending a photo(s) to your computer via a local Wi-Fi Router (Section 8.2).
View on TV	Not a setting; initiates viewing of photos on a Wi-Fi enabled TV (Section 8.3).
One-Touch (NFC)	What app do you want the camera to start when you bump it with your phone? I have it set to "Smart Remote Control" (so I can control the camera with my smartphone). (Section 8.4)
Airplane Mode	Disables ALL Wi-Fi sending or receiving (even that of an Eye-Fi card, if inserted) (Section 8.5).

Wi-Fi Menu 2

Function	Setting
WPS Push	Some Wi-Fi access points have a mechanism called "WPS Push" that makes it easy to pair (to borrow a Bluetooth term) camera to the access point. If yours has it, use this feature to get you going. (Section 8.6)
Access Point Settings	Lets you manually choose which Wi-Fi access point to connect to. (Section 8.7).
Edit Device Name	Change how your camera appears to other Wi-Fi devices (I think the default "ILCE-7RM2" is pretty descriptive) (Section 8.8)

Disp MAC Address	Every Ethernet device (yes, Wi-Fi is built upon TCP/IP protocols which in turn is built atop of Ethernet protocols) has its own globally unique ID. This function shows it to you. (Section 8.9).
SSID/PW Reset	This “unconnects” a previously paired smartphone or Wi-Fi router (Section 8.10).
Reset Network Set.	Kind of self-descriptive. Resets all of the Wi-Fi settings to factory defaults. (Section 8.11)

Apps menu 1

Function	Setting
Application List	Lists all the apps in your camera, either pre-installed or downloaded via sony.net/pmca. (Section 9.1)
Introduction	This is the first step in acquiring downloadable applications to your camera. (Section 9.2)

Playback menu 1

Function	Setting
Delete	Delete one or many images. (Section 10.1)
View Mode	Do you want to playback things only of a certain file type? (i.e., stills, .mp4, XAVC S, or AVCHD videos? I set DATE VIEW (which means you can peruse everything in reverse chronological order). (Section 10.2)
Image Index	Allows you to choose between showing 9 or 25 images on a screen when playing back in Index mode. (Section 10.3)
Display Rotation	“Off” means I see every picture as largely as possible. (“Auto Rotate” will try to rotate vertical pictures and make them look smaller on the screen, which may be good when viewing your pictures on an HDTV.) (Section 10.4)

Slide Show	Automatically runs through your still images every few seconds. Ideal when hooked up to an HDTV. (Section 10.5)
Rotate	It's a command; not a setting. Takes you to a screen where you can manually rotate a playback image. (Section 10.6)

Playback menu 2

Function	Setting
Enlarge Image	Not a setting; it will play back the most recent photo and let you zoom in and around. (Normally I just hit the C3 button while playing back to zoom in and use the arrow buttons to move around – much faster than digging up a menu.) (Section 10.7)
Protect	Protect individual images from accidental deletion while they're in the camera. (Section 10.8)
Specify Printing	Lets you control what gets printed when you hook up your camera or insert your memory card into a compatible inkjet printer. (Section 10.9)

Toolbox menu 1

Function	Setting
Monitor Brightness	I prefer "Manual" set to +1. I set it to "Sunny Weather" on bright days or just use the EVF (Section 11.1)
Viewfinder Brightness	Same as above but only for the built-in EVF. Again, I prefer "Manual" set to +1. (Section 11.2)
Finder Color Temp.	Lets you add either a hint of blue or yellow to the EVF to help match it to the LCD. I don't see a color-mismatch problem on mine so I keep it to "+/- 0". (Section 11.3)
Volume Settings	How loud is the volume when you're playing back movies? (I set mine to "7".) (Section 11.4)

Audio Signals	Enables / Disables audio feedback during camera operation. I prefer my camera to remain as quiet as possible (“Off”). (Section 11.5)
Upload settings (Eye-Fi card only)	This only appears if you have a 3rd party SD card called “Eye-Fi” inserted. (That’s right – even though the camera has this feature built-in, the legacy code to handle Eye-Fi cards has been retained!) Enables or disables transmitting of the Eye-Fi card only. (Keep it on unless you’re on an airplane.) (Section 11.6)

Toolbox menu 2

Function	Setting
Tile Menu	Do you want to enable one of the last holdouts of the experimental user interface that graced the original NEX cameras that experienced users despised? Then turn this On. (Section 11.7)
Mode Dial Guide	This enables one-line “help” memory jogs which you may not find very useful. Mine’s set to “Off”. (Section 11.8)
Delete Confirm.	This can save you one step when deleting an image from the memory card. I prefer “Delete’ first”. (Section 11.9)
Display Quality	This changes the resolution of the live view image being sent to the EVF (only). It uses 20% more battery power and the amount of improvement is trivial. I keep it set to Standard which extends the life of the undersized battery. (Section 11.10)
Power Save Start Time	How long before the camera shuts itself off? My preference is 1 minute unless I’m shooting pictures for this book. ☺. (Section 11.11)
NTSC / PAL Selector	Sets the video mode, which is country dependent. Set this to NTSC if you’re in North America, PAL for almost everywhere else. (Section 11.12)

Toolbox menu  3

Function	Setting
Cleaning Mode	Vigorously shakes the sensor in order to loosen (and hopefully shake off) any dust particles that might have accumulated while changing lenses. (Section 11.13)
Demo Mode	Always greyed out. Is designed for retailers. You can safely ignore this.
TC/UB Settings	Configures the camera's myriad of Time Code and Userbit settings for video (Section 11.15)
Remote Ctrl	Do you want to enable the camera's Infrared received so you can use the infrared remote control? It consumes extra battery so I always keep this "Off" unless I'm actually using it. (Section 11.16)
HDMI Settings	Brings you to three HDMI-related menus, including one that controls resolutions. (Section 11.17)
(Movie) 4K Output Select	Do you want your 4K movies recorded on the memory card, to an external recorder, or both? Option is greyed out if no external recorder attached. (Section 11.18)

Toolbox menu  4

Function	Setting
USB Connection	How do you want your camera to appear to your computer when tethered via USB? I go for "Mass Storage" and I explain why in Section 11.19. (There's also an option to have it controlled by your computer via USB, although there's no live view.)
USB LUN Setting	This has to do with the fact that the camera can appear as multiple devices when plugged into your computer. It was once used to distribute Sony's PlayMemories Home software but now just contains copyright notices. I have it set to "Single"

	and you should too. (Section 11.20)
USB Power Supply	Enables / Disables the ability to use the camera as a camera when hooked up to an intelligent device like a computer. (Normally it automatically becomes a mass storage device.) (Section 11.21)
Language	Duh! (Section 11.22)
Date/Time Setup	Lets you set the date and time. (Section 11.23)
Area Setting	Lets the camera know what time zone you're in. (It needs this information so it can automatically switch to Daylight Savings time.) (Section 11.24)

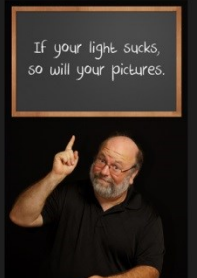
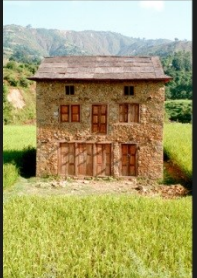
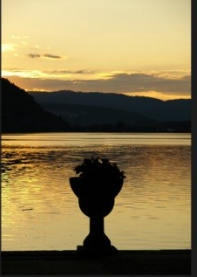
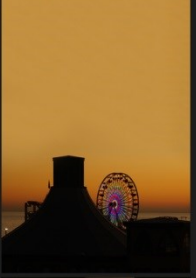
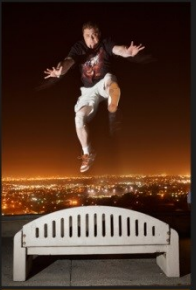
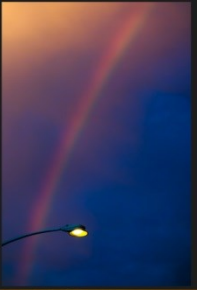
Toolbox menu 5

Function	Setting
Copyright Info	Lets you "hard code" the name of the photographer and the copyright holder into the EXIF information of every picture taken. (Section 11.25)
Format	Quickly erases all images and movies from the card. This is my preferred method of erasing the card. (Section 11.26)
File Number	Specifies whether the camera resets the file number scheme when you change memory cards. I prefer "Series". (Section 11.27)
Select REC Folder	If there is more than one directory for holding still images on the memory card, this function lets you choose which one future images will be stored in. (Section 11.28)
New Folder	Create a new folder to hold new stills. (Section 11.29)
Folder Name	Lets you choose between a cryptic-looking folder name, and one containing the date the images were shot (but in a format that is not computer-sortable). I prefer "Standard Form". (Section 11.30)

Toolbox menu  6

Function	Setting
Recover Image DB	Attempts to recover from a corrupted movie database while it's still on the card. (Section 11.31)
Display Media Info.	Shows you approx. how many more stills can fit on the card, or how many more minutes of video will fit based on current settings. (Section 11.32)
Version	Displays the firmware version of the camera (Section 11.33)
Setting Reset	Resets some or all of the camera settings. (Section 11.34)

Well, that's about it for the general introduction. Now, on to specifics!



Chapter 3 QUICK GUIDE FOR THE IMPATIENT USER

YES, IT'S BASIC, BUT I'LL BET YOU'LL LEARN AT LEAST ONE NEW THING BY READING THIS CHAPTER. ☺

3.1 THE TWO AUTO MODES

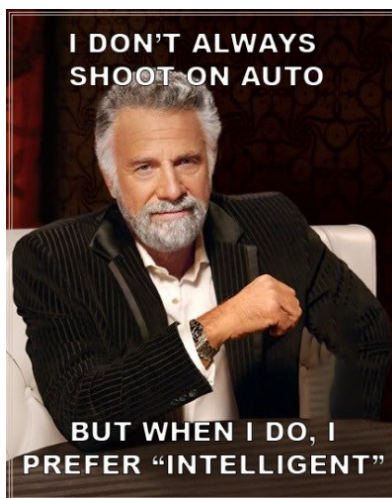
If you're an AUTO mode snob, feel free to skip to the next section. I find it handy whenever I had the camera to someone else and say, "Please take a picture of us".

Yes, there is one AUTO setting on the exposure mode dial (**Figure 3-1**), but it will invoke one of two AUTO modes depending upon how **MENU** → **7** → **Auto Mode** is configured. You can choose between "Intelligent Auto" and "Superior Auto". Here's what they each do:

3.1.1 "INTELLIGENT AUTO"

In a completely ironic and self-referential way, the Intelligent Auto setting turns your expensive camera into a high-quality point-and-shoot. This setting will reset almost every user-changeable feature, so you can shoot the moment and not have to worry about, "Did I remember to reset mode Q?" Once you're finished shooting, you can move right back to your previous exposure mode (probably P, A, S, or M) and all of your previous settings are restored.

Intelligent Auto mode is ideal when handing the camera to someone else to take a picture of you.



Here is a summary of what happens to the camera's settings when you go into Intelligent Auto mode (don't worry; many of these concepts will be explained more thoroughly in this chapter and in Appendix A):

- Metering gets set to Multi-segment
- Focus Area gets set to Wide-area
- Flash compensation reset to 0
- Exposure compensation reset to 0
- White balance gets set to Auto
- ISO (the camera's sensitivity to light) gets set to "Auto" (which in this case means between whatever you set the limits at when you were in P/A/S/M mode).
- Creative Style mode gets set to "Standard"; contrast, sharpness, saturation all reset to 0
- High ISO Noise reduction reset to Normal
- Long exposure Noise Reduction reset to ON.

Features that are NOT reset are:

- Focus Mode – If you put the camera into Manual Focus Mode, AUTO will not override it. On the other hand, if you set it to AF-C (continuous focusing mode, for sports), Auto gets that changed to AF-S (Single-shot).
- Image Quality – if you were shooting RAW before, it will still shoot RAW in AUTO mode. (Not typical of a point-and-shoot!)
- Image Size (Large, Medium, or Small)
- Red Eye Reduction mode
- Aspect Ratio (3:2 or 16:9)

3.1.2 "SUPERIOR AUTO"

Superior Auto does the same thing as Intelligent Auto, but in addition it will automatically decide whether or not to invoke one of several advanced shooting modes that will be discussed in detail later on.



Figure 3-1: One AUTO mode position; two possible AUTO modes selectable.

This camera also offers Scene Selection modes (where you tell the camera the kind of picture you're taking, and it will make the necessary adjustments for you). AND it offers Über modes like High Dynamic Range shooting, Handheld Twilight, and other functions where the camera takes several sequential pictures and then aligns and merges them in-camera as a means of dealing with difficult light. I like these features a lot. And it's true that you do have to understand what they do technically in order to know when to invoke them.

But what if you didn't even want to understand what those functions did in order to benefit from them? Extrapolating this thought process further, what if you didn't even want to know WHERE these functions existed in the menus in order to invoke them?

Welcome to Superior Auto mode, where the camera will analyze the scene you're looking at, figure out which of the advanced scene modes is appropriate (listed below), and then automatically invoke it for you. It's a point-and-shoot on steroids!! With this mode, you can get all the advanced benefits your camera has to offer, without really needing to know much about your camera. Just be aware that there will be times when you think you're going to take one picture but the camera will take three or six (and then say "Processing..." for five seconds, preventing you from getting the next shot) (**Figure 3-2**). You'll get used to that, and as long as you're not shooting sports or kids you'll thank the camera for taking better pictures than your friends were able to get with their pedestrian mobile phones.

Although it may not mean much to you now, here's a list of the different shooting modes that Superior Auto is capable of invoking on its own:

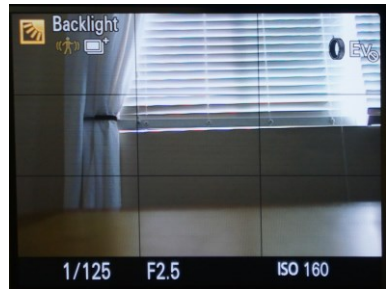


Figure 3-2: Superior Auto mode will tell you what special shooting mode it has selected, and whether it will take multiple shots (so you won't be too surprised when it happens). Here the camera's telling you it detects a backlit object, that it thinks the subject is moving (it's not), and that it will take multiple pictures to handle the extreme brightness range to try to make the shot look "normal".

Portrait	Infant	Night Portrait	Night Scene
Backlight Portrait	Backlight	Landscape	Macro
Spotlight	Low light	Move / Move Bright / Move Dark	Walk
Tripod			

Interestingly, there are modes here that aren't selectable from any menu, such as "Backlight Portrait", "Move Dark", and my favorite, "Infant" (!!!). And since I can't invoke these Superior Auto-only modes on command, I can't be completely sure what the camera does when it decides to use them. (I guess the joy of any "AUTO" function is that you don't really need to know.)

If this brief section left you feeling a little confused, worry not – all will be explained properly later on. It was included here because AUTO mode was designed to be effective in the hands of people who don't know what it does. In that light it makes sense to introduce it at the beginning of the chapter before I get into more of the details of your camera.

Not all scenes are recognized in all modes. For example, when Smile / Face Detection is off, then the camera will not recognize Portrait, Backlight Portrait, Night Portrait, or Infant scenes. (Got all that?)

TIP: *If you're in Superior Auto mode, if you're in RAW or RAW+JPG mode, the camera will not create composite images (making it consistent with normal RAW shooting.) Ironically, this also nullifies the differentiating feature between Intelligent Auto and Superior Auto.*

3.2 P,A,S,M MODES

Program (“P”) mode is almost identical to the regular Intelligent Auto mode described three sections ago. In Program mode, the camera does the basic decision-making for you -- it decides what combination of shutter speed and f/stop to use based upon the ambient light, the currently set ISO sensitivity, and what the lens is zoomed to. The only difference between Program and the Intelligent Auto mode is that *Program mode allows you to change all of the important settings (such as ISO, Autofocus Mode, or white balance)*, whereas the Auto modes often restrict such tweaks.

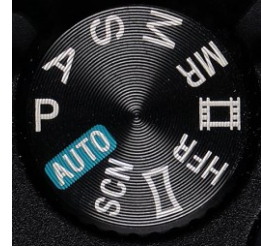


Figure 3-3: Program exposure mode.

For this reason, as you read through the rest of this book, I recommend you keep the camera set to “P”rogram mode as you try out the different features and settings. In Program mode you’ll never get a message saying “This feature is not available in this mode” (**Figure 3-4**). (Well, *almost* never. Sometimes if you’re shooting RAW you might hit a similar brick wall when trying to use some advanced features, but I’ll tell you about those where appropriate.)

What do the other modes do?

- M(annual) exposure mode lets you choose the f/stop and shutter speed yourself using the front and rear control wheels.
- A(perture Priority) exposure mode lets you set the f/stop via either control wheel and the camera chooses a shutter speed depending upon the ISO and available light.
- S(hutter Priority) exposure mode lets you set the shutter speed via either rear control wheel and the camera chooses a corresponding

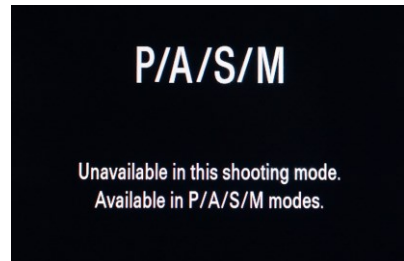


Figure 3-4: The AUTO modes will keep beginners from becoming frustrated by not allowing them to accidentally change some basic settings. Conversely, it makes non-beginners frustrated because they can’t change some basic settings.

f/stop depending upon the ISO and available light.

If you're not familiar with these basic exposure modes, Appendix A provides a Condensed Guide to the Basics.

TIP: *Successful photojournalists have a methodology that they use in the field:*

- 1) *First, just "get a shot". You may never get a second opportunity.*
- 2) *If a second opportunity presents itself, think to yourself "Okay, how can I make it better?"*
- 3) *(Repeat Step 2 several times until you're out of ideas.)*
- 4) *Finally, think outside the box and go for something unusual or "out there". (Those turn out to be the most memorable shots!)*

I live by this methodology, and that is why, no matter what camera I'm using, my default walk-around mode is "Program" mode and Auto ISO. It takes care of everything for me so I can be ready and quickly get the first shot. For Step 2 I'll often take it out of Program mode when I try to make it better: "Would it be better if I used a larger f/stop to get a blurrier background to isolate the subject?", "Would the moving subject be sharper if I used a higher shutter speed?", or "Is the light good enough so I can lower my ISO and not get too blurry a shot for my subject?" are questions I'll often ask myself for Step 2.

(Step 4 is usually synonymous with "get down on the floor and shoot up!", which you can do very easily now with the flip-out screen (or the Camera remote feature!) ☺)

3.3 FOCUSING ESSENTIALS AND FACE DETECTION

There's more to focusing than you think, and many people have been overwhelmed by the sheer number of choices and permutations. That's OK; I'm here for you and I'll explain all of it.

So let's start slowly, showing what a focus point needs in order to work properly, and then I'll expand to "how does the camera know which one to use" and finally "under what conditions will it track a subject accurately?" and "What do all the various focusing modes do?".

A single Focus Point

Let's start from the basics. This Phase Detect Array has more focusing points than any other camera ever made. **Figure 3-5** shows how these focus points are distributed throughout the viewfinder.

Each one of these focus points can detect contrast, and the phase information from the array allows the camera to know exactly how far to move the lens' optics (and in what direction) so it can focus quickly and accurately – usually without hunting.

But unlike phase-detect points in most DSLRs, the ones in the A7r II have a blind spot. To demonstrate this, let's turn on just one and do an experiment: With the exposure mode dial set to "P", do **MENU → [Camera Icon] 3 → Focus Area → Flexible Spot: S** (or access it from the **Fn** menu if it hasn't been removed via customization). This enables only ONE of the focus points – the center one initially – and everything outside that square is ignored.

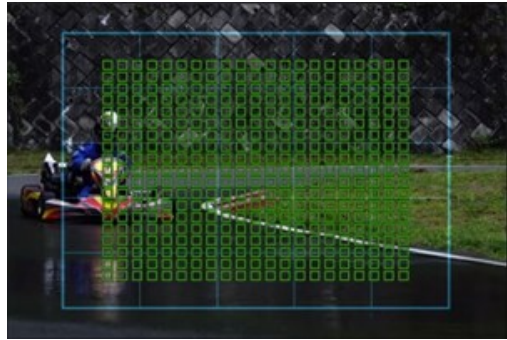


Figure 3-5: Lots-o-focus points. Each one is designed to detect vertical contrast.

If you were to point this square at a blank, featureless wall, the autofocusing would get confused and “give up” (as evidenced by a flashing green dot in the lower left-hand corner). But pointing that small rectangle toward ANYTHING that has contrast, it zeros in on it like an eagle zeros in on its prey.

At least it should. Try holding the camera in landscape (horizontal) orientation and focus on the horizontal line in **Figure 3-6**. Notice how the camera still can't seem to focus!! Now turn the camera 90 degrees to a vertical orientation and try again. Success!!

Are all of the phase-detect points blind to horizontal contrast? Try moving the flexible spot focus area around (hit the center button first so the focus area turns orange; then move it around via the arrow keys). All of the points I tried behaved identically. This is an important limitation to know!

So that's how a single focus point works. Now let's set the focus area to **MENU → 📷 3 → Focus Area → Wide**. This enables all 399 focus points.

So with all of these focus points enabled, how on earth does the camera decide which one to use for focusing? The camera can guess pretty accurately using the following method: The camera evaluates the distance behind every one of the focus points (assuming they all don't have pure horizontal contrast, that is) and then chooses the focus point on top of whatever is closest. How's that for intelligence?


Wait, I'm not done. Over the years Sony has gotten (that's a word!) good at enhancing the subject recognition algorithm by *analyzing the live view feed* and using that information to infer which of the focus points it should pay attention to. The first iteration of this was Face Detection, a feature I've grown to rely on. When this feature is enabled (**MENU → 📷 7 → Smile / Face Detection** which it is set to **ON** by default), the camera will analyze the live view image, and if it detects a face, it will "turn on" only the focus points in front of the face.

"Can we make it better?", the Sony engineers have been saying to themselves?

With the advent of "Lock-on AF", Sony adds another dimension to autofocusing intelligence: When your camera is in AF-C mode, it analyzes the live view stream to "look at" what's behind the currently selected focus point(s), recognize its shape and colors, and then uses that information to follow your subject as it moves across the screen. This feature was born for football / soccer photographers.

Figure 3-6: *Setting the Focus Area to Flexible Spot – Small and trying to focus on this line will fail. Turn the camera 45 or 90 degrees, though, and it will find the line. Conclusion: each element in the phase-detect array is blind to pure horizontal contrast.*

You can see how well the camera can track a subject by doing the following experiment. Set up your A7r II as follows:

- Set your Focus Area to anything BUT Lock-On AF
- Set **MENU** →  **7** → **Center Lock-on AF** to **ON**

The camera will present two small squares in the middle of the screen, telling you to "Aim these squares at your subject and press the center button".

Once you do so, the camera will analyze the Live View feed, try to figure out what your subject actually is, based mostly on color and shape. Once it figures it out, *it shows you the subject it has selected* by outlining it with two-line rectangular border.

Now move the camera left and right, up and down and watch as the two white rectangles track your subject through the frame. Now press the shutter release button halfway and the camera will *only* use focus points that are within the white rectangle (which will now be green).

Depending on the size of your subject, contrast with background, light level, and how quickly you move the camera, the A7r II might track the subject with ease, or it might get confused and lose track of the subject. (Try it on various subjects and see which ones track well. Not all will, depending on a lot of variables. This is an important characteristic to get to know.)

What happens if your tracked subject goes outside the frame? The camera will still remember it and keep searching for it to re-enter the frame for "several seconds". After that, it forgets and you have to start again. (The "several seconds" seems to be highly variable – in some of my tests, it would forget after three. With other tests that involved faces (pictures in a picture frame to be exact), it would remember seemingly forever, even after I turned the camera off then on again.)

What happens if it forgets, or simply can't track the subject? Then the camera reverts to the default behavior, which is to focus on the closest focus point that has contrast.

For this example we used the Center Lock-on AF feature instead of the Lock-on AF in the Focus Area menu because in Center Lock-On AF mode

the camera shows you the subject it's tracking via the double rectangles. The Center-Lock AF feature works very well tracking a person in video mode.

Now let's talk about the OTHER Lock-On AF mode, the one designed for stills. To enable it, we'll undo the settings we made earlier:

- Set **MENU** → **7** → **Center Lock-on AF** to **OFF**.
- Set **MENU** → **3** → **Focus Area** to the bottom option, **LOCK-ON AF** and use the Left or Right arrow buttons to choose **Lock-on AF Center**.
- (And again, make sure the Focus Mode is still set to AF-C.)

This uses the same algorithms as Center Lock-On AF shown earlier, with the key difference being you don't have to overtly tell the camera "This is my subject" and press the center button. Instead, the camera locks onto the subject in the usual way, and then uses that as a starting point for analyzing the live view feed, identifying what the subject looks like, and then tries to track it as previously described.

To see the difference in behavior, place your subject in the middle of the frame (I told you to choose "**Lock-on AF CENTER**" for a reason!), press the shutter release button halfway down, and then move the camera left and right, up and down, just as before. Same behavior! If the camera loses track of your subject, the large double-green rectangle will be replaced by

TIP: *The more ergonomic way to actuate that center button is to use the 1st joint of your right thumb.*



individual phase-detect AF points that the camera is currently focusing on.

This can be a very useful tool in shooting sports, but as discussed earlier, it will either work brilliantly or will quickly default to the "focus on the closest thing in your defined focus area" if the camera can't keep up with your subject. Do some tests in your particular shooting conditions before relying on it to shoot an important event.

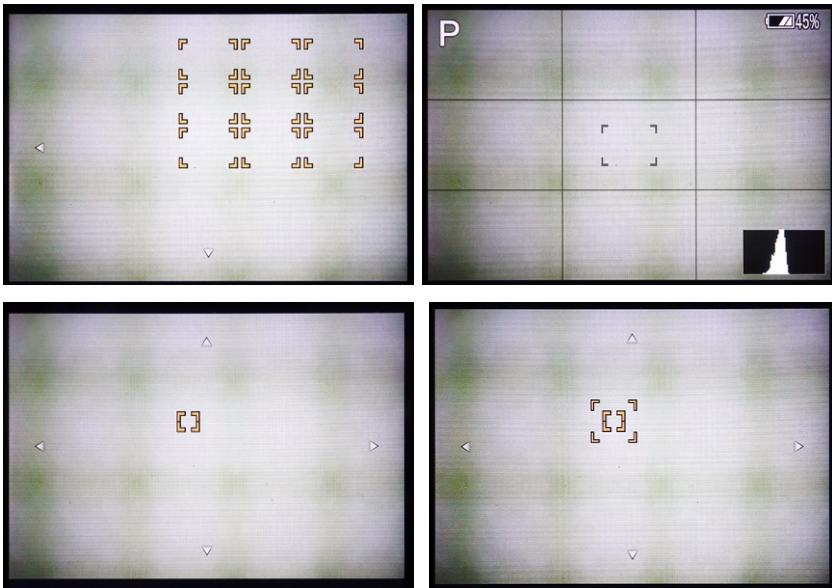


Figure 3-7: If "Wide" is too wide a focus area for you, here are some subsets you can choose from: Zone, Center, Flexible Spot (Small), and Expanded Flexible Spot.



Figure 3-8: A situation where the Wide Area AF setting will be fooled. Switching to “Flexible Spot (Small)” allows me to tell the camera, “Focus on the fowl, not on the fence!”.

3.3.1 OTHER FOCUS AREA CHOICES

So far we’ve talked about three of the **MENU → 📷 3 → Focus Area** settings: Center (one spot in the center of the viewfinder), Flexible Spot (where you can choose any one of the 399 focus points), and Lock-On AF (which is used in conjunction with any of the focus area choices and augments the focus tracking algorithm by analyzing the live view feed.)

What do the other focus area choices do? A quick overview appears below, and you can actually see the differences in **Figure 3-7**.

- Wide – Automatically choose from the camera’s 399 focus points
- Zone – Just a large clump that you can move around the screen.
- Center – Just use the one in the very center.
- Flexible Spot – take one focus point and move it anywhere in the composition
- Expanded Flexible Spot – take a clump of 9 focus points and move them anywhere in the composition
- Lock-on AF was already covered. Use the left and right arrow keys to choose one of the above focus areas for it to work with.

More detail on most of these settings appears in Section 6.15.

3.3.2 FACE DETECTION

In the old days I'd keep the Focus Area set to "Center", since I grew up using the "focus-recompose-shoot" method for more than 20 years. It was fast and I never had to worry about the camera guessing the wrong subject (as it often would do in Wide Area Focus mode).

Anyway, that was all before Sony introduced Face Detection, which changed everything. With Face Detection enabled (**MENU** → **📷 7** → **Smile / Face Detect.** → **Face Detection ON**, which is the factory default), not only does the camera identify a face as a subject to focus on, but it will also meter off that face to better handle difficult light such as backlighting. Face detection helps me get winning shots of the grandkids *much* faster than my old techniques ever would have (and I cut my teeth shooting kids!) I love this feature. For that reason I usually have my Focus Area set to either "Wide" or "Lock-On AF Wide" and rely on face detection to do the hard work for me.




Figure 3-9: When the camera finds a face it will try to focus on that face and prioritize the exposure for that face. This means the camera will get the exposure right even when backlit (a tricky situation for cameras without this feature).

More about Face Detection (smile detection too!) can be discovered in Section 6.35.


3.3.3 FOCUSING MODES

Focusing Mode is different from the Focus Area. Whereas Focusing Area has to do with where in the frame your camera will focus, Focus Mode dictates what the camera does next after it finds focus.

The A7r II has five Focus Mode choices, and you can choose one via **MENU →  3 → Focus Mode → [Choose one]**. (Or just access it from the **Fn** menu.)

The factory default for focusing modes is “Focus on a subject, and then lock focus until I take the picture”. This is called “Single-Shot AF” (AF-S) mode and it behaves the way you’d expect a point-and-shoot to behave. The camera also has a “Continuous AF” (AF-C) mode setting, which can be used when you’re shooting sports or toddlers (or anything that moves). When this mode is enabled, you are essentially telling the camera “My subject is moving, so even when you’ve found focus, keep trying to focus because my subject will not stay still!” To invoke AF-Continuous (AF-C) mode:

MENU →  3 → Focus Mode → Continuous AF (AF-C).

To return it to Single-Shot AF (the factory default), it’s **MENU →  3 → Autofocus Mode → Single-Shot AF (AF-S).**

Don’t want to mess with having to bounce between AF-C and AF-S mode all the time? The A7r II also offers an AF-A mode that automatically selects between the two.

The Focus Mode menu is covered in detail in Section 6.14, as is the 4th option, DMF (which was discussed earlier in Section 2.3).

TIP 1: *When you’re in AF-S mode and in continuous drive mode, the exposure is locked along with the focusing. (Exposure is never locked in AF-C mode.)*

TIP: When the ambient light is too low for the autofocus mechanism to work properly, the A7r II will try to use its built-in red-orange LED to illuminate the subject briefly, thereby allowing the camera to focus “in the dark”.

“But what about those big red LEDs on accessory flashes that project a pattern onto the subject, so that even blank, featureless walls can be focused upon?” I hear you ask. The answer is “The A7r II disables those LED in the flash. Theoretically the light they emit can’t be seen through the IR filter in front of the sensor.” Okay, but they should still work when you attach an A-mount lens with an LA-EA4 adapter! (Regretfully the accessory flash’s LEDs are still disabled in this mode.).



3.3.4 FOCUS CONFIRMATION

Your camera will confirm focus by one of the following 3 methods as shown in **Figure 3-10**:

- Left - If the camera doesn’t detect a face, it will show green brackets around the subject it is focusing on.
- Center – If Face Detection is ON (Section 6.35) and it *does* find a face, it will show you a grey, white, or green square around the entire face. (The square(s) start out white or grey but one will turn green when you press the shutter release halfway. That’s the face it’s focusing on.)
- Right – If you’re zoomed in past the lens’ natural abilities (using either Clear Image Zoom or Digital Zoom, described in Section 7.15), OR if you’re focusing in the dark using the focus assist light, then you’ll get a large green dotted line frame around the entire periphery. In these conditions the camera is working in “Center” Focus mode and you

don't really have fine control over what part of the frame the camera is focusing on.

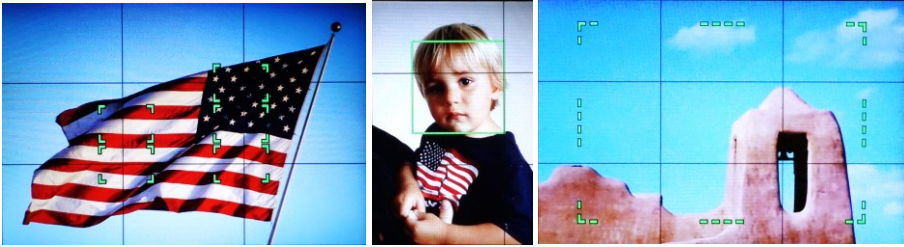


Figure 3-10: The camera will show focus confirmation 3 different ways, depending upon your subject matter and the camera settings.

3.3.5 QUICKLY SWITCHING BETWEEN WIDE AREA AF AND SPOT AF




Here's another unobvious but incredibly useful tip: To quickly handle situations where the camera is just not finding your subject (usually due to clutter), out in the field, I find it time consuming to have to go to **Fn → Focus Area → [choose one]** just to switch between **Lock-on AF Wide** and **Center** or **Flexible Spot**. So here's a very handy shortcut:

- First, make sure **MENU → ⚙️ 7 → Custom Key Settings → 2 → Center Button → Standard**.
- Then set your default autofocus area to **Fn → Focus Area → Wide** or **Lock-on AF - Wide**.

Whenever you need to switch to Center AF quickly, **just press and hold the center of the control wheel**. It will autofocus on whatever's in the center, and then lock focus until you release the button. (So it behaves like AF-S, even if your AF mode is set to AF-C— an even handier thing!) Releasing the button goes back to your AF defaults.

3.4 THINGS YOU PROBABLY DIDN'T KNOW ABOUT PLAYBACK MODE

Before we get into the playback menus and their functions, here are some things you can do while the image is playing back that you might not have been aware of.

- The Trash Can button provides a shortcut to the “delete this image (or movie)” menu item.
- You can zoom into an image to examine it closely using the C3 button, then use the arrow keys to navigate around or to zoom out (rotate the wheel counterclockwise). **NEW!!** The camera will now zoom in to the AF area automatically when first zooming. This has been universally recognized as a Good Thing.
- When examining images closely like this (zoomed in), you can use the front control wheel to examine similar areas of adjacent images (to see which of the series of shots is the sharpest, for example). Be patient with this one, though... due to the high number of megapixels it can take as long as 2 seconds to go from one adjacent frame to the next.
- The DISPlay button (up-arrow) will alternate between Full-screen with annotations (salient data about that shot like time, date, exposure info, etc.), Full screen without annotations, and Histogram view. Go ahead; try it!
- Hitting the AF/MF button (regardless of the position of the AF/MF / AEL switch) takes you to index mode. Selecting any image and pressing the center button of the control wheel takes you back to play mode. **MENU →  1 → Image Index** lets you choose between 9 and 25 images.
- When in index mode, hitting the AF/MF button again takes you to an even higher level, to calendar view. Want to go back down a level? Hit the C3 key.
- The **Fn** button invokes the “Send to Smartphone” function where it can send a downsized image to your smartphone via WiFi (See Chapter 5).
- If you have **MENU →  1 → Display Rotation** set to **AUTO**, you can rotate the image by rotating the camera. In any other mode, if you're really too lazy to rotate the camera 90 degrees you can rotate the image via **MENU →  1 → Rotate** and then press the center button

multiple times to rotate the image counterclockwise. (Which is as much of a pain as it sounds.) (And oddly, you can't assign the Rotate function to a button.)

When playing back movies, the following arrow keys are functional:

- LEFT and RIGHT will act as fast forward and fast reverse. Press them several times in a row and they will play back faster (note that all it does is jump around – it's not exactly smooth playback in this mode).
- The CENTER button will pause and unpause the playback. While paused, rotating the rear control dial will control slow playback. LEFT and RIGHT will still work and they will jump ahead by several seconds each.
- The DOWN button brings up a menu that controls playback speed and volume.

3.5 CONFIGURING THE DISPLAY

When you press the DISP button (the UP arrow button on the rear control wheel **Figure 3-11a**) multiple times, the camera will cycle through the displays you have checked in

Menu → **⚙ 2** → **DISP Button** → **[Monitor or Finder]**.

When you go to this screen you can scroll amongst the options

and a small preview will appear in the lower-right-hand corner. You can select and unselect the screens you want using the center button. In order to have your settings take effect, though, you **MUST** press the **MENU** button to exit the screen – pressing anything else (such as the shutter release button, which works when setting most other things) will exit the screen but not remember any of the changes you just made.

When you go there make sure “Histogram” is checked as an option (**Figure 3-11b**). This is the **ONLY** display option available that shows you a live histogram as you’re composing so you can know if you’re blowing out any highlights (or losing detail in your shadows). (Histograms are explained in Appendix A, in Section A.7.)



Figure 3-11: You can choose which displays the DISP button cycles through via this screen. (And you can configure the camera to cycle through different screens depending on whether you’re looking at the LCD (“Monitor”) or EVF (“Finder”). Notice that once you make your selection, pressing the MENU button is the **ONLY** way to have your selections stick!

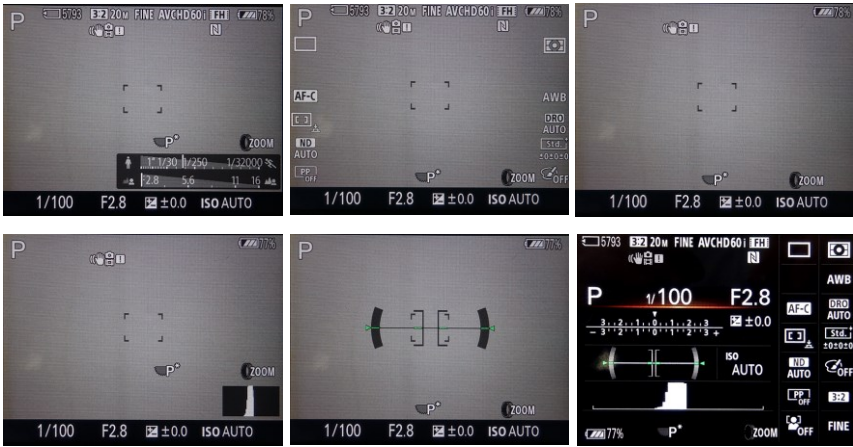


Figure 3-12: The display screens available. Pressing the DISP button switches from one screen to another.

3.6 QUICK GUIDE FOR VIDEO

Video options can be pretty daunting, and so I'm leaving the very heavy technical stuff to Chapter 12. In the meantime, here's the bare minimum you need to know about shooting video, starting with the point-and-shoot auto-everything home movie mode:

- When you want to take movies, just press the red “Movie” button on the back corner of the camera at any time (as long as **MENU → ⚙️ 8 → MOVIE Button** is set to **ALWAYS**). (Or, if you're like me, you've reassigned C2 to be “MOVIE”.) To stop taking movies, push that red button again.
- If you're shooting 4K video, the factory default will put the camera into APS-C (i.e., "Super 35mm") mode, essentially multiplying the focal length of your lens by 1.5. If you don't want this unintended telephoto boost, do a **MENU → ⚙️ 6 → APS C/Super 35mm → Off**.
- While shooting video, the AF Area you selected (either via the function menu or via **MENU → 📷 3 → Focus Area** setting) will work in movie mode *except* for the last item – Lock on AF won't be a selectable option.

- Need the camera to track a subject as it slowly moves across the screen? (Like an actor, or your kids, for example?) Assign the Center Lock-on AF feature to a button, then press that button while you're shooting a video (Section 3.6).
- Focusing manually? You can rely on Peaking Level and Peaking Color to help with quick, accurate focusing. Focus Assist works here as well.
- If you find that you're sometimes hitting that red button accidentally and end up with a lot of unwanted movies, try setting **MENU → ⚙ 8 → MOVIE Button** is set to **Movie Mode Only**. In this configuration, if you want to take a movie you must move the exposure mode dial to Movie position first. (Then if you want to take pictures you'll have to move it to something else.)
- If you want more control over your shooting variables (f/stop, shutter speed), then you want to invoke the **MENU → Gear 8 → Movie** function (while the exposure control dial is set to "Movie") and choose between P, A, S, or M for movies. (Section 6.40).
- When it comes time to uploading your camera's contents to your computer, I have found it most convenient to let Sony's "Import Media Files to PlayMemories Home" program (the software that came with your camera) import all the files for you. Picture and movie files are spread all over different directories of the memory card, and PMH harvests them all and puts them into one directory.

TIP: While shooting movies you can focus-lock using the currently selected focus area by pressing the shutter release button halfway. The focus will remain locked until you take your finger off the shutter release.

TIP: This camera has a clip length limitation – 2 GB file size. If you're shooting in .mp4 video mode (more on that later), then the camera automatically stops shooting when it hits this limit. If on the other hand you're shooting in AVCHD video mode, then the camera will "close" the first file and automatically start recording a new one while you shoot. The only thing for you to do is edit the two clips together using PMH.

3.7 CENTER LOCK-ON AF

“Center Lock-On AF” is the 2nd of two features that allows the camera to track a subject. And unlike the other object tracking feature “Lock-on AF” (Section 6.15.6), this one works when shooting video, too. (This can be a valuable feature since the other great object-recognition feature, Face Recognition, doesn't work in video.)

For best results, take care that your object is distinctly colored relative to its surroundings, for this feature actually is tracking color rather than any particular shape or feature. Here's how to use it:

- Ensure you have a native E-mount lens attached.
- Make sure the camera is NOT in “Lock-on AF” mode (**MENU** → **3** → **Focus Area** → [Choose anything except the last option]).
- Make sure also that **MENU** → Gear 7 → Custom Key Settings → Center Button is set to Standard.
- **MENU** → **7** → **Center Lock-On AF** → **On**. The top screen in **Figure 3-13** is seen.
- Place your subject in the very center of the square and press the center button. This registers your subject with the tracking function.
- The camera enters Wide Area focus mode and you can see a double square superimposed on top of your tracked subject.
- As the subject darts around, the camera analyzes the live view feed and tries to find the registered pattern. When it finds it, it automatically focuses on that subject.

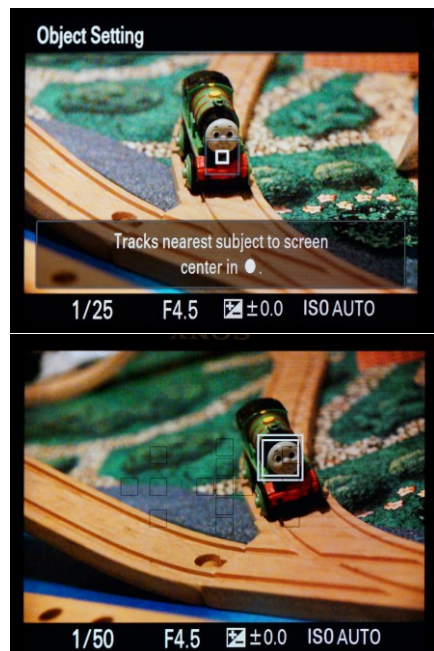


Figure 3-13: You can tell your camera “Here, track this!” via the center button of the multi-selector and it will track the object across the screen.

- To cancel, press the center button again. The camera reverts to whatever Autofocus Area was set beforehand.
- To call up this feature anytime in the future, just hit the center button.

Things to note:

- Like the autofocus function, the tracking function works best with high-contrast subjects. It works even better if the subject has a distinct color compared to its background.
- If the subject goes out of frame, the camera will still be on the lookout for the subject to re-enter the frame for a short while. (Then it will give up and exit the mode).
- This feature is not available when using either the Clear Image Zoom or Digital Zoom.

Overall, I'd say it's best not to expect too much from this feature. I've found that even if the subject moves slowly the camera can get confused and select something else as the subject instead of what you specified. (Don't judge its abilities too harshly – it's a difficult feat to perform.)

I have found this feature to be most useful when shooting home movies – I just focus on my subject and the camera will do a better job focus tracking on a moving subject than if the feature were off.

TIP: *There's a slightly better implementation of this feature which doesn't require you pressing several buttons to invoke it, and your subject doesn't necessarily have to be in the center. It's the 6th Focus Area option "Lock-On AF" and it's described in Section 6.15.5. (It doesn't work when shooting videos, though.)*

3.8 THE PANORAMA MODE

Panorama shots aren't as novel as they once were, but that doesn't make them any less fun or easy. So to get started, turn your exposure mode dial to "Sweep Panorama" (**Figure 3-14**). Then perform the following:

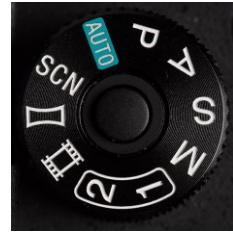



Figure 3-14: Sweep Panorama mode.

- 1) Zoom out all the way. The camera does its best panoramas when there's a lot of overlapping information in adjacent images.
- 2) Hold the camera as close to your body as possible and use the EVF. The stitching algorithms work best when the camera is closest to the axis of rotation (= YOU!) (So whatever you do, don't hold the camera at arm's length!)
- 3) Find your subject (which may or may not be at the very left of your composition) and press and hold the shutter release button halfway. This locks the focus and exposure.



Figure 3-16: Need different aspect ratio? Set Sweep Panorama to "Down", rotate your camera counterclockwise 90 degrees, and sweep from left to right to get an image that looks more like a 16:9 shot and less like a panorama.

- 4) Move the camera to the left of where you want the left part of your panorama to begin. Notice that the left third of the LCD looks greyed out – that portion of the image will NOT appear in the final picture.
- 5) Press and hold the shutter release button down and start to sweep (or pan – same thing) the camera from left to right. The camera actually starts the stitching process internally after the first two images are taken, and if you're going too fast or too slow it will let you know immediately. You'll get the hang of what the correct panning speed is after a few tries. (Officially, Sony recommends covering 180 degrees over a period of six seconds.)
- 6) Once you're finished, hit the Playback button and you'll see the entire image on the rear display. To see it close-up, press the center button of the multi-selector and the image will start to scroll right before your eyes. If you did it well, and there were no moving objects in your shot, the entire image will look quite seamless.

If you have your panorama mode set to Wide (which means “wider than ‘Standard’” -- Make sure the function dial is set to Panorama and then **MENU →  1 → Panorama: Size → Wide**), what you get is a high-resolution panorama picture – 12,416 pixels x 1,856 pixels (**Figure 3-15**). Most impressive! (Interestingly, these are the same dimensions as what Sony's other cameras produced – the number of megapixels doesn't affect the panorama size, apparently.)

There's much more to say about the Panorama features – and I'll continue this subject in Section 6.5.

3.9 REMOTE METHODS

If you like the idea of remote control, there are three options available to you: The ability to control your camera with your Wi-Fi-equipped smartphone (discussed in detail in Chapter 4), an infrared remote control (The Sony RMT-DSLR2), and a new plug-in cable release ideal for time exposures called the RM-VPR1 (**Figure 3-17**.)

TIP: If your Android smartphone has an infrared transmitter (my Galaxy S5 does), there's a FREE app that lets you control Sony cameras remotely. It's called ShutterBOT (<http://bit.ly/1PeoH62>). If you have a Samsung phone then the capability is already there in a pre-loaded app called Samsung IR Universal Remote.



Figure 3-17: You can use your Wi-Fi-enabled smartphone as a remote control (and remote viewfinder) for your camera – as you can see it captured quite an expression on the test subject (left). There's also an IR remote (center) and a new wired option (right) which plugs into the camera's USB port.

3.10 THE “IMAGES REMAINING COUNTER”



When the camera shows you how many more images you can shoot on the memory card (yellow rectangle in **Figure 3-18**), it’s only a guess -- the actual size of a .jpg image can vary wildly based on the content of the image. (Chapter 15 will explain why.) So don’t take this number literally.

Figure 3-18: The “Images Remaining Counter” (yellow rectangle) is only a guess, since the size of a .jpg depends on its content.

TIP: Interestingly, the camera doesn’t take the currently-set aspect ratio into account when making its images-remaining calculation. Files shot in 16:9 aspect ratio take up less room on your memory card than the standard 3:2 (at least JPGs do); yet the camera will show the same number of images remaining for both settings.

3.11 LENS NOMENCLATURE

Okay, this will be a short section. Sony Alpha cameras have two kinds of lens mounts: A-mount, and E-mount. Yours is an E-mount.

Up until the introduction of the original A7, all E-mount cameras have had APS-C-sized sensors (smaller than full frame), and therefore all E-mount lenses made prior to the introduction of these cameras were designed to only cover this smaller sensor size.

THEREFORE, to make sure that your lens’ output can cover the full frame, Sony has introduced the FE lens. (FE stands for Full-Frame E-mount). The physical lens mount is identical, but the lens is designed to provide a

larger image circle. When you go to buy a new native lens for your camera, make sure there's an "FE" somewhere in its name or description.

Have something other than an FE lens? You can use an adapter to attach just about every kind out there. I talk about lens adapters in the next chapter.

High-End Optics

Having a great sensor isn't of much consequence if you don't have great glass to put in front of it. Fortunately this is being aggressively addressed by both Sony and Zeiss (a Sony partner) who are both making native autofocus FE lenses to do justice to the sensor.

Here's a quick rundown on both the Sony and Zeiss brand names:

- **Sony** – Sony's best glass has the "G" name attached to it. Their non-G lenses (which are relatively affordable) are no slouch either – for example, their FE 28-70 f/3.5 – 5.6 "kit" lens performs just as well as the Zeiss Vario-Tessar T* FE 24-70mm f/4 ZA that costs over twice as much (according to <http://bit.ly/1Laakga>).
- **Zeiss** – There are many lenses that have either just the Zeiss name or the **Sony / Zeiss** name. (Usually they have the term "ZA" somewhere in the lens name.) All of these lenses had designs approved by Zeiss, and are using Zeiss manufacturing hardware for precision quality control, and are made either by Sony or Zeiss.
- **Zeiss Batis** – High-end autofocus prime lenses made especially for the E-mount. These are the ones with the fancy OLED readouts showing focusing distance and depth-of-field scales. Some have optical stabilization built-in (which is a feature users of the first generation A7 series of cameras will find helpful).
- **Zeiss Loxia** – These are manual focus lenses with real physical f/stop rings. Designed especially for the E-mount with cinematographers in mind (since the f/stop ring can be "declicked" offering a smooth transition between values).
- **Zeiss Touit** are designed for APS-C sized sensors. These prime lenses are available for both Sony E-mount and Fujifilm X-mount versions.

There are more 3rd party manufacturers coming on board with native FE mount lenses. I won't give a run-down on the lens lineup here; for that I refer you to Brian Smith's continuously-updated master list of E-mount lenses at <http://briansmith.com/sony-a7-a7r-a7s-lens-guide/>

3.12 VIEWFINDER EYEPIECE DIOPTER CORRECTION

Although it's hard to find, the A7r II has what's called a Diopter Correction element built into the top right of the EVF (**Figure 3-19**).

The most basic kinds of eyesight disorders are nearsightedness (Myopia) and farsightedness (Hyperopia), and if that's all you have (and if you only have a mild to moderate case of it) then your camera can provide a correction for you so you need not wear your eyeglasses while shooting. Correction for such disorders are commonly measured in units called diopters; and the number of diopters in your prescription represents the amount of correction needed to provide 20/20 vision.



Figure 3-19: The diopter correction wheel can apply basic eyesight corrections for some eyeglass wearers. The index marks are hard to see in the wheel, but when they are horizontal, then the correction is set to +0.

Interestingly, all camera viewfinders have a built-in optic that makes the focusing screen (which is physically very close) appear to be very far away, allowing your eye to focus to infinity. You can verify this for yourself: set the zoom lens on your lens to around 58mm focal length, and look at your subject with BOTH EYES open (one looking through the viewfinder, the other looking over the “shoulder” of the pseudo-pentaprism hump). The images from both eyes should appear in focus. This means that if you’re

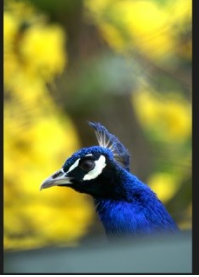
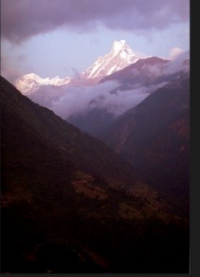
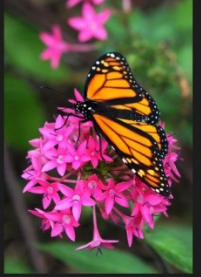
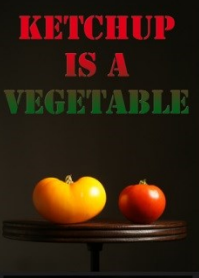
farsighted, you really shouldn't need any diopter correction at all in your viewfinder.

So the EVF has a mechanism built in that can provide diopter correction mostly to help nearsighted folks. The correction ranges from -3 (nearsightedness) to +1 (slight farsightedness). To adjust it, perform the following:

1. Grab your camera and hit the MENU button. (Any menu screen will do.)
2. Look through the viewfinder and turn the diopter adjustment wheel until the menu screen looks sharp to you.

Note that if you have more than a mild astigmatism (another common disorder that can't be corrected using simple "spherical" optics), the built-in diopter correction will probably not make things look clearer to you. You'll need to use the camera with your eyeglasses on instead.

If you want to reset the diopter correction for any reason, you can do so without needing good eyesight. Simply remove that rubber eyepiece hood (it lifts straight up after overcoming some initial resistance), and examine the very tiny markings in the wheel (which, ironically, you need to have good eyesight to see). When the +/- symbols are parallel to the bottom of the camera then the diopter is reset to the factory default setting of +0.



There's a very good chance that you were drawn to the E-mount because you have some old glass from your great film camera gathering dust somewhere. Or maybe you inherited such a set. Many people report that using their old manual focus lenses brings them closer to the essence of photography (or at the very least brings them back to their youth – either way it's an enjoyable experience and a great mental exercise). And the A7r II has features to help in this regard which make precise focusing much easier than in the old days.

In this chapter, I'll be talking about the tools that the camera gives you to make using legacy glass a breeze, and then will discuss the lens mount adapters available for most of the popular camera brands. I will also be giving a very high level info of lens mount types for each brand for those of you who inherited Legacy Glass and want a better idea of what you have. Of course the list can't be exhaustive but it will be enough to get you started.



Figure 4-1: An adapter for every conceivable need.

4.1 ESSENTIAL STUFF – READ THIS FIRST

4.1.1 FOR MANUAL FOCUS LENSES

In general there are two broad categories of old glass that can be used on the E-mount platform: Manual Focus lenses (including rangefinder and film SLR lenses before 1985), and autofocus lenses. I'll talk about tricks to using manual focus lenses here.

One of the great things about using this new camera body for old lenses is that it can help you out in ways that your old film body just couldn't:

- **Peaking level** – this feature shows you what's in focus by highlighting the highest contrast areas of your image (which correspond to the sharpest parts) in the color of your choice. I recommend **MENU → ⚙ 2 → Peaking Level → Mid** and **MENU → ⚙ 2 → Peaking Color → Yellow**
- **Focus Assist** – for even greater focusing accuracy, the camera will show you a magnified view of any portion of your frame, allowing you to focus critically. (Peaking Level can still work here too, but too often the contrast isn't high enough to show the color.) This is a function that you assign to a button – I recommend either the Down Arrow button because of its proximity to the center button, which must be pressed immediately afterwards. (**MENU → ⚙ 7 → Custom Key Settings → [Choose either AF/MF button or Custom Button 3] → Focus Magnifier**). Once assigned, hit the Focus Magnifier button, then use the arrow keys to tell the camera which are of the viewfinder you want to magnify, then hit the center button. Focus critically. Want more magnification? Hit the center button again. Then hit the shutter release button halfway to go back to Live View and shoot at your leisure.
- **Live View Display** – Unlike an ordinary viewfinder, the Live View Display can show you how your exposure and white balance will look even before you shoot. (Too bright? Too dark? Color balance OK?) **MENU → ⚙ 3 → Live View Display → Setting Effect ON**. (This is the factory default.) The downside to this feature is it's difficult to focus first if your exposure is way off. That's why in the procedure

below I'm going to recommend adjusting your exposure first and then your focusing.

- Make sure **MENU → ⚙ 4 → Release w/o Lens is set to Enable**. Otherwise the camera won't take a picture if it doesn't see a native E-mount lens attached.
- For a lot of reasons I'm also going to recommend that you set your ISO to something fixed (i.e., anything but AUTO). If you're really a beginner and don't know what to set it to, start with 400 and see if you like the results.

When using Manual lenses, only the A (Aperture Priority) and M (Manual Exposure) modes on the P-A-S-M dial will work. (Well, "P" (Program) mode works too, but when the camera realizes that it doesn't recognize the f/stop, it defaults to Aperture Priority mode.) In Aperture Priority mode, you set the f/stop on the lens and the camera will choose a shutter speed automatically for the amount of light and the ISO that you have set.

If you want to go back to caveman days you can switch to Manual exposure mode. Manual Exposure mode is just like Aperture Priority mode, except you have to choose your shutter speed too.

Here is the recommend step-by-step procedure for taking a photo using old MF lenses in Manual Exposure Mode:

- First, adjust your exposure. (Usually you focus first but it's difficult to focus if your Live View is showing an image that's too light or too dark.) There are many different ways you can do this:
 - "Match Needle": Adjust your f/stop and shutter speed (front control dials for the shutter speed; aperture ring around the lens) until the +/- display on the bottom of the screen shows "+/-0" (plus or minus zero). This means that an average picture is well-exposed.
 - Use the Histogram: Hit the DISP button several times until you see the live histogram in the lower-right-hand corner. Adjust your f/stop and shutter speed until the histogram looks right for the kind of shot you are pre-visualizing. (Not familiar with Histograms? I cover them in Appendix A, in Section A.7)
 - Use the zebra stripes feature to help you evaluate proper exposure in the field. (See Section 7.1.)

- Don't like all this complex histograms / zebra stripes / match needle stuff? Just use your eyes. Adjust your f/stop and shutter speed until everything looks the way you want it to.
- Then, focus. (Use the focus magnifier function if you need to, but with Peaking Level and a small f/stop you'll get as close as you ever could with a SLR or rangefinder).

Here is the recommend procedure for taking a photo using old MF lenses in Aperture Priority Mode:

- First, focus. (Use the focus magnifier function if you need to, but with Peaking Level and a small f/stop you'll get as close as you ever could with a SLR or rangefinder).
- Set your desired f/stop on the lens' aperture ring. (Don't know what to set it to? See Section A.2.)
- Then, adjust your exposure. Use the Exposure Compensation dial to make it darker or lighter.

4.1.2 FOR AUTOFOCUS LENSES

Here's where things get fun. Not all autofocus lenses will autofocus on this camera. It depends on the lens and it depends on the sophistication of the adapter. At the time of this writing, only three types of Autofocus lenses can actually autofocus using commercial adapters: the Canon EF lenses, the Contax G lenses, and the Sony A-mount lenses. (An AF adapter for Nikon AF lenses is still rumored from "an unknown Chinese company") as of this writing.) Of these, the Sony A-mount are the only ones that can autofocus quickly if the LA-EA3 or LA-EA4 adapter is used.

Furthermore, most modern autofocus lenses don't have an f/stop adjustment ring – they rely on electronic signals from the camera body to set the f/stop automatically. A sophisticated adapter will have the smarts and the electrical contacts inside to communicate and set the f/stop automatically (so the lens thinks it is attached to a native camera body); other adapters don't even try to talk to the lens, and instead build their own

user-adjustable iris into the adapter. Still others offer a ring that controls the lens' f/stop mechanically.

Again, here's where the sophistication of the lens adapter will dictate whether you have control of your f/stop or not. I'll talk about specific implementation details on each major brand later on in this chapter.

So, here's the thing: If your adapter can control both your lens' AF and f/stop (as can the Metabones IV adapter for Canon EF and the LA-EA_x adapter for Sony A-mount), then you don't need to think about anything else – just put the lens on your camera, switch to program mode, and shoot like you normally would. If your adapter can't take care of both AF and f/stop, then you'll need to refer to the previous section on using manual lenses in order to make your Legacy Glass work.

4.1.3 VIGNETTING AND MAGENTA CASTS



When the original A7 first came out, there was sometimes a problem when using extremely wide-angle lenses via adapters, in the form of increased vignetting and a color shift in the corners. To understand why, let me repeat a diagram from Chapter 1 showing light paths from different kinds of lenses (**Figure 4-2**).

Figure 4-2: The closer the rear optic is to the sensor (as is usually the case with wider-angle lenses), the more extreme the angle of light is when you get to the corners.

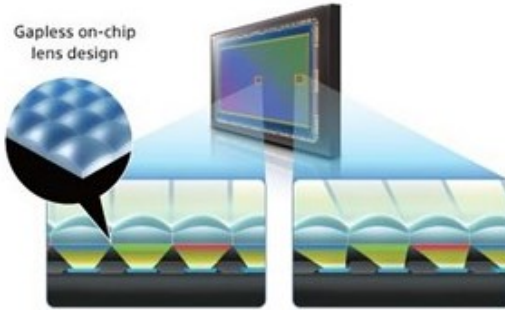


Figure 4-3: Sony has placed a microlens array on top of the original A7r sensor to better capture such light. It's been improved for the A7r II. Notice how the lenses are shifted somewhat as they get closer to the edge and corners.

Some wide angle lenses have a design where the exit pupil is very close to the sensor, resulting in rays of light hitting the corners at rather extreme angles. While this didn't matter at all in the days in film (film doesn't care about the direction of light), digital sensors definitely prefer the rays of light to hit them perpendicularly if possible.

To help mitigate that problem, Sony has placed a tiny hemispherical lens atop every pixel element on recent cameras, starting with the original A7r. See **Figure 4-3**. The A7r II has this also, and it is unclear whether this is an improved version or not.

While the offset microlenses do help, there are still many reports of older high-end Leica wide angles producing dark corners and a magenta color shift as you get closer to the edges of the frame.

As I write this hobbyists the world over are trying out their legacy glass on this new platform and posting their findings about which lenses work best. Your best bet is to google the camera and the lens you have and see if others have posted test reports on using them. (Or, just try it!)

4.2 A SHORT LIST OF THE MOST POPULAR ADAPTERS

It's impossible to compile an exhaustive list of everything out there, for by the time the book got published it would quickly be outdated. However, I can give you a short list of what are proving to be the most popular adapters for the most popular lenses to adapt. And so, without further ado, here's the short list of adapters to consider.

4.2.1 *SONY A-MOUNT LENSES*

Before Sony designed the E-mount for what were originally called the NEX line of very small but very high quality cameras, their interchangeable lens cameras used the A-mount which Sony inherited when they bought Minolta's camera division.

Sony makes two different adapters to allow you to use the A-mount lenses on an E-mount camera: The **LA-EA3** and the **LA-EA4**.

The **LA-EA4** offers two major differences from the **LA-EA3**:

1. It can work with ALL A-mount lenses, as it has a built-in motor to drive the lenses with no built-in motors of their own.
2. It has its own, self-contained Phase-Detect Autofocus mechanism, including a semi-transparent mirror and phase detect array used in the Alpha 99. Once upon a time this made sense back when the E-mount bodies were contrast-detect AF only, and this gave it the amazing speed and accurate motion-tracking ability of a DSLR. But now with the A7r II, this additional AF mechanism is not only redundant, but it provides less performance than what the camera can do natively.

If you have older A-mount lenses that make use of the camera body's screwdriver blade to drive the autofocus, then the **LA-EA4** is the only way to go if you want autofocus.


In contrast, the **LA-EA3** lacks any autofocus sensors (but does retain the electronic communication and f/stop moving mechanism). Although cheaper, it will only work on A-mount lenses that have built-in focusing motors like the SAM and SSM variety and will NOT work with the older

screwdriver-blade-driven lenses. In the past, the **LA-EA3** adapter provided slow and jerky AF performance due to the fact you had a CD-AF camera body trying to drive a lens that was designed for PD-AF commands (yes, they're really different!); however since the A7r II has the native on-sensor PD-AF this is no longer a problem, and the AF performance is as good as on any other camera.

The upshot: If your A-mount is of the SAM or SSM variety, go for the **LA-EA3**. If it's a screwdriver blade type, you must get the **LA-EA4**.

***TIP:** Newer Sony SSM II lenses were actually designed to accept both phase-detect and contrast-detect commands, meaning they will perform much better on an LA-EA3 adapter than earlier lenses.*

There are no special modes necessary to use A-mount lenses on your A7r II – you can use them with all of their automatic features (autofocus and program mode included). However, the camera does provide two tools which are designed to work ONLY on A-mount lenses:

Aperture Preview – This isn't in a menu, but you can assign it to most buttons via **MENU** →  **7** → **Custom Key Settings** (Section 7.35). When pressed, the camera invokes a classic depth-of-field preview function, stopping down the lens so you can see what's going to be in focus before you shoot. (This isn't necessary for native E-mount lenses, since the lens is almost always stopped down when you're composing, allowing you to see what will be in focus without you having to press a button.)

There is also a sister assignable function, called **Shot Result Preview**, which works on E-lenses also and shows you how the shot will look when certain automatic settings are invoked, like what motion will look like with long shutter speeds.

Micro-AF Adjust – This function allows you to calibrate the autofocusing with the A-mount and **LA-EA4** adapter combination. (Native E-mount lenses and the **LA-EA3** adapter don't need it since the sensor is doing the focusing, not some disconnected phase array.) More about this in Section 7.30.

4.2.2 M42 / PENTAX SCREW MOUNT

The M42 mount is a screw mount originally developed in 1949 for the East-German Zeiss Contax S (later Praktica) and later used by Pentax (until 1975), Zenit, Voigtländer, Fujica, Olympus (the FTL model), and Yashica. While the nickname “universal screw mount” was once true, in the early 1970’s the standardization forked as different manufacturers tried to adapt the mount to accommodate automation. I can’t go into all the instances here; however know there are some later versions of M42 lenses from some manufacturers that will not fit onto an adapter because of additional flanges or levers. (Specifically those from Olympus FTL and Fujica.)

Since these lenses are purely mechanical (no electronics) they can be mounted and used in either Aperture Priority or Manual Exposure mode as outlined at the beginning of this chapter.

The most popular M42 lens adapter is the **Novoflex Adapter for M 42 Lens to Sony NEX Camera**, \$157.99 available at <http://bhpho.to/1cKyNuV>. There’s also the newer Fotodiox adapter for less than half the cost of the Novoflex at <http://bhpho.to/1JNkhMg>

4.2.3 LEICA M / ZEISS ZM

This is a bayonet lens mount used on all of Leica’s rangefinder cameras from the Leica M3 (film based) to the modern M9 (digital). The identical lens mount was used on the Zeiss Ikon camera which took Zeiss ZM lenses. Konica and Voigtländer (now owned by Cosina) got into the act also. Unlike the later M42 lenses described in the previous section, all M-mount lenses are interchangeable.

The lens specification hasn’t changed since 1954, and all Leica M lenses are still pure manual focus and manual f/stop control via a ring at the lens’ front.

There are a wide variety of options out there with an equally wide price range. The most recommended adapter for M mount lenses is the **Novoflex Adapter for Leica M Lens to Sony NEX Camera**, currently selling for \$258.85 at B&H. (Don’t let the name fool you; consider “NEX” to be the equivalent of “E-mount” – it will work on full-frame E-mount camera bodies also.) <http://bhpho.to/1mbVh9m>

There is also a **Metabones** adapter which is rumored to be just as high quality but for a significantly lower price: \$89. Users say it has a tight fit. <http://bhpho.to/1cKRG0s>

But wait! The **Voigtländer** VM-E Close-Focus adapter is a little bit thinner than the above adapters, allowing classic lenses to focus on average 30cm closer than with other adapters (without messing with your lens' ability to focus at infinity). I'll leave it to you to decide if that's game-changing enough for you – at USD \$309, that's about \$13/cm. <http://bhpho.to/1cZVfta>

***TIP:** Concerned about whether your wide-angle Leica lens might cause vignetting or color shift in the corners (as they did on earlier FE camera bodies)? Check out this hand-compiled list of lenses that won't do that: <http://bit.ly/1M4I200>*

4.2.4 LEICA R

Once upon a time Leica made an SLR camera called the “R” series, consisting of cameras called the R3 through the R9. (Then they stopped.) Lenses for earlier Leicaflex will not work for this adapter.

Metabones Leica R Mount Lens to Sony NEX Camera Lens Mount Adapter II (Black) \$99 <http://bhpho.to/1GrjVLh>

There's also this one from **Novoflex** that is twice the price but not twice as good: <http://bhpho.to/1FO9NBz>

4.2.5 CANON EF (EOS)

When the A7r II was first announced, the **Metabones IV** adapter was the only one that figured out how to use the camera's baked in PDAF sensors to directly drive the autofocusing of Canon's EF lenses as fast as a Canon body could do.

The good news is that with the **Metabones** adapter, the image stabilization feature works too if the lens has it. The bad news is that it only works on Canon EF lenses made after 2006. There's another drawback, too, in that it tends to drain the camera's battery a lot (although the adapter has the ability to disable some features to address this issue.) Finally, there are reports

that the Metabones adapter makes the best use of the PDAF points closest to the center of the image. (One data point: <http://www.dpreview.com/forums/post/56591568>)

Fred Miranda has been keeping an ongoing list of which Canon EF lenses focus well and not-so-well on his website: <http://www.fredmiranda.com/forum/topic/1379624>

Metabones T Smart Adapter Mark IV for Canon EF or Canon EF-S (crop sensor) lenses: USD \$399 <http://bhpho.to/1U2HHsk>

There's also one from **Fotodiox** for only \$100 that performs moderately well in poor light: <http://bhpho.to/1FHxudd> Here's a video showing off its AF abilities: <https://vimeo.com/135978162>

Viltrox VILTROX EF-NEX II Canon EF Lens To Sony NEX Cameras USD \$85.99, <http://amzn.to/1LiWw0x>. There are user reports that "not all Canon lenses work" but no specifics have been compiled. David Kilpatrick of f2 Cameracraft fame verifies that phase-detect AF points work with this adapter.

Commlite Auto-Focus Mount Adapter EF-NEX for Canon EF to Sony NEX Mount \$75.66 A detailed list of compatible lenses appears on the sales page. David Kilpatrick of f2 Cameracraft fame verifies that phase-detect AF points work with this adapter. <http://amzn.to/1xTHxnc> Here's a video showing how well the AF works with this adapter: <https://vimeo.com/135981179>

In September 2015, a 3rd adapter claiming native AF performance was introduced by **DEO**, their "Saker Falcon Lite", which claims something called Dual Operation that their press release does not at all make clear what it does. Also marketed under the name "Techart", early reports say it's not ready for prime time. Stay away from this one for the time being.

Most of the other Canon EF adapters out there don't have the guts (literally) to drive autofocus, and so your fancy EF lens will be a manual focus affair (and f/stop adjustment will either be impossible or via an iris within the adapter itself).

4.2.6 *CANON FD*

Before Canon switched their entire SLR camera line to the EOS mount in 1987, they used the manual-focus FD mount. Being backward-compatible with earlier lens mounts such as the Canon FL, FD mount lenses were in production starting with the Canon F-1 in 1971 and continuing to 1990 with the Canon T60 (the last camera to offer the FD mount).

Novoflex Adapter for Canon FD Lens to Sony NEX Camera \$211.99
<http://bhpho.to/1i1A4g5>

Metabones adapter USD \$99 <http://bhpho.to/1KV8Civ>

Then there's this very inexpensive one from **Fotodiox** for only USD \$28.95 which seems to get high ratings: <http://amzn.to/1VxYLqX>

Canon also made an R-mount camera lens for their very early Canonflex SLRs. Regrettably there are no known adapters for the Canon R-mount lenses.

4.2.7 *NIKON*

Nikon is the only camera company on the planet that has been using the same lens mount since 1959. They did this to ensure that anyone who has invested in previous Nikkor lenses will still be able to use them on a modern Nikon body. There is an alphabet soup of generational lenses' feature names, and the sheer number of compatibility exceptions between older lenses and newer bodies is mind-boggling, however for the purposes of adapting them to your E-mount body there are only TWO kinds of Nikon adapters that warrant mentioning:

- Nikon's G lenses are modern lenses which do not have a conventional ring around the base to control the f/stop. Instead, the camera body dictates the f/stop used via electronic signals to the lens. Adapters made for Nikon G lenses can also work with the Non-G lenses as well (defined below in the next bullet).
- All other lenses (variously referred to as "Nikon F", "Non-G" or "AF-D-series").

Note that Nikon makes a DX-series of lenses which are designed specifically for smaller APS-C sensors. As such they may not fill the frame

with an image. If this happens to you the A7r II has an APS-C emulation mode which you might want to invoke: **MENU → ⚙ 6 → APS-C / Super 35mm → On.**

Note that none of the adapters mentioned below support neither autofocus nor auto f/stop, nor will they support the lens' Vibration Reduction (VR) feature if it has it. No electronic signals are communicated to the lens. You have to focus manually, and you control the f/stop either from an iris built into the adapter or via a blue ring.

***TIP:** As of this writing there are NO commercially available adapters that support autofocus with Nikon lenses. However, a company called Commlite is working on one and early users of pre-release software have said good things about it. More info here: <http://bit.ly/1hpg36O>*

Adapters that work only with the G series

Metabones Nikon G to Sony E-Mount Adapter \$139 <http://bhpho.to/1lriEKJ>. (This adapter does *not* work with older Nikon F mounted lenses with an aperture tab like AI-s or AF-D series lenses.)

Adapters that work with Any Nikon F lens

FotodioX Adapter for Nikon G to Sony E-Mount \$59.95 It has a blue ring which controls its own built-in f/stop. The literature says it's only for the G series however one user reported that it works with older lenses too. This model does not have a tripod mount (something most of the other adapters offer). <http://bhpho.to/14rS8xh>

Novoflex Adapter for Nikon Lens to Sony NEX Camera \$299 at <http://bhpho.to/1em66zw>. It's three times the price as the Metabones model, works with ANY Nikon lens, and has a special blue ring for manual adjustment of the f/stop.

Adapters for Non-G lenses

Metabones Nikon F Mount Lens to Sony NEX Camera Lens Mount Adapter II \$99 <http://bhpho.to/1fQS1Q0> This is a purely physical adapter with no electronic connectors. For use with lenses that have aperture rings.

Here's one from **Vello** for half the price (USD \$44.50):
<http://bhpho.to/1au9mup>

“Universal” Nikon Adapter

Have both types of Nikkor lenses? This one doesn't have a brand name but seems to be popular and at USD \$18.99 it's a low risk:
<http://bit.ly/NQDvLv>

4.2.8 PENTAX

Pentax, unlike Nikon, has changed their lens mount a few times over the years. In the early days of their Spotmatic F SLR, Pentax used the M42 screw-mount lens (covered in Section 4.2.2). Then they switched to the bayonet-based K-mount (sometimes called the “PK mount” in 1975 (starting with the infamous K1000) and it is still in use, although with various upgrades to allow for increased automation.

None of these adapters support autofocus.

Voigtlander Adapter for Pentax K Lens to Sony E Mount Camera \$179
<http://bhpho.to/1h8h5yy>

Novoflex Adapter for Pentax K Lens to Sony NEX Camera \$292.99
<http://bhpho.to/1flKEPh> This one allows you to control the f/stop on the latest series of K-mount lenses that don't have f/stop rings.

4.2.9 MINOLTA MC/MD

FotodioX Adapter for Minolta MD/MC/SR Rokkor Mount Lens to Sony NEX Mount Camera \$59.95 <http://bhpho.to/1QTgHFL> This is a pure mechanical adapter and you're on your own for adjusting the f/stop.

For considerably more you could spring for the **Novoflex** adapter (USD \$211.99) <http://bhpho.to/1Ma4f0U>

4.2.10 OLYMPUS OM

Olympus' SLR cameras in the 1970's were legendary for their small size and their superb Zuiko optics. The best known cameras of this era were the OM-1, OM-2, and the OM-10. Any OM Zuiko lens can be fitted to the E-mount body via one of these two adapters:

Novoflex Adapter for Olympus OM Lens to Sony NEX Camera \$211.99
<http://bhpho.to/1lQ9f2b>

FotodioX Adapter for Olympus OM Lens to Sony NEX Mount Camera
\$59.95 (quite a difference in price!) <http://bhpho.to/1eml2xk>

Metabones is now in the game too: \$99 <http://bhpho.to/1L0kIol>

Most Zuiko lenses were manual focus, but even those that are autofocus will have to be focused manually with these adapters.

4.2.11 *CONTAX*

Lots of Contax lens formats available:

Contax G

The Contax G series was a modern rangefinder-style camera with autofocus and the option of an automatically-controlled f/stop. And the Zeiss optics were some of the best rated lenses for 35mm cameras ever produced. There were only two camera bodies made – the G1 and G2 - before the camera brand was discontinued in 2005 by its parent, Kyocera.

There were only 7 lenses made (spanning between 16mm to 90mm primes, plus one zoom).

Manual focusing is done via focus-by-wire (the same way it's done via a native FE lens – you turn a ring, but the camera sends electronic signals to the lens' focus motor.)

Performance of this adapter is mixed amongst users – manual-everything operation is great; auto-anything seems to have various problems depending on the lens and the parameter you're trying to automate. Here are two discussion forum threads which talk about users' reactions: <http://www.rangefinderforum.com/forums/showthread.php?t=133697> and <http://www.dpreview.com/forums/thread/3520707#forum-post-51848140> . These threads discuss the adapter when mounted on older CDAF E-mount bodies, and I have yet to come across any reviews of the adapter on the A7r II with its on-chip phase-detect ability.

Techart Contax G to Sony Nex E Mount Auto Focus Full Frame Camera
Mount Adaptor (Version 3) \$300 <http://amzn.to/1JNq6td>

Manual focus options for the Contax G

Metabones Contax G Mount Lens to Sony NEX Camera Lens Mount Adapter \$129 <http://bhpho.to/1IQdRpa>

FotodioX Adapter for Contax G Lens to Sony NEX Mount Camera \$89.95 <http://bhpho.to/1fR0cvH> (No AF and no auto diaphragm).

Contax / Yashica

Contax' history is as long as Leica's in the 35mm photographic world. And their Zeiss lenses were just as good (some say better, but I don't want to start a religious war here).

If you have some of the Zeiss T* lenses that were designed to fit the Contax RTS or later, or Yashica SLR (same mount), then this adapter is for you:

Novoflex Adapter for Contax/Yashica Lens to Sony NEX Camera \$211.99 <http://bhpho.to/1jICWnG>

***Interesting Historical Note:** Although none of the lenses in the Contax / Yashica mount were capable of autofocus, Contax did develop the AX body which achieved autofocus by moving the film plane forward and backward instead of rotating a lens element. They also developed a vacuum system behind the film plane which promised sharper images by sucking the film flat against the pressure plate! It's tough being a pioneer.*

Contax N

The Contax N-mount was the company's push into autofocus, with a brand new lens mount that was not backwards compatible with their RTS system lenses. The N-mount used electronically controlled f/stop and AF.

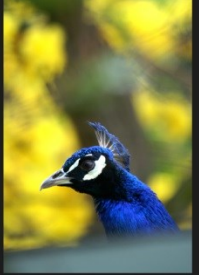
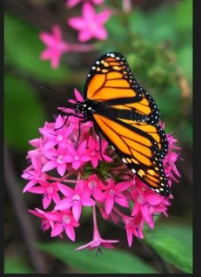
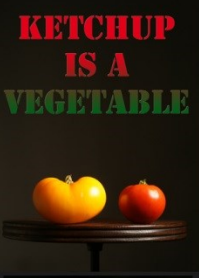
FotodioX Adapter for Contax N Lens to Sony NEX Mount Camera 89.95 <http://bhpho.to/1IQiUG8>

Fringer makes an adapter that fully supports autofocus and f/stop automation, but it's considerably more expensive: \$680 available here: <http://ebay.to/1hpqn5C>

As with most of the other adapters mentioned in this chapter, autofocus doesn't work, and the aperture cannot be controlled at all. Instead the adapter has a built-in iris whose opening you control via a blue ring.

4.2.12 MEDIUM FORMAT LENSES

Really? A lens for a medium format camera adapted to the equivalent of a 35mm camera body? Yup! Google them and you'll find adapters for Pentax 645N, Hasselblad V and Mamiya 645 lenses. Of course the crop factor is insane...



Chapter 5 WI-FI, NFC, AND APPS

How many times have you been on vacation, and were frustrated that you can't share the photos you took with your "good camera" on Facebook when you took them? (Now raise your hand if you ever took a 2nd picture with your phone just so you could post it!) The Wi-Fi and Near Field Communications (NFC) feature of this camera are designed to work with your smartphone to address this very scenario.

And in the continued blurring of the lines between camera and smartphone, the A7r II allows you to download "apps" that provide new features and special effects that you can invoke in-camera without needing Photoshop (or even a bigger computer).

Here's what this chapter will talk about:

- How to initially configure your camera for Wi-Fi
- Cool things you can then do, and how to do them:
 - Uploading a picture to Facebook via your smartphone
 - Using your smartphone as a remote control and remote viewfinder for your camera
 - Uploading images to your home computer wirelessly
- An introduction to Sony's App Store and how to download, invoke, and manage your installed Apps. (Mind you, I hate the word "apps". In my day they were called "Programs". ☺)

All of the smartphone examples I show in this chapter are done with my Android phone (a Samsung Galaxy S5 (yeah I'm a luddite)). An iPhone experience should be very similar except the NFC option will not be available (yes, the iPhone 6 and 6+ have NFC, but it can only be used for Apple Pay at the time of this writing). And a Microsoft Windows phone experience will be VERY different since Sony hasn't yet released a PlayMemories Mobile app for that platform (which is necessary for your smartphone to interact with the camera.) (This puts you spiritually closer to us old Minolta owners, who got used to the fact that the 3rd party world would ignore them completely.)

5.1 WHAT IS NFC?

You're probably already familiar with Wi-Fi, but what's NFC and why should you bother with it?

The short answer is “NFC is the TLA (Three-Letter Acronym) for ‘bump’”, and “Once it's configured, it can shorten the time to initiate something with the smartphone”. For example, in order to send a picture I'm looking at on my camera to my smartphone, all I have to do is touch the side of the camera to the back of my smartphone. (Both have to be on, of course.) The app starts automatically on my smartphone, and the image ends up on my phone seconds later, ready for me to share it with the world. So it can save a little bit of fumbling on both the camera and the smartphone.

The allowable distance between NFC sensors is intentionally small – the official specification is no more than two inches. This was done to minimize the very real possibility of someone standing next to you in a crowded room and slurping up your phone's contents without your knowledge or consent. (I sure wish the folks who decided putting RFID tags into U.S. Passports had taken that scenario into account before deciding it was a good idea.) Anyway, on this camera it's even less than an inch. The sensor itself lies directly beneath the N logo on the camera's side (Figure 5-1a). And at least with my smartphone the N logo must be placed



Figure 5-1: The NFC transceiver is located directly behind the fancy N logo on the camera's side. Once it's aligned with the NFC transceiver on the back of your smartphone (right), you can separate the two devices, and the Wi-Fi transfer will initiate.

EXACTLY where my NFC sensor is in my phone (which is completely unmarked, so I have to slide the camera around the back of the phone a little bit until I hear the “I found you!” sound - **Figure 5-1b**).

5.2 SETTING THINGS UP – SMARTPHONE FUNCTIONS

5.2.1 *INSTALL PLAYMEMORIES MOBILE*

You can get this essential piece of software from the usual places: the App Store for the iPhone, Google Play store for Android.

You can't do much when you run the app by itself, but I encourage you to do so just so you can change one setting. With the app running, hit the MENU button or icon (it varies from phone to phone; on Android phones it's three vertical dots) and choose “Settings”. The first option will be “Copy Image Size”. For a lot of reasons I recommend ensuring this to 2M if it's not there already – that will mean your smartphone will receive an image of 1616 pixels wide x 1080 pixels high. Downloading the full-sized image just to post on Facebook is really overkill. (Why is it called “2M”? Because the image is roughly 1.7 MP, and they just rounded up. Once compressed and stored as a .jpg, though, the picture takes up only about 500 KB, making it ideal to send over your phone's expensive data plan.)

If you're traveling in a foreign country and your roaming data plan is something like \$20/megabyte (it used to be that bad, and I'm sure it still is in some countries), then you might want to consider using the VGA option instead. VGA resolution is 640 x 480 pixels. (Which doesn't sound like much, but you didn't complain about it much in the 1980's when that was the standard computer screen resolution.) The file size (when compressed as a .jpg) will be approx. 75 kilobits – perfect if you want to conserve as much of your data plan as possible and most people won't think it's a bad-looking image.

5.2.2 TRANSFERRING AN IMAGE TO YOUR SMARTPHONE

First, just start the PlayMemories Mobile app. Although it doesn't say so, the phone is now looking specifically for a Wi-Fi enabled camera.

Now turn your camera on and play back an image you just took, and press the **Fn** button then select "This Image". The camera then sets up its own Wi-Fi hot spot and it should then appear on your PlayMemories Mobile Screen. If this is the first time doing this, you need to select the camera it found by tapping it with your finger on the smartphone. The phone should then show "Connecting..." and then the image will transfer over, ending with a confirmation screen like that shown in **Figure 5-2**. Hit "OK" on the phone to finish.

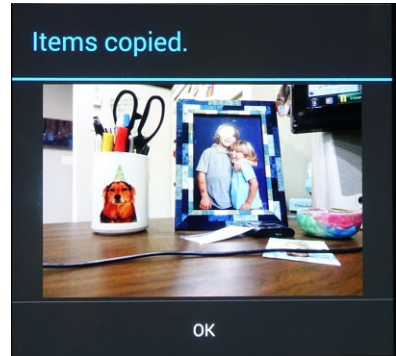


Figure 5-2: What you see after a successful image transfer.

Hit "OK" on the phone to finish.

Congratulations! You just experienced some instant gratification.

TIP 1: You can transfer still images (.jpgs only) or .mp4 movies (not AVCHD or XAVC S) to your smartphone this way. If you're shooting in RAW, the camera converts the RAW file to a .jpg first before transferring it over.

TIP 2: If you're connected to your camera via PlayMemories Mobile on an Android phone, and you put the program in the background (to take a call, for example), the Wi-Fi connection to your camera will terminate. Not good software design in my opinion.

5.2.3 CONFIGURING NFC ON YOUR SMARTPHONE

The above process of transferring a file to your Android smartphone gets much easier if your phone has NFC built-in. To enable NFC on your smartphone, on Android 4.1, just go to **SETTINGS** → **MORE SETTINGS** → **NFC** → **ON**. (This will only appear if your device has an

NFC transmitter built-in, of course.) For more recent versions try **SETTINGS → CONNECTIONS → NFC →** and turn it **On**.

5.3 NOW WHAT?

I have a few favorite uses for this capability:

5.3.1 *SEND (RESIZED) IMAGES TO YOUR SMARTPHONE FOR SOCIAL MEDIA*

When I'm on vacation, and I take a great photo with my camera, I can share it on Facebook almost immediately. Using Wi-Fi (and optionally, the NFC feature to make the process faster) I can transfer a downsized version of the image to my smartphone and have my phone upload it from there using its data connection.

(Why upload a smaller version to Facebook? Because computer screens need far, far fewer pixels than printing or enlarging. So 42 MP are a great thing if you want to make big enlargements to hang on your wall. But it's kind of overkill for social media.)

Here's how to do it, step-by-step:

If your phone has NFC:

- 1) Playback your images on the back of your camera, and stop when you see an image you want to share.
- 2) Turn on your smartphone and touch the side of the camera with the "N" logo to the back of the phone until you hear the "I found you!" sound and see PlayMemories Mobile app start.
- 3) Watch in awe as your image automatically transfers over. (It takes about 10 seconds, eight of which are needed to set up the connection.)
- 4) Once the transfer is finished, exit the app. The image(s) you just transferred can be seen by pressing the "View transferred images" on the PlayMemories Mobile app. You can then left or right swipe to see different images, and share the image you're looking at by clicking on the icon in the upper-right-hand corner.
- 5) Your pictures will also appear in the Android Gallery app, in a subdirectory called "PlayMemories Mobile".

If your phone doesn't have NFC:

- 1) Playback your images on the back of your camera, and stop when you see an image you want to share.
- 2) Go to **MENU** → **1** → **Send to Smartphone**.
- 3) The camera will then ask you to choose between “Select on This Device” or “Select on Smartphone”.
- 4) For simplicity and to save time, choose “Select on this device”, which leads you to a further submenu: “This Image,” “All Still Images on Date”, or “Multiple Images”. For this example I'll choose “This Image” (meaning the one I was looking at in Step 1 above).
- 5) You will see a screen like that in **Figure 5-3** on the back of the camera, indicating it's waiting to hook up with a phone it knows about.
- 6) Start the Playmemories Mobile app on your smartphone. It will start to scan local Wi-Fi access points and will look for the camera it already knows about. When it finds it, it will automatically connect and the image transfer will commence.
- 7) You'll see a “Contents Copied” message on your phone. Hit OK to accept and then you can exit the app.
- 8) Turn off the camera.
- 9) Had you chosen “Select on Smartphone” in Step 3 above, the camera would have shown you tiny thumbnails of all pictures in the current directory; you can then select the ones you want and then hit either “Copy” (which means “Copy to smartphone”) or “Share” (which means “Copy to smartphone, and then either email or post to a variety of social media apps on your phone”.) Choosing “Share” will still leave a copy of the sent picture in your photo gallery.



Figure 5-3: If you don't have NFC in your smartphone, you can still establish Wi-Fi communications the old fashioned way by using the SSID and Password shown to you on the back of the camera.

- 10) Once the transfer is finished, exit the app on your phone. The image(s) you just transferred can be found in your usual pictures directory with whatever picture browsing app you usually use. (Don't you love instructions that are extremely specific?) On my Android phone, I use the Gallery app, and it's in a subsubdirectory called "PlayMemories Mobile".

TIP 1: *The easiest way to exit out of connected mode is to just power down the camera, and then exit the app on your phone.*


TIP 2: *If Wi-Fi is turned off on your smartphone, PlayMemories Mobile will automatically re-enable it for the duration of the transfer, then will shut it down again upon app exit.*

5.3.2 SMART REMOTE CONTROL


This is my 2nd-favorite new feature, because it holds the possibility of taking cools shots that were much more difficult to do previously. Think of it as tethered shooting, but without the tether.

This uses a built-in app on your phone called "Smart Remote Control". (Note: If your camera shows a similarly-named app called "Smart Remote Embedded", that app needs upgrading. See Section 5.5 for how to do so.)

If your smartphone has NFC

- 0) Like everything else in this chapter, you have to configure the camera first. **MENU →  1 → One-Touch(NFC)** tells the camera "Invoke this app when you bump the camera with your phone". Invoke this menu and select "Smart Remote Control" from the list of choices. You only have to do this once.
- 1) Turn your smartphone and the camera on and touch the "N" on the camera to the NFC spot on your phone until you hear the "I found you!" sound. The App starts on your phone and the camera automatically starts the "Smart Remote Control" app.

If your smartphone doesn't have NFC

Manually invoke **MENU →  1 → Application List → Smart Remote Control**. You'll see a screen similar to the one shown in **Figure 5-4**.

Now turn on your smartphone and start the PlayMemories Mobile app. The app will automatically scan Wi-Fi for cameras it knows about and automatically connect when it finds yours.

Continuing...

On your smartphone, a screen shot similar to the example you see in **Figure 5-5** appears. The first thing you should do is touch the "tools" icon (it looks like a wrench and a screwdriver) and make sure you have the following things set:

- set "Touch Shutter" to "On". (This enables you to touch your subject on the smartphone, and the app will focus on that subject first before taking the picture.)
- set Size of Review Image to 2M (as explained earlier)
- Live View Quality = Standard (makes live view screen refresh much faster)
- There are other settings toward the bottom which would be set according to your personal preference:
 - Review Image – do you want to see the image you just took after shooting remotely? It takes about 10 seconds to do so.
 - Save Options – do you want to save the image you just took to your phone (in addition to having it saved to your memory card)?
 - Enable / Disable a 2-second self-timer. (The orange lamp on the front of the camera even goes off beforehand, just like it should!)
 - You can invoke a “Mirror Mode” which reverses the live view display on the phone in case you’re using this to take a remote selfie.

From here, you have the following options:

- Take the picture! Touch your subject on the screen and let the camera do its thing.



Figure 5-4: Starting the “Smart Remote Control” screen. If your phone doesn’t have NFC, you would use the SSID and Password to manually connect your smartphone via Wi-Fi for the first time.

- After you take the picture you'll see a small thumbnail of the image in the lower-right-hand corner. If you press it you go into Photo Review mode, where you can hit the "Share" icon at the top of the screen to send it off via a variety of phone-specific options.
- Want to take a movie? Move the exposure mode dial on the camera to "Movie". The controls on your smartphone screen will change.
- When you're finished, exit the app on your phone and hit the MENU button to exit the app on the camera.

The camera is in a very low-level of AUTO mode using this function – you can't choose an exposure mode (it is determined by the camera's exposure mode knob at the time you start the remote app), but you can control your ISO, white balance, or exposure settings just by touching those variables and adjusting them.

Need to adjust more settings, such as image size, quality, focus mode, focus area, ISO, metering mode, or even DRO / Auto HDR (and others?) Hit the MENU button ON THE CAMERA after a connection has been made on the smartphone and scroll through the menus – these are settings that only apply when in Smart Remote Control mode.

Sony's official specs say that the maximum distance between the camera and the smart phone is 10m / 33ft, but of course this will be reduced depending upon what is between the two devices.

If you're shooting RAW only, the camera will convert it to a .jpg for you and then send it off to your phone (only because it's a near certainty that your phone can't read RAW files, and even if it could, it would take way too long to send it over!)

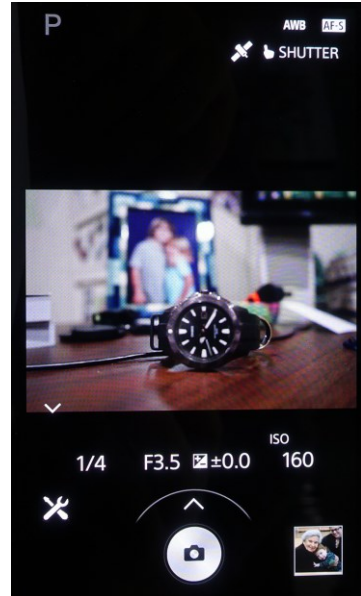


Figure 5-5: The PlayMemories Mobile screen lets you take a picture and switch to Movie mode, but not much else.

How long can the camera last on a full battery charge? (You know I tried it). The camera battery lasted about 2.5 hours with the rear LCD turned off (**MENU → ⚙ 4 → FINDER / MONITOR → Viewfinder**); my smartphone's battery (Samsung Galaxy S5) died about 2.5 hours into the experiment as well. Every smartphone is different.

You can use your imagination for the kinds of unique shots you can get with this feature. Here are some ideas to get you started:

- Take a self-portrait and know that you've framed yourself properly beforehand!
- Shoot way above a large crowd using the long-pole shown in **Figure 5-6**.
- Find a bird nest and shoot when the time is right. (Chances are your patience will be exhausted long before the batteries die.)
- Street photography – put the camera on top of a newspaper stand, point it at where pedestrians are apt to be, and shoot at the decisive moment from around a corner. (I didn't try this because I'm philosophically against street photography, plus I'm worried that someone might walk away with my camera.)
- Hide it amongst some presents under the Christmas tree, and get shots of your kids as they hover near the package to pick it up. (And make sure that the area under your tree is well-lit!)
- Have some cool pictures you've taken with this feature? Email me your best ones and they might appear in a future ebook.



Figure 5-6: One thing you can do with the Smart Remote Control feature is to spy on people through high windows. (Not recommended.)

5.4 UPLOADING FILES TO YOUR HOME COMPUTER

Before you can upload images to your home computer for the first time, you need to do an initial configuration with your Wi-Fi router. The camera can memorize many different routers (which Sony calls “access points”), but I’ve yet to discover what the maximum number is.

There are two methods of pairing with a Wi-Fi access point: the traditional way, and the easy way (which requires that your access point has a “WPS” button, as in **Figure 5-8**). I’ll outline the traditional way first.

The Traditional Way

Go to **Menu** → **2** → **Access Point Settings** and after a few seconds the camera will show you a list of all the Wi-Fi access points it sees. Select the one you want to connect to via the arrows and select with the center button. A password screen appears (if you’re connecting for the first time), then a configuration screen in **Figure 5-7** appears.

Unless you’re an IT Admin guy I recommend you keep the settings as shown in **Figure 5-7** and skip to the next paragraph. **IP Address Setting**

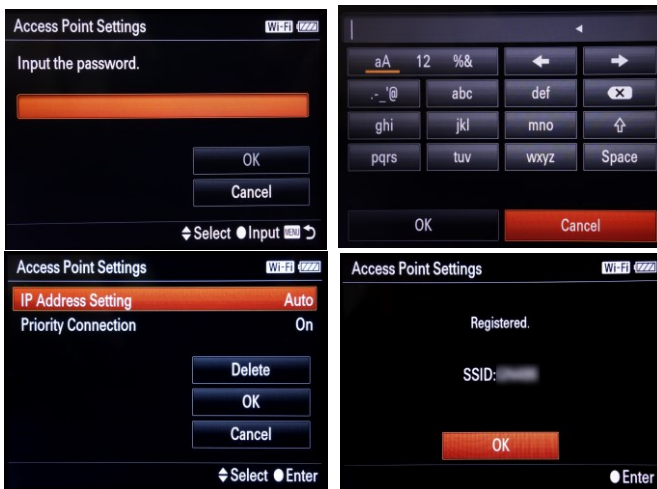


Figure 5-7: The screen you see to set up your Wi-Fi access the traditional way. (You can skip this method if your Wi-Fi router has a “WPS” button.)

set to AUTO allows the camera to automatically be assigned an IP address via the router's DHCP function. Many corporate IT departments have DHCP turned off to keep unapproved devices from accessing their network, and so you'll have to work with them to get an IP address and assign it manually when this function is set to "Manual".

Priority Connection is designed to give your Wi-Fi signal priority when many other devices are wanting to talk at the same time. (Usually this mechanism is used when streaming movies from one Wi-Fi device to another.) Keeping it On will move your pictures faster in theory, but your particular network configuration and activity will determine how much of a speed increase it will get you (if there's one at all).

Then hit OK. The camera will try to access the Access Point, and if necessary it will eventually ask you for a Wi-Fi password (**Figure 5-7a** and **b**). The camera supports WEP, WPA and WPA2 format passcodes, which are the industry standard for Wi-Fi routers. Here's where a touch screen would have been handy; instead you have to enter your passcode old-school cell phone style: press the ABC button three times to get a "C", etc.


Finally, all your hard work will be rewarded with the confirmation screen you see in **Figure 5-7d**. Henceforth, the camera will remember this access point and you shouldn't have to do the above steps anymore.

The Easier Way



Figure 5-8: Many modern Wi-Fi routers possess a WPS button to make the setup of secure networks a push-button affair (left). Just push the button and then initiate "WPS Push" from the camera (right).

If your Wi-Fi router / access point has a button on it labeled “WPS”, then the registration of a Wi-Fi Access point becomes a two-step operation:

1. On the camera: **Menu →  1 → WPS Push**
2. On the Access point: Press the WPS button

You’ll briefly see the screen in **Figure 5-8b** and then you’ll get a confirmation screen. That’s it!

WPS was originally designed to make setting up a secure network a push-button affair (without having to enter any SSID’s or long passphrases). Wi-Fi Protected Setup (WPS) goes by other names too – Wifi Simple Config (WSC), or Push ‘n’ Connect. But the idea is you just press two buttons while the two devices are proximate and that’s that.

5.4.1 CONFIGURING PLAYMEMORIES HOME

Next, in order to transfer images to your home computer you **MUST** be running Sony’s PlayMemories Home software.

So if you haven’t yet installed PlayMemories Home on your computer, now’s a good time, and you can download it from here: <http://sony.net/pm>. Then open the software, connect your camera via USB cable, and turn it on. After a few (or more) seconds you should see a message saying “Hey, I detected a new camera! The following new functions will be installed:” and then an empty box showing no new functions is shown. Hit OK anyway, then after a few more seconds the screen in **Figure 5-9a** appears. It’s saying “This new camera can do Wi-Fi. Do you want to configure

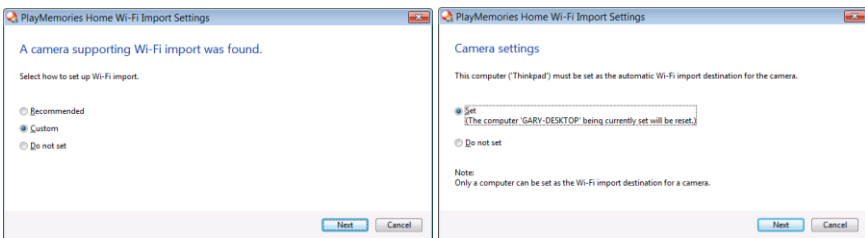



Figure 5-9: Two mandatory setup screens when you configure PlayMemories Home to be the recipient of Wi-Fi downloads.

TIP 1: Your Wi-Fi access point must support WEP, WPA or WPA2 encryption standards (most do) in order for the WPS Push function to work.

TIP 2: The access point also has to have its “Beacon” set to ON in order for your camera to find it.

TIP 3: You can’t use the home router connection to send pictures to Facebook or Twitter. For that you’ll have to use a competing Wi-Fi solution called Eye-Fi (which the camera supports – see Section 11.6).

TIP 4: This is probably kind of obvious, but **MENU** →  **1** → **Airplane Mode** must be **OFF** in order for any Wi-Fi feature to work.

automatic Wi-Fi importing?” Go ahead and hit “Custom” and then “Next”.

Then you’ll see **Figure 5-9b**, asking that you Set the current computer to be the defacto Wi-Fi recipient. (You can’t have more than one machine configured to receive Wi-Fi downloads. So if you have a desktop and a laptop that could work, you have to choose only one.) Choose the “Set” button then hit “Next”.

Next you get an unintuitive Windows Firewall setting screen, which is essentially telling you that it’s unwise to do this Wi-Fi upload thing at Starbuck’s (or other public hot spots) because it opens your computer up to

potential security threats. So make sure you’re doing this just on your home network (check the “Private or domain networks” box and leave the “Public Networks” box unchecked) and hit “Next”. Then there should be a Windows “Are you sure you want to do this?” confirmation screen (say Yes) and then finally you hit

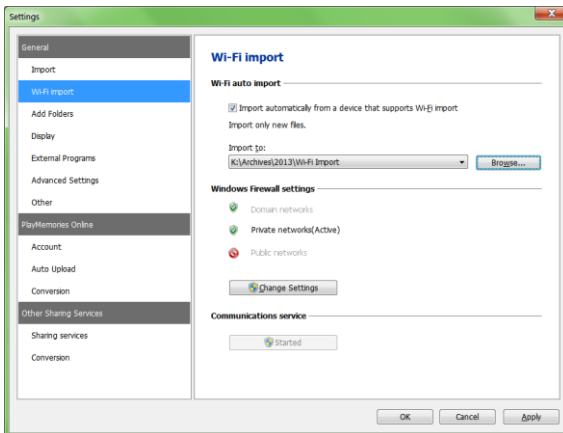


Figure 5-10: Avoid frustration later by telling PMH where you want your Wi-Fi files imported to.


“Finish”. Should you ever need to bring up that “Configure Wi-Fi screen” again, hook up the camera via USB, select the camera supporting the Wi-Fi function from [Cameras and media], and then click on [Wi-Fi Import Settings] on the right-hand side.

One last configuration: You have to tell PMH where you want new images uploaded to. Go to Tools → Settings... and then click “Wi-Fi Import”. The screen in **Figure 5-10** appears. Press the Browse button and specify a destination directory. You can then exit out of PlayMemories Home and go about your business.

If you can't do an upload, your Anti-virus or firewall program may actually be blocking the connection. This is where I leave you in a lurch because every firewall is different and it's impossible to give you step-by-step guidelines on how to fix it. The high-level advice is “Change the settings so that communications can be made using UDP port 1900 and TCP port 2869”.

5.4.2 *INITIATE YOUR DOWNLOAD*

Once all of this is set up (and again, you only need to do the above once), you can upload your pictures wirelessly by doing the following:

- **MENU →  1 → Send to Computer**
- Wait.

The camera will first establish a connection to your Access Point, then to your computer running Playmemories Home, then it will start a pre-upload process, and then the actual transfer will begin. PMH does NOT need to be running beforehand – it should wake up by itself and start importing to the directory specified during the setup process.

The camera will turn itself off once the transfer is finished.

TIP: *I've found the process of downloading images to the computer via Wi-Fi to be a fickle process at best. Even after a successful transfer, a subsequent attempt might be unsuccessful. Sometimes just moving the camera from one side of my desk to the other solved the problem. I'm not sure uploading pics to your computer via Wi-Fi is a preferable method compared to using a USB cable or just shoving the memory card into your computer.*

5.4.3 THROUGHPUT RATES

And now, a First World Problem: The camera has 42 megapixels and the images are so detailed that it will seem to take forever to transfer the images over to your computer (this is especially true if you're sending RAW files). In one of my tests it took 6:34 minutes to transfer 236 MB of images; this works out to be a speed of 4.7 megabits per second.

"4.7 Mbps? Isn't my 802.11n Wi-Fi rated at 300 megabits per second?" Well, that's a maximum theoretical rate and your actual speed depends upon a great many factors, including the distance from the router, building materials between devices, the number of devices that are actively communicating (especially devices that are streaming movies at the same time), and what else your computer is doing. Plus there's the protocol overhead involving preamble, error detection and correction, and packet retransmission on noisy networks. My network is pretty modest so I'd say it's healthy to expect no more than 5 mbps throughput rate.

5.5 APPLICATIONS

Recent Sony cameras have offered the ability to download apps to add additional functionality to your camera. Whether this is a wonderful thing or not depends on who you talk to – many complain that some of these functions used to appear for free in previous cameras, and now have been removed from the native menus and it cost you money to get these features back. Others complain (and I'm among them) that Sony didn't go far enough, and really should open up a programmer's API so 3rd parties can write apps that are truly imaginative and useful. Alas, as of now there's no sign that will happen.

But I digress. Your camera can download applications and I'm going to show you how to download your first one. There are two ways to do it: 1) By tethering your camera to an internet-connected computer via USB cable (this is by far the easiest option), or 2) by establishing a Wi-Fi connection to your router and downloading to the camera directly (less desirable because you'll have to use the camera's video-game keyboard to enter usernames and passwords).

You'll also need to setup a PlayMemoriesOnline.com account. Here's how to go about setting it up, then I'll talk about some of the more noteworthy apps that are available as of this writing.

1. First, go to the PlayMemories Camera Apps website at: <https://www.playmemoriescameraapps.com/portal> (you MUST have the 'www' at the beginning) and setup your account. The same login information for this website should also apply to the PlayMemories Online website (www.PlayMemoriesOnline.com) where you will also need to have an account. If you plan on purchasing any applications, you'll have to register a credit card here by pressing "Add Funds to Wallet".
2. The App store is where you will go to download the camera applications and you will also find user manuals for each app there.

(The PlayMemories Online website is one of the places your photos (and videos) can be sent when you use the Direct Upload app on your camera. Here you can also share an album or send a postcard with an image and message of your choosing via email (messages on the card are limited at 50 characters)).

If your camera is connected to your computer via USB

Once your accounts are set up, just log in to the PlayMemories App store on your computer, choose your camera model from the drop-down list (you may have to scroll down to see it), select the app you want (I started with the Time-Lapse app, which was hyphenated for no good reason), select the "Install" link on the left side of the screen and follow the instructions. On my PC (Windows 7 / IE browser) it installed a downloader program, which involved several popups and browser restarts. This only needs to be done once.) Then you hit the "install" button in the browser. Then you're told turn the camera on and connect it to your computer via a USB cable. After the download, the app automatically installs on your camera and you're ready to go. To install





Figure 5-11: The currently available Camera Apps.


additional apps, just leave the camera connected and select the next app you want.

TIP 1: The Sony website sometimes has issues with the Chrome browser. Switching to Internet Explorer (Windows 7) worked for me. Edge on Windows 10 didn't. Mac users – let me know if Safari works for you. Also, their website has problems every 20 minutes, and seems to forget your password if you don't log in after a month or two.

TIP 2: Some of the apps are free, but others are priced at \$4.99 and \$9.99, so you may want to add money to your account at Sony ahead of time. On the plus side, if you own several Sony cameras with App capabilities, you only have to pay for the app once and it can be installed on all of your cameras.

If your camera is connected to the internet via a Wi-Fi router

If you want to setup the camera so it can download apps over a wireless connection, either using **MENU →  1 → WPS Push** or **MENU →  2 → Access Point Set** as described in Section 5.4.

Then select **Menu →  1 → Application List → PlayMemories Camera Apps**. The camera will connect to the internet via your Wi-Fi router (reboot your router if it's having connectivity issues), and give you a list of all available apps. Make sure you select “All” in the tiny vertical tabs on the left (**Figure 5-11**.) Then scroll to the app you want to install and click on it. It's a pretty smooth process other than the fact that you have to sign in the first time using that awful cursor-driven keyboard. (That keyboard is a good argument for making short, insecure passwords.) (And for touchscreens. Just sayin'.)

Here are the apps that are available for the A7r II camera at the time of this writing:

Name	Price (USD)	Description
Touchless Shutter	Free	This one's very useful. It uses the IR sensor near the eyepiece (which normally senses when there's something proximate so it can switch the EVF on automatically) to trigger the shutter – all you have to do is put something close to the eyepiece. This can be most useful when you wish to take time exposures longer than 30 seconds – normally that requires a cable release like the RM-

		VPR1, or the infrared Wireless Remote Commander. Just put your hand behind the eyepiece once to initiate the exposure, and again to terminate it. It can also be useful for taking macro shots on a tripod, in situations where you'd use the self-timer to ensure a vibration-free shot. But because it's an app it doesn't always pay attention to the camera's nuanced menu settings. My advice: The 2s self-timer is free.
Time-Lapse	\$9.99	Provides a limited Intervolometer function which takes pictures at regular intervals. It will even make an .avi movie for you (which, oddly, the camera doesn't know how to play back outside of this app!) after the sequence is finished. Note: flash mode is set to "No flash" when using this feature. That might be a deal killer if you're doing some scientific macro setups.
Angle-Shift Add-On	\$4.99	If you're doing a time lapse, you need this add-on. This capitalizes on the fact that the sensor is capable of capturing FAR more pixels than are required for an HD or 4K movie. And so this app can use those extra pixels to pan and zoom your way through the timelapse as it's writing the movie to the memory card. In the past this was a time-consuming process on the computer involving mastering movie editing software. Highly recommended.
Direct Upload	Free	Post images to the online photosite of your choice (such as PlayMemoriesOnline, Facebook, or Flickr, the latter of which requires a "Flickr" app below).
Flickr	Free	Used in conjunction with Direct Upload above. Post pictures directly to Flickr
My Best Portrait	Free	This is a skin-smoothing, teeth-whitening, eye-enlargening image manipulation app to turn portraits of people into a hideous overprocessed photoshop job. Play with it if you must.
Star Trail	\$9.99	Shoots a time lapse movie of star trails. (If you want a time-lapse still image of star trails instead of a movie, skip this app and go read my blog post: http://bit.ly/1JO6W6E)
Smooth Reflection	\$4.99	For five dollars, the camera will set the slowest shutter speed for you to get smooth waterfalls. Seriously, don't bother with this – just set your ISO low, your F/stop high (small opening), and shoot with MFNR and you'll achieve the same effect for free.
LiveView Grading	\$9.99	Lets you set white balance and Create Styles for your movies, and see the results in real-time as you adjust.


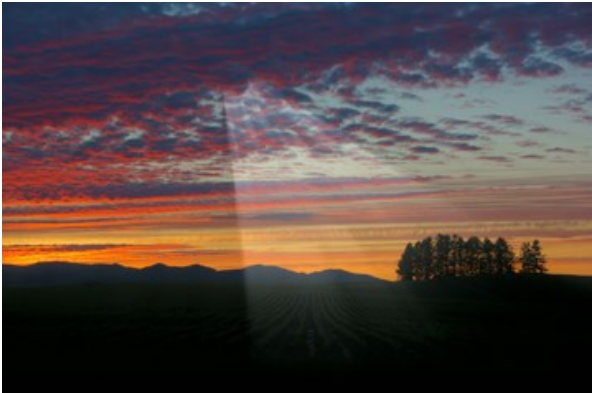

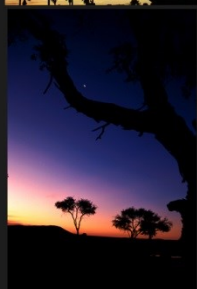
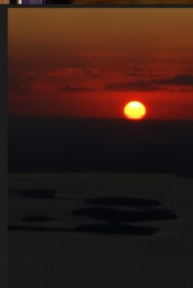
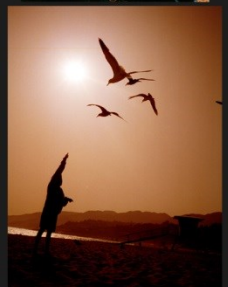
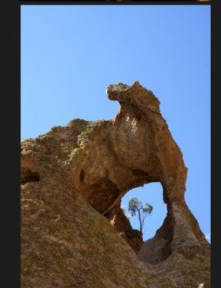
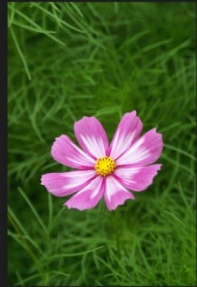
Motion Shot	\$4.99	<p>This one's kind of cool. Takes a sequence of shots of a moving object and merges them into one image.</p> 
Portrait Lighting	\$4.99	<p>Not impressed with this. All it seems to do is darken the corners of your image.</p>
Light Shaft	\$4.99	<p>Add beams of light (and you can specify intensity, width, and direction) to a picture that's already been taken.</p> 
Bracket Pro	\$4.99	<p>Unique features being offered here are flash exposure bracketing (something that should have been included in the original firmware), automatically take one shot with flash and one without, and focus bracketing.</p>
Multiple Exposure	\$4.99	<p>Emulates something that was easy to do back in the film days – expose one frame of film twice. I know someone who used to use this feature a lot: http://bit.ly/OssSz5</p>
Picture Effect +		<p>Can't get enough of your camera's built-in picture effects? Can't stand the idea of learning Photoshop? This might appeal to you.</p>
Photo Retouch	Free	<p>Allows you to do basic things like exposure adjustment and cropping in-camera. Can apply soft skin effect or straighten an</p>

		image after-the-fact. Might be a handy thing before you share the picture via social media.
Smart Remote Control	(Built in)	Allows your Android or iOS smart phone to trigger your camera wirelessly with Live View. Make sure you've downloaded the latest version.
Light Painting	\$4.99	This one is interesting. Take 3 pictures (background, a moving light source like a flashlight, and finally a person) and merge them all into one .jpg. Great if you want to take exactly the kind of image this can create. ☺
Stop Motion +	\$4.99	Make your own version of "The Nightmare Before Christmas" (or, if you're my age, "Gumby") by shooting one frame at a time and have the camera assemble it into a movie for you.
Sync to Smartphone	Free	This transfers your images to a pre-designated smartphone or tablet every time you turn off your camera. While some people might find this useful, I can't think of a faster way to drain your batteries (for both camera and smartphone) while out in the field.
Sound Photo	Free	Great for family get-togethers. Takes a sound byte of what's happening a maximum of 5 seconds before and after the shot is taken.
Multi-Lingual Keyboards	Free	New languages are being made available all the time.

Tip 1: For many of these apps (such as "time lapse" or "star trail") the battery is needlessly wasted by powering the rear display during operation. You can turn it off and save battery power by:


MENU →  4 → **FINDER / MONITOR** → **Viewfinder**, and make sure nothing comes near the EVF.

TIP 2: Remember that these are separate applications running on your camera's "computer system" and as such you will experience some slight delays in their operation. They don't start instantly but may take a couple of seconds to get going. Once the selected app is up and running, it takes over completely – you have to exit the app by hitting the "MENU" button to regain control of your camera again. Merely turning the camera off doesn't exit the app.



Chapter 6 THE “RECORDING” (CAMERA ICON) MENU SETTINGS

6.1 IMAGE SIZE

Menu Position MENU →  1 → Image Size

What it Does Dictates the pixel dimensions of the captured image – you can choose from Large (42 MP), Medium (18 MP), or Small (11 MP) images

Recommended Setting L: 42M (the largest the camera can capture)

There may be times when you won't necessarily want to shoot large and very detailed images. (Posting product images to ebay, for example, where 20 MP is quite simply overkill.) And so your camera allows you to take pictures that have about the same number of pixels as the Alpha 100 (10 megapixels) or the Konica Minolta A1 (about 5 megapixels for that “retro” low-res look ☺). And then you can switch back to high-resolution whenever you want – quite versatile!

The three options that are available to you are:

Setting	Pixel Dimensions (when aspect ratio = 3:2)	Large enough to print (at 300 dpi)	Approx. file size produced on your memory card
Large; 42 MP	7952 x 5304 pixels	26.5" x 17.7"	Standard: 4.5 MB Fine: 7.5 MB X. Fine: 16.5 MB RAW: 41.1 MB
Medium; 18 MP	5168 x 3448 pixels	17" x 11.4"	Standard: 2.4 MB Fine: 3.7 MB X. Fine: 8.5 MB RAW: 41.1MB

Small; 11 MP	3984 x 2656 pixels	13.28” x 8.8”	Standard: 1.5 MB Fine: 2.4 MB X. Fine: 5.4 MB RAW: 41.1 MB
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TIP: *A person who had more memory than time would shoot RAW+JPG and keep the Image Size set to “S”; that way they could quickly upload their pictures to social media sites / friends and family; but keep the large RAW files for making prints from later. (Kind of like keeping your negatives...)*



On the other hand, these cameras give you the option of making files smaller when you transfer them to your smartphone via Wi-Fi (see previous chapter), so now you have two good options.

Note also that this function only affects the sizes of .jpg files. If you’re shooting in RAW (or RAW+JPG), the RAW files produced will always be the largest size possible. (In fact, when you shoot in RAW only mode, the image size option is grayed out – you can’t change it.) Furthermore, the image sizes listed (42 MP, 18 MP, 11 MP) don’t correspond to the file sizes the camera produces on your memory card. The file sizes are smaller because every file type (yes, including RAW) involves some sort of image compression.

Other variables that control file and image sizes are Aspect Ratio and Quality (next two sections).

6.2 ASPECT RATIO

Menu Position MENU →  1 → Aspect ratio

What it Does Changes the shape of the images taken. from this  to this .

Recommended Setting 3:2, which is 100% of what the sensor can capture.

The aspect ratio is simply the ratio of the width to the height. A standard 6" x 4" print, for example, has a ratio of 6:4 which, when reduced, yields 3:2 (and that's what I usually shoot). Standard definition (analog) television screens have an aspect ratio of 4:3, whereas HDTV is a bit wider, at 16:9.

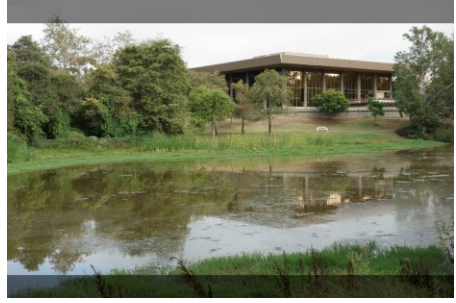
Be aware that when switching to 16:9 mode, the top and bottom of your composition gets chopped off (see graphic depiction in **Figure 6-1**). This setting only affects .jpg's, though.

If you're shooting a RAW file, the camera still captures the entire image, but makes a note that you shot it in some other aspect ratio. It is up to the program that opens the RAW file to look for that flag and know to crop it upon opening. Sony's IDC software, for example, shows you the entire RAW file but, noting that you shot in 16:9 mode, visually "grays out" the top and the bottom, as shown in **Figure 6-1**, although the image is still a 3:2 image.

When you're shooting in any of the aspect ratio modes, the camera's Live View shows you what the final composition will look like before you shoot.



3:2



16:9

Figure 6-1: Changing the Aspect Ratio to 16:9 will throw away pixels (as shown by the grey areas) in order to get the desired shape. (This is true of .jpg only – shooting RAW captures the entire 3:2 frame, regardless of the setting of Aspect Ratio.)

6.3 QUALITY

Menu Position MENU →  1 → Quality

What it Does Changes the kind of image that is written to the memory card. You can choose between 3 kinds of .jpg, RAW, or both RAW and JPG

Recommended Setting This is an intensely personal choice. RAW + JPG might be the best of all worlds, but it also takes up a lot of memory (and writing time) per shot

Chapter 15 explains the tradeoffs between shooting with .jpg and RAW. In a nutshell, though: .jpg images are compressed to take up less space on your memory card, at the expense of some information which usually your eye and brain cannot perceive). RAW, on the other hand, captures all the information directly from the sensor and shoves it onto the memory card without any processing at all (although there is a little lossy compression going on; again see Chapter 15 for details). With RAW, standard image processing functions, such as applying the white balance, sharpness, contrast, color space, etc. settings happens later on your computer. RAW will give you the highest possible quality that the camera is capable of capturing, and also a few stops' more dynamic range, but it requires computer post-processing to make the images look great. RAW is also a proprietary format, and not all image editing software will know how to open this newest version of .ARW (Alpha RaW) files.

As a file size comparison, I set my camera up on a tripod and took five shots of a single scene, with Image Size set to “L:42M” and Aspect ratio set to 3:2 and ISO set to 400 to produce an average amount of noise. (.jpg images tend to take up more space the more noise they have). Then I compared them all to the equivalent “JPG Quality” compression settings used in Photoshop. Check out the table below for how they all compare. This is the nature of .jpg's; the file size is very much content-dependent. Here are the different file sizes used by each:

Image Format	File Size	JPG Quality Equivalent in Photoshop
Standard (.jpg)	4.5 MB	Quality = 8 (!)
Fine (.jpg)	7.5 MB	Quality = 9
X.Fine (.jpg)	16.5 MB	Quality = 11
RAW (.arw)	41.1 MB	
RAW + JPEG produces 2 files	41.1 MB (.arw) + 7.5 MB (.jpg)	

The sizes of .jpgs can vary greatly. So if you try this experiment yourself, don't be surprised if your numbers differ by a factor of two or more. This is why the “Images Remaining” counter shows you conservative numbers – often you can fit more images on a card than what the camera shows you when an empty card is inserted. The camera never knows how large your .jpgs are going to be. It is also interesting to note that, even for the “standard” (lowest quality) .jpg setting, the compression is very conservative, and the image quality is still quite high. The image quality setting has no effect on RAW files.

So, in my personal opinion, it's always best to record your images at the largest size (X. Fine and/or RAW) that you can afford; as you can rarely predict ahead of time if a 4”x6” print or a 30”x40” poster will be needed. Memory cards are pretty cheap compared to what you just spent on this camera, and the cost of hard disks in terms of dollars per gigabyte continues to drop.

6.4 RAW FILE TYPE

Menu Position MENU →  1 → RAW File Type

What These Do Specifies whether to save RAW files as uncompressed or as compressed. (One is double the file size as the other.)

Recommended Setting I use Compressed because the file size is half and the compression artifacts are elusive.

I spoke about this feature (new to Firmware version 2.0) at length in Section 1.1.5.

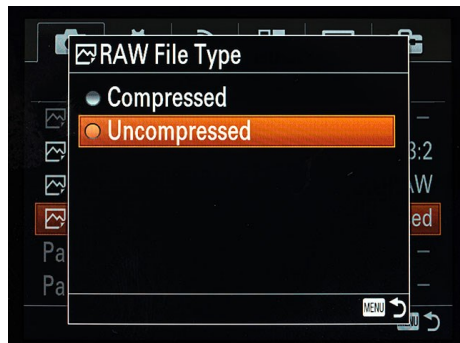



Figure 6-2: Storing your RAW files as uncompressed will take up significantly more room on your memory card. I recommend not using it unless you have actually witnessed any debilitating artifacts using "compressed" mode.

6.5 PANORAMA FUNCTIONS

Menu Position MENU →  1 → Panorama: Size,
Panorama: Direction


What These Do Specifies how wide the final sweep panorama image will be (and indirectly the maximum number of images the camera will capture in order to create the sweep panorama)



Recommended Setting Wide / Right or Down (see Figure 6-7)

Figure 6-3: The Sweep Panorama mode.

In Section 3.8 I gave you a basic overview of how to take a panorama image using the Sweep Panorama mode. To recap, just turn the exposure mode dial to the long rectangle (the icon for “sweep panorama”, **Figure 6-3**), press and hold the shutter release button, and pan from left to right.

You can modify some of the parameters for taking panorama pictures – for example, you can tell the camera that you want to sweep right-to-left instead of left-to-right. Or you can even sweep up-to-down or down-to-up (**Figure 6-7**). You can change these settings by MENU →  1 → **PANORAMA: DIRECTION** → [Choose from Right, Left, Up, or Down]. (Note that you must be in panorama mode in order for this option to be changeable.)


You can also change the aspect ratio of the image by doing MENU →  1 → **PANORAMA: SIZE** → [Choose between ‘Standard’ and ‘Wide!']. All this setting really does is control the number of shots the camera takes



Figure 6-4: Took this one in Arizona. Every trip should have an establishing shot! 😊



Figure 6-5: Comparison between Wide and Standard Panorama sizes. Both started from the same point; it's just a matter of how long the sequence goes.

before it quits. The more shots, the wider the panorama becomes. Have a look at **Figure 6-5**. For both of these images I started in the same position and tried to take the same panorama. It's almost as if the camera started with the wide shot and then just chopped off the right side at some point. Now that I understand this difference, I now keep my Panorama Image Size parameter set to "Wide" at all times, which (according to Sony) covers 226 degrees around the photographer. If I ever want it smaller, I'll just crop it later on my computer.

You may find that panorama mode is a little temperamental. Like it might complain if your speed isn't just right. Or it won't complain but will just leave a giant grey rectangle near the end of your panorama sweep. Why is the camera so fussy?


Well, it turns out that the camera starts aligning and stitching the images together *while you're still shooting*. In fact, if you look very closely at the dark grey horizontal bar in the lower half of the display, it is kind of like a progress bar – it gets longer the more you sweep, and if it's getting longer



Figure 6-6: Above is an outdoor panorama that had a slight (!) moving subject. The camera does its best to eliminate those artifacts but sometimes it's just not possible. Don't let this happen to you! Try to use still subjects during panoramas.

at a constant pace then you know you’re sweeping at the right speed. If it’s having too much trouble making the ends of adjacent pictures match up, it will stop the process and complain, saying something about it can’t create the panorama, and sometimes it will also give you a specific thing you can do to fix the problem, such as shoot more slowly or more quickly. (Sometimes it doesn’t.) It is a process that takes practice.



Figure 6-7: Not sure how to compose your landscape? Sweep panorama gives you more options. Top: Standard, non-panorama 3:2 image. Bottom: Sweep Panorama set to Wide. Center: A panorama of a slightly different aspect ratio. I got this by holding the camera vertically, setting **MENU** →  **1** → **PANORAMA: DIRECTION** → **DOWN**, and sweeping left to right. (This beautiful landscape was found on Prince Edward Island, Canada.)

Another thing to watch out for is subjects that move while you’re panorama-ing. (That’s a word!) For a moving subject can appear in more than one adjacent frame and look quite un-natural. **Figure 6-6** has a real-world example.

There are a lot of things to note while shooting panoramas:

- You can't zoom when you shoot panoramas. (The camera makes sure of that!)
- If you are shooting in RAW or RAW+JPG mode, the camera will switch to .jpg automatically and then switch back to whatever you had set when you exit Panorama mode.
- Keep the camera close to your body when shooting panoramas. (i.e., it's best to use the EVF!) The algorithms work best when the axis of rotation is close to the sensor plane.
- Don't forget to focus-lock on your subject before moving the camera to the left and starting your panorama. (This is especially true if your subject is a different distance from what's on the left.) The camera won't try to autofocus nor change its exposure once the panorama shooting has begun.
- Try to avoid shooting panorama pictures under fluorescent light. Such lights are known for their flickering and can produce uneven lighting and varying shot-to-shot color balance as you sweep across your scene.
- Panorama shots come out best when they're taken under bright light. Low-light can cause all sorts of problems with blurriness and noise.
- When framing your panorama, the camera will likely capture LESS vertical information than what you see in the viewfinder. Why?

Sometimes if you're not perfectly level the distortion correction can get out of hand and the camera will crop the final image so that there's no dead space, like the yellow rectangle below. So make sure your important subjects are nowhere near the top or bottom of your frame, and stay as level as you can!




Figure 6-8: *Panning in the UP direction can make some great architectural shots.*



Figure 6-9: *If you’re sloppy about keeping your camera horizontal, the camera will likely capture LESS vertical information than what you see in the rear display. Why? Sometimes if you’re not perfectly level the distortion correction can get out of hand and the camera will crop the final image so that there’s no dead space, like the yellow rectangle above. So make sure that no important subjects are anywhere near the top or bottom of your frame, and stay as level as you can!*

6.6 (MOVIE) FILE FORMAT

Menu Position MENU →  2 → File Format


What it Does Lets you specify the video format – XAVC S (4K or HD), AVCHD, or MP4

Recommended Setting If you’re not sure, you can’t go wrong with XAVC S HD.

The video file formats and their tradeoffs are discussed pretty thoroughly in the chapter about Movies, Section 12.1. Once you read that you’ll understand why I made the recommendation I did above, and why I chose a specific frame rate and bit rate.

6.7 (MOVIE) RECORD SETTING

Menu Position MENU →  2 → Record Setting

What it Does Lets you specify frame rate for the video specified in **MENU**
→  2 → (Movie) File Format

Recommended Setting 60p 50M

The video file formats and their tradeoffs are discussed pretty thoroughly in the chapter about Video, Section 12.3. In it I explain why I recommend “60p 50M” for those who aren’t sure which format is best for them.

6.8 DUAL VIDEO REC

Menu Position MENU →  2 → Dual Video Rec(ord)

What it Does Tells the camera to store a high quality and a low quality file for every video clip you shoot.

Recommended Setting Tough call. If you’re going to want to share this on Facebook I’d set this to “On” if the camera allows it

This feature was initially described in Section 1.1.6. Basically it lets you save both a high- and low-quality video clip on the memory card each time you shoot a video. It’s designed to give you something that’s easy to share via social media (the low-quality .mp4) and still get high-quality footage for later use.

Interestingly, the smaller, social-media-friendly .mp4 file this feature produces is of noticeably MUCH lower quality than any video setting you can choose manually (the “worst” being MP4 and 1280 x 720 30p 6M) – the resolution is lower and the file is compressed to about 1/3rd the size of the “worst” setting just described. (The good news, if you can call it that, is

that Facebook crappifies all uploaded video anyway so nobody is going to notice the reduced quality.)

There are lots of constraints for this function. The feature is not available if you’ve chosen **MENU → [Camera icon] 2 → (Movie) File Format → MP4**, or have chosen any other video Record Setting of 60p or faster. (AVCHD’s 60i is OK though.)

6.9 DRIVE MODE

Menu Position **MENU → [Camera icon] 2 → Drive Mode**

What it Does Lets you specify how the camera behaves if you keep your finger held down on the shutter release button

Recommended Setting “Single” as the default setting for day-to-day use, unless I’m shooting kids or sports, in which case it’s “Continuous”

The term “Drive” is derived from the old “motor drive” accessory from the film camera days, and is used now to generally specify how the camera advances shot-to-shot. There are three ways to invoke the Drive Mode menu: The first is via the **Fn** menu, the second is via **MENU → [Camera icon] 2 → Drive Mode**. The third way is to invoke the factory-default shortcut if it hasn’t been reassigned: the LEFT arrow button on the back of the camera - **Figure 6-10a**.

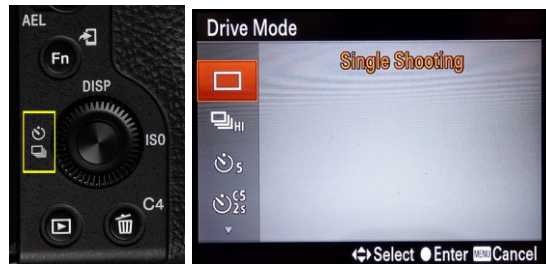


Figure 6-10: The drive mode button and screen.

The third way is to invoke the factory-default shortcut if it hasn’t been reassigned: the LEFT arrow button on the back of the camera - **Figure 6-10a**.

Once there you can then use the UP and DOWN arrow buttons to select from several options. In some cases, once you choose a drive mode you

can tweak its characteristics by using the LEFT and RIGHT multi-selector positions. The various modes are described below.

TIP: *The Drive mode menu is greyed out if you're in HDR (Section 14.2) or MFNR mode (Section 6.22.2). In those modes you can only shoot one picture at a time. It will also prevent you from selecting "BULB" mode (in Manual Exposure mode) when the drive mode is set to anything but "Single" and "Self Timer". (And in Self Timer mode "Bulb" will give you an exposure of 1/10th of a second, so that's not a viable option either.)*

6.9.1 SINGLE-SHOT ADVANCE



This is the most basic mode, which works like a point-and-shoot does. Single Shot will take only one picture, no matter how long your finger stays on the shutter release button.

Most important: if you're shooting RAW or RAW+JPG the camera will shoot a 14-bit RAW in this mode ONLY (as previously discussed in Section 1.1.5).


6.9.2 CONTINUOUS ADVANCE



You can think of “continuous advance” as a modern-day equivalent of a motor drive – if you hold the shutter release button down, the A7r II will continue to take pictures. This feature has two speeds, selectable at the time you're selecting the drive mode: just use the LEFT and RIGHT arrow buttons to switch between "Continuous Low" (about 2.5 pictures per second) and "Continuous High" for 5 pictures per second. The camera will continue to shoot until the memory card is full.


If autofocus is enabled, the camera will autofocus between shots unless **MENU → ⚙ 5 → AF w Shutter** is set to **Off**. It will also re-evaluate and adjust the exposure between shots unless **MENU → ⚙ 5 → AEL w Shutter** is set to **On**.

6.9.3 10S, 5S, AND 2S SELF-TIMERS

 There are actually three self-timer durations. The first one, with a delay of 10 seconds, is ideal for the typical group shot scenario. The second one is a 2-second delay that’s designed for macro photography – you’re behind a tripod, taking lots of pictures in a row, you don’t want your finger-on-the-shutter-release action to induce vibration in the camera, and you’re too impatient to wait a full 10 seconds for every shot.

Sony has just recently added a third duration, 5s, because “Why not?”. Use the Left and Right arrow keys to switch between the three self-timer values when in the menu.

6.9.4 SELF-TIMER CONTINUOUS

 This works just like your normal 10-second self-timer, except it will take either 3 or 5 images in a row – *as fast as it can*. So don’t be surprised if you end up with 3 or 5 images that are nearly identical. I do wish it were possible to slow this down – to put some space between shots – that way you can capture some truly different facial expressions on group shots. Oh, well.

So there are a total of six permutations you can choose from:

- 10 seconds, 3 or 5 continuous shots
- 5 seconds, 3 or 5 continuous shots
- 2 seconds, 3 or 5 continuous shots

To select, go to the Drive Mode menu, select Self-Timer Continuous, then use the left and right cursor keys to choose either 3 or 5 images.

TIP: If you were in AF-C mode, when switching to Self-Timer Continuous, the AF mode automatically switches to AF-S.

6.9.5 BRACKETING

BRK C
0.5EV 5 Bracketing was a concept that was very useful in the days of film – specifically when shooting transparencies, where you had to really nail the exposure in-camera and there was no such thing as post-processing. While in the days of shooting slide film this was an important function, in the era of digital (where you can see a preview of



Figure 6-11: Exposure Bracketing Example. Automatic bracketing can help you make sure you have the best exposure when you don't have a lot of time. It is most useful for do-it-yourself High Dynamic Range (HDR) images.

exactly how it will come out before you shoot, and /or examine the results immediately afterward, and whose output you can tweak in Photoshop) its usefulness is pretty limited. However, it *is* useful for making High-Dynamic Range images the old fashioned way. More about that in a minute.

Sony has increased the options with this function. The Bracketing function automatically takes a sequence of 3, 5, or 9 shots whose exposure is tweaked by either 1/3 of a stop (“0.3 EV”), 2/3 of a stop (“0.7 EV”), 1 stop (“1.0 EV”), 2 full stops (“2.0 EV”), or 3 full stops (“3.0 EV”). Those last two functions – bracketing by two stops, and bracketing by three stops – are useful for conventional HDR (where you merge it in your computer later on).

TIP: The ability to do a 9-image bracket is new. Interestingly, all permutations of bracketing exposure and bracketing number are allowed EXCEPT for “3 EV 9” and “2 EV 9”. That’s probably way too much dynamic range for the real world anyway.


While in bracketing mode, when you take three pictures in a row, the first will be exposed according to the camera’s recommendation; the second will be underexposed by the amount chosen, and the third will be overexposed by the amount chosen. Taking five pictures does the same thing in the same order, except you are shooting two more images, one even more underexposed, and one even more overexposed. Bracketing mode remains in effect until you turn it off.

You’ll notice that your camera has TWO bracketing modes – one labeled “BRK S” (Single) and the other labeled “BRK C” (Continuous). For the “Single”, you must depress the shutter release button three separate times in order to capture the three bracketed exposures. For Continuous, press *and hold* the shutter release button, and the camera will take three (or five, or nine) bracketed pictures as described above.

So, to summarize, when choosing a bracketing mode you have three different parameters to specify:

- Single or Continuous
- 0.3, 0.7, 1.0, 2.0 or 3.0 EV stops apart
- 3, 5, or 9 frames (9 frames not available for 2 or 3 EV option)

And that is the reason so many different permutations appear to you as you select from the Bracketing mode menu. To choose among them, first use UP and DOWN to select either BRK-C or BRK-S, and then use LEFT and RIGHT to choose the icon containing the other two parameters.

TIP: You can also change the bracketing order by doing **MENU →  2 → Bracket Settings → Bracket order → [Choose from “Normal – Under – Over” and “Under – Normal – Over”].**

6.9.6 BRACKETING FOR HDR

As mentioned a couple of paragraphs ago, your camera has the ability to do automatic bracketing using a much greater range than with a previous generation of cameras. It can bracket 3, 5, or 9 pictures, each spaced two or three full stops apart in either Bracket-Single or Bracket-Continuous mode. This is designed for High Dynamic Range (HDR) photography – specifically for those people who want to do it themselves and not rely on

the camera's über-convenient built-in HDR function. To do HDR photography on your own, you put the camera on a tripod and take three pictures, each two or three stops apart, and then you merge them on your computer once you get back home using special software. Conventional HDR photography is a large subject, and I talk about it more (and walk you through how to do it) in my "Advanced Topics 2" e-booklet, which can be purchased at www.FriedmanArchives.com/ebooks . But don't forget that your camera now has this function built-in (described in Section 14.2) so you may want to try that method first.

TIP: *When in Bracketing – Single mode, your camera will show you what each exposure will look like before you shoot. So don't be alarmed if your viewfinder looks a little dark or light sometimes – remember, you told your camera to do this!*

6.9.7 WHAT EXACTLY CHANGES WHEN YOU BRACKET?

I already said that the camera will underexpose and overexpose an image when you bracket. How does it do this – by changing the f/stop, shutter speed, or ISO? The answer depends upon what exposure mode you're in:

- In Aperture Priority exposure mode, the camera keeps the aperture constant and changes the shutter speed.
- In Shutter Priority exposure mode, the camera keeps the shutter speed constant and changes the f/stop. If the camera reaches the end of its f/stop range (for example, if you're shooting in low light and have the shutter speed set to 1/1,000th of a second), the camera will still take multiple pictures, but they may all have the same exposure.
- In Program exposure mode, the camera modifies both the f/stop and shutter speed.
- In Manual exposure mode, if Auto ISO is set, then the camera changes the ISO. If ISO is set to something fixed, then the camera modifies the shutter speed.
- When you use a flash, the f/stop and shutter speed remain constant across all bracketed images – it is the *flash* burst that is adjusted. And, because the camera designers were afraid that the flash wouldn't be able to recycle in time, when you're bracketing with flash the camera

automatically switches to Bracketing – Single mode (even if you had specifically told it to shoot Bracketing – Continuous).

6.9.8 WHITE BALANCE BRACKETING

BRK WB Just as it’s tough to assess whether the exposure is perfect out in the field (driving the need for exposure bracketing), so too can you sometimes be unsure about the White Balance setting. White Balance Bracketing will take ONE image and store it three different ways: “Normal” (the way the camera would normally shoot the image), a little on the blue side, and a little on the yellow side, as shown in **Figure 6-12**.



Figure 6-12: White Balance Bracketing Examples. Top row is “Low bracketing” (Normal → blueish → yellowish); and the bottom row is “High Bracketing”. The difference is “High bracketing” will shift the color twice as much in either direction.


TIP: I strongly prefer either using Custom White Balance (Section 6.25.4) or shooting RAW and choosing the right white balance at my computer. I’ve never seen a situation where WB bracketing gave me a better result.

6.9.9 DRO BRACKETING

Chapter 14 discusses the very useful Dynamic Range Optimization function. DRO Bracketing mode is useful if you're not sure which manual DRO setting to use. With this setting set to "Hi", the camera takes one picture but saves 3 different images, each taken with the equivalent Level 1, 3, and 5 to the image. With "Lo", the Camera will apply Level 1, 2, and 3 to the image.

TIP: Shooting RAW+JPG, combined with DRO Bracketing as described above, will result in SIX files on your memory card for every single click of the shutter: three JPG files (each with different levels of DRO applied), and three identical RAW files (with only slightly different file sizes – that's due to the different EXIF information and thumbnail contained within the file).

6.10 BRACKET SETTINGS

Menu Position MENU →  2 → Bracket Settings

What it Does Sets 2 variables that kick in every time you shoot in a bracketed mode

Recommended Setting Self-timer: Off. Bracket order 0 → - → +

Bracketing means "I'm not exactly sure what my settings should be, so take several pictures, adjusting a variable each time and I'll figure out which one I like later". Your camera has a lot of bracketing modes, all accessible via the **Fn. → Drive Mode** menu and described in Section 6.9.

So what do these two Bracket Settings do?

Self-timer: This lets you choose a delay of 2, 5, or 10 seconds after you press the shutter release button when any of the above bracketing modes are

selected. This can be useful for situations where your camera is on an unsteady tripod and you don’t want your finger push to shake the camera. (This can happen a lot when you’ve carefully set up a macro shot.) This has been broken out into its own menu because normally the bracketing and self-timer functions are mutually exclusive.


Bracket Order: When the exposure bracketing feature is enabled, the camera takes three, five, or nine pictures, each at a slightly different exposure to “cover your bases”. (This was especially necessary back in the days of slides.) The question becomes, “In what order should the images be taken?” The camera gives you two choices:

Choice #1: Normal Exposure → Underexposed → Overexposed (0 → - → +)

Choice #2: Underexposed → Normal Exposure → Overexposed (- → 0 → +)

I recommend the setting which takes the “normal exposure” first, only because when you’re shooting things that move, the decisive moment becomes a higher priority and the backup “just in case” exposure tweaks are slightly less important.

6.11 FLASH MODE

Menu Position MENU →  3 → Flash Mode

What it Does Chooses between Auto, Fill Flash, and some specialty flash settings

Recommended Setting I keep it on “Fill Flash” most of the time

Before I discuss the various flash modes and what they do, let me summarize what flash modes are available in what shooting modes:

Mode	Flash Off	AutoFlash	Fill Flash	Slow Sync.	Rear Sync.	Wireless
P/A/S/M			✓	✓	✓	✓
Intelligent / Superior Auto	✓	✓	✓			
Movie						

Panorama						
Portrait	✓	✓	✓			
Anti-Motion Blur						
Sports	✓		✓			
Pets	✓		✓			
Gourmet	✓		✓			
Macro	✓	✓	✓			
Landscape	✓		✓			
Sunset	✓		✓			
Night Scene						
Night Portrait						
Handheld Twilight						
Fireworks						
High Sensitivity						

6.11.1 FLASH OFF

I probably don't have to describe what this does. 😊 It is only meaningful if you're in one of the Auto modes and an accessory flash is attached and "on".

There's no real reason to use the Flash Off feature. Just turn the flash itself off – it's much faster.

6.11.2 AUTO FLASH

With Auto Flash selected (in the allowed modes), and an accessory flash is attached and "on", the camera decides whether to use the flash or not, and when it decides to do so it behaves according to the "Fill Flash" behavior described below. In this mode, you can't force the camera to use a flash if it doesn't think it's warranted.



Figure 6-13: Flash mode can also be used to better capture close action and to give your subjects better illumination. To get this unusually well-lit bird shot I left bread crumbs on the back of a boat that was going close to shore and waited. (Oh, and I had “Fill Flash” selected.)

6.11.3 FILL FLASH

Fill-flash will ALWAYS fire the flash when it's attached and on. It behaves differently depending on how much light there is in the scene.

Normally, the camera makes the assumption that the flash will be providing the *only* source of light. If you are shooting a dance party in a darkened room this is not a bad assumption and the images will come out well-exposed (well... the *subjects* will be well-exposed, and the backgrounds black.)




Figure 6-14: Portrait with and without fill flash.

But when the majority of the subject’s illumination comes from another source (usually the sun), then the flash gives only a tiny burst of light, just enough to lighten the shadows a little bit (see **Figure 6-14**). Your camera automatically switches between these two modes when the flash is used. The best time to use it is when your subject is in shade on a bright day. For example, in **Figure 6-14**, the light was poor and the subject (the face of the fisherman) was in shade, under his hat. It looked fine to me when I was standing there, but because cameras don’t see the same range of light as the human eye, fill-flash was in order.

6.11.4 SLOW SYNC

This does EXACTLY the same thing as Night Portrait mode (Section 6.39.8) – that is, when you take a flash picture at night, instead of the shutter speed defaulting to 1/60th of a second, it will be whatever it would normally be had the flash not been enabled. That way you can “burn in” your ambient light yet still illuminate your subject via the flash.

The only difference between this and the Night Portrait function is that with the slow sync function, you can change important parameters like ISO, white balance, exposure compensation, etc.

To invoke the Slow Sync function, set up a flash shot as you normally would in P/A/S/M mode and **then MENU →  3 → Flash Mode → Slow Sync** (or via the **Fn** menu).

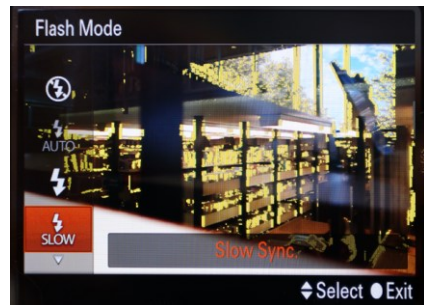


Figure 6-15: Selecting “Slow Sync” from the flash menu will “drag the shutter” and give you a long nighttime exposure along with a flash burst.



Figure 6-16: The Slow-Sync function will help you balance out the light from the flash and allow the background light (dim as it may be) to show up brighter than if your camera were simply in Auto mode.

6.11.5 REAR SYNC

Rear Sync is an indispensable tool for certain kinds of action shots where ambient light (with longish shutter speeds) is combined with flash. The classic image is a person running in a marathon, with a “ghost” trail behind them.

When you use a fast shutter speed, flash pictures are easy: The exposure starts, the flash goes off, and the exposure stops. Not too hard. But, what

if you kept the shutter open for several seconds and you wanted to use the flash? When should the flash fire – at the beginning of the exposure, or at the end, coinciding with the 2nd or “rear” shutter curtain? Most cameras

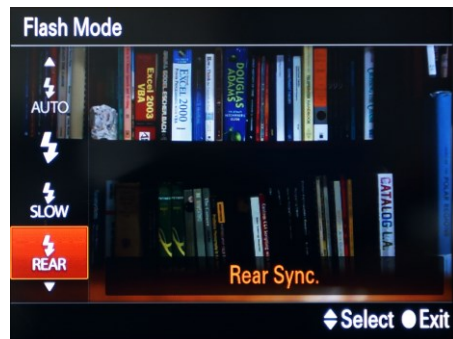


Figure 6-17: Invoking the Rear Sync function.

will only fire the flash at the beginning of the exposure. The Rear-Sync function tells the camera to select the second option: fire the flash near the end of the exposure, at a time when the rear shutter curtain would close. When would you want to do this? See **Figure 6-18**.



Figure 6-18: Examples of Normal (left) and Rear (right) Flash Sync

The idea is that you can control leading or trailing light when you're using both long shutter speeds (ambient) and flash on a moving subject. Rear sync (right) allows the pedestrian's trail to show up behind him, whereas with normal settings (left) the trail appears in front of him! Who wants that? For this shot, the shutter speed was set to 1.5 seconds to capture the motion, and the flash still went off to freeze the subject – hence we have both a blur and a “frozen” subject all in the same shot.


6.11.6 WIRELESS FLASH

In order to use wireless flash you need to purchase two accessory flashes – one that sits on the camera’s hot shoe, the other placed anywhere. It’s so valuable that I’ve dedicated an entire chapter to it (Chapter 13).



Figure 6-19: Wireless Flash will add “Wow!” to your photography like nothing else.

6.12 FLASH COMPENSATION

Menu Position Menu →  3 → Flash Comp.

What it Does Allows you to specify whether the camera generates more flash or less flash intensity

Recommended Setting 0

The Flash Compensation function only varies the intensity of the flash when it’s used – it has no effect on the ambient light (for that, you should use the Exposure Compensation function (Section 6.20), which adjusts BOTH the ambient AND flash).

Oddly this feature is greyed out in anything other than P, A, S, or M modes.

6.13 RED EYE REDUCTION

Menu Position MENU →  3 → Red Eye Reduction

What it Does Tries to reduce the natural occurrence of red eye in flash pictures taken using the pop-up flash

Recommended Setting I hate this feature

Red eye can occur in flash pictures if the flash is too close to the lens. What happens is the light from the flash bounces off the subject's retina (which shows up red for humans, and yellow-green-blueish for most animals) and then bounces right back to the camera. The traditional solution to this problem is to attach an accessory flash to the camera, increasing the distance between flash and lens and eliminating problem entirely.


However, there IS another way, based upon a biological trick that actually works: Fire some low-intensity flash bursts half a second before the real flash takes place. The human eye reacts very fast to these; thinking “OMG, there’s so much light here!” and closes down the eye’s iris almost immediately. A smaller window to the eye means a lesser opportunity for the red-eye phenomenon to occur. So when this feature is enabled, the camera will output several quick flashes, wait a half-second, then put out a quick pre-flash and then take the final exposure - about $\frac{3}{4}$ of a second in latency.



Figure 6-20: *The Dreaded red-eye! This image was taken with a Sony DSC-T10 camera with the red-eye reduction feature turned off. (Ahhh... I simply must return to Mars someday!)*

While this trick is certainly effective, it also promotes very stale, non-genuine smiles when people are posing for you (plus it increases the shutter lag tremendously). Not at all the kind of spirited expression I’ve been trained since birth to capture. And so I always keep this feature off. If I *must* shoot using the pop-up flash as the main source of light in a darkened room (the worst kind of light imaginable), then I’d rather turn this feature off and eliminate the red-eye on my computer. (Or by using a sharpie on the physical print, like we used to do in the old days. ☺)

6.14 FOCUS MODE

Menu Position MENU →  3 → Focus Mode

What it Does Chooses between 5 focusing modes

Recommended Setting DMF, unless you’re shooting sports or kids, in which case use AF-C

Your camera gives you five choices for Focus Mode. I’ll talk about these a little out of order so the explanations will be more meaningful:

AF-S

The factory default for focusing modes is “Focus on a subject, and then lock focus until I take the picture.” This is called “Single Shot AF” (AutoFocus) mode, and is denoted by “AF-S”. This your standard point-and-shoot mode.

AF-C

The camera also has a “Continuous AF” mode setting (denoted by “AF-C”), which can be used when you’re shooting sports (or anything that moves). When this mode is enabled you are essentially telling the camera “my subject is moving. Even when you’ve found focus, keep trying to focus on the subject because my subject will not stay still!” Keep in mind that in Continuous mode, once the camera achieves autofocus, it will *not* give you a steady green light and an audible “chirp”. Instead, it will continue to track and refocus (the subject is moving after all, right?) in an

attempt to keep the subject in focus until the final shot is taken. You can always tell when you're in Continuous focus mode, because the green focus indicator along the bottom left corner of the screen is surrounded by two sets of parentheses, which is supposed to convey movement.

AF-A

Tired of constantly switching between AF-S and AF-C modes? AF-A will choose for you intelligently. That's the idea, anyway; however there have been many occasions where I was not happy with its decisions and it kind of got in my way. Not recommended.

DMF

“Direct Manual Focus” mode means it will start out in AF-S mode (focus on a subject, then stop trying to focus) and *then* it will go directly into manual focus mode, where you can quickly tweak the focusing if you so choose. It will stay in manual focus mode for as long as you hold the shutter release button down halfway.


That's the official purpose, anyway. As mentioned previously at the end of “Other Essential Customizations” (Section 2.3), DMF is even more useful when you have Peaking Level and Peaking Color enabled (Section 7.9). With Peaking Level enabled, as soon as the camera switches to Manual Focus mode, the things that are in focus (areas of highest contrast) will appear in a certain color.

I never actually use DMF for tweaking the focus afterward; rather I used the combination of DMF and Peaking Color to confirm that the focus was what I wanted before I shot. This was even more important for the A7r II's predecessors, which were all contrast-detect in AF-S mode and therefore was vulnerable to false positives. So it's not needed as much anymore; however this kind of focus confirmation is comforting to me.

DMF is perhaps most useful when shooting macro handheld, as if the wind picks up or something else is off I can just move the camera back and forth by hand until the item I want in focus appears in a bright color, then shoot.

MF

Manual Focusing, which probably needs no explanation. The camera will actually magnify the center of the viewfinder for easy focusing if **MENU**

→  1 → **MF Assist** is set to **ON** (Section 7.39). Peaking Level functions (as described above) work here also, but for some reason are harder to see.

I should mention here that if you're after absolutely critical focus, manually focusing using the MF Assist feature will get you accuracy greater than if you just relied on autofocus. This is especially true in macro and other shots that require the sharpest detail.

TIP: You can fine-tune the AF-S and AF-C settings by telling the camera either "Don't take the picture unless you think it's in focus", or "Do your best to AF but take the picture when I say so, no matter what!". The Priority Setting function is described in Section 7.20.

TIP: As a shortcut, when you put the camera into Sports Action mode (Section 6.39.2), the camera automatically invokes AF-C, continuous shooting "high" and wide area focus for you.

6.15 FOCUS AREA

Menu Position MENU →  3 → Focus Area

What it Does Lets you decide which of 5 focusing areas to use.

Recommended Setting It all depends. My standard setting is either Wide or Lock-On AF Wide.

6.15.1 WIDE

Basically “Wide” means the camera gets to decide where the subject is and therefore what to focus on. I find that this, combined with Face Detection, successfully identifies my intended subject 99% of the time.

We all know that sensor has 399 AF points; however the programmers at Sony decided to arbitrarily divide up the viewfinder into smaller overlapping “AF Areas”, some of which you can see in **Figure 6-21**.

When your AF area is set to Wide and the camera finds a subject, it will briefly illuminate (in green) all of the AF area brackets in which it finds something in focus.

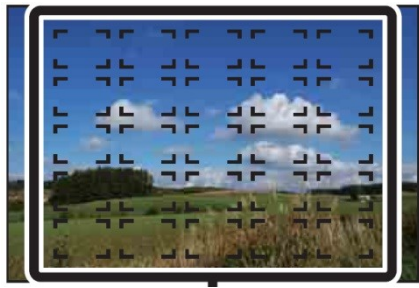



Figure 6-21: Different AF areas available to the camera when this variable is set to “Wide”. These indicators are actually misleading since there are so many tiny ones throughout the frame.

TIP: If you really want a good feel for how small the phase-detect AF points really are, set this mode to “Wide” (Section 6.15.6), set Focus Mode to AF-C, and set MENU →  3 → Disp. Cont. AF Area = ON. Then press the shutter release button halfway. Tiny-sized AF points that are tracking your subject will appear.

6.15.2 ZONE

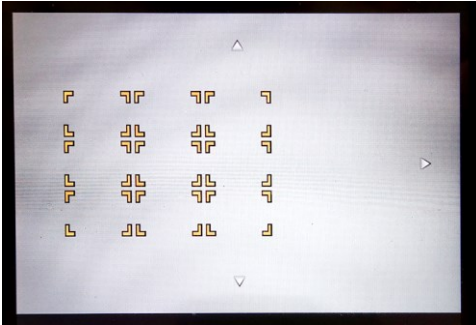


Figure 6-22: Not as wide as "Wide", not as small as "Flexible Spot".

the arrows left or right will change zones.

This is a hybrid between Wide (previous section) and Flexible Spot focus (Section 6.15.4) – here you have a very large collection of focus areas all clumped together, and you can move them all en masse all around the screen. The camera will choose one of the AF areas within that zone. Pressing the center button (assuming the center button has been assigned to "Standard") and then moving

6.15.3 CENTER

"Center" uses ONLY the center focus area, ignoring all others. Like spot metering, it's useful in difficult situations where the camera's automation can't decide what the subject is. Using "Center", you can tell it. An example appears in **Figure 6-23**).

6.15.4 FLEXIBLE SPOT (S, M, OR L)

“**Flexible Spot**” lets YOU specify a focus point anywhere in the frame, and it lets you specify a size of the AF point as well. (Changing sizes involves clumping together smaller PDAF points. This is all invisible to you – all you know is the square gets bigger.)



Figure 6-23: Here’s a situation where the Wide autofocus setting might get it wrong: when shooting an animal (face detection doesn’t work on animals) behind bars. Here it makes sense to use either “Center” or “Flexible spot” to prevent the bars from being focused on. (We ended up adopting this kitty. He’s since clawed up the couch and the curtains.)

To invoke Flexible Spot:

1. **Menu** → **3** → **Focus Area** → **Flexible Spot**
2. (Also make sure **MENU** → **7** → **Custom Key Settings** → **Center Button** is set to **Standard**.)
3. Use the Left and Right arrow keys to choose between Small, Medium, or Large spot focusing area.
4. Hit the center button to select
5. Use the cursor buttons to choose your focus point.
6. Press the center button to select.
7. Your focus point is now set. If you want to change it, you have to go back to Step 4. (Yes, step 4! The center button is always reassigned to move the flexible spot when in Flexible Spot mode.)

TIP 1: If you invoke either Digital Zoom or Clear Image Zoom, the focus confirmation changes from small green squares to one gigantic dotted-line square which fills the screen.

TIP 2: Remember, changing the focusing mode doesn’t affect the exposure mode. If you want to use spot metering (which isn’t flexible), you should invoke that with the AEL function (discussed in Section 6.24.2) first before focusing.

6.15.5 EXPAND FLEXIBLE SPOT



Is that tiny AF point (from either “Spot” or “Flexible Spot” above) too small to do the job? Then Sony has given you “Expand Flexible Spot” which makes the AF area larger. Technically, the camera will try to use the centermost point for autofocus; and if it can’t lock onto anything it will then try to use the surrounding area to find focus.

6.15.6 LOCK-ON AF

This is an easier-to-invoke version of Center Lock-On AF (originally described in Section 3.6). It’s better because you’re not restricted to the center and, once set, you don’t have to press any buttons to invoke it.

Basically, you just set your focusing point, press the shutter release button halfway, and immediately after the camera does a focus-lock it will start to track what it thinks is the subject as it wanders slowly across the viewfinder.

Here’s how to use it:

- 1) Make sure you have a native E-mount lens attached. (This won't work with legacy glass).
- 2) Ironically, you have to make sure that **MENU →  7 → Center Lock-On AF** is **OFF**.
- 3) Go to the Focus Area menu either through the **Fn** button or via **MENU →  3 → Focus Area** and navigate to the 6th option, “**Lock-On AF**”.
- 4) You can use the Left and Right arrow buttons to choose your AF area: Wide, Zone, Center, Flexible Spot (L, M, or S) or Expanded Flexible Spot – all of these options were described in the previous 5 sections.

From that point on, pressing the shutter release button halfway will focus on whatever’s behind the selected focus point, and then the camera will instantly go into Lock-On AF tracking mode and try to track the object as it moves slowly throughout the scene.

The best part about this is that Face Detection still works in this mode, and again, this is an ideal mode when shooting the kids who never stay still.

TIP: All these different focusing modes can get confusing to many people.

When the Sony A77 II came out, I made a video which gives a more intuitive feel for what all the different functions do. The points in this video apply equally well to the A7r II, including the first demonstration where it can only "see" a line in one orientation. So if you find the focusing mode choices confusing, this video might make it clearer: <https://youtu.be/306xXWy7Izw>

6.16 FOCUS SETTINGS

Menu Position MENU →  4 → Focus Settings

What it Does Lets you assign TWO different features to one button!

Recommended Setting: n/a

Constraints: Some scene modes will override. Not compatible with digital zoom, clear image zoom or movie mode.


If you were to invoke Focus Settings from the menu, and then turn the rear control wheel, you'd see that it allows you to choose the same focus areas as MENU →  3 → Focus Area, only the user interface is completely different. You can see this in **Figure 6-24**. The biggest difference is Flexible Spot Small, Medium, and Large all appear along the linear animation.



Figure 6-24: Focus Settings provides a different User Interface for selecting focusing modes. When assigned to a button, it also switches to Focus Magnifier automatically when in MF mode or a non-AF lens is attached.

Why have two different ways to change the same setting? Here’s the advantage: When you assign Focus settings to a button, it behaves in two different ways depending on the autofocus mode you’re in: If you’re in an Autofocus mode (AF-S, AF-C, or DMF) then pressing this button lets you change the focus area as described in the previous section. If on the other hand you’re in MF (Manual Focus) mode or have legacy glass attached, pressing the button initiates the Focus Magnifier to help with critical focusing. Pretty handy.

6.17 AF ILLUMINATOR

Menu Position MENU →  4 → AF Illuminator

What it Does Specifies whether the camera should invoke its AF Assist light when trying to focus in dark rooms

Recommended Setting: Auto, unless you don’t want to call attention to yourself at a party

Your camera has the ability to focus in complete darkness, thanks its built-in red/orange LED. This function can tell the camera it has the option of using this focusing aid when the light gets too low (AUTO), or not (OFF).

So if this focus-assist mechanism is so useful, why on earth would you want to turn it off? Well, that light does call attention to itself (and to you!), plus it can add a second or two to the total focusing time. If you’re not in total darkness and your subject does have enough contrast, the camera might still be able to find focus on its own – it’s actually quite sensitive. At least you have the AF illuminator option as a safety net for totally dark environments.


This focus-assist beam is very useful and accurate, but is only good for subjects that are about 10 feet away or so. (Oh, and this light doubles as the self-timer countdown light. But you probably already figured that out.)

If you're shooting with a long lens, the lens or its lens shade might block the light from hitting your subject. If this happens, try removing the lens hood and maybe zoom out a little.

Restrictive TIP: *The AF Illuminator function will NOT work if the camera is set to AF-C (continuous AF mode, Section 6.14), nor in a handful of Scene modes (specifically Landscape, Night Scene, or Sports Action. I can't explain all of these restrictions.*

TIP 2: *When it's dark and the AF Illuminator function is enabled, the camera will ignore the current focusing area and lock onto whatever it can instead, regardless of where it is in the frame.*

6.18 (MOVIE) AF DRIVE SPEED

Menu Position MENU →  4 → AF Drive Speed

What it Does When shooting video, do you want a slow AF that doesn't call much attention to itself, or a fast that might be visually distracting

Recommended Setting: It depends, but "Normal" is a good general purpose setting.

Constraints Phase detect AF only; FE lenses only.

Videographers care about this. (Well, the ones that REALLY care will pull focus manually to suit their needs. It's the *others* that care about this.) But for the rest of us we can choose between smooth transitions (like when panning a landscape slowly) or slightly more jarring autofocus (like when shooting sports).

TIP: *Older APS-C E-mount lenses (ones that don't have an "FE" in their name) cannot accept phase detect control commands, and therefore features like AF Drive Speed, AF Track Sens (next section), or AF-A focusing mode are disallowed.*

6.19 (MOVIE) AF TRACK SENS

Menu Position MENU →  4 → AF Track Sens

What it Does Tells the camera how aggressive it should be in tracking moving subjects in movie mode

Recommended Setting Normal unless you're shooting sports

Constraints Phase detect AF only; FE lenses only

You can see just what this feature does by doing a quick test:

1. First, set the Exposure Mode dial to MOVIE and set this setting to HIGH.
2. Now alternately point the camera to something far away and then to something close, and notice how long it takes for the camera to start readjusting its focus.
3. Set this setting to Normal and repeat Step 2 again. The camera will take almost twice as long before it begins to refocus.

This feature can be useful in sports events where the main person holding the ball will periodically have people running in front of them, and you don't want the camera's AF to be so easily distracted. In all other situations I keep this set to “Normal”.

TIP 1: Speaking of focusing during movies, while shooting movies you can focus-lock using the currently selected focus area by pressing the shutter release button halfway. The focus will remain locked until you take your finger off the shutter release. Most Sony cameras don't do this.

TIP 2: Older APS-C E-mount lenses (ones that don't have an “FE” in their name) cannot accept phase detect control commands, and therefore features like AF Drive Speed (previous section), AF Track Sens, or AF-A focusing mode are disallowed.

6.20 EXPOSURE COMPENSATION

Menu Position MENU →  4 → Exposure Comp.

What it Does Makes the picture lighter or darker

Recommended Setting: Zero, unless you need to override the camera's choice to achieve the image you've pre-conceived in your mind.

The automatic exposure function (in all cameras) does a great job metering for average subjects, but they have no idea at all if your subject is whitish or darkish, or if your lighting isn't average. All exposure meters of all cameras have been programmed to provide an exposure that would be correct for an "average" scene – that is, a scene that is made up mostly of grays and colors that are not predominantly white or black. There are many things you can do to override the meter's recommendation (such as spot metering, AEL, and manual exposure mode). Probably the most straightforward of all of these is the exposure compensation function, which essentially tells the camera "Make it Darker!" or "Make it Lighter!"

To invoke the Exposure Compensation function while in AUTO, P, S, or A exposure modes, just rotate the Exposure Compensation Dial as shown in **Figure 6-25**. A good example of its use appears in **Figure 6-26**.

You may be wondering why there would be a menu function for something for which there is a dedicated dial. Won't the two conflict? A reasonable person would suspect that it's there so it can be remembered as part of a Memory function (Section 6.50); however the A7r II doesn't remember

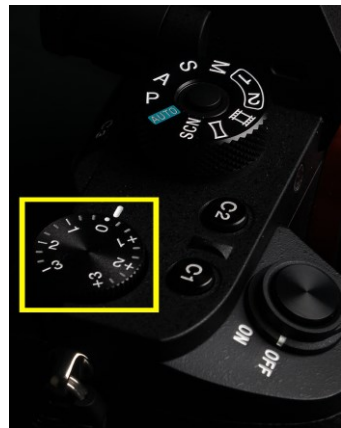


Figure 6-25: You may wonder, "Why is there an Exposure Compensation function in the menu when there's a dedicated dial right on top of the camera??"

exposure compensation as part of the memory function. So I have no idea. If there's a conflict, the dedicated knob wins. (In fact, if the exposure mode dial is set to anything other than "0", this menu item is greyed out.)

TIP: Changing the Exposure Compensation in the menus allows you to go to +/- 5 stops; whereas changing it via the dedicated dial lets you only go +/- 3.

Using the dial, the camera allow you to alter the exposure in 1/3 stop increments to as much as 3 stops in either direction in still image mode, and as much as +/- 2 stops in Movie mode. Changing it in the menu lets you go +/- 5 stops for stills and in either 0.3 or 0.5-stop increments (based on the setting of **MENU** → **📷 4** → **Exposure Step**, Section 6.21.). Got all that?

Don't forget to reset this feature back to +/- 0 when you're finished – this camera can remember your exposure compensation setting even when you turn the camera off. (And you can change it to reset Exposure Comp. to 0 every time you turn it off via **MENU** → **⚙️ 6** → **Reset EV Comp.**, as explained in Section 7.27.)



Figure 6-26: An example of where exposure compensation comes in handy.

Automatic exposure works great for average images, but if your image isn't average (like in a dark clearing, left image) the camera is likely to over-expose the picture in its quest to render the scene as “average”. You can override the camera's recommendation and use Exposure Compensation to make it darker or lighter (in this case a setting of “-1” made it one stop darker, closer to the way it actually looked). (I also changed the color balance to Daylight to make it look the way my eyes saw it.) Good thing you have Live View for instant feedback!

6.21 EXPOSURE STEP

Menu Position MENU →  4 → Exposure Step

What it Does Lets you specify whether you “dial in” exposure compensation and flash compensation values in $\frac{1}{2}$ -stop increments (0.5 EV), or $\frac{1}{3}$ rd of a stop increments (0.3 EV) when changing values via the menu

Recommended Setting 0.3 EV, only because I find that two of these steps (+0.7 EV) is an ideal bracketing amount for digital cameras, and you can’t dial that in when the Exposure Step is set to 0.5. (Besides, the dial is fixed at 0.3. Consistency is good.)

When you change the Exposure Compensation setting via the menu (not by the dedicated dial), each click of the wheel can either represent $\frac{1}{2}$ stop in either direction, or it can represent $\frac{1}{3}$ rd of a stop in either direction depending upon the setting of this function.

Many of you may be scratching your heads, saying “The difference between $\frac{1}{2}$ a stop and $\frac{1}{3}$ rd of a stop is so minute, why would you ever need to choose between one and another?” The answer is such minute differences made more sense in the days of shooting slides when tiny tweaks were meaningful.

Whenever I tweak my exposures out in the field, I usually do it 0.7 stop increments, which is the equivalent of two clicks when this variable is set to 0.3. (Remember, 0.3 is actually 0.3333333 truncated, which is why when you click it two times you get 0.6666666, or 0.7 rounded up.)

Anyway, this setting doesn’t matter to me because I only change the exposure compensation via the dedicated dial, which is hard-coded to change the brightness of the image in $\frac{1}{3}$ rd of a stop increments.

6.22 ISO

Menu Position MENU → 📷 5 → ISO

What it Does Specifies how sensitive the camera is to light. The higher the number, the more sensitive (and the greater the noise)

Recommended Setting: For general walk-around photography, I recommend AUTO with the limits set to between 100 and 3200. When you’re getting serious about a composition, take it off AUTO and set it for as low a value as you can get away with.

[Note: This camera has the same amazing ISO range as the current low-light king, the A7s: from ISO 100 to a whopping 102,400! While it's rarely advisable to use a camera's highest ISO setting, such a high high-end means the lower value ISOs may now suddenly be acceptable to use (depending upon your needs, of course). This is an amazing era we live in.]

You probably already know everything you need to know about ISO:

- **Rule:** The higher the number, the more sensitive the camera is to light.
- **Corollary:** The more sensitive the camera is to light, the more “noise” appears in the image.

So for the best image quality, your goal will be to use the lowest ISO you can for the amount of light you have and for how fast your subject is moving.

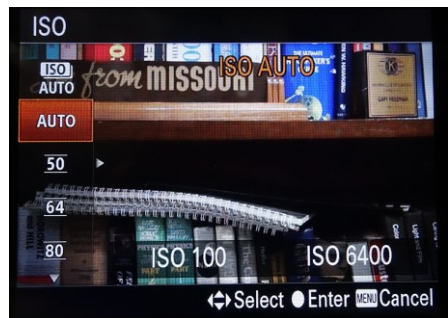


Figure 6-27: The ISO selection screen. At the top of the list is the “Multi-Frame Noise Reduction” feature which is a great tool for low light if you don’t have a tripod.

But, you can choose more than just the ISO value when you go to the ISO menu (**Figure 6-27**). There's also an Auto ISO setting where the camera can choose one for you (and you can specify the upper and lower bounds), and there's also an awesome feature at the top of the list called Multi-Frame Noise Reduction. I'll get to all those in a minute.

***TIP:** Many photo editing programs and online photo galleries don't know what to do with six-digit ISO values – many will display only 65,535 because the non-visionary programmers foolishly made the variable that holds the ISO value a 16-bit integer. ☺*

6.22.1 HIGH ISO NOISE LEVELS

But first, let's see just how noise increases with ISO values. You can see the tradeoffs in the .jpg examples in **Figure 6-28**. It is important to note that high ISO noise affects the shadows more than lighter areas, which is why a darker area is being used for comparison purposes – that is where the noise will be most noticeable. These images were taken with the in-camera noise reduction feature (**MENU → 📷 6 → High ISO NR**) set to NORMAL, and yes, these are .jpgs out of the camera. You can read more about how I get low-noise images taken at high ISO in Section 15.8.

Another thing worth noticing is that the black areas get blacker as the ISO gets higher. This is a result of the sensor's dynamic range getting a little narrower as the ISO increases.

One final thought – and this is to help put the noise characteristic into perspective – the insanely-high ISO values of the A7r II give LESS NOISE than an ISO 3200 shot from 7 years ago (**Figure 6-29**). Well done, Sony!

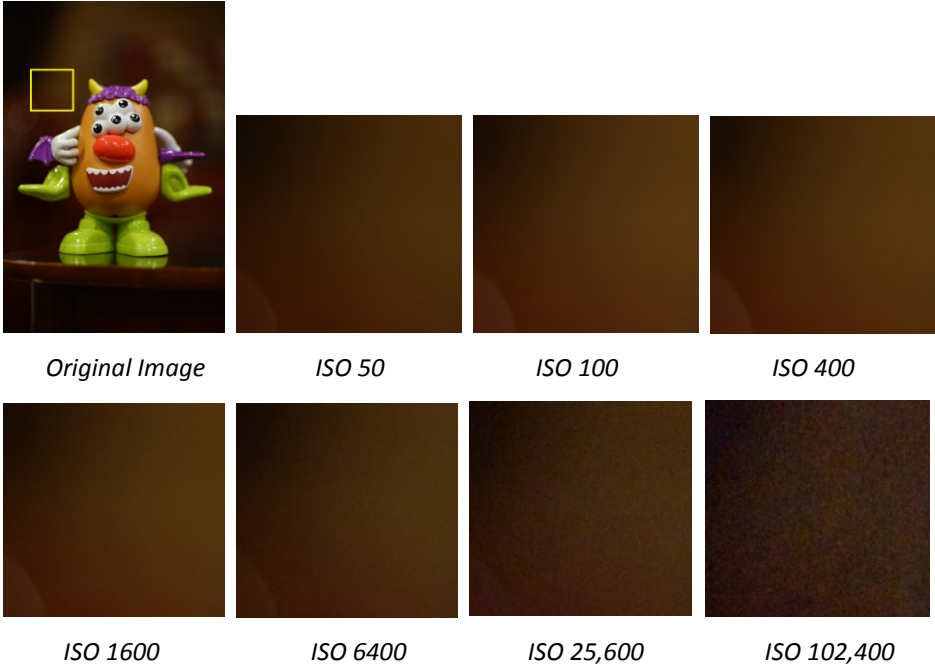


Figure 6-28: *ISO and Noise.* This camera has the same ISO range as the Sony A7s, but with roughly 4 stops' more noise. For some historical perspective on just how far we've come, have a look at **Figure 6-29**.

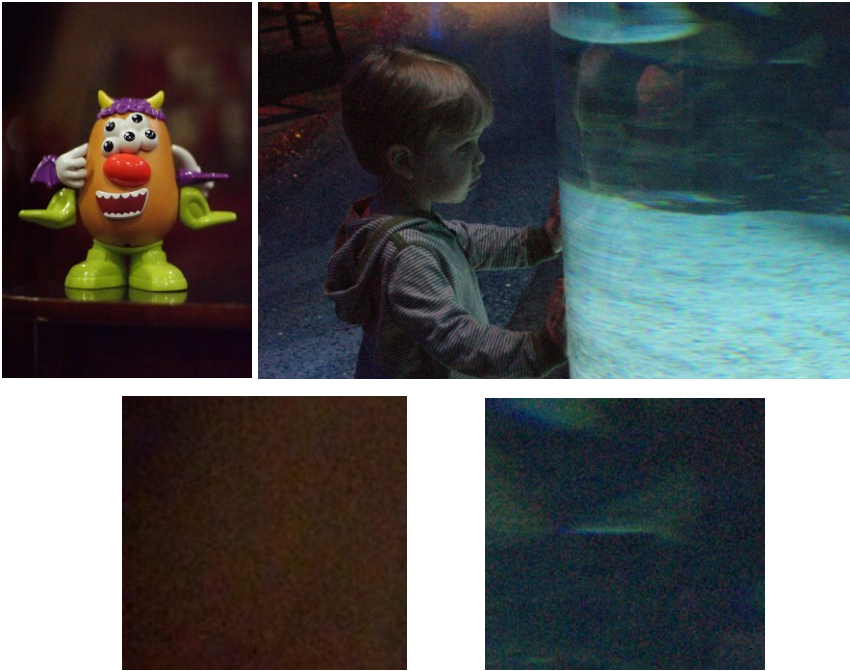


Figure 6-29: I should point out that even the highest ISO of this camera (102,400, left) is less noisy than this ISO 3200 image of the Sony Alpha 200, a camera from 2008 (right)!

So let's look at the ISO menu choices, starting from the top:

6.22.2 MULTI-FRAME NOISE REDUCTION (MFNR)

MFNR was originally mentioned in Chapter 1 (Section 1.1.8). To summarize, when in this mode the camera will take four sequential pictures at the user-specified ISO, align them then merge them, averaging away the noise in the process. A good example of this feature appears in **Figure 6-30**, which was taken on a plane to Copenhagen (I was on the way there to give one of my world-famous seminars, which I absolutely refuse to plug in my books (www.FriedmanArchives.com/seminars)). Anyway, the cabin was almost pitch black, and most of the passengers were sleeping. I

decided that this was the kind of low-light shot that MFNR would really excel in, and so I took two shots: One in Program mode, and one in MFNR ISO 1600. Both are in the figure, along with a close-up of a sleeping person in the front row. A considerable reduction in noise occurs when you average identical images together!

To invoke the MFNR setting: go to **MENU** → **📷 5** → **ISO** (or, if you’re like me, you’ll just call it up in the **Fn** menu) and then scroll all the way up. The setting above AUTO is MFNR. Then move to the right, and use the UP and DOWN cursor keys to choose an ISO. Then hit the center button to select. That’s it! The ISO you choose should be no different than the speed



Figure 6-30: *The airplane was actually much darker than this, which made it a perfect challenge. To get a handheld shot I put the camera into Program mode at ISO 1600. Then I tried MFNR at the same ISO which took four shots and did a delightful job at averaging out all the noise. I like this mode! (This example was shot with an earlier camera, but the benefits you can expect are identical.)*

you would choose normally for the ambient light that you have – for example, choosing ISO 200 (the lowest number it will allow) would indeed yield the lowest noise, but if the light is too low for you to handhold your shot, the camera will be trying to merge four blurry, long-exposure images. You should expect that MFNR will reduce the amount of visible noise by between two and three stops – that is, MFNR at ISO 800 will produce noise that is visibly similar to a single shot taken at between ISO 160 and 200. Also, unlike earlier implementations, MFNR AUTO will honor your Auto ISO values you have set (next section).

TIP 1: *Handheld Twilight, Anti-Motion Blur, and MFNR modes only work in JPG mode. If you're shooting in RAW or RAW + JPG, the camera will yell at you if you try to set MFNR. You must physically change out of RAW or RAW+JPG first. On the other hand, if you're in RAW or RAW + JPG and you choose Handheld Twilight, the camera will just change the image quality to "Fine" without telling you. And then change it back when you leave HHT mode. It would have been nice if the camera had behaved consistently when trying to invoke non-RAW compatible features.*

TIP 2: *Enabling MFNR mode will disable any form of continuous shooting mode.*

TIP 3: *Unlike previous cameras, you can now use the self-timer function in MFNR mode. Hooray!*

TIP 4: *MFNR is also incompatible with any flash mode, so whatever flash mode you have set will be disabled.*

6.22.3 AUTO ISO SETTINGS

Auto ISO doesn't do what you think it does out of the box. (Come to think of it, you don't *want* it to do what you think it does!) Just as you give the camera free range to pick a shutter speed and f/stop when you're in Program mode, it sure would be nice for the camera to pick an ISO for you too, leaving you mentally unencumbered to concentrate on your subject and composition (and, hopefully, your light).

Left to its own devices, the camera might routinely choose very high ISO values like 102,400 under common indoor shooting situations. That just

leads to noisy pictures and unhappy beginners (who will then spread their ire all over the internet). Which is why Auto ISO has a top *default* limit of 3200 – if you want it to be higher, you have to set it that way yourself. (Class-action lawsuit avoided.)

TIP: The A7r II offers an Auto ISO in Manual Exposure mode. Normally that is seen as incompatible, since (for example) if you wanted to underexpose by 1 stop, the AUTO ISO might kick in and raise the ISO sensitivity to guarantee an average exposure – defeating your artistic vision! But Nikon owners have been screaming for this feature for years.

So if you set your camera to Manual Exposure and discover that the image is not getting brighter or darker when you adjust the controls, this is why. Just remember to set it to a fixed ISO when in Manual.

6.22.4 SPECIFYING AUTO ISO BOUNDARIES

If you don’t care for the fixed limits of Auto ISO described above, your camera actually allows you to customize both the low and high boundary of what the camera will choose while in Auto ISO. When in the ISO menu and you’ve selected Auto, just use the Right arrow to move to the right. Hitting UP and DOWN now will change your minimum AUTO ISO value; then move to the right once more and you’re adjusting your Maximum Auto ISO. Notice that with this feature you can set the upper end of ISO as high as 102,400 (which I strongly discourage). I keep mine set to between 125 and 3200 for casual shooting. I’ll set the ISO to something higher (and switch to RAW mode or MFNR mode) when there’s just no other choice.

6.22.5 LESS-THAN-100 ISO VALUES

Notice that the first three ISO choices (“50”, “64”, and “80”) have bars above and below them, as seen in the right image in **Figure 6-27**. Why the bars?

The short answer is that this CMOS sensor actually has a native speed of ISO 100. Technically, it can’t be less sensitive than this. When you set the camera to a lower value, the system simply pays less attention to the signal (resulting in slightly less dynamic range) to simulate the lower value. If

you want proof, have another look at the ISO test shots from a few pages ago and notice that the noise level for ISO 50 and 100 are identical but the blacks in the ISO 50 image are darker – a result of the slightly reduced dynamic range. Thus, unless you need the slow speed for technical work (like shooting waterfalls with motion, where the slowest shutter speed gets you the most beautiful flowing water effect), there's actually little technical benefit to using the lower speeds – the amount of image noise will be the same as for that of ISO 100.

6.23 ISO AUTO MIN. SS

Menu Position MENU →  5 → ISO Auto Minimum Shutter Speed

What it Does Specifies the slowest shutter speed the camera is allowed to go to before increasing the ISO (when ISO is set to "Auto").

Recommended Setting: "STD" unless you're doing action photography

You can think of this feature as a way to tweak the Program mode to your needs without having to move the exposure mode dial to Shutter Priority mode. Here you can specify the lowest shutter speed that the camera is allowed to use in Program or Aperture Priority mode before it resorts to raising the Auto ISO value. This can be a useful feature for people shooting sports and still want the benefit of a "set it and forget it" kind of automation.

This was a badly needed feature on Sony's RX-100 IV and RX-10 II (two cameras upon which my last book was based.) For the A7r II, however, the behavior in the auto exposure modes is different and so the need for this feature is not as great.

Here was the problem: Once upon a time there was a heuristic regarding the slowest shutter speed you could shoot with without needing a tripod (and without SteadyShot). That heuristic was:

$$\text{Slowest shutter speed} = 1/(\text{the lens' focal length})$$

So, if your lens was set to 70mm, the slowest shutter speed you could safely hand-hold the camera at was $1/70^{\text{th}}$ of a second. And if your lens was set to 24mm, then the slowest shutter speed you could safely hand-hold the camera at was $1/24^{\text{th}}$ of a second. Program Mode actually knows about this heuristic, and if it knows you're using a long lens it will up the shutter speed accordingly. But the A7r II will not let you shoot slower than $1/60^{\text{th}}$ of a second in most circumstances (unless you've hit the upper limit of your Auto ISO setting.)

So the factory default behavior is pretty good. But the aforementioned RX cameras didn't stop at $1/60^{\text{th}}$ of a second -- they would shoot at about $1/24^{\text{th}}$ of a second (rounded up to $1/30^{\text{th}}$ of a second). If the light got lower than that, only then did the Auto ISO get increased.

I didn't care for that, since if you're shooting pictures of people in low light, people tend to move. And at less than $1/60^{\text{th}}$ of a second if people move they will come out blurry. NO OTHER CAMERA I'VE EVER USED WOULD GO BELOW $1/60^{\text{TH}}$ OF A SECOND IN PROGRAM MODE for this very reason. Yes, $1/30^{\text{th}}$ of a second might work great for still life shots, but if you're shooting people $1/30^{\text{th}}$ of a second will just result in blurry pictures of the grandkids.

So I was happy when Sony introduced this feature on the RX-100 IV, since I could use it to tell the camera "Don't go below $1/60^{\text{th}}$ of a second when in Auto ISO mode". (Because before that, I was recommending "Shoot in "P"rogram mode when the light is good, but switch to "S"hutter Priority mode set to $1/60^{\text{th}}$ of a second when you get inside". That can be a lot of remembering.)

So is this feature meaningful for the A7r II? It can be useful in situations where you'd normally want to switch to Shutter Priority mode. Maybe you shoot equestrian events and never, ever want to go slower than $1/250^{\text{th}}$ of a second (but you wouldn't mind going faster if the light was good). This would be the feature for you then.

TIP: The shutter speed will indeed go slower than what you specify if the light is so low that the camera hits your maximum Auto ISO speed. (Of course you can specify that too...)


But wait – Sony has added new options to this feature. In addition to being able to choose a specific shutter speed as the lowest it, it gives you fuzzy choices: Slow, Slower, Fast, Faster, or Standard. I can't fathom any expert wanting to use such vague terms – how is the camera going to behave?

I did a quick test: I pointed my camera to a darkish indoor scene and set my Auto ISO high limit to ISO 12,800. Here are the shutter speeds the camera chose for each of the settings:

STD	1/60 th of a second (this is what the camera would do in program mode on its own)
Fast	1/125 th
Faster	1/250 th
Slow	1/30 th
Slower	1/15 th

So I can best describe these settings as "one or two stops faster / slower than what normal program mode would do". Of course depending on your light level and the ISO Auto – High value you have set, you may see different behavior

6.24 METERING MODE

Menu Position Menu →  5 → Metering Mode

What it Does Allows you to select between Multi-Segment, Center-weighted, and Spot Metering

Recommended Setting Multi-Segment Metering



It's easiest to understand the evolution of the different metering modes once you understand the history of determining exposure. It all started with the handheld meter like the kind shown in **Figure 6-31**. They measured the amount of light falling onto your subject, and they were always right.

Handheld exposure meters work on a completely different principle than the ones built into your camera: Handheld exposure meters *measure the light that is falling onto your subject*. Built-in exposure meters, on the other hand, *measure the light that*

Figure 6-31: *This is an old-fashioned exposure meter. They still serve a useful purpose: When used correctly they will always give you the right exposure recommendations, regardless of how dark or how light your subject is.*

Super-De-Duper Important Tip: *These metering modes evolved from the days of film cameras, when you were shooting blind. Well, now you have live view and you're not shooting blind anymore. So for the vast majority of situations you don't need to know this stuff. Just keep this set to "Multi-segment" and then use the exposure compensation dial until the preview looks right to you, then shoot.*

I explain the three metering modes below anyway, but if you're impatient, jump to Section 6.24.3 where I show you how much simpler the new way is.



Figure 6-32: Average subjects in average scenes reflect back about 18% of the light, and so that's what your camera tries to create – it is assuming you're shooting an average subject. As an interesting experiment, when you average together hundreds and thousands of normal snapshots, you will eventually end up with an image that's about 18% grey.

is reflected off of your subject and back into the camera.

Is this a good idea? Well, yes and no. No because the reflectance of the subject will vary wildly – brides in white dresses, for example, will reflect much more light than, say, a groom with a black tux – and therefore your in-camera meter will give you wildly different values. Yes, because it's infinitely more convenient to have the camera guess the right exposure than to go over and measure it with a handheld meter. And besides, for average subjects (like pictures of anything except brides and grooms ☺) the reflected method works reasonably well.

More detail: The camera has absolutely no idea that your subject is bright or dark; white or black, or yellow. Once upon a time, an analysis of thousands of different snapshots showed that the *average* reflectance of an average photographic subject was about 18%. Therefore, when the camera is looking at the reflected light from your subject, it will assume the subject is average: it will assume the light it is seeing represents 18% of how much light is hitting it. It can then infer what the intensity of the original light source must have been, and set the exposure for that value. If it does its job right, all images (when the color information is removed) will look about 18% grey. (See example in **Figure 6-32**.)

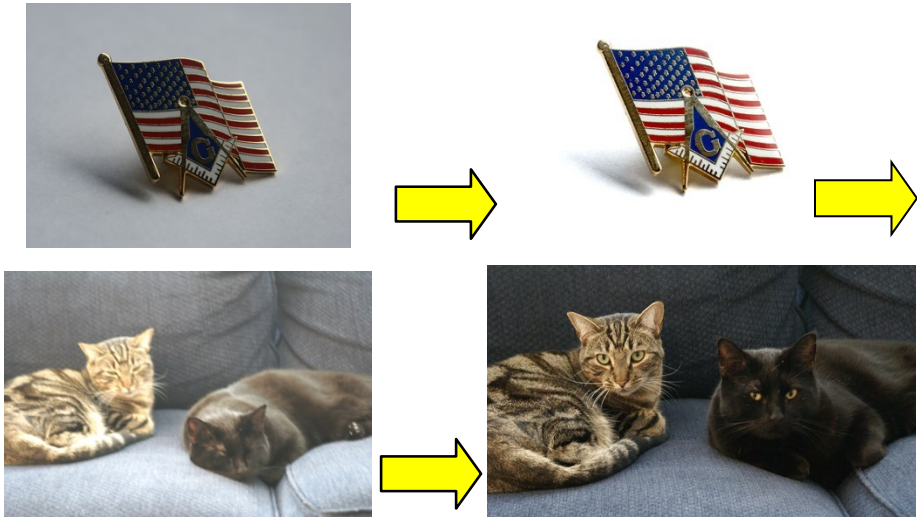


Figure 6-33: Examples of where the exposure meter tries to make things look 18% grey (and how using exposure compensation can fix it). These errors would never have happened if a handheld exposure meter were being used! Yet another example of where we trade off convenience for accuracy.

The fact that the camera tries to make things look 18% grey explains a great deal of the exposure mistakes you might see your (or any other) camera make. (Have a look at **Figure 6-33** for some startling examples.)

And so, this basic principle of assuming that the average of all scenes should be rendered as 18% grey persists to this day. And although it's far from perfect, on average most point-and-shooters have been very happy with its decisions. People in-the-know (and readers of this book) tend to be happy making the occasional override using their Exposure Compensation function when necessary, in exchange for the convenience of NOT having to use the handheld exposure meters.

6.24.1 CENTER-WEIGHTED AND MULTI-SEGMENT METERING

Since the advent of the “18% grey” principle (in the 1960’s!), reflectance meters have been incorporated into cameras. A depiction of the most popular implementation appears in **Figure 6-34a** (left), where the camera would weigh the reflected light coming from the center of the viewfinder more than it would the edges. This “Center-weighted” metering pattern (a Nikon invention) makes the reasonable assumption that your subject is more likely to occur in the center than the edges. (Clearly, nobody at Nikon had ever heard of the rule of thirds! ☺) Center weighted metering was in use in all cameras throughout the 1970’s and 1980’s.

Starting in the 1980’s, there were many attempts to improve upon the accuracy of the built-in exposure meter for scenes that are not “average”, such as subjects that are backlit. Usually these entailed dividing the picture into smaller areas and analyzing each of these areas in terms of absolute light measurement (with an emphasis on what’s behind the focus point) and comparing the values against each other and against a tiny in-camera database of “standard compositions” with rules like “When the metering pattern looks like this pattern, overexpose by $\frac{1}{2}$ a stop; and when the pattern looks like this other pattern, then underexpose by 0.7 stops.”

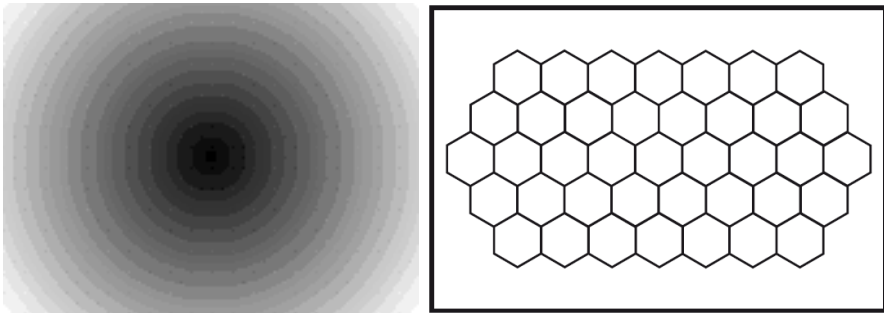


Figure 6-34: *The older Center-weighted metering pattern (left) and the modern Multi-Segment metering pattern (right). (Well, truth be told the modern cameras use every single pixel as a metering area, not the 40 honeycomb pattern pictured on the right. But you get the idea.) With the advent of full-time live view it’s hard to find a reason to use center-weighted anymore.*

This technique of dividing the frame and evaluating the exposure is commonly known as “Matrix Metering” (Nikon terminology) or “Evaluative Metering” (Canon terminology), or “Multi-Segment Metering” (Sony) (**Figure 6-34b**). It tends to succeed in getting the right exposure under a wider set of circumstances than the standard, center-weighted 18% grey method. The earliest versions (Nikon) divided up the viewfinder into 5 segments; earlier Sony cameras had 40 segments, and your camera (because the metering is done via Live View) uses every single pixel as a metering segment. (Overkill, yes, but in this case it’s the easiest thing for them to implement.)

Old film professionals disliked Multi-Segment metering at first, because they had invested a *lot* of time understanding their 18% exposure meters and knowing intuitively when they would make bad recommendations and when (and how much) to override them. In their minds, the problem with Multi-Segment metering (and this was quite relevant in the days of shooting slides) is that you can’t possibly know how much to set your exposure compensation to since you don’t know how the camera’s meter is choosing to handle a difficult, non-average composition. (“Should I overexpose this picture of a bride in her white dress, or did the Evaluative metering already take that into account?”) And so, for these folks, camera manufacturers left the old Center-weighted metering system in the camera as a selectable option. It was consistent and predictable and it would never try to second-guess you.

With the advent of digital, and especially full-time live view, you’re not working blind anymore, plus the Multi-Segment metering algorithms have a great track record of making the right choices in a wider set of circumstances. That’s why I keep my camera set to Multi-Segment metering all the time. And when the light is really harsh and non-average, like a predominantly dark scene, I temporarily switch to either Spot metering (explained in the next section) or manual exposure. I never use center-weighted.

6.24.2 SPOT METERING AND AEL

The third metering mode is called “Spot Metering”, and in fact when you invoke this mode a small circle magically appears in the very center of the live view image. In Spot metering mode, the camera looks *only* at the very center of the viewfinder when it determines the proper exposure, and ignores everything outside of that circle (see the blue circle in **Figure 6-35**).

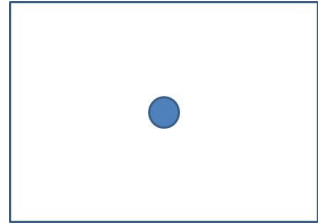


Figure 6-35: The spot Metering sensitivity pattern.

Under what circumstances would Spot Metering be useful? **Figure 6-36** provides an example.

Spot Metering by itself isn't terribly useful unless your subject is in the very center of the image, which (for you fans of the rule of thirds



Figure 6-36: Spot metering is necessary for situations where only your subject is lit well (but everything else is not). Had I shot this on Auto the exposure would have been several seconds long and horribly overexposed because the camera would try to make the picture look 18% grey. For this image I spot metered on the subject's face and locked it using the AEL function. Then I recomposed and shot. Very fast!

compositional rule) will likely never happen, so I recommend using Spot Metering mode in conjunction with the AEL (Auto Exposure Lock) Toggle function. (Note that back in Chapter 2 I assigned the "Spot Metering AEL Toggle" function to the AEL button so I could work quickly in difficult lighting just like this.)

6.24.3 A DIFFERENT METHOD OF HANDLING DIFFICULT LIGHTING

Now that I've explained what all of these different metering mode choices do, let me throw you a curve ball. You don't really need them anymore. Recall that they all evolved from the days of film when photographers were shooting blind and needed reliable tools for when the light was non-average.

Well, guess what? You're not shooting film and you're not shooting blind – you have a camera that uses Live View, and shows you how the image will come out before you take the picture. So, if Auto mode isn't doing it for you, just use exposure compensation to make the image brighter or darker until it looks just the way you want it, then shoot! (**Figure 6-37**)

For more tricky compositions (like the Grant Corban shot above), I'll often lock the exposure first (Spot AEL Toggle, Section 7.35) before adjusting it so once I get the exposure the way I want it I can try all sorts of different compositions.

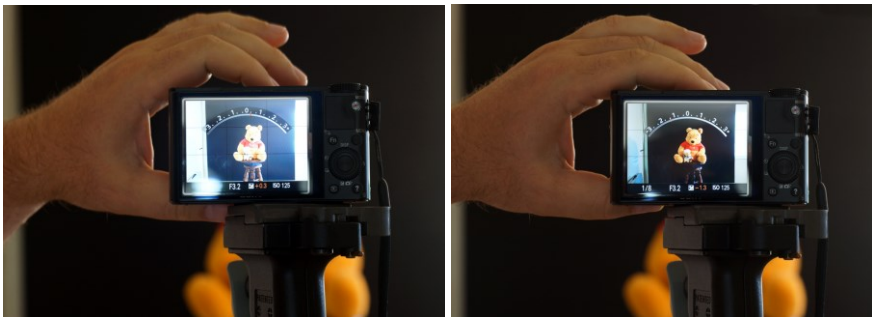



Figure 6-37: With Live View, you can very quickly adjust the exposure compensation to get the right exposure in difficult light. This is much faster than poking around in menus to change metering modes!

6.25 WHITE BALANCE

Menu Position Menu →  5 → White Balance

What it Does Invokes one of many tools for compensating for light that is not pure white

Recommended Setting: AWB unless your camera is producing yucky results under artificial light, in which case I strongly endorse “Custom WB” or shooting RAW and figuring it out later

Have you ever taken a picture indoors at night using a film camera (without a flash), and were surprised to see your results come out looking a little yellowish? Or have you ever taken pictures under a fluorescent light, only to step back in horror when the pictures turned out sort of a ghoulish green? If so, you inadvertently witnessed evidence that all artificial light is NOT the same!

It turns out that, while sunlight contains all seven colors of the rainbow, incandescent light (that which comes from ordinary light bulbs) and fluorescent light radiate only 2 or 3 colors out of the spectrum. Our brains do a wonderful job of adjusting to this different light, but alas, one of the biggest drawbacks of film was that it could not automatically correct for



Figure 6-38: *White Balance Examples. Photos taken under normal light bulbs can turn out yellow-orangish, but the proper white balance setting can make it look the way we remember seeing it.*

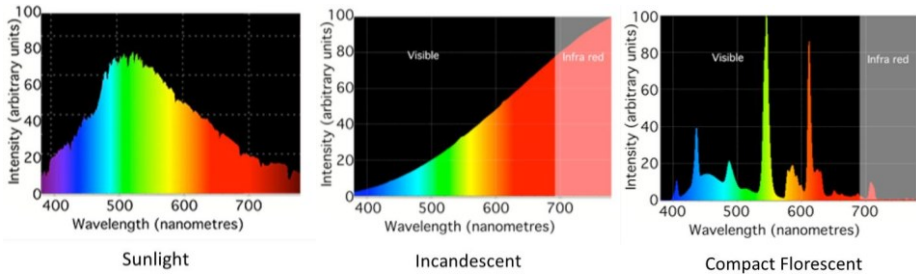


Figure 6-39: A comparison of spectrum put out by daylight (left), incandescent bulbs (center), and Compact Florescent bulbs (right). Our eyes and brain adjust seamlessly, but cameras often need help.

indoor light. You had to use filters, otherwise the result was often strangely colored snapshots.

This is where digital cameras are a huge improvement – they have the ability to sense what kind of light they are shooting under, and correct for it automatically. The ability for the camera to adjust to any kind of indoor light is called “White Balance” – it means that if you take a picture of a white wall, it will come out looking white even though it is being illuminated by the yellowish color of a lightbulb or the greenish color of a flourescent.

What the WB function does isn’t rocket science – all it does is add a tint to the image. No intelligence going on at all – just a blanket color cast. You can see this in action as you thumb through the options: Just do **MENU** → **5** → **White Balance** (or invoke it from the **Fn** menu) and then scroll UP and DOWN and watch the parade of color casts get applied to the live view image.

TIP: Your camera will always make white balance and exposure errors when shooting in the forest. I talk about how to correct for it in 2 easy steps in my blog: <http://tinyurl.com/267m2ka>

6.25.1 AUTO WHITE BALANCE AND PRE-SET WHITE BALANCE

Your camera has the ability to look at a scene and figure out what kind of light is being used, and to adjust for it automatically – a feature called “Auto White Balance”. This feature is turned on by default, and under the vast majority of circumstances it will make good decisions about the white balance and you will never have to worry about it.

BUT, just as no camera can always guess what exposure is right for the kind of picture *you* want to take, no camera can guess the correct White Balance 100% of the time. Sometimes you’re shooting in the forest (where AWB will ALWAYS get it wrong). Sometimes there is a mixture of incandescent (yellowish) and fluorescent (greenish) light. Or, what if you’re taking a picture of a yellowish wall; how can the camera possibly know that the color is due to the wall and not the kind of light that’s illuminating it? It is for tricky situations like these that the camera allows you to specify what kind of light you’re shooting under.

The first 10 options under the White Balance menu are called “Pre-Set White Balance” – they are presets designed to compensate for the most common types of consumer-grade artificial light. (And Sony has added some settings which attempt to correct for the new breed of Compact Fluorescent light, although it still may need some tweaking from the factory defaults. (More about how to do that in the next section).

The Pre-set White Balance functions are:



Daylight – the sun is shining, the grass is green, and your subject is being illuminated by all seven colors of the rainbow (i.e., white light). This White Balance setting is designed to render images correctly under this “full spectrum” sunlight.



Shade – although it’s not artificial light, a cloudy day tends to be just a tiny bit bluer than a full sunny day. (You’d never guess this by just looking at a shady spot, but if you took a scientific instrument which measured the color of the light in open shade, you’d see the difference!) The Shade setting adds some yellow to the image to compensate, plus some magenta. (See **Figure 6-40**.)



Cloudy – the light in open shade is kind of like light on a cloudy day, but not quite as blue. This setting adds just a touch of yellow to the picture to compensate.



Incandescent – another word for “Tungsten” (which in turn is another word for “old fashioned light bulb”). Incandescent bulbs give light that is predominantly red-orange (see **Figure 6-39**). Setting the camera to Incandescent mode lends a compensating bluish cast to the image.



Figure 6-40: An open-shade portrait taking using the Daylight setting (top) and the Shade setting (bottom), which blindly adds a lot of yellow.



Figure 6-41: *One evening I switched my camera to "Shadow" white balance when it started getting dark, but forgot to switch back the next day. It gave family shots a nice warm feel!*



Fluorescent (Four settings) –

There used to be only one type of fluorescent bulb: the long, tubular lights that have graced the inside of office buildings for decades. But in the past few years the Compact Fluorescent type bulbs (which are designed to be screw-in replacements for incandescent light bulbs) have become very popular. When they first came out their color balances were horrid – and the bulb had to stay on for 10 minutes before that color became stable.

CF bulbs today are much improved and have standardized (sort of) on color balances across manufacturers. And so the first three fluorescent settings (“Warm White”, “Cool White”, and “Day White”) were designed to compensate for these CF bulbs, whereas the fourth setting, “Daylight”, was designed for the old-fashioned long-tube fluorescent light. (In my experience, pre-set WB settings for

fluorescent lights are never great out of the box. The next section shows how to tweak it, but read ahead to the “Custom WB” function for a faster and more precise method of correcting the color balance.)

TIP: *As of this writing CF bulbs are falling out of fashion and more environmentally-friendly LED bulbs are now appearing. The good news is they try hard to emulate the color spectrum put out by the CF bulbs, and that’s why these Fluorescent settings can be used for LED bulbs as well.*



Flash -- the camera’s electronic flash is designed to send out all seven colors of the rainbow, just as daylight does. However, market research shows that people like their flash pictures to look a little “warmer” (or perhaps more Canon-like, with some yellow added), and so that’s what this feature does – it’s balanced for daylight, then it adds a touch of yellow. (See **Figure 6-42**.)



Underwater Auto – Seriously, I have no idea what this does or why. It appears to add a little bit of blue to a test image, which is counter-intuitive since most underwater shots suffer from an abundance of blue. Anyway, it’s an option for you.

(We’ll cover the rest of the White Balance settings two sections from now. But first I want to talk about the tool that Sony gave you for tweaking the pre-set white balances.)

TIP: While the camera offers you plenty of different ways to correct for non-white light (including the tools described on the next few pages), and while all of these will work well under the vast majority of circumstances, there are extreme circumstances for which no camera will be able to compensate. For example, shooting under the all-red lighting of a submarine during a red alert. In these extreme cases, no amount of added green or blue can ever make the image look “normal”. For everything else, use these tools!



Daylight WB



Flash WB

Figure 6-42: Sony has tweaked their “Flash WB” to be a little more yellowish than the daylight version, providing for warmer skin tones.

6.25.2 TWEAKING THE PRE-SET WHITE BALANCE

When choosing a pre-set white balance as described above, your camera gives you the opportunity to do a local tweak of the correction. (Even for the Auto White Balance setting.) Just navigate to any of the pre-set white balance options and then hit the right arrow button. A screen very much like the one in **Figure 6-43** will appear.

Here you can use the cursor to add either Green or Magenta (the UP and DOWN buttons) or add either Blue or Amber (the LEFT and RIGHT buttons). How do you know what settings to use? Tweak the settings until the color balance looks right to you in the live view screen.



Figure 6-43: You can tweak the Pre-set White Balance settings by moving the arrow key to the RIGHT and then add some local correction: Green to Magenta, Amber to Blue.

Keep in mind that the range of tweaks this setting offers you is rather narrow – you can't, for example, start from the Incandescent pre-set white balance screen and tweak it enough to equal the Daylight setting.

Although this feature might appeal to those who are obsessed with accurate color, there are actually two much better tools for color accuracy: the absolute color temperature setting described next, or (my favorite) the custom white balance, described in Section 6.25.4.

6.25.3 THE COLOR TEMPERATURE SETTING

The next option on the White Balance menu (**Figure 6-44**) is designed for professionals who prefer to work in terms of exact color temperature instead of vague terms like “cloudy” or “shade”. Professionals measure the whiteness of their light by using “Color Temperature” readings, measured in K (Kelvin). For example, an incandescent bulb registers on color temperature light meters as 3400K, whereas daylight is 5500K.

To use it, just do **MENU** → **📷 5** → **White Balance** → **C. Temp / Filter** (or just access it from the **Fn** menu) and then hit the RIGHT arrow once. That will allow you to set your exact value by using the UP and DOWN arrow keys.

Hit the RIGHT arrow button once more and you’re now into the tweak screen, where you can do a local tweak of the value you just input. (**Figure 6-44** right.) (Fortunately the camera shows you the updated color temperature as you’re tweaking, as confirmation that you’ve got it right.) Hit the Center button to accept your value and exit.

Chances are, if you had to read this entry, you’re not in need of this feature. ☺ (I find it faster and easier to use the Custom White Balance function described on the next section.)



Figure 6-44: Absolute color temperature can be dialed in via the Color Temperature and Color Filter screen.

TIP: *If you shoot in RAW mode you don't have to worry about any of this white balance stuff while out in the field. You can experiment and specify the proper white balance after the fact, when you get back to your computer. (See Chapter 15 for details.)*

6.25.4 CUSTOM WHITE BALANCE

Custom White Balance is the feature you use when you have a non-standard lighting source (such as halogen), or a mix of white, incandescent, fluorescent, ultraviolet, and you-name-it type of lights illuminating your subject. Or when you're under fluorescent lights that are a non-standard shade of green, or under a soft-white bulb which is a non-standard shade of red-orange. The way Custom White Balance works is pretty ingenious: you aim the camera at a nearby white object (that is lit with the same light that is falling on your subject), preferably a white wall or a piece of paper. (Neutral grey works too.)

Then you invoke the Custom White balance feature, essentially telling the camera, "Here! I'm showing you a white piece of paper. Add whatever tint you have to add, or remove any tint you have to remove, to make that piece of paper look white!" The camera will measure which of the rainbow colors it sees, and then it can compensate automatically for the rainbow colors it doesn't see. It will make the right choice every time except in the most extreme sources of light. It's a great tool.

To Use Custom White Balance:

1. Go to **Menu** → **5** → **White Balance** → **Custom Setup** (the very last option) as shown in **Figure 6-45a**. The screen in **Figure 6-45b** appears.
2. Do as the screen says! Fill the screen's center circle with your white surface and press the shutter release button.

3. Press the center button to confirm. Notice that the screen in **Figure 6-45c** actually gives you the values of the correction it is about to store ("4600K M1") on the screen.
4. Press the Right and Left arrow buttons to choose whether to save the value in Custom Register 1, 2, or 3.
4. From then on, the corrections you just set will be employed in all future images (until you choose a new value, of course!) This value is stored in the "Custom" WB settings (the ones just above Custom Setup in the menu) and the value can be instantly recalled just by selecting "Custom 1, 2, or 3" from the WB menu in the future.
5. As with the pre-set white balances, you can tweak this setting if you want to by going to **Menu → [Camera icon] 5 → White Balance → Custom [1, 2, or 3]**, hitting the RIGHT arrow, and then tweaking the custom white balance using the 4-axis graph. (But you should never want to.)

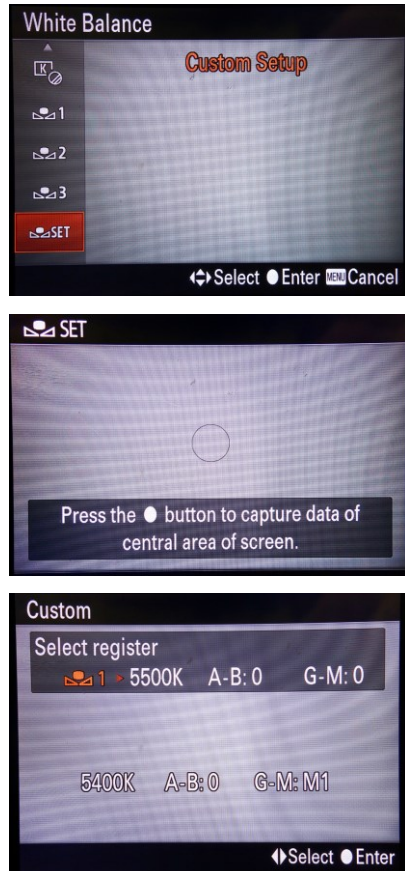


Figure 6-45: The Custom White Balance Control and its associated screens.

6.26 DRO / AUTO HDR

Menu Position MENU →  5 → DRO / Auto HDR

What it Does Lets you choose settings for two different functions that are designed to “expand” the dynamic range of the camera (I used the quotes intentionally)

Recommended Setting D-Range Optimizer - Auto

This menu function controls one of two features that are designed to address the problem of “Your eye can see much more dynamic range than the sensor can”.

The first is Dynamic Range Optimization. When this feature is enabled in its default configuration, in certain circumstances, the camera will examine the brightness range of the image you just took and, if it feels the image will benefit, will attempt to lighten some of the shadows before it writes it to the memory card. When used properly it can really make your images look brighter and, for lack of a better word, “Happier”. You can see an example of it in action in **Figure 6-46**.

TIP: DRO does not affect RAW files, so if you shoot RAW + JPG, only the JPGs will be affected.

DRO is a very powerful tool but I have found that it takes some experimenting to learn when to use it and how much. I find it particularly beneficial when shooting outdoors when the light is splotchy.

The Second feature to expand the dynamic range is High Dynamic Range or HDR. Basically it takes three pictures bracketed up to 6 stops apart and merges them in-camera.

Both Dynamic Range Optimization (DRO) and High Dynamic Range (HDR) functions are described fully in Chapter 14.



Figure 6-46: Dynamic Range Optimization at work. DRO processes the image in-camera and automatically lightens some of the shadows in certain circumstances without touching the highlights (notice the window light still shows the tree).

True Story: National Geographic photographer Michael Yamashita shot many assignments with Sony cameras with DRO set to AUTO. He usually shoots RAW+JPG, and sends the RAW files to the NatGeo staff for post-processing. Mike credits the DRO feature for making the shadows look exactly how his eye sees them, and he tells his staff to “make the RAW files look just like the .jpg”. On several occasions the staff complained, “We can’t!”. This reinforces other stories I’ve heard where it can take an hour or more to do in Photoshop (by experienced users!) what the intelligent DRO feature does in mere seconds.



6.27 CREATIVE STYLES

Menu Position MENU → 5 → Creative Style



What it Does Specify in-camera tweaks to your .jpg images







Recommended Setting I personally prefer to keep the factory default settings (everything essentially “neutral”) and do any color cast, contrast, or sharpening on my computer later on

“Creative Style” is a catch-all phrase which means “A collection of tweaks the camera can apply to an image” – tweaks like color cast, sharpness, contrast, and saturation. The degree of change you can invoke by these settings is very small (see comparison shots in the next sections), however you can achieve noticeable differences by combining several of these variables together and storing them in one of six spaces (“Creative Style locations”). I’ll give examples of such combinations after the settings are demonstrated.

Note that these settings only affect pictures taken in P, A, S, or M exposure modes and are only applied to .jpgs (although the settings used are written to the EXIF area of RAW files so programs like Lightroom can open them up and automatically tweak the image according to the settings you dialed in if it wants to. (Kind of a time-saving step.)

The first thing I’ll explain is the concept of what Sony calls an “Image Style”. The A7r II has 13 Image Styles, plus six customizable slots which you can play with on your own. The 13 image styles are described below:

Image Style		Comments
Standard		This is the “normal” mode against which all other modes are compared. It is an excellent general-purpose setting from which I rarely deviate.
Vivid		All colors and contrast are enhanced slightly.

Neutral		All colors are muted slightly.
Clear		More vivid than “Vivid”.
Deep		Darkens the image a little.
Light		Lightens the image a little.
Portrait		Similar to Neutral, it gives soft, warm colors which traditionally work well with portraits.
Landscape		Similar to Clear; it enhances the colors and contrast slightly.






Sunset		Adds reds and yellows to the image.
Night Scene		The colors are untouched; Night View simply lowers the contrast.
Autumn Leaves		Hello, Reds! I actually like using this color setting when shooting time exposures at night (see Figure 6-47 .)
Black & White		Removes all color from the image. (Note: It's really gone! You can't get it back later on!!) But it does more than just de-saturate the image – it emphasizes some colors over others so that a caucasian face comes out more white than grey.
Sepia		Removes all the color from the image, and then turns the black parts into a beautiful light brown, reminiscent of 1800's-style photos. (See note above regarding color not being recoverable.)



Figure 6-47: A time exposure of downtown Los Angeles on a rare clear evening taken using “Standard” (left) and “Autumn” (right). I kind of like the extra reds added to this kind of a shot.

6.27.1 FREQUENTLY ASKED QUESTIONS

Q: “Are all these choices *really* necessary? Which ones do you use?”

A: Some people love the fact that you can do all these neat things in your camera without ever having to visit your computer later on. I will say that, when combined with other settings (keep reading!), you really can tailor a kind of emotional feel to your subjects using these combinations of settings.

So those are the “Image Styles” (color tweaks). Now pick up your camera and go to **MENU** → **5** → **Creative Style** (or access it via the **Fn** menu if it's still there) and scroll down to the last six choices (they're numbered). Select one of these numbered memory locations, then move **RIGHT** to highlight the Image



Figure 6-48 The Creative Styles screen allows you to set your own unique style comprised of a collection of image-tweaking variables: color space, contrast, sharpness, and color intensity (saturation).

Style associated with that memory location. You can then use the UP and DOWN buttons to see them all. Press the center of the multi-selector to select one. These customizable Creative Style slots can be handy in case you want to configure six presets using Autumn color palette (just to give an example).

Okay, time for an illustration. Let's say you want to modify the Creative Style called "Vivid" so that the images it produces have a little more "punch" right out of the box, so they will look most impressive when you plug your memory card directly into your inkjet printer and say "Here, print these!". To achieve this effect, you might want to set the Contrast to +2, the Saturation to +1, and the Sharpness to +1 (in addition to getting Vivid's enhanced colors) to all the pictures you take. Here's how to achieve this step-by-step:

1. **MENU** → **📷 5** → **Creative Style** → [Hit "Enter"]. **Figure 6-48** is seen.
2. Move DOWN one until Memory Location #2 ("Vivid") is highlighted. Use the arrow button to move RIGHT.
3. The first parameter you can adjust is "Image Style". It should already be factory set to "Vivid", but in case it's not, use the UP and DOWN arrows to select Vivid.



Figure 6-49 Your current Creative Style and its associated tweaks are visible on the main screen (highlighted in yellow). And here is a "before" and "after" shot showing the collective impact of these tweaks.

4. Move to the right to select Contrast (🔍). Once the Contrast icon is highlighted, move UP twice, and watch the icon’s value change to +2.
5. Move to the right again, and move UP to change the Saturation icon (🌈) to +1
6. Move to the right again, and move UP to change the Sharpness icon (📐) to +1.
7. Then hit the shutter release button halfway to save your settings and return to shooting mode.

You can see the changes you’ve made to your Creative Style by looking at the main display screen (**Figure 6-49a** – yellow box). Just for fun, **Figure 6-49b and c** shows a “before” and “after” view showing that indeed, a collection of tweaks really can make a subtle yet visible difference.

So that’s the story behind Image Styles and Creative Styles: Image Styles represent color tweaks to the image, while Creative Styles are the camera’s 6 memory locations in which you can store (and instantly recall) combinations of image tweaks, including Image Style, contrast, saturation, and sharpness. On the next page I’ll show you some examples of what the settings do.

CONTRAST SETTING

The first variable you can change after selecting an Image Style is contrast. Contrast is a difficult thing to describe, but you know instantly if your pictures don’t have enough of it. Basically it is “how white are the whites, and how black are the blacks?” If you are going to have your pictures processed at a 1-hour photo lab, then they almost always adjust the contrast for you and there should be no need to change this setting.

Figure 6-50 gives examples.

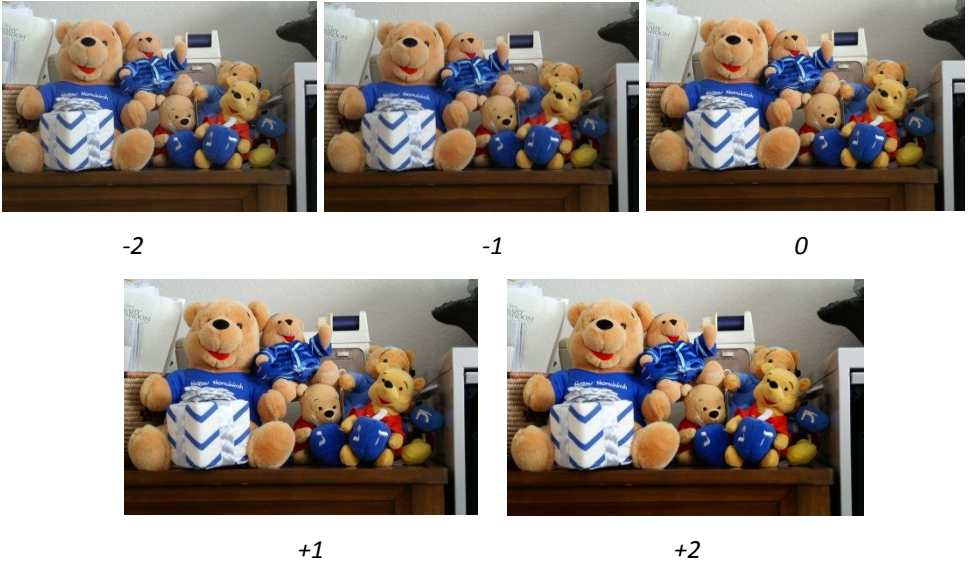


Figure 6-50 The Contrast setting from -2 to +2.

6.27.2 SATURATION SETTING

This setting increases or decreases the intensity of the colors, adjustable from -2 to $+2$. See **Figure 6-51** for examples.

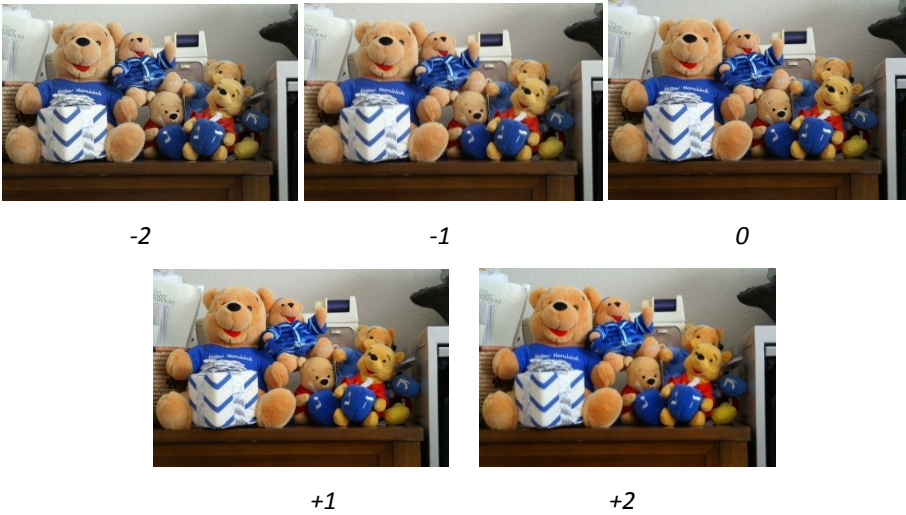


Figure 6-51 The Saturation setting from -2 to $+2$.

6.27.3 SHARPNESS SETTING

If you think all these comparison shots so far look alike, just wait until you see the comparison with the sharpness settings in **Figure 6-52**! To make the differences visible, a small portion of the images presented for



The yellow square shows the zoom area

-2



-1



+0



+1



+2



Figure 6-52 The Sharpness setting from -2 to +2. These are enlargements from the small yellow rectangle in the first image. Notice that sharpening can also, in theory, exaggerate .jpg compression artifacts.

comparison have been greatly enlarged.

6.27.4 COMBINING SETTINGS

As alluded to at the beginning of this section, you can combine these settings for good effect. (In fact, I already gave a mild example of this in **Figure 6-49**.)

What are some other things you can do with these settings? Here are some ideas and suggestions:

Image Type	Suggested Settings
<p>Children & Birthday Parties</p> 	<p>Children and bright colors go together. Try this combination of settings:</p> <ul style="list-style-type: none"> • Image Style: Clear • Saturation: +1 • Contrast: 2 • Sharpness: +1
<p>Sports & Photojournalism</p> 	<p>Most newspapers can't reproduce the fine nuances of a quality photographic print. Here a gritty, high-contrast look will be a good fit for newsprint images:</p> <ul style="list-style-type: none"> • Image Style: Standard • Saturation: +1 • Contrast: +2 • Sharpness: +2

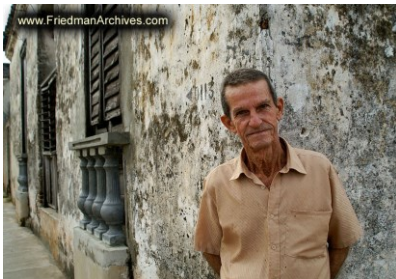
Portraits & Weddings



Softness and tonal range is best here.

- Image Style: Portrait
- Saturation: -1
- Contrast: -2
- Sharpness: +1



Travel Photography



It all depends upon the country you're visiting. If you're visiting a land filled with bright colors (Cuba or South America, for example), use the same settings as "Children and Birthday Parties" above. If you're in parts of old Europe or the Middle East (where the muted colors of Agfa film used to reign) then try something more subdued:

- Image Style: Neutral
- Saturation: -1
- Contrast: -1
- Sharpness: 0 ("Standard")

Of course these settings only serve to reinforce a pre-conceived stereotype. Sometimes it's best to put your camera away for awhile, look with your eyes, absorb the mood, and then choose settings that convey that mood.

<p>Low-key artistic avant-garde</p> 	<p>All settings at minimum value (except Image Style, which should be either “Clear” or “Sunset” (for interesting effect) 😊)</p>
<p>Time Exposure Photography</p> 	<ul style="list-style-type: none"> • Image Style: Autumn • Brightness: +1 • White Balance: Fluorescent Daylight (really!)

If you’re not sure what settings to use, or are overwhelmed by the sheer number of permutations, you do have another option available to you: Shoot in RAW mode (Chapter 15) so you can make all of these choices later, by the comfort of your computer. Ain’t it great to have choices?

6.27.5 B&W MODE

Once upon a time (back in the days of film) I was shooting a wedding, and the couple requested that I shoot black-and-white in my famous wedding photojournalism style.

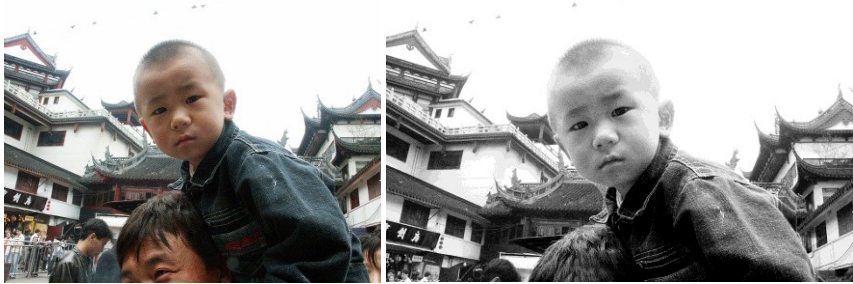


Figure 6-53: B&W can save a shot that has poor lighting. Also, most non-photographers tend to regard Black-and-white shots as being more “artistic”. (These are the same people who think that a big and heavy camera must take better pictures.)

“Sure!” I said, “but it would probably be much easier and cheaper to shoot everything in color, and then just convert selected pictures to B&W in the computer.”

“Absolutely not!” the bride insisted. “Black-and-white must be black-and-white from start to finish!” (And trust me, being a reformed wedding photographer, you do *not* want to argue with a bride!)

The engineer in me, who has learned that the results are more important than the process, acquiesced to this very common mode of thinking in the art world, where process is just as important (or perhaps more so) than the results. (This is why darkroom-processed fiber-based prints are allowed in art galleries, but inkjet prints containing the same quality image are not. Go figure.)

Rightly or wrongly, this is the perception and paradigm that we all must live with. And while Sony graced your camera with a B&W and Sepia mode to save you the trouble of creating the B&W image on your computer, I’ll bet it could also be used for wedding couples with a degree

in art. (B&W and Sepia mode are two of the Image Styles described a couple of sections ago.)

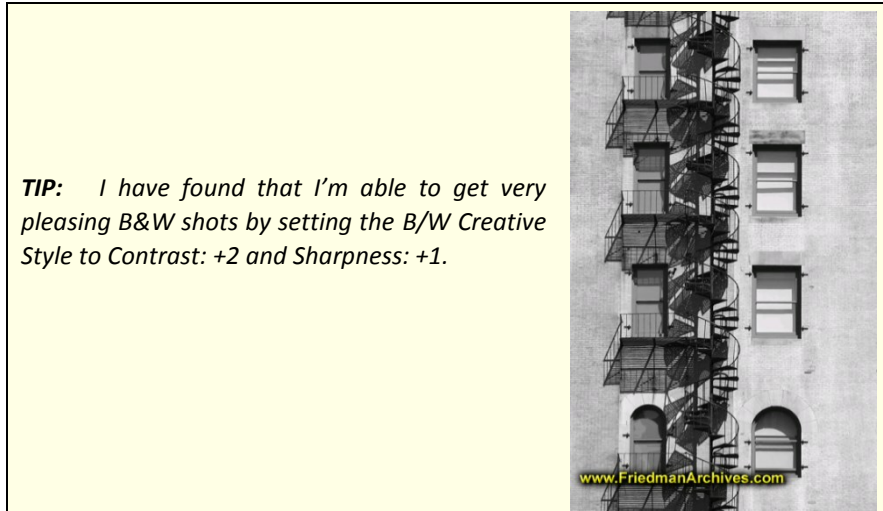
B/W mode has other practical applications too. Besides taking pictures which others perceive as being more artistic, it can also save you from RBL (Really Bad Light) in some circumstances. For example, **Figure 6-53** is a shot of a Chinese boy on his father’s shoulders. The child is backlit, with little direct light hitting the boy’s face. This light is just awful, but when shot in B&W mode the poor lighting hardly gets noticed.

Want the best of both worlds? Earlier in the book I mentioned that if you shoot in B/W or Sepia mode, then the color is gone forever and it can’t be recovered. UNLESS, that is, you choose **MENU → 📷 1 → Quality → RAW & JPEG**, in which case the camera will record one color and one

TIP: B&W mode isn’t just a simple desaturation. Below is an image I took in B&W mode, plus the Lightroom adjustments I had to make to make the RAW file (taken at the same time) look the same as what came out of the camera. A little extra contrast on the curves, a slightly non-standard conversion of the colors to greyscale.



B&W image for each picture you take. Kind of like a safety net! RAW and JPEG are all covered in Chapter 15.



6.28 PICTURE EFFECT

Menu Position MENU → 📷 6 → Picture Effect

What it Does Turns your very expensive serious digital camera into a cheezy hipster Instagram camera that will no doubt impress your tasteless friends

Recommended Setting Hey, it's up to you!

Would it surprise you to know that as professional photographers, we hardly ever use these picture effects? At least, I found I hardly ever did. Then one day I was in a café and fell into conversation with an artist. This lovely lady was fascinated with the camera's picture effects and their value to her in visualizing something new – and my own interest in what I'd previously thought of as “toy camera” effects began to change. (Well at least they were tweaked a bit. 😊)

So if you’ve never used your picture effects before, and you want to have a little more fun with your camera, dig into this feature and try shooting different subjects to see what works best.



Figure 6-54: Try your Picture Effects on everything till you get a feel for what works. This is a B&W posterization of shacks on a jetty.

So what do they do? Well, you get the ability to capture only selective colors; to make striking high-contrast B&W images; to make the image look old/faded; or even make your picture look like it was taken with a 1960’s era plastic toy camera. These effects apply when you’re shooting movies, too!

To help provide a meaningful technical explanation for what these settings *really* do, I’ve photographed one colorful test subject using a variety of settings. Afterwards I’ll show you other subject matter more suited to each effect, and then I’ll compare some of these effects to the camera’s other effects – the Creative Styles (described in the previous section).

For fun, reader Kathi Horste put together this fun little video showing off the various Picture Effects (plus how it looks in movie mode – quite cool!): <http://tinyurl.com/3ejuapo> . (Thanks, Kathi!)



Reference Photo - Program Mode using "Standard" creative Style.



Toy Camera – Designed to emulate the toy plastic cameras of the 1960's. Introduces some vignetteing in the corners, bumps up the colors a little and provides one of 5 mild color casts.



Pop Color - Saturated colors – similar to the "Vivid" Creative Style.



Posterization – Color. (Very high contrast!)



Posterization – B&W.



Retro Photo – A combination of a low color saturation and a yellowish / brownish (sepia) color cast.

6.28.1 TOY CAMERA

So where would you use these effects? Check out these examples. It’s all a bit of fun really as a part of playing round and being creative. Try shooting green trees with the green color cast, and a sunset with ‘magenta’ or ‘warm’, to see what happens.

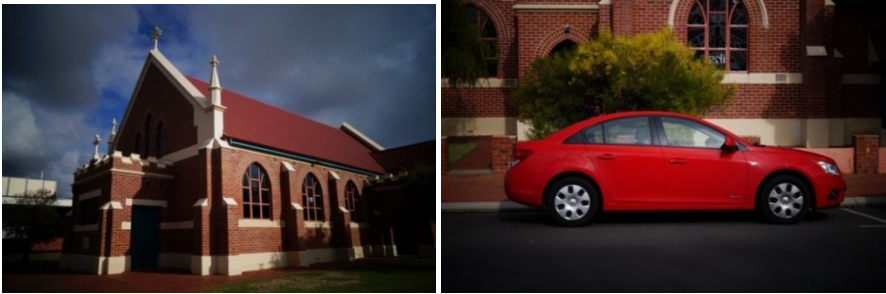


Figure 6-55: Toy Camera examples. I can tell you, on a big screen, it is actually an interesting effect – whereas, without a doubt, the realistic picture is just plain boring.

6.28.2 POP COLOR AND POSTERIZATION



Figure 6-56: Pop Color (left) can be surprising when you turn it on a colorful subject. To save bad light, try posterization-ing (right).

6.28.3 RETRO PHOTO






Figure 6-57: Retro. Have a hankerin’ for the good-old-days? Try Retro mode, which makes the image look like a faded color print from the ‘70’s. In some images like these, you’ll get ‘good’ results. In others, it will look more like a washed-out camera work. ☺

6.28.4 PARTIAL COLOR

Time for the next batch of Picture Effects. I find Partial Color and High Contrast Monochrome to be the most useful of these effects so far.

<p>Soft High Key – Sorry to be brutal, but that’s just</p>	<p>Partial Color (Red) - As you can see, everything that’s red is colored;</p>	<p>Partial Color (Green) - Look closely and you’ll</p>

<p>another word for “washed out” or “overexposed”.</p>	<p>everything not red is rendered in B&W.</p>	<p>see some yellow on the edges as well. It’s not a perfect filter.</p>
 <p>Partial Color (Blue).</p>	 <p>Partial Color (Yellow).</p>	 <p>High Contrast Monochrome.</p>

6.28.5 *SOFT HIGH-KEY*



Figure 6-58: *Partial Color* simply desaturates the other colors to monochrome, keeping only the color you selected.

6.28.6 HIGH-CONTRAST MONOCHROME



Figure 6-59: High Contrast Monochrome adds extra contrast to B&W pictures.

And finally, the last batch of Picture Effects. I'll deal with each of these individually.

6.28.7 SOFT FOCUS

Yup, soft focus does what you think it does – it fuzzifies the image in a slightly different way than you could achieve by simply not focusing accurately with your lens. It can be useful for dreamy-like portraits for aging movie stars, and the intensity is selectable from three levels.

This effect is often used in the advertising world to make something seem more mysterious, moody, romantic and desirable.

Figure 6-60 shows this effect at work on an ordinary scene taken in a tea shop of a man choosing a product.

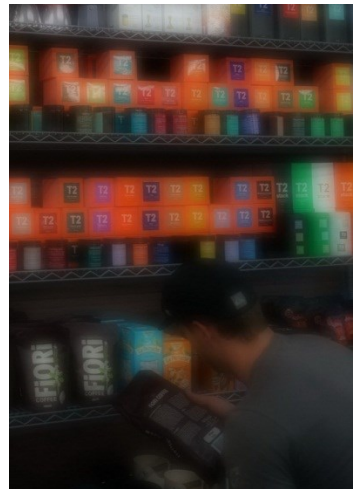


Figure 6-60: Soft Focus can create a mood effect - misty and surrealistic.

6.28.8 HDR PAINTING

HDR Painting emulates the kind of grungy Topaz-filter look that seems to be all the rage. HDR Painting will take three pictures (just like the dynamic-range-expanding HDR function does) and then it does something to it, making it look a lot grungier.

Try shooting a portrait with HDR Painting set to High and see just how many of your Facebook friends like it. ☺

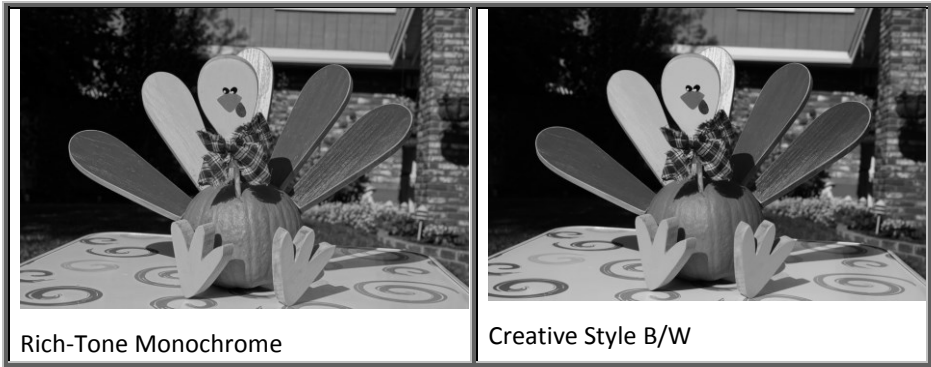


Figure 6-61: HDR Painting. Notice the boosted color and contrast - probably to the extreme for these examples. Try shooting rusting cars with this effect.

6.28.9 RICH-TONE MONOCHROME

The High-Dynamic Range (HDR) function won't be covered until Chapter 14, but basically the function just brackets three pictures and merges them together in-camera, yielding a lower-contrast image whose highlights and shadows aren't as likely to blow out. The Rich-Tone Monochrome feature is essentially an HDR image shot in Black-and-White. When invoked, the camera will switch to B&W mode, shoot three images in a row, align them internally (in case you had a shaky hand) and write it as a .jpg to your memory card.

The example below compares Rich-Tone Monochrome with the camera's other B&W mode. Since this test subject had a pretty narrow tonal range the only real difference you'll see here is the slightly lower contrast of the Picture Effects version (left).



As it turns out, this provides a fairly pleasing effect and is a good way to get a quick B&W of good quality, or to pre-visualize a B&W that you intend to shoot in color then work with on your computer later.



Figure 6-62: Left: RTM performed well in rendering the dark, shadowy face of this church in Busselton, Western Australia. Right: Rich Tone Mono – or HDR B&W can give some pleasing results.

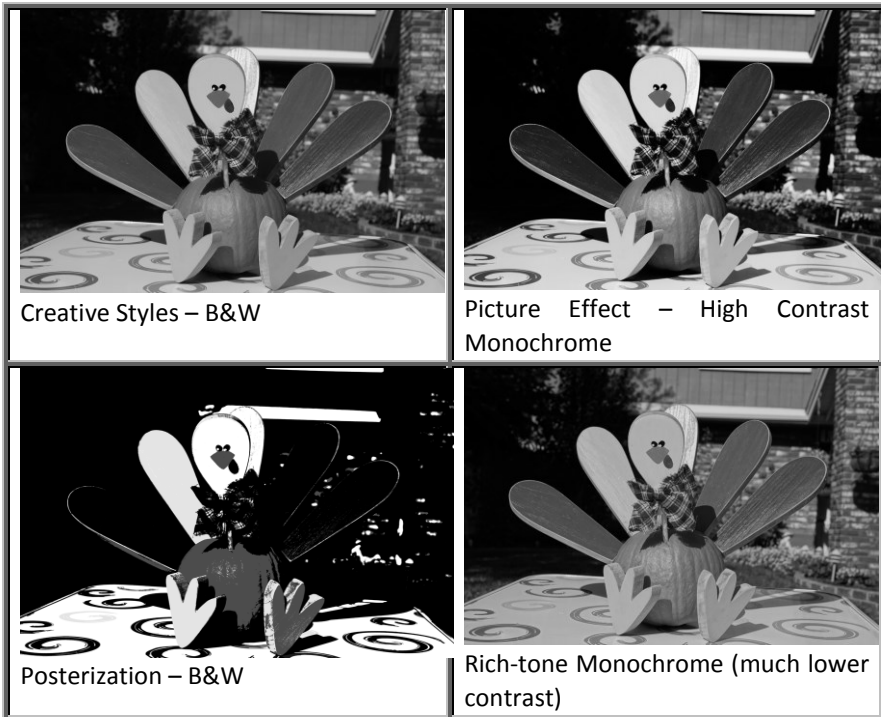
6.28.10 HOW DO THESE EFFECTS DIFFER FROM BEFORE?

Astute readers who are already familiar with the camera’s Creative Styles function (Section 6.27) may notice that your camera *already* has a “Vivid” mode and a B&W mode. How do these new modes compare?

Good question! Here’s a 3-way comparison of a “Normal” shot, the Creative Styles “Vivid” function, and the new “Pop Color” Picture Effect:



And here’s a comparison of the camera’s native B&W mode with the three new ones:



The differences are subtle, but they’re there! Different choices for different subjects and different moods. Rich-tone monochrome might be ideal for an old town in a foggy evening.

6.28.11 MINIATURE MODE

This feature is kind of misleadingly named. It is claimed to give the image a feel of what the old Japanese Monster movies used to look like – the giant monsters were actually miniatures filmed in a certain way that exaggerated the shallow depth-of-field, trying to make it look like it would normally look had the monster actually been monster-sized.

So all this feature does is selectively apply the soft-focus function demonstrated earlier to all but $1/3^{\text{rd}}$ of the image, plus it exaggerates color intensity to an unreal degree. And to help you compose properly, the camera will show you which $1/3^{\text{rd}}$ of the image will be sharp while you're shooting in this mode.

Now you might think that this is a pointless feature, but don't dismiss it out of hand. This feature was just *made* for Instagram. In fact, there's also an entire series of lenses (called Lensbaby www.lensbaby.com) designed to help you do something just like this (though much more and with much better control over what is in focus).

Figure 6-63 provides an example of Miniature Mode in action. Personally, I would have liked it more if it was possible to steer a dot (for want of a better word) around the screen and selectively choose what I wanted to be in focus – using much the same methodology as zooming in a picture in playback mode or when using Manual Focus Assist (Section 7.2) to manually focus before taking a picture.



Miniature: Auto (the camera chooses a zone based on focus point and the orientation of the camera)



Miniature: Top



Miniature: Middle (Horizontal)



Miniature: Bottom



Miniature: Right



Miniature: Middle (Vertical)



Miniature: Left

(This space intentionally left blank)

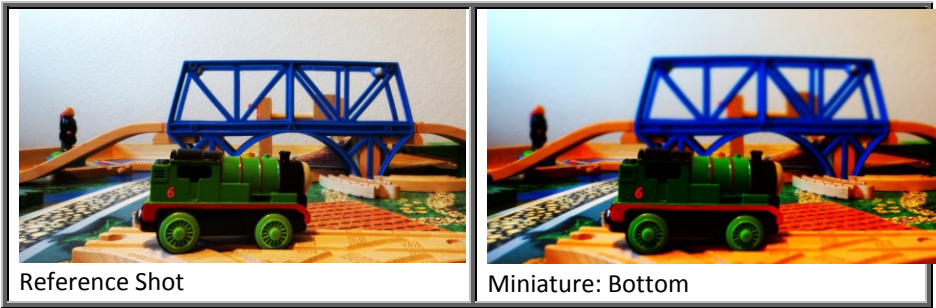


Figure 6-63 The Miniature effect is applied horizontally through the line of cars – and it actually looks like a miniature!

6.28.12 WATERCOLOR AND ILLUSTRATION MODE

I have to say, of all the Picture Effects available, these are two of my favorites. Its effects are hard to see when you’re just reviewing them on the back of your camera (without zooming in); but when you get back to your computer and view them full-screen, *whoa! That’s pretty awesome!* (Examples can be seen in **Figure 6-64** and **Figure 6-65**) The two effects are so similar (you can think of Watercolor as Illustration Mode set to “Really, Really Low” – just the heavy black lines are missing) so I’ll cover them both here.

To use, do **📷 MENU → 📷 5 → Picture Effect → Illustration (choose from Low, Mid, High)** (Make sure the camera isn’t in RAW mode beforehand otherwise it will be greyed out). This will work well but it disables any sort of continuous drive mode (which makes sense – the effect



Figure 6-64: The Original, Illustration Mode (set to “High”), and Watercolor mode.

TIP 1: Unlike most other Picture Effects, neither Watercolor nor Illustration can be applied in movie mode. (Actually, that’s true of every Picture Effect after High Contrast Monochrome.)

TIP 2: Want to apply this effect to some old picture (printed or on your computer screen)? Just take a picture of the picture or your computer screen. The end results are such that you can’t tell if the original was low-res or not. (Hey, that’s how I created some of the examples shown here!)

is computationally expensive). Invoking Illustration mode this way only saves the modified image – there’s no way to get a “normal” plus an Illustration Mode image.

Watercolor mode handles identically to the above (just substitute “Watercolor” for “Illustrations” in the instructions above), the only difference is you can’t specify high-mid-low strength.

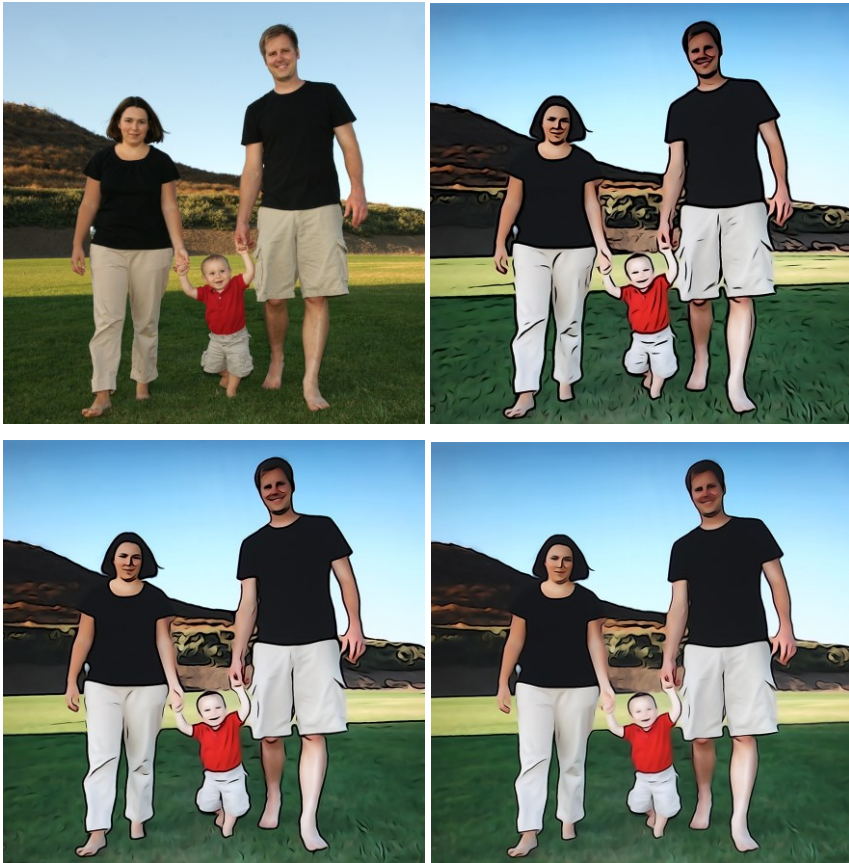


Figure 6-65: Illustration mode looks more impressive when you look at a large version of the image. Here is the original, then Illustration mode set to Hi, Mid, and Low.

6.29 PICTURE PROFILE

Menu Position MENU →  6 → Picture Profile

What it Does The equivalent of “Creative Styles” but for video

Recommended Setting: n/a

Okay, there’s a lot to explain here. Take a deep breath, and get a glass of wine. If you have no video experience this might seem intimidating. I’ll get you through it.

Just as your camera has “Creative Styles” (Section 6.27) which present several collections of image tweaks, each recallable at a moment’s notice, so too does it have a similar feature designed expressly for video. The Picture Profile setting presents seven instantly-recallable “slots” into which you can store a collection of video tweaks, including several gamma curves (described in the next section), color modes, and very specific changes you can specify to change how the camera handles highlights and shadows.

One of the variables in each Picture Profile slot enables you to choose a pre-set Gamma curve; others allow you to alter the characteristics of the chosen curve. These Gamma curve-altering features are designed for professional cinematographers and videographers who want better control over the dynamic range of their output and the “look” of the finished piece. The camera’s most famous Gamma curve flavor, the S-Log2 curve (Section 6.29.4), *must* be used in conjunction with a post-production process called “grading”, and probably its most important attribute is it can be used to capture more dynamic range of a scene than HDTVs can display.

TIP: *Picture Profiles are really designed for video – you could use them to shoot stills, but there’s really no advantage compared to shooting RAW and post-processing.*



Figure 6-66: In Photoshop, using the curve tool adjusts how the brightness range of the source image is rendered in the final output. In the video world, such curves are referred to as "Gamma curves" and also can change the look of a scene.

Before I can explain what any of the parameters within these collections actually do, there are some basics I need to explain in order to make the technical stuff make sense:

6.29.1 THE GAMMA CURVES

Do you remember Dolby audio? It's been used by the motion picture industry for decades in order to dramatically reduce the "hiss" sound from the sound track. But not many people know how it works.

It's actually pretty simple: when the master print is created, all of the high sounds are accentuated – made louder than they normally would be – and the soundtrack is recorded that way. In the projection booth, the opposite is done – the highs are reduced, making the sound track sound

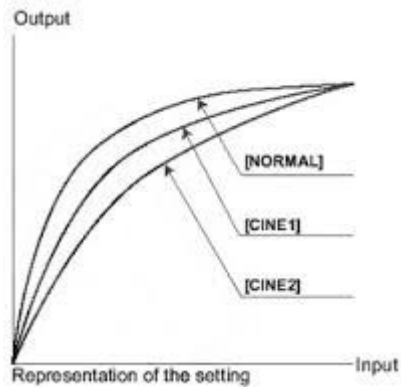


Figure 6-67: The camera offers several pre-configured Gamma curves which alter how the camera handles high-dynamic-range scenes. (This shows just 3 examples.)

“normal” and hiss is actually attenuated in the process as well. Yeah, that’s unintuitive, but it works.

Well, an analogous process happens with gamma curves. You compress the video brightness levels in the camera (“the gamma function”), and then you have to do almost the opposite to the video footage in post-production (a process called “grading”). This is like shooting RAW for its greater dynamic range, and then adjusting the curves in Photoshop later on to place your whites and blacks where you want them (**Figure 6-66**).

The original purpose of gamma curves was to correct for the non-linear response of the early TV’s – whatever the cathode-ray tube couldn’t display efficiently, was bumped up in the camera to even things out. The graph representing what brightness levels were being amplified (or not) was called a “gamma curve”, and the idea of using a curve to change how brightness levels are rendered in the final output persists to this day.

“But the camera provides so many choices for curves! How do you go about choosing the right one that is perfectly matched to the brightness range of your scene?” I hear you ask. (Not unlike the several “Creative Styles” offered by the camera (page 232) – how to choose the best one out in the field?)

The answer to both: You Don’t. Just as high-end photographers don’t mess with picture effects or creative styles (preferring instead to just shoot in RAW and figure everything out later), professional videographers usually just shoot straight and adjust the gamma curves in post-production. Just the idea of tweaking the characteristics of the gamma curve in the camera seems like not a good

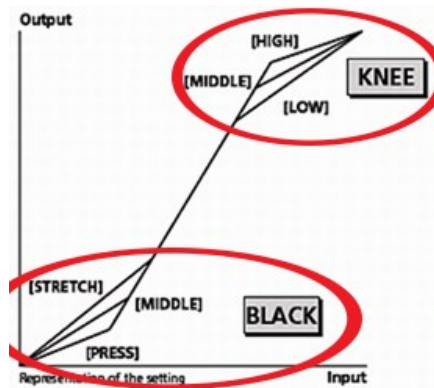


Figure 6-68: A Gamma curve isn’t always in such a recognizable “S” shape, but when it is it’s easy to identify the “Knee” (the region dictating how the highlights are handled) and the “Black” (the region dictating how the shadows are handled).

use of time out in the field.

There is one huge exception to this, though: the S-Log2 gamma curve, which is actually quite useful but requires a lot of technical knowledge to use properly. I'll talk more about that shortly.

6.29.2 GAMMA CURVE NOMENCLATURE

Now that I just finished telling you that very few cinematographers adjust the gamma curve in-camera, I will still explain what each of gamma-curve-tweaking functions do later on, so let me talk a little bit more about the characteristics of a gamma curve so it will make sense later. Check out **Figure 6-68**.

As part of the "Picture Profile" collection of video tweaks (Section 6.29.6), the camera will let you change where the "Knee" begins and its slope, dictating how shadows and highlights are handled. It will also allow you to adjust the level of blacks.

TIP: *xdcam-user.com* has a boatload of good introductions to the technical side of gamma curves from a videographer's point of view. This webpage provides a good start: <http://bit.ly/1Cl1o1z>.

TIP 2: *There's an excellent video on youtube by Alister Chapman giving a very good introduction to some of the different gammas available, and toward the end a good example of where adjusting the knee can prevent background highlights from blowing out:* <http://bit.ly/1ya4k1B>.

TIP 3: *Here's another, using the gammas offered by the Sony FS-700:* <http://bit.ly/1Eblq03> Notice how subtle the differences can be – in one part he has to pixel peep to see any difference in the highlights.

6.29.3 HDTVS HAVE MUCH LESS DYNAMIC RANGE

The second thing you need to understand is that while your camera's sensor can see about 14 stops' worth of dynamic range, your everyday HDTV can see only about six stops. That's it. How that came to be isn't hard to understand – during the market research phase of the standards-making

process many people were asked to judge the best-looking image from a wall full of different screens – not unlike how televisions are displayed at a Big Box electronics retailer today – and of course consumers gravitated toward the screens with the brightest colors and the highest contrast. (High contrast and High Dynamic Range are opposites.) Standards always

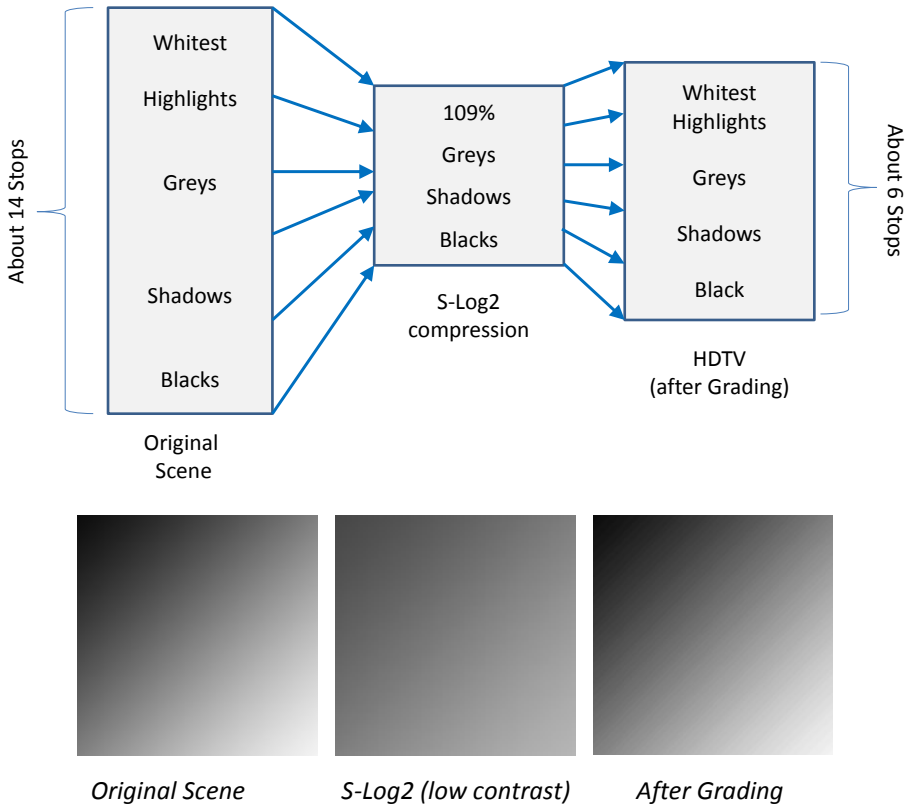


Figure 6-69: S-Log2 compresses the dynamic range of the original scene so much that it looks very low contrast (center). Using a process called "Grading" the compressed scene is then expanded slightly to match the 6-stop range of an HDTV. The bottom rectangles give you an idea of what's going on – the original scene to the left, and the compressed, low-contrast scene in the center. **Look carefully at the right square** and you'll see a slight "banding" effect that can occur if you apply too much grading in post.


involve compromise between what the filmmakers want and what the consumers prefer.

In the past, professional cinematographers would address this intentional limitation of dynamic range by controlling their lighting – if the scene they were shooting had too much dynamic range, they would tell their lighting guys “Give me more fill!”, which would bring the darkest parts of the scene up to a level that the sensor (or film) could capture, so everything fit neatly into six stops.

Documentary videographers have a harder time, since they don’t have that kind of control over the available light. So a new tool they have at their disposal is a special gamma curve called S-Log2.

6.29.4 S-LOG2

Choosing an S-Log2 gamma curve in the Picture Profiles section will “compress” the 14 stops of dynamic range into about six stops’ worth, all in the name of keeping details in your shadows and preventing the sky from blowing out when played back on a consumer HDTV. With all the sensor’s natural range captured, the dynamic range of the scene can be expanded later on to the appropriate degree (according to the director’s vision) in a post-production process called “grading”.

Before I go any further, let me show you how to turn on S-Log2 so you can see just why grading needs to happen. Go to **MENU →  6 → Picture Profile → PP7**. (In the factory configuration, the S-Log2 gamma curve is assigned to Picture Profile 7, although you can assign ANY gamma curve to ANY Picture Profile via customization.)


Notice how flat and lifeless the preview image now looks! (Not unlike how an HDR image looks straight out of the camera.) **Figure 6-69** shows what’s going on.

Brightnesses are being “reassigned” to new levels – blacks are a little less black, whites are a little less white – in order that all the information that’s captured by the camera’s sensor will “fit” into the narrower dynamic range of an HDTV. But you’re looking at this compressed information via a display that can show more, and so it will look a little flat. (Both your camera’s LCD, EVF, and your computer’s monitor all have a wider dynamic range than your consumer HDTV.)

So that’s what S-Log2 does – it remaps brightnesses so they can be recovered and intentionally placed later on in post production. The actual response curve looks like **Figure 6-70**. This diagram is very much like the “curves” tool in photoshop – the bottom axis is your input (the dynamic range of your scene), and the left axis is your output (in this case your narrow-dynamic-range HDTV).

In this diagram, the two most important curves (for the sake of this discussion) are the leftmost one labeled R709, which as you can see can only accurately represent input values from 0-100%, and the bottom-most curve labeled S-Log2, which can represent brightness values between 0 and 1300% (meaning 13x more brightness than what a standard HDTV can show). That’s a lot more information.

TIP: S-Log 2 has a minimum required ISO of 800.

TIP 2: For best results, when shooting with S-Log2 Gamma you should also choose **MENU →  6 → Picture Profile → [Choose a profile] → Right Arrow → Color Mode → S-Gamut** so you can have as much control over your color as you do for your dynamic range. These two features were designed to be used together.

TIP 3: If all of this S-Log2 and Grading stuff has your head spinning, there are some outstanding resources online which explain the process in greater detail from the point of view of a working videographer:

- <http://videoproduction.training> - An outstanding starting point for video production using S-Log2 on the A7s (applies to your camera as well)
- Two other excellent tutorials (seriously, these really are good): <http://bit.ly/1560POH> and <http://bit.ly/1C3hQFH>
- <https://www.youtube.com/watch?v=jRI40GI4I8g> – A very technical, 1-hour long discussion of the tradeoffs of using S-Log2.
- Here’s a cool example of how a professional editor / grader deals with s-log2 files (western scene): <http://blog.abelcine.com/2013/01/18/sonys-s-log2-and-dynamic-range-percentages/>

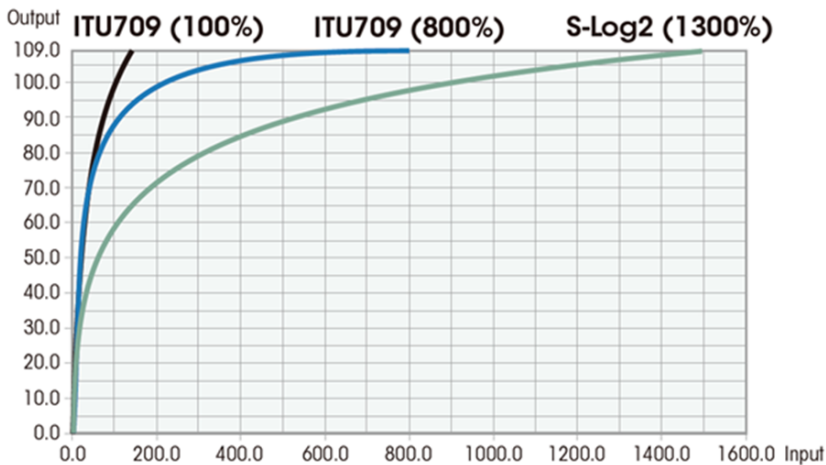


Figure 6-70: Here are three of the Gamma curves your camera can use to map the 14-stop dynamic range of your sensor (bottom axis, the input) to the 6-stop dynamic range of an HDTV (left axis, the output).


6.29.5 GRADING

Grading is done in post production, using such popular NLE (Non-Linear Editing) computer editing packages such as Adobe Premier, Final Cut Pro, Sony Vegas, and many others. There are also dedicated single purpose programs JUST for grading, the most popular being DaVinci Resolve and Adobe Speedgrade.

Although the details and user interface for all of these programs vary (making it impossible to discuss how to do it in this ebook), the process in general involves applying a function called a LUT (Look-Up Table) which can selectively decompress the S-Log2 file in order to place your blacks, whites, midtones, and color so they look the way you want them. Every program requires LUTs in a proprietary format, and if you're unfamiliar with how to do it in post I found a website which shows you how to apply LUTs to deal with S-Log compression with a variety of editors: <http://bit.ly/1ufevgd>.

There is also a collection of LUTs designed for the A7s, but can be used with this camera as well. The collection is generously offered on this page from xdcam-user.com: <http://bit.ly/1x1fb55>. And here’s a youtube video showing how to apply it using Adobe Premier: <http://bit.ly/1wkb4ok>.

6.29.6 THE SEVEN PROFILES

As mentioned earlier, each of the seven pre-defined profiles is a collection of tweaks to variables the camera uses to capture video. To get to them do **MENU** →  **6** → **Picture Profile**, scroll to any profile, and then hit the Right-arrow button in order to change any of its parameters. Each of these settings can be changed; and below I describe what each of the variables does.

***TIP:** With the exception of the S-Log2 gamma feature (described in Section 6.29.4), several cinematographers I spoke with say that hardly anybody ever tweaks these features in-camera. It's easier and un-doable when you make these changes in post production. That makes these Picture Profiles the equivalent of the "Creative Styles" used in stills – nice, but it's better to do it later at your computer.*

- **Black Level** – operates on just the blacks, equivalent to moving the lower-left-hand corner of the curve to the right.
- **Gamma** – See Section 6.29.1.
- **Black Gamma** – Adjusts the gain of the lower (darker) parts of the gamma curve. Makes the picture look more/less contrasty. A negative value makes the darker parts of the image darker, but note that too much negative black gamma can lead to “crushed” or clipped blacks.
- **Knee** – changes the inflection point of the bend in the chosen gamma curve. This can help you prevent blown-out highlights in certain situations.
- **Mode** – Here you can custom tweak your curve (specifically the knee point and slope) by choosing MANUAL, or you can have the camera do it automatically for you.
- **Auto Set** – When Auto is set in Mode (above),

- Max Point: Sets the maximum point of the knee point. (90% to 100%)
- Sensitivity: Sets the sensitivity. (High / Mid / Low)
- Manual Set: Settings when [Manual] is selected.
- Point: Sets the knee point. (75% to 105%)
- Slope: Sets the knee slope. (-5 (gentle) to +5 (steep))
- **Color mode** – See actual examples in **Figure 6-71**.
 - Movie: Suitable colors when [Gamma] is set to [Movie].
 - Still: Suitable colors when [Gamma] is set to [Still].
 - Cinema: Suitable colors when [Gamma] is set to [Cine1].
 - Pro: Similar color tones to the standard image quality of Sony professional cameras (when combined with ITU-709 gamma)
 - ITU709 Matrix: Colors corresponding to ITU-709 HDTV standard (when combined with ITU-709 gamma)
 - Black & White: Sets the saturation to zero for shooting in black and white.
 - S-Gamut: Setting based on the assumption that the pictures will be processed after shooting. Designed for use when [Gamma] is set to [S-Log2].
- **Saturation** – As with stills, increases or decreases the intensity of the colors. Set from -32 to +32
- **Color Phase** – This is the equivalent of the "Tint" knob on older color TVs – changing the color of your scene from magenta to an ugly yellow-green.
- **Color Depth** - Sets the color depth for each color phase (aka color channel). Color intensity goes from strongest (positive numbers) to a lighter shade (negative numbers). This function is even effective even if you set [Color Mode] to [Black & White].
 - [R] -7 (light red) to +7 (deep red)
 - [G] -7 (light green) to +7 (deep green)
 - [B] -7 (light blue) to +7 (deep blue)
 - [C] -7 (light cyan) to +7 (deep cyan)
 - [M] -7 (light magenta) to +7 (deep magenta)
 - [Y] -7 (light yellow) to +7 (deep yellow)
- **Detail** - Works like the "Unsharp Mask" function in Photoshop – adds halos around high contrast areas to make the scene appear sharper. The

definitions below come from one of Sony’s professional-level support websites:

- Level: (-7 to +7) – adjusts the intensity of the sharpening methods available in the Adjust option below.
- Adjust: The following parameters can be selected manually:
 - Mode: Selects auto/manual setting. (Auto (automatic optimization) / Manual (The details below are set manually.))
 - V/H Balance: Sets the vertical (V) and horizontal (H) balance of DETAIL. (-2 (off to the vertical (V) side) to +2 (off to the horizontal (H) side))
 - B/W Balance: Selects the balance of the lower DETAIL (B) and the upper DETAIL (W). (Type1 (off to the lower DETAIL (B) side) to Type5 (off to the upper DETAIL (W) side))
 - Limit: Sets the limit level of [Detail]. (0 (Low limit level: likely to be limited) to 7 (High limit level: unlikely to be limited))
 - Crispning: Works in conjunction with the Detail: Level setting, setting a threshold below which no sharpening will occur. Range from 0 to 7; with 7 being no threshold and everything gets sharpened.
 - Hi-Light Detail: Sets the [Detail] level in the high intensity areas. (0 to 4)
- Copy - Copies the settings of the picture profile to another picture profile number. MENU → (Camera Settings) → [Picture Profile] → [Copy]
- **Reset** - Resets the picture profile to the default setting. You cannot reset all picture profile settings at once. MENU → (Camera Settings) → [Picture Profile] → [Reset]

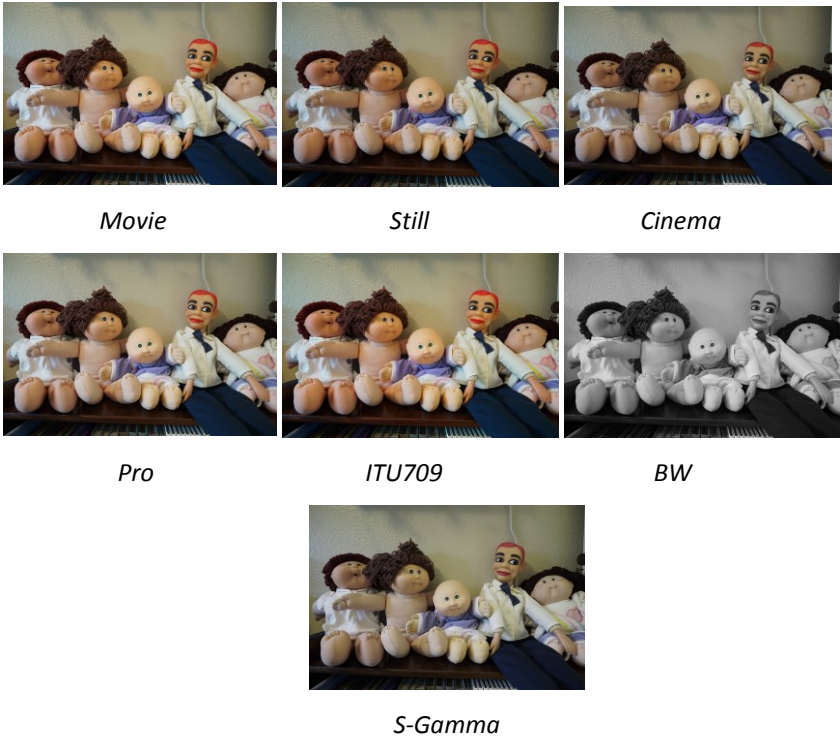


Figure 6-71: The different color modes available in Picture Profiles. With the exception of the last two, the differences are very subtle. S-Gamma is designed to be used (and graded) along with S-Log2. (10 points for those of you who are able to identify the doll 2nd from the right. 😊)

CINE Gamma Curves



CINE1: This smoothes the contrast in darker areas and accentuates gradation changes in brighter areas, for a calm and quiet effect.

CINE2: This gives almost the same results as CINE1. Select this when you wish to obtain 100% video signals for editing or other purposes.

CINE3: This emphasizes the contrast between light and dark more than CINE1 and CINE2, and also accentuates gradation changes on the black side.

CINE4: This emphasizes the contrast in dark areas more than CINE3. Contrast in dark areas is weaker and contrast in bright areas is stronger than STD curves.

Figure 6-72: In the Picture Profiles menu, one of the variables you can change is the Gamma curve. There are many similar-looking curves to choose from – CINE1-4 are displayed here, but there are others. Of all the choices, only the S-Log2 is worthwhile. The rest are very similar and you can achieve the same effect later on in post production.

6.29.7 GAMMA OPTIONS

So in the Picture Profiles, if you still wanted to modify the Gamma setting, the camera will provide for you the following options:

- **Movie:** Standard gamma curve for movies
- **Still:** Standard gamma curve for still images
- **Cine1:** Softens the contrast in dark parts and emphasizes gradation in bright parts to produce a relaxed color movie. (equivalent to HG4609G33)
- **Cine2:** Similar to [Cine1] but optimized for editing with up to 100% video signal. (equivalent to HG4600G30)
- **Cine3:** Intensifies the contrast in light and shade more than [Cine1] and [Cine2] and strengthens gradation in black.
- **Cine4:** Strengthens the contrast in dark parts more than [Cine3]. The contrast in dark parts is lower and the contrast in bright parts is higher than for [Movie].
- **ITU709:** Gamma curve that corresponds to ITU-709 HDTV standard.

- **ITU709(800%):** This is an older standard designed for expanding dynamic range. It is not as good as S-Log2.
- **S-Log2:** Gamma curve for [S-Log2]. This setting is based on the assumption that the picture will be processed after shooting.

You can see just how similar some of these options are when viewing the curves in graph form (**Figure 6-72**).

There is also an outstanding 5-minute youtube video by Alister Chapman which compares some of the curves available on a Sony EX video camera at <http://bit.ly/1ya4k1B>. Here he shows the differences between Cinegamma 1-4, and also talks about how he changes the knee to help keep

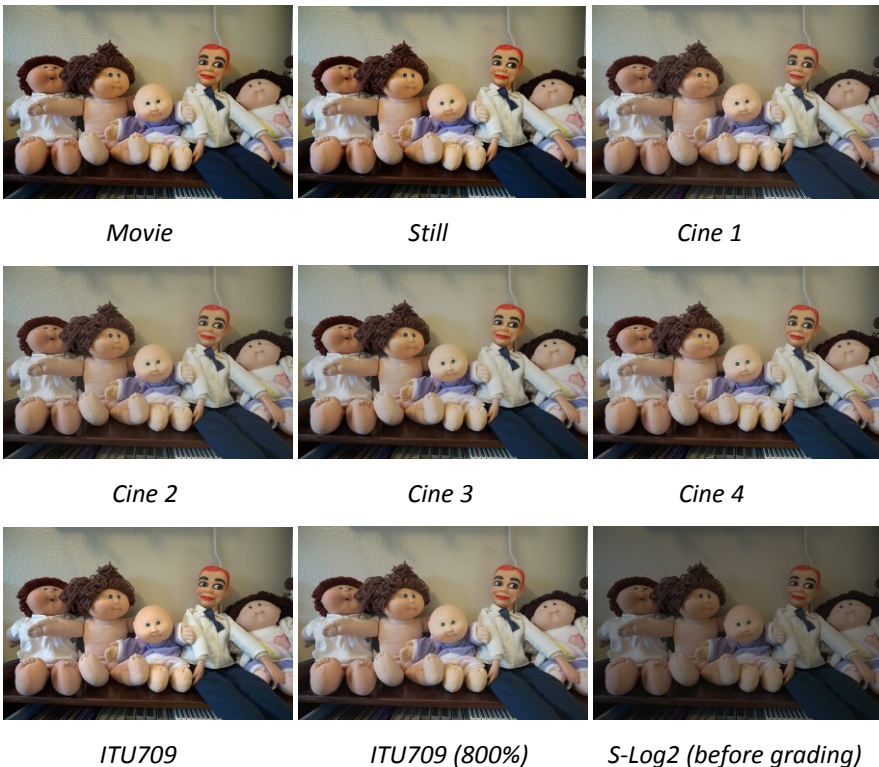


Figure 6-73: A visual comparison of the different gamma curves available.


his highlights from blowing out.

Since I wasn’t able to come up with actual curves for all of these options, the next best thing is to take pictures in each of the modes and show you just how similar they are to each other (**Figure 6-73**).

TIP: Okay, that was a lot to absorb, but it was also an overview. If you want to learn more about the use of S-Log2 and grading, I highly recommend this page from xdcam-user.com: <http://www.xdcam-user.com/2014/08/exposing-and-using-slog2-on-the-sony-a7s-part-one-gamma-and-exposure>

6.30 ZOOM

Menu Position MENU →  6 → Zoom

What it Does Enables a Digital Zoom whose abilities are controlled by image size and the setting of MENU →  3 → Zoom Setting

Recommended Setting n/a

Constraints None except...

This feature allows you to zoom in up to 8x more than what your lens is naturally capable of. Just how much you’re allowed depends on the settings of Image Size (Section 6.1) and Zoom Setting (Section 7.15).

I go into much more detail about the different permutations in the Zoom Settings section description, but let me quickly summarize the three different ways that the camera will do a digital zoom (each method represents one of the three boxes in the zoom scale in **Figure 6-74**):

1. **Natural Zoom** (my terminology): If your **MENU** → **1** → **Image Size** is set to Medium or Small, then the camera zooms in by throwing pixels away from the perimeter of the frame. There's no deterioration of quality since you've already asked the camera to produce a smaller image. You can zoom up to 2x via this method.
2. **Clear Image Zoom**: The camera zooms in by throwing pixels away from the perimeter of the frame, but then it upsamples it to a full-size (Image Quality = Large) image using something a little better than Photoshop's bicubic resampling upsizing algorithm. You can zoom in up to an additional 2x using this method.
3. **Digital Zoom**: The camera zooms in by throwing pixels away from the perimeter of the frame, then upsizing it using a less impressive algorithm than Clear Image Zoom. You can zoom in an additional 2x via this method.



Figure 6-74: The Zoom magnification scale is divided into as many as three quadrants corresponding to the three different digital zoom methods described in the text.

As you use this function to zoom in via the right arrow key, you'll see the total amount of magnification the camera is allowing you (which, again, is determined by the **Zoom Setting** and the **Image Size** settings).

Below is a table which summarizes the different zooms available via different settings:

Image Size	"S" natural zoom	Clear image Zoom	w/ Digital Zoom	Movie Mode
L	--	2x	4x	4x
M	1.5x	2.9x	6.1x	4x
S	2x	3.9x	8x	4x


TIP: While I never use the zoom function myself (I prefer to do any cropping or upsampling in post-processing), you may find this feature particularly useful when shooting movies. Especially in the back of an auditorium with a lens of insufficient reach. The video function has to throw away pixels anyway to get the image down to the size of an HD frame anyway, and so this will just change which pixels get thrown away. The most digital zoom you can get with movies is 4x.

6.31 FOCUS MAGNIFIER

Menu Position MENU →  6 → Focus Magnifier

What it Does Magnifies a small area of the image to allow you to focus critically

Recommended Setting [Frankly, I think the MF assist function is a better option]

TIP: Talk about feature redundancy! This function is nearly IDENTICAL to the MENU →  1 → MF Assist function described in Section 7.2. The only difference is “Focus Magnifier” needs to be invoked first, and you have to tell it where you want to zoom in to first. Why is this feature included, then? Because this function works in Movie mode, and MF Assist does not. Focus Magnifier is also the feature of choice to use with legacy glass, since the camera has no idea when you’re turning the focusing ring (and hence doesn’t know when to turn this feature on).

Normally, when you’re in Manual Focus or DMF mode, the A7r II automatically magnifies the Live View image whenever you turn the focusing ring so you can focus critically. (This, combined with the Peaking Level function make this camera a joy for manual focusing.)

But if you’re using a non-native E-mount lens, the camera has no idea when you’re focusing manually, and hence the need for this feature which should

ideally be assigned to a button first for quick access. (I've assigned it to the DOWN arrow button.) When invoked (either from the menu or by assigning it to a button), it first asks you to specify where in the image you want to focus critically, and *then* it zooms in to allow you to focus.

Here's how to use it:

1. First make sure you're NOT in either AF-S or AF-C mode (the menu item is greyed out otherwise).
2. Invoke the feature either from the menu or pressing a previously-assigned button
3. A small orange rectangle appears in the middle of the screen. Here the camera is asking you "What part of your composition do you want me to magnify?" Use the arrow buttons to move the rectangle around to the subject of interest and hit the center of the controller wheel to confirm.
4. The camera then magnifies just that portion of the image so you can see when your subject is in critical focus when you turn your lens' manual focusing ring.
5. Want even greater magnification? Hit the center button, and the magnification goes from 8.6x to 17.1x.
6. Take your picture and exit the mode. Or, exit the Focus Magnifier mode by pressing the shutter release button halfway, or just wait five seconds for it to time out.

TIP #1: *If you also have Peaking Level enabled, you might need to set it to "High" since this feature doesn't always see contrast when set to high magnification.*

TIP #2: *The Focus Magnifier function works in movie mode too! But it only magnifies 4x regardless of the File Format setting, whereas it will magnify about 17x (for purposes of critical focusing) when taking stills.*

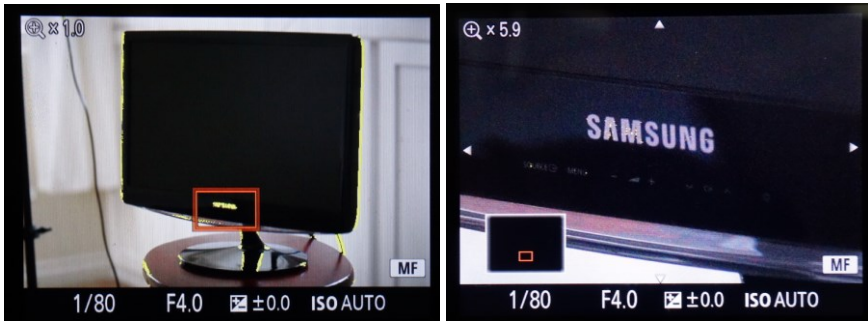


Figure 6-75: With the Focus Magnifier, you tell it where you want to zoom in, and then that area of the composition is magnified for critical focusing

6.32 LONG EXPOSURE NR

Menu Position MENU → 6 → Long Exposure NR

What it Does Tells the camera to do a “Dark Frame Subtraction” on exposures taking longer than 1 second

Recommended Setting: On (unless you just can’t wait to shoot the next frame)

This setting applies to Long Exposures, defined as those lasting more than one second. In such situations, digital image sensors tend to produce a lot of noise even though your ISO may be set to its lowest value. All digital cameras from all manufacturers address the problem in pretty much the same way: They employ -- in-camera -- a technique called “Dark Frame Subtraction”.


When Long exp. NR is set to “On” (which is recommended), the camera will take TWO pictures every time a shutter speed of 1 second or longer is used. The first picture is of your subject – as you would expect. The second picture is taken with the shutter closed, for the same duration,

removing all light from the sensor, resulting in a black picture which contains only the natural noise from the sensor at the same temperature, ISO setting, and duration as the first picture. With this second “dark frame” picture, the camera has a clear idea of the kind of noise that is permeating the first picture. And then it can remove (to a certain degree) this characteristic noise from the image you just took. This technique is very worthwhile, BUT you are forced to wait twice as long until you can take your next picture. This means if you had set the camera on a tripod at night and took an exposure of a meadow on a moonlit night, the camera would be unresponsive for twice as long as your set exposure as it captures the sensor’s noise for subtraction.

People shooting fireworks get frustrated by this feature, since to them this feature makes their camera “lock up” and they can’t do anything until it’s done – meanwhile, the best fireworks bursts seem to be happening. (*That will increase your stress!*) (And the Fireworks Scene mode the camera offers is no better – in fact, you can’t disable Long Exposure Noise Reduction in that mode!) If this describes you, just turn this feature off. Advanced users will take just one dark frame manually, and then do some post-processing on their computer later on to achieve the same noise-reduction effect. (I do show how to do noise reduction using Lightroom and Capture One Express (free for you!) later. The whole shebang is described in Section 15.8.)

Note that the Noise Reduction function will not work when the camera is set to Continuous Advance or any sort of bracketing mode (including sweep panorama).

6.33 HI ISO NR

Menu Position MENU →  6 → High ISO NR

What it Does Allows you to specify the amount of in-camera noise reduction when shooting .jpg’s at ISO 1600 or higher

Recommended Setting Normal

Noise is a fact of life, and the higher the pixel density, the more you will get. That’s just the laws of physics for this kind of sensor technology. Most cameras try to minimize it in their .jpgs algorithmically, by smoothing over the noise artifacts, reducing noise at the expense of detail. That’s the tradeoff. And even though the amount of noise this sensor produces is lower than what I was expecting, if you’re looking for the best method of noise reduction, this High ISO NR feature is not it.

With this setting the camera is offering to reduce the noise of .jpgs (not RAW) at ISO settings of 1600 and above. (It’s not selectable if you’re shooting just RAW.) You can see the effects of the High ISO Noise Reduction settings on an ISO 6400 test image in **Figure 6-76**. These settings can actually be quite effective when you’re making 4x6 prints from .jpgs, as they do tend to make the picture look noticeably cleaner at that size when printed. Anything larger than that, and/or if you’re the kind of person who likes to pixel peep (and shame on you if you do 😊), then none of these settings will particularly please you.

Those who really want the best quality images at high ISO should shoot RAW (where no noise reduction is applied) and post-process using noise-reduction software such as Noise Ninja or NeatImage (those are stand-alone packages) or use the native noise reduction features in workflow software (such as Lightroom, CaptureOne, Bibble, DxO, or Adobe Camera RAW). **Figure 6-77** shows the same test image shot in RAW and cleaned up using the Noise Reduction feature in Lightroom.



Original Image – ISO 6400



Close-up – High ISO NR = Low



High ISO NR = Normal



High ISO NR = High

Figure 6-76: The effects of High ISO Noise Reduction on an ISO 6400 image. Normally the higher the noise reduction level, the “splotchier” the image appears to be. However, in these examples I am impressed at just how low the noise level is to begin with, even at ISO 6400! These sample images were taken with the original A7.

I discuss my techniques for reducing noise in high-ISO RAW files in Section 15.8.



RAW before Noise Reduction



RAW after Noise Reduction

Figure 6-77: The same picture shot in RAW and post-processed in Lightroom. If pixel-peeping is your hobby, then shooting RAW is the way to go! 😊

6.34 CENTER LOCK-ON AF

Menu Position MENU → 📷 7 → Center Lock-On AF

What it Does Tracks brightly-colored objects that move slowly across the screen

Recommended Setting n/a

This feature was described earlier in Section 3.6

6.35 SMILE / FACE DETECTION

Menu Position MENU →  7 → Smile / Face Detection

What it Does Enables / disables the ability to detect faces when autofocus, resulting in the camera being able to find your subject a greater percentage of the time. Also controls the “Smile Shutter” function.

Recommended Setting Face Detection On

Historically, autofocus cameras have been unable to reliably find the subject in the composition. With Face Detection mode enabled, the camera no longer needs to guess – it automatically knows that if it recognizes a face (or several faces), then THAT is what it should focus on. If you’re taking pictures of people (especially toddlers), there is no better tool for getting accurate AF, exposure, and white balance than Face Detection mode.

The choices for this feature are “Off”, “Face Detection On” (where it will focus on any face – recommended setting), “Face Detection On (Registered Faces)” where it gives priority to faces it knows about, and “Smile Shutter”, where the camera will trigger the shutter release when it sees a smiling face. (More detail on all of these choices below.)

So when you use Face Detection and the camera is autofocus, you’ll see many different squares that are superimposed onto your subject, of various sizes and colors. What does it all mean? Here’s a quick translation table:

What You See	What It Means
A set of green brackets	No face was detected, and so a focus point was selected using other criteria.
Grey Square / White Square	A face was detected
Multiple White and Grey Squares	The camera has detected more than one face (outlined in more than one grey square). But the camera has to then decide which of those faces to focus on, and it indicates its decision via a white

	square.
Green Square	The White square turns green when you press the shutter release button halfway. That’s what the camera is focusing on.

6.35.1 ON (REGISTERED FACES)

Let’s say you have two children and one is your favorite. (Okay, scratch that. Let’s say your child is at school and you’re taking shots of him among his classmates and you really want the camera to pick him out of a crowd.) Being able to register a face within the camera so it can get autofocus priority amongst many faces is the feature for you (**Figure 6-78**).

In order to register a face, you have to go to **Menu → ⚙ 6 → Face Registration → New Registration** and follow the directions given in the Face Registration section (Section 7.28).

Once registered, the recognized face will show up as a green square before you press the shutter release button halfway.

Does it work? If the entire face fills a goodly portion of the scene, and the lighting is good, and the face is not partially obstructed (like with sunglasses, hats, etc.) then this feature actually does a good job.



Figure 6-78: The camera will give priority to faces that you’ve registered.

6.35.2 SMILE SHUTTER

Here's another variation on the same theme. If you can detect that a face is in the picture, you can also look a little closer and tell if that face is smiling. And you can tell the camera "Yo! Don't wait for me to push the button. Take the picture as soon as you detect someone is smiling!". And so, with autofocus enabled, if you invoke **Menu → 📷 7 → Smile / Face Detection → Smile Shutter ON**, the camera will constantly analyze the scene and it will not rest until it finds a smiling face and takes the picture. You can even adjust its sensitivity by using the Left and Right arrows to choose between Big, Normal, or Slight Smile. This feature can really come in handy when you're taking self-portraits.

It's actually kind of a fun feature to play with. When you enable Smile Shutter, you see a vertical scale on the left, indicating the strength of the smiles it detects. And you don't have to press the shutter release button halfway. Just point the camera in a general direction of a face. When the camera sees a face, the vertical scale on the left springs to life, and the camera starts to focus on any faces it finds. When the "smile strength" is higher than the currently-set threshold, (that white triangle to the right of the vertical scale), the camera takes the picture. It will continue doing so until you disable the feature by turning the camera OFF (when you turn it on again the function defaults to Face Detection ON – Registered Faces). Try enabling this feature and shooting some family photos you have hanging on the wall. It will give you a very good feel for what works and what doesn't for this feature.

Smile Detection is hard to do algorithmically (although not as hard as recognizing a registered face), and so in order for it to work properly you have to help the camera out a little. The face has to appear rather large in the picture (it won't work with a face that's a mile away, for example). The face can't be obscured – that is, no sunglasses, no hats, or anything else that would give the image recognition algorithm a hard time. And even if the camera detects that there is more than one face in the picture, it doesn't wait for both faces to smile – only one face will trigger it. (That's why I said this feature was great for self-portraits but not necessarily for group pictures.)



Figure 6-79: *The smile shutter is an interesting feature but is easily fooled. (It triggered all of these pictures!)*

Some additional details about this feature you ought to know:

- Smile Shutter is also a real energy hog – the camera is constantly on a high state of alert, analyzing the live view stream and staying on regardless of what you have Power Save set to.
- Invoking Smile shutter automatically activates wide area AF and single-shot.
- It’s not selectable if you’re in Manual Focus mode.

TIP: *I haven’t tried this myself, but reader Tim Boyle suggests using Smile Detection at a party – just put your camera on a tripod, set your lens to “Wide”, ensure that the battery is fully charged, and let the camera shoot whatever smiling faces it sees!*

6.36 SOFT SKIN EFFECT

Menu Position MENU →  7 → Soft Skin Effect

What it Does Removes wrinkles and blemishes under certain circumstances.

Recommended Setting: It depends on the age of your subject. 😊

This feature is designed to give your subject smoother skin when in fact they have “wrinkles and blemishes”. It’s hard to see its effects unless you happen to have a blemish-ridden subject, but it does to a pretty good job of getting rid of zits without requiring Photoshop.

When enabling the function, you can use the Left and Right cursor keys to choose between Lo, Mid, and Hi intensity.

I had a hard time finding a subject on which this feature made a difference. According to Sony’s press release, the effect “removes or reduces blemishes and smooths skin texture. It also maintains sharpness in higher contrast areas, like eyes and mouth.” **Figure 6-80** shows an example (you may have to zoom in a little to see the differences, but they are there!)

TIP: Like many of the processing-intensive features of this camera, the Soft Skin mode can’t be used when in any kind of continuous shooting mode or bracketing mode, movie mode, panorama mode, etc. Only modes which take one picture at a time. (It doesn’t work in RAW mode, either.)



Figure 6-80: *The effects of the soft-skin feature can't really be seen unless you have access to a blemish-ridden teenager. But it does do a good job of smoothing the skin for the rest of us, too.*

6.37 AUTO OBJECT FRAMING

Menu Position MENU → 📷 7 → Auto Object Framing

What it Does Gives the camera permission to analyze the picture you just shot and then save a 2nd version – one where the image is cropped so the subject is placed according to the Rule of Thirds.

Recommended Setting: On if you want to have a laugh. (Then turn it OFF and keep it there. 😊)

This function might be helpful to you if you're the kind of person who likes everything done for them. (Litmus test: If you have a butler, then this feature might be for you.)

This feature actually determines the subject for you and then crops your image so the subject appears according to the “Rule of Thirds” (Section A.10). In experimenting with this, I was often surprised by the “framing”

the camera chose, cropping in close on faces, or changing the format from landscape to portrait (or the other way round).


You probably guessed by now that I don't care much for this feature. I'm not much for throwing pixels away in the camera when I can crop it later in my computer. Besides, I expect that if you can remember how to turn on this feature in your camera's menu, then you can probably remember the "rule of thirds" composition rule that Auto Object Framing applies, and frame your picture to your own liking. ☺

It's worth noting that you can only use Auto Object Framing if the Drive Mode is set to "Single Shooting" AND the Autofocus Area is set to "Wide". When this feature is invoked, "Continuous Shooting" to capture multiple frames is greyed out on the function menu. This feature is also available in Panorama recording and can be used with Picture Effect features.



Figure 6-81: Auto Object Framing. If it recognizes a face, the image will be cropped so the face appears according to the rule of thirds. The feature has been expanded to behave the same way for ANY object.

6.38 AUTO MODE

Menu Position MENU →  7 → Auto Mode


What they Do Lets you specify whether the camera goes to "Intelligent Auto" or "Superior Auto" when the exposure mode dial is set to **AUTO**.

Recommended Setting I prefer Intelligent Auto, personally.

There are actually two different auto modes available to you when you move the Exposure Mode dial to "Auto": Intelligent Auto, and Superior Auto. I went into the differences in Sections 3.1.1 and 3.1.2. This feature lets you select which auto mode gets invoked.

The only time I really use Auto is when I give the camera to a stranger to take a poorly composed and shaky picture of me and my wife. For this purpose I prefer "Intelligent Auto" because there are fewer surprises for the inexperienced shooter (like multiple frames taken for every press of the shutter release button). Another use is when something happens and I need to shoot NOW and don't have time to undo all the complex settings I had done.

6.39 SCENE SELECTION

Menu Position MENU →  7 → Scene Selection (Only selectable when the exposure dial is set to “SCN”)

What they Do Lets you choose between 13 specialized point-and-shoot modes

Recommended Setting It depends on what you’re shooting, of course. Sports Program mode can also a good mode for shooting kids.

These are designed to quickly implement a combination of the camera’s settings ideal for each of the identified shooting scenarios. And, like the Auto modes, they reset the camera to a certain combination of settings.

When you move the Exposure Mode dial to “SCN” you can then rotate the front control dial to choose from one of 13 “Scene Selection” modes. (OR invoke this menu function and use the arrow keys to make the selection.)

Since these modes were designed with the point-and-shoot crowd in mind, many useful parameters (like exposure compensation, autofocus area, white balance, metering mode, and other features) *cannot be tweaked*. So, use them for what they were designed for, but you’ll have to go back to P, A, S, or M mode in order to regain full control of your camera.

Let’s go over what each scene mode does, shall we?

6.39.1 PORTRAIT

Like the all the other Scene modes, Portrait mode (**Figure 6-82**) can take advantage of knowing the kind of picture you’re trying to take and help you along. Portrait mode does three things:

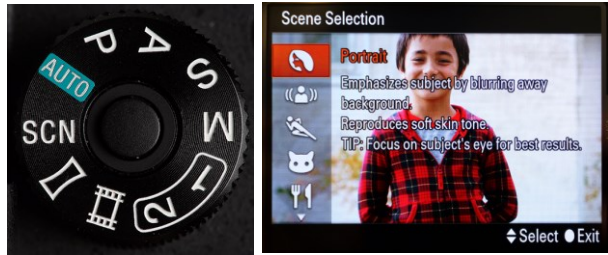


Figure 6-82: Portrait Mode

1. It emphasizes shallow depth-of-field (large f/stops, like f/2.8), which is often a component to a pleasing portrait.
2. It assumes the largest portion of your image is your subject’s face, and concentrates its exposure calculation on that. (Face Detection does the same thing now.)
3. It adds a little warmth to the color which usually makes for the most



Figure 6-83: Portrait Mode Examples

pleasing portraits.

To get the most out of this mode and end up with a classical-looking portrait, it is best to zoom in all the way AND make sure that you have “good light”, such as that provided by a large, North-facing window. (Or a South-Facing window if you’re in the Southern hemisphere.) Figure 6-83 has some examples of good existing-light portraits taken in this way.

TIP: For fun, try combining Portrait Mode with Soft Skin Effect (Section 6.36).

6.39.2 SPORTS ACTION

Sports Action Mode will choose the fastest shutter speed possible for the given amount of light. Not only is it ideal for sports, but it also excels at shooting kids and pets (two more groups that don’t sit still for *anything*). Sports Action mode will invoke the following camera features:

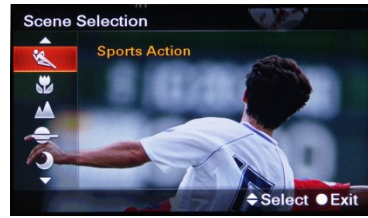


Figure 6-84: Sports Action Mode

- Auto ISO (maximum of 6400)
- Wide AF
- Continuous AF mode (AF-C)
- Continuous Drive mode
- And it will strive for the fastest possible shutter speed for the amount of light.

If you’re after less blur than what Sports mode produces, I highly recommend using the following settings (which you may wish to commit to a memory location (Section 6.50):

- Set your camera to “A”perture Priority mode
- Set the f/stop all the way open (lowest number)
- Set ISO to something reasonable depending on your light. Your target goal is for a shutter speed between 1/500th and 1/1000th of a second.

- Set focusing mode to AF-C.
- Set focusing area to Wide.
- Set drive mode to “Continuous”.

6.39.3 *MACRO*

Macro mode (**Figure 6-85.**) is almost identical to Portrait mode, in that it tends to favor shallow depth-of-field. “Macro” is photographer-ese for “taking pictures of things up close” like insects and flowers. It is best used with a special-purpose Macro lens, such as the outstanding FE 90 mm F2.8 Macro G OSS lens.

Macro mode sets the camera to AF-S (single shot) mode.



Figure 6-85: “Macro” means “taking pictures of things up close”. A special Macro lens will produce the best results, and Macro Mode will set the camera’s parameters to help get a striking shot.

6.39.4 *LANDSCAPE*

Although the instruction manual is kind of vague when describing what Landscape mode does, my own tests reveal that it increases the contrast a little bit and also increases the intensity of the colors mildly – not as vivid as the “Vivid” creative style (described in Section 6.27), but it’s there. (See example in **Figure 6-86**). The effects are subtle when shrunk down in this example. In fact, you might prefer the “out-of-the-box” look if all images were shot using Landscape mode.

One would think that landscape mode would emphasize small f/stops to get everything in focus, but in my tests it behaved rather similarly to Program mode in bright light.



Figure 6-86: An urban scenic taken in Program mode (left) and in Landscape mode (right). Landscape mode increases the contrast and the color saturation, and just might be your preferred shooting mode for all of your photos.

6.39.5 SUNSET

Now, here's a feature that never could appear on a film camera. Sunset Mode (**Figure 6-87**) is designed to make your sunsets look a little more spectacular. When in Sunset mode, the reds and yellows of the image – the very colors that are responsible for the beauty of a sunset – are enhanced a little to make the image just that much more pleasing. A foolproof sunset!!

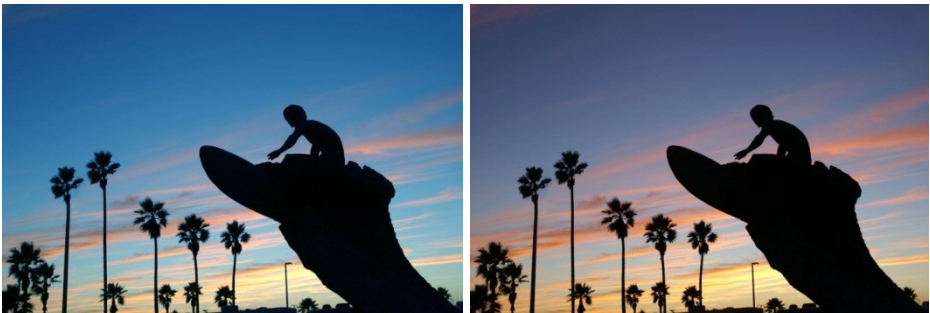


Figure 6-87: Sunset Mode Examples, without (left) and with (right). Sunset Mode enhances the yellows and reds in an image. (I still can't decide which one I like better.)

6.39.6 NIGHT SCENE

Seriously, I have no idea what this feature does. It’s supposed to “shoot night scenes clearly”; however test shots I took at night compared to Auto and P mode with no flash yield visually indistinguishable results.

6.39.7 HANDHELD TWILIGHT

An impressive feature is the Handheld Twilight Mode (which is extremely similar to the Multi-Frame Noise Reduction (MFNR) and Anti-Motion Blur features described previously. Both use a similar technique to HDR, in that the camera takes multiple sequential images at high ISOs and then merges them in the camera. Even a shaky hand can now take high-quality nighttime shots without a problem!



Figure 6-88: Handheld twilight allows you to take a sharper low-light picture without needing a tripod. It takes 4 consecutive exposures, aligns them, and then merges them in-camera, providing you with a lower-noise image than you could otherwise attain. The left image was taken in program mode, the right using HHT.

6.39.8 NIGHT PORTRAIT

Night Portrait mode (**Figure 6-89**) is the same thing as using the flash in Manual mode with a long shutter speed. Also known as “Slow Sync” in the rest of the photographic world, Night Portrait Mode uses the flash to illuminate your subject properly, but then leaves the shutter open a little longer so the sensor can “absorb” the light from the background. The result is a nicely balanced picture, with both foreground and background equally represented. **Figure 6-90** shows an example of a normal flash picture in “P” mode, and a flash picture using Night Portrait Mode which brings out the background lights.

One caveat of this mode is that you must instruct your subjects to remain still even after the flash has gone off – because the shutter will remain open for several seconds after the flash has fired, and moving subjects can cause an eerie and undesirable ghost effect.



Figure 6-89: Night Portrait Mode



Figure 6-90: Night Portrait Mode Example. The left image was taken in “P” (Program) mode with flash. The right was taken in Night Portrait / Night View mode with flash, which enables you to “burn in” the background, providing a picture a little closer to the way you remember it being.

6.39.9 ANTI-MOTION BLUR

AMB is designed to make things look less blurry in borderline situations. It works almost identically to Multi-Frame Noise Reduction (MFNR, Section 6.22.2), in that it, too, takes four sequential images and attempts to merge them in-camera. But AMB applies a little more intelligence to the merging, analyzing each individual shot, looking for the sharpest parts of each. If an object is sharp in one of the frames but blurry in others, only the sharp part will be included in the merged image. This results in a sharp picture with relatively low noise in most of the shot. (Figure 6-91.)



Figure 6-91: A moving subject in extremely low light as captured in Program Mode (Left) and AMB mode (right). AMB takes 4 shots at any given ISO in rapid succession, and merges areas that don’t move (reducing noise in those areas), but not including areas of images that contain blur. If you look very closely, you can see higher ISO noise around the pendulum, but not around the areas that didn’t move. This is an impressive algorithm.

The only real differences between MFNR and AMB are 1) you can use the MFNR feature at ANY ISO, resulting in even less noise at any given setting, and 2) you have full control over the camera’s features, such as exposure compensation, ISO, White Balance, spot metering, etc.

Figure 6-92, which was taken in *extremely* low light (although it doesn’t look it), provides a little more insight as to what is going on inside the camera when it handles subjects that move. Both of the sky buckets were moving during the 4 shots, and if all 4 shots had been averaged together you would have seen one big blur. The camera, while processing the shots, noticed the movement, and said “I can’t merge these – it’ll be a blur!”. And so it picked one frame where they were sharp, and just didn’t merge

that part of the image from the other frames. You can see evidence of this if you look really closely at the parts that are moving – the noise level in and immediately around the skybuckets is more intense than the other, non-moving areas immediately around them.

TIP: If you're shooting either RAW or RAW+Jpg, and switch to either Anti-Motion Blur or Handheld Twilight, the camera automatically switches you to .jpg only, of quality "Fine".




Figure 6-92: Things that move during the AMB exposures will be noisier than the things that don't move. If you look carefully, the noise in the sky immediately surrounding both of these sky buckets is higher than the rest of the sky.

6.40 MOVIE

Menu Position MENU →  8 → Movie

What it Does Allows you to configure Shutter priority, Aperture Priority, Manual Exposure, as well as Program mode movies.


Recommended Setting “It depends”

Constraints Only available when the exposure mode dial is set to .

Hate the fact that pressing the red button in all other modes doesn’t give you any control over f/stop or shutter speed while making movies? Then this is definitely for you.

Basically, all you have to do is move the Exposure Mode dial to “Movie” and then this function will allow you to have full manual control over everything. You can choose whether you want Aperture Priority, Shutter Priority, or Manual video mode by moving the exposure mode dial to the Movie setting and selecting from one of 4 choices. These modes are the equivalent to their still-shooting counterpart modes; for example you can specify f/stop (Movie-A), shutter speed (Movie-S), or both (Movie-M).

When in movie mode:

- If you’re going to be focusing manually, the use of Peaking Level during movie making can be tremendously helpful! (MENU →  2 → **Peaking Level** and **Peaking Color**, described in Section 7.9.)
- In Movie shutter priority mode, you can select a shutter speed as slow as $\frac{1}{4}$ of a second. ($\frac{1}{4}$ of a second makes for pretty blurry movies when things move; but if you’re shooting in extremely low light it may be the only option you have.)
- The fastest shutter speed? $\frac{1}{8,000}$ th of a second!!!
- In Movie Aperture Priority mode, you can set any f/stop you wish. In this mode, the slowest shutter speed the camera will select is $\frac{1}{30}$ th of a second (and there’s no upper bound).

- In any of the movie modes, the most you can adjust the exposure compensation is +/- 2 stops.
- You have lots of control over lots of variables: When you start recording, the camera will use the currently set white balance, creative styles, exposure lock, exposure compensation, and metering mode. However, while you're shooting, you can't change any of them.

TIP: Want to switch between these 4 modes quickly? When the exposure mode dial is set to "Movie", access the "Shoot Mode" from the **Fn** menu (assuming you haven't reassigned it to "Quality" as I told you to do in Chapter 2 ☺). Shoot mode may be useless in the **Fn** menu when you're shooting stills, but in movie mode it serves a useful purpose.



Figure 6-93: The Movie exposure mode lets you take control of the aperture, shutter, or both.

6.41 STEADYSHOT

Menu Position MENU → 📷 8 → SteadyShot

What it Does Turns image stabilization ON or OFF.

Recommended Setting On (unless your camera’s on a tripod)

SteadyShot is an ingenious invention which is designed to give you a slight edge when it comes to eliminating the blur sometimes caused by shaky hands. Basically, when you’re zoomed in all the way, it’s more than just the subject that gets magnified – the shakiness of the hands is amplified as well. The camera’s engineers have cleverly incorporated sensors into the camera body which can



Figure 6-94: Low light, 1/15th of a second handheld with SteadyShot ON. (This was to get the background pedestrian blurred on purpose.) This feature helps even more when you’re zoomed in all the way.

not only detect when the camera is shaking, but can also measure how much and in which direction. Tiny piezo actuators then move the camera’s sensor in equal but opposite directions as the detected movement, effectively canceling out the shake. This is a phenomenal engineering achievement, and the photographic world has graced this invention with many accolades.

The A7r II’s built-in SteadyShot can correct for 5 (count ‘em!) dimensions of shake: Roll, Pitch, Yaw, Vertical, and Horizontal. I could show you a complex diagram of what that all means, or I could show you this outstanding video from Sony when they introduced this improved sensor-based SteadyShot in the A7 II camera body: <https://youtu.be/svbUXedWsbA>

TIP 1: *The original E-mount was designed to have the image stabilization be done in the lens in order to keep the body as small as possible. So if you have a native E-mount lens with the “Optical Steady Shot” (OSS) specification, that lens can correct for the pitch and yaw shaking, and the A7r II’s sensor will correct for the other 3 dimensions (Horizontal, Vertical, and Rotation).*

TIP 2: *Note that the following Sony A-mount lenses do not feature built-in distance encoders, and so will only make use of 3-axis image stabilization when attached via an LA-EA3 or LA-EA4 adapter: SAL16F28, SAL20F28, SAL28F28, SAL135F28 (STF), and SAL500F8.*

It should be noted that the SteadyShot feature, as brilliant as it is, is not a panacea. It will not nullify all camera shake in all situations, and it does not mean you can throw away your tripod. Before SteadyShot was invented, there was a rule of thumb in photography regarding how to get sharp-looking pictures: If you’re using a shutter speed above 1/(the focal length of the lens), your picture will probably not be affected by hand shakiness. For example, if you’re shooting with a 100mm telephoto lens, your shutter speed should be 1/100th of a second or faster to ensure a sharp image. (If there’s not enough light for that, you should use a tripod to ensure sharpness.) On the other hand, if you’re shooting with a 28mm wide angle lens, you can get sharp-looking handheld shots if your shutter speed is 1/28th of a second or faster.

With the SteadyShot feature engaged, it gives you the ability to shoot handheld at shutter speeds up to 3 stops slower (Sony’s marketing material says up to 4.5 stops) than with the established rule of thumb. In the example above, where you could only shoot at 1/100th of a second or faster, with SteadyShot you can safely shoot at 1/15th of a second or faster. When the available light is low, this can increase your chances of getting a sharp shot in such borderline situations, like the real-world example in **Figure 6-94**.

TIP 1: *The owner’s manual says that SteadyShot should be turned off when the camera is mounted on a tripod. This is because control systems are*

inherently imperfect, and if there is no movement to counteract, then the actuators will likely react to some phantom noise coming from the pitch and yaw sensors, and otherwise move the sensor at times when it shouldn't. This rule only applies to rock-solid, really good tripods, though. If you happen to own a cheapie tripod and use it with the center column all the way up and it's a windy day, your image might just benefit a little by having it on. To be safe, try it both ways.

TIP 2: *The flashing “SteadyShot Warning Indicator” that flashes during times of likely camera blur doesn't show up in either Manual or Shutter Priority modes.*

6.42 STEADYSHOT SETTINGS

Menu Position MENU →  8 → Steadyshot Settings

What it Does Allows for optimal SteadyShot with lenses that don't communicate their focal length to the camera

Recommended Setting: SteadyShot Adjust = Auto, unless a non-native E-mount lens is attached (in which case it automatically switches to Manual)

You already know a lot about the camera's in-body image stabilization from the previous section. Here's some more technical detail I left out: The camera's algorithms adjust the way the sensor is stabilized based on how long your lens is – after all, when you attach a telephoto lens, not only does the image get magnified, but so does the shakiness of your hands.

The camera knows the focal length of a native E-mount lens and will adjust the shake correction accordingly. It will also adjust it automatically when using a Legacy Glass adapter that communicates the focal length to the camera such as the LA-EA3 and LA-EA4. But what if you don't have a native E-mount lens?

That's what this feature is for. In situations where the camera can't ascertain the focal length of the attached lens, you can enter the lens' focal length here and maximize SteadyShot's ability to do its job.

There are two settings in this feature's menu:

- Steadyshot Adjust. – You can choose from Auto and Manual. When you put a non-native lens on the camera this switches to Manual on its own.
- SteadyS. Focal Len. – Here you can dial in the focal length of your lens, from 8mm – 1000mm. This feature is greyed out unless the Steadyshot Adjust feature (above) is set to Manual.

TIP 1: *If you have a Canon EF lens with a Metabones IV adapter (<http://www.metabones.com/products/details/MB-EF-E-BM4>), then not only is your focus and aperture fully automated, but this adapter also sends the focal length of the lens to the camera body for optimum settings.*

TIP 2: *Using a teleconverter with a long lens? Your camera won't know it. You'll have to manually set the effective focal length.*

6.43 COLOR SPACE

Menu Position MENU →  8 → Color Space

What it Does Allows you to choose between sRGB and AdobeRGB color spaces

Recommended Setting sRGB unless you're an expert

Digital cameras can only store numbers, not colors. And so it is very important that everyone agree on a way to represent colors so that what looks like red in the real world also looks like the same shade of red on your monitor and on your printer as well.

And so the concept of color space (or “gamut”) was invented to help everyone agree on a way to represent such colors using numbers. Both color space options in your camera (sRGB and AdobeRGB) will represent each pixel color using 3 8-bit numbers – one each for Red, Green, and Blue - and a lookup table that will translate the number triplet into a particular, previously-defined wavelength of color. You can see a good example of a color space for a computer screen in **Figure 6-95**.

There are many different color space definitions in use, but by far the two most popular are sRGB and AdobeRGB. sRGB is really the worldwide de-facto standard, being used by all point-and-shoots, computer monitors, and photo labs on the planet. A different standard, called AdobeRGB, provides a different assortment of colors designed specifically to emulate what a CMYK printer can produce (like your inkjet printer, or a conventional printing press).

AdobeRGB is essential if you’re a real stickler for color accuracy AND you know the final product will be printed by a commercial graphics house (or a high-end inkjet that knows how to handle AdobeRGB). Shooting in AdobeRGB and setting up your workflow to handle it is the only way to accurately preview how the colors will appear on the final printout, and that’s why most professionals use it.

There are a few downsides, though. Not all monitors (and not all inkjet printers) know how to work with AdobeRGB color spaces. If you choose to shoot in AdobeRGB format, you will still have to convert back to sRGB in your photo editor if you want to share the file electronically with non-professionals (email or web), or send it to most 1-hour photo printers. (And

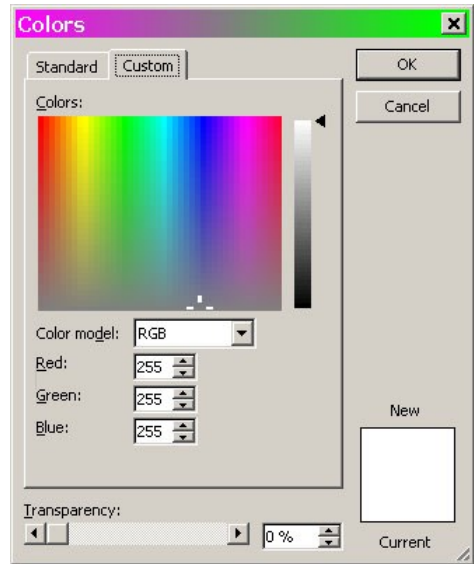


Figure 6-95: An example of a color space: All the possible colors that can be represented by a program or printer.

if you forget to convert it back, the image will tend to look faded and low-contrast.)

TIP: *If you choose to shoot in AdobeRGB mode, you'll notice that the file names begin with "_DSC", whereas with sRGB the file names begin with "DSCO". This is a visual cue to the folks in charge of post-processing images (in the event that that person is not you) that they still need to be tweaked into a more universally accepted color space so that they can be easily shared with others.*

Not sure what to do? You can always shoot in RAW and then choose your color space on your computer when you open / convert the RAW file. One advantage to doing that is that RAW files represent colors using 12 bits per color instead of 8, so if you open the RAW file in Photoshop you can pull it in using 16-bit AdobeRGB and have a larger palette of colors to play with.

One thing to keep in mind is that shooting in AdobeRGB doesn't mean your final output will necessarily look "better" or you'll see more colors. It means only that the preview you see on your monitor will more accurately reflect what the printed output will look like (if everything has been calibrated).

(Shameless plug: Color space is a very big topic – probably too big for this book. If you found this summary confusing, I explain the complex ideas of color space, ICC profiles, and color matching output at length in my ebooklet "Advanced Topics 2", available at www.FriedmanArchives.com/ebooks).

Equal Time: *While it's true that most professionals shoot in AdobeRGB and have configured their software and calibrated their equipment to handle it, not every professional thinks it's worth the trouble. See photography pundit Ken Rockwell's (I know, I know... but this time he has a point!) treatise on the subject at: <http://tinyurl.com/2yjdct>*

6.44 AUTO SLOW SHUTTER

Menu Position MENU →  8 → Auto Slow Shutter

What it Does Enables / disables a slow video shutter speed in low light in limited circumstances

Recommended Setting On

This function appears to do two different things:

1. When in movie mode and ISO = Auto, AND you’re in Aperture Priority mode, AND the light level is low, this feature gives the camera permission to use a shutter speed slower than 1/30th of a second (it will go down to 1/15th of a second instead).
2. The camera’s manual says it produces movies of less noise when ISO = Auto and the light is low. (Translation: Using 1-stop slower shutter speed means the camera didn’t have to bump up the ISO 1 stop, resulting in lower noise.)

I can’t vouch for the usefulness of this feature; it seems to be designed for those shooting in low light and want the camera to do the best it can under this narrow set of circumstances.

6.45 AUDIO RECORDING

Menu Position MENU →  8 → Audio Recording

What it Does Enables / disables a sound track when you’re shooting video

Recommended Setting On


The function is straightforward enough. And I have no special insights into situations where it might be desirable to turn the audio off. All major video editing packages provide the ability to discard the audio track, so it’s better to have it on.


6.46 AUDIO REC LEVEL

Menu Position MENU →  9 → Audio Record Level

What it Does Allows you to adjust the audio levels of the built-in or external microphones.

Recommended Setting n/a

Constraints Only available when exposure mode dial is set to 

You can manually change the audio input levels while recording a video; however to do so you must assign Audio Rec Level to a button first via **MENU** →  7 → **Custom Key Settings**.

So, when you're shooting a move, press the DISP button multiple times until you see the audio levels superimposed onto the Live Views screen so you can monitor your levels in real time. (Listening through headphones can help too.) Then, if you want to change your levels while shooting, press the assigned button and you can adjust using the screen that pops up in **Figure 6-96**.

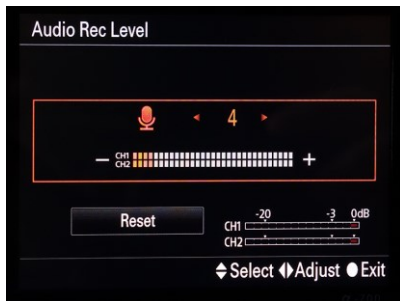


Figure 6-96: What the Audio Record level screen looks like when invoked through the menu.

TIP: Rightly or wrongly, the camera will still try to limit the audio levels if it detects high volume levels. So much for manual control!

6.47 AUDIO OUT TIMING

Menu Position MENU →  9 → Audio Output Timing

What it Does Delays the audio monitoring through the headphone jack a fraction of a second to match the video delay

Recommended Setting Live

This feature can come in handy when you're shooting music videos and your actor / actress is lip syncing to a pre-recorded track. (You know, like this guy: <http://youtu.be/8WD0WVL-HjE>) Depending on how your audio is fed to the camera and to your actors, there's the possibility of a slight time shift between the audio you're hearing and what's going on in the scene. Because it has to go through the camera's video processor first, the image you see in the camera's viewfinder or LCD is slightly delayed from real time. If the audio is delayed the same amount, everything's fine, as the audio and video will be in sync with each other.

So this setting simply delays the audio by the same amount that the video is being delayed. Not by much but in certain situations it can be a handy thing.

6.48 WIND NOISE REDUCTION

Menu Position MENU → 📷 9 → Wind Noise Reduction

What it Does Attempts to eliminate the problem of wind noise from the built-in condenser microphones by cutting out the low frequencies in which said wind noise tends to occur

Recommended Setting Off, unless you're outdoors on a windy day

Professional audio engineers always use expensive microphones with “wind screens” attached (usually a wire mesh or a fur-like cover over the actual sound sensor) which not only filters out wind noise, but also covers for ill-trained actors who always “pop” their P’s when speaking.

Unfortunately such microphones are bulky, expensive, and not nearly as universally useful as the condenser microphones (which can pick up sounds from much further away, are tiny, light weight, and inexpensive). And that’s why your camera uses condenser mics.

And just as there are two ways to get rid of red-eye (the right way by increasing the distance between the lens and flash, and the other way by fooling the eye into thinking it’s bright outside), there are also two ways to cut out wind noise: the expensive way as outlined above, and the software way by cutting out ALL of the low frequencies in which the wind noise tends to reside (**Figure 6-97**). (Of course, this means you’re cutting out the low frequencies in the rest of your audio track too. You might not notice it unless you’re recording rock concerts or something.)

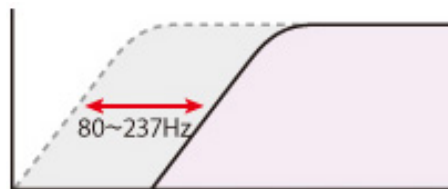




Figure 6-97: This is the audio range in which wind noise typically appears. Cut that out and you’ll cut out the wind noise, too.

6.49 MEMORY RECALL

Menu Position MENU →  9 → Memory Recall

What it Does Allows you to recall one of six previously-saved system configurations

Recommended Setting: n/a

This feature recalls one of the six camera settings committed to memory via **MENU** →  9 → **Memory** as described in the next section. This menu item will be greyed out unless the Exposure Mode dial is set to "1" or "2".

To use, bring up the Memory Recall menu (or set the exposure mode dial to "1" or "2"), select the memory location you'd like to recall via the arrow buttons, and hit the center button to select.

Important Note: Sony has expanded its functionality: Instead of only 2 memory locations as in the original A7r, Sony has added an additional 4 memory locations that are stored (wait for it...) on your memory card.

Why would this be a desirable thing? I can think of only one scenario: Let's say you're an über-pro and you take many identical Sony camera bodies with you on location. Rather than spending a lot of time configuring each camera individually, this new feature allows you to configure your camera ONCE, store it on a memory card, and then move that memory card from camera to camera, doing a quick “Recall”, followed by another save to a local memory location.



Figure 6-98: Memory Recall screen – choose between 6 previously-stored configurations (4 of which are stored on the memory card).

That's my guess, anyway. The problem is that only settings from the Recording (📷) menu, the f/stop, shutter speed, and exposure mode are saved. That's it. Things like the **Fn** menu customization or the custom button assignments don't.

Here are the locations and file names where the information is stored on the memory card:

```
/PRIVATE/SONY/SETTING/[camera-unique name]/CAMPRO01.DAT  
/PRIVATE/SONY/SETTING/[camera-unique name]/CAMPRO02.DAT  
/PRIVATE/SONY/SETTING/[camera-unique name]/CAMPRO03.DAT  
/PRIVATE/SONY/SETTING/[camera-unique name]/CAMPRO04.DAT
```

(Each of these M1-M4 DAT files is 1Kb each. I tried to peruse them via a text editor, but most of the information is not in human-readable ASCII or Unicode text. Also note the camera-specific path name, meaning you can't transfer settings between dissimilar cameras. (I guess that eliminates the possibility of conflict should the dissimilar cameras have different feature sets.)

TIP: *Memory Recall (menu function) is greyed out unless the exposure mode dial is set to either 1 or 2. At that time this function will either let you recall Memory Location 1 + M1-M4 (as shown in **Figure 6-98**), or Memory Location 2 + M1-M4.*

6.50 MEMORY

Menu Position MENU →  9 → Memory

What it Does Allows you to store up to six sets of camera settings for instant recall in the field

Recommended Setting: [Not applicable; it really comes down to what you shoot and what features you change frequently]

A very handy feature that can save a lot of time is the ability of the camera to memorize a group of settings so that they can be recalled all at once. For an example of why this can be a good thing, let me review the camera settings I normally need to set when taking time exposures like the kind in **Figure 6-99**:

* SteadyShot OFF	* Aperture priority mode
* Set f/stop to f/8	* Overexpose 2 stops (this works best in low light)
* ISO set to 100	* White Balance set to "Fluorescent: Day White"
* Self-timer (2s)	* RAW + JPG
* Long Exposure NR = OFF	* DMF (Direct Manual Focus)

With the memory feature, all I have to do is configure these camera settings *once* and then tell the camera to memorize them for instant recall later. This feature saves even more time after the photos have been taken, since I don't have to un-do all of these parameters one-at-a-time to return the camera to "normal" (and risk forgetting one, potentially affecting a future shot).



Figure 6-99 *Total Recall.* By committing these settings to a memory location, setting up shots like this can take as little as two seconds.

So let's say I wish to have the camera memorize the above settings. I just set the desired modes and then **MENU → [Camera Icon] 9 → Memory → [Enter]**, which brings up the Save To Memory screen shown in **Figure 6-100**. The display shows all of the parameters that are being stored (notice the vertical scroll bar on the right – there are more parameters listed than can fit on one screen! Scroll down to see them all), and the very top

has numbers 1-2-M1-M2-M3-M4, asking you, "In which of these six locations would you like me to save your settings?" You can select a number by scrolling right or left with the arrow buttons and then press the center button to complete the save.

TIP: As described in the previous section, Memory locations 1 and 2 are stored in the camera itself; whereas memory locations M1 through M4 are stored on the SD card in the camera. If you swap memory cards, whatever you stored in M1-M4 will no longer be accessible for recall.

To recall the settings at a future time, just turn the Exposure Mode dial on top of the camera to either "1" or "2" and then follow the instructions given in the previous section for "Memory Recall".

I configured Memory Register 2 for shooting video in the studio:

- White Balance C. Temp / Filter: 6300K M6 (I have weird lights)
- Movie Manual exposure mode: 1/60th of a second at f/3.5

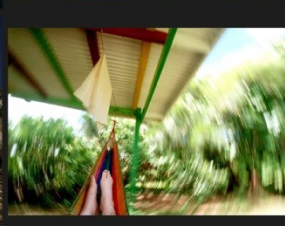
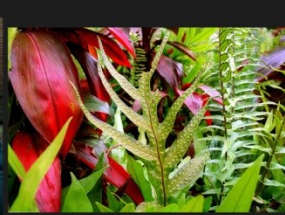
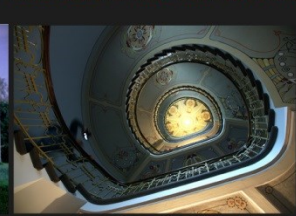
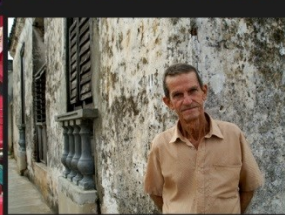
- File Format: XAVC S HD (I don't need 4K for the kinds of videos I shoot)
- Wind Noise Reduction = Off
- Record setting 30p 50M
- ISO 800
- Manual Focus
- MF Assist On



I personally don't store anything in M1 – M4 simply because if I were to change out my memory card, my stored settings would be changed out with it and no longer recallable. So I treat this camera as if it has only 2 memory settings.

Figure 6-100 The Memory Store screen. Here you can choose which of 6 memory registers to store the settings in for later instant recall. The first two memory slots reside in the camera, whereas M1-M4 are stored on the memory card so they can be easily transferred to another A7r II.

TIP: Regretfully, the Memory function does NOT remember any button reassignments, nor the setting for Manual Focus Assist, nor the one for Live View Display. That's a shame because it would be GREAT to have one set of configurations optimized for shooting video and one for stills (and this would provide a fast way of switching between the two).



Chapter 7 “CUSTOM” (GEAR ICON) MENU SETTINGS

7.1 ZEBRA

Menu Position MENU → ⚙️ 1 → Zebra

What it Does Enables and controls the “Zebra Stripe” pattern used in composing both images and video.

Recommended Setting You can set it to either show you highlights that are going to blow out, or Caucasian skin that is well-exposed.

Constraints Does not appear on external HDMI output.

Before I explain Zebra Stripes, let me first explain how videographers do their job.

News cameramen do not use any sort of automation – focus and exposure are all done manually. (This is because any kind of unintended changes of settings during shooting will be very distracting to the viewer.) When it comes to exposure, the shutter speed and ISO are usually pre-set, so

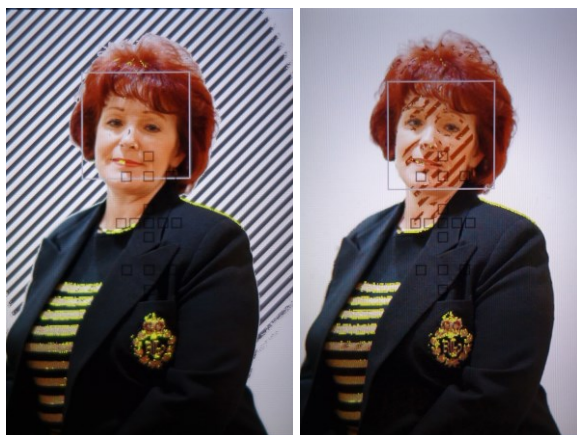


Figure 7-1: Zebra stripe example. It can either show you what’s going to blow out (in video – stills have a greater dynamic range) or it can be set to show when a Caucasian face is properly exposed (right).

they just change the f/stop until the exposure looks “correct” and start shooting.

How does the camera operator know when it looks correct? Handheld light meters? No. Histograms? Surely you jest. He (traditionally it’s a ‘he’) looks at the zebra stripes.

The Zebra stripes function can be configured to be used in one of two ways:

- 1) It can be configured to tell you if any of your highlights are blowing out before you shoot, and if so WHERE IN THE FRAME IT WILL HAPPEN. (As opposed to Live View histograms, which will only tell you that something is blowing out, but it won’t tell you where.)
- 2) It can be configured to tell you if the exposure for your subject is correct. (Assuming that your subject is a Caucasian-skinned journalist – again, this function evolved during a time when that was mostly true.)

Basically it’s a feature grafted from the professional videography world that allows camera operators to quickly adjust the manual exposure so their talking head subject would be well-exposed. But now this feature can be used to adjust exposure for stills as well as for video.

The Zebra stripes will only show themselves when a part of your scene is equal in brightness to the threshold you’ve set. If it’s darker or brighter, it won’t show. Have a look at the right picture in **Figure 7-1**. Here the Zebra setting was set to 75, and notice that although the background is brighter than the face, only the face is highlighted.

TRY THIS: Turn zebra stripes on and set it to 70. Now point your camera to any given scene and adjust the Exposure Compensation one way or the other, and watch how the zebra stripes jump around your scene from one brightness level to another.

The numbers represent IRE (Institute of Radio Engineers – yes, RADIO. It’s an old institution) values of 0 (blackest) to 100 (whitest). Note that this does NOT correlate to the blackest and whitest in terms of still images! Stills can capture a wider dynamic range. That’s why when you see zebra stripes when the setting is set to 100 in stills you might still be able to recover some highlight detail if you work hard.

I have found two settings to be the most useful when shooting stills: either 75% (showing when a Caucasian face is well-exposed) and 100+ (showing when a part of your image will be blown out, as evidenced by the blinking portions when played back in histogram view). The correlation is very close but not exact.

7.2 MF ASSIST

Menu Position MENU → ⚙️ 1 → MF Assist

What it Does Allows the camera to magnify the Live View image when focusing manually

Recommended Setting On

[Note: This camera has TWO similar focus-magnification aids: MF Assist (this section), which kicks in automatically when manually focusing with a native lens, and Focus Magnifier (Section 6.31), which is invoked manually and can be used with non-native lenses and in movie mode.]

Nothing beats manual focusing for critical work, such as product or macro shots. (Except Peaking Level, which you can actually use in conjunction with this feature. More about that in a minute.) And so your camera provides a “Manual Focus Assist” which magnifies the live view so that you can very easily see when it’s in focus. In the old days you needed expensive equipment to get this kind of focusing aid, like the camera shown in **Figure 7-2**.



Figure 7-2: In the old days, if you wanted magnified focusing for critical work, you had to buy a high-end camera with interchangeable finders.

To use it, do the following:

1. Turn this feature ON (**MENU** → **⚙ 1** → **MF Assist** → **On**)
2. Set the Focus Mode to either Manual Focus or DMF.
3. Using a native E-mount lens, turn the lens' focusing ring to start focusing. The Live View image is immediately magnified and you can see pretty clearly what's in focus and what's not. (If you have Peaking Color enabled (Section 7.9), that will operate too, although sometimes in this mode the color splotches aren't as readily apparent.)
4. Notice two small rectangles in the lower-left-hand corner of the screen (**Figure 7-3**). This is showing you where you are in your composition. You can actually move that rectangle around using the cursor keys to look closely at any point in your image. (This is useful for when your camera is on a tripod.)
5. Want even greater magnification? Hit the center button of the rear control dial, and watch the magnification jump from 8.6x to 17.1x. (Hitting the button again goes back.)
6. You can exit the MF Assist mode by pressing the shutter release button halfway, or letting it time out according to the Focus Magnification Time setting (next section).



Figure 7-3: With MF Assist, you tell it where you want to zoom in, and then that area of the composition is magnified for critical focusing.

TIP 1: Somewhat regretfully, the green focus confirmation circle doesn't work when you're in MF mode (with or without magnification).

TIP 2: MF Assist DOES work in DMF (Direct Manual Focus) mode – just keep the shutter release button pressed halfway after it's focused and you can tweak the focus manually using MF Assist and Peaking Color as described above.

TIP 3: MF Assist does NOT work in Movie mode. However, a nearly identical feature does: the Focus Magnifier function, described in Section 6.31.

7.3 FOCUS MAGNIFICATION TIME

Menu Position MENU →  1 → Focus Magnif. Time

What it Does Determines for how long the MF Assist will stay zoomed in after you've stopped turning the Control / Focusing Ring.

Recommended Setting 2s

This is used in conjunction with the MF Assist function (previous section), telling it how long you want the image to be zoomed in when focusing manually. Your choices are 2 seconds, 5 seconds, or “No Limit”. If you choose “No Limit” you have to press the shutter release button halfway down in order to go back to composing your image full-frame.

TIP: Choosing “No Limit” is almost completely incompatible with Direct Manual Focus mode (Section 6.14), for you have to keep the shutter release button pressed to focus, and the only way to cancel the MF Assist is to lift the shutter release button. But then to take a picture you must press the shutter release button all the way, which activates AF again and nullifies whatever critical focusing you just did. My advice: Don't use “No Limit” when using in conjunction with DMF.

7.4 GRID LINE

Menu Position MENU → ⚙ 1 → Grid Line

What it Does Superimposes (or removes) a compositional aid onto the LCD

Recommended Setting It's an intensely personal preference

Once upon a time you had to change focusing screens in your DSLR in order to see special compositional guides in your viewfinder. Now, thanks to the miracle that is Live View, all you have to do is push a button and you can choose from one of 3 different grid line patterns. (Or turn it off, of course.) The three grid patterns available can be seen in **Figure 7-4**.

In this book's introduction I specifically stated that this book is not being aimed at beginners, and so I would intentionally skip some of the staples of my beginner's books which talked about the basics, including light and

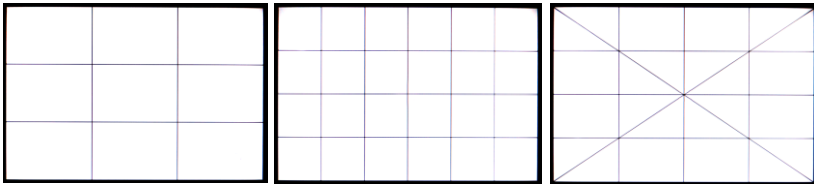


Figure 7-4: You can have three different kinds of compositional aids superimposed on your display.

composition, f/stops and shutter speeds. Well, these compositional grids kind of fall into that 'beginning' category – I'll simply say that if you know what the rule of thirds is and you'd like to see a rule of thirds grid magically appear in your display as a compositional aid, just set **MENU → ⚙ 1 → Grid Line → Rule of 3rds Grid**. There are two other choices as well: A 6x10 grid which is roughly double the density of the rule of 3rds grid, and a grid with two diagonals. The 6x10 grid is designed for people doing work with a copy stand to make sure the camera is absolutely parallel to the work being copied and that there are no converging or diverging lines. The one with the diagonal line is for those who want to add some

visual energy to their shot and place the subject lines according to it (although I personally can't see needing a compositional aid for that).

I grew up with ground glass viewfinder screens, and so I don't really need any compositional guides. However if I were to pick one, I'd probably go for the Rule of Thirds as my standard grid.

TIP: If you're wondering where that ubiquitous rule-of-thirds was derived from (hint: it's related to the Golden Ratio), here's a website which explains it all very well: <http://tinyurl.com/899jssb>.

7.5 MARKER DISPLAY / MARKER SETTINGS

Menu Position MENU → ⚙️ 1 → Marker Display

Menu Position MENU → ⚙️ 1 → Marker Settings

What it Does Specifies which of four compositional aids you want visible when shooting video

Recommended Setting: n/a

Constraints: Guides only appear when exposure mode knob is set to "Movie" and MENU → ⚙️ 1 → Marker Display is set to "On".

Just as there are compositional aids available for shooting stills (Grid Line, described in the previous section), so too are there compositional aids for shooting video. There are four to choose from; and you can choose to have some or all displaying simultaneously.

Center – This just puts a giant cross in the center. If you're shooting a talking head, this can be a useful guide.

Aspect – Shooting video for a project that will be shown on something OTHER than an HDTV? The camera will show you a framing guide for that format. For example, if you're shooting for a standard definition TV (you know, like the TV screen you grew up with), you'd choose 4:3 and the camera will show you **Figure 7-5c**.

Safety Zone – It turns out that some consumer TV sets have large bezels or are “out of alignment” and won’t show all of the pixels at the perimeter of the image. If you want to make sure they see everything that’s important, you’d make sure that everything that’s important in your shot appears in a “safety zone”, one that takes up 80% or 90% of the full frame. **Figure 7-5e** and f.

Guideframe – A rule-of-thirds compositional guide. (**Figure 7-5g**)

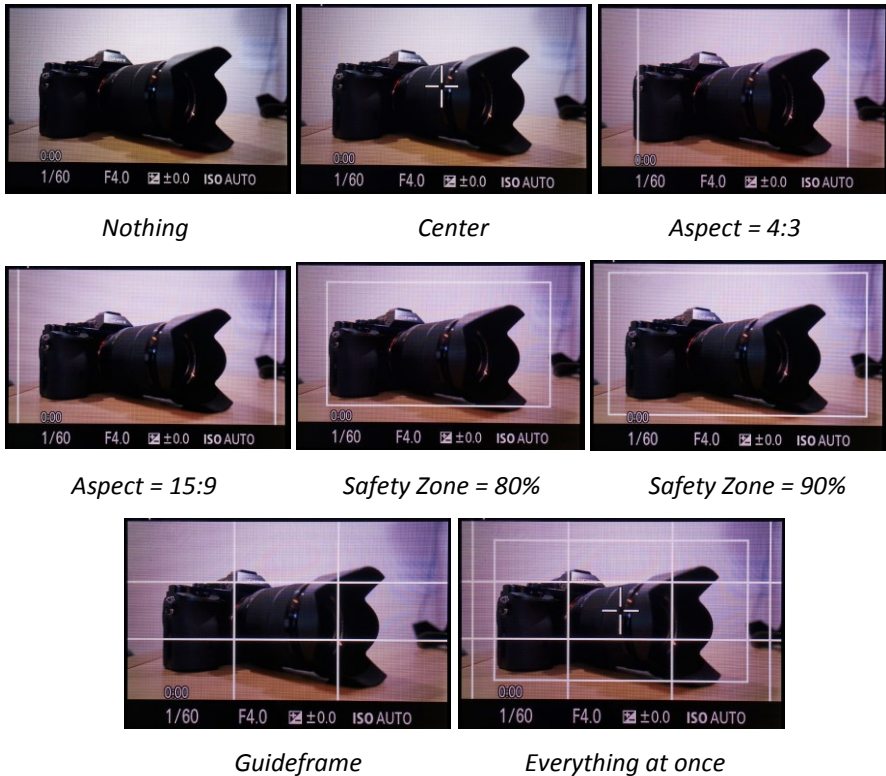


Figure 7-5: Marker Settings choices. These are merely compositional aids you can enable to meet your particular video-shooting needs.

Things can look pretty busy if you have all of these on at once (**Figure 7-5h**). 😊

7.6 AUDIO LEVEL DISPLAY

Menu Position MENU → ⚙️ 2 → Audio Level Display

What it Does Do you want to see pseudo VU meters superimposed on top of your video image as you shoot video?

Recommended Setting On

Constraints Doesn't work on external HDMI output

The camera's Audio Level Display shows a peak meter, rather than an older-style VU meter. With a traditional VU meter (**Figure 7-6a**) designed for analog audio, you want your sound level to get to about $\frac{3}{4}$ of the allowable scale (marked 0 VU), after which some distortion may occur gradually with increasing sound level.

Just as digital still photography is unforgiving about "blown out" highlights, digital audio is almost completely unforgiving of excessive sound levels, which create a harsh distortion sound. And so for digital audio the VU meter has been replaced with the "peak meter" (the lower-left hand corner of **Figure 7-6b**).

If your audio is so loud that you end up hitting this "brick wall", you'll know it by looking at the tiny red square on the right of each audio channel - it will light up for about a quarter of a second each time your audio gets too loud.

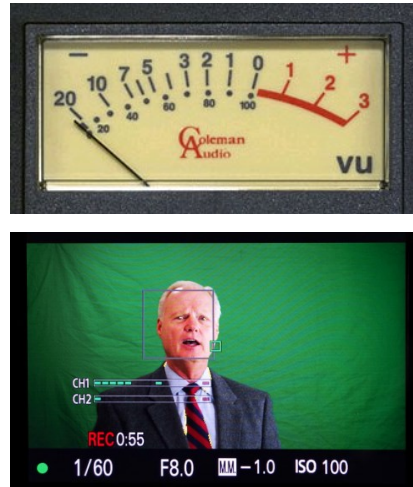




Figure 7-6: A traditional VU meter (top) and what the A7r II shows you (bottom). The two don't seem to work the same way – full-scale on the display seems to equal the "0" level (3/4 deflection) of the VU meter.

Here's the good news - every time I try to feed loud audio to the camera, the camera seems to invoke an "automatic gain control" to keep you from hitting that brick wall. So while the audio level control will specify how loud your lower sounds are, the camera is working in the background to keep the distortion at bay.

You can adjust the audio levels of your input via **MENU →  9 → Audio Record Level** (Section 6.46).

7.7 AUTO REVIEW

Menu Position MENU →  2 → Auto Review

What it Does After you take a picture, this setting tells the camera how long to show the image you just took

Recommended Setting 10 seconds, unless you're shooting kids


There's a behavior called "chimping" that plagues DSLR owners – it's the constant Take-a-picture-then-pull-your-eye-away-from-the-viewfinder-and-examine-the-shot-you-just-took-on-the-rear-screen reflex. Thankfully a camera that has EVF completely eliminates the need for this awkward and inefficient behavior.

The Auto Review feature will automatically play back the last image taken if you want it to for either 2, 5, or 10 seconds. It can be a really useful feature – for example, if you're taking pictures of people, you can know instantly if someone had their eyes closed or if an expression was off. Set it to 10 seconds and it will always show you the last picture you took, giving you enough time to turn the camera around and show the subjects the shot you just took without needing to press a button.

The only time I ever turn this off is when shooting kids, since reviewing your shot = missing the next expression (and they're always changing expressions every nanosecond!)

You can cancel the Auto Review at any time just by pressing the shutter release button halfway, at which time the camera goes back to Live View mode, ready for you to take the next picture.

7.8 DISP BUTTON

Menu Position MENU →  2 → DISP Button

What it Does Lets you specify which of 5 information screens the DISP button will cycle through.

Recommended Setting n/a

You can have a lot or a little data co-existing with your Live View image.


Perhaps the best way to explain how these work is to walk you through it. Have a look at **Figure 7-7**. Now invoke **MENU** →  2 → **Display Button** → **Monitor** and the screen in **Figure 7-7b** appears on the LCD.



Figure 7-7: The DISPlay button (left) and the screen you can use to configure them (right). Each time you press the DISP button, you will cycle through each of the checked options. (This screen shows options for the LCD monitor; the one for the EVF (“Finder”) has one less option.)

This screen lets you specify which of six (five for the EVF) prefabricated information screens the DISP button will cycle through. Try using the arrow keys to “browse” the five different options available, and notice that with each option the camera shows you a small thumbnail preview of what the screen will look like. You can use the center button to check or uncheck each option. Then use the MENU button to exit (you MUST use the MENU button; you can’t just press the shutter release button halfway like you can on most other menu functions.).

Now go back to shooting mode and look at the rear LCD screen. Now press the DISP button several times and watch the information display

change. The camera is showing you, in order, each of the screens you selected.

The “Display All Info” and “No Disp. Info” screens are pretty obvious. I’ll explain some of the less-obvious screens in a little more detail below.

7.8.1 GRAPHIC DISPLAY

This one’s pretty basic. A strip of useful information on the top and the bottom, plus a complex graphic that you can’t get rid of in the bottom of your composition (**Figure 7-8**).

That graphic is meant for beginners who understand the basics of shutter speed and f/stop, and provides at-a-glance knowledge of what characteristics (i.e, blurry vs. sharp, all in focus or not) your photo will exhibit.

The triangle at the top represents the full range of the camera’s shutter speeds – 30 seconds on the left (showing a motionless person), and 1/8,000th of a second on the right (iconified by the sprint runner). The vertical line along that triangle shows where along this continuum your current shutter speed resides, letting you see visually whether this is an action-stopping speed (right end) or one where a tripod is definitely needed (left end).

Similarly, the bottom triangle shows you the f/stop range of the lens, with the vertical line showing you where the current setting resides along the scale of “everything’s in focus” (right; showing the person and the background in sharp focus) to “just the subject is in focus” (left; with the icon of the sharp person and fuzzy mountain background).

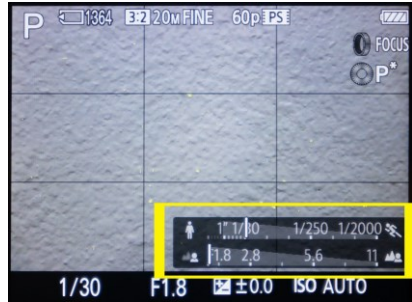
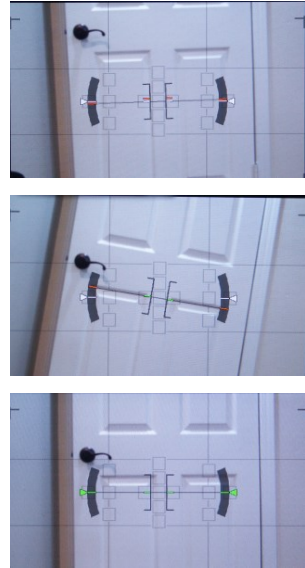


Figure 7-8: The two scales in the DISPlay screen show you graphically where you are along the continuum of “fast vs. slow” and “everything in focus vs. little in focus”

7.8.2 LEVEL

For those of you who want absolutely level horizons, or when you want to make absolutely sure your camera is parallel to the building you’re shooting (to ensure there are no converging or diverging lines), then this feature is for you. Technically referred to as “Pitch and Roll”, you would use it in much the same way as you’d use a carpenter’s level.

Figure 7-9 shows the display in action, although it’s a little difficult to see the red and green lines in the pictures. These lines help guide you to the correct positioning of the camera. When both axes are lined up, all colored lines turn green and you’re all set!



7.8.3 HISTOGRAM



Figure 7-10: You can see before you shoot whether there will be detail in your highlights or shadows with the live Histogram.

I find it very, very handy to have a live histogram in my Live View screen. It can show you right away if any of your whites have blown out or if there’s no detail in your shadows. **Figure 7-10** shows you what it looks like.

If you don’t know what a histogram is, that’s OK – I’ve included an explanation of it (with lots of examples) in Appendix A, Section A.7.

Figure 7-9: The Digital Level Gauge will help you position your camera so it is parallel to a building (pitch, in the upper image) and is level (roll, the middle image). When both parameters are correct, all lines will show green across the center (bottom).

NEW FEATURE: Unlike in previous cameras, the histogram display is now finally available in movie mode!

7.8.4 FOR VIEWFINDER (REAR LCD ONLY)

This is an information screen that is only available on the rear LCD screen and it can be seen in **Figure 7-11**.

This screen is kind of a throwback to the old days (before Live View) when you'd compose your image using the Optical Viewfinder and the large LCD screen on the back would show your camera's configuration status when it wasn't playing back images. Well, your

newfangled camera can still work the same way. It's good

to have choices. This screen would only be useful when you're actually using the EVF for composing and shooting.

This screen also provides a VERY QUICK method of changing the parameters you see in front of you. Just press the **Fn** button and one of the parameters is highlighted in red. Use the arrow keys to navigate to the parameter you want to change, then hit the center button. Sony calls this the "Quick Navi"(gation) function, and you can see why.



Figure 7-11: Everything you'd ever want to know about your camera's settings can be found on this screen! (Rear LCD only).

7.9 PEAKING LEVEL / PEAKING COLOR

Menu Position MENU → ⚙️ 2 → Peaking Level

MENU → ⚙️ 2 → Peaking Color

What it Does Provides a GREAT visual Manual Focusing aid – things that are sharp will be highlighted in the color of your choice.

Recommended Setting Peaking Level: Mid / Peaking Color: Yellow

The two functions “Peaking Level” and “Peaking Color” make it significantly easier to focus critically than with using a camera with an optical viewfinder.

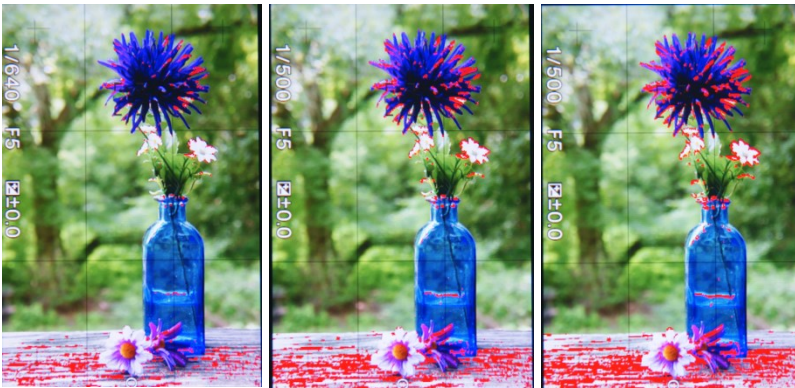


Figure 7-12: The wonderfully useful Peaking Level function puts a splotch of color over things that are sharp when you’re focusing manually. Here you can see the slight differences between the function’s three settings: High (left), Mid (middle), and Low (right).

What does it do? It highlights (via a color splotch) all the areas of the picture which are in focus RIGHT NOW. If you see a splotch on your subject in your chosen color, you know that part of your composition is sharp. (How does the camera know when something is in focus? Whenever there’s great contrast among adjacent pixels. This means that if

the contrast is mild the peaking function may not show you any colors – even if it’s in proper focus. But don’t let that scare you off – try this feature, it’s quite useful.) **Figure 7-12** shows an example of this feature in use. In this instance the peaking color is set to RED and you can see the minor differences between when the function is set to High, Mid, or Low.

There are two menu settings required to invoke this feature: The first is **MENU → ⚙️ 2 → Peaking Level → [Choose from Low, Mid, High, or Off]**. (Off is the factory default.) Basically this setting dictates how thick the splotch of color is. I personally prefer “mid” myself.

The second menu setting is **MENU → ⚙️ 2 → Peaking Color → [Choose from Red, White, or Yellow]**. Why would you choose one color over another? If you’re shooting a subject that’s red, then it’ll be hard to see the Peaking Level splotches if this function is set to “red”. (Kind of obvious.) I personally keep this set to yellow most of the time since that color is the easiest to see in most shooting situations. I’ll switch it to something else if there’s a conflict.

This Peaking Level feature is extremely handy when shooting movies in Manual Focusing mode. It is also very useful when combined with the DMF function as described earlier at the end of Section 2.2.

NEW FEATURE: *Peaking Color is now available when manually focusing in movie mode! Woo hoo!*

TIP 1: Peaking Level = HI is almost essential when zoomed in and using MF Assist (Section 7.2). For some reason the peaking level highlights barely show in this mode unless the contrast is exceptionally high (even in-focus items won't always show it).

TIP 2: For reasons I'll never understand, the Peaking Level function doesn't work if your camera is attached to an external screen via the HDMI cable.

TIP 3: Some think that Peaking Level is easiest to use when your image is B&W. So if you set Creative Styles to B/W and shoot RAW+JPG, you can focus / compose in B&W and have your color image too!



7.10 EXPOSURE SET. GUIDE

Menu Position MENU → ⚙️ 2 → Exposure Set. Guide

What it Does Provides a nice “moving ribbon” visual when you’re changing exposure settings (but it block the Histogram!)

Recommended Setting Off



Figure 7-13: *The Exposure Setting guide provides a nice UI but hides the histogram and so it’s not useful to me.*

This was a nice user interface idea. Whenever you change either the f/stop or shutter speed in most DISPlay modes, you’ll get this nice little animation showing you how the f/stop and / or shutter speed are changing but in opposite directions, as shown in **Figure 7-13**. Cute, but there are MANY occasions when I’m changing these settings and I look at the live histogram in the lower-right-hand corner at the same time.

I keep it off because the ribbon blocks the live histogram when you’re adjusting settings in manual exposure mode. (Oops!)

This setting is not available when DISP is set to “Graphic Display” or “For Viewfinder”.

7.11 LIVE VIEW DISPLAY

Menu Position MENU → ⚙ 3 → Live View Display

What it Does Enables / Disables the ability to preview how your image will look before you take the picture

Recommended Setting Setting Effect ON

This feature comes in the most handy when you're shooting with studio strobes.

So basically you can tell the camera "Show me what my final image will look like when I'm composing the shot. I want to know if my image will be too dark or too bright; and I want to see what the white balance would look like. I want to see what it will look like with the Creative Styles and Picture effects I have selected before I shoot!" I always keep this set to "Setting Effect ON" because I want to know those things.

Why would you ever want it off? When you're shooting with strobes in the studio, which usually means using a fast shutter speed and a small f/stop –

conditions which will practically guarantee that your Live View Image will be black because your ambient light isn't nearly as strong as your studio strobes will be. So in that case, changing this feature to "Setting Effect OFF" means you can see your subject and compose your image.



Figure 7-14: This is what studio photographers saw in their viewfinder when shooting with traditional strobes using older Live View cameras. (Hard to frame your shot this way!) The Live View Display feature was designed to address this problem.

TIP: You might want to set your white balance to either Daylight or Flash when using studio strobes, since the camera has no idea you're shooting with flash and

will want to do a white balance on your ambient light instead.

7.12 DISP. CONT. AF AREA

Menu Position MENU → ⚙️ 3 → Disp. Cont. AF area

What it Does Lets you see the individual phase-detect AF points at work when the camera's focusing mode is set to AF-C.

Recommended Setting [It depends on how easily you get distracted]

Constraints AF-C mode only

You've always heard that there are a LOT of phase-detect pixels baked into your A7r II's sensor, and this is the ONLY way to see where they are and watch them work. With this setting set to ON and your camera's focusing mode set to AF-C (Continuous), press the shutter release button halfway and you'll see tinier-than-usual AF points illuminate when they've found something to focus on. (These PDAF points are all clumped together in the center of the sensor – MENU → ⚙️ 3 → Phase Detect. Area → On shows you a bounding box within which all these focus points are contained.)

7.13 PHASE DETECT. AREA

Menu Position MENU → ⚙ 3 → Phase Detect. Area

What it Does Enables / Disables a small set of brackets in the Live View screen showing you where the clump of phase-detect pixels are located.

Recommended Setting Off

As mentioned in Section 1.1.2, the A7r II has a ton of phase-detect pixels baked into the sensor, and when this feature is on a pair of brackets appear showing you where in general they're located.

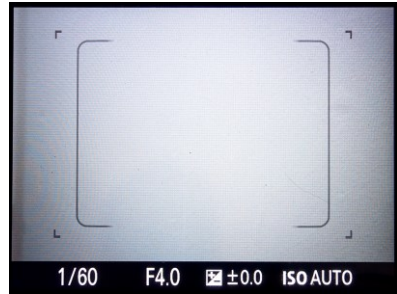


Figure 7-15: See those brackets in the center? The phase detect array of pixels are all in there somewhere.

Generally speaking it's good to turn this feature on only once so you can get a good feel for where in your frame your camera will successfully autofocus (or just look at **Figure 7-15**); then turn it off for some visual clutter relief.

7.14 PRE-AF

Menu Position MENU → ⚙️ 3 → Pre-AF

What it Does Enables the camera's ability to start autofocus even before you press the shutter release button halfway.

Recommended Setting On if shooting kids or pets

The description above says it all. In theory it uses a tad bit more power, but again, if you're shooting kids or pets it holds the possibility of making a difference and the difference in power consumption is negligible.

7.15 ZOOM SETTING

Menu Position MENU → ⚙️ 3 → Zoom Setting

What It Does Enables one of two "Digital Zoom and Upsize" features

Recommended Setting "Optical Zoom Only" if you're an image quality snob. If you're just a tourist taking snapshots, or you're shooting movies, go for "Digital Zoom" feature which offers the longer reach and a smooth pseudo-zoom.

Constraints .jpps only

This feature lets you specify how aggressive a digital zoom you want the camera to provide when shooting .jpps. Once either Clear Image Zoom or Digital Zoom is selected, you have to assign "Zoom" to a button via [MENU → ⚙️ 7 → Custom Key Settings](#), and then press that button to invoke the feature.

Here are the choices it gives you:

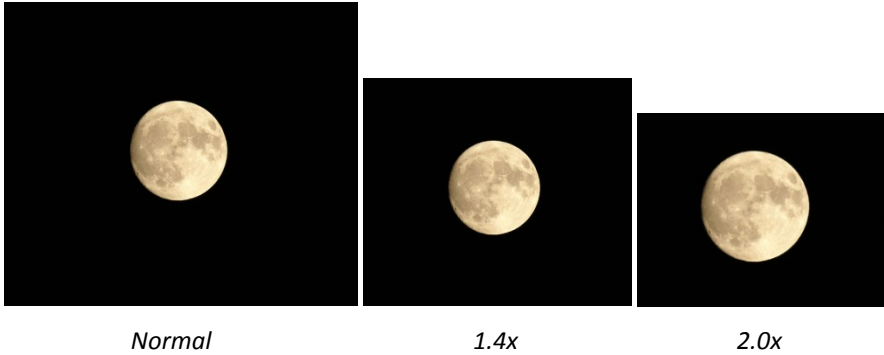


Figure 7-16: The "Digital Zoom" function just throws away pixels in an attempt to simulate "zooming in" more than what your lens can provide. The image it captures is smaller, because it only captures what's in the middle of the sensor. Then it upsizes it again, lowering the quality of the image a little.

1. **Clear Image Zoom:** The camera zooms in by throwing pixels away from the perimeter of the frame, but then it upsamples it to a full-size (Image Quality = Large) image using something a little better than Photoshop's bicubic resampling upsizing algorithm. You can zoom in up to an additional 2x using this method.
2. **Digital Zoom:** The camera zooms in by throwing pixels away from the perimeter of the frame, giving you a smaller picture. It then upsizes it again using a not-quite-as-good algorithm as that used in the Clear Image Zoom above. You can zoom in an additional 2x (as compared to Clear Image Zoom) via this method.

But wait! These features can actually zoom in MORE than a combined 4x (when shooting stills) if you have **MENU** → 📷 1 → **Image Size** set to either **Medium** or **Small**. The table below has details:

Function	Magnification
Clear Image Zoom	2x when Image Size = L 3.1x when Image Size = M 4x when Image Size = S
Digital Zoom	4x when Image Size = L 6.2x when Image Size = M 8x when Image Size = S

Have a look at the images in **Figure 7-16** to see a graphic example of how this function actually works. Had this been done by a real zoom lens, the images would all have been the same size, and the moon would have been progressively larger in each. Instead, the moon is the same size and the border around the subjects just gets progressively smaller, with the outer black area being chopped off.

That's bad enough, but then the camera *upsizes the image back up to 42 megapixels*, making a lower-resolution image now appear even lower quality. (Yes, it does this with the Digital Zoom function also.)

As a photographer who prefers to do his cropping on his computer (which can be “undone” if I don't like it), this feature is not at all appealing. And as someone who never upsizes his pictures unless it's absolutely warranted (and that rarely happens), this camera has so many megapixels to start with that if you left the feature OFF and cropped the image without resizing when you got home, you'll still end up with enough megapixels left over to make a decent sized print.

On the plus side, when shooting movies, these features DO give you a handy zoom where there is *no image deterioration* (you have to throw away pixels when shooting video anyway since HD or 4K video is so much lower resolution than what the sensor can capture. The only difference is with the digital zoom you're throwing away pixels from the perimeter rather than between pixels.)

TIP 1: For quick access, I have assigned this function to the RIGHT arrow button because immediately after you invoke it, you have to specify a zoom level. So then pressing and holding the RIGHT arrow button (again) provides a smooth digital zoom with the least amount of finger movement. Great for video.

TIP 2: When you set the zoom function to anything other than “Optical”, the metering mode is automatically set to “Multi” (and you can't change it). What's more, Face / Smile detection is disabled, Lock-On AF won't track anything, and Auto Object Framing is disabled. (Yeah, like you really used that last one.) Finally, if you're in either of the AUTO modes, no scene recognition will take place.



Figure 7-17: Clear Image Zoom can double the reach of your zoom lens without much degradation to the image quality. It works better than I expected. (Digital Zoom, on the other hand, can quadruple the reach of your zoom lens, and it works worse than I expected. 😊 But it’s still handy if you’re just going for snapshots.)

7.15.1 DIFFERENCES BETWEEN CIZ AND DIGITAL ZOOM

At this point it makes sense to do a test: How does Clear Image Zoom’s upsampling feature compare to taking the same image with CIZ OFF, then cropping and upsizing in Photoshop? I performed the test on the sample in **Figure 7-17** and the result can be seen in **Figure 7-18**. Sony’s marketing department wasn’t overselling; it’s very hard to tell the difference.

TIP: When you’re playing images back, and you look at the stats (f/stop, shutter speed, ISO, etc.) or EXIF information, the camera shows you the optical zoom value only.

TIP 2: This probably goes without saying, but none of these fancy digital zoom functions are enabled when you’re shooting RAW or RAW+JPG.

Other things of note for these features:

- The Focus Area switches to Center.
- The Metering Mode is set to Multi.
- Face detection doesn’t work in the Digital Zoom stage.
- Neither feature can be used in RAW or RAW+JPG mode.

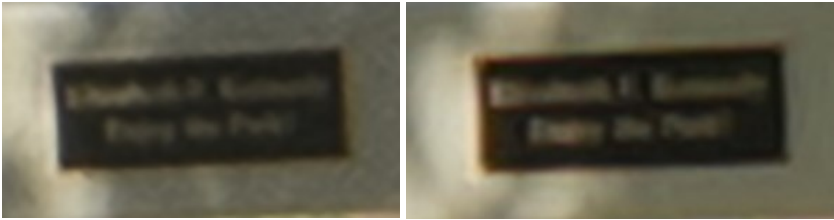


Figure 7-18: Left: Close-up of **Figure 7-17**, cropped and upsized in Photoshop. Right: Close-up of 8x with Digital Zoom. This is an extreme test but definitely shows that the digital zoom beats cropping and upsizing in Photoshop.

7.16 EYE-START AF (A-MOUNT ONLY)

Menu Position MENU → ⚙️ 4 → Eye-Start AF

What it Does When using an A-mount lens and the LA-EA4 adapter, tells the camera to immediately start autofocus when you bring the camera up to your eye – even before you press the shutter release button halfway

Recommended Setting Off, unless you're shooting sports and you are careful

Constraints Only works with an A-mount adapter having a built-in phase detect array (LA-EA2, LA-EA4)

The history behind this feature is a long one and this book is already too big so I'm going to give you the Campbell's Condensed version:

- Once upon a time there was a feature which started AF early - as soon as you grabbed a camera AND held your eye to the EVF.
- The metals used to sense when the hand was gripping the camera were outlawed by the European Union and for some reason Sony decided to drop the grip sensor altogether.
- So now the AF will start based on just one criteria: when something is close to the eyepiece. It uses an IR emitter and detector pair placed above the EVF as shown in **Figure 7-19**.

- Having only one “start AF” criteria is a bad design. If you hang your camera around your neck, and the back of the camera rests against your chest, the camera will think your eye is next to the viewfinder and automatically start to autofocus. If this happens a lot you’ll drain your batteries in a hurry.
- This problem gets even worse since this camera has an EVF that is more battery-hungry than the rear LCD screen when it’s on, and the camera uses the same IR detector to turn on the EVF if it senses something proximate.
- As mentioned earlier, this **ONLY** applies when using an A-mount lens attached to the camera via either the LA-EA2 (designed for APS-C bodies) or the LA-EA4 (designed for full-frame) adapters.

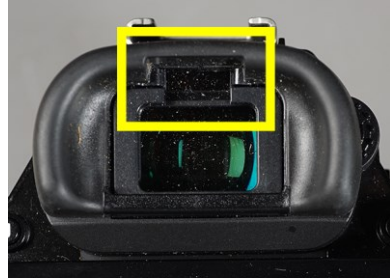


Figure 7-19: See all that dust on the optics? That’s your assurance that I take all my own product shots. Anyway, the IR emitter and detector pair assume that your eye is looking through the viewfinder whenever **ANYTHING** is up against it. (So make sure it’s your eye, otherwise needless battery drainage will occur!)


Notice that this feature does *not* wake the camera up from a power-save state (thank goodness). It simply starts the AF circuitry when the camera is already on so that you might have an extra split-second to capture that decisive moment before it goes away. If you’re a sports photographer, you might like this feature.

Regardless of whether you’re shooting sports or not, in order to maximize battery life when this feature is on, here’s what you should do:

1. Set the power save mode to something short, like 10 seconds.
2. Use just the EVF for all of your viewing needs.
3. Be extremely aware of what’s next to the camera’s IR sensors when you’re not looking through the EVF. Keep the area clear for 10 or 15 seconds until power save mode kicks in; then you’re safe to handle the camera freely.

I don't bother with any of that since the time to wake up the camera from Power Save mode is about the same as turning it on, and you're not wasting 10 seconds of battery power waiting for Power Save mode to kick in.

7.17 FINDER / MONITOR

Menu Position MENU →  4 → Finder / Monitor

What it Does Specifies how the camera switches between the EVF and the rear LCD

Recommended Setting Auto

There's a short explanation and an accurate explanation of how this function works. I'll start with the short explanation.

This function determines if the infrared sensor near the EVF should be used to automatically switch between the LCD and EVF. When set to AUTO, the rear LCD is always in use, unless something comes close to the IR sensor above the viewfinder, in which case the EVF is invoked.

When set to VIEWFINDER, the rear LCD remains dark and the EVF will only turn on if the IR sensor above the viewfinder senses something proximate.

I set this feature to VIEWFINDER whenever I'm doing some time exposures or using the intervalometer and I don't want to waste valuable battery power illuminating the rear LCD during the exposure. In this configuration battery power is only used for the display when I'm looking through the EVF.

7.18 RELEASE W/O LENS

Menu Position MENU →  4 → Release w/o Lens

What it Does Allows you to take a picture even though the camera doesn't think there's a lens attached

Recommended Setting Enable

If you attach anything other than a native E-mount lens to the camera (such as legacy glass, a telescope, LensBaby, or just drill a hole into your body cap to make a pinhole camera), because these items have no electrical contacts and don't communicate with the camera body, your camera will think that there's no lens attached and will not allow you to take the shot. Setting this feature to "Enable" saves you from Big Brother and lets you take a picture any damn time you choose. (It's also useful if you like taking off the lens and seeing how the shutter works.)

Keep in mind that most special purpose lenses have no adjustable f/stop, and so exposure mode settings "P" and "A" will provide identical automatic metering behavior. "S" and "M" modes, on the other hand, will not automatically meter for the scene at all – the camera will blindly shoot with whatever shutter speed you specify (and whatever fixed f/stop the lens has). So check your image after you shoot to make sure it's right.

7.19 RELEASE W/O CARD

Menu Position MENU →  4 → Release w/o Card

What it Does Lets you take a picture even though a memory card is not present to store it

Recommended Setting Disable

This function is kind of self-describing. The feature is there to prevent an absent-minded tourist from taking pictures even though the “NO CARD” warning is flashing in the Live View display, thus ruining his/her trip. I keep it set to “Enable” just because I often play with features in the course of writing this book and have no intention of keeping the images. For everyone else I’d recommend setting this to “Disable”.

7.20 PRIORITY SET IN AF-S / AF-C

Menu Position MENU →  4 → Priority Set in AF-S
MENU →  4 → Priority Set in AF-C

What it Does Lets you select between “Only take a picture if the camera thinks the subject is in focus” and “Take the picture NOW, damn you!!”

Recommended Setting I strongly endorse “Release” for both menu items, but it really depends on your personal tastes and working style.

There is a very important function which was designed to work in conjunction with Continuous Focus mode: It is called “Autofocus Priority”, and it essentially means “When I press the shutter release button down all the way, don’t take the picture unless the subject is actually in focus!” This can increase your yield for sports photographers, but can also increase your frustration if you’re trying to go for the decisive moment but your camera doesn’t think it’s in focus.

So if you ever find yourself saying, “Take the picture NOW, %\$#@%!”, then you are SO ready for Release Priority mode. Release Priority mode tells the camera to take the picture WHEN YOU PRESS THE SHUTTER RELEASE BUTTON, whether it thinks the image is in focus or not. History is filled with important pictures that were either out of focus or poorly exposed. Using the combination of Continuous Autofocus and Release Priority, the camera will do its best to quickly get the subject into focus, while you wait for the decisive moment to occur. The camera will never disobey your direct order to SHOOT! It’s a great partnership.

The A7r II introduces a 3rd setting for this feature called “Balanced Emphasis”. I am guessing that this is supposed to provide a happy medium between the two extremes represented by the other two settings. My problem with it is I have no idea how the camera makes its decisions in this setting, and so my trust level is low. Couple this with the fact that memory is cheap, bad pictures deletable, and that “Release” always obeys my commands, and you can quickly see why I don’t see any benefit to this new setting.

TIP: *Autofocus Priority mode does not work when your camera is set to Manual Focus, so don’t expect it to act as a tool that will only take pictures when you’ve manually set the lens to the right distance. In Manual Focus mode, you’re really on your own!*

7.21 AF W/ SHUTTER

Menu Position MENU → ⚙️ 5 → AF With Shutter

What it Does De-couples the shutter release and Autofocus Functions when off.

Recommended Setting On

Nearly every point-and-shoot and DSLR on the planet uses the shutter release button for both autofocus and for taking the picture. But I have been in situations where having one button perform two functions makes things less ideal than they could be. For example, when shooting weddings and you're taking group shots (or when you're shooting portraits in the studio), the distance between the subject and the camera doesn't change, yet each time you want to take a shot you have to focus lock on the subject, recompose, and shoot. Really, for these situations all you really need to do is focus once and then lock it in until your camera-to-subject distance changes.

The A7r II actually gives you a few different ways of doing this:

- 1) Once focus has been achieved, you can switch the camera to Manual Focus (either by **Fn → Focus Mode → MF**. This works irrespective of the status of the “AF with Shutter” setting.
- 2) Once focus has been achieved, you can switch the camera to Manual Focus by using the AF/MF button on the back of the camera. (For this to be truly helpful you'll have to set **MENU → ⚙️ 7 → Custom key Settings → AF/MF Button → AF/MF control toggle** so that this switch toggles instead of being a momentary button.) This too works irrespective of the “AF with Shutter” setting.
- 3) You can perform a useful twist on option 2) above by setting the focus mode to Manual (MF) and setting the AF/MF switch to momentary (**MENU → ⚙️ 7 → Custom key Settings → AF/MF Button → AF/MF Control Hold**, which is the factory default). In this configuration, the camera is always in manual focus mode. Whenever you need to focus, just press the AF/MF switch, which puts the camera

into AF mode momentarily until you release it. Then shoot away until you need to autofocus again. (A very handy configuration I use all the time in the studio!) Like the first two options, this works regardless of what the "AF with Shutter" is set to.

- 4) With the "AF with Shutter" option set to OFF, you can split the responsibility of focusing and shooting to two separate buttons. Make sure to set **MENU → ⚙️ 7 → Custom key Settings → 1 → Center Button → AF On** or **Eye AF**, then use the center of the control wheel to focus, then take the picture using the shutter release. Once you achieve focus, you don't have to keep holding the center button in -- the focusing will stay put until you press it again. For many years (like when I shot with film using the Minolta Maxxum 9) this was the preferred way for me to work.

So that's what the setting is for. AF with Shutter simply allows you to decouple autofocusing and taking of the picture (which normally are assigned to the same button). Personally, whenever I'm in the studio, I use technique #3 above to decouple AF with the shutter release, and therefore never have to bother with setting "AF with Shutter" to OFF.

7.22 AEL W/ SHUTTER

Menu Position MENU → ⚙️ 5 → AEL With Shutter

What it Does De-couples the shutter release and Exposure Lock when off.

Recommended Setting Auto

Usually with point-and-shoots, every time you press the shutter release button halfway, you not only lock the focusing but you also lock the exposure as well. This function lets you modify the "locks the exposure" part.


So here are the three choices and what they do:

1. **Auto** – Exposure is only locked when you're in AF-S mode and the focus has been confirmed.
2. **On** – Exposure is ALWAYS locked when you press the shutter release button halfway.
3. **Off** – Never lock exposure with the shutter release button.

Option 1 above is ideal for this reason: It will only lock exposure in AF-S (single-shot) mode. If you're shooting something that moves like a race car or bicycle, you'd be using some other mode (probably AF-C) and in that circumstance you DON'T want to lock the exposure – a moving subject will probably be moving into different light and you'll want the camera to adjust for it.

If you choose option 3 you may desire to use the AEL function if you want the exposure locked. (Section 6.24.2)

7.23 SILENT SHOOTING

Menu Position MENU →  5 → Silent Shooting

What it Does Invokes a mode where no mechanical noise is made when shooting stills

Recommended Setting I find myself choosing "Off" most of the time.

Constraints PASM mode only, no flash, no continuous shooting mode, and others listed at the end of this section

When this mode is invoked, the camera captures the image using no shutter sound at all.

You may very well ask “Since cameras don’t use film anymore, why do we still need a shutter in the first place? Can’t we just tell the sensor ‘start collecting light’ and ‘stop collecting light’?”

The short answer is “Yes, but it’s still prohibitively difficult and expensive to make the sensor that way”. Sony has been working on it, though – earlier sensors that were used with live view required the shutter to close

both before and after the exposure to get the cleanest image (and your camera can still shoot that way via **MENU → ⚙ 5 → e-front Curtain Shut. → OFF**). The sensor can now zero out the light collected in its pixels electronically, eliminating the need for the first shutter. So that's progress.

But reading out the pixels all at once requires something called a "Global Shutter" which nobody has not yet been able to realize on a sensor of this size.

***TIP:** There seems to be an additional 100ms delay – about the same duration as the delay used in shooting flash – associated with using Silent Shutter mode. This has caused me to miss some facial expressions when shooting kids. So while*



Silent shutter Off



Silent Shutter On

Figure 7-20: *Silent Shutter has some characteristic artifacts which will only show up with extreme movement. The first is that it uses the rolling shutter technique, making things that move fast look distorted (right). In this example the camera was panning with a shutter speed of 1/500th. The second might (!) be reduced dynamic range, which I'll talk about next.*

this mode is outstanding for discreet shooting, it may not be the best for the decisive moment.

And so the way the data is offloaded involves a video technique called “rolling shutter”, which reads out the captured image one row at a time rather than all at once, starting at the top and ending at the bottom a fraction of a second later. Although it works great, it can create what videographers call the “jello effect” when your subject or camera is moving during exposure – vertical lines can look like diagonal lines, for example, because of the way the sensor is being read out during the exposure. This may or may not affect you depending on how much your subject (or you) move when you’re taking stills.

You can create this effect on purpose - just shoot a picture of subjects with vertical lines while you’re panning the camera from left to right (**Figure 11-6**). To get this result I set the shutter speed to 1/500th of a second and panned the camera from left to right very quickly.

Can this jello effect be minimized? Yes – anything you can do to speed up the downloading of pixels off the sensor will lessen the intensity of this effect. Camera manufacturers like Panasonic (which have had a similar ‘silent shutter’ mode on some of their mirrorless cameras for quite some time) try to reduce this effect by resetting some analog-to-digital converter settings on-chip – essentially lowering the image quality slightly in exchange for a faster sensor readout (and hence less jello).

Is Sony using Panasonic’s technique? I wasn’t sure, so I did two quick tests. If the technique is being used, then you should be able to see some difference in the shadows of a high-ISO image when you scrutinize it carefully.



Figure 7-21: Okay, it's a boring test shot, but whatever we're looking for will be found in the shadows (yellow rectangle). See **Figure 7-22**.

And so a boring test shot appears in **Figure 7-22**, with enlargements from RAW appearing below. I did two tests, one taken at ISO 6400 and the other at ISO 102,400. No meaningful differences – while I expected to see reduced dynamic range, all I saw was a mild exposure difference. I must say these images are much closer in quality than I was expecting.

Not all features are accessible when Silent Shutter is enabled. Here's a short list of restrictions:

- This is only available in P/A/S/M modes.
- You can't shoot with flash. (Even radio triggers won't fire.) Again, this is because of the progressive nature of the sensor readout, which is incompatible with the instantaneousness of a flash.
- 14-bit RAW mode is not an option here. The camera will automatically go to 12 bit. (So that's two very slight image quality hits.)

- Multi-shot modes such as High Dynamic Range (HDR), Long Exposure Noise Reduction, and Multi-Frame Noise Reduction (MFNR) aren't available
- You can't use "Continuous" drive mode either.
- Picture Effect and Picture Profiles are not available
- You can't shoot at ISO speeds less than 100.
- Bulb shutter speed (where the exposure lasts for as long as you hold the shutter release button down) is not available.

It's always good to know about the limitations of your tools.



Figure 7-22: Enlargements from RAW of the yellow rectangle in **Figure 7-21**. Top row: ISO 6400. Not much difference. Bottom Row: ISO 102,400. Differences in exposure are there if you look for them, but no glaring evidence of reduced dynamic range. (And if you have to pixel peep to see a difference, the difference is not meaningful!)

TIP 1: Because of the progressive nature of the sensor readout in Silent Shutter mode, certain kinds of fluorescent lighting may cause a striping effect with certain shutter speeds. (Don't ask me which; I wasn't able to create a test which demonstrated the problem. But it's true in theory!)

TIP 2: Don't forget that you can't shoot in "Continuous" drive mode with Silent Shooting on.

TIP 3: Silent Shutter mode, since the image is read out gradually, increases the risk of someone else's flash partially-exposing your shot, like this example from a shot I took at a wedding:



7.24 E-FRONT CURTAIN SHUT.

Menu Position MENU → ⚙ 5 → e-Front Curtain Shutter

What it Does Obviates the need for the shutter to close first before initiating the exposure

Recommended Setting ON unless you're experiencing overexposures with older A-mount lenses

Constraints Not available when Silent Shooting is On.

So let's talk about what happens each time you take a picture with this camera normally:

1. The shutter stays open to allow live view to occur.
2. The shutter release button is pressed.
3. The shutter closes (& the sensor is reset).
4. The shutter opens (starting the exposure)
5. The shutter closes (terminating the exposure)
6. The shutter opens again (allowing Live View to occur once again).

That's a lot of shuttering! You can actually hear what all this sounds like by setting this e-Front Curtain Shutter variable to "Off" and taking a single picture. Yup! It sounds like two consecutive shots are being taken. This is a lot of extra wear and tear on the shutter too.

While there are still some technical hurdles to tackle before we can get to the day when the shutter is eliminated altogether, Sony has made some progress toward that goal by borrowing a technique pioneered by Canon in the previous decade: by eliminating the need to block out all light to the sensor at the beginning of the exposure (to "reset" the sensor). This technique is called "e-Front Curtain Shutter".

So with this new feature enabled (which is the factory default), the shutter sequence gets shortened to this:

1. The shutter stays open to allow live view to occur.

2. The shutter release button is pressed.
3. The sensor is reset electronically. The exposure begins immediately.
4. The shutter closes (terminating the exposure).
5. The shutter opens again (allowing Live View to occur once again).

That's right – ONE cycle of shutter-close-then-open. Much more efficient. I keep this on all the time.

So why would you ever want this feature to be off? When using some older A-mount lenses (and some modern 3rd party lenses), especially if they have large maximum apertures (where the f/stop blades have a further distance to travel), the lens might not be able to close their f/stop blades quickly enough to coincide with the beginning of the exposure. (In the old days the mirror had to flip up and the shutter open and the f/stop blades had more time to close all the way). If this happens to you you'll see occasional overexposed images, especially at fast shutter speeds and on bright days. Turning this feature off is the sure cure.


7.25 S. AUTO IMG. EXTRACT

Menu Position MENU →  5 → S. Auto Image Extraction

What it Does Works in conjunction "Superior Auto" mode. Tells the camera to keep only the good one if the camera decided to shoot multiple images


Recommended Setting Auto

Constraints Superior Auto mode only

When the exposure mode dial is set to AUTO, and MENU →  7 → **Auto Mode** is set to **Superior Auto**, and the camera decides to shoot continuously, you can tell the camera whether to save all of the shots it takes (OFF) or save only what it thinks is the best / sharpest one (AUTO). Useful for saving time and not filling up your memory card.

This function has no effect if Superior Auto mode chooses Auto HDR, Anti-Motion Blur, or Handheld Twilight multi-shot modes.

7.26 EXP.COMP.SET

Menu Position MENU →  6 → Exp.comp.set

What it Does Specifies whether the Exposure Compensation function affects the flash exposure as well

Recommended Setting Ambient Only


The A7r II offers two different kinds of exposure compensation: the first one is the physical Exposure Compensation dial, which adjusts how much ambient light hits the sensor.

The second, flash compensation (Section 6.12), adjusts how much light is generated from the flash, be it the pop-up, an accessory flash, or off-camera flash via wireless mode. These are two completely different kinds of exposures, and that's why the camera allows you to control both independently.

But... what if you wanted to control both at once? Then you would set **Exposure Compensation Set** to **Ambient&Flash**, and from that time on changing the exposure compensation would control both the ambient light and amount of flash.

There has never been a time in my professional career when I had wanted to adjust both at once... In fact, often I set the flash to -1 or -1.7 so it looks more natural when I'm using the flash as a fill. That's why I recommend setting this parameter to "Ambient Only".


7.27 RESET EV COMP.

Menu Position MENU →  6 → Reset EV Comp.

What it Does "Do you want the exposure compensation setting to reset to zero every time you turn off the camera?"

Recommended Setting Reset

Constraints Not valid when the Exposure Compensation Dial is set to something other than zero.

As you know there are two ways to change the exposure compensation: Via the dedicated dial and via **MENU →  4 → Exposure Comp.** (Yeah, I don't know why they allow you to do it in software as well... especially since the menu-based exposure compensation can't be recalled in a memory location!)

Anyway, when set to **RESET** this setting will change the menu-based exposure compensation setting to zero when the camera is switched off. (This is only true when the physical Exposure Compensation dial is set to zero.) If you set this variable to **MAINTAIN** then it remembers.

TIP: *Keep in mind that the physical Exposure Compensation dial will always override the menu-based Exposure Compensation setting when it's set to anything but zero!*

7.28 FACE REGISTRATION

Menu Position MENU → ⚙️ 6 → Face Registration

What it Does Allows you to register up to 8 different faces it can prioritize focusing on a preferred person in a group shot

Recommended Setting n/a

You already know that your camera (with Face Detection enabled) is able to recognize faces and therefore will use those as the subject on which to focus and expose for. (In fact, this is one of my favorite features of this camera, especially when shooting kids!) Sony has now pushed this concept even further by allowing you to register up to eight different faces with the camera. When faced with a group of many faces from which

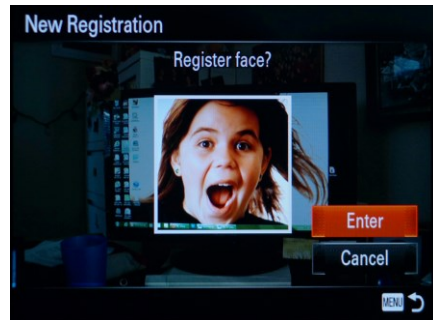


Figure 7-23: You can take a picture of a picture in order to have the camera prioritize your favorite face.

to choose, the camera will consult with these previously-stored faces and look for a match – if a match is found, the camera will give focus priority to the registered faces. What if two registered faces are detected? Then you can tell the camera which one takes priority.

In theory, Face Registration would be ideal when shooting sports (like soccer games where the person of interest is flocked by a whole lot of other people), but regretfully when shooting from the sidelines the faces won't really appear large enough for the face recognition to work. And while it works in group shots very well, in those cases all people are roughly the same distance from the camera anyway (plus you want everyone to be in focus, not just one particular person) so there's no great benefit.

Here's how to use it anyway:

- Invoke **MENU → ⚙ 6 → Face Registration → New Registration.**
- The camera presents you with a small square. Fill that square with the face of your choice and take the picture. (**Figure 7-23.**) You can even take a picture of a picture - you don't need the person actually there. Hit OK each time you're prompted.
- Now make sure **MENU → 📷 7 → Smile / Face Detect.** is set to **ON (REGIST. FACES).**

That's it! From now on, when you start composing your shot, any recognized face will get focusing priority.

You can register up to 8 different people. And if no registered faces are recognized, then the camera will revert to just focusing on any old face it sees. This feature won't work on pets, and for maximum effectiveness you should use good light when taking your classic head shot. (In other words, the more detail the camera has, the better job it will do recognizing a person.)

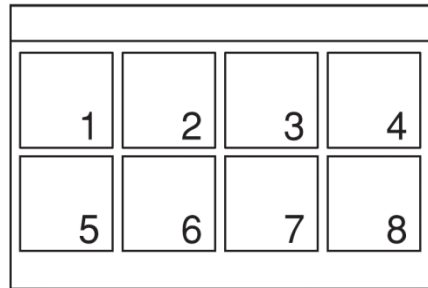


Figure 7-24: You can re-shuffle the registered faces to tell the camera which face has priority.

Want to take it a step further? If you have a favorite child, you can program the camera to favor that child in case it recognizes both your favorite and non-favorite child in the same picture. 😊 Just register both faces in the camera and then use the **MENU → ⚙ 6 → Face Registration → Order Exchanging** function to tell the camera which face to favor (**Figure 7-24**). Just call it up, select a face, and then choose which priority level you want.

7.29 APS-C / SUPER 35MM

Menu Position MENU → ⚙️ 6 → APS-C / Super 35mm

What it Does Tells the camera to only capture a picture using a portion of the full-frame sensor

Recommended Setting Auto

Okay, so you probably know that older digital cameras used the APS-C sized sensor because they were easier and cheaper to make. And you probably also know that lenses designed for those smaller sensors produced smaller image circles (**Figure 7-27**) that, when attached to your A7r II, will produce a whole lot of vignetting not unlike the example in **Figure 7-26**. If your camera recognizes that such a crop-mode lens has been attached it automatically switches this function to only use the center of the sensor equivalent in size to an APS-C sensor, yielding images that are 18 MP in size. The camera adjusts the live view image so that only the APS-C-area of the sensor fills the viewfinder. Usually I have this set to AUTO to have it kick in automatically.

Type	APS-C	Super 35	35mm Full Frame
sensor w x h	22.2 x 14.8mm	24.89 x 18.66mm	36 x 24mm
sensor diagonal	26.7mm	31.1mm	43.3mm
sensor area	329mm ²	464.44mm ²	864mm ²
crop factor	1.62	1.39	1

Figure 7-25: A comparison between the sizes of the Full-frame sensor (right) and the smaller APS-C sensor (left). The "Super 35mm" is a size similar to APS-C defined by the movie industry.

TIP: Putting an APS-C lens onto your A7r II essentially turns your camera into an 18 MP shooter.

TIP 2: When this feature is set to AUTO, when you go to shoot 4K video the camera will automatically go into "Super 35mm" mode, meaning what you're shooting will look a little zoomed in. If you don't want it to automatically zoom in like that, set this feature to OFF.

Every E-mount lens made before the introduction of the original A7 is an APS-C lens, and therefore will invoke this function automatically when mounted. But if you're shooting with legacy glass (well, APS-C legacy glass) then you'd have to set this feature to ON to tell the camera "just use the center part of the sensor – I've got an APS-C lens attached to you!")

But now there's more to it than



Figure 7-26: This is what would happen if your camera didn't do an automatic crop when it sensed an APS-C lens attached to your camera. (This is me giving a seminar.)

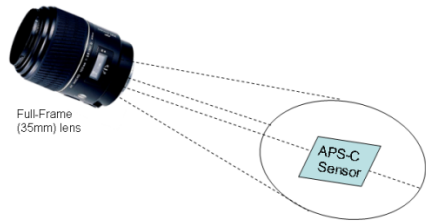


Figure 7-27: When a full-frame lens is projected onto an APS-C sized sensor, very little of what the lens sees is captured by the sensor.

that. The movie industry has also latched onto a sensor size that is a tiny bit larger than an APS-C sensor, and calling it "Super 35mm" (strange since there's nothing super about it. It's the center example in **Figure 7-25**). But if you're shooting 4K video the camera will automatically switch to this Super 35mm part of the sensor because that will yield the best video quality. Notice that your video will look a little zoomed in when you shoot in this mode because of the crop factor. If that bothers you, you can switch this OFF and your wide angle lens will once again be wide.

7.30 AF MICRO ADJ. (A-MOUNT LENSES ONLY)

Menu Position MENU →  6 → AF Micro Adjust

What it Does Invokes a feature which can correct for focusing problems when using certain lenses

Recommended Setting On

Constraints Only needed for an A-mount lens with an LA-EA2 or LA-EA4 adapter.

One of the things that has been plaguing Autofocus Cameras (from all manufacturers) for over a decade has been a phenomenon commonly called “Backfocus” – it refers to a scenario where a lens-body combination will autofocus inaccurately – typically a centimeter or two behind (or in front of) where the camera ought to be focused. If you’re doing critical work on your camera a Backfocus (BF) or Frontfocus (FF) issue can really ruin a shot for you.

What causes this is a little difficult to explain – it’s not just the body and it’s not just the lens, but the two of them each might be just enough out of tolerance to produce a consistent focusing error when used together. If you wanted to fix this in the olden days you’d have to send both the camera and lens back to the manufacturer so they could be calibrated together. While that may have worked, it was time consuming and expensive and often the problem would be fixed with the lens you sent in but then it would start to happen on other, previously accurately-focusing lenses.

This problem is eliminated completely in mirrorless cameras, where the sensor = the focusing sensor. It’s a closed loop system, with no possibility of bad manufacturing tolerances giving way to inaccurate AF. However, when attaching an A-mount lens with either the LA-EA2 (APS-C) or LA-EA4 (full-frame) adapter, the old fashioned phase-detect array is built in to the adapter and therefore the possibility of this kind of focusing error returns. Hence this feature which allows you to calibrate your lenses and dial in a correction if backfocus is evident. Whenever you put that lens back on, the camera recalls the AF correction amount you dialed in for that

lens. The camera can remember correction values for up to 30 different lenses.

7.30.1 HOW TO TEST

There is a right way and a wrong way to test for Backfocus issues. The wrong way can be seen in **Figure 7-28**, where you just have a ruler with a continuous scale at a 45 degree angle from the camera. There are several reasons why this test is unideal: the center focusing sensor is actually larger in size than the

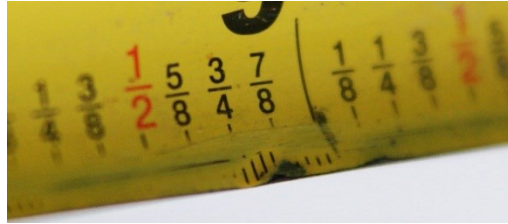


Figure 7-28: The wrong way to test for frontfocus / backfocus issues is looking at a continuous scale on a ruler or tape measure at a 45-degree angle to the camera.

small square you see in the viewfinder, so you never know which part of the rectangle it will focus on if there's more than one choice. In some cases the pattern can easily confuse the autofocusing algorithms (especially when you're testing in poor light conditions, such as under compact fluorescent light).

A better test was published back in 2003, when the backfocus issues with the Canon 10D were dominating internet discussion boards. Bob Atkins from Photo.net published a well-thought-out plan for testing and even provided a proper testing chart that you could print out and use yourself (**Figure 7-29**). This is a better chart because there is only one vertical line for your center sensor to focus on; and you can read the degree of BF/FF in centimeters in the edge of the image. (The scale was designed so the distances between the numbers would actually be one centimeter apart when viewed at 45 degrees. Very clever!)

You can read the entire Photo.net article here: <http://photo.net/learn/focustest/> and you can download your own chart for your own testing from here: <http://tinyurl.com/bpv2a5>.

The best procedure I know of to calibrate your camera/lens combination using the AF Micro Adjust feature and this chart is outlined below:

1. Tape the test chart to a wall, and position your camera on a tripod at 45 degrees to it as shown in the bottom half of **Figure 7-29**. Your goal is to place the camera so that the test chart fills the frame (as much as possible), and the small line in the center is placed *directly* behind the center focusing point within the viewfinder.
2. Place the camera into “A”perture exposure mode and open the f/stop all the way (smallest number).
3. Ensure that only the center focusing point is selected (via **Fn → Focus Area → Center**).
4. Put your camera into 2s self timer mode (**Fn → Drive Mode → Self Timer (2s)**).
5. Autofocus on the center line, and then take a picture.
6. After the camera takes the picture, examine closely the scale on the picture’s edges. A properly working camera-lens combination will look like that in **Figure 7-30a**; a problem combination looks like that in **Figure 7-30b**.

7. If you have a problem lens, you can “dial in” a correction via the camera’s AF Micro Adjust feature:

- a. Setting the adjustment for the lens to +20 will have the camera focusing 1 cm further away than it should (this is how I shot **Figure 7-30b**)
- b. Setting the adjustment for the lens to -20 will have the camera

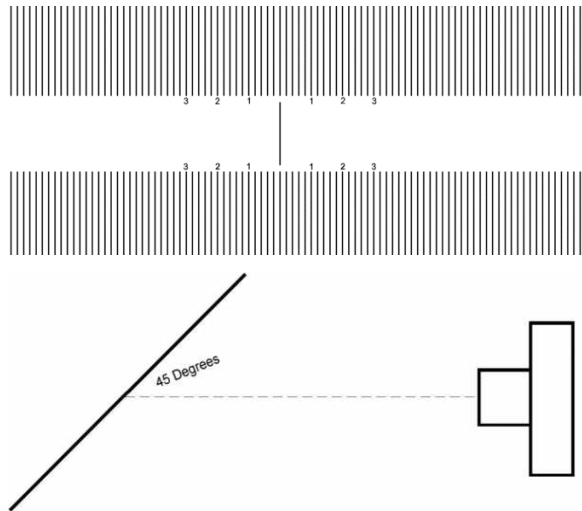


Figure 7-29: A test chart designed not to confuse the camera (above, downloadable from Photo.net). A recommended testing scenario appears on the lower illustration.

focusing 1 cm closer than it should.

Repeat steps 5-7 until the center line looks sharp. Then change to your next lens and repeat the procedure starting from Step 5.

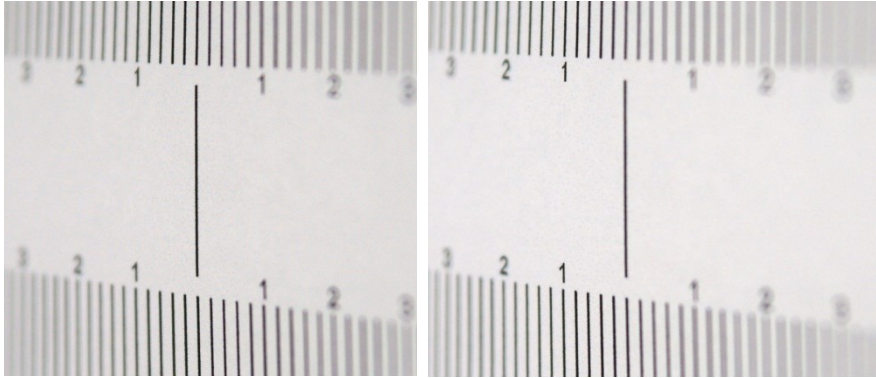


Figure 7-30: Healthy test results (left), and a problem (right). The problem is that the center of gravity of in-focus measurement marks is to the left of the large vertical line.

As you can see, AF Micro Adjust gives you a very fine way of tuning the focusing system. If you are testing a zoom lens, it's most meaningful to test the lens all the way zoomed in.

Once you have dialed in the correct amount (and verified that it works properly), you need not do anything else. The camera remembers this correction and will invoke it again automatically every time you re-attach this lens. The camera can keep track of corrections for up to 30 *different* lenses.

Q: What if I have two Minolta 50mm f/1.4 lenses – will the camera distinguish between the two?

A: No, it won't. Each lens has a manufacturer's model number which is communicated to the camera body each time it is attached. The camera has no way to distinguish between two models with the same model number.

Q: What if I have a Sony 85mm f/1.4 and a Minolta 85mm f/1.4?

A: The camera cannot differentiate between two lenses of the same specifications; even if they were manufactured under different regimes. It will see both lenses as being the same one.

Q: Will the AF Micro-Adjust feature affect the way I focus manually with the camera?

A: No, it won't, as the physical light path from the lens to the sensor doesn't change. All this does is put in a slight adjustment for when the camera autofocuses with your chosen lenses.

TIP: Those of you who are curious can see the published Lens ID table used for AF Microadjust for yourself: <http://bit.ly/1q57RRp> . Rightly or wrongly, Sony doesn't take decimals into account. For example, lens ID# 24 is the Minolta 24-105....but lens ID# 24.5 is the Sigma 18-200. So if you own both those lenses, you'll have a conflict.

7.31 LENS COMP.

Menu Position MENU →  7 → Lens Comp.: [3 variables]

What it Does Allows your camera to digitally correct 3 types of common lens ailments for lenses that it knows about (most apply to .jpgs only)

Recommended Setting AUTO on all three variables

Constraints Only works for lenses it knows about.

There are two ways to get exceptional image quality: 1) start with the highest-quality, most-expensive lenses available, or 2) start with slightly cheaper lenses and use computers to compensate for their known deficiencies.

In the past this was the work of high-end photo workflow software, but now it's baked into your camera which makes things considerably easier for you. These features can perform these computerized lens correction algorithms for three of the most common types of lens deficiencies: Vignetting in the corners ("Shading"), Chromatic Aberration ("Chro. Aber."), and either Pincushion or Barrel distortion ("Distortion").

As of this writing the camera knows about all native E-mount and FE lenses, and Sony will add data for future lenses via future firmware updates. The effects are applied to .jpgs only (with the sole exception of the "Shading" variable, which interestingly gets applied to RAW files too!)

Normally I'd recommend keeping all three of these variable set to ON all the time. Because they are computationally expensive, in the past I've recommended turning these OFF if you're shooting at very high frame rates (which this camera can't do).

7.31.1 SHADING

The first setting is the easiest to see: A darkening in the corners, and almost all lenses have it to some degree. (Worse, sometimes you'll have more of it as you zoom in or out, making it difficult to correct for as a batch program on your computer). The rest of the world calls this "Vignetting"; however Sony didn't want to scare you off so they called it "Shading" instead. You can see an



Figure 7-31: An extreme case of Vignetting (Shading) in the corners. (And no, I didn't take this picture...)

extreme example of Vignetting in **Figure 7-31**. If you want to get rid of it programmatically, just set this function to AUTO.

TIP: 'Shading' is the ONLY special effect that applies to RAW files as well as .jpg. (And if you're a purist like me, you'd be saying "It shouldn't be applied to RAW at all!" C'est la vie.)

7.31.2 CHROMATIC ABERRATION

The next setting usually occurs only in telephoto lenses. As you know, optics are designed to bend light. And as you also may know, optics might also have the ability to bend light like a prism does – that is, different wavelengths get bent by different amounts (**Figure 7-32**). To combat this, many expensive telephoto lenses employ something called “apochromatic” glass which is designed to bend visible wavelengths by the same amount, resulting in very sharp pictures at long focal lengths. The good news is that if you don't have such a fancy lens, it is now possible to correct for this in-camera by understanding the lens' CA characteristics extremely well. And I can think of no good reason to ever turn this feature off.

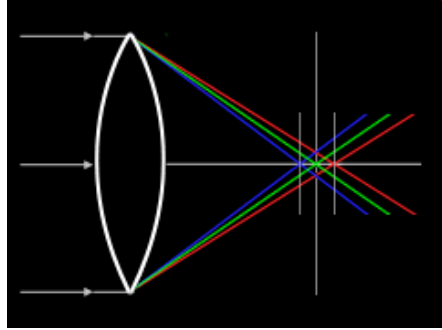


Figure 7-32: Chromatic Aberration is what happens when the optics don't bend all wavelengths of light by the same degree. Usually this effects telephoto lenses above 200 mm.

7.31.3 DISTORTION

The third lens correction is formally referred to as either “Pincushion Distortion” or “Barrel Distortion” (but Sony likes to just call it “Distortion”). Essentially it means that a lens will start to curve straight lines at different focal lengths. (See an example in **Figure 7-33**.) If you understand the characteristics of a specific lens (at each focal length) you can correct for it in-camera, which is what the LENS COMP.: DISTORTION mode does when it's set to AUTO. Like the other lens

TIP: The Distortion Correction function is only enabled when the camera recognizes a native lens whose distortion characteristics it knows about. I can't find a comprehensive list of such lenses anywhere, but don't be surprised if this option is greyed out when you try to enable it.

correction functions, I can think of no good reason to turn this feature off. (Ever.)



Figure 7-33: Pincushion distortion (left) is often the worst at wide angles. This, too, can be corrected automatically via the Lens Correction: Distortion function (right). Notice also that the slight vignetting in the corners can be corrected, too!

7.32 AF SYSTEM

Menu Position MENU → ⚙️ 7 → AF System

What it Does Lets you specify what kind of autofocus technology to use when an LA-EA1 or LA-EA3 A-mount adapter is attached

Recommended Setting: Phase Detect

While it's true that the A7r II employs what's called a Hybrid AF system (which utilizes both the older Contrast Detect AF and the newer on-chip Phase Detect AF), when you attach a Sony or Minolta A-mount lens using either the LA-EA1 (for APS-C lenses) or LA-EA3 (for full-frame lenses) adapter, you can only choose one type of AF or the other. (This applies to other "smart" adapters as well, such as the Metabones IV for the Canon EF lenses.)

Even so, when you are allowed to choose only one or the other, there are certain trade-offs you should know about:

Benefits to choosing Phase-Detect AF:

- Much faster AF
- Works in AF-C mode (CDAF doesn't)

Benefits to choosing Contrast Detect AF:

- Eye AF is available.
- More focusing modes are available – specifically Zone, Expand, Flexible Spot, and Lock-on AF.
- You can place the Flexible Spot focus point anywhere in the frame (except for the extreme edges). (With Phase-Detection, you're limited to the area shown with the "Phase Detect Area" function described in Section 7.13.)

TIP: When "Phase Detect" is chosen, Priority Set in AF-S mode (Section 7.20) is fixed to "AF".

I think the main reason this feature is here is so you can see for yourself the superiority of the new on-chip Phase Detect autofocus system is compared to the older contrast-detect AF. ☺

As you might expect with a complex and nuanced feature such as autofocus, there will be some caveats and restrictions when trying to be backwards-compatible with older lenses. Here's a short list:

- Phase Detection only works with lenses where the f /stop is less than F9 when focusing.
- Phase detection only works when you attach lenses that were designed to be driven by phase-detect commands. As far as I know, every A-mount lens ever made was designed for phase-detect commands, so I'm not sure why Sony put that caveat in the manual.

7.33 VIDEO LIGHT MODE

Menu Position MENU → ⚙️ 7 → Video Light Mode

What it Does Dictates how and when certain accessory Video Lights will illuminate when mounted on the MIS hot shoe.

Recommended Setting: Power Link for professional crews; REC Link for family movies.

An accessory video light that is designed to mount on top of the camera via the hotshoe (officially called the Multi-Interface Shoe) can communicate with the camera and turn the light on and off automatically each time you start/stop shooting video. This function lets you change the behavior slightly. The options are:

- **Power Link** – The accessory video light, when turned on, will only illuminate when the camera is on. (This is the factory default.)
- **REC Link** - The video light will only operate when you're actually recording video. (This is my preferred setting for casual home movies, but I'll switch to Power Link when I'm part of a crew. It's essential to see how your image will look before you start shooting!).
- **REC Link & STBY:** the same as Power Link above, except the light dims when you're not shooting video. (It saves batteries, and might help the camera with autofocus before you start shooting.)
- **Auto:** Just like a consumer camcorder, the accessory light automatically illuminates only when the camera thinks it's too dark to shoot. If you're a control freak you won't like this feature.

TIP: Sony doesn't say which of its video lights this feature is compatible with (and so far I haven't been able to figure it out).

7.34 FUNCTION MENU SET.

Menu Position MENU → ⚙️ 7 → Function Menu Set.

What it Does Allows you to populate the 12 quickly-accessible slots of the Fn menu.

Recommended Setting These are intensely personal choices. I’ve made only one change to the factory defaults

Reassigning these 12 positions is pretty straightforward – just do **Menu → ⚙️ 7 → Function Menu Set.**, choose the position you wish to re-assign, and then choose from the menu of allowable functions.

The set of choices you have available to you for each square is a subset of the choices you have for the Custom Key settings (next section), and so to save space a complete list everything along with their descriptions and where to turn to learn more appears in the next section. (Note that some of the items in the list may be out of order – they’re presented differently depending on whether you’re assigning a Fn space or assigning a button.)

The only one I changed was the one in the lower-right-hand corner – instead of “Shoot Mode” (which is pretty useless since you can see the

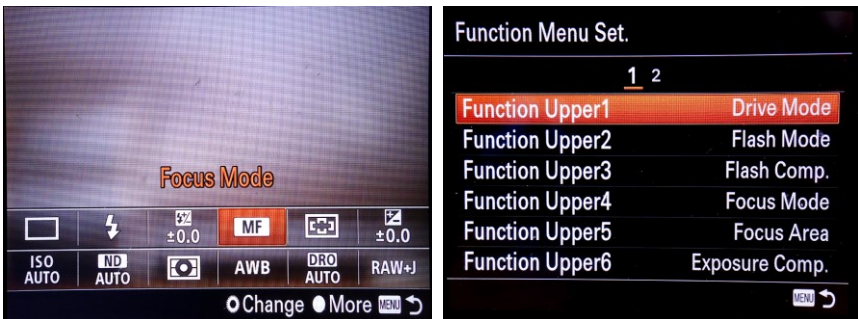


Figure 7-34: The options presented to you in the Fn menu (left) are determined by the Function Menu Set. screen (right).

shoot mode on the exposure mode dial) I changed it to “Quality” so I can quickly switch between “RAW+JPG” and “X.Fine” – a change I make often in the field.

TIP: If you keep the **MENU** → ⚙️ 7 → **Function Menu Set.** → 2 → **[Everything]** set to “Not Set”, then the Fn menu will only show you 6 squares instead of 12.



7.35 CUSTOM KEY SETTINGS


Menu Position MENU →  7 → Custom Key Settings

What it Does Allows you to reassign certain buttons

Recommended Setting These are intensely personal choices

The A7r II allows you to assign new functions to the following buttons, overriding the factory defaults (but not their labeling!):

A7r II reassignable buttons
Control wheel (around the center button)
Custom Buttons C1, C2, C3, and C4
Center Button
Left arrow button
Right arrow button
Down arrow button
AEL Button (when switch is in the "AEL" position)
AF/MF button (when switch is in the "AF/MF" position)
Focus Hold Button (which appears on a limited number of lenses)

Reassigning buttons is pretty straightforward – just do **Menu** →  7 → **Custom Key Settings**, choose the button you wish to re-assign, and then choose from the menu of allowable functions.

Not all functions can be assigned to all buttons, as the comprehensive table in the next section will show.



7.35.1 ALL ASSIGNABLE FUNCTIONS




There are some assignable functions that don't appear in any other menu and require some explanation. I'll go over ALL of the available functions

here, and will explain the ones that aren't covered in the book anywhere else after that.

Feature	Descriptions	C1 – C4	Center Button	Left Right Down	AF/MF AEL	Focus Hold	Control Wheel
Standard	This invokes Center Lock-On AF (if feature is already enabled). When the Focus Area is set to "Zone", "Flexible Spot", or "Expand Flexible Spot", this lets you change the focusing location quickly. If the Center Lock-on AF is disabled and AF Area is set to Wide or Lock-On AF Wide, pressing the center button instantly switches to Center focus area and locks the focus. In all other focusing modes, it does nothing.		✓				
Drive Mode	Brings up the Drive Mode menu screen.	✓	✓	✓	✓	✓	
Selftimer during Bracket	Specifies an optional self-timer duration during all bracketing modes (Section 6.10)	✓	✓	✓	✓	✓	
Flash Mode	A quick way to access the Fn → Flash Mode menu (Section 6.11)	✓	✓	✓	✓	✓	
Flash Comp.	A quick way to access the Fn → Flash Comp. menu (Section 6.12).	✓	✓	✓	✓	✓	
Focus Mode	A quick way to access the Fn → Focus Mode menu (Section 6.14).		✓		✓	✓	

Focus Area	A quick way to access the Fn → Focus Area menu (Section 6.15).	✓	✓	✓	✓	✓	
Focus Settings	This function lets you change the Focus Area if you have a native AF lens attached, and the Focus Magnifier if you have any other kind of lens attached. (Section 6.16)	✓	✓	✓	✓	✓	
Exposure Comp.	Make the image darker or lighter. This goes from -5 to +5 stops (wherease the dedicated exposure compensation dial goes from -3 to +3). (Section 6.20).	✓	✓	✓	✓	✓	
ISO	A quick way to access the Fn → ISO (Section 6.22).	✓	✓	✓	✓	✓	✓
ISO Auto Min. SS	Specifies the slowest shutter speed allowed before Auto ISO kicks in (Section 6.23)	✓	✓	✓	✓	✓	
Metering Mode	A quick way to access the Fn → Metering Mode menu (Section 6.24).	✓	✓	✓	✓	✓	
White Balance	A quick way to access the Fn → White Balance menu (Section 6.25).	✓	✓	✓	✓	✓	✓
DRO / Auto HDR	A quick way to access the Fn → DRO / Auto HDR menu (Section 6.26).	✓	✓	✓	✓	✓	
Creative	A quick way to access	✓	✓	✓	✓	✓	✓

Style	the Fn → Creative Styles menu (Section 6.27).						
Picture Effect	A quick way to access the Fn → Picture Effects menu (Section 6.28).	✓	✓	✓	✓	✓	✓
Picture Profile	Quick access to the Picture Profile menus (designed for Video). (Section 6.29)	✓	✓	✓	✓	✓	
Smile / Face Detect.	A quick way to access the Fn → Smile / Face Detect menu (Section 6.35).	✓	✓	✓	✓	✓	
Soft Skin Effect	Turn the soft-skin effect on or off (or adjust its intensity). (Section 6.36).	✓	✓	✓	✓	✓	
Auto Obj. Framing	A quick way to access the Fn → Auto Obj. Framing menu (Section 6.37).	✓	✓	✓	✓	✓	
SteadyShot	Enables / Disables the steady shot feature (there are two functions here – one for stills only, one for movies only) (Section 6.41).	✓	✓	✓	✓	✓	
SteadyShot Adjust	A quick way to access MENU →  8 → SteadyShot Settings → SteadyShot Adjust (Auto / Manual). (Section 6.42)	✓	✓	✓	✓	✓	
SteadyShot Focal Len.	A quick way to access MENU →  8 → SteadyShot Settings → SteadyShot Focal Len	✓	✓	✓	✓	✓	




	(Where you specify the focal length of your manual focus lens so SteadyShot will work its best). (Section 6.42)						
Audio Rec Level	Allows you to adjust the audio levels of the built-in or external microphones (Section 6.46)	✓	✓	✓	✓	✓	
Image Size	A quick way to access the MENU →  1→ Image Size menu (Section 6.1).	✓	✓	✓	✓	✓	
Aspect Ratio	A quick way to access MENU →  1→ Aspect Ratio menu (Section 6.2).	✓	✓	✓	✓	✓	
Quality	A quick way to access the MENU →  1→ Quality menu (Section 6.3).	✓	✓	✓	✓	✓	
In-Camera Guide	Not sure what a particular menu of Fn function does? Press the assigned button and a one-line memory jog appears on your screen.	✓			✓	✓	
Memory	Lets you store much of your current configuration to one of six memory locations (two of which reside in the camera's memory) (Section 6.50).	✓	✓	✓	✓	✓	
AEL hold	Locks the current exposure, for as long as you hold your finger on the assigned button.	✓	✓		✓	✓	

		Not available in menus.						
AEL toggle		Locks the current exposure until you press the assigned button again. Not available in menus.	✓	✓	✓	✓	✓	
<input type="checkbox"/> AEL hold		Switches to Spot Metering mode and then locks the current exposure for as long as you hold your finger on the assigned button. (Section 6.24.2) Not available in menus.	✓	✓		✓	✓	
<input type="checkbox"/> AEL toggle		Switches to Spot Metering mode and then locks the current exposure until you press the assigned button again. (This one's my personal preference.) (Section 6.24.2) Not available in menus.	✓	✓	✓	✓	✓	
FEL Lock Hold		Flash Exposure Lock (Hold) – Use in the same circumstances as when using AEL above – when your flash-illuminated subject is not being metered properly by the camera. (Section 7.35.4)	✓	✓		✓	✓	
FEL Lock Toggle		Flash Exposure Lock (Toggle) – Use in the same circumstances as when using AEL above – when your flash-illuminated subject is not being metered properly by the camera.	✓	✓	✓	✓	✓	

	(Section 7.35.4)						
FEL Lock / AEL Hold	This combines Flash Exposure Lock and Exposure Lock in one convenient button. (Section 7.35.4)	✓	✓		✓	✓	
FEL Lock / AEL Toggle	This combines Flash Exposure Lock and Exposure Lock in one convenient button. (Section 7.35.4)	✓	✓	✓	✓	✓	
AF/MF Control Hold	Changes the Autofocus / Manual Focus status for as long as you hold that button down. Not available in menus.	✓	✓		✓	✓	
AF/MF Control Toggle	Changes the Autofocus / Manual Focus status until you press it again. Not available in menus.	✓	✓	✓	✓	✓	
Center Lock-On AF	Initiates the Tracking of a slow-moving object (Section 3.6)	✓	✓	✓	✓	✓	
Eye-AF	Tries to focus on the eye if it detects a face. (No face? No focus.) You can invoke this feature even if Face Detection is off. (Section 7.35.3)	✓	✓		✓	✓	
AF On	Assign just the ability to autofocus to a button. (No exposure lock)	✓	✓		✓	✓	
Focus Hold	Tells the camera to stop trying to focus right now.	✓	✓		✓	✓	
Aperture Preview	Performs the classic depth-of-field preview	✓	✓		✓	✓	

	(which shouldn't be necessary since e-mount lenses ALWAYS are in stopped down mode!) However, it does stop down the lens on an A-mount lens when attached, and so I declare that that's what this feature is specifically for.						
Shot. Result Preview	Lets you preview things like lens correction, DRO effects, and even blurry moving objects with slow shutter speeds before you shoot. (DRO seems to be previewed all of the time with this camera).	✓	✓		✓	✓	
Bright Monitoring	Brightens the Live View image to help you compose and focus your shot in extreme darkness (like for the cover of this book). (Section 7.35.2)	✓	✓	✓	✓	✓	
Zoom	Just a dumb digital zoom – throws away pixels and doesn't try to upsize it back to 20 MP. (Most useful when shooting videos – gives you a nice smooth zoom when you hold down the right arrow button.)	✓	✓	✓	✓	✓	
Focus Magnifier	Magnifies the Live View image so you can manual focus with great precision (Section 6.31). Not available in menus.	✓	✓	✓	✓	✓	

Deactivate Monitor	Not available in any menu. "Turns off" the rear LCD (even though it's still on – notice the f/stop and shutter speed info along the bottom are still being displayed). <i>This feature is useless.</i> The best way to disable the rear screen is to Menu → ⚙ 4 → FINDER / MONITOR → Viewfinder , and don't put anything near the EVF (Section 7.17).	✓	✓	✓	✓	✓	
MOVIE	Starts / Stops the recording of video.	✓	✓	✓	✓	✓	
Zebra	Brings up the zebra settings menu (Section 7.1).	✓	✓	✓	✓	✓	
Grid Line	Lets you choose between one of three grids (compositional aids) or turn it off. (Section 7.4.)	✓	✓	✓	✓	✓	
Marker Disp. Sel.	Lets you specify compositional aids while Exposure Mode dial is set to "movie" (Section 7.5)	✓	✓	✓	✓	✓	
Audio Level Display	Makes the pseudo-VU meters appear / disappear in movie mode (Section 7.6)	✓	✓	✓	✓	✓	
Peaking Level	Lets you set the Peaking Level to high-medium-low (Section 7.9)	✓	✓	✓	✓	✓	
Peaking	Lets you set the Peaking Color to yellow-red-	✓	✓	✓	✓	✓	

Color	white (Section 7.9)						
Silent Shooting	Enables / Disables shooting without a mechanical shutter. (Section 7.23)	✓	✓	✓	✓	✓	
Finder / Monitor Sel.	Temporarily forces the display through the EVF only. (Similar to Section 7.17)	✓	✓	✓	✓	✓	
Send to Smartphone	Shortcut to MENU →  1 → Send to Smartphone . (Section 8.1.) There's no need to assign this anyway – when you're playing back you can just hit the Fn button and you'll get the Send to Smartphone menu.	✓	✓	✓	✓	✓	
Download Appli.	Shortcut to any application that's already been downloaded to your camera. The specific application you want to run is determined immediately after the custom button assignment is made. Not available in a menu.	✓	✓	✓	✓	✓	
Application List	Shortcut to MENU →  1 → Application List (Section 9.1.)	✓	✓	✓	✓	✓	
Monitor Brightness	Shortcut to MENU →  1 → Monitor Brightness (Section 11.1.)	✓	✓	✓	✓	✓	
TC/UB Disp.	Enables the viewing of time code and userbit	✓	✓	✓	✓	✓	

Switch	on screen while shooting video (Section 11.15)						
Not Set	The assigned button does nothing.	✓	✓	✓	✓	✓	✓
Aperture	Change the f/stop in A or M exposure modes. (And invokes program shift in "P" mode.)						✓
Shutter Speed	Change the shutter speed in S or M exposure modes. (And invokes program shift in "P" mode.)						✓

7.35.2 BRIGHT MONITORING

In my blog on <http://bit.ly/1JO6W6E>, where I talk about how I shot a star trails picture (**Figure 7-35**, and the cover of this book), I lamented about how it was almost impossible to compose and focus shots like this in the dark without an optical viewfinder. If only I had finished that book when I shot that, I would have known that this new feature was put there by Sony to address this specific problem!



Figure 7-35: The Bright Monitoring function was designed to help you compose your shot in extremely low light – situations where previous Live View cameras would only show you a black screen.

When you enable this feature, the camera SLOWLY starts to oversample the Live View capture – very similar to what it does when Auto Slow Shutter is engaged in movie mode – in order to offer you a brighter view but at a slower refresh rate. So don't expect to be able to use this to capture the decisive moment, but it can be a life-saver when you're trying to compose your time exposure shot in a very dark place.

This feature only works in PASM mode with the focus mode set to Manual. And it has to be dark. And while it's an awesome feature for people who want to carefully compose their time exposures, it's unfortunate that the brightness boost does NOT kick in when you're focusing manually using MF Assist (which is my preferred configuration).

TIP: *You will see no boost in brightness when there's plenty of light to focus by.*

7.35.3 MORE ON EYE AF

This feature is a great idea, although it will only make a difference in limited circumstances. If you're shooting portraits, the traditional method of focusing was to switch to Spot AF and focus-lock on the eyes, then recompose and shoot. Well, Sony has modified their excellent Face Detection algorithms (which I have come to rely on now when shooting the grandkids) to hone in on just the eye, doing what you would do normally without having to resort to the focus-lock-recompose-shoot method.

In order to use it you have to assign it to a button, and I find the most natural choice for me is the center button on the back. To use it, you have to hold the center button in to focus lock and then shoot with your index finger. The trick to making it work is to use the 1st joint rather than the ball of your thumb on the center button. Then it won't feel so awkward.

Back in Section 1.1.11 I gave a small rant about the way this feature was implemented, and so I won't repeat it here. (Other than to say that if you try to use Eye AF on a subject without a detectable face, the focus will fail – it won't try to default on "just focus on something if you can't find a face".) Go ahead, read the rant in the aforementioned section. I'll wait.

So here it makes sense to harp on the stronger features of Eye AF:

- This is actually an improved implementation over previous cameras. For example, when holding the button down in AF-C mode, Eye-AF can actually be used to track the eye if it's moving around the frame.
- Eye AF overrides whatever focus area you have set, although it does pay attention to where your flexible spot or expanded flexible spot is and seeks out an eye nearest that point.
- This feature works independent of whether Face Detection is on or not.
- Multiple faces in your composition? Registered faces (i.e., your favorite child 😊) take priority.
- Eye AF doesn't work in video.

7.35.4 *FLASH EXPOSURE LOCK / HOLD*

This is a very handy feature, and you use it the same way you would use the Autoexposure Lock (AEL) button (Discussed in the "Metering Mode" Section 6.24). Just like with normal exposure, sometimes your subject does not constitute the majority of your composition, and the camera will have a hard time figuring out when your subject has had enough light. When this happens the camera will get the flash exposure completely wrong. (See example in **Figure 7-36**.)

This feature can only be available if you assign it to a button, and if you do I strongly recommend you assign Flash Exposure Lock Toggle (the other option, Flash Exposure Lock Hold requires you to hold that button in until you're finished shooting, something I don't enjoy doing.)

To use, attach a flash, place your subject behind the center of the viewfinder, press the button to which you have the Flash Exposure Lock function assigned, recompose, and shoot. When you press the FEL button, the camera tells the flash to fire a "Pre-Flash" of a known amount, and then measures the amount of light which gets reflected back. The proper exposure is calculated and then that determines how much light the flash will output for the final exposure. If you have configured the button for Flash Exposure Lock Toggle, the camera will REMEMBER THAT VALUE for all future flash exposures until the Flash Exposure Lock button is pressed again.

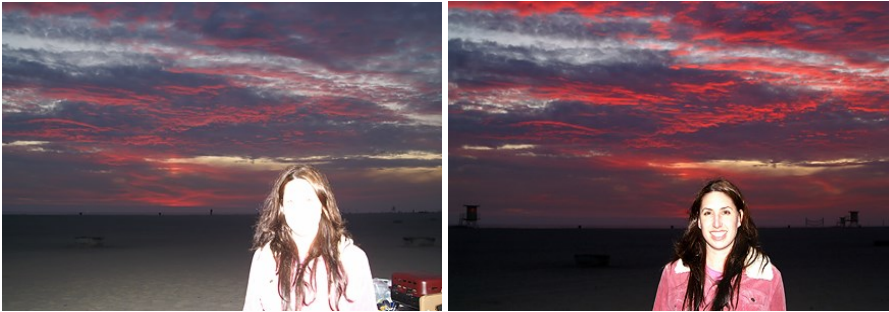


Figure 7-36: After you've focus-locked and recomposed, sometimes your subject is not conveniently behind a focus point, and therefore your camera will have trouble figuring out what to expose for. This is especially true of flash, and that's where the Flash Exposure Lock comes in handy. It is used exactly like AEL button: Place your subject in the center of the viewfinder, press the Flash Exposure Lock button. A pre-flash will occur and the proper exposure calculated. Then recompose, and shoot.

TIP 1: The Flash Exposure Lock only works with newer flashes (F60, F43, F20). Using an older flash will result in an error message.





7.36 DIAL SETUP

Menu Position MENU →  7 → Ctrl dial setup

What it Does Lets you customize what the front and rear control dials do

Recommended Setting  SS  F/no

This parameter allows you to swap the functions of the front and rear control dials during times when you're selecting shutter speed or aperture.

 SS  F/no	The front dial changes the shutter speed, the rear dial changes the f/stop.
 F/no.  SS	The front dial changes the f/stop, the rear dial changes the shutter speed.

This parameter matters most when you're in manual exposure mode (where you need to be able to set both variables); when you're in Aperture or Shutter priority mode, you'll notice that BOTH control dials do exactly the same thing, so this parameter has no effect in those modes, unless you enable the "Dial Exposure Compensation" feature (next section).

7.37 DIAL EV COMP

Menu Position MENU → ⚙ 8 → Dial Exp.comp

What it Does Lets you assign “exposure compensation” function to either the front or rear control dials

Recommended Setting Off

I normally use this function on all of my Sony SLT cameras – reassign the front control dial to “exposure compensation” because it’s useful and it’s handy. However, the A7r II has a dedicated exposure compensation dial that’s just as handy and so I keep the front control dial in its default configuration.

You may well ask, “Yo! The front control dial usually is used for setting exposure values, like shutter speeds and f/stops. That’s a pretty important function. How can you change those parameters when the front dial has been reassigned?” The answer is “Well, it’s not that complex. When you reassign either one of the wheels, the other wheel works like this:”

Program Mode	Program Shift occurs (as described in Section A.6).
Aperture Priority Mode	Changes f/stop
Shutter Priority mode	Changes shutter speed
Manual	The concept of exposure compensation doesn’t apply (unless you have ISO set to AUTO), therefore the front dial controls shutter speed, and the rear dial controls f/stops (unless they were reversed using Control Dial Setup (previous section).

(Note for sticklers: Okay, you’re right when you point out that you do lose some Program Shift flexibility when you reassign a wheel. When you reassign the front wheel, you only have P(a) mode accessible, meaning you

can't always select any shutter speed you want. When you reassign the rear wheel, you only have P(s) mode available, so you can't always select any f/stop. Life is full of tradeoffs, and since I use program shift only once in a blue moon, I happily forgo this program shift limitation.)

7.38 ZOOM RING ROTATE

Menu Position MENU → ⚙ 8 → Zoom Ring Rotate

What it Does When a power zoom lens is attached, this changes the direction you twist the zoom ring in order to zoom in or out

Recommended Setting: There's a good chance you'll find the default behavior to be the most intuitive.

Sony makes 4 E-mount “Power Zoom” lenses, with a built-in motor designed for smooth zooming when shooting movies. These lenses are:

16-50mm E PZ 3.5-5.6 OSS

18-105mm G E PZ 4 OSS

18-200mm E PZ 3.5-6.3 OSS

28-135mm G FE PZ 4 OSS

Of the four, the first three are designed for APS-C cameras like the Alpha 6000, so when mounted on the A7r II you'll only be utilizing the center portion of the sensor, yielding 18 MP stills (and cropped but full-res movies). And the last one is a monster of a lens, designed expressly for cinema rigs and is pretty expensive.

Anyway, these lenses utilize a “zoom-by-wire” mechanism: When you turn the ring to zoom in or out, all it does is send an electronic signal to the camera body, which in turn sends another electronic signal to the lens instructing it to zoom in or out.


Therefore it's pretty easy to reassign which way the camera zooms when you twist the ring a certain way. And that's what this feature does.

Your options are:

- **Left(W)/Right(T)** – The factory default
- **Right(W)/Left(T)** – The opposite of the factory default. ☺

Focusing is also a fly-by-wire function for most lenses, but for some reason Sony is not offering a function to perform a similar direction swap.

7.39 MOVIE BUTTON

Menu Position MENU →  8 → **Movie Button**

What it Does Prevents accidental movie taking by insisting the mode dial be in “Movie” mode first.

Recommended Setting Always

Depending upon who you talk to, the red movie button on the camera was either designed to be easy to take movies on a moment’s notice, or was designed to be accidentally activated with the greatest of ease, causing frustration with the user and drained batteries to boot.

This feature was designed for those who, for whatever reason, find themselves accidentally taking movies a lot. When this feature is set to “Movie mode only”, the red button becomes inert unless you specifically move the mode dial to “Movie mode”; at which time the red button will then dutifully start and stop movies.

I’ve never had much of a problem with accidental activation, and so I keep this set to “Always” (meaning, “The red button will always start / stop movies, no matter what mode I’m shooting in”.)

TIP: *The restriction applies to buttons that are assigned to “Movie” mode as well.*

7.40 DIAL / WHEEL LOCK

Menu Position MENU →  8 → Dial / Wheel Lock

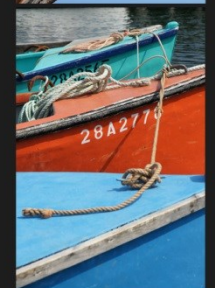
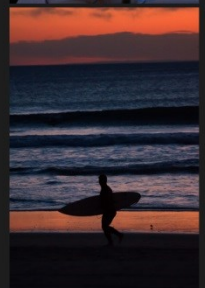
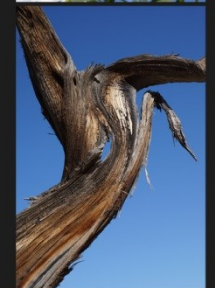
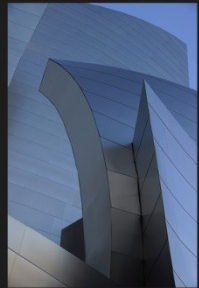
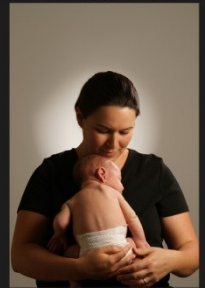
What it Does Enables / Disables the ability to lock some of the controls when holding down the Fn button for 2 seconds

Recommended Setting Unlock

Constraints None

Controls changing on you accidentally? This feature was designed to address that. When enabled, pressing and holding the Fn button for 2 seconds will lock (and then unlock) the front wheel, the rear wheel, and the rear control dial.

I don't use leather camera cases for my cameras for the same reason I wouldn't use this: it would slow me down. If I'm worried about accidentally changing some settings, I just turn the camera off.



Chapter 8 WI-FI MENU

8.1 SEND TO SMARTPHONE

Menu Position MENU →  1 → Send to Smartphone

What it Does This lets you send one (or more) images to your Wi-Fi enabled smartphone

Recommended Setting n/a

With this function and your Wi-Fi equipped smartphone you can do the following:

- Choose which images to transfer either on the camera or on the phone
- Choose what resolution to receive via the PlayMemories Mobile app (if you're just posting to a social networking site then a 42 MP image is way too big, plus it'll eat up your data plan)
- If your phone has Near-Field Communication (NFC, more commonly known as “bump”) you can make things incredibly simple just by playing back the image you want to send on your camera, and then bump the phone to the camera. It automatically gets sent to your phone and you can share it with the internet from there. (If your phone doesn't have NFC then you can still do all the same things; but you have to initialize them manually on both devices.)

Much of the details of how to send images to your smart phone (whether they are equipped with NFC or not) was covered earlier in Section 5.2.

8.2 SEND TO COMPUTER


Menu Position MENU →  1 → Send to Computer

What it Does This initiates a transfer of all images on your memory card (or just a folder) to your personal computer running PlayMemories Home via WiFi.

Recommended Setting n/a

This feature was covered in pretty good detail in Section 5.4.

8.3 VIEW ON TV

Menu Position MENU →  1 → View on TV

What it Does This lets you playback your pictures over any Wi-Fi enabled HDTV




Recommended Setting n/a

Having a Wi-Fi enabled camera enables a lot of interesting features for the very patient. Here's another example: You can play back the images (pictures only, not video) you just took over an HDTV that has built-in Wi-Fi capabilities and DLNA (Digital Living Network Alliance).


Is this better than hooking it up to a TV via an HDMI cable to view your images? Well, it depends on the kind of person you are. If you're very much into convenience, and don't mind waiting 3-4 seconds to see the next image, then this is definitely for you! On the other hand, if you're impatient, and/or want to see your videos, then hooking up a cable is a lot better.

'How to use it' is broken down into two sections – before you use it for the first time, and afterward.

Before You Use It For The First Time

- 0) Before you do anything, you must make sure that the HDTV and the camera are both logged in to the same Wi-Fi Access point. (You can do this via the **MENU →  2 → Access point settings** (described further in Section 8.7.)
- 1) Hit the play button on your camera. Then go to **MENU →  1 → View on TV**. The first time you invoke this function, the camera will start searching for compatible devices on your Wi-Fi network, and gives you a menu of found devices, asking you to choose one. Once you do that it will start “negotiating” a connection with the TV (which may take several seconds).
- 2) If negotiation was unsuccessful, make sure the camera’s MAC address is on your HDTV’s “approved” list. (A MAC address is like a unique fingerprint, different from an IP address, which all internet-connected devices have embedded within. You can see the address for yours by going to **MENU →  2 → Disp MAC address**.) I can’t tell you how to configure your TV to make sure your camera is approved because every TV has a different user interface.)


After You Use It For The First Time

- 3) Hit the play button on your camera. Then go to **MENU →  1 → View on TV**.
- 4) Press the center button to start a slide show. Watch as the images take over your TV!
- 5) Use the LEFT and RIGHT arrow keys on the back of the camera to switch. (And be patient!)
- 6) You can also invoke a slide show by pressing the center button during this mode.
- 7) Press the down-arrow key to change playback devices and modify slideshow options.

Notes

- If you invoke the feature without having a Wi-Fi enabled HDTV nearby, and then exit out of the feature, you may encounter a black screen with just a +/- indicator on the bottom. If this happens to you (and it’s only happened to me once), the sure-fire way to regain control is to remove the battery.

8.4 ONE-TOUCH (NFC)

Menu Position MENU →  1 → One-Touch

What it Does Defines which of the camera's downloadable applications will be invoked when you bump the camera to your smartphone.

Recommended Setting n/a

I set this to use the “Smart Remote Control” app every time the phones get bumped with NFC. But you can choose any app in the [MENU → !\[\]\(9397ee8a33f64727fd0fdce8ebb09e7e_img.jpg\) 1 → Application List](#), whether it was downloaded or pre-loaded at the factory.

8.5 AIRPLANE MODE

Menu Position MENU →  1 → Airplane Mode

What it Does Disables Wi-Fi activity on your camera (and Eye-Fi card, if inserted)

Recommended Setting n/a

Once upon a time, during the early 1990's, there was some anecdotal evidence from some airline flight attendants where a passenger's laptop with an external mouse-like device was interfering with the plane's newfangled GPS receivers. Since the Federal Aviation Administration (the US agency in charge of all flight safety rules and procedures) had neither the funds nor the motivation to properly study the matter, they just did the easiest thing: issue a blanket rule saying “electronic devices cannot emit any radio frequency signals during flight”. The FAA bureaucrats were happy and passengers routinely ignored it.

Anyway, for those of you who wish to adhere to the rule, turning Airplane Mode “ON” will disable the camera's Wi-Fi and NFC (“bump”) functions.

TIP: *Wi-Fi doesn't use any battery power unless you actually invoke a Wi-Fi function. And NFC uses so trivially little compared to everything else in your camera (CPU, display, and shoveling data from the chip to the LCD for live view) that it's as good as off. Therefore, don't waste your time putting your camera into airplane mode for the purpose of saving battery power. It won't make a difference.*

8.6 WPS PUSH

Menu Position MENU →  1 → WPS Push

What it Does Very quickly establishes a connection with a Wi-Fi Access Point that has a WPS Button

Recommended Setting n/a

As explained in Section 5.4, if your Wi-Fi router (Sony likes to call it an “Access Point”) has a WPS button, you can quickly get the two talking to each other by pressing the WPS button and then invoking this feature from the menu.

(If your router doesn't have a WPS button, then you'll set things up manually using the “Access Point Settings” menu item (next section).

8.7 ACCESS POINT SETTINGS

Menu Position MENU →  2 → Access Point Settings

What it Does Allows you to connect to a Wi-Fi Access Point the old fashioned way – by selecting an SSID and inputting a password

Recommended Setting n/a



This is the method of pairing with a Wi-Fi router if said router doesn't have a WPS button. Its use was detailed in Section 5.4

8.8 EDIT DEVICE NAME

Menu Position MENU →  2 → Edit Device Name

What it Does Allows you to change the SSID of the camera for when your Wi-Fi equipped Smartphone is trying to communicate with it.

Recommended Setting The default setting is pretty good

When transferring images to your smartphone, the camera acts as a Wi-Fi hotspot, and your phone then looks for its SSID, and then connects with it before transferring images (.jpg only) or movies (mp4 only). The Edit Device Name is essentially “Change the camera’s SSID”. The factory default is “ILCE-7RM2” (“Interchangeable Lens Camera E-mount – 7R mark II”) which I think is pretty descriptive. Some of you may wish to change it to simply “A7r II”, or have some fun with your war-driving friends and change it to “NSA-sweep627”. ☺ The camera only broadcasts this SSID during times when you initiate a transfer, either via the **MENU →  1 → Application List → Smart Remote Control** command, or the **MENU →  1 → Send to Smartphone** command. (**Send to Computer** has the camera looking for your router’s SSID, so “Edit Device Name” doesn’t affect this operation.)

Mind you, changing this value after you’ve already paired the camera and the phone means you have to pair the two all over again (Chapter 5).

8.9 DISP MAC ADDRESS

Menu Position MENU →  2 → Display MAC Address


What it Does Allows you to view the phone's Media Access Control (MAC) address

Recommended Setting n/a

You will probably never need this function. To explain why it's needed I'd have to talk about TCP/IP protocol, and the Ethernet protocol over which TCP/IP is built. Probably more detail than you need.


So here's the short version: Every internet-enabled device has a unique physical address burned right into it at the factory. This MAC address is different from the IP address you may be familiar with. MAC addresses look like this: F0:27:65:00:7D:BD.

Why would you ever need to know this? It's needed in situations where you want to use the camera's Wi-Fi features in a private network (typically a well-run office network) which is locked down by the company's IT staff. Only devices that the company knows about will be allowed on. And yes, there are network management tools that let you register every MAC address of every Ethernet card in every computer that's in the company's asset management system.

If you find yourself trying to use your camera's **MENU →  1 → Send to Computer** feature in such an environment, what you need to do is call your friendly neighborhood IT support person, explain to them what you're trying to do (probably several times), get approval in triplicate from six layers of management above you, and when everything is done and approved you tell your IT person "Here is my MAC address. Please allow it onto the network."



TIP: You'll only have to register your MAC address when using the "Send to Computer" function. The "Send to Smartphone" features do not require any cooperation from your IT department.

8.10 SSID/PW RESET

Menu Position MENU →  2 → SSID / PW Reset

What it Does Erases the camera's memory of your smartphone connection info

Recommended Setting n/a

I can't imagine why you would ever need this function. Each time you invoke the MENU →  1 → [Send to Smartphone](#) or MENU →  1 → [Application List](#) → [Smart Remote Control](#) function, the camera connects to the phone, logs on using a password, and from then on both the phone and the camera remember each other, making future transfers less fiddly.


Sony's manual hints that it is necessary to use this function to “forget” the previous smart phone it was connected to before you connect it to another. However, in my testing using this feature is entirely optional and you can hook up to a different smart phone without invoking this feature at all.

8.11 RESET NETWORK SET.

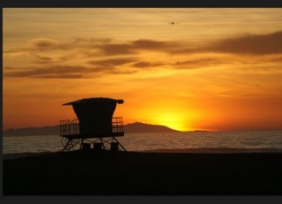
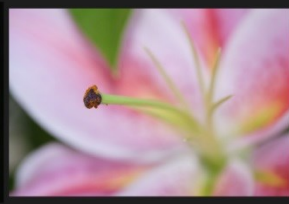
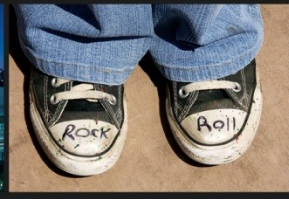
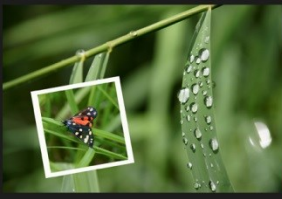
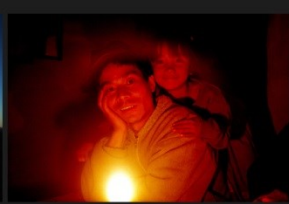
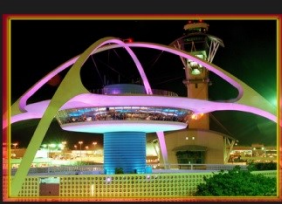
Menu Position MENU →  2 → Reset Network Set.

What it Does Erases the camera's memory of your Wi-Fi router for your computer network

Recommended Setting n/a


This is a handy feature to use before you sell your camera, since just doing a MENU →  6 → [Setting Reset](#) → [Initialize](#) (a system reset) does NOT erase the SSID names and passwords that have been used in the past.

This resets just the information needed to connect to your home network's Wi-Fi access point. For information on how to forget your smartphone connection info, see the previous section.



Chapter 9 APPS MENU

9.1 APPLICATION LIST

Menu Position MENU →  1 → Application List

What it Does This is the directory of your downloaded apps.

Recommended Setting n/a

From the factory, this Directory of Applications is pre-loaded with three icons (**Figure 9-1**). The three icons do the following:

- Play Memories Camera Apps lets you browse and download apps from the Sony app store (you need to be connected to your Wi-Fi router or connected via USB to an internet-enabled computer in order to do so). Detailed instructions on how to do this were presented in Section 5.5.
- Application Management lets you review and delete the apps you have on your camera.
- Smart Remote Control is the program that allows your smartphone to control your camera (and display the live view screen). (Use of this app was described in Section 5.3.2.) Early cameras had the app "Smart Remote Embedded" pre-loaded on the camera from the factory (**Figure 9-1**), however I recommend installing the newer "Smart Remote Control" app which updates it.

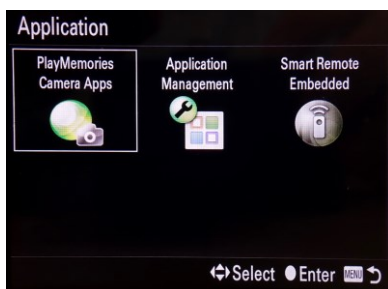



Figure 9-1: From the factory, the Application List is pre-populated with a few icons. (Your camera may or may not look like this.) The first thing I recommend is downloading "Smart Remote Control" to replace the 3rd icon.

9.2 INTRODUCTION

Menu Position MENU →  1 → Introduction

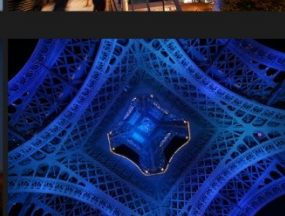
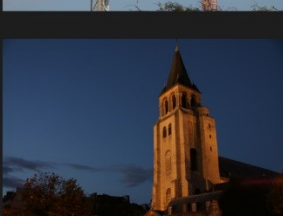
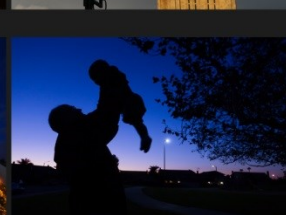
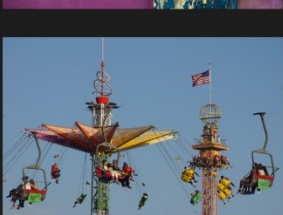
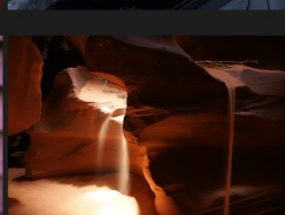
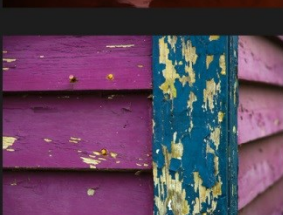
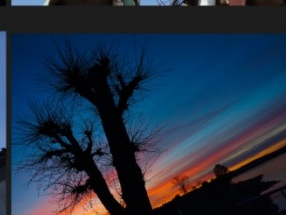
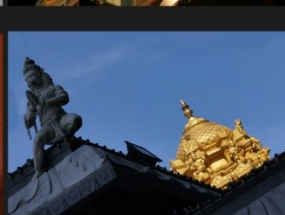
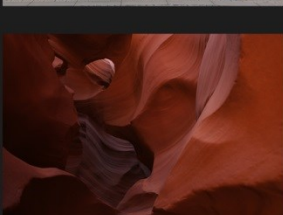
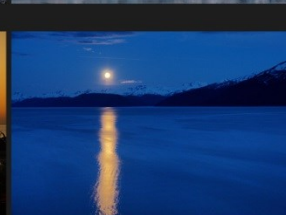
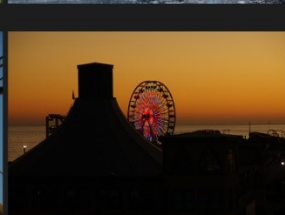
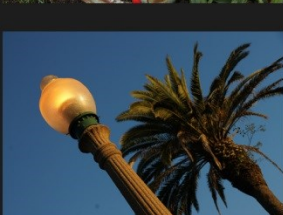
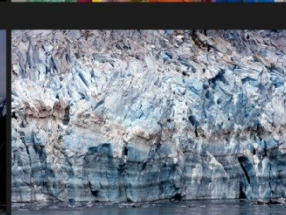
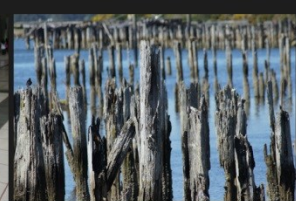
What it Does Nothing really useful

Recommended Setting n/a

You can safely ignore this. This menu item brings up two choices:

1. “Service Introduction” which essentially tells you to go to www.sony.net/pmca to download your apps, and
2. “Service Availability” which tries to download (via your pre-established Wi-Fi connection to your home router) a list of countries you can use this feature in.

You don’t need either of these features to do useful things with the camera.



Chapter 10 THE “PLAYBACK” MENU SETTINGS


10.1 DELETE

Menu Position MENU →  1 → Delete

What it Does Allows you to delete one image or multiple images at once

Recommended Setting n/a

The most straightforward way to delete a single image while you’re playing it back is to simply hit the “Trash Can” button on the back of the camera (**Figure 10-1** left) and then choose “Delete” to confirm.

A slightly more involved method of deletion allows you to delete multiple images at a time. Just hit **MENU** →  1 → **Delete** → **Multiple Images**. Then use the arrow buttons (Left – Right) to scroll through the images, and press the center button for each image you wish to delete. (Press the center button again to unmark it.) Images marked for deletion have a small Check in the check box on the very left of the image. Continue to scroll through and select other images for deletion. When you’ve finished marking your images, hit the **MENU** button again, and then confirm the deletion. All of

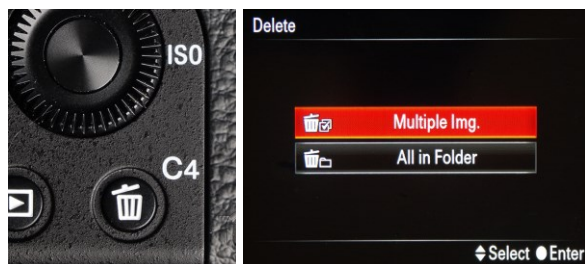


Figure 10-1 The “Trash Can” (Delete Image) button is good for one image; whereas the Delete function from the playback menu lets you delete many images at once.

your selected images will then evaporate.

Want to just wipe out all still images in your current directory? **MENU** → **1** → **Delete** → **All In Folder** will get you there. Want to wipe out everything on the card (including all movies and stills)? Use the **MENU** → **5** → **Format** function (described in Section 11.26).

This feature can be very handy in the field when you realize that you must make more room on your memory card. However, I have found that it is better to wait to delete images on your computer if you can afford to do so. Deleting on the computer means you’re not unnecessarily wasting your camera’s batteries, plus you really do get to see your images better so you can make a more informed choice. (The camera’s LCD screen has a lower dynamic range than your computer screen’s; meaning some images may look poor on the camera but better on your computer (**Figure 10-2**).

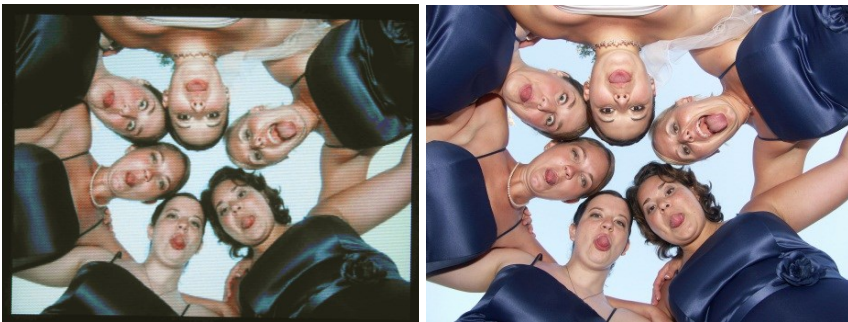



Figure 10-2: The camera (right) can capture much more detail and brightness range than the rear LCD display (left) will show you. Don’t delete images in-camera just because they don’t appear to be exposed correctly!

10.2 VIEW MODE

Menu Position MENU →  1 → View Mode

What it Does Allows you to specify what kinds of files to play back – stills, movies, or everything


Recommended Setting Date View

With this feature Sony has fixed a long-standing complaint from consumers: earlier Sony cameras would ONLY let you view stills, or .mp4 movies, or AVCHD movies when playing back. You couldn't just view things in reverse chronological order like every normal person wanted to do.

And so finally Sony has added the “Date View” option which lets you do just that – view things in reverse chronological order.

Under what circumstances would it be better to switch to the other modes (stills / mp4 / AVCHD / XAVC S / 4K)? I can't think of a scenario.

10.3 IMAGE INDEX

Menu Position MENU →  1 → Image Index

What it Does Lets you select whether the camera displays 9 or 25 images when in Index mode

Recommended Setting 9 (so you can sort of see the content of the thumbnails)

It's not at all obvious that you can show thumbnails during playback mode as well as individual pictures. All you have to do is hit the AF/MF button (regardless of the position of the button's AF/MF / AEL selector) while

playing back an individual image and Voilà! Image Index mode. To go back to viewing individual images, highlight an image you want to look at and press the center of the control wheel.

So this function lets you choose between seeing 9 or 25 images while in index mode.

TIP: *Want even more playback fun? Hit the AF/MF button again while you're in index mode and you're now looking at Calendar view! (Hit the Center button to go back to index mode; and again to go back to viewing a single image.*

10.4 DISPLAY ROTATION

Menu Position MENU →  1 → Display Rotation

What it Does Determines how vertical images are displayed when played back

Recommended Setting Off

When the camera plays back an image shot in horizontal format, the entire image fills the LCD. But what should the camera do when you’ve shot a vertical composition? Should the camera shrink the vertical image so it fits the height of the horizontal display (which is the factory default)? Or should it display it as large as possible and let YOU turn the camera to see it properly (my preference)?


So this function gives you three different choices:

1. Auto – The camera will automatically rotate the image so it appears “properly” – even when you rotate the camera. (You can still rotate it manually in this mode – see below.)
2. Manual – The camera behaves the same way as Auto mode above, only it won’t automatically rotate the image when you rotate the camera during playback. (But you can still rotate it manually.)
3. Off – All images show as horizontal, filling the display.

In my mind this feature is a little broken, since in order to rotate the image manually in options 1 or 2 above, you have to dig into a menu: **MENU** → **1** → **Rotate** (and no, you can't assign it to a button!)

If you've hooked up your camera to an HDTV and are playing the images back using the Slide Show function (next section), then you'd want to use the "Auto" setting so vertical pictures are oriented on the screen correctly.

10.5 SLIDE SHOW

Menu Position **MENU** →  **1** → **Slide show**

What it Does Displays your images for a few seconds each, either on the display or on an HDTV

Recommended Setting n/a

Your camera has the ability to hook directly up to an HDTV and play back your stills AND movies via a Slide show, scrolling through one image at a time on its own. Your camera also has the ability to do the same thing with a Wi-Fi enabled TV. (See Section 8.3 for more details.)

The camera will "optimize" images when they're played on your HDTV: The contrast is bumped up and the image is sharpened – so if you're a technical purist you might be disappointed by the incorrect color, increased contrast, and over-the-top sharpness you see on your display. (Everyone else in the room, however, is



Figure 10-3: *You'll scream when you see how good your pictures look in HD! (And when I say "good" I really mean "High Contrast and over-sharpened"!)*

going “Wow!” because they’re not purists.) In fact, there is an HD-optimized thumbnail embedded within every .jpg (RAW files too) just for this purpose.

I’ve found that the SlideShow feature comes in especially handy when I’m taking studio portraits of couples or families. It allows a large group to review the shots taken in small batches. Once the subjects get the “instant feedback” through the magic of digital, the next batch of pictures in the studio almost always result in more relaxed, spirited portraits. It’s the next best thing to shooting with Wi-Fi (Section 5.4).



Figure 10-4: Here’s where to hook up the HDMI cable for slideshow viewing.

To have the camera give you a “slide show” (either through the LCD display or while hooked up to an HDTV):

1. Make sure that **MENU → [1] → View Mode** is set to either Date View or Folder View (Still).
2. Connect the camera to an external HD set via an accessory HDMI cable. (See connector in **Figure 10-4**.)
3. Turn the camera and the TV on, and make sure you tell your HDTV to accept an input from the HDMI IN port (rather than from the cable). Many HDTVs will actually sense the camera is there, and automatically turn on and configure themselves to show you that input.) The camera will also automatically sense that an HDTV is hooked up to it, and it will communicate with the TV the proper video parameters to use (1080p, 1080i or 720p, or something else altogether); and will then automatically re-route all information from the rear LCD screen to the HDMI cable. (You could use the camera as you normally would this way, *however the rear LCD will be inactive while hooked up to a TV.*)

4. Start the slide show: hit **MENU** → **1** → **Slide show** → **[center button]** and you will see a screen where you can set the interval (how often a slide changes if you're showing stills) and whether the whole show will repeat when finished. Finally, highlight "ENTER" and press the center button to start the show.
5. To stop a slide show, hit the Menu button again and you will find yourself back at the Playback menu. Oh, and you can also hit the Left and Right buttons to advance to the next picture sooner than the specified interval time. Finally, pressing the multi-selector's center button will end the slide show and put you back into playback mode (where you're scrolling through images manually).
6. Unlike with previous Sony cameras, there's no way to pause a slide show.

TIP: *The camera is VERY picky about images it will play back – if you have tweaked some images and/or have renamed them on your computer, and then uploaded them to a memory card hoping to use the slide show feature to display them on your HDTV, the tweaked images may not display.*

TIP: *When hooked up to the television, your camera's Power Save setting (**MENU** → **2** → **Pwr Save Start Time**) is automatically switched to 30 minutes. Disconnecting the TV from the camera restores your previous setting.*

10.5.1 PHOTOTV HD AND BRAVIA SYNC

Here's an excerpt from Sony's instruction manual: "This camera is compatible with the PhotoTV HD standard." What's that??

It's marketing speak. One of the things that automatically happens when you hook up anything to an HDTV is that a conversation between the TV and the peripheral takes place, and the TV configures itself to show the content optimally. This happened long before someone in marketing decided to give it a name. Here's an article which explains how "PhotoTV HD" worked for this Australian journalist: <http://tinyurl.com/726lfq3>


Another supported standard is called “Bravia Sync”, another attempt to give a trade name to a feature that adheres to an international standard (in this case the HDMI Consumer Electronics Control (CEC) protocol¹. This standard was designed to solve the problem of having too many remote controls to deal with when many devices are hooked together via HDMI. (“Wouldn’t it be swell if there were just one remote control that could talk to all devices hooked up to our flat panel display?”) And so the CEC standard was born, which is not proprietary and Sony says that other brands adhere to this protocol “to an unknown degree”.

Anyway, because your camera is Bravia Sync / CEC compatible, you can operate your camera by the TV remote control when it’s connected via HDMI. What buttons do you press, and what functions can you operate? I took my camera to my local Sony store (back when they HAD local Sony stores, that is) to find out.

Once you *manually* put the camera into Playback mode, very few of the TV’s remote control buttons will have an effect on your camera. The remote’s LEFT and RIGHT buttons are used to scroll through the images; if you come across a panorama the remote’s center button (equivalent to the center button on the camera) will scroll the panorama. Then in addition to scrolling you can also use the PLAY, PAUSE and STOP buttons on the remote.

TIP: *If you find that the 3rd party device didn’t exactly adhere to the Bravia Sync standard properly, you can disable this feature and restore predictable*

¹ Sony’s not the only company to put their own name on their implementation of a standard. Other trade names for CEC are Anynet+ (Samsung); Aquos Link (Sharp); HDMI-CEC (Hitachi); E-link (AOC); Kuro Link (Pioneer); CE-Link and Regza Link (Toshiba); RIHD (Remote Interactive over HDMI) (Onkyo); RuncoLink (Runco International); SimpLink (LG); HDAVI Control, EZ-Sync, VIERA Link (Panasonic); EasyLink (Philips); and NetCommand for HDMI (Mitsubishi).

behavior to your system. MENU →  3 → HDMI Settings → CTRL for HDMI → OFF (Section 11.17.6).

10.6 ROTATE

Menu Position MENU →  1 → Rotate

What it Does Provides a cumbersome way to rotate your images during playback.

Recommended Setting n/a


Constraints Display Rotation must be set to Auto or Manual for this to work. Only works on images

So here's how it works. When playing back your image, if you want to rotate it, you have to dig into this menu item to get to the "Rotate screen". Once there each time you press the center button the image rotates counterclockwise 90 degrees. Press it 4 times and you're back to where you started. Press the MENU button to go back to play mode.

The camera remembers this new orientation, but that remembrance may not follow the image to your computer. (Not all image viewing programs pay attention to the orientation flag inside the .jpg!)

Regretfully this function is not assignable to a button in playback mode as it was for many previous Sony cameras.

10.7 ENLARGE IMAGE

Menu Position MENU →  2 → Enlarge Image

What it Does Lets you zoom in to examine images closely during playback mode

Recommended Setting n/a

Constraints Only works on images

Why is this even in the menu? You can use the C3 button on the camera to zoom in on images during playback already!!! (And then use the rear dial + arrows to wander around and change the zoom level while looking.)


10.8 PROTECT

Menu Position MENU →  2 → Protect

What it Does Protects images against accidental erasures while in the camera

Recommended Setting n/a


An image can be “protected” as an extra measure against accidental deletion. The way you mark pictures for protection is remarkably similar to the way you mark pictures for deletion:

- 1) Go to **MENU →  2 → Protect** and choose from “**Multiple images**”, “**All with this date**”, or “**Cancel All Images**” which means “Unprotect all images on the card”.
- 2) If you choose “**Multiple images**”, proceed and mark images for locking the same way you mark images for deletion (see “Delete” in Section 10.1). A check will appear in the little check box on the left of the image.

- 3) Hit the MENU button again, then confirm to finish.

TIP: Images are only protected while in the camera; once they have been copied to your computer they have no special protection against accidental deletion.


10.9 SPECIFY PRINTING

Menu Position MENU →  2 → Specify Printing

What it Does Provides the means to print images directly to an attached DPOF-compliant inkjet printer, or tell a 1-hour photo lab which images you want to print

Recommended Setting n/a

The Digital Print Order Format (DPOF) standard was originally designed to make it easy (Ha!) for consumers to order prints directly from their camera without ever having to touch a computer first. In principle, you review your images using the camera's LCD, mark the ones you want printed, and then plug the memory card into your inkjet printer or give it to your 1-hour photo lab and they'll just print what you want.

To use, hit **MENU →  2 → Specify Printing**. Then you have to use the arrow keys to go up to the top option ("DPOF Setup") and make sure it's set to "Multiple Images". Then highlight the ENTER box and press the center button of the control dial.

Select the pictures you wish to print using the same method as deleting multiple images (covered earlier in Section 10.1). Hit the MENU button to finish and confirm by selecting OK.


The camera will create a special file on the memory card called a DPOF file, which tells most modern 1-hour photo equipment which pictures you want. Note you can only specify .jpg files for printing – RAW files are not selectable for technical reasons.

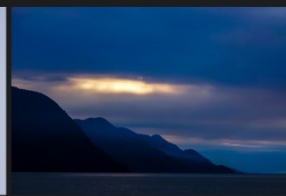
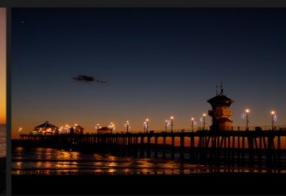
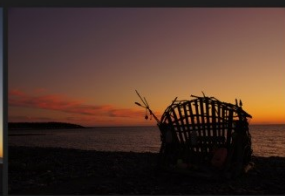
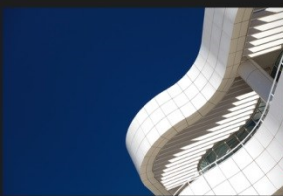
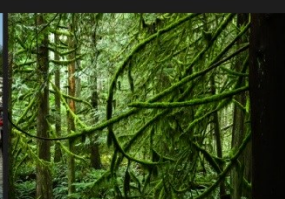
TIP: Unlike Sony’s previous cameras, you cannot specify print quantities when selecting pictures for printing. Hopefully, all you’ll want is one. Also, index prints are no longer an option.

10.9.1 PRINTING THE DATE ON THE IMAGE

This feature tells whatever DPOF-compliant device you’re using to include the date on the prints. Each device will print one in a different place, using a different font size and style, so those things need to be configured on the printer (if they can be configured at all). To use, while in the Specify Printing menu, navigate to the Date Imprint option and change it to “On”.

10.9.2 CANCELLING DPOF FILES

Once your pictures have been printed, and even if they have been erased, there may still be a DPOF file remaining on the memory card. To erase it, invoke **MENU** →  **2** → **Specify Printing**, navigate to “DPOF Setup” and change it to **Cancel All** then hit “OK” when prompted.



Chapter 11 THE “SETUP” (TOOLBOX ICON) MENU SETTINGS

11.1 MONITOR BRIGHTNESS

Menu Position MENU →  1 → Monitor Brightness

What it Does Lets you specify the brightness of the rear LCD screen, from -2 to +2. Also provides a “Sunny Weather” mode so you can compose your shot in bright sunlight

Recommended Setting Manual +1 unless you’re at the beach.

This function allows you to change this from AUTO to MANUAL and then set it from -2 to +2. My personal preference is to set it to +1.

The menu also provides a “Sunny Weather” option which makes the screen as bright as possible. Not good if you’re looking for exposure or color accuracy (and viewing it indoors), but I’ve found that when you’re shooting outdoors on a bright day (especially at the beach or snow), this feature is essential just to let you see the shot you’re composing. On the other hand, those are EXACTLY the conditions for which the EVF was made.

11.2 VIEWFINDER (EVF) BRIGHTNESS

Menu Position MENU →  1 → Viewfinder Brightness

What it Does Lets you control the brightness intensity of the EVF

Recommended Setting Manual +1

This does exactly the same thing as the Monitor Brightness setting (previous section). The only difference is there is no “Sunny Weather” setting (it is assumed that you’re using the EVF precisely because you’re in sunny weather and can’t see the LCD screen so easily.)

There is an option to set this to "AUTO" brightness, by the way. It senses the ambient light level by using the light coming through the lens (and read of the sensor). Clever! And although Sony has tweaked the implementation so it looks brighter than in previous models, I'm still recommending setting this to Manual +1 for the easiest-to-see image in bright daylight.

11.3 FINDER COLOR TEMP.

Menu Position MENU →  1 → Finder Color Temp.

What it Does Lets you make the viewfinder yellower or bluer

Recommended Setting 0, but your mileage may vary

If you’re a stickler for color accuracy, it’s possible that the color balance of the LCD doesn’t match that of the EVF exactly. (The two look very close to me on my cameras.)

The good news is Sony has provide a way to assign a slight color shift to the EVF to make it a little more yellow (-2) or a little more blue (+2) using this feature. The amount of change is roughly the same as what the camera offers with white balance bracketing (Lo) – described in Section 6.9.8.

11.4 VOLUME SETTINGS


Menu Position MENU →  1 → Volume Settings

What it Does Determines the volume of movies when played back in-camera

Recommended Setting n/a

This menu item controls how loud your movies are played back through the tiny built-in speaker (the two little holes on top of the camera, to the left of the hot shoe.). It has no effect on other camera functions (such as the focus confirmation beep, or the self-timer beep).


11.5 AUDIO SIGNALS

Menu Position MENU →  1 → Audio signals

What it Does Enables / Disables audio feedback during camera operation

Recommended Setting Off (personal preference)

The recommendation of “Off” is actually an unjustifiable personal preference. Audio feedback can be nice at times, but I have always preferred my cameras to be as quiet as possible. Either setting (On or Off) is good.

Note that this setting does NOT apply to video playback – if you want to control the sound for video (including turning it OFF) you must go to **MENU →  1 → Volume Settings** discussed in the previous section (0 = “no sound”).

11.6 UPLOAD SETTINGS (EYE-FI CARD ONLY)

Menu Position MENU →  1 → Upload Settings

What it Does Enables or disables transmitting for a 3rd party SD card called “Eye-Fi”

Recommended Setting On, unless you’re on an airplane.

(NOTE 1: This feature will only appear if an Eye-Fi card is inserted into the memory card slot of your camera.)


(NOTE 2: Given that the camera has a Wi-Fi feature built right in, it kind of eliminates the need for an Eye-Fi card. On the other hand, the Eye-Fi card allows you to post directly to social media sites and you don’t have to deal with PlayMemories Home to receive your transmitted images.)

Eye-Fi (www.Eye-Fi) is a brilliant SDHC card which packs in a standard 8 – 32 gigs of memory and a Wi-Fi transmitter – all in a tiny little package! With this card in your camera you can automatically upload your images to sites such as flickr or Facebook (or your own FTP server) from any WiFi hotspot in the world, or automatically download directly to your local hard drive when near your WiFi router. Some models also employ geotagging using an imprecise service called Skyhook which attempts to map Wifi Hotspots to geographical locations.

If the card is inserted in the camera’s memory slot, then this menu function appears and it allows you to turn off the card’s radio transmitter to save battery power. Once the card is properly configured and then inserted into your camera, the only options for this feature are “On” and “Off”. The best reasons to turn it off is either to save battery power, or keep it from transmitting (which may be a problem on airplanes).

Endless Memory Mode: *From the manual: “This product does not support the Eye-Fi ‘Endless Memory Mode’. Make sure that Eye-Fi cards that you insert into this product have “Endless Memory Mode” turned off.”*

11.7 TILE MENU

Menu Position MENU →  2 → Tile Menu

What it Does Allows you to see what the original NEX camera menus looked like, and provides a means of turning them off forever

Recommended Setting Off (personal preference)

When the first Sony E-mount cameras were introduced, they were aimed at a demographic who had previously used smartphones as their primary camera. And so Sony decided “Why not make the user interface similar to that of a smartphone so users would feel more comfortable with it?” You can see an example of it in **Figure 11-1**. All it does is present you with a high-level screen, asking “which menu screen do you want to jump directly to?” It may or may not require any fewer button presses depending on how far away the menu item you seek is from where you were. So whether it is a help or not is a toss-up.



Figure 11-1: You can see two different screens when you hit the MENU button, depending upon the setting of the Tile menu function.

One of the reasons I love the A7 series is that the menu system matches that of my Sony A-mount cameras, making operating it in the field much faster since I don’t have to hunt around for where things are. So naturally I want to keep it pure. For that reason I turn this feature off.

11.8 MODE DIAL GUIDE

Menu Position MENU →  2 → Mode Dial Guide

What it Does Enables / Disables some eye candy when you’re switching modes using the Exposure Mode dial

Recommended Setting Off

This camera has an awful lot of beginner-level help screens for something that was supposed to be targeted at advanced users. 😊 This one applies just to the mode exposure dial – each time you move it to a new function, a quick picture and 1-sentence explanation appears, letting you know what this mode is supposed to do. (Figure 11-2). I keep it off because I already know what they do.

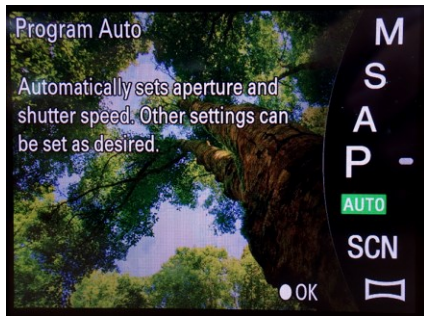




Figure 11-2: The Mode Dial Guide enables / disables these colorful screens which let you know just what this mode is supposed to do.


TIP: When Mode Dial Guide is set to ON, when you switch the exposure mode dial to “Auto”, a menu automatically pops up asking if you want Superior Auto or Intelligent Auto. With it off, switching to Auto will invoke the setting as defined in MENU →  7 → Auto Mode.

11.9 DELETE CONFIRM.

Menu Position MENU →  2 → Delete confirm

What it Does It can save you one step when deleting an image from the memory card

Recommended Setting “Delete” first

When you go to delete a picture from the camera by pressing the trash can button (or via the **MENU** →  1 → **Delete** function), a confirmation screen appears saying either “Delete” or “Cancel”. The factory default is for “Cancel” to be highlighted, which means if you really want to delete something you have to use the arrow buttons to select “Delete” and then press the center button to actually do the deleting.

Changing this parameter from “Cancel first” to “Delete First” skips just one step (having to highlight the “Delete” button before pressing the center to confirm). It’s a minor thing unless you delete a lot of images.

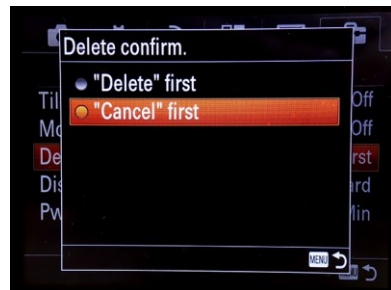



Figure 11-3: The Delete Confirmation Screen normally has one of these options highlighted. “Delete Confirmation” tells the camera which to highlight by default.

11.10 DISPLAY QUALITY

Menu Position MENU →  2 → Display Quality

What it Does Changes the resolution of the EVF image when composing images (at the expense of considerable battery power)

Recommended Setting Standard

It took me a long time to figure out what this feature did, since I was looking for either an increased refresh rate or a higher resolution – and I was looking on the camera’s rear LCD screen to evaluate it, and I couldn’t detect any difference at all.

Then I looked through the EVF and I discovered that you really could see a quality difference when set to High. (Maybe the camera sends the same data to both screens but only the EVF is capable of showing you the difference.) Regretfully I can’t shoot the EVF screen and show you some pixel-peeping differences. But they are there if you look very carefully. This setting only affects Live View – playing back the image through the EVF will always be at highest quality setting.

Sony’s manual says that setting this to High increases the power consumption, so of course I wanted to find out by how much. So I measured it: the “High” setting consumes about 20% more juice. That’s a lot of power for not much more image quality.

So my advice: Set it to Standard to get the most out of your undersized battery.

11.11 POWER SAVE START TIME

Menu Position MENU →  2 → Pwr save Start Time

What it Does Controls how long before the camera shuts itself off

Recommended Setting “1 minute”

The camera automatically shuts itself off if none of its buttons have been pressed for a certain number of minutes (as determined by “Power Saving Start Time” setting) and if there is nothing detected by the IR sensor near the EVF. This parameter can be set to anywhere between 1 minute and 30 minutes.

TIP 1: *When the camera is hooked up to a TV, this parameter is automatically changed to 30 minutes. (And when you disconnect it from a TV, it reverts back to your selected preference.)*

TIP 2: *If you are uploading your pictures to your home computer via Wi-Fi, or are doing so via an Eye-Fi card inserted (Section 11.6), the Power Save setting will be ignored until all of the pictures have finished downloading.*

11.12 NTSC/PAL SELECTOR

Menu Position MENU →  2 → NTSC / PAL Selector

What it Does Selects which of the two popular video standards to use (these tend to be country-specific)

Recommended Setting NTSC (because that’s the standard in the U.S. where I live)

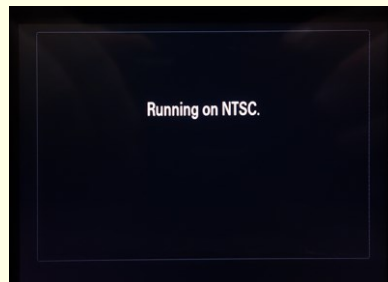
This feature allows you to select between either PAL or NTSC video modes. The one you choose depends upon the standards used in the

country you live in. When you change the video format using this function, the camera reformats the card (I don't know why) and then reboots so it can take effect. So be sure to copy all the pictures off your memory card before invoking this feature!


VERY STRANGE: *When you switch modes, the camera warns you that the memory card needs to be reformatted. When going from PAL to NTSC this is exactly what happens; however when going from NTSC to PAL, the camera warns you that a reformat needs to happen but doesn't actually reformat the card UNTIL YOU TRY TO SHOOT A MOVIE. Then it will insist on reformatting the card. So the behavior is slightly different depending on which mode you're switching to.*

IMPORTANT TIP: *All of this NTSC and PAL stuff are all ANALOG TV standards – if you're playing back on an HDTV or a computer, these differences shouldn't matter, as all modern equipment can deal with the various frame rates. (At least in most cases. I hooked up one of my European DSLRs to two HDTVs – one worked just fine (they were both Samsung) and the other gave the error “Mode not supported”; whereas my US version worked beautifully on both.)*

TIP: *If you have a camera that defaults to one standard (such as PAL) and you change this setting to NTSC, the camera will give you a “Running on NTSC” warning **each and every time** it turns on or wakes up from sleep mode. And it will only go away a second or two after pressing the shutter release button halfway. Annoying!!*



11.13 CLEANING MODE

Menu Position MENU →  3 → Cleaning Mode

What it Does Vigorously shakes the sensor in order to loosen (and hopefully shake off) any dust particles that might have migrated behind the fixed mirror

Recommended Setting n/a

Unlike the original A7r camera, which gave the sensor a gentle ultrasonic vibration to shake off some dust, this implementation makes excellent use of the in-body image stabilization mechanism and VIOLENTLY shakes the sensor to get off some dust!

One wonders why you need this feature anyway, since like most mirrorless cameras the sensor is embarrassingly easy to clean. Just take off the lens and give it a blast of compressed air. If you have anything more stubborn than that then I recommend a product called LensPen™.

Cleaning the sensor is actually no different than cleaning the front surface of a lens. In fact, you can pretty much use the same cleaning materials on both. The front of the sensor has a coated layer of glass in front of it so you don't have to be too afraid of this essential maintenance task.

11.14 DEMO MODE

Menu Position MENU →  3 → Demo Mode


What it Does It's supposed to make the camera more appealing when it's sitting on a retail shelf

Recommended Setting Off

This feature was designed to make the camera more appealing to consumers as it sits unloved on a retail shelf. After a minute of inactivity,

if the camera hasn't been set to power off it will automatically start to play back whatever movies are in there, sequentially. Presumably, the retailer would have been product-savvy enough to put a demo movie on the memory card and would have protected it from accidental deletion. Anyway, I'm not a retailer, so it's off. (Well, truth be told, I can't seem to get it to not be grey. Doesn't concern me.)

11.15 TC/UB SETTINGS

Menu Position MENU →  3 → TC/UB Settings

What it Does Controls various settings of the time code embedded in video files

Recommended Setting n/a

Constraints XAVC S and AVCHD only. Must be in Movie mode in order to change most parameters.

Time Codes have many purposes in the world of post-production, but the main reason to have them in a camera is to enable the easy synchronization of footage shot with multiple cameras at a live event. It is an invisible code – not actually part of the video image – that is written within the file in an industry-standard way. (It is formally known as “SMPTE Time Code”, SMPTE being an acronym for the Society of Motion Picture and Television Engineers.) High-end video editors such as Adobe Premier, Final Cut Pro, and Sony Vegas know how to import and read this info. When it all works all of the tracks line themselves up on the timeline effortlessly, even if they had been started and stopped many times during the live event. That's a huge timesaver in post-production.

Traditionally, professional cameras would all be tethered to an external time-code generator so they would all be synchronized and to prevent drift; regretfully there is no such ability to accept an external sync signal with this camera. The best workaround is for many people to “type in” a starting point in the TC Preset field, and for everyone to hit the center


button at the same time to synchronize everything. I talk about how to do this in this section.

Let's talk more about each of the options in this menu:

TC/UB Display Setting


This specifies not what gets recorded onto the Time Code track, but what shows in the display when a video clip is played back.

- **Counter** – Simply displays an elapsed time counter (H:MM:SS) in the Time Code Field, always starting at zero.
- **TC** - Time Code, referring to the SMPTE time code described above. The format is HH:MM:SS:00 (the last two digits always show zero when played back on the camera)
- **U-bit** – This one is hard to describe, but I can save you some time – NOBODY uses this anymore. 40 years ago the video standards committee thought it might be useful to have 4 fixed alphanumeric characters (A-Z, 0-9 plus punctuation) that are recorded in the video file along with the SMPTE time code. It was designed in an era when LEDs were red, computer keyboards made a klacking sound, and David Lee Roth was still in Van Halen. The original idea was that it provided a “thumbprint” on the video track – if each camera had its own personal identifier (= Userbit), then if something looked wrong in editing you'd be able to trace it back to which camera was causing the problem.

Internally, an ASCII character is represented by 8 bits, and 40 years ago, it was very common to enter ASCII characters not as 1's and 0's, but as two hexadecimal characters (you know, base 16 -- instead of 0-9, a hexadecimal digit goes from 0-F). So using an ASCII table such as the kind shown below, you could represent the letters "WNBC" using the hexadecimal letters 57 4E 42 43. And that's what you would enter in **MENU →  3 → TC/UB Settings → UB Preset**. And on many professional video monitors of the day, the letters “WNBC” would display on the editor's screen when enabled.

ASCII Table

Dec	Hex	Oct	Char	Dec	Hex	Oct	Char	Dec	Hex	Oct	Char	Dec	Hex	Oct	Char
0	0	0		32	20	40	[space]	64	40	100	@	96	60	140	`
1	1	1		33	21	41	!	65	41	101	A	97	61	141	a
2	2	2		34	22	42	"	66	42	102	B	98	62	142	b
3	3	3		35	23	43	#	67	43	103	C	99	63	143	c
4	4	4		36	24	44	\$	68	44	104	D	100	64	144	d
5	5	5		37	25	45	%	69	45	105	E	101	65	145	e
6	6	6		38	26	46	&	70	46	106	F	102	66	146	f
7	7	7		39	27	47	'	71	47	107	G	103	67	147	g
8	8	10		40	28	50	(	72	48	110	H	104	68	150	h
9	9	11		41	29	51	)	73	49	111	I	105	69	151	i
10	A	12		42	2A	52	*	74	4A	112	J	106	6A	152	j
11	B	13		43	2B	53	+	75	4B	113	K	107	6B	153	k
12	C	14		44	2C	54	,	76	4C	114	L	108	6C	154	l
13	D	15		45	2D	55	-	77	4D	115	M	109	6D	155	m
14	E	16		46	2E	56	.	78	4E	116	N	110	6E	156	n
15	F	17		47	2F	57	/	79	4F	117	O	111	6F	157	o
16	10	20		48	30	60	0	80	50	120	P	112	70	160	p
17	11	21		49	31	61	1	81	51	121	Q	113	71	161	q
18	12	22		50	32	62	2	82	52	122	R	114	72	162	r
19	13	23		51	33	63	3	83	53	123	S	115	73	163	s
20	14	24		52	34	64	4	84	54	124	T	116	74	164	t
21	15	25		53	35	65	5	85	55	125	U	117	75	165	u
22	16	26		54	36	66	6	86	56	126	V	118	76	166	v
23	17	27		55	37	67	7	87	57	127	W	119	77	167	w
24	18	30		56	38	70	8	88	58	130	X	120	78	170	x
25	19	31		57	39	71	9	89	59	131	Y	121	79	171	y
26	1A	32		58	3A	72	:	90	5A	132	Z	122	7A	172	z
27	1B	33		59	3B	73	;	91	5B	133	[	123	7B	173	{
28	1C	34		60	3C	74	<	92	5C	134	\	124	7C	174	|
29	1D	35		61	3D	75	=	93	5D	135	]	125	7D	175	}
30	1E	36		62	3E	76	>	94	5E	136	^	126	7E	176	~
31	1F	37		63	3F	77	?	95	5F	137	_	127	7F	177	

In order for this to play back as a Userbit, though, the clip has to be recorded with **MENU** →  **3** → **TC/UB settings** → **2** → **UB Time Record** set to **Off** (which in my mind is labeled completely backwards).

***TIP:** Although the original goal with Userbits was to have 4 alphanumeric letters show up during editing, Sony has decided to take a more literal interpretation of the standards and show you the 8 hexadecimal characters you entered instead:*



TC Preset

Don't want your time code to start at zero? You can set it to anything using this variable.

TIP 1: According to an obscure Sony website, their RMT-845 Wireless Remote Commander has the capability to reset the timecode via IR.

TIP 2: True professional camcorders have the ability to accept an external SMTE Time Code signal so that multiple cameras are synchronized and there is no drift. This camera can't accept a timecode signal; however if you really want to Jam Sync your time code to multiple cameras, there's a third-party product called LockIt Buddy which injects a signal into your microphone jack and records the timecode onto one of your two audio channels. Hey, it's an option and pretty affordable at \$155 USD: <http://www.lockitbuddy.com>

UB Preset

This is where you can type in the hexadecimal digits representing the 4 ASCII characters of the Userbit field, from 00 00 00 00 to FF FF FF FF. This is a fixed "string", meaning it will never change or increment on its own. You can either use it as a "serial number" for your camera, or you can just ignore it like everyone else. Most NLE video editing programs don't even read Userbits.

TC Format

[**Note:** This only applies to NTSC video models at 30p and 60p. PAL is a more civilized video standard and doesn’t need to worry about drop frame time codes.]

Here you can specify either a “drop frame” (DF) or “Non-Drop Frame” (NDF). You can think of a “drop frame” in the context of a leap year – there’s not an even number of days per year – in fact there are $365 \frac{1}{4}$. So to compensate for this non-whole number we actually do an “add frame” – add one day every 4 years.

Well, there’s not exactly 30 frames per second in NTSC video. There’s actually 29.97 – slightly less. (Don’t ask.) And so to make sure that the SMPTE time code always matches the exact length of the video, the concept of Drop Frame was invented – the time code will skip the first two numbers each minute (except every 10th minute) so that no drift will result and the time code will always match the actual video length. (That’s for 30p. At 60p, the first four frame numbers are dropped every minute.)

TIP: This setting is fixed to NDF (non-drop frame) when recording in 1080/24p.

Want more detail? Here’s a good site from Apple that explains it: <http://bit.ly/1B1CL49>.

TC Run

In the synchronized, multi-camera scenario I outlined in the beginning of this section, I talked about having several people set the TC Preset (above) all at the same time to make sure all cameras were synchronized to the same time code. In that scenario, you also want to have the TC Run variable set to “Free Run”, meaning “the timecode is always counting up, regardless of whether you’re shooting video or not”. (And when this is set you can always see the time code running in the lower-left-hand corner of the viewfinder.) If you’re an editor of a multi-camera event, you can see the benefit of this setting: When you pull the video clips into your editing program, the clips will automatically organize themselves on the timeline properly, even if some cameras were starting and stopping throughout the event.

The other option for this setting is “Record Run” (commonly called “Rec Run”) where the time code doesn’t advance unless video is actually recording.

TC Make

When this function is set to “Regenerate”, the camera reads the last time code for the previous recording and records the new time code consecutively from the last time code. The time code advances in [Rec Run] mode regardless of the [TC Run] setting.

(Conversely, when its set to “Preset” it pays attention to the camera’s current Time Code, whether free-running or not.) (Yeah, it’s confusing.)


UB Time Rec

Do you want the fixed, 8-hex-character Userbit (specified in UB Preset, above) to be recorded as part of the timecode? Unintuitively, this feature has to be OFF if you want it recorded. (You can then select what gets played back via the TC/UB Display Setting above.)

Notes:

- Timecodes are recorded in XAVC S HD or AVCHD video formats only.
- They can also be enabled when recording 4K video to an external 4K recorder.
- Although you have to have the exposure mode dial set to “Movie” mode in order to change most of the parameters, once it’s been configured the timecode will be captured when you’re shooting movies in any mode (i.e., P, A, S, or M).
- Video clip names reset to C0001.mp4 every time you reformat or swap out the memory card! (Not so with stills.) Videographers just hate that – how useless is a bunch of project clips with duplicate filenames? You’ll have to change the names using whatever import software you have.

11.16 REMOTE CTRL

Menu Position MENU →  3 → Remote Ctrl

What it Does Enables the infrared receiver so you can use the IR Remote

Recommended Setting n/a

The A7r II has an infrared receiver built-into the camera’s grip, but to conserve power this receiver is OFF by default. To turn it ON you have to enable this option.

If you’re looking for a remote control, you can use either the wired variety (like Sony’s RM-VPR1, **Figure 11-4a**) or the wireless infrared kind. Sony sells such a remote -- the RMT-DSLR2 – however I strongly recommend a



Figure 11-4: This feature enables the IR receiver built into the camera’s grip. There are many remotes available: The wired RM-VPR1 (top right), and infrared units (bottom row).

3rd party unit called the Snapshot Tech AUS model RC-05 which is more reasonably priced, does the same thing, AND the buttons won’t get accidentally activated while in your camera bag (thus draining the battery unnecessarily). There is also a one-button IRMT-DSLR1. Such remotes can improve the sharpness of time exposures when you use shaky tripods on windy nights.

Once enabled, only two buttons on the Sony IR remote control will function: The one labeled “Shutter” (which works

like a remote shutter release), and the one marked “2 sec” (which will fire the shutter after a 2-second delay – this is handy when you want to be in the group shot but don’t want the shot to show you pointing the remote at the camera ☺). The red button on the RMT-DSLR2 allows you to start / stop the video, a feature that previous video-shooting SLT owners have been asking for.

The rest of the buttons are useful for when your camera is attached to an HDTV and you’re playing back your images through an HDMI cable (which I discuss starting on page 403).

There’s also an insanely cheap one-button remote, which isn’t all that limiting now that you can couple the IR remote with the self-timer function in the Drive menu. It’s called the IRMT-DSLR1 and it’s available for about USD \$3 from <http://amzn.to/1mr0WdC>.

The infrared remote commander has a limited range – maybe 20 feet or so indoors, and as little as 5 feet outdoors on a bright day. So if it doesn’t work for you, at least you have the 10 second self-timer to fall back on.

TIP 1: *When you use the infrared remote commander (either the “shutter” or the “2 sec” button), the camera will autofocus first before it takes the picture (assuming it’s not in Manual Focus mode, of course). If it can’t find focus, it won’t take a picture.*

TIP 2: *When your camera is in Remote Ctrl mode, the camera remains in a high state of alert – it never goes to “sleep”, and the rear display stays on full-blast. This will drain your battery in a hurry, so be sure to take your camera OUT of Remote Commander mode as soon as you are finished!*

11.17 HDMI SETTINGS

Menu Position MENU →  3 → HDMI Settings

What it Does Controls three settings related to the HD output

Recommended Setting n/a

This lets you select one of three HDMI-related functions:

11.17.1 HDMI RESOLUTION

What it Does Forces the camera’s output to be either progressive or interlaced video scan

Recommended Setting AUTO

This feature really shouldn’t be necessary. One of the great things about the HDMI specification is that the first thing two devices will do when you hook them together is inquire about their resolutions and other capabilities. So when you hook up your camera to a 1080p video display the camera will know it and adjust its output accordingly – all automatically.



So why did Sony include this little function? I don’t know, but I can guess – not all video sources and video displays implement the specification properly, and there probably have been cases where automatic parameter setting didn’t occur correctly. Anyway, there’s a very good chance you’ll never even need this function, but at least now you know what it does.

11.17.2 24P / 60P OUTPUT

What it Does Lets you change the playback frame rate when you've recorded in 24p (in certain modes) but wish to play it back on an HDMI-connected device

Recommended Setting 60p

Constraints Appears only in NTSC mode; AVCHD and XAVC S HD only

This feature is not intuitive. Basically, if **MENU →  3 → NTSC / PAL Selector** is set to **NTSC**, and **MENU →  3 → HDMI Settings → HDMI Resolution** is set to either **1080p or 2160p/1080p**, and you've recorded your video in 24p mode via either AVCHD or XAVC S, THEN this feature will let you play it back at either 24p or 60p when you have a display attached to the camera's HDMI port.

How can it play back at 60 frames per second if you've recorded your video at 24 frames per second? The answer is “the camera feeds your HDMI display duplicate frames to mimic 60 fps in this mode”.

11.17.3 HDMI INFO. DISPLAY

What it Does When you're shooting video, and you have an external monitor attached via the HDMI cable, do you want a “sanitized” version of the Live View image to appear on the monitor?

Recommended Setting Mine is set to OFF, but your needs may vary

Normally, whenever you plug in an external monitor to the camera, all the information which normally appears on the EVF or LCD is instantly re-routed to the external monitor, leaving the EVF and LCD blank.

When HDMI Info Display is OFF it keeps your EVF or LCD display information intact when you're shooting movies (not stills!) and the HDMI port is occupied. If you have a monitor hooked up to that port, then only

the live video feed will be seen on the monitor and none of the operator’s annunciators (such as battery life, exposure settings, audio levels, or whatever you have the DISP button configured to show). If an external video recorder is attached, then uncompressed video is sent out via the HDMI port when this setting is OFF.

11.17.4 TC OUTPUT

What it Does Adds the timecode information to the signal going to the HDMI port

Recommended Setting Mine is set to OFF, but your needs may vary

If you have the timecode function enabled (Section 11.15), this specifies whether you want that time code to be added to the video signal exiting the HDMI port.

If you’re outputting to a digital recorder and you’re using the time code, you will probably want this feature ON. On the other hand, if you’re just connecting a consumer HDTV to the HDMI port, it will likely not know how to handle the embedded time code, producing a noisy image at best. In that instance, turn this feature OFF.

TIP: This function does NOT control whether a visible time code appears in the corner of the image; rather, this refers to the invisible time code that your video editing software knows how to read.

11.17.5 REC CONTROL

What it Does Enables remote stopping and stopping of the external recorder

Recommended Setting ON

Constraints TC Output (above) must be set to ON.



When an external recorder is attached to the camera and this setting is enabled, starting and stopping the movie function (via the red button) will also start and stop the external recorder (if it's compatible, of course). When enabled, a new icon appears to the left of the STBY / REC icon in the viewfinder's lower-left corner.

11.17.6 CTRL FOR HDMI

What it Does Disables the ability for your big screen's remote control to control your camera

Recommended Setting On

Back in Section 10.5.1 I talked about Bravia Sync, a standardized protocol designed to let the remote control of a big-screen TV to control peripherals that are connected to it via HDMI. And I also mentioned that it's not a protocol proprietary to Sony; other 3rd party big screen manufacturers try to comply with it too.

Well, not all 3rd party manufacturers implement specifications correctly (*cough* Sigma *cough*) and so there might be circumstances where you hook up your camera to an HDTV to view your pictures, try to use the TV's remote control to control the camera, and things just go wrong. When that happens Sony recommends that you set this parameter to OFF to disable the Bravia Sync feature.

(I talk more about playing pictures back on your HDTV in Section 10.2).

11.18 4K OUTPUT SEL(ECT)


Menu Position MENU →  3 → 4K Output Sel.

What it Does Specifies how 4K video files are written to an external recorder (when attached)

Recommended Setting n/a


Constraints Only available when in Movie mode, with Format = 4K, and an external recorder is attached.


Yes, you can record 4K movies on your internal memory card, but the camera applies some compression to these files in order to allow more footage to fit on a card. If you have an external 4K recorder attached to the camera's HDMI port, however, you can tell the camera to save it as uncompressed 4K video, with a bitrate estimated to be 147 Mbps. (Compare this to the available bit rates of 100M available to record on the memory card, which frankly is still pretty good. But you're a purist; otherwise you wouldn't even be reading this.)

This menu item only appears when you have an external 4K recorder attached and **MENU →  2 → File Format** is set to XAVC S 4K.

Here are the choices this setting gives you:


Memory Card + HDMI: This outputs video to both the internal memory card (compressed) and the external recorder (uncompressed).

HDMI Only(30p): Sends the output to the external recording device only, not on the memory card. (This is irregardless of how the **MENU →  2 → Record Setting** is set.)

HDMI Only(24p) / (25p): You guessed it – outputs 24p video onto the external recorder only. If **MENU →  3 → NTSC/PAL Selector** is set to **PAL**, then the option presented is 25p.

Few people can actually see the difference between the compressed and uncompressed video footage; however the purist will go for the uncompressed just because in theory, it's better.

TIP 1: Certain functions don't work when outputting to an external 4K recorder: Center Lock-On AF, Eye AF, and Face Detection.

TIP 2: When any of the HDMI Only functions are selected, **MENU** →  **3** → **HDMI Settings** → **HDMI Info Display** is temporarily set to "Off".

11.19 USB CONNECTION

Menu Position **MENU** →  **4** → **USB Connection**

What it Does Specifies how the camera appears to your computer when attached via the USB cable

Recommended Setting Mass Storage

When the camera is hooked up to another device via its USB cable, it can actually “behave” like a different device. Below are the three choices the camera gives you for this parameter:

Setting	What it Means
AUTO	Chooses between the two options below automatically so you won't have to. On my Windows 7 machine it chooses "MTP"
Mass Storage	The camera behaves as a giant “memory card to USB” adapter. Useful for when you're hooking the camera to a computer, and you want to be able to drag and drop files from the camera's memory card to your hard drive.
MTP	“Media Transfer Protocol” should be selected when you're plugging your camera into a PICTBridge-compatible printer. With this setting you can use the camera's DPOF settings (Section 10.9) to specify which images to print. This is also compatible with

	Microsoft’s new Device Staging feature. Read on for more details.
PC Remote	Use this option when you wish to control your camera with your PC (no live view, though, so don’t get too excited). See Section 11.19.1 for where to download the software.

The Mass Storage option is pretty straightforward. It’s kind of what you would expect your camera to behave like if you hooked it up to your computer via the USB cable. If you’re using Sony’s PlayMemories Home software to automatically import your images when you plug your camera in, then you must use this setting.

But what’s MTP? The simple answer is it was designed for beginners to allow whatever you plugged your camera into to provide intelligent options based on the fact that it knows you’ve plugged a camera in. For example, if you used the **MENU → [] 2 → Specify Printing** feature (Section 10.9), when you plugged your camera directly into your printer the printer would see that it was a camera that had certain pictures slated for printing. Microsoft also has developed the ability to provide context-sensitive options for you depending on what has been plugged in (many provided by the device manufacturers themselves). You can read more about this feature at <http://tinyurl.com/y82pz9x>.

Just for fun I tried hooking up the camera to my Windows 7 machine while in MTP mode. The first difference I noticed is that while I could still view and drag/drop my pictures to my hard drive, I couldn’t delete my images off the memory card². It also took twice as long to import my images and it

² (Well, there was an obscure way to delete them but it’s not ideal. First I’d have to allow Windows to import all the files off the memory card, and beforehand specify “Delete after import”, which is not the best time to delete images. Anyway, this feature is not for me.

would only import my movie files. This may or may not be a big deal for you, but I always prefer the more straightforward options, which is why I recommend this feature be set to “Mass Storage”.

11.19.1 PC REMOTE SOFTWARE

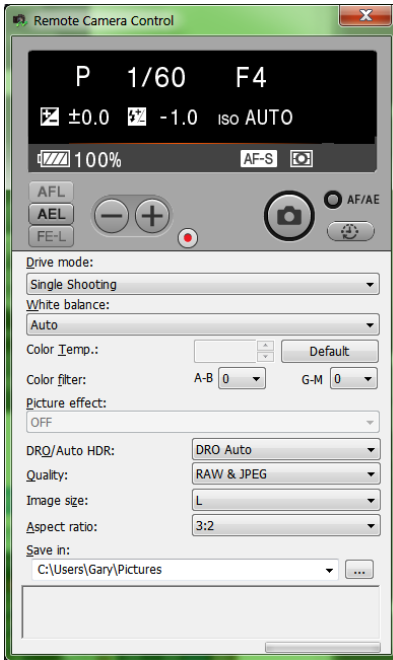


Figure 11-5: You can control your camera remotely via the Remote Camera Control software.

Here’s how to get tethered shooting for those of you who love studio work. Your camera works with a new version of Sony’s Remote Camera Control software, and it works for both Macs and PCs. (You Linux users are out in the cold, as usual.) You can download the program from here: <http://bit.ly/1dNxqts>

To use it, your camera must be set to **MENU → 4 → USB Connection → PC Remote**. Attach the camera, turn it on, start the software, then the control screen in **Figure 11-5** appears.

At this point much about how to use this software is obvious. In addition to being able to adjust all of the settings shown on the screen, you can also just keep using the camera as you normally would and your images will instantly be transferred to the directory specified in the “Save To” field (and not saved to your memory card).

You can use this program to start / stop movies, too! But the movies stay on the camera’s memory card.


According to the documentation, tethered shooting in this way works best when a memory card is inserted into the camera, to give it a bigger buffer.

TIP 1: A new feature has been added with Firmware v2.0! You can now use this PC window to initiate video recording and have the output routed out the HDMI!

port.


Windows 10 users: A LOT of programs that used to work just great in Windows 7 (this one included) seem to get confused about the screen dimensions in Windows 10. On my Win10 laptop the bottom of the PC Remote screen got cut off and there was no way for me to specify the download directory. (Hmmmph!)


11.20 USB LUN SETTING

Menu Position MENU →  4 → USB LUN Setting

What it Does Allows a 2nd read-only drive with no useful info whatsoever to appear when attached to a computer.

Recommended Setting Single

LUN stands for Logical Unit Number, and if a camera has more than one USB LUN, then it can appear as more than one device when hooked up to a computer. In this case, with this function set to ON, and MENU →  4 → USB Connection is set to Mass Storage, then your computer sees *two* drives when the camera is turned on: The memory card, and a separate drive called PMHOME which used to contain the installation software for PlayMemories Home on previous cameras, but now contains nothing but non-useful copyright notices for things like Apache and other GPL software that is (apparently) used within the camera. So there’s no reason at all to keep this function on and you can safely change it to **Single**.

The PMHOME directory is read-only; you can’t erase it from the camera, nor can you store information in it. Sony recommends setting this feature to **Single** when connecting to something other than a computer, or when MENU →  4 → USB Connection is set to **MTP** and doesn’t work.

Mac Users: Sony recommends selecting this function to **Single** all the time.

11.21 USB POWER SUPPLY

Menu Position MENU →  4 → USB Power Supply

What it Does Controls whether the camera can accept a charge via the USB port

Recommended Setting On

I finally figured this feature out. In theory, this feature is asking you “When you hook up your camera to a computer (or other device that is not just supplying power), do you want the computer to charge the battery while the camera is on?”

That seems straightforward enough, but there’s more to it than that. What if you want to have your computer power your camera while you’re using it to take pictures?

In the past you couldn’t, as the camera would be consumed with trying to behave like a USB device. But now you can.

So, **Behavior #1**: With this feature ON, and you’re plugged into a computer, you can see the little plug next to the battery icon in the upper right hand corner, meaning it’s charging while it’s behaving like a USB device (**Figure 11-6**). When it’s off, that plug icon vanishes, so you’re depleting your batteries. I can’t think of a scenario where you *wouldn’t* want your computer to charge your battery in this mode.

Behavior #2: With this feature ON, and you’re plugged into a computer, a new “Playback” icon appears in the lower-right-hand corner (again, **Figure 11-6**). This icon is telling you “Press the playback button”. What happens

TIP 1: *Hooking up to the wall via the supplied AC adapter or an external USB battery pack? Then this setting doesn’t matter – your camera will always charge.*

TIP 2: *This feature has no effect when the USB Connection is set to “PC Remote”.*

when you press it? **Figure 11-7** shows you: You get a confirmation screen that says “Disconnects USB connection and switches to USB Power supply”. Hitting the center button confirms this, and then you are left with a fully-functioning camera that is still being charged by your computer. I’ve wanted this feature for a long time.



Figure 11-6: With the USB Power Supply setting “On”, two new icons appear when you attach your camera to a computer: the “plugged in” icon (upper right), and the “Playback” icon (lower right).

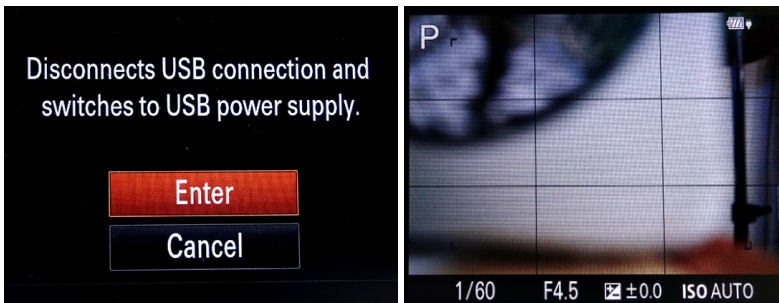


Figure 11-7: Pressing the “Playback” button when **Figure 11-6** is visible leads to the left screen, then pressing the center button lets you use the camera as a camera while still being charged by your computer.

11.22 LANGUAGE

Really?

11.23 DATE/TIME SETUP

When you turn on your camera for the first time you see this screen, but then you may never need to bother with it.

11.24 AREA SETTING

This sets your time zone.

11.25 COPYRIGHT INFO

Menu Position MENU →  5 → Copyright Info

What it Does Lets you specify the name of the photographer and the copyright holder – information which will be embedded into every image taken.

Recommended Setting: [Your name here]

At long last, Sony has caught up with other camera manufacturers in allowing you to store basic copyright info into the EXIF information field within every .jpg and .arw file the camera takes. In theory this could be useful in tracking down online image theft from stupid content creators who don't know how to erase this information from the image (it's not very hard).

For those of you who are wondering what EXIF info is, it's the information you see whenever you choose to view "File Info" from your favorite image editing program. (The user interface will vary of course.) Usually things like shutter speed, f/stop, ISO, white balance, lens used, time and date taken, GPS info (if your camera has one built-in – yours doesn't), and camera-specific features are stored within, and now you can store your own personal name here as well.

This menu function provides you with the following options (**Figure 11-8a**):

- **Write Copyright Info** – This just enables / disables the writing of the Photographer and Copyright Holder in the appropriate EXIF fields.
- **Set Photographer** – Enter the name of the photographer.
- **Set Copyright** – Enter the name of the Copyright holder. (This will usually be the same as the name of the photographer, unless you're working for someone else and they own the rights to what you produce.)
- **Display Copyright Holder** – This just lets you see how the previous two settings look like (**Figure 11-8d**).

In order to enter your name, you have to use this video-game-like keyboard which is kind of a pain, but like setting the Wi-Fi settings you only have to do it once.



Figure 11-8: There are several screens to configure for the Copyright Info function. It's rarely-used features like these that you wish the camera had a touch screen.

11.26 FORMAT

Menu Position MENU →  5 → Format

What it Does Formats the memory card, erasing all content and mapping out corrupted blocks

Recommended Setting: n/a

Many people wonder what's the purpose of formatting – after all, isn't it the same thing as deleting all the content off your memory card?

The answer is that formatting and deleting work completely different internally, and do different things. Think of a memory card as a library, but instead of storing books it stores image files. Libraries have a collection of books on shelves, and a card catalog telling you where each book is located.

Using this analogy, when you erase a book (image file) from the library, all you do is remove the relevant card from the card catalog. It doesn't actually remove the book from the shelf; just the index card which points to the book's location. The book doesn't actually get removed from the shelves until a new book comes in to replace it. (Similarly, an old image doesn't actually get erased until a new image overwrites the old one). At that time, the new book is added to the card catalog.

Hard as it is to believe, all digital storage media is imperfect, just like some libraries have broken shelves and leaky ceilings where books cannot be stored. And so the process of formatting was designed to identify these bad shelves (known in computer terms as “bad blocks”). Using the Library analogy, formatting a library involves removing all the books, taking note of where the broken shelves are and where the roof leaks, painting the good shelves, re-numbering all the shelves, and putting bricks in the card catalog so you can never accommodate a card which points to those bad spots. You're then open for business.

Clearly, erasing and formatting are now two different things – erasing actually leaves the image on your memory card. And they will stay there

too, until you start taking more pictures, at which time your old images will be irrecoverably overwritten. Formatting a card erases all the information, blocks out bad sectors, and sets things up again so new images can be accommodated without the bad parts causing corruption.

Now that you sort of get the idea behind formatting, let me add a little more important detail. There are actually two kinds of formatting that are possible; the first one being a thorough format and is the kind of formatting I described above: A complete teardown and rebuild of the library shelves, tossing all books in the process.

So, to reiterate: When you delete an image from your memory card, the image doesn't actually get deleted (for that would take too much time); rather, a pointer to it just gets deleted from the memory card's card catalog. (This is usually true when you delete files from computer hard drives too.) Unintuitively, when you format a memory card using the camera, the same thing is true: *The card catalog is erased, but the previous image data still remains!*

You may recall reading in the camera manual that you should always format the memory card in the camera, and not the computer. Given that in-camera formatting is really an erasing of the card catalog and not a thorough formatting at all, what on earth was Sony thinking when they wrote that? For the answer, let's think back to the ancient Apple vs. IBM wars of the early 1980s. Even before the Macintosh was introduced, Apple always had their own proprietary format for floppy disks. So even if the floppy disk was physically the same, if it was written to on an Apple, it could not be read by an IBM PC. This was still true when the Mac was invented, although Apple did go out of their way to make sure that their machines could read IBM floppies if they were inserted. (A technically difficult task, since the two machines would require different mechanical spin rates at different times.)

Today, there are still many different competing proprietary formats used by Apple, Linux, and Microsoft, and when you format a memory card in those machines, who knows what format it will use? A Windows PC might use NTFS, FAT32, or FAT16 formats; whereas a Mac might use HFS+. But when your camera formats a card, it will use the Microsoft FAT32 format, which seems to be the lowest-common denominator as far as formats go – everyone can read it. (Unless, of course, you've inserted an SDXC card,

which can hold so much data that FAT32's card catalog isn't big enough to address all of it. And so this specific type of memory card requires the exFAT file system, which your computer needs to know how to read if you're going to be extracting files off of it.)

So that's where the advice came from: It was easier to say "Just format it in the camera" instead of giving a bewildering technical explanation and saying what I'm going to say next: Should extreme corruption occur on your memory card, your best course of action to make the card usable again is to format it *on your computer* and specify FAT32 and disable the "Quick format" option. Why? Because a thorough format will identify and map out the bad memory locations on your card, whereas a quick format might keep the bad memory blocks active, leaving them free to once again ruin one or more of your shots.

TIP #1: *The new SDXC memory cards MUST be formatted in your camera, since they use the exFAT file system which most computers are ignorant of.*

TIP #2: *There do exist "undelete" programs which scour through your memory and try to recover the actual data that's still there (if it hasn't been overwritten or thoroughly formatted); there also exists image recovery software that can try to recover as much of that image as it can in the case of a corrupted memory card (this is not a rare event – sometimes it pays to shoot RAW+JPG so at least if one image gets corrupted you'll probably still be able to read the other.) I know that Lexar brand memory cards come with an example of the latter software for free – so it's worth getting at least one of their cards. Other freebies that have a good reputation are:*

"Recuva" from Pirisoft (Obviously a New Jersey outfit):
<http://tinyurl.com/c3eosk>

Transcend memory test utilities: <http://tinyurl.com/7buzlv2>

11.27 FILE NUMBER

Menu Position MENU →  5 → File Number

What it Does Specifies whether the camera resets the file numbering scheme when you change memory cards

Recommended Setting Series

Every time your camera takes a picture, it writes a file to the memory card named “DSC0xxxx.jpg” (or .arw). This, and the practice of putting these images into a directory named DCIM/1xxMSDCF, is in accordance with the DCF industry standard created by JEITA (the Japan Electronics and Information Technology Industries Association; www.jeita.or.jp) to encourage interoperability between imaging devices. The last four xxxx’s in the filename are actually a 4-digit number, and they increase in sequence for each picture you take. But you almost certainly already knew that.

When you swap out a memory card, the camera can continue to number the files in the same sequence (“Series”), or reset the counter and start numbering the files starting with DSC00000.jpg (“Reset”). Notice that these commands only apply when you insert a fresh memory card – you can’t, for example, reset the filename counter to zero while a card is still in the camera.

I personally prefer “Series”, since after I take pictures I tend to move pictures from one directory to another all the time, and with “Series” each image has a slightly more unique identifier.

11.28 SELECT REC FOLDER


Menu Position MENU →  5 → Select REcording Folder

What it Does If there is more than one directory properly labeled to hold still images on the memory card, this function lets you choose which one the camera will store images into

Recommended Setting n/a


The description above pretty much says it all. Usually if you have a fresh card inserted into the camera, only one such directory will exist: for storing still images: 100MSDCF. (The previous section talks about where that name came from.) If you want to create a new directory, see the next section.

11.29 NEW FOLDER


Menu Position MENU →  5 → New Folder

What it Does Creates a new folder for recording future still images

Recommended Setting n/a

This feature creates a new folder for still images. Try it now and chances are it will create a new folder called “102MSDCF”. (The file name follows the industry-standard file naming convention.) If for some reason I wanted to put future images into the previous directory (101MSDCF), I’d use the **MENU →  5 → Select REC Folder** function described in the previous section.

11.30 FOLDER NAME

Menu Position MENU →  5 → Folder Name

What it Does Lets you choose between a cryptic-looking folder name, and one containing the date the images were shot (but in a format that is not computer-sortable)

Recommended Setting Standard Form

Every time you install a fresh, blank memory card into your camera, it automatically creates directories on the cards and stores subsequent images into one of them. These directories and locations may seem strange and arbitrary to you, but this is an “industry standard” practice originally designed to make it easy to stick your memory card into a 1-hour photo kiosk and it will know where to go and what to do (and still allow you to keep additional files on your memory card without confusing the equipment).

11.30.1 IF STANDARD FORM IS SELECTED

The directories it creates are:

- “DCIM\1xxMSDCF” (this is the directory into which your images are placed)
- “AVF_INFO” – This contains some .bnp and .inp files which are said to be proprietary Sony format and contain information about the video file but not the video itself. The Sony manual reads, “When you delete the files, you cannot record/play back the images correctly. The files are defaulted as hidden files and not usually displayed.”
- “MP_ROOT\xxxANV01” – This is where all the .mp4 files (and their associated thumbnails) go.
- “PRIVATE\AVCHD\BDMV\STREAM” – All the AVCHD movies go here.
- “D:\PRIVATE\M4ROOT\CLIP” – all XAVC S movies (4K and HD) go here.
- “Sony\” – Nothing important in here.

- “MISC\” (appears when DPOF files are specified. It is used to hold files relative to DPOF print ordering functions (and other consumer cameras use it for other purposes as well).

If the camera is writing images to the default DCIM\100MSDCF directory, and the .jpg filenames run out of numbers (DSC09999.jpg), the camera automatically creates a brand new directory called 101MSDCF to store the next image (DSC00001.jpg) into. It does this to avoid the possibility of writing two images with the same file name in the same directory (making the assumption that the old directory is full, containing images from DSC00000 through DSC09999).

So this function allows you to specify which such directory your images will be written to. But beware that this camera only recognizes directories *with industry standard filenames and locations*. For example, if you put the memory card into your computer, which contains a manually-created directory called “DCIM\My_Files”, when you put the memory card back into the camera and tried to select “My_files” as the new default directory, you’ll see that “My files” doesn’t even show up in the list of available directories to select. The camera only recognizes directory names of the format xxxMSDCF (with xxx equaling 100 or more). “077MSDCF” won’t be recognized, but “201MSDCF” will be.

TIP: According to the manual, up to 4,000 images can be stored in a folder. When the folder capacity is exceeded, a new folder is created automatically.

11.30.2 IF DATE FORM IS SELECTED

The directories it creates are:

- “DCIM\20290111”; a directory whose name represents (somewhat cryptically) the date on which the image is shot.
- MISC\ (Appears when DPOF files are specified). It is used to hold files relative to DPOF print ordering functions (and other consumer cameras use it for other purposes as well).

Now look at the top example again: “DCIM\20290111”. A strange format for a date, no? Here’s how the date format breaks down:

- First 3 digits: The folder number. This automatically gets incremented when your .jpg filename counter rolls over. No way I know of to reset it or control what this number is.
- Next digit: the last digit of the year
- Next two digits: the current month
- Next two digits: the current day of the month

So, a directory name of “10131208” breaks down as “Folder 101, taken in 2013, on December 8th.”

Notice that this date format applies only to the directories that hold still images. The video directories listed earlier are not affected.

If you ever had a dream of just uploading all of these folders into a “My pictures” directory and have them automatically sorted by date, then dream on. This date format is just awful for that purpose, as it was apparently not designed for computer sorting to produce a chronological order.

TIP: *If you do want your directories to sort chronologically once they're on your computer, you have to rename them manually once they get there. Here's the format I personally use:*

2015-01-02 Carol's Birthday Party

When you sort your directory list alphabetically, your directories will all be in chronological order – regardless of the description (“Carol's Birthday Party”) you append to the directory name. In this way I can sort them by date, and also find pictures by keywords (at least at the directory level) using Windows search. Also note that I'm using 4 digits to represent the year. I don't want to create another Y2K problem on my own computer.

11.31 RECOVER IMAGE DB

Menu Position MENU →  6 → Recover Image DB

What it Does This function tries to recover the internal database required for AVCHD and XAVC S movies should it ever become corrupted

Recommended Setting n/a

“A database for recording movies?”. Yup. Let’s just say that the standards and methods behind recording AVCHD and XAVC S video are more complex than a reasonable person might expect. And so there’s a database on your memory card that’s used as part of the process PlayMemories Home (PMH, Sony’s software which came with your camera) uses to transfer the files to your computer. And just like your still images can be destroyed due to memory card corruption issues, so can movies.

The function is actually poorly named, since the primary function is to Check the database for errors and then recreate / rebuild it if found. Plus, it applies to MOVIES and not IMAGES.

Just pray you’ll never need it ☺.

11.32 DISPLAY MEDIA INFO.

Menu Position MENU →  6 → Display Card Space

What it Does Shows you how much free memory is left on your card

Recommended Setting n/a

It’s a friendly screen which shows you approximately how many still images and how many minutes of movies the card will hold, calculated using the current image quality and movie format settings.

The number of still images remaining is the same number that is shown to you in the standard data display, and as such suffers from the same inaccuracies (as originally described in Section 3.9).

11.33 VERSION

Menu Position MENU →  6 → Version

What it Does Lets you know what version your camera’s Firmware contains

Recommended Setting n/a

Not sure what firmware version your camera has loaded? Then this feature is for you. If your camera doesn't show versiin2.0, it's time to upgrade. (Earlier versions had some image quality issues and lacked an option for uncompressed RAW.) Here's the site with the instructions and the firmware download: <http://bit.ly/1MB05DZ>

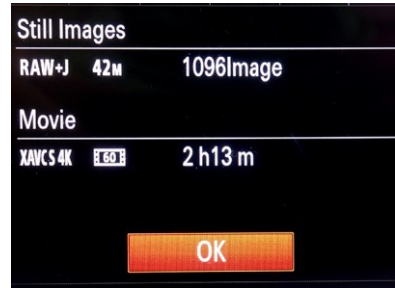



Figure 11-9: You can see how many stills and how many more movie minutes you can store using the current settings.


11.34 SETTING RESET

Menu Position MENU →  6 → Setting Reset

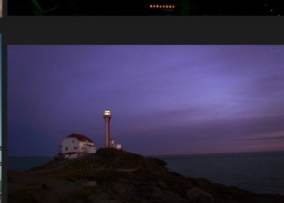
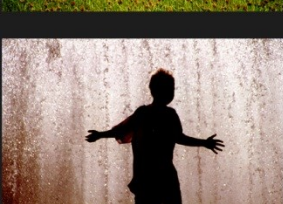
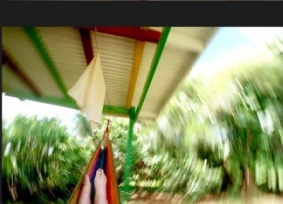
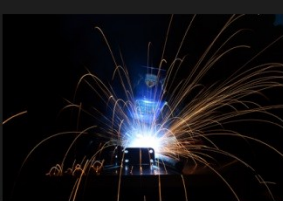
What it Does Resets some or all of the camera’s settings

Recommended Setting If you’re going to use it, just use ‘Initialize’

When things go wrong; when you don’t know what variable you changed and you just want to reset everything back to factory defaults, this feature can be a lifesaver. Sony gives you two different choices:

Camera Settings Reset: Resets all settings in the Camera  menus only. Fn customizations are untouched, as are the apps that you’ve downloaded.

Initialize: Resets everything EXCEPT for the Wi-Fi settings (memorization of hot spots and passwords, for example) and AF MicroAdjust values (Section 7.30). Your installed apps disappear too!



Chapter 12 MOVIE MODE

[Note: The basics of shooting movies were covered earlier in Section 3.6.]

If you're approaching this camera from the perspective of an experienced still photographer, you may feel that the video options are too many and their explanations too few. And so before I get to the ins and outs of shooting high-end video with this camera, let me talk about the formats for just a moment. (Or longer.)

12.1 THE SIMPLIFIED EXPLANATIONS

An important new feature of the A7r II is the 4K video capability. But there is a lot of nomenclature and settings to choose from. Those need to be explained first.

Analogy can be a wonderful tool for explaining things. So to explain some of the parameters let me use the camera's still image settings as an analogy to the video settings:

Image Settings	Analogous Video Settings
Image Size (in pixels) <ul style="list-style-type: none">• Large : 7952 x 5304• Medium: 5168 x 3448• Small: 3984 x 2656	File Format <ul style="list-style-type: none">• XAVC S 4K: 3840 x 2160• XAVC S HD: 1920 x 1080• AVCHD: 1920 x 1080• .MP4 1440 x 1080
Quality dictates how large the .jpg images are (i.e., how much compression gets applied): <ul style="list-style-type: none">• Standard (small file size)• Fine (larger file size)• X.Fine (larger still) Not everyone can see the difference between these settings.	Record Setting defines the bitrate (the lower the bitrate, the higher the compression and the lower the quality). Record setting also determines the frame rate For example, the Record Setting "30p 50M" refers to a frame rate of 30 frames per second, and a bit rate of 60 megabits per second.

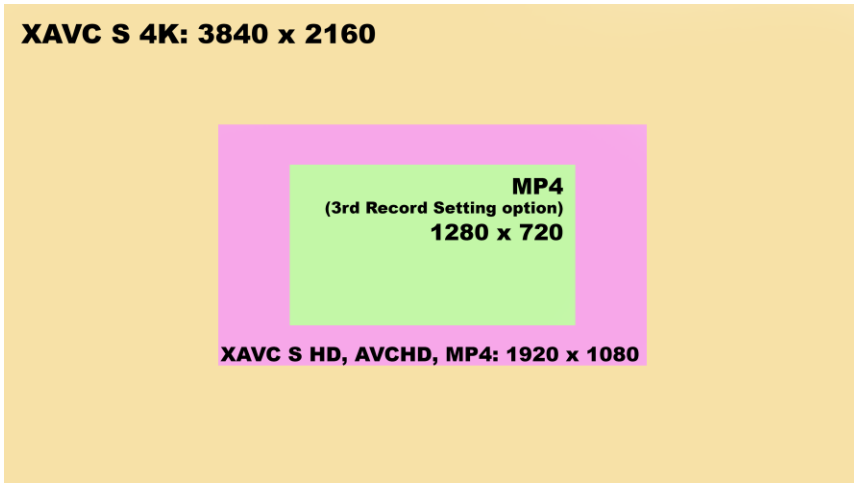


Figure 12-1: Here's a comparison between the number of pixels of the various video formats. As you can see, 4K captures a LOT more pixels every second, creating a heavy workload (and proportional heat buildup) for the camera's processor.

TIP: If you're shooting 4K video, the factory default will put the camera into APS-C (i.e., "Super 35mm") mode, essentially multiplying the focal length of your lens by 1.5. If you don't want this unintended telephoto boost, do a **MENU** → ⚙️ **6** → **APS C/Super 35mm** → **Off**.

So each choice of video Format (.mp4, AVCHD, XAVC S, etc.) comes with an array of choices for frame rate and bit rate. For the sake of completeness, here are all of the choices available:

Format	Record Setting Choices NTSC	Record Setting Choices PAL
XAVC S 4K	30p 100M 30p 60M 24p 100M 24p 60M	25p 100M 25p 60M
XAVCS HD (120p and 100p are options for slow-motion playback.)	60p 50M 30p 50M 24p 50M 120p 50M	50p 50M 25p 50M 100p 50M
AVCHD	60i 24M 60i 17M 60p 28M 24p 24M 24p 17M	50i 24M 50i 17M 50p 28M 25p 24M 25p 17M
MP4	1920 x 1080 60p 28M 1920 x 1080 30p 16M 1280 x 720 30p 6M	1920 x 1080 50p 28M 1920 x 1080 25p 16M 1280 x 720 25p 6M

So the 3rd .mp4 option represents the equivalent of the STD .jpg setting - offering the most compression with a bitrate of 6 megabits per second. It's ideal if your video is only going to get uploaded to social media. Weighing in on the other end of the spectrum, the XAVC S formats (4K and HD) offer the equivalent of “X.Fine .jpg” compression at up to a whopping 100 megabits per second bitrate.

XAVC S also offers a unique feature: You can shoot at 120 frames per second, which is ideal for very smooth slow-motion playback on your computer. (You must slow it down using a commercial video editing package, like Adobe Premier, Final Cut Pro, or Sony Vegas.)

TIP: Sony has improved the resolution and increased the bitrate for the MP4 Format option compared to previous cameras, to the point where it can be on par with one of the AVCHD settings. (60p 28M.) This means there's no longer any reason to recommend using AVCHD format, given its non-standard .m2ts file extension (which my friends at Paramount Studios were not able to open, nor can it be read by Google Photos. ☹)



TIP: The term ".mp4" as a video format can be confusing, since the 4K, HD, and .MP4 movie formats all appear as .mp4 movie files when they land on your hard disk (AVCHD videos show as .m2ts files). "MP4" is also the name Sony gives to the lowest-resolution and lowest bit-rate video format available on the camera. Throughout this book I try to draw a distinction so as to avoid confusion.

12.2 SO HOW DO I KNOW WHAT VIDEO FORMAT TO CHOOSE?

If you're a videographer, you already know: Just shoot the highest resolution and highest bitrate and frame rate on everything and you can figure out everything else later. (That would be XAVC S 4K, 30p 100M.) This is the equivalent of shooting RAW all the time just so you can have the best possible source material to work with, even if the final use for the image doesn't warrant it.

If you're not a videographer, keep in mind that just as the world has moved on from Standard Definition TV to HDTV, the world seems to be embracing the new 4K video standard. (This wasn't a forgone conclusion – remember the 3D TV craze a couple of years ago that never got traction?) Anyway, if you want your video to be more relevant a few decades from now, when 4K will be the norm, it makes sense to shoot 4K now.


On the other hand, that may not be the best option if you're traveling since the memory card and battery usage will both go up. And so, *if you don't know what to choose for general purpose work*, the video format I'm recommending is XAVC S HD.


TIP: Longing for the smooth motion of a motorized zoom lens? There's a pseudo-zoom function that works great with movies and is smoother than I can zoom manually with any lens. Enable **MENU** →  **3** → **Zoom Setting** to **On: Digital Zoom**. Then do a **MENU** →  **7** → **Custom Key Settings** → **2** → **Right Button to Zoom**.

When you wish to do a steady zoom, hit the right arrow button once with your thumb, then press and hold the right button again for a smooth, continuous zoom effect.

Normally the Clear Image Zoom and Digital Zoom functions will deteriorate the image quality a little when taking stills, but there's no such drawback when using them with video.

12.3 CHOOSING A FRAME RATE AND A BIT RATE

OK, so if you're not going to shoot 4K you've already seen that I recommend **MENU →  2 → (movie) Format** be set to **XAVC S HD**.

Next comes the harder question of "Which Record Settings (**MENU →  2 → Record Setting**) should I choose?" There are four available on my NTSC camera:

- 60p 50M
- 30p 50M
- 24p 50M
- 120p 50M

We can throw out the last choice right away (120 frame per second) since that's intended for slow motion playback.

The 3rd choice, 24p 50M should be used if you're going to be editing your video footage and intermixing it with film footage, since they both go at 24 fps. If you're not, 24 fps has a drawback: when you're doing a slow pan, things can look awfully jerky. (This is true of film too. Some people love the look of film frame rate, warts and all.)

That leaves the first two choices: 60p 50M, or 30p 50M. One being twice the frame rate of the other. Since we all grew up with television that was about 30 fps, this would seem a reasonable setting to use. On the other hand, fast motion looks much smoother in 60p. Plus, **FILE SIZES FOR 30P AND 60P ARE IDENTICAL**. What's more, with 60p you can (via a good video editor) transcode to get perfect 30p for Internet, 60i for DVD and BluRay as well as 1280x720 60p for BluRay if you have projects with fast motion. So 60p seems to be the way to go.

So the settings I use for everyday use is **XAVC S HD, 60p 50M**.

TIP: 60p may be better for smooth motion videos, but if you're shooting video at high ISO, 30p might be the better choice since you're sampling at half the rate and therefore the sensor will (in theory) be producing less heat, which translates to lower noise. Plus, the normal low-light shutter speed for 30p is 1/60th and for 60p is 1/120th, so you'll be letting in one stop more light, allowing one stop lower ISO assuming all other camera defaults. Two benefits!

If you have some spare time, you might enjoy the process of shooting test footage using different Record Settings, play them back on your video consumption device of choice, and see if you can see a difference. Just as many people cannot hear the difference between .mp3 and .wav audio files, so too can many people not see the difference in quality between .mp4 and XAVC S. (Or perhaps your equipment isn't rendering it optimally. Both options are likely.)


TIP: You must use a SDXC card in order to shoot XAVC S 4K, XAVC S HD or High Frame Rate video. Here's the nomenclature to look for: UHS-I or II, Class U3.

12.4 4K SHOOTING

There are two methods for shooting 4K on the A7r II: In crop mode (reading only from the center of the sensor, an area equivalent to an APS-C-sized sensor) or nearly full-frame. Shooting in APS-C mode, also called "Super 35mm" in the video world, yields the best possible video quality, as you get a full pixel readout free of moiré and aliasing artifacts. On the other hand, the focal length of whatever lens you attach to it gets multiplied by 1.5, meaning a 50mm lens turns into a 75mm lens.

You can force the camera to shoot 4K video in either Full-Frame or "Super 35mm" mode via **MENU → ⚙ 6 → APS-C / Super 35mm → [Select either "On" (meaning it will crop) or "Off" (meaning Full Frame).]**

There are also two ways you can save your 4K video with this camera:

- 1) Internally, using an "appropriate" memory card (I'm using a Lexar Professional 1000x 128 GB SDXC UHS-II Class U3 card (sounds like Nikon lens nomenclature), rated at 150 MB/s.)
- 2) Externally via the HDMI port, using an external recorder such as the Atomos Shogun Recorder. (<http://www.atomos.com/shogun/>)
- 3) (Okay, three ways – you can select both methods via **MENU** →  **3** → **4K output select** when you have an external recorder attached.)

There IS a difference in video quality between options 1 and 2 – to make things fit onto a standard size SD card, the camera does compress the video a little bit as it gets written. The maximum bitrate you can choose for SD-stored 4K is 100 Mbps, whereas for external recorders you can record your video at about 147 Mbps.

Will you be able to tell the difference? If you're the kind that will plunk down a couple of thousand dollars for an external recorder, then the answer is, by definition, "yes". ☺

As mentioned earlier in the book, there is a limit to the clip length you can shoot 4K at: 29 minutes, at which time the camera stops recording and you have to start it up again manually.

TIP: *This camera doesn't overheat as much as earlier cameras did during video shooting, but if it concerns you at all it's best to keep the LCD display tilted OUT to allow whatever accumulated heat there is to dissipate.*

What's in a Filename? *Since both 4K, HD, and MP4 all produce movie files ending in .mp4, can you tell what the original movie format was by looking at the filename?*



The answer is "sort of", and here's how the various filenames appear ('x' represents a number):

XAVC S (both 4K and HD): Cxxxx.mp4

MP4: MAHxxxxx.mp4

AVCHD: (the file ends in .m2ts – no confusion there!)

Interestingly, if you're shooting with a 4K recorder attached, the camera's displays don't show you what you're shooting – you'll have to consult the external recorder for that. There are some other limitations when shooting 4K using an external recorder as well:

- Face Detection and Center Lock-on AF are disabled
- If Dual Video Record is enabled, the ability of the camera to remotely start/stop the external recorder (**MENU →  3 → HDMI Settings → REC Control**) is disabled.
- **MENU →  3 → HDMI Settings → HDMI Info Display** is disabled as well.

12.5 CAPTURING A 4K FREEZE FRAME

In the past, capturing a video freeze frame usually meant settling for a low-resolution image with murky sharpness. One of the nice things about 4K is that each frame stands on its own (i.e., it's not interlaced) – you get a 3840 x 2860 pixel image (about 8 megapixels), good for printing a 12.8" x 7.2" print at 300 dpi.

If you don't have video editing software that can do this for you, the PlayMemories Home program that came with your camera can do the extraction for you. Here's how to do it:

1. First, play back your video using PlayMemories Home, and choose Media Control → Save Frame. (**Figure 12-2**). Once done, the screen in **Figure 12-3** appears.
2. Most of the controls on this screen are pretty self explanatory – you can slide the red dot across the timeline to choose your exact frame, change your aspect ratio, crop, choose from two levels of autocorrect ("standard", "high", and "off" (okay, that's 3 levels)) and then you hit "Save".
3. Your saved image will appear in the same directory as the video clip, with the same file name, appended with an (x).jpg (x being the number of freeze frames taken with it.)

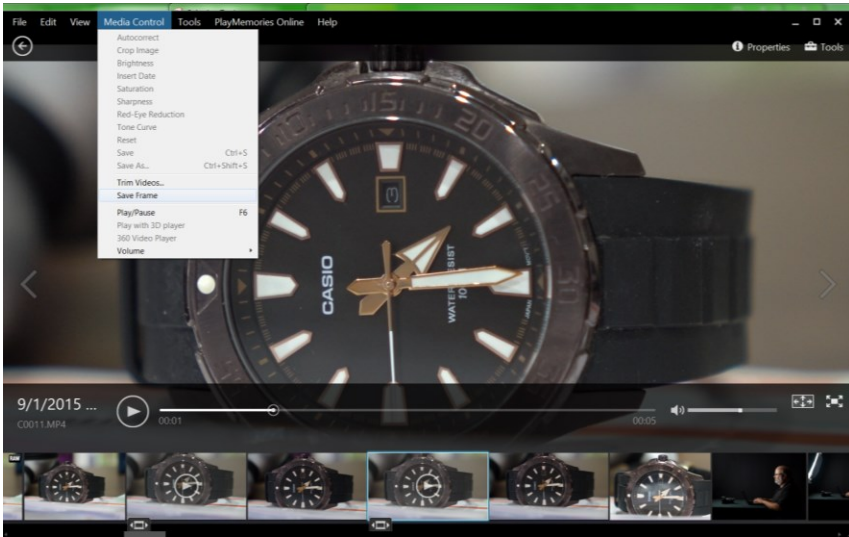


Figure 12-2: To capture a "freeze frame" of a 4K video, play it back in PlayMemories Home and choose **Media Control** → **Save Frame**.

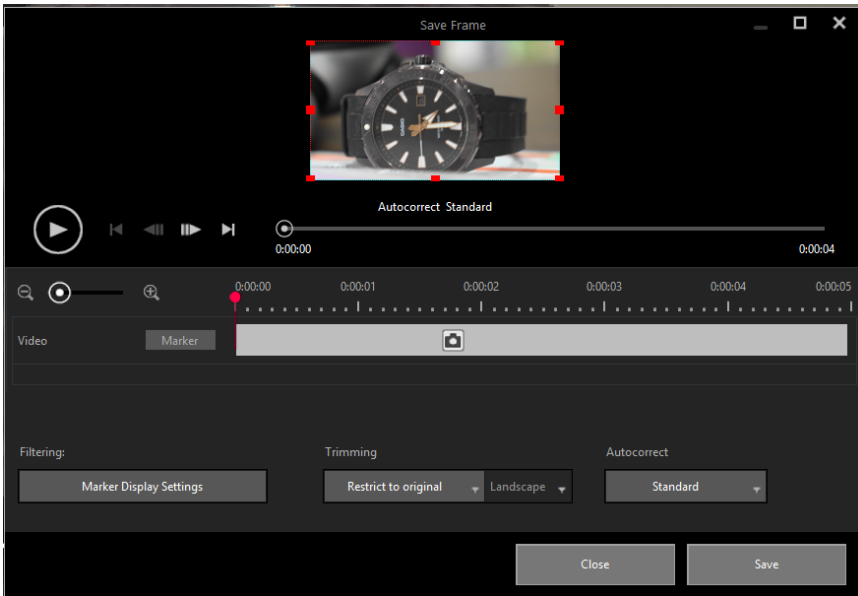


Figure 12-3: This screen lets you choose a frame, an aspect ratio, crop, and even do some basic autocorrect before saving.


12.6 SLOW-MOTION VIDEOS

To shoot a mild slow-motion video, choose **MENU → 📷 2 → File Format → XAVC S HD**, and then **MENU → 📷 2 → Record Setting of 120p 50M**.




When played back at 30 frames per second there's a 4x slowdown.

12.7 MANUAL CONTROL IN MOVIE MODE

By factory default, pressing the red button starts movies in program mode – that is, the camera selects an f/stop and shutter speed for you (and ISO, if the ISO has been set to AUTO.)

You can invoke the equivalent of Shutter Priority, Aperture Priority, or Manual Exposure modes by invoking **MENU →  8 → Movie**. When configured, this movie exposure mode will only kick in when the exposure mode dial is set to "Movie".

Here are some other factoids to know when shooting movies in manual mode:

- If you're going to be focusing manually, the use of Peaking Level during movie making can be tremendously helpful. (**MENU →  2 → Peaking Level and Peaking Color**, described in Section 7.9.) The Focus Magnifier function can work while you're recording also (just assign it to a button beforehand).
- When your exposure mode dial is set to movie mode, the shutter release button is inert. You cannot take stills while shooting video with this camera.
- In Movie Shutter Priority mode or manual exposure mode, you can select a shutter speed as slow as $\frac{1}{4}$ of a second, and $\frac{1}{8000}$ th of a second, regardless of the setting of **MENU →  8 → Auto Slow Shutter**. $\frac{1}{4}$ of a second makes for pretty blurry movies when things move; but if you're shooting in extremely low light it may be the only option you have.
- In Movie Aperture Priority mode, the slowest shutter speed the camera will select is $\frac{1}{60}$ th of a second. (This is irregardless of the setting of **MENU →  8 → Auto Slow Shutter**.)
- In any of the movie modes, the most you can adjust the exposure compensation is +/- 2 stops. (Even though the exposure compensation dial is marked for +/- 3 stops.)
- You have lots of control over lots of variables: When you start recording the camera will use the currently set white balance, creative styles, exposure lock, exposure compensation, AF area (if you're autofocus), and metering mode. However, while you're shooting,

the only things you can change are focusing mode, focusing area, ISO, and exposure compensation.

- When the AF area is set to Flexible Spot or Expanded Flexible Spot, you can't adjust the AF point without going to the Focus Area function either through the menu or the **Fn.** Button.
- You cannot set the Custom White Balance in Movie mode. (You have to set it in P/A/S/M mode first, store it in a memory location, and then recall that memory location when in Movie mode.)

TIP 1: *The general rule-of-thumb for smooth looking video is “half the frame rate”; which means if you’re shooting at 60 frames per second, then your ideal shutter speed will be 1/120th of a second.*

TIP 2: *You may be wondering, “If the camera is shooting at 60 frames per second, how on earth is it possible to shoot at a slower shutter speed?” (Good question!) The answer is, when you shoot at a slower shutter speed, the camera duplicates frames when it creates the movie. So for example, if you were shooting at 1/60th of a second, one “exposure” will equal one frame of the movie as you play it back. If, on the other hand, you were to set the shutter speed to ¼ of a second (the slowest shutter speed the camera will allow in movie mode), the camera will take the ¼ second exposure and save it as 8 consecutive identical frames in the movie file. So your blurry shot will actually take ¼ of a second to view.*

12.8 AVCHD WARNINGS

Some of the AVCHD settings (which I've already said I don't recommend you use) are of such high bitrate that they can't be burned directly to a Blu-Ray or a DVD disk without some severe re-encoding. The camera will try to warn you about format limitations when you try to select one or the other (“Cannot record to DVD disk at 24M(FX). Save on a Blu-ray disc.”) but the fact of the matter is most other good video editing packages (and the PMH software is NOT included in this category, nor is Apple's iMovie from what I'm told) will do whatever conversions are necessary to save it in any format you choose.

12.8.1 WHY IS MY CAMERA WARNING ME WHEN I CHANGE FORMATS?

The formal specifications for video on AVCHD DVDs is 18 megabits per second. And so your first AVCHD Record setting option, 60i/50i 24M (FX) records video at 24 megabits per second – faster than the DVD standard, which is why the camera warns you that this is too fast for an AVCHD DVD. Observers of the warning message for 60p/50p 28M (Neither Blu-Ray nor DVD) might conclude that the Blu-ray data rate was less than 28 Mbits/second; however it's actually closer to 48 MB/s for audio and video, so I'm not sure what the issue is. But again, PMH or your editing package will be able to perform whatever conversions are necessary to burn your movies to the format of your choice. With this in mind, if I were to choose AVCHD movies, I'd go for the 60p/50p 28M (PS) option.

12.8.2 “CAN'T RECORD THIS KIND OF MOVIE”

If you ever see this error message when you switch from recording .mp4 to AVCHD recording, it's because the camera was not able to find an AVCHD database on the memory card. The easiest way to fix the problem is to format your memory card in the camera and not on your computer.

12.9 PLAYING BACK VIDEOS

You have a few options when playing back. Not all of them are intuitive.

- Make sure **MENU** → **1** → **View Mode** is set to **Date View**. Otherwise you might not see everything on the card.
- As you scroll left and right to decide what video clip to play back, you can press the DOWN arrow button to adjust the volume (the sound comes out of those two tiny holes on the top plate of the camera, to the left of the hot shoe).
- Press the center button to play back a video clip.
- While playing back, you can press the DOWN button and a whole menu of options appears across the bottom of the screen. Most of the controls will be familiar to you (playback, fast forward, etc.). The rightmost icon makes the control strip go away.
- Pressing the UP arrow during playback brings up stats about the video clip (name, mode, date, etc.)

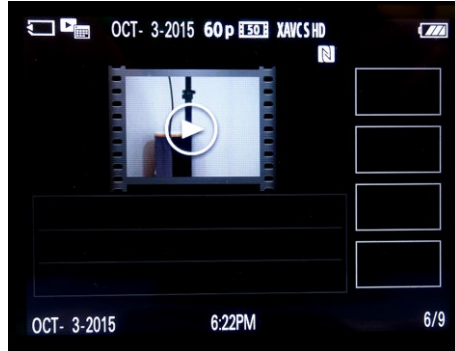


Figure 12-4: You can still get the histogram playback screen by hitting the DISP (Up arrow) button several times during playback mode – but as you would expect, no histograms are shown. (Good news, though: Live histograms now work when you’re shooting movies, which is a relatively new feature for Sony.)

12.10 SHOOTING 2 VIDEO FORMATS AT ONCE

This feature of being able to shoot one video and store it on the memory card in two different formats was covered in Section 1.1.6

12.11 EXTERNAL MICROPHONES

Sony has released TWO different external microphones as an accessory to your camera: the ECM-ALST1 (about USD \$117 on Amazon.com) and the ECM-CG50 (about USD \$170, also at Amazon), both of which appear in **Figure 12-5**. Each of these microphones attach to the camera's flash shoe and offer a better-quality, wider-bandwidth audio experience along with a real windscreen for cutting out that famous wind distortion noise. The ECM-CG50 is definitely the way to go if you're an audio pro: it has a serious shock mount (for isolating mechanical noise), a better windscreen, and just looks intimidating to others.

I wasn't able to test either of these units in person for a side-by-side comparison; and it seems nobody on the internet has been able to do so either. However, I did find these video user reviews of the ECM-ALST1 on youtube: <http://tinyurl.com/4h8b75g>. And then there's this test of an ECM-CG50 taken in a Sony store: <http://tinyurl.com/4uxmwft>.



Figure 12-5: Two Sony options for external microphones: The ECM-ALST1 (left) and the more expensive and intimidating ECM-CG50 (right).

Here's a third option: Sony Alpha guru and f2 CameraCraft magazine publisher David Kilpatrick tested the RØDE Stereo VideoMic and had phenomenal things to say about it. "The difference in sound quality is more than a basic improvement, it's a transformation." David's sample video is here <http://tinyurl.com/7u9rhbv> (youtube) and you can purchase one for \$249 here: <http://bit.ly/1hDFRfK>

Got a high-quality mic of your own with a mini-phono plug? You can plug it right into the A7r II (the green mini-phono plug). It even accepts microphones with the “Plug In Power” logo (meaning the camera powers the mic, rather than needing its own battery).



There is also an XLR mic adapter and audio mixer available for Sony which feeds the audio through the new hotshoe design (Figure 12-6). Know that if you order this you must also purchase the VCT-55LH L-shaped bracket to mount it to the camera. (Most retailers don't know this.) This bracket also has a hotshoe mount which event videographers can use to attach an LED light source or a wireless mic receiver.

Figure 12-6: The Sony XLR-K1M audio adapter kit can accept two professional-level microphone connections, mix them down, then feed them to the camera via the A99's new hotshoe. Don't forget to buy a VCT-55LH bracket also so you can mount it to the camera.

TIP: There's no "Line in / Mic" switch on the camera. It's Mic all the way. You have to turn the volume way down on the input (and output) in order to control any distortion.

Important Yet Obscure Tip: The Memory function (Section 6.50) actually remembers the audio levels you set when you commit a collection of settings to memory. So if you rotate the exposure mode dial and pass a memory location that has it, your sound level setting will change to what was memorized. (And your focusing point is apt to change too if you were set to manual focus before.) So be sure to move your exposure mode dial so that it never passes settings 1 or 2!

12.12 EXTERNAL DISPLAY

Well, this seems to be a reasonable place to bring this up. Sony has also sells an optional external display called the CLM-V55 (**Figure 12-7**), which is being marketed to DSLR movie makers of any brand. It measures 5 inches diagonally and plugs into the camera's HDMI output port. Why do you need it when you already have a larger LCD screen on the back of the camera? Well, just like photographers have always like big, bright viewfinders and big rear displays to see how their images look, so too do videographers like to really see what they're doing. Big.



Figure 12-7: Look badass with the external HDMI monitor and the external shotgun microphone!

12.13 MONITORING VIDEO AND AUDIO

As you know, the A7r II lets you view live video from an external monitor (AND the LCD/EVF simultaneously) and monitor audio (via what looks like real-time VU meters) while you're shooting video.

As mentioned in the Introduction to this chapter, you can monitor your video by plugging in an HDMI monitor (and setting **MENU → 3 → HDMI Settings → HDMI Info Display → OFF**). You can see an example of this setup in action in **Figure 12-8**. (Okay, it's a picture taken using the A99, but the functionality is identical! 😊) You can also use this configuration to hook up an external HD video recorder and record uncompressed video directly from the camera.



Figure 12-8: When shooting video you can use the camera's LCD AND external monitor (via HDMI) at the same time. And you can have two separate views (one with function status icons, one without) on the different screens. In addition, you can monitor the audio via headphones and via on-screen VU meters. (But there are caveats to these features!)

However, be careful not to judge your color balance or exposure by paying attention to the HDMI output! It turns out that the color space associated with HDMI is called Rec. 709 and represents only 35.9% of the color gamut your sensor is capable of capturing. Another way to think about it is your camera can represent each color in the range of 0-255; however the HDTV standard uses a narrower range, from 16-235. (This is because Sony is adhering to a CIE 1931 color industry standard for television colors.

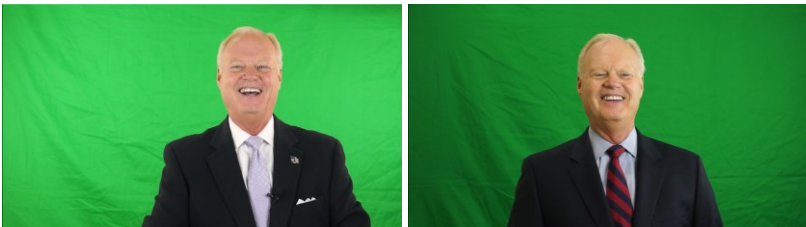




Figure 12-9: Be careful about trusting the HDMI monitor when it comes to judging your lighting and exposure! Just as viewing your pictures on an HDTV make them look bright and contrasty, so too will your video preview. The left image is how a video looked while we were filming it; the right one (a different take, obviously) is how it looked on my computer monitor during editing. (The sound VU meters were equally misleading!) I found a way around it though...

Don't blame Sony.) The result is that the monitor will look brighter and contrastier (pretend it's a word) than what your rear LCD monitor will show, or what it will look like when viewing later on a computer monitor. (See **Figure 12-9**.)

TIP: *The different color palettes used between your camera and the monitors can be a problem when you're editing, since it can look GREAT on your computer screen but completely different when viewing it on an HDTV. (Again, **Figure 12-9**). What to do? I've found a trick that works well. First, tweak your color and levels on your computer using the video editor software of your choice. Then, just before you render your video, you should invoke a function that all video editors have which performs a "COMPUTER RGB TO STUDIO RGB" conversion. It makes the output match what you saw in editing, and no longer will you cringe when you see your work played back on consumer equipment.*

You can see the equivalent of VU meters (the volume level graphically superimposed on the screen) if you have **MENU** →  **2** → **Audio Level Display** set to **On** (Section 7.6). And you can listen to the audio in real time using external headphones; however I discovered that even if the VU levels look healthy and the sound through the headphones sounds good, once you get back to your computer the sound level can sound low. Something to think about.

TIP: *One problem I discovered while using an external monitor in a studio (with **MENU** →  **3** → **HDMI Settings** → **HDMI Info. Display** set to **OFF**) is that the live video feed also carries the audio monitor (even if your monitor headphones are plugged into the camera), so you might get audio feedback during filming if you're using sensitive microphones and your monitor is close by. To solve this problem we had to constantly turn down the sound on the monitor whenever we were taping, and then turn it up again when reviewing the footage. Don't know what Sony could have done about this since the HDMI output can also get routed to a DV recorder which needs the sound as well.*

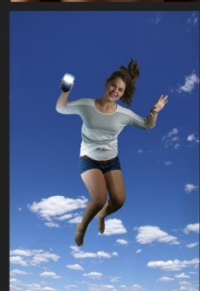
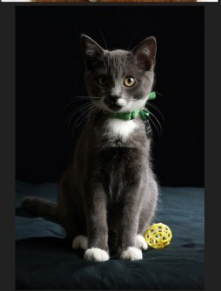
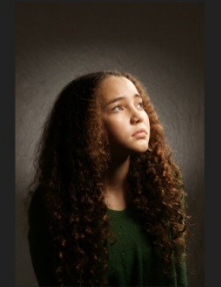
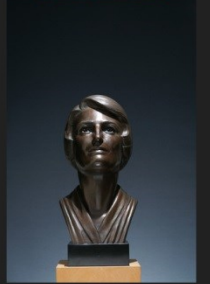
12.14 IMPORTING YOUR FILES TO YOUR COMPUTER

I've never been a fan of these fancy programs that imported your images for you once you inserted a memory card into your computer. (I'd much rather drag the images to wherever I want, thank you very much!) However, in the case of movies the importing software such as PlayMemories Home (PMH) or iMovie really are helpful, since the camera stuffs images and videos into different directories. For example, here is where the camera stashes the raw information for movie files on the memory card:

- MP4 Videos: MP_ROOT\100ANVXX*.mp4 and *.thm
- AVCHD Videos: PRIVATE\AVCHD\BDMV\STREAM*.mts
- Images: DCIM\100MSDCF*.jpg and *.arw
- XAVC S videos (4K and HD): PRIVATE\M4ROOT\CLIP\C*.mp4 and *.xml

The PMH software knows about all of these directories and it pulls them across and onto your hard drive, and it appears to do some file renaming at the same time. (.mts on the memory card, .m2ts on your hard drive, for example.) Sony's manual strongly warns against hooking up your camera to your computer and manually transferring the movie files over to your hard disk: *"Do not delete or copy AVCHD View movies on the memory card from the computer. Sony is not held liable for consequences resulting from such operations via the computer."* Pretty serious warning. It probably has something to do with that mysterious AVCHD database on the memory card.

Important TIP for Macintosh owners who insist on shooting in AVCHD: When importing AVCHD movies as "iMovie" or "Final Cut Pro", make sure you're using MacOS version 10.6.7 or higher. Older versions will not be able to read the AVCHD video files.



Chapter 13 WIRELESS FLASH AND ADVANCED FLASH TOPICS

13.1 INTRODUCTION

“Wireless Flash” refers to the ability to move Sony’s accessory flashes away from the camera, position them anywhere else in the room, and still have them fire and auto-expose as if one of them were still sitting on the camera’s flash-mount shoe. In the old days, it was very difficult to accomplish this, but the wireless technology makes off-camera flash as easy as autofocus makes it easy to focus.



Figure 13-1: *Wireless flash makes complex shots like this exceptionally easy!*

It’s true that a lot of people are scared off by wireless flash at first, but let me reassure you that it’s easy, fun, and the results are *totally* worth it!

On the next pages are some more examples of wireless flash in use.

TIP: In order for ANY flash to be used (normal or wireless), **MENU** → ⚙ 5 → **Silent Shooting** must be set to **OFF**.



The \$5 Studio: one flash and two pieces of white cloth. Read more about how I did it in my blog post: <http://bit.ly/1dtQQ94>



Go from boring to dramatic just by controlling your light! More info on how this shot was done at <http://bit.ly/1lwRntx>





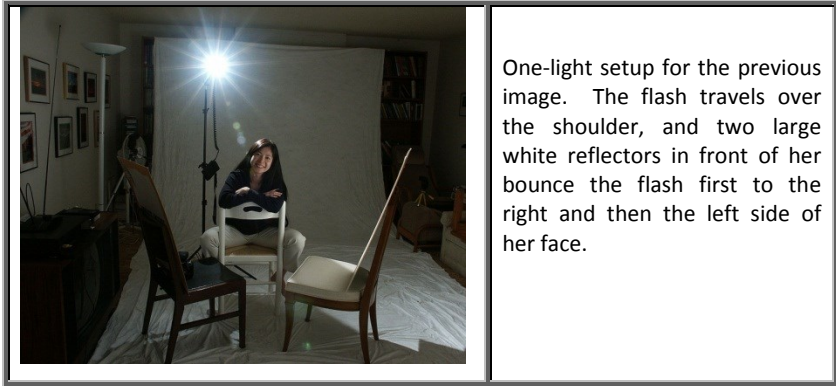


See later on in this chapter for how to use wireless flash to create an easy and inexpensive studio for portraits of family members.



Okay, now I'm just showing off.
😊

	<p>Read more about how I created this pregnancy shot at http://tinyurl.com/72okfae</p>
	<p>This shot was taken with ONE flash over shoulder with two front reflectors (see explanation below) – Wow!!</p>



One-light setup for the previous image. The flash travels over the shoulder, and two large white reflectors in front of her bounce the flash first to the right and then the left side of her face.

The shot above is a truly remarkable image using only ONE FLASH, and again shows off the versatility of this flash system in automatic mode. The flash was placed BEHIND the model and over her shoulder so that the bottom of the flash “beam” just touched her hair, and the majority of the beam hit the reflector placed out-of-frame, on the right. The right reflector was angled to reflect some of the light onto the model’s face, and some of it to the reflector placed out-of-frame to the left. This secondary-bounce light then illuminated the left side of the model’s face.

13.2 FLASH MODELS

Before we get into the basics, there are three Sony flash models that will fit onto your camera's hot shoe. All of them are shown in **Figure 13-2** and some of the important differences are spelled out. And because Sony’s flash model nomenclature can be a mouthful, let me provide a quick translation table between the Sony names, and how I’ll refer to each of them in this chapter:

Sony Name	Friedman Name 😊	Notes
HVL-F60M	“F60”	Works great on top of camera. Can trigger other wireless flashes using the “New” flash protocol. Can control ratios or groups using the new protocol.

		Can act as an off-camera wireless flash via either the new or old protocols. In “Slave” mode, understands ratio mode, and can be controlled in groups.
HVL-F43M	“F43”	The “60”'s little brother. It functions identically to the 60 flash other than the price and output power, both of which are lower. (And the user interface is different too.)
HVL-F32M	“F32”	Same capabilities as the F43, but with a size that doesn't dominate an E-mount body. Runs on only 2 AA batteries and lower power than the F43.
HVL-F20M	“F20”	Small and light, makes for a convenient way to trigger wireless flash (or a slightly stronger popup flash). It cannot be used as a slave.



Figure 13-2: The Sony Accessory flashes that will work with your camera. Note that there are similar-sounding models (HVL-F43AM, HVL-F20AM) which will not fit your camera's hot shoe.

TIP 1: There are many (but not all) older Sony and Minolta flashes that possess the old Minolta hot shoe, and require the Sony ADP-MAA adapter to work on your camera. I'm not going to talk about them in this book, but I will list them by name: HVL-F36AM, HVL-F56AM, HVL-F58AM, 5600HS(D), and 3600HS(D). Without needing the adapter, these flashes work great as wireless receivers and since they're been obsoleted they can be bought pretty cheaply in the used market.

TIP 2: Those of you owning 3rd party "dumb" radio flash triggers and slaves for conventional ISO flash feet may find that the position of the firing pin on the new Sony flashes don't line up with firing contact on most of the 3rd party radio triggers out there. Here's a youtube video showing the kind of modifications one Sony shooter had to make to overcome this design deficiency: http://youtu.be/pG_jywhbMeg

TIP: If you don't own any Sony flashes right now, and are thinking of buying a flash, I can highly recommend getting the new Nissin Di700a flash with the Air 1 radio remote control. The bundle cost about half what a Sony flash goes for, is completely compatible (right down to obscure modes like wireless High Speed Sync and the new MiS hot shoe design), offers more wireless options for use with strobes and optical wireless protocols, and uses RADIO rather than pulses of light to communicate with the off-camera flash. (The radio receiver is built right into the flash.) Radio is great for when you're using wireless flash outdoors. Nicely done.



13.3 BOUNCE FLASH

Before we start talking about wireless flash, let's talk about ways to make regular flash a bit more palatable. I mentioned earlier that the absolutely worst kind of light is when the flash on top of your camera is the sole source of light in a darkened room, as in **Figure 13-4a**. (Ironically, this is how most people use their accessory flash, which is really a travesty.) Historically, the most common way around this was to point the accessory flash UP and have it bounce off a low, white ceiling, turning the ceiling into a large diffuser (**Figure 13-4b**), which was certainly an improvement.



Figure 13-3 An example of the kind of natural light you get using the piece of paper shown in **Figure 13-4**. Tremendous improvement in flash for such an inexpensive modification!

Can we do better than “bounce flash”? Yes! Pointing the flash UP (like you’re going to bounce it off the ceiling) and then attaching a large sheet of paper as illustrated in **Figure 13-4c**. (Another example using this technique is shown in **Figure 13-3**). This very effective (and inexpensive!) tool takes some of the light going straight up and reflects it forward, sending soft, diffused light toward the subject. The rest of the light bounces off a low, white ceiling, providing natural-looking illumination for the rest of the room. The result is the best of both worlds and very natural looking lighting!

Since light is such an important ingredient to good photography, light modifiers are almost always a necessary part of a great flash picture. I always use the piece of paper, even when shooting outdoors with no ceiling to bounce off of because the quality of the fill light is that much nicer.

TIP: Yes, the F60 flash comes with a big pop-on diffuser. It's nice, but I've found the piece of paper to be better – it provides a larger surface area (softer light) and doesn't waste the light by sending it backwards behind the photographer.



Figure 13-4: Examples of Straight on-camera flash (left - Yuk!) vs. ceiling bounce (center). The right picture uses an easy-to-make light modifier which takes some of the light destined for the ceiling and converts it into a soft, pleasing subject light. What a difference!

13.3.1 DIFFUSING YOUR LIGHT



On-Camera flash

Off-camera flash

*Off-camera flash
with umbrella diffuser*

Figure 13-5: The same flash used three different ways drives the point home: light modifiers really make a difference!!

Bouncing off the ceiling and a piece of paper is nice if you're a photojournalist out in the field, but if you want even higher quality of diffused light on your subject, professionals for decades have turned to either umbrellas or softboxes. Both are designed to soften the light and give you a high degree of control of direction for the most pleasing shadows and greatest subject depth (to

give a 2-D image a 3-D look). **Figure 13-5** shows an example.



Figure 13-6: A simple umbrella and wireless flash configuration. About USD \$20 plus a tripod. This represents the single best investment you can make to improve your quality of light from your flash.



Figure 13-7: One umbrella and a black sheet for a background is all you need for professional-looking portraits.

13.4 WIRELESS FLASH

Back in 1991, Minolta engineers had developed the ability to have the camera and the remote flashes communicate with each other using tiny bursts of low-intensity light – kind of like a “Morse code” using long- and short-light pulses. (See **Figure 13-9**.)

These pulses are too faint to significantly affect the final exposure, but are strong enough to communicate with any other flashes in the vicinity – even when they are reflected off the walls, ceiling, or the subject. This scheme allowed even the

tiny pop-up flash of Minolta’s and Sony’s prior cameras to control several off-camera flashes at once without the need for cables. (This was a **BIG DEAL** if you’ve ever had to struggle with the cable method on a regular basis.) By sending long and short pulse widths of light at small intensities, the camera’s flash could tell the other flash units how much light to output and when to start doing it.



Figure 13-8: Moving the light around (via wireless flash) can help you add drama to even the most boring subject. In this case I wrapped some paper around the flash; yielding a “tube” of light that was then placed below left. I’m telling you, wireless flash is worth the effort!

TIP: The 60 flash has a feature where you can control the flash exposure compensation from the back of the flash as well as through the camera’s **MENU** → **3** → **Flash Comp.** menu. If you should adjust both, the total of the two settings gets implemented, although the back of the flash and the camera’s menu will only show you their respective individual values.

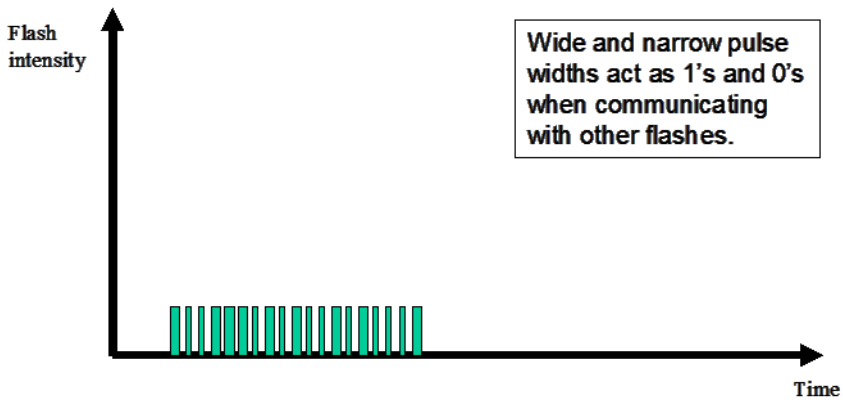


Figure 13-9: The flashes can communicate with each other using a "Morse Code" of wide and narrow pulses. In the blink of an eye this protocol can individually address groups of flashes and tailor the output of each group.

So, here's how the flash metering system works, from the moment you press the shutter release to the moment the camera finishes taking the picture:

- 1) The on-camera flash fires a "Morse code" that tells all flashes in the room to generate a short, fixed "pre-flash" of known brightness.
- 2) The pre-flash burst is reflected off of the subject and back to the camera. The camera's sensor measures the intensity of the reflected pre-flash and compares it against any ambient light present.
- 3) The exact amount of flash brightness needed is calculated by the camera. The camera communicates the calculated brightness value to the off-camera flash via another Morse Code message.
- 4) The exposure begins.
- 5) The on-camera flash sends a Morse code command to all of the off-camera flashes telling them to "FIRE!" and output the previously-set flash burst.
- 6) All of the off-camera flashes fire with the proper intensity in a single burst.
- 7) The camera's sensor may continue to collect light a little longer if you told the camera to use a longer exposure. Then the shutter closes and the exposure is finished.

A real “conversation” between the camera and the remote flash has been recorded and appears in **Figure 13-11**. In this graph, time (in milliseconds) is represented by the horizontal axis, and each flash’s output is represented in yellow (the pop-up flash) and blue (the off-camera flash).



Figure 13-10: *The sensor at the front of your slave flash (yellow square) must be able to see the control signals from the master. Line of sight is best; but it can also see control signals that bounce off of walls or the subject.*

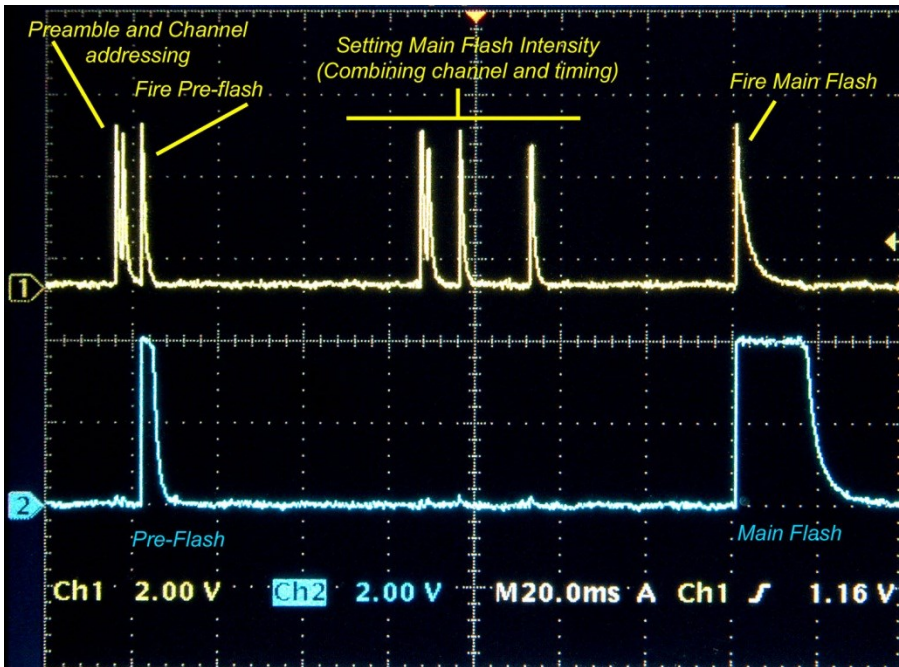


Figure 13-11: This is what a conversation between the Master (top yellow) and the Slave (bottom, blue) looks like on an oscilloscope. The Master communicates to the Slave using combinations of wide and narrow flash pulses, and the Slave responds by firing a pre-flash and the actual flash of the proper intensity on command. The firing intensity is communicated to the off-camera flash in the middle section by a combination of pulses and time delay. This is the old wireless protocol in action – the new protocol is more complex than this and it takes a tad longer to execute.

13.5 AS SIMPLE AS IT GETS

Okay, enough arm-waving. How do you actually get the camera and flash to work in wireless mode? Basically, it requires two flashes: One on top of the camera (I recommend the “F20M” flash for this purpose) and any other flash which acts as the off-camera “Slave” (either an F60 or F43). Slaves can be placed almost anywhere in the room as long as it can see the control

signals coming from the Master, either via direct line-of-sight or after being bounced off a wall or ceiling (it's pretty resilient). Just follow these steps:

1. First, we must put the Slave flash into wireless mode. The easiest way to do this is to mount it on top of the camera, turn it and the camera on, and then put the camera into Wireless mode via **MENU → [Camera Icon] 3 → Flash Mode → Wireless**

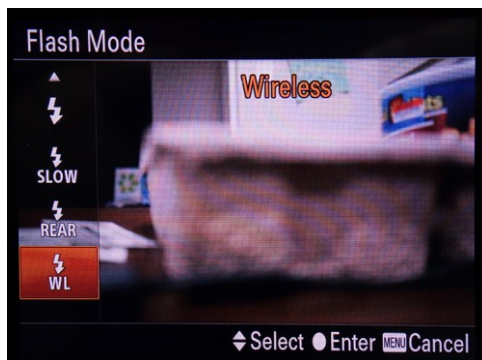


Figure 13-12: Putting the camera into wireless flash mode

- (**Figure 13-12**). (Or you can access it via the **Fn** menu.)
2. Press the shutter release button halfway. This makes the camera communicate all the necessary settings to the flash.
3. Remove the flash from the top of the camera. The large red LED on the front of the flash will start blinking once a second, telling you that 1) the camera was successfully set to wireless mode, and 2) that the flash is fully charged and ready to fire.

4. Mount another flash atop the camera to act as the Master. (Again, I recommend the “F20M” for this purpose.)
5. You can now place the slave flash(es) almost anywhere in the room (as long as it can see the control signals from the master), aim it at your subject, bounce it off the wall, aim it at the background, or [insert your own ideas here]. If the strength of the reflected pre-flash signals are adequately strong (as described in the previous section), the system will do its best to make sure the exposure comes out correctly.
6. To make sure that the master and the slave flash can talk to each other, you can do a quick flash communications test. Press the camera’s AEL button once. The master flash will emit a quick pulse, and then half a second later the slave flash (if it can see the control pulses coming from the master flash) will respond with a short pulse of its own.
7. Shoot away!



Figure 13-13: A good photographer has good light wherever he or she goes!

With this setup, you can have one or many slave flashes in the room – and when you take the picture they will all fire with the same intensity.

TIP: When testing the Master → Slave communication via step 6 above, you might have to press the AEL button a second time if you have **MENU → ⚙️ 7 → Custom Key Settings → AEL button set to AEL TOGGLE**. (Otherwise it will lock the f/stop and shutter speed for wherever your camera was pointing when you pressed AEL the first time.)

That's it! Put your flashes all over the room, and experiment with placement of the light. Create emotion by simulating a sunrise. Highlight only someone's hair and have the rest of them be a silhouette. Light them from beneath to give that classic Hollywood "Bad Guy" lighting. In short, add drama to your pictures just by moving the light around!

Simplest: One Master and One Slave

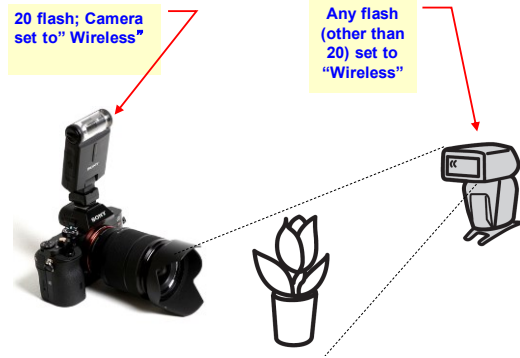


Figure 13-14: The simplest wireless flash setup, where all the illumination comes from the slave flash.

TIP 1: The F60 flash will beep twice after it's fired wirelessly – the first time (short beep) means “the exposure was OK”; the second time (longer) means the flash is fully charged and is ready to shoot again. (This can be disabled via the flash's menu, but in the studio shooting kids I find this audio feedback useful.)

TIP 2: The F20 flash, while very convenient as a wireless flash trigger, has very poor battery life. Batteries in the unit will also tend to self-discharge even when sitting unused on a shelf. If you're going to be using this for an important shoot, take a ton of extra AAA batteries with you!

13.6 THE NEW WIRELESS PROTOCOL

As mentioned at the beginning of this chapter, you can use Sony's “New” wireless flash protocol by putting the F60 or F43 flash atop the camera (as lopsided as that is). (The F20 flash only will trigger using the old wireless

protocol, so that's no good for this section.) The new flash protocol provides the following new features:

1. Ratio mode. Ratio mode means you can have two off-camera flashes on either side of your subject, at any distance, and the camera will automatically light your subject with, say, one flash being twice as strong as the other for 2:1 lighting ratio. (Or three times as strong as the other for 3:1 lighting ratio.) Lighting ratios worked brilliantly on film based cameras, but it had to be disabled for technical reasons when the world switched to digital. Now it's back, and it's explained in greater detail in the next section.
2. You can have as many Slaves lighting your scene as you want, and you can even assign a group of Slaves to be "Group 1" (what Sony calls "RMT"), "Group 2" (what Sony calls "RMT2"), or "Group C" (which isn't really a Group at all – it's the fill light that comes from your on-camera Master flash). Each time you take a picture, all three groups are fired and autoexposure occurs automatically. So far so good.

But what if you did some test shots, and decided that you wanted the background a little darker? Well, if you had assigned all the flashes illuminating the background to "Group 2", then all you'd have to do is tell your Master flash to say "All the Group 2 flashes must reduce their output by one stop" and then shoot again. Or you can have Group 1 overexpose by half a stop, without affecting the other groups of flashes. This can be a tremendous time-saver when you're in the studio and you're experimenting with your lighting setup. If not for groups, if you wanted to modify the output of certain flashes, you'd have to walk over to each flash, dial in a manual exposure compensation amount, walk back and take another test shot. Nuts to that! All Sony flashes are set to Group 1 (which Sony calls "RMT") by default, and when you alter many of the settings on the Master (such as Flash Exposure Compensation, Flash Exposure Bracketing), they are automatically invoked on the Slaves.

It's true that there are a lot of variables to get your arms around before all of the features of new wireless flash can be understood, and it all seems rather intimidating at first. (Worry not; I'll get you through it.)

In this book I'm only going to explain how to do the new flash protocol (with ratio and groups) using the new F60 flash as the controller only because its user interface is superior to that of the 43.

TIP: *You can put alkaline, Ni-Cd, or Lithium-Ion batteries into your accessory flashes, but beware of pure lithium AA (sometimes called "NiZn") batteries in your flash. Your flash will recycle almost instantaneously (which can be nice), although you'll get fewer total flashes per charge. And the low internal resistance may cause the flash to overheat if you shoot too rapidly for too long. They also have a very short life – I had three sets which lost the ability to hold a charge after sitting on the shelf for a few months. Otherwise, they can provide a nice edge when shooting children (when fast recycle times are essential!)*

Simplest: F60 + One Slave



Figure 13-15: The simplest wireless flash setup, where all the illumination comes from the slave flash. .

Figure 13-15 presents a diagram showing the simplest way to get yourself going with wireless flash with the “60” atop the camera. Notice that with this configuration, illumination for the subject comes only from the slave flash. (The Master only sends out Morse-code-like commands using weak flash pulses which shouldn’t affect the exposure significantly.)

To achieve the basic wireless setup as illustrated in **Figure 13-15**, just follow these steps:

1. Attach what is going to be the Slave flash to the camera’s flash shoe, and make sure both the flash and camera are on.
2. **MENU → 📷 3 → Flash Mode → Wireless**
3. Press the camera’s shutter release halfway. The camera communicates with the flash and sets the appropriate parameters.
4. Remove the flash from the camera. It is now in “Slave” mode. The large red LED on the front of the slave flash will start to blink once a second, indicating it is ready to fire when instructed by the Master.

5. Now let's set up the Master flash controller. Place a 60 on top of the camera, and turn it on.
6. Even though the camera has been put into Wireless Flash mode, with the 60 you must manually put it into Wireless Controller mode. To do this, press **MODE → WL CTRL** on the back of the flash.
7. You can now place the slave flashes almost anywhere in the room (as long as it can see the control signals from the master), aim it at your subject, bounce it off the wall, aim it at the background, or [insert your own ideas here]. If the strength of the reflected pre-flash signals are adequately strong, the system will do its best to make sure the exposure comes out correctly.
8. Shoot away!
9. Sometimes it's helpful to test the communication between the camera and the remote flash before you start shooting away. To test the system, perform steps 1 through 7 and press the camera's AEL button. A tiny test flash should emanate from the master flash, and ½ a second later a "response" flash should emanate from the off-camera flash, indicating that the two can indeed communicate with each other. *If you don't see the response flash, it means the off-camera flash cannot see the light coming from the on-camera flash, and you may have to re-position the flash.* In practice, you'll be surprised at how well the flashes communicate indoors even if there is no line-of-sight.
10. Once you're finished with your photo session, you may want to put the 60 back into "normal mode". To do this, just do **MODE → TTL**



Figure 13-16: You can change from the new wireless flash protocol (CTRL+) to the old one ("CTRL") by going MENU → Tab 1 → WL CTRL → CTRL on the back of the 60 flash. This will allow you to control older Sony flashes (and certain Minolta flashes as well).

TIP: Triggering an older flash, like the Minolta 3600, 5600 or Sony F36, F56? Then you need to set the Master flash to **MENU → Tab 1 → WL CTRL → CTRL** (not **CTRL+**) in order to specify using the old protocol. (See **Figure 13-16.**)

13.6.1 HOW TO DO RATIO FLASH

Professional portrait photographers and cinematographers have learned that the most flattering and dramatic lighting for people is “ratio lighting”, where you have two lights illuminating your subject from the left and the



Figure 13-17: Examples of ratio flash.

right sides, but one light is twice as strong as the other. **Figure 13-17** shows some examples of this, which is formally called “2:1 ratio lighting”.

To do ratio flash, you can configure one slave to Group 1 (“RMT”) on one side of your subject, and one slave to Group 2 (“RMT2”) on the other. (I’ll go over how to do this in a minute.) Then you tell the Master flash (60) on the camera to invoke RATIO mode, so you can specify the ratio of light from Group 1 : Group 2. (The Master can then also be configured to contribute some fill light to the image if desired.)

Simplest: Ratio

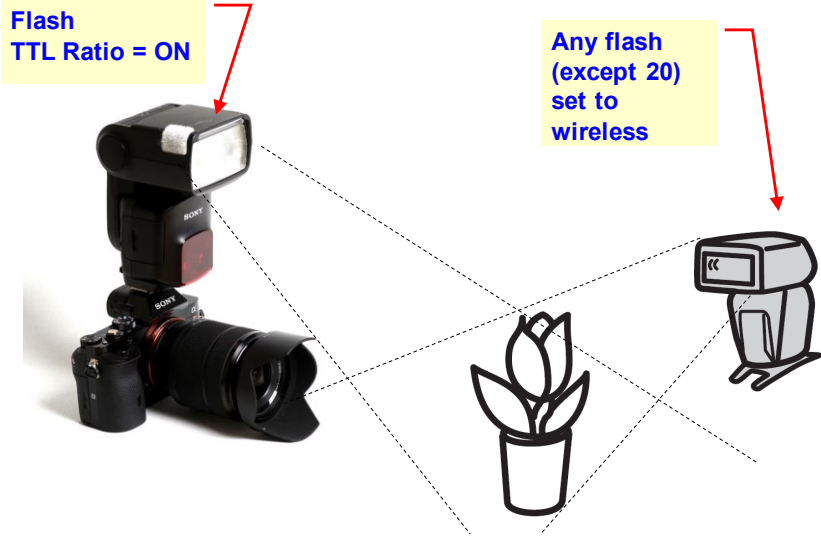


Figure 13-18: Ratio flash setup if you have older flashes, such as an F36 or F56 as a slave. This is the only way to do ratio flash using flashes that only can “speak” the old wireless flash protocol. The Master flash provides both the control signals AND the fill light to achieve the desired ratio.



Figure 13-19: Here are Ratio samples using one slave flash (to the left) and the 60 as a master flash. The left number of the ratio represents the relative output from the master; the right number from the slave.

More Complex: 3-way Ratio

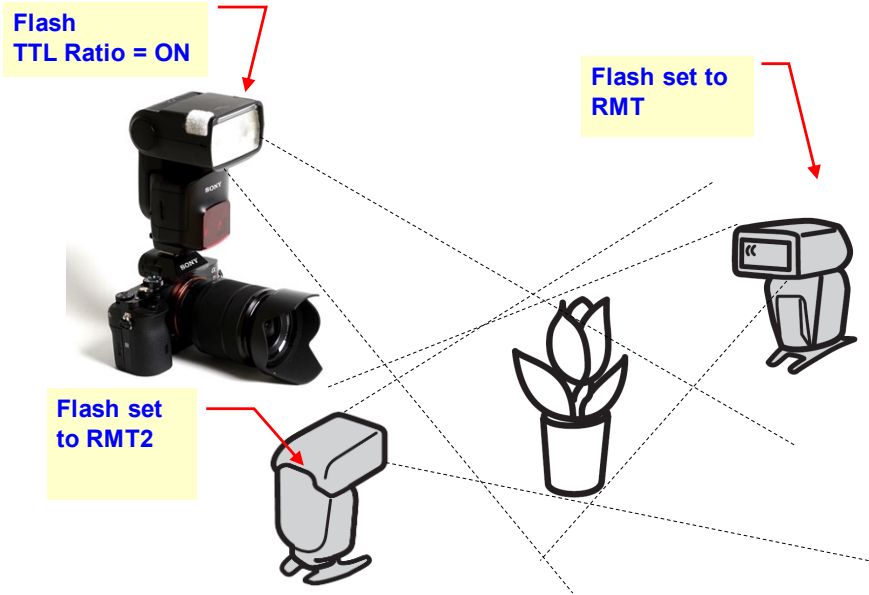


Figure 13-20: A more advanced 2- or 3-way Ratio flash setup is possible if you have F42, F58 (old protocol, or “RMT”), and/or F43 or F60 flashes (new protocol, “RMT2”) as slaves.

13.6.2 ADVANCED 2- OR 3-WAY RATIO FLASH

This is the advanced 3-way Ratio flash that Sony’s marketing materials were talking about (see **Figure 13-20**). In this mode, light for the subject can come from the flash atop the camera (CTRL), the flash on the left (RMT), and the flash on the right (RMT2).

To configure your flashes for this setup, do the following:

1. Attach what is going to be the first Slave flash to the camera, and make sure both the flash and camera are on.
2. On the camera, **MENU** → **3** → **Flash Mode** → **Wireless**

3. Press the camera's shutter release halfway. The camera communicates with the flash and sets the appropriate parameters.
4. Remove the flash from the camera. It is now in "Slave" mode. The large red LED on the front of the slave flash will start to blink once a second, indicating it is ready to fire when instructed by the Master.
5. Mount the 2nd slave flash to the top of the camera and press the camera's shutter release button halfway. The slave is now configured for wireless mode, but now we have to configure it to be part of the "RMT2" group.
 - a. To do this on a 60, hit **MODE → WL RMT** (center button), then hit **Fn** (on the flash), highlight TTL Remote, then choose **TTL REMOTE 2**.
 - b. To do this on a 43, press the "**Fn**" button on the back of the flash once – you should see the word "CTRL" or "RMT" blinking. Press the right arrow (on the back of the flash) twice until you see "RMT2" blink. Then press "**Fn**" again and you're done. Remove the 2nd slave from the camera, and verify that the front red light is blinking (meaning it's in wireless mode and awaiting further commands).
6. Now let's set up the Master flash controller. Place a 60 on top of the camera, turn it on, and press the shutter release button halfway.
7. **MODE → WL CTRL**, then **MENU (on the flash) → WL CTRL → CTRL+** (press MENU again to exit), then **Fn** (on the flash), highlight TTL Ratio On.
8. Press the "**Fn**" button again, highlight either the CTRL, RMT, or RMT2 label, and hit the center button. You'll see the screen in **Figure 13-21**. Here we have three numbers representing the relative intensities of the on-board flash ("CTRL"), the slave on the left ("RMT"), and the slave on the right ("RMT2"). In the figure, the on-board flash is configured to put out one-quarter as much



Figure 13-21: Setting 3-way Ratio mode on the back of the 60.

light as the Remote (“RMT”), which in turn is putting out twice as much light as the other slave (“RMT2”). Use the Up and Down arrows to adjust each ratio numbers, from “-“ (no light) to 16. Then press the right arrow until the number under “RMT” is flashing; you can adjust this number up and down the same way. Do the same to adjust “RMT2”. (You can keep this screen showing for the rest of your shooting session; there’s no need to press the **Fn** button again to exit this mode.) Know that no matter which ratio combination you choose, the camera makes its exposure decisions by measuring the light from the strongest flash. A ratio of 2:4:8 will look the same as a ratio of 1:2:4.

More Complex: 3-way Ratio w Groups

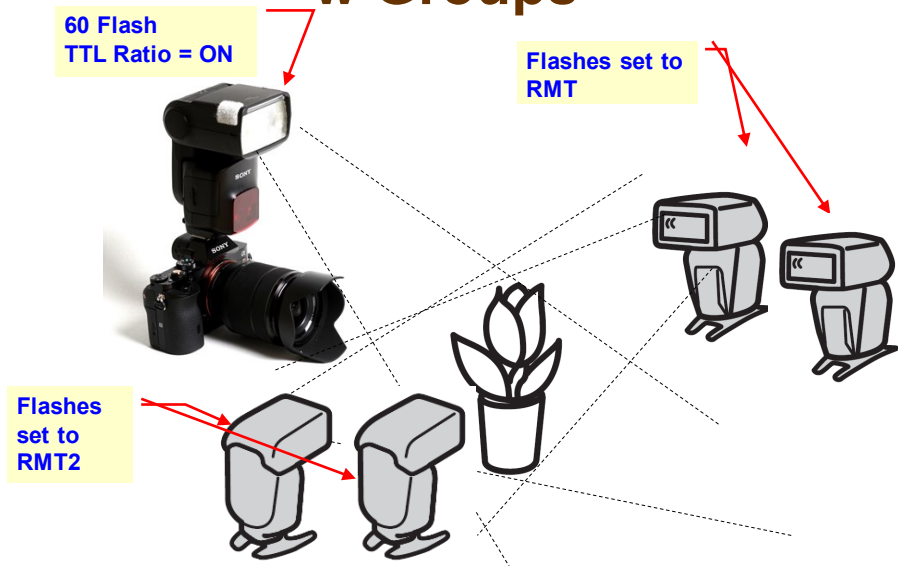


Figure 13-22: Flashes literally become groups when you have more than one configured the same way.

9. You can now place the slave flashes almost anywhere in the room (as long as it can see the control signals from the master), aim it at your

subject, bounce it off the wall, aim it at the background, or [insert your own ideas here]. If the strength of the reflected pre-flash signals are adequately strong (as described in the next section), the system will do its best to make sure the exposure comes out correctly.

10. Shoot away!
11. Sometimes it's helpful to test the communication between the camera and the remote flashes before you start shooting away. To test the system, perform steps 1 through 9 above and press the camera's AEL button. A tiny test flash should emanate from the master flash, and $\frac{1}{2}$ a second later a "response" flash should emanate from the off-camera flashes, indicating that the slaves can indeed communicate with each other. If you don't see the response flash, it means the slave cannot see the light coming from the on-camera flash, and you may have to re-position the flash or its sensor. In practice, you'll be surprised at how well the flashes communicate even if there is no line-of-sight.
12. Once you're finished with your photo session, you may want to put the 60 back into "normal mode". To do this, just do **MODE → TTL**

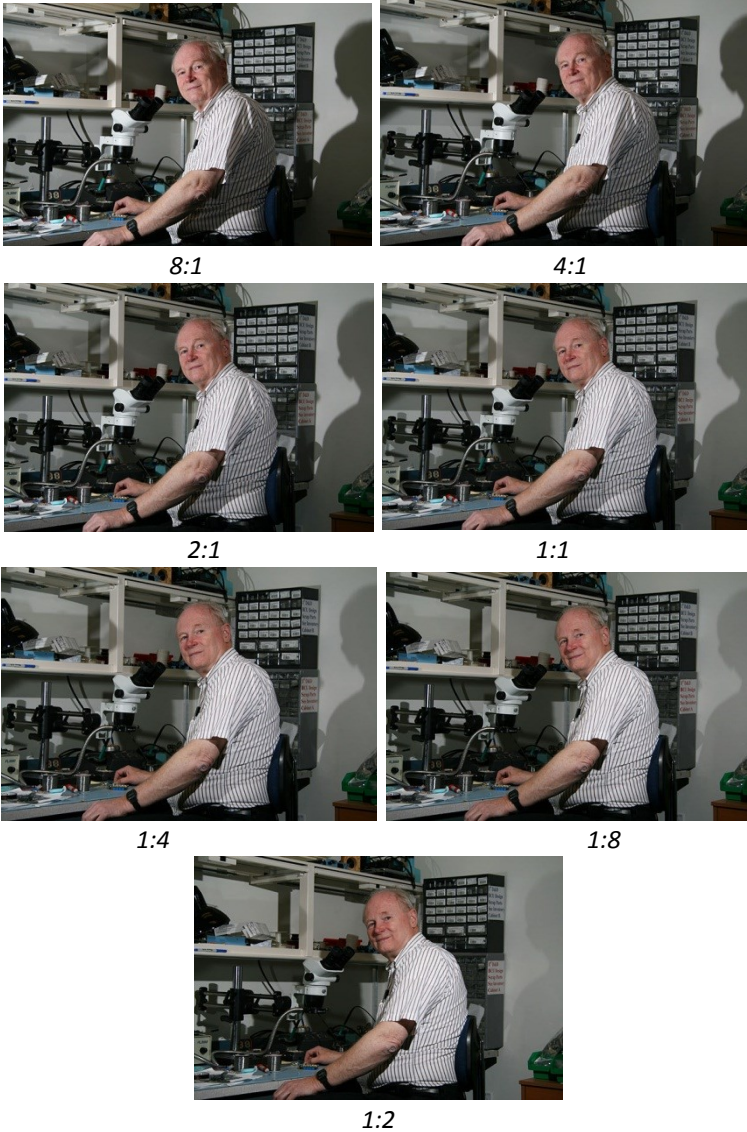


Figure 13-23: Using two Slaves, you can easily control the ratio of the two from the back of the 60. Dial-in your dramatic light!

13.7 GROUPS AND CHANNELS

Most people, when learning about wireless flash for the first time, get the concepts of Groups and Channels confused. Groups were just explained – the ability to adjust one or more flashes as a “group”, whose output can all be adjusted at once, all from the comfort of behind the camera.

But what’s a Channel? Well, let’s say that you’re shooting with wireless flash in a room, and suddenly another Sony photographer comes in and sets up his own wireless flashes to shoot something else in another corner. And every time he snapped a picture, YOUR wireless flashes went off!! An undesirable situation? You bet!

For this reason the wireless flash system was given “Channels” to ensure that two Sony photographers can work in the same room without their equipment interfering with one another. Each flash can be programmed to work on either Channel 1 or 2, and it is essential that both the Master and the Slave be set to the same channel. From the factory all flashes (Master and Slave) are set to Channel 1 by default, and it is very likely that you will never need to change it in your lifetime.

On the 60 flash, the Channel is set straightforwardly via **MENU → Tab 1 → WL CH → [Choose from Channel 1-4]**. On 43 flashes, the channel can be set by changing Custom Function 2. (You can access the Custom Function menus by holding the “Fn” button for more than three seconds.). Do this for each flash in your wireless setup.

TIP: *The F20M flash is fixed at Channel 1 and cannot be changed.*

13.8 WILL THE CONTROL BURSTS AFFECT EXPOSURE?

No. The pre-flash bursts all occur before the exposure begins, so none of that activity ends up in the shot. But, as mentioned in the “How it Works” section earlier, if you’re shooting with off-camera wireless flashes, the Morse Code “FIRE!” command does indeed occur during the exposure and might be noticeable in the shot. Generally all Morse Code commands are of such low intensity that they will not be detectable in the final image.

However, there are conditions under which the “FIRE!” Morse code command becomes visible and can affect the appearance of the subject. For example, if you’re shooting a close subject with the lens wide open (as I did in the examples in **Figure 13-25**), the intended dramatic lighting effect is washed out. This won’t happen very often but if it does there are two things you can do about it.

The first is to simply put a piece of cardboard between the master flash and the subject, so that there’s no direct illumination by the flash on the subject. (Make sure that there’s still a bounce path that the light can take to get to the off-camera flash!) The 2nd option is to place an Infrared filter on the front of the master flash – this way the slave flash will still be able to see the control signals, but the same light will NOT appear in the image because the camera’s sensor has an Infrared filter built right in! Snippets of overexposed and developed color negative film (yes, FILM! Remember that?) can act as an ideal IR filter for the master flash. (**Figure 13-24.**) I actually took my 20 flash apart and taped the exposed and developed film over the 20’s useless flash diffuser, and I explained how I did it in this article I wrote for Photoworld magazine: <http://tinyurl.com/d9tgvfm> .



Figure 13-24: A strip of overexposed and developed color negative film makes for an ideal IR filter for your flash. The control signals still get through, but your shot is not affected by the “Fire!” command. I took my F20 flash apart and glued a strip onto that useless flash diffuser, so now I can roll the IR filter out of the way when I want to use the 20 as a pop-up flash.

There is also a third method: Use HSS flash, which I talk about in Section 13.11.



Figure 13-25: Usually the “FIRE!” Morse Code command from the Master flash has no significant effect on exposure, but you can create conditions where it makes a big difference (usually in shooting close subjects with large lens openings.) For these shots a wireless flash was placed below on the right, and the left image shows what a dramatic shot can look like when the “FIRE!” command affects the shot. Putting an IR filter in front of the Master flash, or simply blocking direct illumination with your hand or a piece of cardboard, produced the intended dramatically-lit scene on the right.

13.9 MANUAL FLASH MODE

The 43 and 60 flashes have the capability to provide a fixed amount of light output when triggered by a camera in wireless controller mode. With the advent of automatic wireless flash exposure, why would you ever need manual control like this?

An example which provides the answer can be seen in **Figure 13-26**. In this scenario you cannot rely on the camera's auto flash exposure mode because of the predominantly black background – the camera's exposure computer would look at all that light coming back in from the background and say “Whoa! That's WAY too much light! I'll increase to the total amount of light I command to make sure pictures looks about 18% grey!!” (This is the same problem with ambient light exposure modes of any camera.)

What to do? Studio photographers solved the problem ages ago by using powerful strobe lights (so they can shoot at small f/stops) that always flash with a known, fixed amount of light. The photographer would use a handheld flashmeter to measure the light falling on the subject and calculate the proper f/stop to use.

Well, using an accessory flash that has manual flash output mode, a Sony wireless photographer on a budget can do the same thing, and it's a whole lot less work to set up. A handheld flashmeter isn't even needed anymore – just do test shots and look at the histogram to see if your blacks are as black as you'd like.




Figure 13-26 *Just like manual exposure mode is necessary for non-average subjects, manual mode for your flash is necessary for black (or white) backgrounds. I got this result with just one flash and one diffuser.*

13.9.1 TO PUT THE 60 INTO MANUAL SLAVE MODE

1. **MODE → WL REMOTE**
2. **Fn → [Highlight TTL label] → Center button → Manual Remote → Center button**
3. Then adjust the power of the flash output by **Fn → [Highlight the LEVEL label and hit the center button] → [Rotate the wheel to change the value, from 1/1 (full power) to 1/128th power, in 1/3rd stop increments].**

Voila!

13.9.2 TO PUT THE 43 INTO MANUAL SLAVE MODE

1. Change the flash's Custom Function 4 to read "PASM" to allow manual output using all of the camera's exposure modes (not just "M" as is the factory default). (Technically this isn't needed to use the flash as a slave, but it's a good setting to keep nevertheless.)
2. Make sure the flash's Custom Function 1 to "On". This enables the High Speed Synch function, which might be needed if you're shooting with a shutter speed above 1/250th of a second (You can keep this setting on "On" forever.)
3. With the flash atop the camera, set the camera to "Wireless" mode (**MENU →  2 → Flash Mode → Wireless**). Press the shutter release button halfway.
4. Press the "**Fn**" button on the back of the flash. The "CTRL" icon starts to blink. Press the right arrow on the back of the flash until you see the "RMT" (Remote) icon flash. This puts the flash into slave mode. Press the "**Fn**" button again.
5. Press the TTL/M button on the back of the flash once. You will see the "MANUAL" icon appear along the bottom edge of the flash's display.
6. Use the left and right arrows on the back of the flash to control the fixed amount of light that the flash sends. "1/1" means full output; "1/2" means half of full output... all the way down to 1/32nd of full output. (How much is appropriate? Some test shots will reveal this quickly. Check the histogram (Section A.7) for exposure accuracy.)

13.10 A PORTABLE STUDIO SETUP

Figure 13-27 (next page) shows how my portable wireless studio is set up. It uses just one wireless flash and one diffusing umbrella. A parts list appears below:

- A portable Tripod
- Black cloth as a backdrop (in my case a black bedsheet, bought on sale for USD \$10)
- An Umbrella reflector which collapses down to 15" (I chose a reflector umbrella rather than a shoot-through to make sure that 100% of the light from the flash ends up on the subject. Accessory flashes are inherently weak compared to studio strobes and so I prefer to utilize all of their output.) You can buy one here: <http://tinyurl.com/4ved82g>
- Umbrella Swivel hardware (<http://tinyurl.com/6g72vs>)
- Minolta 5600 Flash (although you could use ANY wireless flash) but at least the head on this one can turn around 180 degrees – useful for soft boxes.
- Minolta Off-camera shoe OS-1100 just to physically mount the flash because it has the old hot shoe (<http://tinyurl.com/4shjvwj>)

Usually I place the umbrella about 45 degrees off to one side (**Figure 13-26**), but you can also place it 90 degrees (depending on your subject) for even greater impact. **Figure 13-27** shows an example of this.



Figure 13-27: My ultra-simple, 1-flash portable studio produces outstanding results and it travels well!

13.11 HIGH SPEED SYNC (HSS) FLASH

The same circuitry that allows an accessory flash to communicate in Morse Code also allows the flash to “spread out” the total light output by providing one long low-intensity burst of light rather than just one large short one. (See **Figure 13-29** below.) *This means you can shoot with flash at a much higher shutter speed than normal.* With this capability you can shoot outdoors, wide



Figure 13-28: *The High Speed Sync (HSS) feature lets you shoot wide open on a sunny day (1/2,000th in this case), providing for the out-of-focus background and still getting the benefits of wireless flash. Here, the wireless flash with a small softbox was set to the above left of the subject, who was standing in open shade.*

open, and still have your slave flash expose everything automatically (see **Figure 13-28** for an example of this). Equally amazing, Sony has combined the ability to do HSS with wireless flashes.

It’s a little tricky to explain how they did it, so if you don’t care and just want to know how to use it, skip to the “How to Activate HSS” section below.

TIP: *Sometimes complex things can be better explained via video. That’s exactly what I do here in making High Speed Sync intuitively understandable: : <https://youtu.be/edkLa0HEbcA>*

HOW IT WORKS

Rather than waiting for the shutter to open all the way (or turn on electronically in the case of the A7 only) before triggering the flash, the flash is told to output one long continuous flash whose intensity is right for the subject (as determined by the pre-flash). This long flash pulse illuminates the subject while the shutter’s “traveling slit” exposes a different part of the sensor.

It’s kind of like standing outside of a baseball park and looking at the game through a tiny little slit in the fence. You can’t see the whole scene at once, but you can move your head left and right and “see” the entire scene a small slit at a time. That’s how HSS works – as the shutter’s “slit” travels across the face of the sensor, the sensor is provided another thin strip of the scene. The HSS flash pulse is long enough to ensure that there’s the same amount of light on the subject when the slit is at the top of the frame and at the bottom.

Those of you who are technically inclined might be scratching your head, saying “Hey, I thought that Sony went with that electronic first shutter curtain thingy. Since the sensor is always fully open until the exposure ends, why is this ‘traveling slit’ stuff still relevant?” Good question. The answer is “the pixels are turned on one row at a time, starting at the top, at

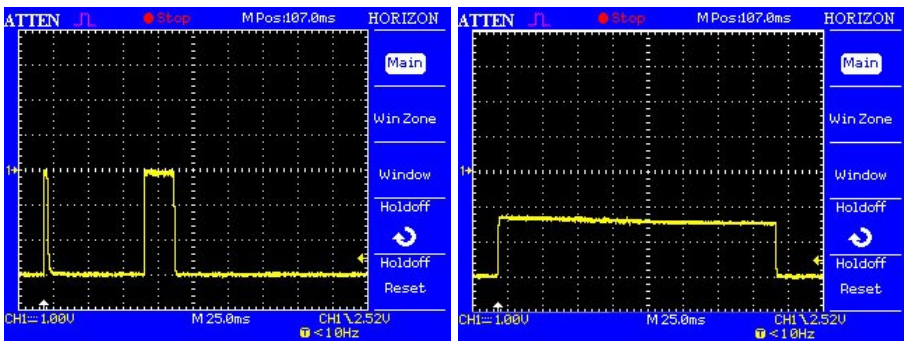



Figure 13-29: HSS Flash: A normal flash burst (the wider pulse in the left image) and the equivalent HSS output (right). The long pulse evenly illuminates the “traveling slit” used in High-speed Synch. Downside: you can only shoot close subjects.

the same speed as what a physical shutter would have done”, thus enabling them to get the exact same kinds of high shutter speeds as with a conventional shutter.

There are some limitations to using HSS:

- Your flash doesn't have the reach that a non-HSS flash burst has. (This is because you're trading off one intense short burst for one much-less-intense longer burst.) Therefore, your subject can't be nearly as far away as it could for non-HSS operation. You can actually see the distance scale on the back of your 60 flash change as you change the shutter speed – the faster you go, the less reach your flash will have. So if your picture looks too dark via HSS, reduce the distance between the camera and the subject.
- You can't use HSS when the rear sync is selected (**MENU →  3 → Flash Mode → Rear sync**). (Why? The two ideas are incompatible. Rear sync applies when the shutter is completely open for a long period of time. That never happens when HSS is used.)

13.12 TO PROBE FURTHER

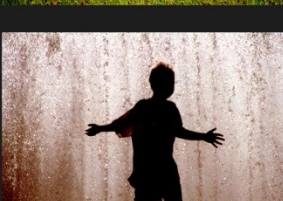
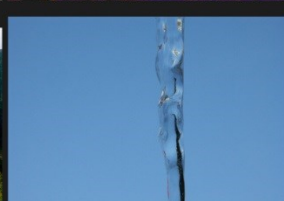
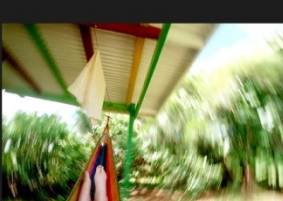
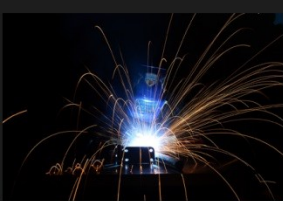
If you'd like more inspiration on what wireless flash can do to give you awe-inspiring images, I highly recommend you spend some serious time at the website www.strobist.com. From their website: "Think of Strobist as a lighting idea bank, run by and for the most enthusiastic DSLR photographers. Our goal is to exchange ideas with other shooters and post many different lighting techniques - using real-world assignments as examples."



Figure 13-30: Even boring subjects can look dramatic using wireless flash. ☺

I have also created other non-intimidating learning resources if you're interested in exploring this very important technique even more:

- Ways to 'Wow!' with Wireless Flash – an e-book that takes a distinctly non-technical approach to learning wireless. (<http://friedmanarchives.com/WWWF>)
- Wireless Flash Lecture – a videotape of a live demonstration. (http://friedmanarchives.com/wireless_flash)
- There's also a segment covering wireless flash in the Friedman Archives Seminars (www.FriedmanArchives.com/seminars)




Chapter 14 DRO AND HDR

Sony offers two different features which attempt to address the problem of “My picture doesn’t look the same as what my eye saw!”: The first is called Dynamic Range Optimization (which operates in an intelligent way to brighten the shadows), and the second is the High Dynamic Range technique which takes three images of different exposures and merges them together in-camera. Both features have their tradeoffs: DRO works great for moving subjects, whereas HDR images (for still subjects) don’t have as much noise in the shadows. The whole shebang (or Magilla, or enchilada) is explained in this chapter.

14.1 DYNAMIC RANGE OPTIMIZATION

The advanced Dynamic Range Optimization feature first appeared in the A100 more than 8 years ago, and I have grown to really love this feature (in fact I hardly ever shoot with it off!). It can help you make the best of un-ideal light, and it can save you countless hours trying to do the same thing in post-processing on your computer (which is not easy to emulate). Unlike the original implementation on the A100, the A7r II’s DRO feature gives you more control: You have “AUTO” plus five manual settings, ranging from “the most conservative” to “the most aggressive”. Sony’s Image Data Converter software also allows you to perform a similar adjustment to your RAW files using your computer after-the-fact, but as the examples in this Chapter will show, the results of the in-camera DRO processing are usually more effective.

Before I get into the technical stuff about how it works and where it fails, I should tell you how to set this feature: **MENU →  5 → DRO / Auto HDR → DRO Auto.** (or access it from the **Fn** menu if it hasn’t been configured to not be there).

***TIP:** DRO works in all movie modes except the XAVC S HD 100p or 120p modes.*

Let me share with you some DRO success examples. **Figure 14-1** and **Figure 14-2** are images where DRO has made the image better right out of the box in difficult light – no additional effort on my part was required.

Sony doesn't provide much technical information about this feature, and so through much experimentation I have learned to “see” in which situations the feature would provide the most benefits, and (perhaps just as important) know under which situations the feature will produce just awful-looking results. In this chapter I will share my knowledge and experimentation with you, so you too can get the most out of this remarkable feature.



DRO Off



DRO Level 1



DRO Level 3



DRO Level 5

Figure 14-1: *This is a good example of a scene that can benefit from DRO. I used DRO Bracketing “Hi” to produce DRO Levels 1, 3, and 5 to “bring out the shadows” in this outdoor scene. For this shot I think I like Level “1” or “3” the best – 5 looks a little too artificial for my tastes.*



Figure 14-2: DRO can act as an effective “fill flash” to only the dark parts of the picture when the lighting is non-ideal. It can also make things look natural in extremely low light and high ISO (upper right). Bottom row: Another example of making pictures look like you remember them (left and middle), and improving a subject in shade (right)

14.1.1 HOW IT WORKS

First, let me get some misconceptions out of the way: DRO only works with information that the sensor has already captured. It does not give the sensor a wider dynamic range. DRO simply takes the information that’s already there and makes the darker areas a little lighter in a fast and intelligent way.

So how does it work? Those of you who are familiar with the Tone Curve tool in programs like Photoshop, Lightroom, or Sony’s Image Data Converter software, you could affect the brightness of certain parts of the

image, while not affecting the other parts (as shown in **Figure 14-3**). Most people use the tone curve to increase contrast (making the blacks blacker), but the tone curve can also be used in reverse – to make the blacks less black. And while the image in **Figure 14-3** certainly doesn't benefit from making the blacks lighter, images in future examples certainly will.

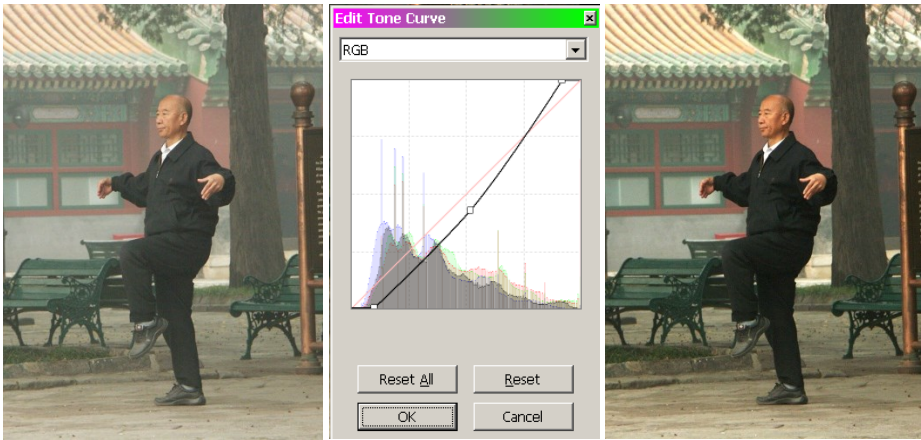


Figure 14-3: The tone curve has the ability to change only the blacks and leave everything else alone. This is the principle behind the most basic DRO setting, except it happens in-camera and is designed to LIGHTEN the blacks, not darken them.

That is exactly what DRO does: in certain circumstances, the algorithms in the camera's image processing chip will examine the brightness range of the image and, if it feels the image will benefit, will evaluate and map out every light and dark area of the image, and apply a local gamma curve to each individual area. Considering all the computation involved and the 20 MP sensor, the speed at which the camera analyzes and processes the image is actually quite an achievement. (And the camera does other image processing wizardry too, like correcting for distortion and chromatic aberrations in the lens after you shoot.)

“DRO Auto” will only kick in when the camera decides the images can benefit from it. This is in direct contrast with the manual DRO settings (Levels 1-5), where the camera will dutifully analyze the image pixel-by-pixel and lighten certain shadows and contrast areas it finds by a pre-

determined amount, regardless of whether it feels the image will benefit. You can manually set the DRO manual settings from “1” (doesn’t brighten the shadows much) to “5” (where the shadows are lightened so much that the scene might look unnatural).



Figure 14-4: Another DRO example – Level 1, 3, and 5.

Does DRO affect RAW files? No. Also, you should be aware that Sony has a DRO-like feature to their Image Data Converter SR software so you can play with this setting in the comfort of your office instead of in the field. The results it produces aren’t quite as good as the in-camera algorithms, and it takes considerably longer to do, but at least you have the option.

Like the SteadyShot feature, Dynamic Range Optimization is not a panacea, and not all images will benefit from its application. The following should be kept in mind when considering using any of the DRO settings:

- DRO Auto won’t have a visible effect on most images. It only kicks in under certain circumstances, where there are strong black and strong whites and a lot of detail (i.e., not blown out) in each. (See example in **Figure 14-5**.)
- DRO doesn’t actually increase the dynamic range of the sensor; rather it manipulates the information that has been captured and tries to make it look more like how the human eye saw it. (Careful readers will observe that I already said that.)

Noise is almost always more visible in the shadows; and when you amplify the shadows (as the DRO does) the noise will become much more apparent as well (**Figure 14-6**). This is an unavoidable consequence of the technique; to minimize this noise it is recommend to shoot at the lowest ISO settings you can (or try HDR if your subject is not moving – covered in the 2nd half of this chapter).



(DRO OFF)



DRO Auto



(DRO OFF)



DRO Auto

Figure 14-5: Two situations of extreme brightness ranges which were able to trigger the DRO Auto algorithms into lightening the shadows. Not all scenes will trigger it. The mode was designed to be a “set it and forget it” feature, where the camera will invoke it when needed. I tend to keep the camera on DRO Auto as my default setting.



Figure 14-6: DRO can also bring out some undesirable qualities. Noise, which is always strongest in the shadows, gets amplified with any level of DRO (above, right). On the other hand, this feature gives you a fighting chance of getting usable images in the worst kind of light.

14.1.2 MORE DRO EXAMPLES

Figure 14-7 shows a scene where the entire range of DRO options (including “OFF”) are used so you can get a feel for the effect of each setting. I strongly encourage you to do similar test shots of your own – DRO takes awhile to acquire a “feel” of when to use it best (and when not to use it), and this kind of experimentation is the only way to acquire it.

14.1.3 FREQUENTLY ASKED QUESTIONS ABOUT DRO

Q: Gee, there are so many different choices regarding settings, and they all produce such different results! How in the world will I know which one to use for any given scene?

A: It is difficult to say; every situation is different and in my experience, no single setting is optimal for all images. While trying different values in the field and examining each afterward on the camera’s display can work, it can be very time consuming, and we all know that images on the camera’s display can look very different from the same image viewed on the computer screen or when printed.



OFF



DRO Auto



Level 1



Level 3



Level 5

Figure 14-7: DRO has many different settings. Auto makes very, very conservative adjustments to ensure that the feature never calls attention to itself. The manual settings (Levels 1 through 5) allow you to use the feature more forcefully, making the image look more like the way you remember seeing it.

What I find myself doing is keeping the camera set to DRO Auto almost all the time, and then when I encounter a scene with tricky or splotchy lighting I'll save time by using the camera's DRO Bracketing feature. When

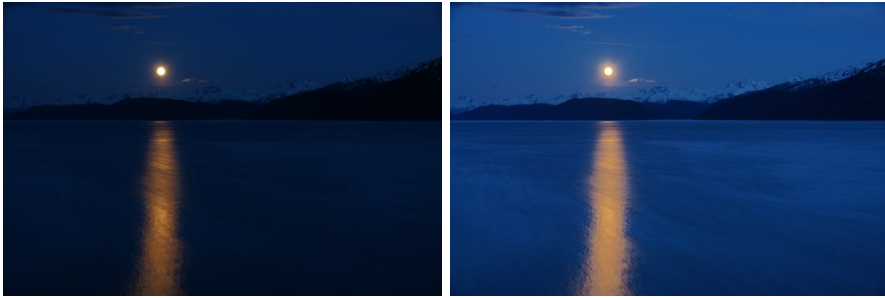


*DRO Level 1**DRO Level 5**DRO Auto**DRO Level 3*

Figure 14-8: More examples of where DRO has made a positive difference.

activated via **Fn → Drive Mode →**  or , the camera takes ONE picture, processes it at three different Level DRO settings, and then saves the resulting THREE image files onto the memory card.

To hedge my bets in tricky lighting situations, I will often shoot DRO at various Levels with RAW & JPG, so in case I decide later that the image looked better without DRO (it happens), I can always have an unmodified version to tweak later. Of course this slows down the camera and consumes memory cards quickly in the field, but for some shots it's just better to have options.

Q: Under what circumstances have you found the DRO most useful?

A: When shooting in low, splotchy light without a flash, the DRO Levels 2 or 3 makes the images look much more natural than without. Even High ISO shots look better (although if you're not a fan of high ISO noise, you

won't like this effect at all! The noise in the shadows is amplified right along with the detail.)

Q: Does the DRO processing affect RAW files?

A: RAW files are NOT affected if you're shooting with DRO. (Well, that's



DRO Auto

Level 5

Figure 14-9 *In the outdoors, when shadows can be annoying, DRO does to the picture what our brain does with the signal from the eyes – it makes shadows not call attention to themselves. (And apparently it straightens buildings, too! ☺)*

the official answer, anyway, but this 2007 article from David Kilpatrick explains that the camera will underexpose the RAW file a little bit to make sure the highlights don't blow out: <http://tinvurl.com/6mm47bw> The underexposure may be difficult to see because raw processors like Sony's Image Data Converter will make it a bit lighter when showing the image to you.)

Q: You mentioned DRO bracketing and shooting RAW & JPG. Any disadvantages to setting the camera to a DRO setting and then shooting RAW only?

A: Well, yes, there are huge disadvantages in my mind. When you play back the RAW file you just took, the camera won't show you the RAW file as you might expect – instead it will show you a DRO-processed thumbnail that's embedded in the RAW file. (The histogram will reflect this processed thumbnail as well, and not the RAW image). But when you get back to your computer, you'll see that the RAW file looks COMPLETELY different from what you saw on the back of the camera, and it might take you a considerable amount of post-processing to get the image to look as

good as the thumbnail which was produced in-camera. (As will be seen shortly, the Sony-supplied software to give you DRO-like features on your computer won't give you the same results as the DRO algorithms in your camera.)

Q: Do you have a favorite DRO Level setting?

A: Other than DRO Auto, DRO Levels 3 and 4 seem to produce the most pleasing images for me most of the time. Like everything else, though, It All Depends upon your light, your subject, and the vision of the final image you have in your mind.

Q: Are you telling me that DRO Auto and the DRO manual level functions do a superior job compared to a post-processed RAW file using time-honored conventional tools like Photoshop?

A: Well, in theory, you should be able to produce identical results, but the reality is that it can take an experienced computer operator tens of minutes (often longer) to do what your camera can do in barely half a second. That is because the traditional Curves tool operates on the whole image, whereas the Sony software breaks down the image to the pixel level and applies individual corrections locally instead of globally. Maybe one day Sony will supply us with IDC software that implements the same algorithms as what is built into the camera, but in the meantime, the in-camera DRO tends to produce the better results.

TIP: DRO actually works in movie mode, both in DRO Auto and using any of the five manual settings. Easier than providing a physical fill light. 😊

14.1.4 SO WHEN DOES DRO KICK IN?

If you look closely at the first three images of **Figure 14-7**, you'll see hardly any change between DRO OFF and DRO Auto. Why is this? Well, as mentioned at the beginning of this chapter, DRO only kicks in when the camera thinks it's warranted. And, as I discovered the hard way, it can be very difficult to know ahead of time which scenes will trigger these settings



DRO Level 5 Full Picture....

...and close-up.

Figure 14-10: *Too much DRO can cause colors to saturate and increase the noise substantially.*

and which ones won't. It took me two days' worth of intense shooting just to come up with a few good examples of what it can do when it's working (see **Figure 14-5**).

That's why I was quite thankful when Sony started including manual DRO Level settings on their cameras. With these settings, YOU can decide when it gets used, and not wonder if the camera was invoking it.



Figure 14-11: *Another example of where DRO looks bad. The funny thing is, it's very difficult to know without trying whether any level of DRO will help or hurt a shot. A good rule of thumb, though, might be "If the lighting is insanely difficult to begin with, DRO will likely not be much of a help."*

14.1.5 WHEN DRO IS BAD

Too much DRO can blow out colors and increase the shadow noise to unacceptable levels. Check out the examples in **Figure 14-10** and **Figure 14-11**.

14.1.6 COMBINING WITH SUNSET IMAGE STYLE

Recall the “Sunset” Image Style (described under “Creative Styles” in Section 6.27) adds reds and yellows to the image to enhance the sunset somewhat. A very cool effect comes when you combine DRO Level 3 with the Sunset Image Style as shown in **Figure 14-12**. Try it!



Figure 14-12: I combined Sunset Mode (which adds reds and yellows to the image) with DRO Level 3 so the subjects wouldn’t look so silhouetted. The left image is how the image looked out of the camera, with no additional post-processing. The center and right images show another example, shot in “Standard” and “Sunset” images styles.

14.1.7 DRO ON YOUR COMPUTER

As mentioned previously, Sony has provided us with a “DRO-like” algorithm that can be invoked from Image Data Converter SR.

That’s the good news. The bad news is that the software algorithms in Image Data Converter don’t produce the same results at all. See **Figure 14-13**, and again I refer you to David Kilpatrick’s excellent article at <http://photoclubalpha.com/2007/11/01/advanced-dro-the-a700s-magic-bullet/> for even more examples.



Figure 14-13: In-camera DRO (right) cannot be duplicated by processing the RAW file with Image Data Converter’s “DRO” feature (center).

14.2 HIGH DYNAMIC RANGE (HDR)

Dynamic Range Optimization (covered extensively in the previous section) is a nice feature because it can make the most of one exposure; the drawback of it (as I’ll show shortly) is that it increases noise in the shadows – something that many people just don’t like.

So that’s one way to (virtually) increase dynamic range. The High Dynamic Range function provides a second, perhaps more time-honored way to solve the same problem.

First, some background. In the olden days (like eight years ago), whenever

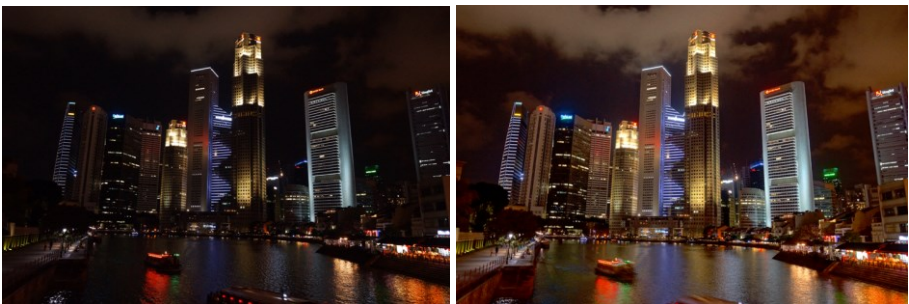


Figure 14-14: The best use for the HDR setting, by far, is shooting city nightscapes. This shot in Singapore was taken via HDR Level 6.

people wanted to get around the 8-stop range of digital sensors (shown in **Figure 14-15**), they would put their camera on a tripod, take several pictures, each 2 or 3 stops apart, and then merge them in their computer using programs like Photomatix or Photoshop’s Merge-to-HDR feature. An example of this using the old technique is shown in **Figure 14-16**.

But what if I told you it were now possible to take HDR images without a tripod, without Photoshop, and without any technical knowledge at all? The camera you now own can do this for you. To invoke it, put your camera to P, A, S, or M mode and then press **MENU → 📷 5 → DRO / AUTO HDR → HDR AUTO**. Then point and shoot at a difficult scene. The camera will do the following:

- It will analyze the scene and decide how much bracketing is required.

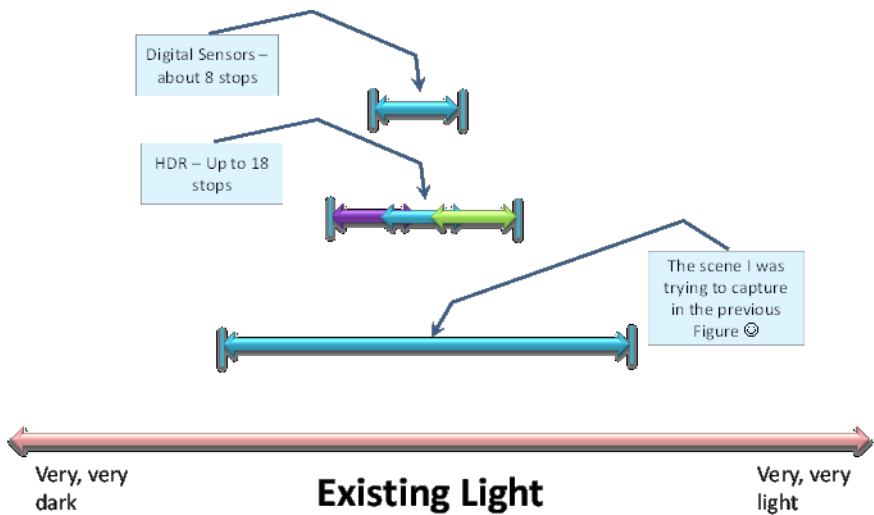


Figure 14-15: The HDR technique can capture much more brightness range as compared to taking just one shot. But take care that the brightness range of the scene you’re shooting falls within this expanded sensitivity! If not, an HDR shot will still not capture everything you see.



Figure 14-16: High Dynamic Range imaging done the old way. The idea behind HDR is to take several different exposures, capturing all of the brights and darks that the scene has to offer (typically more dynamic range than a camera sensor can capture in a single shot), and then merging the images in your computer to make the image look a little more like the way you saw it. This is a relatively simple example -- the first three images were taken on a tripod, and bracketed 2 stops apart. The fourth one shows the output from Photoshop's "Merge to HDR..." function.

- The camera will take three shots in rapid succession, anywhere between one and six stops apart (as determined in the previous step).
- The camera will align and merge the three images automatically, and write a single .jpg image to the memory card. (Yes, .jpg. This feature is unavailable if RAW or RAW+JPG is selected.)
- It will also take one of the three exposures (probably the middle one, but I'm honestly not sure) and write that to the card too. This way you can have "Without HDR" and "With HDR" so you can see just how much good your camera is doing for you.

TIP: Unlike DRO mode, HDR mode is not invocable in RAW mode. So if you are in RAW or RAW+JPG, the camera won't let you invoke HDR. And if you're in HDR mode and then choose RAW or RAW+JPG, then camera will default to DRO mode until you return to .jpg mode.

Probably the most impressive part of that process is the fact that if you had shaky hands and moved the camera between the first and second exposure (you don't have to use a tripod anymore, remember?), the camera will figure out the best way to merge all three images together so that the major features will overlap, resulting in no double-vision. Impressive!

In addition to having the camera choose how much bracketing to do for you, the camera also lets you specify a bracketing range for your HDR images in case you're not happy with what the camera chooses. Just go to **MENU → 📷 5 → DRO / AUTO HDR → HDR AUTO** and then use the LEFT or RIGHT cursor buttons to choose specific bracketing strengths: anywhere from 1.0 EV to 6.0 EV.

Please don't expect this feature to produce some of the over-cooked uber-HDR examples you've probably seen online where the image looks absolutely unreal. The purpose of this feature is really to help make the scene look a little more like your eye saw it – but in a natural way. Note also that High Dynamic Range is practically the equivalent of “low contrast”, so don't be surprised if your HDR images look a little flat right out of the camera. (There's a REASON the film and digital sensors were designed with a narrow dynamic range to begin with – it's because anything wider looked too low-contrast, resulting in images that people said looked flat and lacked punch.)

Okay, time for some examples. **Figure 14-14** and **Figure 14-17** are real-world examples where the HDR function performed admirably.

WONDERFUL TIP: *A great fringe benefit of the HDR function is that noise in the image is reduced. This is because the random noise in high ISO images is averaged away in the camera when the three images are merged (the same reason Multi-Frame Noise Reduction (MFNR) works). Fortuitous synergy!*



Figure 14-17: HDR Level 3 helps to de-silhouette the foreground. (And, yes, “silhouette” is now a verb. ☺)

These are all examples where things worked out well. In the course of preparing for this book I tried to take many, many other illustrative examples where HDR didn’t seem to have the effect I was seeking. (See **Figure 14-18** for an example). This may very well happen to you, too when you start playing with this feature. **Figure 14-15** provides a visual explanation of what’s going on. Both the DRO and the HDR functions

TIP: When you think of HDR images, you might think of über-processed unreal-looking images such as this one by Domingo Leiva (image used with permission):



Images like these may be called HDR (and in fact they are), but what you see is a result of a secondary process called Tone Mapping which no digital camera can do. (More of Domingo’s work can be found on his website: <http://dleiva.com>)

work well but only when the dynamic range of the subject is within a well-specified range.



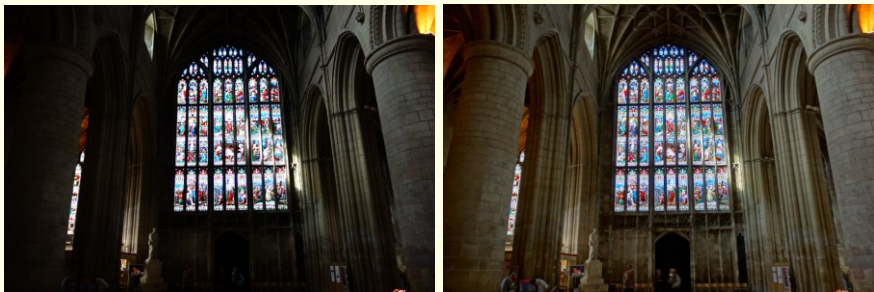
Expose for the Window

Expose for the inside

HDR set to "6"

Figure 14-18: Sometimes the scene you're trying to capture exceeds the dynamic range of what HDR can do. The moral to the story is "HDR will do its best job in only certain situations where the total dynamic range is about 18 stops".

TIP: I've found that it's best to lock the exposure lock on your highlights before shooting HDR images – otherwise your highlights have a greater chance of blowing out.



14.3 DRO VS. HDR

Okay, so these two functions try to do the same thing under similarly bad light but go about it in very different ways. How do they compare? Two examples are below. **Figure 14-19** shows a situation in bright light. **Figure 14-20** shows a scene with poor light taken three different ways; and **Figure 14-22** shows some close-ups of the yellow rectangles so you can see the tradeoffs of both methods.

The upshot? There is no upshot – the two tools work differently and will each be well-suited to different images. In good light, either tool can be the



DRO OFF



DRO Auto



DRO Level 5



HDR 6

Figure 14-19: Here's a subject in bright light whose dynamic range barely fit into what the sensor could capture. Of the three techniques (DRO Auto, Forced DRO, and HDR), DRO Auto produced the most natural looking image. (That's why I like this feature so much.) (And really, who paints their house black?)

winner. In low light, if your subject is not moving, then HDR produces superior results (mostly in the area of low noise), although the camera will say “Processing...” for several seconds after each image. If your subject is moving and/or you need to shoot rapidly (for example, if you’re a photojournalist shooting at high ISO in impossibly low light of a non-stationary subject), then DRO is really your best option, and you can shoot in B&W mode (see Section 6.27.5) to make the scene look visually more palatable.



Figure 14-20: The same poorly-lit scene taken three different ways. **Figure 14-22** shows you close-ups of the yellow rectangles.

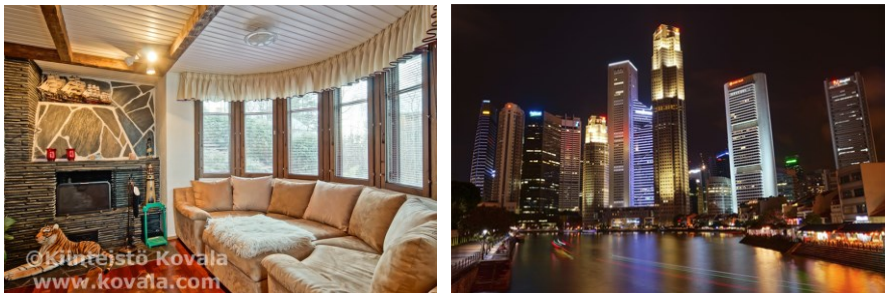


Figure 14-21: HDR photography can help balance indoor and outdoor light, like this interior design shot (left, courtesy real estate photographer Jukka Toyli), and make a nighttime scene just come alive (right, courtesy me).

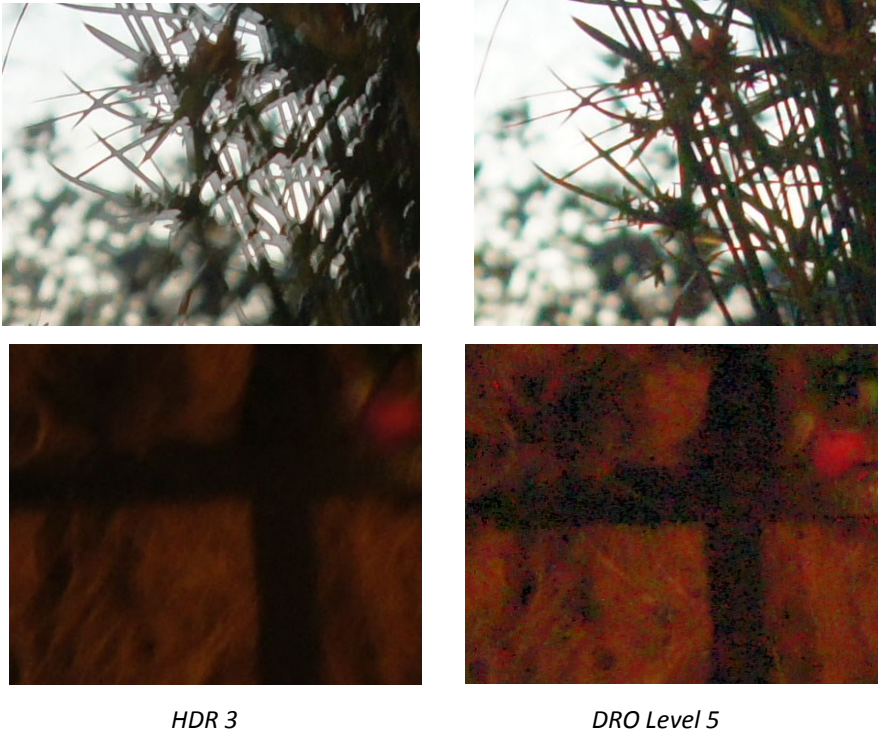
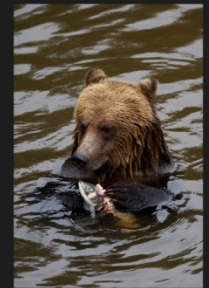
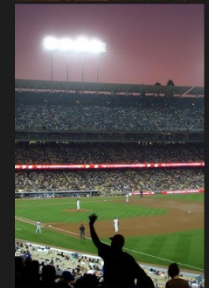
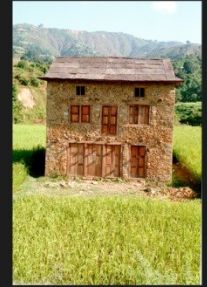
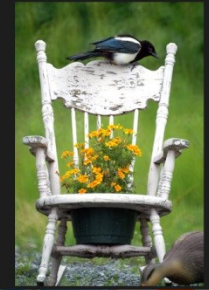


Figure 14-22: Close-ups from the previous figure. If things are moving (even if the camera isn't), it will sometimes show up as a double-image in HDR. Here, the wind was blowing, resulting in these classic HDR double-image artifacts. Not so with DRO! The lower figure shows the other tradeoff: DRO tends to add considerable noise (especially in the dark parts of the image), whereas HDR tends to smooth it out.



Chapter 15 DIGITAL IMAGING TOPICS

15.1 INTRODUCTION

Even experienced photographers can be a little unsure about the tradeoffs between RAW and the quality differences between Standard & Fine .jpg. How can you know what to choose? Are there preferable ways to process RAW files?

In this chapter I will talk a little bit more about RAW, and will share with you my own personal workflow I use with my RAW images. I'll also go into some of the tradeoffs between shooting RAW and JPG.

DISCLAIMER #1: The workflow I use suits me well but it's not necessarily the best for everybody. Different tools have different strengths.

DISCLAIMER #2: Some of the techniques outlined in this chapter require what's called "Pixel Peeping" in order to see the small differences they make. This is something that computers have made very, very easy to do even though such close examination is not at all a meaningful way to evaluate image quality in the real world. The proper way to evaluate image quality is to print it at the size it's going to be used and view it at the distance at which it's going to be seen. But for purposes of illustration I must violate my own policy here and show close-ups of certain images. Let it be known that I generally don't recommend such close examination (see **Figure 15-1**).

DISCLAIMER #3: Although I do show some of the controls for some of the software packages (Capture One Express, and Lightroom), by necessity this book cannot be a comprehensive guide to using these software packages. (That would require at least one other whole book!)

DISCLAIMER #4: Sony has thoughtfully provided you a FREE copy of Phase One's Capture One Express image editing software which I hear is quite good but I will make no mention of here because I haven't had any time at all to traverse the learning curve. But if you hate Adobe for their new direction of software subscriptions, this might be the viable alternative

you've been looking for. Learn more and download your free copy at <https://www.phaseone.com/en/Imaging-Software/Capture-One-for-Sony.aspx> .

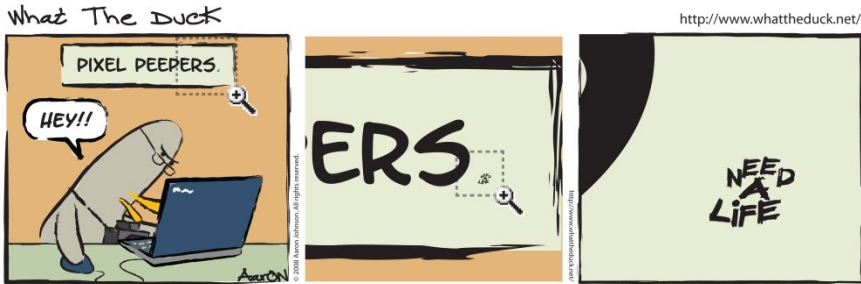


Figure 15-1: “Pixel peeping” is generally not a useful way to evaluate the quality of an image. Images that may look poor when examined too closely may actually look just great when printed. Don’t get hung up on this technique to evaluate image quality! (What the Duck Comic used with permission.)

15.2 AN INTRODUCTION TO RAW

Back in my day, photographers would shoot either slides or negatives. Real photographers who sold images for publication shot slides, since that was the preferred format in the publishing world – they were incredibly sharp (especially Kodachrome 25 or 64), and there were fewer problems with accurate color reproduction, since what you saw on the slide was considered the “correct” exposure and color. (Negatives, by contrast, could be tweaked in terms of exposure and color balance until the cows came home and the folks in the print house rarely got it right – at least not to the photographer’s satisfaction.)

So professional photographers had a right to be somewhat arrogant, since in order to have the perfectly exposed slide (and therefore a perfectly sellable shot) you really, really had to have the right light and the right exposure. You had to have the right filter on your lens if you were shooting daylight balanced film under incandescent light. You had to get everything right in the camera – there was no safety net of post-processing. One might have

assumed that the pros would have vastly preferred negatives, since that would give them more control over the final print later on in the darkroom. But the demands of the industry forced a great deal of people to work within the exacting tolerances of transparencies.

In a very crude way, you can think of shooting RAW as being the same as shooting with negatives. Having a negative is not the final product – you have to print it in a darkroom (or a 1-hour photo lab) first before you get your final image. And if the idiot working the 1-hour photo machine made gross errors in printing, you could simply throw those bad prints away, go back to the original negative, and make a better print using different exposure and color balance settings.

Many, many people think of shooting .jpg as the equivalent of keeping the (possibly bad) 1-hour photo prints and throwing away the original negative, leaving no hope of correcting for in-camera processing errors. Therefore, these folks opine that you should ALWAYS shoot RAW, or RAW + JPG if you want the convenience of both prints and negatives. Hard to argue with that.

But there are also plenty of working photographers who shoot under deadlines (without the luxury of time for post-processing) and/or grew up shooting slides. These pros feel (justifiably so) that if you know what you're doing and take the same care to keep your light right and exposure and color balance set properly for the situation as you did for slides, your final print from in-camera .jpg's will look just as good as shooting with RAW and post-processing, only it will take significantly less time. (Have a look at the photos on the back cover of this book, for example – ALL OF THEM were .jpls straight out of the camera.) Speaking such viewpoints on internet discussion forums usually invokes disdain from vocal "experts", but it is a perfectly valid viewpoint and one which I respect – for only the photographers who really know what they're doing can get away with it. For everyone else, shooting RAW can offer a safety net and helps ensure you can end up with the highest quality image your camera is capable of producing.

RAW vs. JPG has become a religious issue in some circles, with some saying "RAW is technically better in every aspect, and so you should never shoot anything else. If you do, then you're obviously an idiot." Others say "In theory that's true, but in the real world if you get your lighting and

exposure right the in-camera .jpgs are so good that the image won't be significantly improved by shooting RAW." (Yet a third, vocal minority shouts "You're both right, and if you do your post-processing using Adobe's Lightroom, it handles RAW conversion invisibly so there's no additional effort to process either format!")

But I'm getting ahead of myself. My real goal with this section is to remove the mystery surrounding RAW shooting. (RAW shooting, like histograms, seem complex until someone explains them to you properly, then they become so intuitively obvious that you wonder what the big deal was.) And so, let's take a nice deep breath and get a little technical for a minute, while I explain exactly what goes on inside your camera in order to convert directed photons into a file on your memory card. First, let's see how your camera turns what's essentially a black-and-white sensor into a color image.

15.3 THE BAYER FILTER AND DEMOSAICING



Figure 15-2: Seriously, this is one pixel. Get 42 million of these together and you can make your own A7r II.

See that handheld light meter in **Figure 15-2**? That's the equivalent of one pixel. All it can do is measure light intensity, not color. It measures light intensity and, internally, the intensity is converted into a number between 0 and 4096 (or between 0 and 16,384 if you're shooting 14-bit RAW files). (Then the on-board computer suggests an f/stop and shutter speed combination that would work for that given light intensity at a given ISO.)

Let's say you had a lot of spare time and purchased 42 million of these handheld light meters, and you took them apart and wired them together, taking the numeric output for each one and feeding them to your computer. What you'd have is a giant 42 megapixel sensor, which, when combined with a large lens and an image processing program, will give you a very nice, high-resolution, B&W photo.

B&W Photo? Yes, that's right. Pixels don't measure color. When arrayed together, they can only form the equivalent of one large B&W image.

So how can you turn B&W images into color ones?

Back in the 1970's, a very clever way of inferring color of a scene using only ONE sensor was developed at Kodak by Dr. Bryce E. Bayer. Dr. Bayer proposed using only one sensor but placing different color filters over each individual pixel (a manufacturing challenge, to be sure!). Then it would be up to the camera's computer to infer a red, green, and blue value for EACH PIXEL even though only one of those three values is actually being measured.

For example, for a pixel with a green filter over it, you can know the value only of the green intensity. How much red and blue should be assigned to that pixel? The camera's computer has to guess. To estimate the amount of red that should be assigned to that pixel, it might look at the values of other red pixels in close proximity to the green one in question, and try to interpolate. Same with the blue component. In all, your camera's computer must perform this guesswork for *every single pixel* in the sensor as it produces a .jpg image in the camera. This process of estimating what the other color components must be for each pixel is called "de-mosaicing". It works remarkably well.

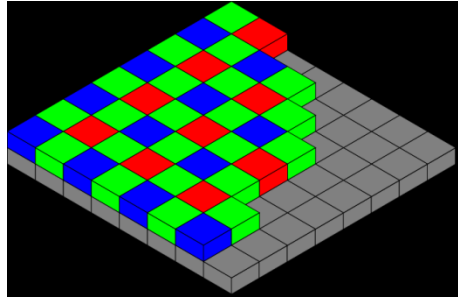


Figure 15-3: *The Bayer Mosaic covers each pixel (which can only sense brightness, not color) with a red, green, or blue filter. For each pixel, the camera's computer must guess what the other colors must have been. For example, for a pixel with a green filter, what should the red and blue values be? A sophisticated algorithm must infer it from the values of neighboring pixels.*

Now here's where things get fun. Demosaicing is an inexact science. Many, many people have tried to make a de-mosaicing algorithm that adds the color back "properly": Spline Interpolation, Lanczos Resampling, Variable Number of Gradients, and Adaptive homogeneity-directed interpolation are just four examples of the very complex methods different software applications use. And each algorithm will work well for certain kinds of pictures, but not well for other kinds. And every method produces an image that has a different look. Want proof?

Have a look at **Figure 15-4**, which was a handheld shot at ISO 10,000 with Noise Reduction set to "Normal". This was shot via RAW + JPG, and the JPG is pictured, straight out of the camera. The image probably looks just fine at first glance, but as you zoom in you'll start to see some of the "watercolor effects" – artifacts of the camera trying hard to clean up the noise at such a high ISO (**Figure 15-5a**). Many people who grew up shooting grainy, high-speed film would be perfectly ecstatic with this result (this is way better than what film could do) and not see the noise as being a distraction. (You may not be one of them. ☺) Later on in this chapter I'm going to show you how I get a great high ISO image (like the kind in **Figure 15-5b**) by shooting RAW and post-processing.



Figure 15-4: A shot taken with the worst light I could find, handheld at ISO 10000. Image was shot RAW + JPG; this was the JPG.

So far we've only seen the in-camera .jpps from this image. Does the RAW image (also produced by the camera) look any better after demosaicing? Have a look at **Figure 15-6**, which shows you the same image as converted by three different RAW processing programs. (No noise reduction was performed on any of these sample images.)

So you can clearly see that the process of demosaicing can be done in many different ways, to many different effects. Your camera will do it one way, Adobe Camera RAW will do it another, Bibble or CaptureOne will do it a third and a fourth way. In 2008 David Kilpatrick (then-editor of

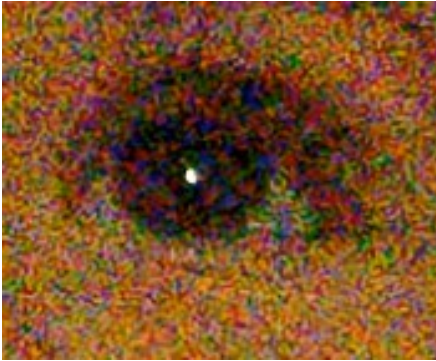


JPG with NR set to "Normal"

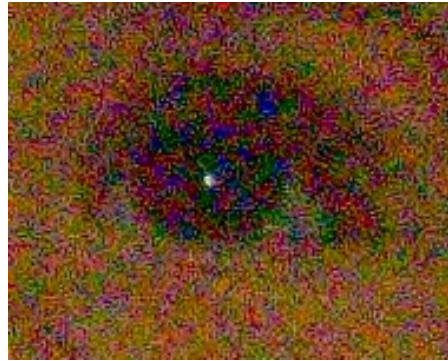
RAW cleaned up in Lightroom

Figure 15-5: Zooming in you can see some of the noise and the "watercolor effect" of in-camera noise reduction on .jpps (left). Can we do better by processing the RAW file? The right image says "Yes" and I'll show you the tools I use later on in this chapter.

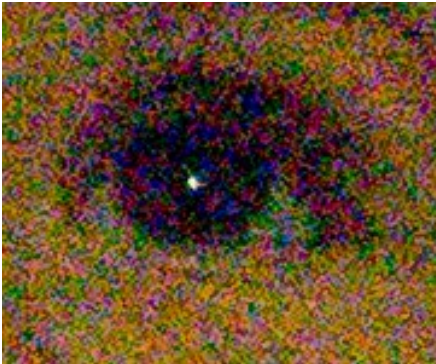
Photoworld magazine and runner of the PhotoClubAlpha.com website; currently the publisher of f2 Cameracraft magazine of which I am associate editor and you really ought to subscribe! ☺) published a comparison of SEVEN different RAW processors, trying hard to tweak the controls of each to get the best possible quality. You can see his results and read his recommendations at <http://tinyurl.com/7t4ngj6>. He has since done a similar comparison and concluded that Lightroom version 3.3 and later (as well as Adobe Camera RAW CS5 and later) have completely re-done their demosaicing algorithms for Sony sensors, and, finally, they were done



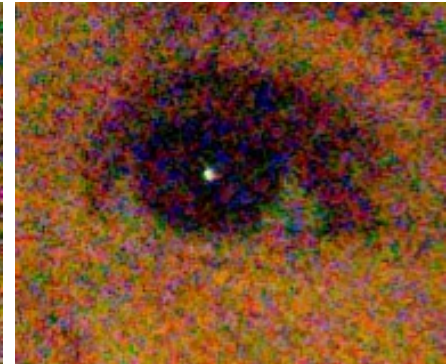
Sony's IDC Software



RAW Therapee



Adobe Lightroom



DxO

Figure 15-6: An example of how a RAW file looks when decoded using different RAW processors (with no noise reduction applied). (These were taken with an earlier camera.) As you can see, there is more than one way to estimate what the color of a pixel should be without knowing for certain what it was. You can also see that noise and detail are tradeoffs. I go for detail since I can always remove the noise later using different tools. (These tools are getting very similar – you should have seen the differences between these tools in the A900 book from 2009!)

right. David even recommended that all camera review sites (*cough* dpreview *cough*) re-do their RAW comparison sections for ALL older Sony cameras since Adobe Camera RAW (the “level playing field” used to compare RAW results from different cameras) finally makes Sony RAW files look good.

There's no industry standard for RAW file processing, and all ways have their tradeoffs. Since graduating to Lightroom I now use it for all of my RAW processing needs out of sheer convenience. (That software handles RAW and JPG files identically – no additional steps are needed in theory.) It's invisible, and therefore shooting RAW is no longer the pain in the butt that it used to be. But there's still some benefit to shooting RAW+ JPG and I talk about this plus how to use it to reduce noise in Section 15.9.

15.4 HOW YOUR CAMERA CREATES A JPG

So the previous section described how almost all consumer cameras add color to what is essentially a collection of B&W pixels. But this is just *the first step* of the many steps your camera takes to turn an image into a .jpg. Want to see the other steps? Have a look at **Figure 15-7**.

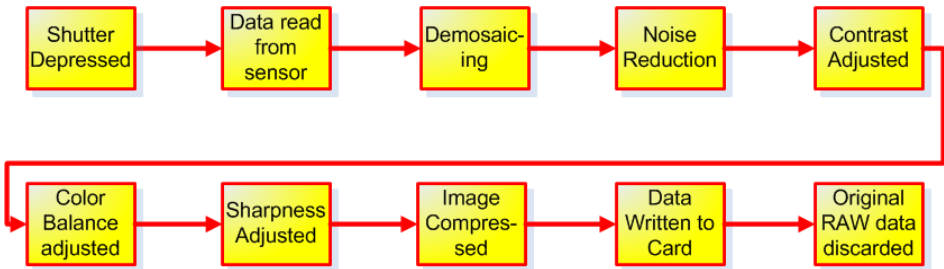


Figure 15-7: All of the things your camera does when generating an in-camera .jpg.

As you can see, once the data is read off the sensor, the demosaicing process commences, and then the camera will start to do what a one-hour photo lab would do (using settings from the Creative Styles (6.27) as a guide). It then compresses the image and writes it to the memory card as a .jpg format.

Let me provide a little more detail on the above. The process of creating .jpgs is synonymous with the process of throwing away information. 12-bits of data per channel from the sensor gets squeezed into 8 bits of data per channel (giving up some tonality and fine shades of color). A little bit of

dynamic range gets lost too. Then Lots of visual information that the human eye and brain cannot perceive gets thrown away, which is what's responsible for JPG's famously small size. If there is a lot of high-frequency detail in the image, then that gets replaced by what's called a .jpg compression artifact (which I describe in a couple of sections). Then the compressed .jpg image file is written to the memory card, *and then the raw information from which the .jpg was produced is discarded* (unless you were wise enough to shoot in RAW + JPG mode). Once this information is gone, there's no going back. If you didn't like what the camera did to the image, you can't go back again and re-process it using different settings.

So what happens when you shoot RAW then? When you shoot RAW, the camera just sucks the data off the sensor and writes it directly to the memory card (executing just the green squares in **Figure 15-8**), leaving you to do all that other image processing later on your computer. (Well, that's what happened in the old days. With modern Sony cameras, some of the way the light intensities are represented are manipulated a bit before being written to the memory card. (See TIP on page 564). But as far as you're concerned, it's still an unprocessed image with no color, sharpening, contrast, or saturation applied.)

The whole idea of just capturing the raw, unprocessed data (which is where the term RAW file came from) stems from the fact that there might be other commercial software out there that can process the image differently / better than the camera's firmware can, or not compress the image *at all* like

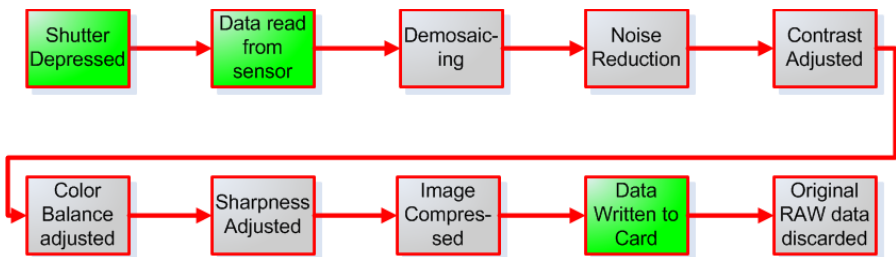


Figure 15-8: The green boxes represent what happens when shooting RAW: the camera saves only the raw, unprocessed data so it can be processed (and re-processed, if desired) on your own terms, on your own time. The steps in the grey boxes are skipped.

the camera normally would when creating a .jpg. We've already seen

differences in what 3rd party software can do with the demosaicing process, and similar differences exist with different noise reduction packages too. Shooting RAW is just like shooting negatives and laboriously printing every picture in your home darkroom.

The raw data file also has some notes in it – it knows, for example, what your white balance was set to, and what the contrast, saturation, sharpness, and noise reduction settings were. Those settings aren't actually applied to the RAW data, mind you -- those notes are there for the benefit of the desktop-computer-based raw conversion software, so when the file is opened and demosaiced, it can apply these settings *in a reversible way* to your image and you can start tweaking it from there. This way, there's no danger of accidentally setting the wrong color balance, or having too much in-camera sharpening which can't be undone – none of that is actually applied until it gets to your computer, and even then, at that time it's still all optional.

So should you shoot RAW or JPG? Don't answer that question until you read the section about .jpg compression artifacts (Section 15.6). That might change your mind in a hurry.

15.5 RAW, TIF, AND JPG COMPARED

Have you ever used a program like WinZip or StuffIt? These two programs are designed to email many computer files to another person. First it collects the many files into one big file, and then it “compresses” that one big file so it takes up less space on your hard drive, and also makes it faster to email. The kind of compression used in this kind of application is called “lossless”, since when it is received at the other end and decompressed, the resulting collection of files must be absolutely, bit-for-bit identical to the original files before compression.

RAW: RAW is simply pulling the bits off the sensor and shoving it into the memory card. The A7r II gives you the option of compressing it so it takes up roughly half the size with minimal downside.

TIFF: TIFF is not offered by your camera, but you’ll need to know about this when working with other imaging professionals. This was one of the earliest standard file formats for storing images, and offers the highest image quality format (because there is no compression whatsoever). Although TIFF image files produce images of the highest quality, their files sizes can be quite large – usually much larger than the equivalent RAW files!.

white white white white white white white white white white white white white white white
 white white white white white white red red white white white white white white white
 white white white white white red red red red red white white white white white white
 white white white red red red red red red red red red red red white white white white
 white white white red red red red red red red red red red red white white white white
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 white white white white white white white white white white white white white white white

Figure 15-9: An oversimplified computer representation of a Japanese Flag

JPG: This is the most popular image format in the world. At the time that the image file formats were being established, the Joint Photographic Experts Group (JPEG for short) got together to establish an alternative file format that would be substantially more compact than TIFF files. Comprised of experts in imaging, perception, cognitive science, computer science, and mathematics, the JPEG group devised a method of “compressing” an image by throwing away information that the human eye and brain cannot perceive, thus reducing the file size tremendously without significantly altering how the image appears.

As a simple example of how files get “compressed”, let’s start with an image of a Japanese Flag, which is a large red dot in a plain white rectangle. When stored as a RAW file, the information is arranged something like what’s in **Figure 15-9** (pretend the red parts constitute a

circle). With a 42 Megapixel camera, this information plus the header info (plus some thumbnails which usually get embedded into an image file) usually adds up to quite a large size: (7952 pixels) x (5304 pixels) x (8 bits per pixel) = 337 Megabits = more than 42 Megabytes!

When stored as a compressed file, however, the Japanese Flag image might be represented something like this: “Okay, the first row has 417 pixels that are all white. The second row has 312 pixels that are white, followed by 87 that are red, followed by 312 that are white”, and so on for each row. (In reality, the compression is much more complex than that, involving trig functions and wavelets and other compression algorithms. But the general idea is that very clever methods are used to throw out information the eye cannot perceive at a distance, and then represent what’s left in clever ways that take up less space.) Because a more detailed image would require more words than “This much white / this much red” to describe it, images containing a lot of detail will be slightly larger than images that are simple (like the flag example above). This is why no product brochure or manual can ever tell you with certainty how many images will fit onto a memory card – when shooting in .jpg, it all depends on the content of the image. The most significant advantage of shooting with .jpg is the sheer number of images you can fit onto a card – up to five times more than if you were to shoot with RAW.

The downside is that .jpg’s are compressed using a “lossy” compression algorithm – unlike with the WinZip or StuffIt examples described earlier, when the image is uncompressed the resulting file is NOT the same as before it was compressed. For a Microsoft Word or Excel document this would be quite unacceptable; but for images that will only be looked at visually (and not computed upon), this is considered not only acceptable, but preferable (“Look how much memory card space we’re saving!!!”)

15.6 JPG COMPRESSION ARTIFACTS

One thing about the JPEG compression standard that *wasn't* specified was how much to compress the image – this is usually up to the user. The JPEG standard (represented as a .jpg file extension in most computers) allows you to specify a “quality” level of one to ten, ten being the best quality. The tradeoff is file size, for as the compression gets higher, the file size gets smaller and the image quality gets lower.

For an example of the quality tradeoffs the JPG format offers, have a look at **Figure 15-11**. These examples were made using another software package which allowed me to specify the .jpg compression levels from 1 (best) to 100 (worst). These represent extreme limits, and are being used here just to give you an understanding of the correlation between file size and image quality. In real life, you would probably never want to store the image using the worst quality settings (unless you were writing a book that wanted to show .jpg compression artifacts ☺).

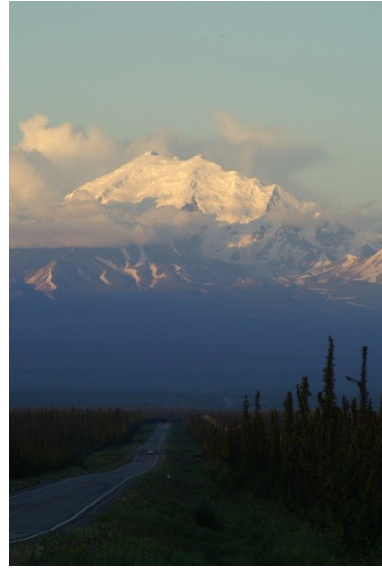


Figure 15-10: *The source image for the .jpg compression comparisons in **Figure 15-11**.*

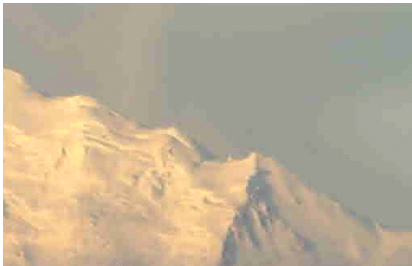
TIP: *Today's out-of-camera .jpps look outstanding compared to those of 10 years ago, making it safe for photographers who have good light and whose exposure is right for that light to shoot .jpg exclusively. For more insights on such heresy, see my blog post entitled, "Where the anti-JPG bias came from" here: <http://tinyurl.com/7m327cj> and the follow-up here: <http://tinyurl.com/8kkfpsh>.*



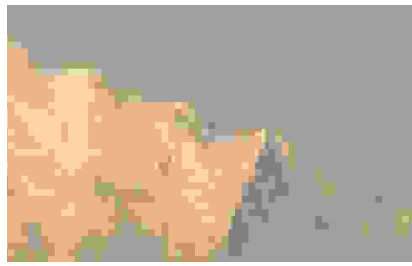
Compression = 1 (3.2 Mb, Highest quality)



Compression = 51 (218 kB, Still pretty good)



Compression = 80 (178 kb, Can start to see some compression artifacts in the sky)



Compression = 100 (158 kb, Yuk!!!)

Figure 15-11: Extreme examples of JPG compression artifacts. (Don't try this at home, kids!)

IMPORTANT TIP: These compression artifacts can get worse the more you work with them. Every time you open-modify-save-close a file, the file is re-compressed, adding more compression artifacts to whatever was already there. To avoid this (and in keeping with the mantra of NEVER OVERWRITE YOUR ORIGINALS), always go back to a copy of your original before making any modifications, and make sure that you make all of your modifications in one session before saving as a JPG.

Your camera allows you to save your images as .JPG files with three quality formats: “Standard” (not to be confused with the “Standard” Creative Style discussed in Section 6.27), “Fine”, and “X.Fine”. You can switch between these modes by invoking **MENU** → **1** → **Quality** →

[Choose one]. Most people would have to examine an enlargement with a microscope in order to see the differences in quality between these three settings in good light. Just as not everyone can hear differences between .wav and .mp3 digital audio file formats, not everyone can perceive the difference in image quality between RAW and JPG, or between different qualities of JPG. Try shooting in all 3 modes, printing the results at 8.5x11 or A4, and see if you can tell the difference!

So, in summary...

RAW (*.arw)	A “dump” of all the bits from the sensor. Large file size. Requires post-processing on a computer by hand. Designed for professionals who demand the highest image quality. Almost a necessity when shooting in low light and high ISO to get both low noise and detail in your final print. Modern RAW files are compressed using a nearly-lossless compression scheme.
TIFF (*.tif)	(Not created by the camera, but exportable from RAW via Image Data Converter and 3 rd party programs such as Photoshop.) Same information as RAW, plus the color, contrast, and other factors are applied. About 3 times larger file size than RAW, but unlike RAW it can be read by most other applications. TIFF and RAW produce the highest quality images because there’s no .jpg-like loss due to compression.
JPEG (Standard, Fine, and Extra Fine) (*.jpg)	Very high image quality with substantially reduced file sizes (see comparison table below) due to innovative mathematical compression techniques.

A comparison of the different file sizes and quality levels can be seen below (and these are identical to the table appearing earlier in the book in Section 6.3). This is with the compressed RAW feature turned on:

Image Format	File Size
Standard (.jpg)	4.5 MB
Fine (.jpg)	7.5 MB
X.Fine (.jpg)	16.5 MB

RAW (.arw)	41.1 MB
RAW + JPEG produces 2 files	41.1 MB (.arw) + 7.5 MB (.jpg)

It is interesting to note that, even for the “standard” (lowest quality) .jpg setting, the compression is very conservative, and the image quality is still quite high.

TIP: The sizes of .jpgs vary greatly. For example, my “FINE” quality .jpgs vary in size from 3MB to 9 MB, depending on the amount of high contrast detail in the subject. So if you try this experiment yourself, don’t be surprised if your numbers are off by a factor of two or more. This is why the “Images Remaining” counter shows you conservative numbers – often you can fit more images on a card than what the camera shows you when an empty card is inserted. The camera never knows how large your .jpg’s are going to be.

15.7 ANY OTHER UPSIDES TO SHOOTING .JPG?

Well, we already know that they take up less space and they (potentially) require less work for post-processing. And you already know (having read the blog post I pointed to earlier at <http://tinyurl.com/7m327cj> and its follow-up, <http://tinyurl.com/9h9fju6>) that if my light is good and my exposure is right for that light, I sometimes will shoot only X.FINE .jpg since the benefits of RAW in that scenario are not compelling. Are there any other benefits to shooting .jpg?

Yes, I can think of three more:

- You may not know this, but your camera keeps a database of the optical deficiencies of most native E-mount lenses (distortion at various zoom distances, chromatic aberration, and darkening in the corners) and it corrects for all of these deficiencies in software automatically – but only to .jpg files. It also stores the suggested corrections in every RAW file it writes (without actually applying it) so programs like DxO, Lightroom or Bibble can correct for it automatically – you don’t have to create a special lens profile first.

- DRO shadow lightening (Chapter 14) is not applied to RAW files, although you have the option of using Sony's IDC software to give you a close approximation to the in-camera algorithms. Global editing parameters in other packages such as "fill light" do *not* do the same thing as DRO. Many people in the past had complained that it takes too much time to try to re-create what DRO does using Photoshop.
- A lot of your camera's best features, such as Multi-Frame noise reduction and High Dynamic Range, work only when shooting .jpg (by definition).

Is now a good time to mention the joys of "RAW + JPG"? Shoot now, decide later. All the options are kept open for you.

TIP: *Once upon a time there was an esoteric noise reduction technique called "Expose to the right" (ETTR). The idea behind it was to overexpose the image when you're shooting RAW (taking care that you didn't blow out your highlights) and then bring the brightness down later in your computer. It really worked! (And I gave an example of this in my Advanced Topics 1 e-booklet).*

Recently someone at Sony decided to optimize the way brightnesses were distributed within the newer RAW file standards, meaning there's now better quality when shooting in good light but the ETTR technique is no longer as effective. An article on SonyAlphaRumors.com (which summarizes an even more technical dpreview thread) is here: <http://tinyurl.com/5s335pg>. If you love technical details then read the referenced dpreview thread all the way through – they're talking about an earlier camera, but the light distribution representation of the RAW file is the same.)

15.8 RAW PROCESSING USING CAPTURE ONE EXPRESS

If you're just getting started with RAW, I can tell you the two greatest benefits to shooting with it are the slightly greater dynamic range (as compared to .jpg), and better control over noise reduction. (Many people don't like the "watercolor effect" that the camera can apply to .jpgs using the High ISO Noise Reduction feature.

For the past few years I've been using Lightroom and Adobe Camera RAW for their noise reduction abilities. But I've also been playing with the new



Figure 15-12: This is a sample shot taken in very low light at ISO 102,400. I shot this RAW+JPG, and the .jpg out of the camera (above) is OK but very soft. Can we process the RAW file to reduce noise while keeping the detail?

Capture One Express software ("COE" from now on) that Sony has provided for FREE with the purchase of this camera. I'll show you the basics of de-noisifying a RAW file with both tools.

COE uses an image database just like Lightroom, and so when you open the program you have to do a "File → Import Images" in the program. You'll see the screen in **Figure 15-13**. To specify a directory to import files from, click on the orange "Choose..." in the upper-left-hand corner (and then click on the secondary "Choose" pop-up that appears after that. Strange UI.) Then a conventional "Open" dialog box appears. You choose your directory and then click OK. (Ignore the fact that you're not seeing thumbnails yet. You're just choosing a directory now.)

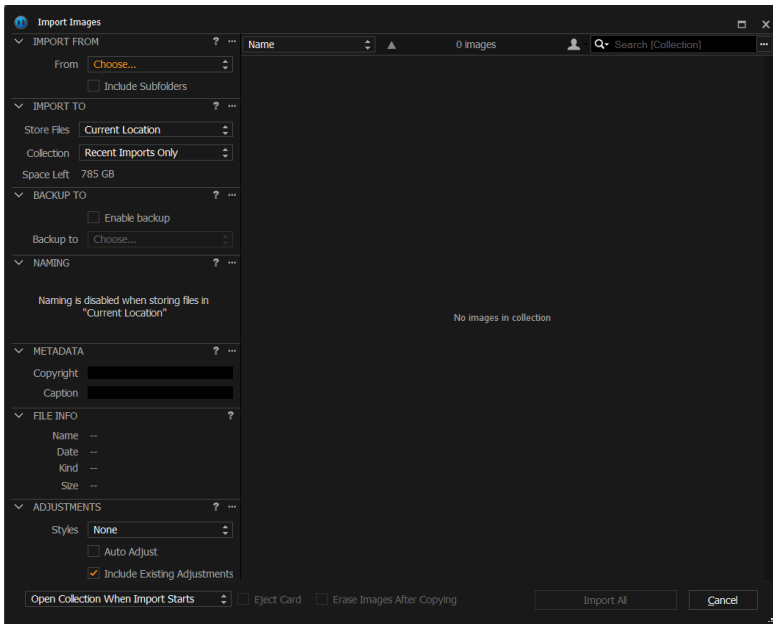


Figure 15-13: Capture One's File Import screen. After you browse for files and double-click on a thumbnail in the bottom center window, thumbnails will appear for choosing.

Once you hit OK, thumbnails appear. Click on "Import All" at the bottom of the screen and the program will do so. **Figure 15-14** shows a thumbnail selected along the bottom, and a larger version appears on top, ready for editing.

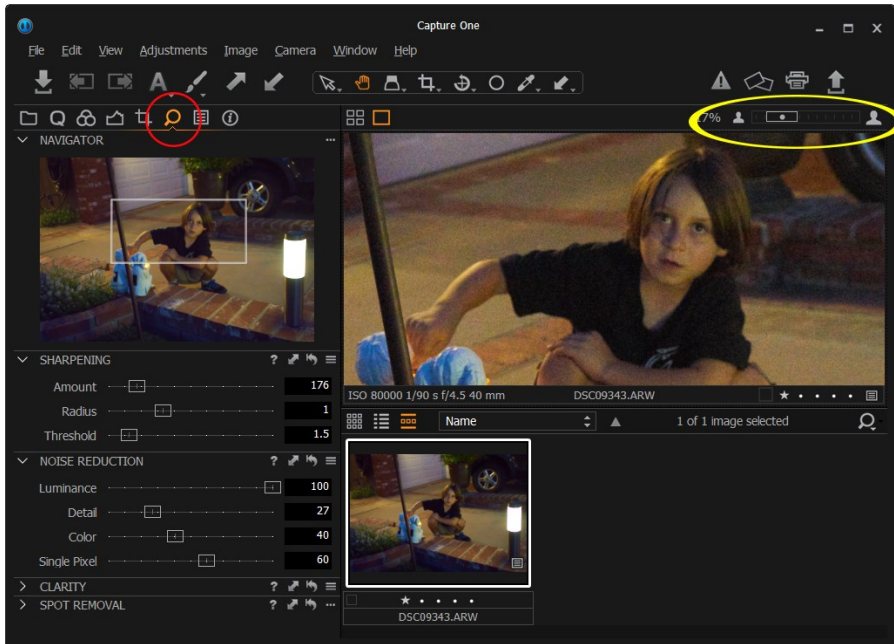


Figure 15-14: A "filmstrip" appears across the bottom. Click on one of those and a larger image appears above, ready for tweaking.

Now here you have a lot of choices. Near the upper-left-hand corner you'll see a series of icons. Click on the "magnifying glass" icon in the 2nd row; it will take you directly to the Sharpening and Noise Reduction controls. (Click on the other icons as well to access other editing tools. You can learn a lot about this program simply by clicking and exploring.) I'll talk just about de-noising the image here.

You can zoom in for a closer look by moving the slider bar (yellow circle in the upper-right-hand-corner). Then go to work de-noising the image – the sliders you see in the lower-left-hand corner can be a good starting point.

After this and any other desired adjustments are made, do a File → Export Images → Variants... The intimidating screen of **Figure 15-15** appears. Strangely, COE export directory doesn't default to the same directory from which you imported; you have to tell it specifically where you want your

exported images to be. Hitting the right arrow in the yellow circle brings you to another conventional dialog box where you can specify where you want the images stored.

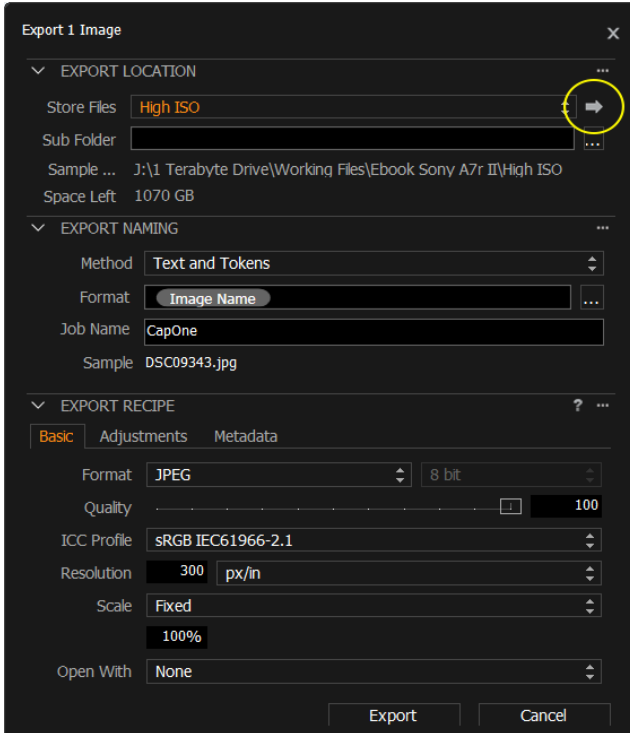


Figure 15-15: *File* → *Export* → *Varients...* brings up this export screen. Clicking on the arrow in the yellow circle allows you to specify a directory.



Figure 15-16: Here's a close-up of the out-of-camera .jpg and the cleaned-up RAW (right).

15.9 RAW PROCESSING USING LIGHTROOM OR ADOBE CAMERA RAW

Adobe Photoshop and Adobe Lightroom (both CC 2015, as earlier versions may not be able to open the new RAW files) use the same improved demosaicing and de-noise algorithms (and thankfully they both also have the same simplified controls) that can process Sony RAW files properly. Without going into great detail about the operation of these two behemoth software programs, here's a quick rundown on how to use their controls to reduce the noise in high-ISO RAW files (we'll use the same sample image as in the previous section; refer to **Figure 15-17**):

1. (Photoshop only): Open the .ARW (RAW) file and the Adobe Camera RAW (ACR) window opens up, providing many controls for color balance, sharpness, noise, etc. – with the slider controls pre-set to the values that the camera took note of when the image was shot. (Remember, things like white balance aren't actually applied to RAW files; however the camera's settings are noted in the RAW file and Adobe's software reads these values and then pre-adjusts the controls accordingly. This saves you a little bit of time.)
2. (ACR only): Click on the "Detail" tab (red circle in **Figure 15-17**) to bring up the Sharpen and Noise Reduction controls. (Lightroom users have this available to them in the right side of the "Develop" work area.)
3. Zoom in to 50% or 100% and look at a patch of noise (which will be easier to spot in the shadows). There are two major variables to control: Luminance noise and Color noise (often called "Chroma" noise). Chroma noise is easy to spot – it is the random distribution of color pixels that don't belong in the image. That's why I recommend quashing it first.
4. Move the "Color" slider to the right until you see the splotchy color patterns fade away. (Don't move it too far – too much noise reduction of either type can cause an undesired blurriness.)
5. The "Color Detail" slider is a tool that can help restore some of the important edge color which the Color slider might have gotten rid of. You may not see any meaningful effect of this slider on your picture –

and that's OK. This slider has the least impact on image quality of the image than any other slider.

6. The Luminance slider is next. Notice that moving it too far to the right blurs all that noise right out of existence – along with all that detail you paid so dearly to capture. Clearly you want to apply no more noise reduction than necessary.
7. In an effort to restore some of that detail which got blurred away in the previous step, the Luminance Detail and Luminance Contrast sliders are there. Both of these are actually employing a kind of sharpening to bring back some of the detail that was lost (yes, I know, that seems like

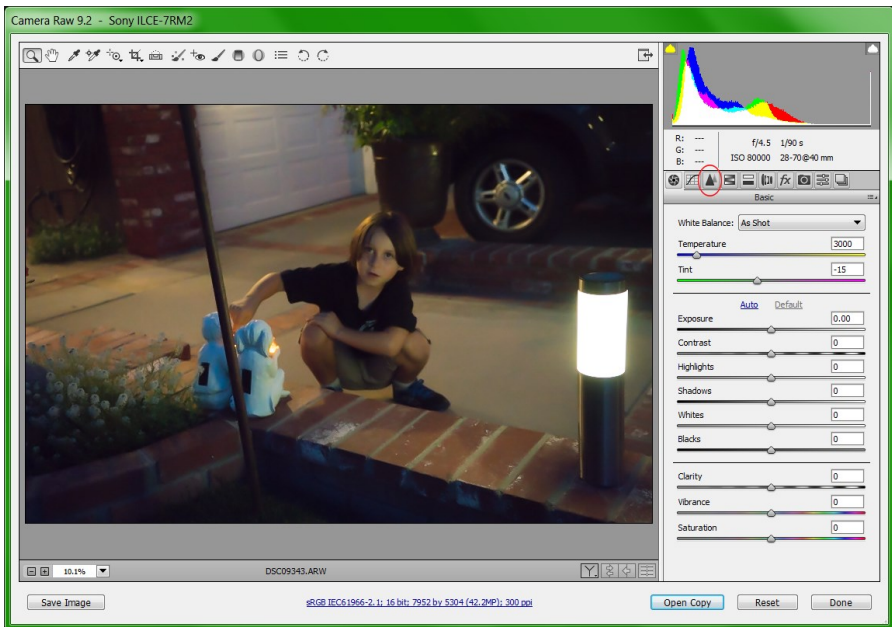


Figure 15-17: Both Lightroom and Adobe Camera RAW (which comes with Photoshop, and pictured above) use the same six sliders when it comes to reducing noise. The sliders you see on the right are typical of the values I use when de-noisifying most high-ISO RAW files.

a very backwards way to attack the problem; however when applied sparingly the combination of blurred luminance noise and sharpened edges really does degrade the noise while appearing to preserve detail.

8. The value of the sliders you should use may vary considerably from picture to picture – there is no one-setting-fits-all for your images. Start to experiment and see what looks best to you – there is no other way to find the right settings.
9. (ACR only) – hit the “Open Image” button in the lower-right-hand corner and the image is then opened in Photoshop, ready for further tweaking.

There’s more to it than that, but just the steps I outlined above are enough to produce dramatically better high ISO results than what your in-camera JPGs look like. If you’d like to delve more into understanding what all

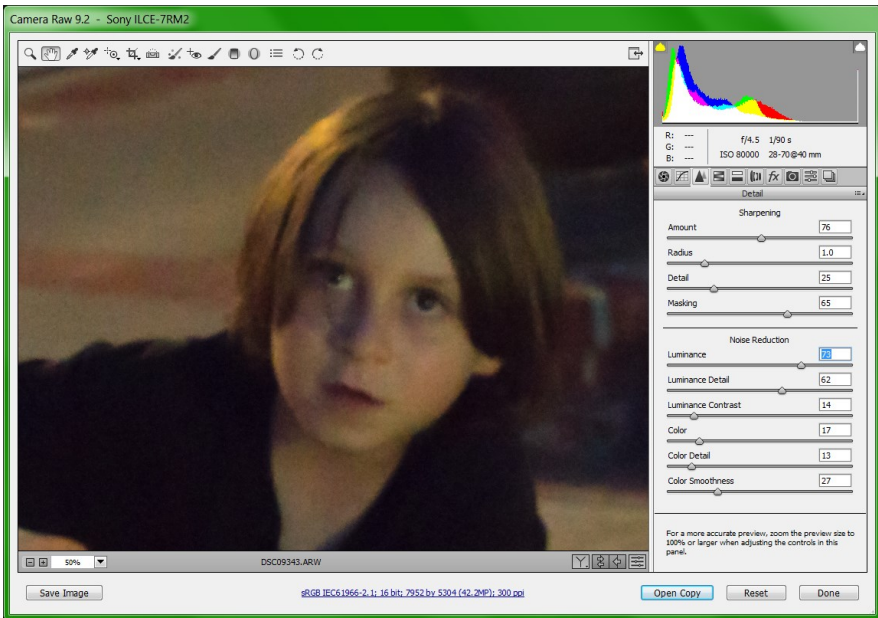


Figure 15-18: The Details tab allows you to both de-noise the image and also sharpen a bit.

these variables do, Peachpit.com has posted a very nice video which provides a slightly more detailed overview: <http://tinyurl.com/3gmsz8b>. (This is for CS5, whose user interface is identical.)



Figure 15-19: The original .jpg and the post-processed RAW file from ACR.

15.10 IMAGE SIZE AND RESOLUTION

There are three variables which determine how large an image will appear when printed or when viewed on the web: the number of pixels (height), the number of pixels (width), and the number of pixels per inch (typically referred to as “dots per inch” by the majority of the populace). **Figure 15-20** shows three IDENTICAL sets of pixels that can magically “change” dimensions when printed on printers of different resolution.

The gist of this is *the same set of pixels can print in different sizes* just by redefining the dots-per-inch setting of the printer.

This is an important concept to grasp if you will be printing the images yourself on your inkjet printer, for sizing them properly (using tools such as PlayMemories Home or Photoshop) to match the output resolution of the final imaging device (be it printer or web page) is critical to retaining the image quality.

So, how is this all relevant? Your A7r II has a 42 megapixel sensor which produces images that are about 110" x 73" x 72 dpi out of the camera. Taking the exact same set of pixels and changing to print resolution (300 dpi), the dimensions change to 26" x 17" x 300 dpi.

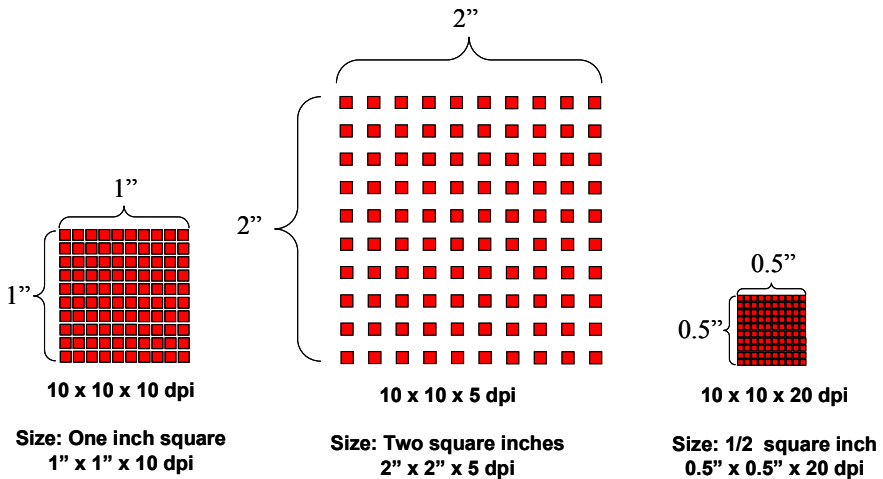


Figure 15-20: Same number of pixels, but each will print at a different size given different resolutions.

If you wanted to make the image twice as large, you could decrease the dpi to 150 dpi and end up with an image 53" x 35" in size. Such large images are often viewed at a distance, and therefore, few notice the lower resolution needed to achieve such a large size.

15.11 "HOT PIXELS"

Sometimes a small dot on every picture isn't caused by a speck of dust; rather sometimes a single pixel can "go south" and remain a fixed color forever. Although it is not mentioned anywhere in the documentation, and although I haven't actually had the opportunity to test this myself, it is now well-established that every Sony camera has a method for finding and

“eliminating” stuck sensor pixels automatically and in a way that’s invisible to the user.

At the beginning of a month when the camera is turned on, it will test itself for a stuck pixel, and if it finds one it “maps it out” in its memory, replacing its value with the average of all the surrounding pixel’s values when it processes the image and writes it to the memory card. So if you suspect your camera has such a “hot pixel”, set the camera’s date to the beginning of next month, turn the camera off and then on, and the problem should go away. (You can then move the date back to today once it’s done.)

15.12 MEMORY CARDS

Your camera’s memory slot was cleverly designed to accept both SD-class and MemoryStick Pro Duo memory cards. Many flavors of these memory cards have evolved over the years, but here are the ones that are guaranteed to work with all of the camera’s high-bandwidth features (such as 4K and XAVC S HD video shooting):

SD Class: SDXC, UHS-I or II, Class U3 (here’s an example: <http://amzn.to/1NbotwR>)

MemoryStick Class: (Inconceivably, Sony’s manual makes no mention of MS cards that can support these high-bandwidth features!)



Figure 15-21: Newer cards are essential to use these camera’s latest video modes

If you’re not shooting 4K or XAVC S video, then these kinds of cards will work:

SD Class: Any kind: SD, SDHC, SDXC. Speed class 4, or UHS class U1 or faster

MemoryStick Class: Pro Duo Mark 2, Pro-HG Duo,

If I were to recommend a brand, based solely on my personal experience I would highly recommend Lexar and Sandisk – both have had a strong, reliable (albeit not blemish-free) track record with me.

If you shoot a lot of RAW out in the field, you might also consider a USB 3 card reader if your computer has USB 3-compatible ports. Reader Bill Jacobsen writes, "When I downloaded 68GB of files from this last weekend using an old USB2 reader from the new card it took over 2 hours! ...So I bought the SanDisk ImageMate USB 3 reader and in a test it only took 5 minutes for the same 68GB of data....big difference."

TIP 1: *When you buy memory cards, make sure you purchase them from a retailer that will accept returns, no-questions-asked. As an example of why I say this, here's how Lexar handles their in-warranty returns for cards that fail bit-error tests: 1) You must wait two days to get an RMA number by email, 2) You must return the card at your own expense (including insurance), 3) You must wait 2-3 weeks for them to test it and send out a replacement (!). Being able to return a bad card immediately is a Good Thing. Note also that the Sandisk tend to be the most often counterfeited brand, so test it thoroughly (see next section) before going out to shoot!*

TIP 2: *SDXC cards use an EX-FAT format which many computers don't know how to read. How can you tell? Tether your camera to your computer and turn it on. If your computer prompts you to format the card, say no and disconnect the camera. You'll have to use only SC or SCHK cards from now on.*

TIP 3: *Large capacity cards make the camera take longer to turn on initially (it has to estimate the number of images remaining on the card the first time you turn it on).*

15.12.1 MEMORY CARD CORRUPTION ISSUES

Alas, with new technology often comes even newer, unanticipated drawbacks. Although all memory cards have been designed for reasonably rough usage (and some expensive models have been introduced, which are advertised as being designed for *extremely* rough usage), there may be

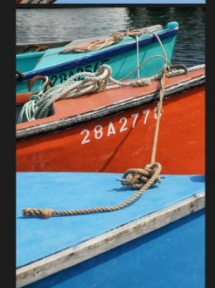
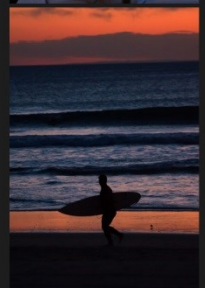
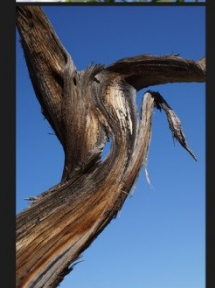
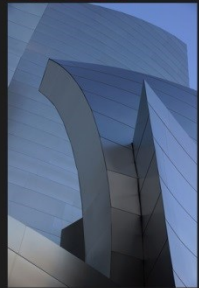
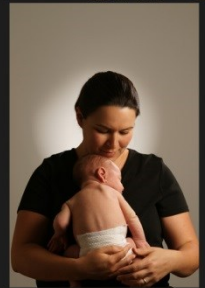
times when the unthinkable occurs: several random bit errors occur within the card, resulting in “corruption” – the inability for the computers to reconstruct the image due to the missing or damaged information.

There are several software tools on the market designed specifically to try to recover from these kinds of errors. Two tools I can highly recommend are [Photo Rescue™](http://www.datarescue.com/photorescue) at <http://www.datarescue.com/photorescue>. The other is Image Rescue™, which comes bundled for free with some Lexar memory cards (a bold move if you stop and think about it...). Both are worth every penny for recovering from corrupted media (assuming recovery is possible... some corruption is unrecoverable.) You can try Photo Rescue for free to see if it will do any good before you plunk down any money.

[Note: I get no compensation for endorsing these companies. But I’ve used both successfully to retrieve images off a corrupted memory card more than once.]

Since the last two memory cards I’ve purchased had such corruption issues, I’ve now learned a few things about minimizing the surprise factor involved:

1. When you first get your card, format the card **ON YOUR COMPUTER** (not in the camera). Format it for FAT32, and make sure you have the “Quick Format” option disabled. (If you have an SDXC card, format it in your camera as “ex-FAT”.) One of the purposes of formatting is to find the bad memory blocks and “map them out” so your camera doesn’t try to use it.
2. Test every new memory card you buy for bit errors. Here’s some free software originally distributed by Lexar for doing so: <http://bit.ly/1LM4pxV> The testing should occur after the formatting stage. Return the card immediately if your results consistently show bit errors.



Chapter 16 ADDITIONAL RESOURCES

THOUGHT THIS BOOK PROVIDED A GREAT AMOUNT OF INFORMATION? WAIT, THERE'S MORE!

In this book I have tried to provide a careful balance of information, knowledge, inspiration, and history. But your journey has only just begun. There is so much to learn about photography that one book cannot possibly convey it all. Plus, there are many internet-based resources that you might find helpful in your continuing discovery of this wonderful medium.

To that end I have created a hodgepodge of information, in case these might be of interest to you. (There are also other things that have little to do with teaching the photographic arts, but what the heck! I'll share these with you as well! ☺)

16.1 SOME COOL ACCESSORIES

16.1.1 *EXTERNAL USB BATTERY*

There are a gazillion of these out there, but this one was rated the best by thewirecutter.com and I use this model personally. External USB batteries can power the camera while they're in use, allowing you to shoot video without worry and do some extended intervalometer work. The Anker Astro E5 1600 mAh battery available here: <http://amzn.to/1JPliUr> .



A newer one with a 2000 mAh capacity is available as well.

16.1.2 *DIRT CHEAP BATTERY CHARGERS*

Dual Battery charger – USD \$38.50: <http://amzn.to/1X1YPN0>

Oooh! This one's even cheaper! A Newer for \$19.90!

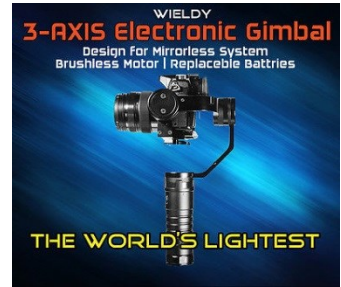
<http://amzn.to/1Psgp3R>

Oooh Oooh! \$15 from Opteka! <http://amzn.to/1PfQOr6>

16.1.3 *WORLD'S LIGHTEST 3-AXIS GIMBAL*

Steadyshot is great when you're hand-holding your camera, but if you're making a movie and plan any moving camera shots, a steadycam of some sort is required. Here's one that's billed as the world's lightest:

<http://ebay.to/1LalUaZ>



16.1.4 *LESS-PROTRUDING RUBBER EYE CUP*

Is this even worth talking about? \$12.99 <http://bhpho.to/1GcFsg2>

16.1.5 *SCREEN PROTECTOR*

Any one that fits the Sony RX-1, RX-100, or A7 II will fit this one. Here's Sony's offering for \$11.99:

<http://bhpho.to/1LiYXmP>

And here's the Larmor / GGS (my preferred brand) version for \$8.46:

<http://ebay.to/1RGJ5fB>



Me? I just used the one I had from the original A7. Had to put it on upside down though because of the new way the screen is placed in the hinge mechanism.

16.1.6 MOVIE BUTTON MODIFIER

That poorly-placed and hard-to-actuate video button got that way because these cameras evolved from still photography, and still photographers kept hitting the button accidentally. So we're stuck with the button placement because of them.

I've solved the problem by assigning MOVIE to C2; but that leaves a video button that can't be reassigned. So here's another simple and cheap solution: A tiny plastic button fatterer from Cineasy:

The Cineasy Touch installs in just minutes and offers a much more intuitive and responsive experience. It provides a larger point of contact which can easily be found without removing your eye from the view finder. It simply attaches to the neck strap eyelet nearest the video button with the included screw. The nylon resin material is resistant to vibration which minimizes the risk of bumping and accidentally engaging the video button.

<http://bit.ly/1MpZMYa>



16.1.7 EXTERNAL MICROPHONES

I talked about external mics in the Movie chapter in Section 12.11.

16.1.8 AND MORE...

I've highlighted some of the more interesting and useful accessories for your camera. There's a ton more available and you can see a pretty comprehensive list at <http://briansmith.com/sony-a7-a7r-accessories-guide>.

16.2 UPSELLS

Hey, let's call a spade a spade. I've written and worked on a lot of other stuff, some of which you might find useful. Everything mentioned in this section is available from www.FriedmanArchives.com/ebooks .

16.2.1 BACK-BUTTON FOCUS

This e-booklet discusses in nuanced detail one of the camera's most misunderstood features - the ability to strip the Autofocus function away from the shutter release button, and assign it instead to one of the buttons on the back of the camera.

There are different situations where configuring your camera this way would be beneficial, ranging from portraits to landscapes to shooting movies, both in AF and MF mode - and this booklet covers each of these scenarios in detail and shows the optimal configuration for each one.

It's a different way to work, and taking the time to learn to use the camera in this way can actually make the camera to be a more natural extension to your mind.

This full-color, 68-page e-booklet is being offered in .pdf format only, allowing it to be viewed on any electronic device you own. <http://bit.ly/1RuYb9B>

16.2.2 BOOKS ON OTHER CAMERAS

I've written a ton of book on other high-end cameras (mostly Sony and Minolta, but there are also books on Canon, Fujifilm, and Olympus sprinkled in there as well). You can see the entire list at www.FriedmanArchives.com/ebooks .



16.2.3 AN INTRODUCTION TO SONY'S WIRELESS FLASH (VIDEO)

In this downloadable video you can watch me go from “Yuk!” to “OMG!” in about ten minutes (including all the trials of getting the light to look “just right”). All by using just a wireless flash and a \$5 piece of cloth!

The 50-minute video is available as a downloadable .mp4 file for USD \$9.95. You can see more info and a preview of the talk at http://friedmanarchives.com/wireless_flash.



16.2.4 WAYS TO 'WOW!' WITH WIRELESS FLASH



Another tool to help you get your feet wet. This presents a series of exercises using (at first) a minimal of equipment just so you can get the most "Wow!" with minimal effort. Controlling your light results in WAY better pictures than just buying an expensive lens!

Learning wireless flash is the best investment you can make in taking your photography to the next level. Take the plunge and learn to use this essential tool the non-intimidating way! <http://friedmanarchives.com/WWWF>

16.2.5 25 WAYS TO “WOW!” E-BOOKLET

A collection of 25 ideas and additional compositional rules designed to get your creative juices flowing and to help you take the kinds of pictures that make people say "Wow!" (the goal of every photographer!). It is available for only USD \$5.95 as an instantly-downloadable .pdf file from www.FriedmanArchives.com/ebooks and search for "25 ways".

16.2.6 *ADVANCED TOPICS 2*

This e-booklet (instantly downloadable and priced right!) delves into more technical issues that just couldn't be squeezed into this book. Advanced Topics 2 covers:

- All about filters - what's useful, what's obsolete
- Color Space, Bit Depth, and ICC Profiles Explained
- Bird and Wildlife Photography
- Macro Photography
- Long-term Archiving of Terabytes of Information
- Low-light Sports Photography
- The Basics of High Dynamic Range (HDR) Imaging (the old fashioned way to do it). (It was uphill both ways!).

Learn more at www.FriedmanArchives.com/ebooks.

16.2.7 *F2 CAMERACRAFT MAGAZINE*

For as long as I can remember, the vast majority of the “Popular” photography magazines served as a vehicle for their advertisers. And as I got older things seemed to get worse, as content took a back seat to both the latest gear AND the will of the graphic layout artist.

As an example, have a look at some of the sample pages of a photo magazine I actually used to write for (below). Its layout is gorgeous. It has the backing of the camera company whose products they herald. But its content leads the crusade of misinformation the photo industry loves to impose on the masses: If only you had the latest gear, or if only you understood this obscure feature of the intimidating camera you can't ever hope to understand, only THEN can you get the great shots you see in their pages. (In one issue they managed to write a FOUR PAGE spread on how to use the shutter release button! Geez.) They would showcase a guest



photographer and only talk about what gear he used, not the light or how he approached the shot in his mind (sending the message that if you bought gear like his, your shots would be as good).

You could argue that the successful magazines have evolved to this point because they're actually giving their readers the content they want. That may be true, but I really couldn't stand being a part of it. I felt they were sending the wrong message (and in fact this is part of what drove me to start the Friedman Archives Seminars (next section 😊) – to combat this institutional culture of mis-information.

Fast-forward to today. When legendary publisher David Kilpatrick visited me in June 2012, not only did he pose for the cover of a book, but he also wanted to talk to me about his latest project: A new quarterly photo magazine which returns to the forgotten roots of great photography and spends more time talking about light, composition, mindset, backstory, and the things that give photographs an emotional edge. It would be printed on high-quality stock rather than over-bleached, uncoated newsprint with pulp and fillers. It would be brand agnostic, and inspire its readers creatively by showcasing works and thought processes of other photographers. And while it will contain some ads, the intention is to publish for like-minded readers and not to chase the mass circulation demanded by today's advertisers. Best of all (at least in my mind), he offered me the position of Associate Editor, which I enthusiastically accepted.

As part of my duties I'll be curating content, editing submissions, and will have a regular column discussing the "mind game" behind important shots. The first issue was released in September, 2012 to high acclaim and great reviews.

I invite you to come be inspired once again about the power and mindset of photography and become a charter subscriber. A subscription link appears below -- Share this with every artistic person you know! (Better yet, subscribe today!) I promise you will find it worth your while.

<http://friedmanarchives.com/Cameracraft>

16.2.8 THE FRIEDMAN ARCHIVES SEMINARS

This is for you if you've gone through everything in this book but are still not satisfied with your pictures.

I started the Friedman Archives High-Impact Photography Seminars because I got tired of seeing so much poor advice disseminated on the online discussion forums when a beginner would ask how to improve their photography. “Start shooting in Aperture priority mode”, one person would opine. “Learn Photoshop” blurted another. “Examine the EXIF information of pictures you like online and see what they did!” And the most ill-prescribed advice which I see all too often: “Shoot RAW!”

Well, that kind of advice may be well-meaning, but it's not effective. Never in my life have I seen a rank beginner switch to RAW (or shoot in Aperture Priority mode) and then suddenly start producing "Wow!" type images. Clearly



the secret to high-impact images must lie elsewhere. And so I thought it was time to share the (seemingly) forgotten knowledge that all successful Kodachrome shooters knew back in the day – how to take pictures that make other people say “Wow!” with nothing more than a point-and-shoot. (Even Photoshop is optional if you know what you're doing!)

And so the seminars were created with the goal of dispelling no end of online myths and explaining what's REALLY important in photography. And they've been a hit with both newbie and experienced photographers alike, all over the world. All in a fun, friendly, supportive, and nurturing environment.

TIP: Don't live near a major city? A condensed version of the Friedman Archives Seminars is now available to view in the comfort of your home, anywhere in the world! More details at www.FriedmanArchives.com/seminars

Here are some of the things you'll learn from this 2-day seminar:

Day 1 ("The Creativity Day", or "The camera can do quite a bit by itself. Teach me about creativity and light and things that only the human can do!")

- How to take great pictures from ANY camera!
- The secrets of outstanding travel photography
- The difference between snapshots and photographs (and why both are important)
- How to "see" light, and making the most of available light
- The "inner game" mindsets used by all the photographic masters
- Compositional rules derived from the world of fine art
- Hands-on experience with wireless flash
- How quality of light can affect emotion
- In-class exercises for creativity and composition.



Day 2 ("The Technical Stuff")

- The four variables of exposure
- The three types of metering, and when to use them.
- How your exposure meter thinks.
- Color balance and Human Perception
- The benefits and drawbacks of RAW mode
- How to avoid horrific .jpg compression artifacts
- Print vs. screen resolution
- The most-useful Post-processing functions

There are also ample discovery exercises to allow you to become familiar with your camera's operation and experiment with particular features.

The Friedman Archives High-Impact Photography Seminars are a wonderful way to help you get the most out of your digital camera investment, and to invigorate your creative spirit all at the same time. More information (including cities and schedules) can be found at www.FriedmanArchives.com/seminars . Come visit the site and register your interest in having a seminar in your city! If you're a member of a photo club you can get me there even faster. I'll go wherever there's demand, anywhere in the world.

What Others Are Saying

"It's the best money you'll ever spend for a photo class. Gary obviously loves what he does and can also make a complex topic easy to understand, which is a great combination. It made me a better photographer!" - George Saadeh

"In a world of dry, artsy information, you bring a vibrant, humorous and fun approach to the subject. Best of all, I feel a renewed enthusiasm for photography. You are an excellent teacher." – Lee Friedman (no relation)

"Well worth it!! Learned soooooo much from Gary in San Mateo! My wife went for the 2-day, and raved about it so much after Day 1, I signed up for Day 2! Ya, that good - thanks for all the after-seminar advice, and 'being there' for technical questions, a year later! Fun and informative." – Daniel Devane

"Best seminar I have ever taken. – THANK YOU!!!" -Joseph R. Conklin

16.2.9 FACEBOOK AND THE FRIEDMAN ARCHIVES BLOG

I write a blog which expounds not just on cameras, but on the more general themes of photography as it relates to experiencing life. Many who follow it say it's quite worthwhile. Unlike many bloggers who feel compelled to find something (anything!) to say several times a week, I tend to only post to it once



every six weeks or so, and even then only if I feel I have something worthwhile to say. (This way I don't add to the noise in your life.) If you've purchased the downloadable .pdf version of this book, then you're automatically on the blog notification list (to which you can easily unsubscribe). If you bought the printed version of this book and registered your copy with me (as you were encouraged to do, for you get free .pdf updates like everyone else if you do), then you're on this list too.

You can read back issues of the blog by visiting www.FriedmanArchives.com/blog. And a compendium of the "Best of the Blog" can be purchased here: <http://friedmanarchives.com/BestOfBlog> (case sensitive).

For those of you on Facebook, you can follow me there too at www.Facebook.com/FriedmanArchives. I don't always have a lot of time to hang out there, but when I do I tend to post smaller things there a little more frequently.

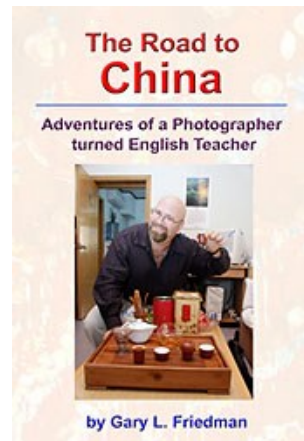
16.2.10 THE ROAD TO CHINA

In August, 2003 I made arrangements to teach English in China, but when I got there, there was no job. So begins a very interesting six-month stay in Beijing, and I blogged about my adventures there. Within these pages you'll hear stories of college life, the move to a



market economy, corruption, burnout, mobsters, government as benevolent parent, the

surprising gravitation to all things Western, and the tribulations of a foreigner trying to start a new business. (Oh, yes, and the experiences of a newbie teaching English in a foreign land!) You are also introduced to some of my students, who, in their own



words, talk about their lives, aspirations, and frustrations.

This highly-acclaimed work is now available in a printed edition, in both Color and B&W. You can learn more by visiting www.FriedmanArchives.com/ebooks.

16.2.11 THE MAUI XAPHOON



There's no better way to make friends in a strange land than with photography. I have also found another way - it is a musical instrument called a Xaphoon (www.Xaphoon.com). It looks like a recorder (about 12 inches in length) but sounds like a cross between a saxophone and clarinet -- much deeper and richer than its size would suggest.

It's great because it doesn't weigh me down, it's always with me, and no matter where I go, I can sit down on a street corner (usually next to a good acoustic space) and just play. What happens next is almost always magical, for you can elicit smiles and eye contact from complete strangers as they walk by.

This has little to do with photography, other than to reinforce the philosophy that the whole purpose of travel is to interact with the locals and perhaps spread a little joy throughout the world. There's always one in my camera bag. If you're an independent thinker and musically inclined, (or if you know someone that is), this is a must-have instrument!



(Full disclosure: I love the instrument so much that I became a Xaphoon distributor, and I created and run the Xaphoon.com website. I figured that while I'm on this shameless self-promotion spree, why not share my enthusiasm for this amazing instrument as well? 😊) You can read more about the Xaphoon (both the plastic and original handmade bamboo versions – the backstory is pretty amazing) at www.Xaphoon.com.

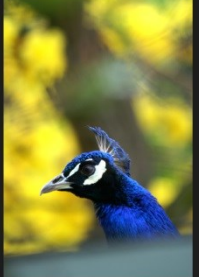
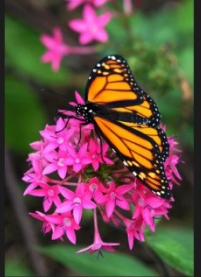
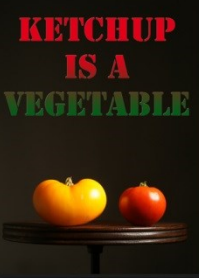
16.3 EPILOGUE

Congratulations! You have successfully plowed through one very large and very detailed book! I hope you enjoyed reading this book as much as I did writing it.

Books like this are a monumental effort. As mentioned at the time you bought this book, I have no advertising budget per se – instead, I rely solely on the enthusiastic recommendations people make to their friends and online. If you liked this book, if you feel it stands apart from all the other commercial-grade, corporate-backed, dryly written photography books out there, then I encourage you to speak up and let the world know about it! 😊 Here are some things you can do:

1. Feel free to visit any of the online photography forums you frequent and tell people what you thought about it. Mention your skill level, mention what you liked (and even what you didn't like, if you must), and the link www.FriedmanArchives.com/ebooks.
2. Feel even freer to send me a testimonial via email at Gary@FriedmanArchives.com. Parts of it may end up on my website.
3. Facebook and Twitter are great places to spread the word too!

Many thanks, and may your pursuit of great images give you an excuse to go out and see the world in new ways!

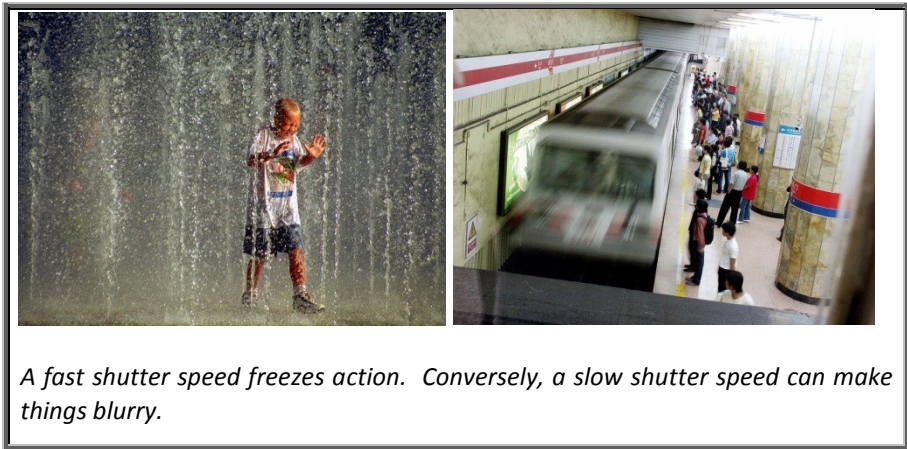


Appendix A A CONDENSED GUIDE TO THE BASICS

A QUICK REMINDER OF THE TECHNICAL FUNDAMENTALS

This Appendix is designed to refresh your memory about the basics. (It will probably not be effective if you never learned these in the first place. ☹) But as I said in the book's introduction, it's unlikely that a person with no knowledge of the basics would spring for this camera. (On the other hand, I do explain the histograms pretty thoroughly...)

A.1 SHUTTER SPEEDS



The shutter speed can make a moving subject appear frozen and sharp, or can make it appear to be moving and blurry. The A7r II can let in as little as $1/8,000^{\text{th}}$ of a second of light, freezing a moving subject, as in the left photo above. Or it can let in as much as 30 seconds (or longer) in manual mode, which is guaranteed to blur anything unless the camera is mounted on a tripod and your subject is just as steady.

If you know what shutter speed you want to use to achieve a certain effect, put the camera into either S(hutter priority) exposure mode, or M(annual) exposure mode and use the front control dial to set the shutter speed.



A slow shutter speed means that anything that moves relative to the camera will come out blurry. So, to get a blurred background, a slow shutter speed was used (about $1/8^{\text{th}}$ of a second) and the camera was moving in sync with the passengers. This technique is called “panning” and does take some practice.

A.2 F/STOPS

“F/stop” (also “aperture”) is photo jargon meaning “the lens opening”. The f/stop controls how much light enters through the lens, and in doing so also determines how much of the picture is sharp in front of the focus point and behind the focus point. A wide-open aperture (small numbers, like f/2.8) means very little is in focus beyond what you’ve focused on; whereas a small aperture (large f/stop numbers, such as f/22) means that things in front of what you focused on and behind what you’ve focused on will be sharper.

If you know that you need to use a particular f /stop to achieve a particular effect, put the camera into A(perture priority) or M(annual) exposure mode, and you can adjust the f /stop via the rear dial.

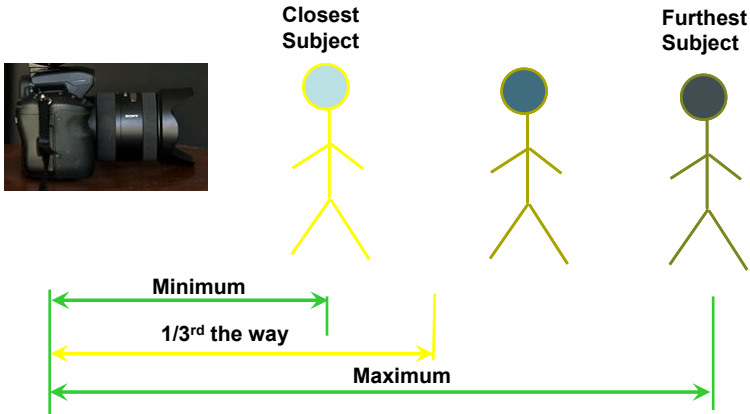
The nice thing about the E-mount architecture is that when using native lenses you can see what will be in focus before you shoot, just by changing the value of the f /stop and watching the background change. (No need to invoke a "Depth-of-field Preview" like you do with most DSLRs!)



Sometimes you want EVERYTHING to be in focus. A small f /stop (like $f/11$) is the answer. (Left)

Sometimes you want a fuzzy background so it will not draw attention away from your subject (like this photo of actor Joe Mantegna, right). A large f /stop (like $f/2.8$), coupled with a long zoom and a goodly distance between the subject and background, is the answer. (Yes, "Goodly" is a word. :-)

To Get Everything in Focus...



When using small f /stops, typically it's best to focus $1/3^{\text{rd}}$ of the way (rather than halfway) between your closest and furthest subject in order to squeeze the most out of that aperture's depth-of-field.

A.3 ISO

ISO is: how sensitive the sensor is to light. The higher the number, the more sensitive it is. (This corresponds almost exactly to the ISO ratings of film.) The tradeoff is the higher the ISO, the more random "noise" appears in the picture. The A7r II has native ISO settings going from 100 all the way up to a whopping 102400! (As you might expect, though, such a high number can result in quite a bit of noise.)

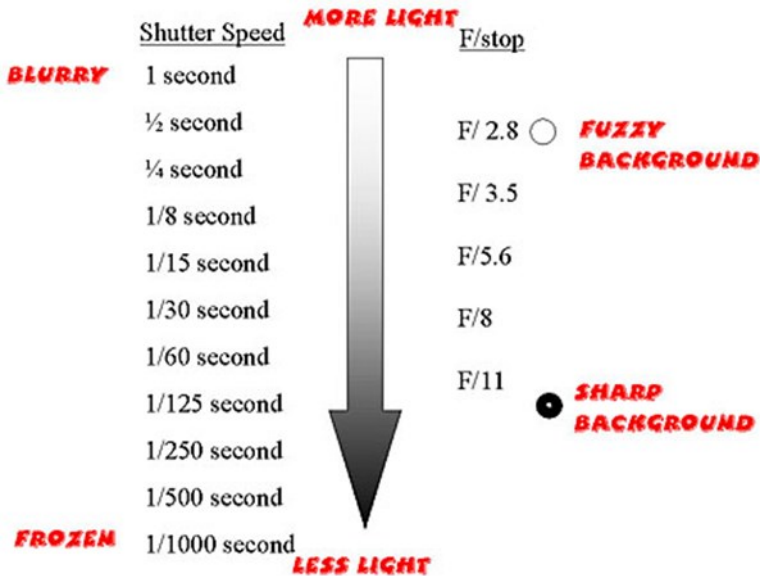
Shutter speeds, f /stops, and ISO are all tied together; if you increase one you must decrease one (or both) of the others to get the right exposure. The fourth variable doesn't employ such tradeoffs:

A.4 FOCAL LENGTH

Focal length is how much the lens is zoomed in or out. The reason this factors in to exposure calculation is twofold:

- 1) When you zoom in, both the image and your hand shakiness are amplified. And so when you're in Program mode (or either Auto mode), the camera will tend to choose faster shutter speeds when you're zoomed in all the way to try to counteract the shakiness.
- 2) Most zoom lenses change their maximum f/stop slightly as it zooms in, necessitating a longer shutter speed. (Kind of counteracts number 1), above.)

A.5 TRADEOFFS



Shutter Speed and f/Stop tradeoff – there are many different possible f/stop / shutter speed combinations that will let in an identical amount of light for any given scene. You can use a combination that emphasizes frozen subjects (fast shutter speeds), or everything in focus (small lens openings).

- When you increase the shutter speed:
 - You freeze motion
 - You let in less light (the picture looks darker)
- When you make the f/stop smaller (i.e., increase the number):
 - You increase what’s in focus
 - You let in less light (the picture looks darker)

The relationship between these variables can be seen graphically on the previous page.

A.6 PROGRAM SHIFT

When evaluating the appropriate combination of f/stop and shutter speed to use for a given amount of light, you will find that more than one combination of these variables will produce a correct exposure. For example, any of these combinations below will provide the *same amount of light* for the sensor:

Shutter speed	f/stop
1/1000 (fast)	f/2.8 (wide open)
1/500	f/4
1/250	f/5.6
1/125	f/8
1/60	f/11
1/30 (slow)	f/16 (small)

Which combination to choose depends upon the kind of picture you’re taking – for example, if this were a sporting event, you would tend to use 1/1000th at f/2.8 (because the faster shutter speed stops the action), whereas if you were doing a cityscape you would tend toward smaller f/stops and

use $1/30^{\text{th}}$ at $f/11$, because the smaller aperture produces the greatest depth of field. But when you're in "P" Program mode, the camera will choose the combination somewhere in the middle, like $1/250^{\text{th}}$ at $f/5.6$ (the yellow row in the table above), because it has no idea what kind of picture you're trying to take. Average is safe.

Another way to tell the camera to "use the faster shutter speed combination" or "use the smaller f/stop" is the Program Shift. It's not a mode; it's what either of the control dials (front or rear) does by default when the exposure mode dial is set to "P". Here's how to use it:

1. Focus-lock on a scene (by pressing the shutter release button down halfway, then release).
2. Rotate one of the control wheels – front or back. This will tell the camera to choose another equivalent f/stop and shutter speed combination that will let in the same amount of light.

Program Shift is a very handy function which lets you change to a different f/stop / shutter speed combination from what the camera recommended *very quickly, without having to press a lot of buttons or turn a lot of dials*. One control dial rotation is all it takes.

A.7 THE HISTOGRAM DISPLAY

BRIGHTNESS RANGE, SENSORS, AND THE HUMAN EYE

Have you ever seen something which looked *really cool*, only to take a picture of it and have it come out looking darker (*much* darker) and ‘muddier’ than the way you remembered it? Why wouldn’t the picture look *exactly* the way you remembered seeing it?

It turns out that the answer to this question is far from easy. But the short answer is: *cameras (film or digital) see light differently from the way the human eye and brain do.*

To understand this difference, have a look at the picture in **Figure A-1**. When I took this picture, the scene didn’t look like this to the naked eye. I could see the skateboarders quite plainly, right down to the color of their clothes and the stickers on their skateboards. But *film and digital cameras cannot see the same range of light as the human eye can.* (This is by design. Long story. I explain it all in my seminar.) In the vast majority of cases you can either capture the sky, or the foreground, but not both, as illustrated in **Figure A-2**.

So for the skateboarding silhouette above, I chose to expose for the sky, intentionally leaving the subject to be rendered as black.

Figure A-3 gives a good comparison of the range of sensitivity of the human eye, color negative film, and digital cameras. In the figure, a “stop” means “a factor of two” in light intensity. So when it says a digital sensor



Figure A-1: *Limited Brightness Range can lead to artistic images. You can create silhouettes on purpose by exposing for the sky (via AEL and Spot metering) and then recompose, focus, and shoot*

can sense a range of brightness of 8 stops, it means that the brightest part of the picture is no more than $2^8 = 256$ times brighter than the darkest part of the picture. Put another way, if you were using the spot metering feature of the camera and you were to measure the brightest and darkest parts of your scene, and the brightest part reads $1/1,000^{\text{th}}$ of a second, then the darkest part must read no less than $1/4$ of a second (8 stops away) for everything to be visible.

This is a *really, really* important concept to understand. Your eye can see a greater brightness range than can film or digital. Film or digital can see a greater brightness range than the camera's LCD. This means *when you look at a scene using the LCD, you're not seeing all the detail that the digital sensor can capture*. In reality, you're seeing about 90% of the light range, and for the vast majority of shots, this is great and useful and wonderful.

Once you understand the important concept of reduced brightness sensitivity range, it becomes easy to understand why Fill Flash is sometimes used to make the subject look good on film (or digital) even though they look perfectly good to the unaided eye. It also explains why



Figure A-2: A real-world example. Unlike the human eye, with digital cameras you can either capture the sky (left) or the subject (right), but not both.

the motion picture industry uses gigantic studio lights in their productions, only to have the scene look perfectly normal when you see it in the theatre. *It is because for an image to look normal, the brightest part of your scene must be no more than 8 stops brighter than the darkest part of your scene.* If it is more than 8 stops – that is, if the brightest part of your picture is more than 8 stops brighter than the darkest part of your picture, the camera will not be able to capture it all, and some information will be lost – perhaps areas in the darkest part will become deep black, or the lightest part will “blow out” and be so white that you can’t make out any detail.

In the previous silhouetted skateboarder image, the range of light in the scene was indeed greater than 8 stops, and the information in the darker parts (where the skateboarders were) was lost, resulting in the darker parts looking black. (So, sometimes the limited range of a sensor can be used for artistic purposes. But far more often it results in frustration because the camera was not able to capture what you remember seeing.)

In the days of film, such loss of information usually came as a surprise to the photographer after the developed film came back. But, at least with

Different Devices can “see” different ranges of light

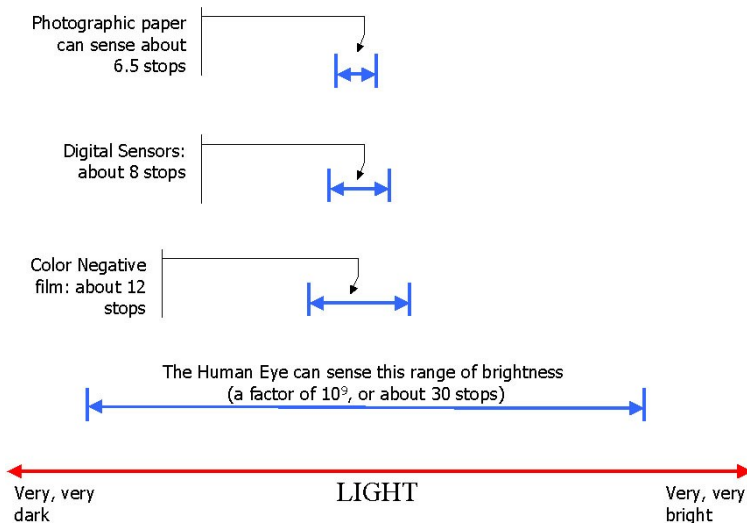


Figure A-3: The dynamic range of several types of media.

digital cameras *you can get a good idea of whether or not the camera captured the brightest and darkest parts of your scene.*

USING THE HISTOGRAM FOR A FINER DEGREE OF CONTROL

So, all of the above was a prelude to the Histogram function. The histogram display simply shows you where the brightness in your image “falls” within the 8-stop range. It is useful when you are shooting subjects that are predominantly white (like a bride in a wedding dress) or black (like portraits of black cats on black backgrounds), and you need to know if the sensor is capturing the detail that the LCD cannot show you. It's also doubly-useful when you're reviewing your images

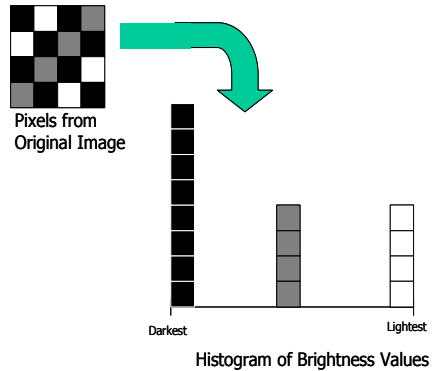


Figure A-4: A simplified view of how histograms work.

outdoors on a bright day and your LCD screen is getting washed out. Being able to see what you captured graphically can be a stress-reducer out in the field! The histogram shows you the range of brightness values in your image, rearranged in order, with the most frequently-occurring brightnesses being taller.

Figure A-4 shows an illustration of how histograms relate to the scene being captured. Let's say that the collection of black, white, and grey boxes in the upper-left-hand corner represent the pixels of your (*very* low-resolution) digital camera. The histogram simply re-arranges the pixels in order of ascending brightness; the brightest to the right and the darkest to the left. Pixels with the same brightness value get “stacked” on top of each other. The resulting graph shows the brightness distribution of the image; where the brightest parts and darkest parts fall within the camera's sensitivity range.

Okay, so how do you use this information? Remember that the right edge of the histogram represents *the brightest value the sensor can capture*, and the left edge represents *the darkest value the sensor can capture*. It is

important that the tallest parts of the graph (representing the dominant shades in your image) are not clumped up at the left-edge or right-edge; for if they are, it means that the brightness level of these pictures is exceeding the sensor's brightness range. It's also important to remember that *there is no such thing as a standard-looking histogram* for all pictures – you use the histogram to make sure that the brightnesses in the image fall where you want them to fall for the kind of image YOU intend to create.

You can view an image's histogram while it is still in the camera. While in Playback mode, hit the DISP Button multiple times until you get the histogram playback screens (Figure A-5).



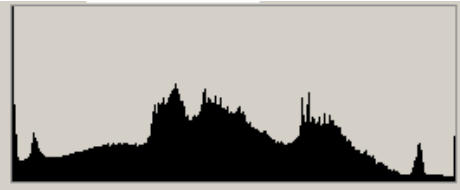
Figure A-5: One of the selectable playback displays shows a histogram of your image.

Let's start with some simple examples:

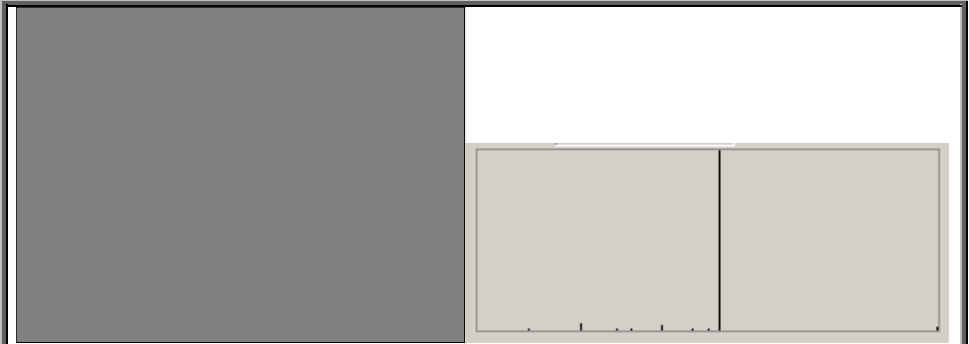
TIP: There is a quick and easy way to tell if your image contains any blown-out highlights or too-dark shadows. When you playback the image in histogram mode, the parts of the exposure that are "off the scale" will blink. A VERY useful feature!!



Here's a picture of a Cuban boy against a dark-ish background. Since there is more dark than bright in the picture, this is reflected in the histogram, which shows more dark pixels than light ones. Notice that the blacks are not SO black that they bump up against the left edge – this is perfect for this shot. Black, but still showing detail.



Here's a truly average scene, with brightnesses spread out pretty evenly across the horizontal axis. The black spike you see near the left-hand edge represents the black in the road sign. As you can see, the tall spike means there are more black pixels than of any other single color. (There are many different shades of blue, which is why there's no large spike in the center.) Here it is OK if the blacks are outside the range, for we don't need to see detail in the black part of the sign.



Here's a picture of a grey piece of paper.

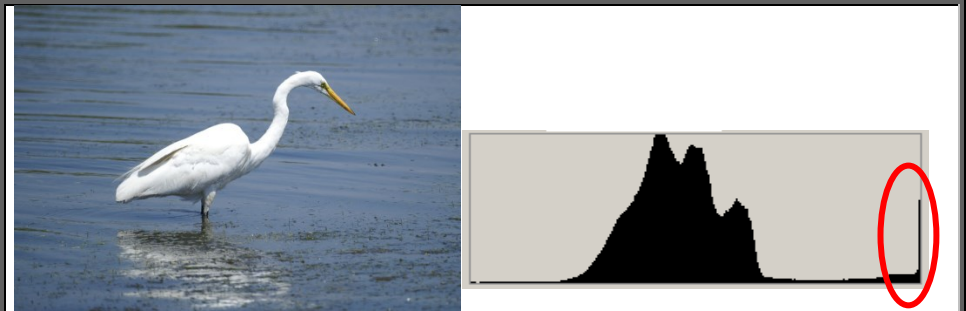
Here the histogram looks exactly as you expect it would – all grey pixels stacked up high, with no lighter or darker pixels anywhere (i.e., nothing to the left or the right of the spike). (Well, nothing significant...)



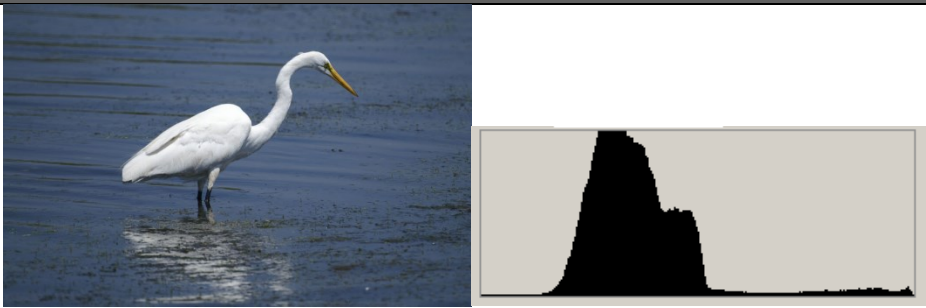
Here is an image comprised entirely of black, white, and grey. Here, we expect to see 3 spikes: Black on the left, white on the right, and grey in the middle. (And we do!)



Oh no! I just took this picture, and the camera’s LCD screen makes the white building look washed out and overexposed! Is it?? Let me check the histogram.... WHEW! According to the graph on the right, the vast majority of the white in the image is within range. Only a tiny white spike on the rightmost edge – represented by the whitest part of the clouds above – is “blown out”, which for this picture is acceptable. (How do I know it’s the clouds and not the building? Because in Histogram Playback view, the “blown out” part of the clouds blinks.)



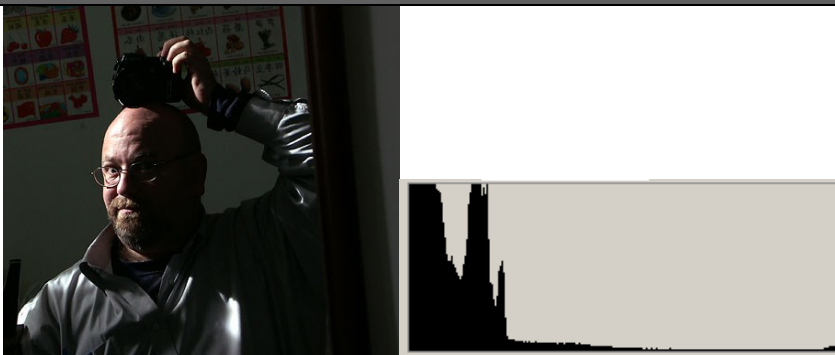
Another real-world situation. I had just taken the picture of this bird, and I couldn’t tell by looking at the LCD screen whether the whites were blown out or not. A quick histogram check indicated that they were indeed blown out! (See circled area – plus, the blown-out parts of the image were blinking in Histogram view.)



I immediately set the camera to underexpose by $\frac{1}{2}$ stop and shot again. All of the histogram shifted to the left (thus the entire picture got darker), and now the blown-out portion is safely captured within the camera's available dynamic range. Hooray!

Luckily the bird was still there when I took the 2nd shot. It's situations like these for which Auto Exposure Bracketing was invented – take several at different exposures NOW; I'll choose the best one on the computer later.

It's hard to see the difference in these tiny thumbnails, but if I were to make an enlargement of this picture, the lack of detail in the bird's feathers would definitely have been noticeable!



Remember, there is no such thing as an average-looking or "correct" histogram shape – each will be different and depends entirely on the kind of image you were looking to create.

For this picture, it was perfectly OK to have some blacks be so dark that there's no detail, as long as the highlights on the face were captured properly. As you can see in the histogram, the face details were captured just fine and there's no "blow out" of the highlights.

A.8 THE “SECRETS” OF LIGHT AND COMPOSITION

Okay, you now know the basics of how to use your camera. But having a sophisticated, capable camera is only part of the formula for better pictures. Behold! The remaining secrets to great photography are herein revealed!!

Let’s start with the pie chart in Figure A-6 below, which shows the relative importance of all the different variables that comprise a really good photograph.

Notice that the two biggest variables, *by far*, are ‘composition’ and ‘quality of light’. Not how many megapixels your camera has, or how expensive your lens. As I will explain below, *armed with these techniques, your pictures taken with your camera can make people say, “Wow!”*

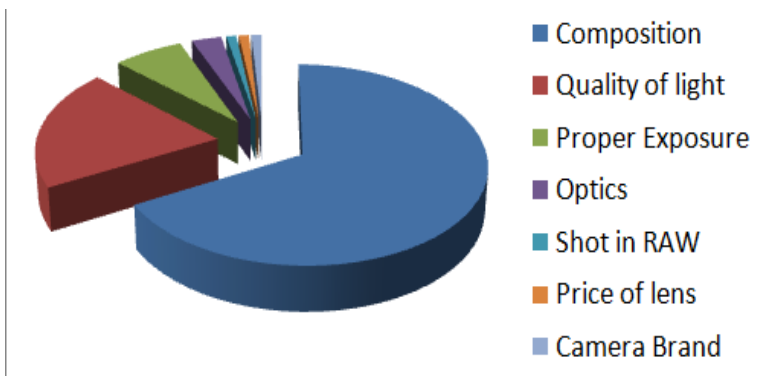


Figure A-6: The elements of a good photograph. (Notice that “How expensive your camera is” is not a variable.) Point-and-shoots can take great pictures too using the techniques outlined in this appendix.

A.9 WRITING WITH LIGHT

Light is everything in photography. It can make the difference between a mere snapshot and a beautiful shot which conveys emotion. To see this, let's look at the example from **Figure A-7**.

Both pictures were taken within minutes of each other. The first picture was taken with the camera's pop-up flash. The second picture captured other available light which added a certain warmth and drama to the picture.



Figure A-7: *It's all about light. The right kind of light can transform an average picture into something remarkable.*

Many other examples will be shown throughout the rest of this appendix (and a great example can be found in this blog post: <http://bit.ly/1lwRntx>), but the upshot is *be aware of the quality of the light!* Most of us are oblivious to whether light is harsh (like on a bright sunny day) or soft (like on a bright cloudy day), because our brains adapt to bad light in all sorts of amazing ways. But as described in the beginning of this appendix, the camera can see less than you can, and so providing the right kind of light for the camera can greatly increase the quality of the shot and, in some cases, help give your images an emotional feel.

The first general rule is, “Soft light from a nearby open window is often best for portraits.” It creates a diffuse light which is quite pleasing to the eye. **Figure A-8** provides examples.



Figure A-8: Be on the lookout for diffuse window light. These are examples of the right light creating an ideal picture.

If you think you're in a harsh light situation, the best thing you can do is use fill-flash if your subject is within flash range, as in **Figure A-9**.

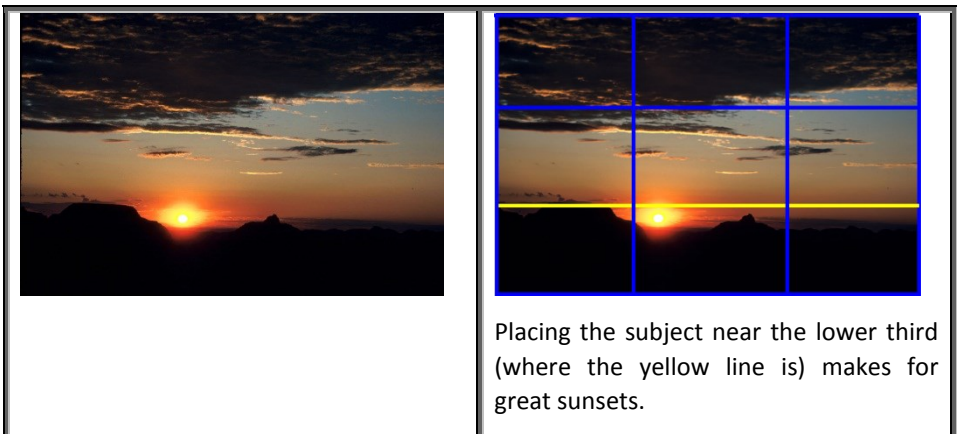
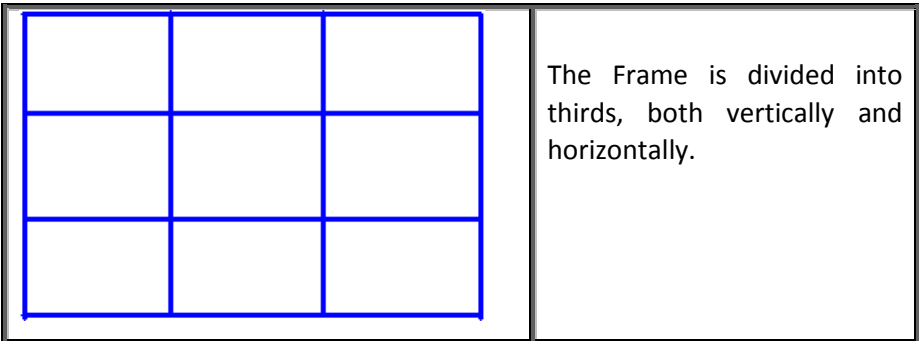


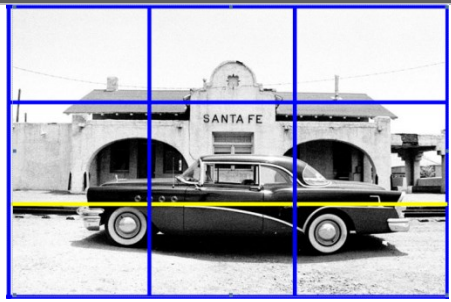
Figure A-9: Fill Flash can help! Harsh light like that on the left image can often be made less harsh by using the fill flash (right).

A.10 COMPOSITION – THE RULE OF THIRDS

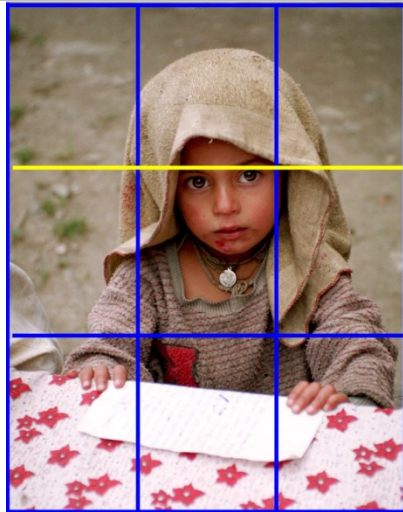
It's true that image composition -- how the photographer frames the shot -- which differentiates the "snapshots" from photographic masterpieces. The compositional rule that you are about to learn is used by all artists, even those who do painting and drawing.

Imagine that your viewfinder is divided into thirds (vertically and horizontally), as in the illustration below. The "Rule of Thirds" simply says that if you place your subject close to any of these imaginary lines instead of in the direct center, it will result in a substantially more pleasing picture. (Results are even better if the subject is placed at any intersection of these lines!) Some examples are below.

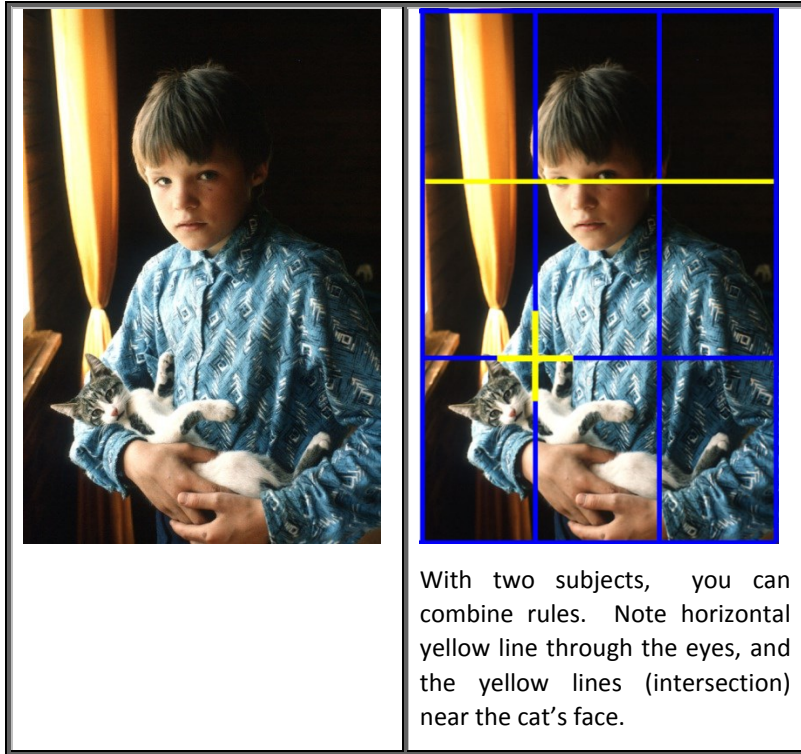




The same is true for any subject. (Guess where this shot was taken.)



In a portrait, the eyes should always be somewhere in the upper third.



So, the secret to great pictures isn't only having a great digital camera with all the available features, it's also knowing how to compose your image and recognize (or create) dramatic light.

To be sure, there are other rules of composition, but the "Rule of Thirds" is the most important and can make the biggest difference in your pictures.

Some other rules you may wish to experiment with:

OUT OF PLACE SHOT – an out-of-place shot often involves a repeating pattern with a disrupting subject placed according to the Rule of Thirds. **(Figure A-10)**

TEXTURE – a picture composed of pure texture requires no conventional subject. **(Figure A-11)**



Figure A-10: A subject which breaks the monotony.



Figure A-11: Pure texture can be a subject.



Figure A-12: Classical Portrait. Put the eyes near the upper-third. (Awesome light helps.)

CLASSICAL PORTRAIT – classic head shots adhere to the rule of thirds – the eyes generally are placed right on the upper-third line. (**Figure A-12.**)

ENVIRONMENTAL PORTRAIT – an environmental portrait tries to capture the essence of a person’s character in their own environment. (**Figure A-13.**) For shots like this the camera should be zoomed out all the way, with your subject placed via the Rule of Thirds and as much about the subject’s surroundings (“his or her life”) filling up the rest of the shot. Photojournalists use this technique a lot.

“HEY, LOOK AT ME!” – This technique is the antithesis of the Rule of Thirds. These are “in-your-face” shots that absolutely force you to look at the subject and ponder it a little. The subject should be front-and-center, parallel to the sensor, with no distracting backgrounds. Examples in **Figure A-14.**



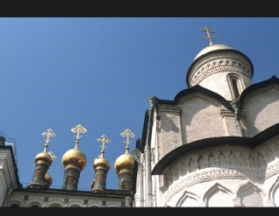
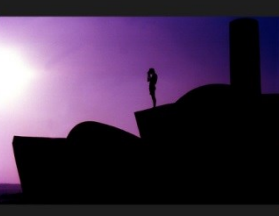
Figure A-13: *Environmental Portraits shy away from the standard head-and-shoulders formula; instead they show the person in their element, documenting not only their character, but the space in which their gift thrives.*



Figure A-14: “Hey, Look at Me!” shots are very in-your-face, and force viewers to ponder your subject. It is the opposite of the rule of thirds, where your subject is front and center. (And what is it about outhouses that draws people’s interest? 😊)



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Appendix B A “COOKBOOK” FOR SPECIAL SHOOTING SITUATIONS

CAMERA SETTINGS YOU CAN USE FOR DIFFERENT TYPES OF SHOTS.

B.1 INTRODUCTION

This Appendix will provide a “Cookbook” approach to taking pictures in special situations where your camera’s automatic exposure meter is sure to get it wrong:

- Street Photography
- Fireworks
- Artistic Waterfalls
- Stage Performances / Rock Concerts
- Nighttime Time Exposures
- Shooting in Snow
- Outdoor Group Portraits
- Sunsets and Silhouettes
- Nighttime Sports
- Christmas Lights
- Product Shots
- Candlelight Shots
- Star Trails

B.2 STREET PHOTOGRAPHY

Street photography is often done as a candid shot, sometimes “shot from the hip” as you are walking by. Classic street photography from the old days was often done with rangefinder cameras which had no automatic focus or exposure. Your camera, with its autofocus, flip-out display and completely silent operation, makes it a perfect tool for the job. Here’s how to shoot in this classic style:

- ✓ If it is not a bright day, set your ISO to 400. Otherwise, 100 or 200 will do.
- ✓ Use a wide-ish lens – 24mm to 35mm or so.
- ✓ Use Manual Focus mode and manually set the focus to infinity. (This will get most things into focus.)
- ✓ Use Manual Exposure mode, set your f/stop to f/5.6.
- ✓ Meter for the sidewalk to set your shutter speed. (Sidewalks are usually pretty close to 18% grey. If it’s a light-colored concrete, then overexpose the reading by 2/3 stop.) If the resulting shutter speed is slower than 1/60th, increase your ISO or open the f/stop to compensate.
- ✓ Silent mode is best to minimize the chances of getting beat up.
- ✓ Shoot away!

Notice that if you’re shooting on a well-lit street at night, the same procedure (metering off the sidewalk) will work equally well, although you may have to boost the ISO to 3200 or greater.



B.3 FIREWORKS

- ✓ Set the camera on a tripod.
- ✓ Turn SteadyShot OFF.
- ✓ Set focusing to Manual and set the lens to focus at infinity.
- ✓ Set the ISO to 100.
- ✓ Set white balance to Daylight.
- ✓ Set the aperture to 5.6 (just to start out).
- ✓ Turn Long Exposure NR OFF so you can take the next picture right away.
- ✓ 2-second self-timer
- ✓ Set the shutter speed to 15 seconds. You can set it for longer to capture additional fireworks bursts, but setting it for too long will cause the sky to turn grey and everything else will be overexposed.
- ✓ Sometimes it is helpful to include something on the ground in the composition to get a sense of place.

Check your initial pictures. If they appear overexposed, set the aperture to a higher number (like $f/8$ or $f/11$). If they appear underexposed, set it to a lower number (like $f/3.5$).



B.4 ARTISTIC WATERFALLS

We've all seen them – Waterfalls which have a kind of fluid quality to them. How is this done? Well, we all know that using a fast shutter speed will freeze things, and we also know that using a slow shutter speed will make *everything that is*



moving appear blurry. In the picture only the water is moving (while the rocks and vegetation stay still), and using as slow a shutter speed as possible will give it the effect of smooth movement.

- ✓ Use a tripod. Turn SteadyShot off only if your tripod is rock-solid.
- ✓ Set ISO to the lowest value you can (a low sensitivity extends exposure).
- ✓ Set Exposure mode to “A” and choose the smallest f/stop (the highest number) you can.
- ✓ To have the camera merge several frames together (for even smoother waterfalls), go to the ISO menu and invoke Multi-Frame Noise Reduction.
- ✓ In situations like the example picture above where you're surrounded by greenery, underexpose by about 1 stop. Vegetation reflects back much less than 18% of the light!

If you have a circular polarizer or a neutral density (grey) filter, put that in front of the lens. This will slow down the shutter speed even further.

TIP: Yes, you can download (and pay for) an app that does the same thing – but really, in this case it's a waste of money. The settings above will produce the same results!

B.5 STAGE PERFORMANCES / ROCK CONCERTS

- ✓ Use “P” mode.
- ✓ White balance set to Incandescent.
- ✓ Focus-lock and then put the camera into Manual Focus mode.
- ✓ Turn Spot Metering Mode ON.
- ✓ When a white spotlight is on the performer, aim the camera so the illuminated performer falls within the center of the viewfinder, and invoke the AE Lock feature. This locks the exposure.

You can shoot the entire concert with this locked exposure setting. (Even when the lighting changes!) For worry-free shooting, like if you turn your camera on and off a lot, note the locked exposure setting, and dial them into Manual exposure mode.



Paul Simon in concert. See that guy in the middle playing the Xaphoon? I hand-picked that instrument for him. ☺ Anyway, had I shot this on "Auto" the black background would have thrown off the exposure meter.

B.6 NIGHTTIME TIME EXPOSURES

- ✓ Put the camera on a tripod and Turn SteadyShot OFF
- ✓ ISO to 100
- ✓ Manual exposure mode, set the shutter speed to 30 seconds or less.
- ✓ Focus-lock on your subject and switch to manual focus mode.
- ✓ If you're shooting streets lit with mercury vapor lamps, set the white balance to "Fluorescent". If your scene is lit with normal light bulbs, set the white balance to "Incandescent". If you're not sure, use Auto White Balance or shoot RAW and find the right color balance later on your computer.
- ✓ Set the *f*/stop to something medium, like *f*/5.6.
- ✓ For lowest noise, try enabling Multi-Frame Noise Reduction (in the ISO menu) at ISO 100 (the lowest fixed value you can set).
- ✓ If you're shooting for longer than 30 seconds, set the shutter speed to "Bulb" and use either a wired cable release (RM-VPR1), an infrared remote commander, or the free "touchless shutter release" app to start and stop the exposure.

Start with a 30-second exposure, look at the results, and tweak your exposure from there.



B.7 SHOOTING IN SNOW

Snow can be tricky because the white background can throw off the metering. There are two different methods you can use that work well:

1. Set Exposure Compensation about +1 or +1.5 stops.
2. Use the camera's built-in flash to illuminate your subject (if you are close enough, that is.) No exposure compensation is necessary with this method.



B.8 OUTDOOR GROUP PORTRAITS

While it may be counter-intuitive, outdoor group portraits should actually be done in open shade (NOT direct sunlight) using a flash to “fill in” the faces. The following assumes that YOU want to be in the shot as well:

- Put the camera on a tripod.
- Set the camera to Program mode, and 10-second Self-Timer
- Use an accessory flash and set the FLASH compensation to -1.0
- Shoot away!

The results will look quite professional, and not as if it was shot with a flash.



B.9 SUNSETS AND SILHOUETTES

- ✓ Focus-lock on your subject, then set Manual Focus mode
- ✓ Using Spot Metering mode, and meter for a bright area of the sky that DOESN'T contain the sun.
- ✓ Use AE-LOCK to lock the exposure.
- ✓ You may wish to use the Creative Style Sunset mode for warmer hues.

Be sure to remember to use the rule of thirds when it comes to placing the subject (sun, horizon, or silhouette)!



B.10 NIGHTTIME SPORTS

For shooting sports like football or basketball games that are illuminated by bright stadium lights, don't use auto exposure mode since the black sky or the bright stadium lights can often throw the exposure meter off. Instead, do the following:

- ✓ Use ISO 6400 (or even higher if it's really dark, although higher settings will result in noisier pictures).
- ✓ Use Aperture Priority Exposure mode, and open up the lens all the way. (This ensures the fastest shutter speed.) Then meter off a patch of illuminated dirt or grass. Ideally this should give you a shutter speed of 1/125th of a second.
- ✓ Set White Balance to Incandescent or Fluorescent (depending on whether the stadium lights are tungsten or Mercury Vapor lamps).
- ✓ If all the action will be roughly the same distance away, focus-lock on where the action will be and put the camera into Manual Focus mode.

Anticipate the action and Shoot! Shoot! Shoot!



B.11 CHRISTMAS LIGHTS

(or any other type of nighttime lights)

You don't use a flash when taking pictures of Christmas lights, since the lights themselves create their own light. Instead, use this simple procedure:

- ✓ Set White Balance to Incandescent.
- ✓ If you're using a tripod, turn SteadyShot OFF and set the ISO to 100. If handheld, turn SteadyShot ON and set the ISO to 200 or 400 (depending upon how bright the lights are). The picture below was taken with a tripod.
- ✓ Use Spot Metering and aim the camera so the metering area is filled with lights; then use AE Lock to lock the exposure.
- ✓ Recompose your image and shoot away!



B.12 PRODUCT SHOTS

Here's another instance where setting your camera to Automatic will probably not yield the professional-looking results you seek. The image below was designed for selling these items on e-bay. (I have learned that the higher quality your shot, the higher the bids you get on your old equipment! ☺)

- ✓ For a light source, use wireless flash. Or a table lamp with the lampshade removed, in a darkened room.
- ✓ Camera set to Manual exposure mode. $f/11$ was used to keep most items in focus.
- ✓ Use a tripod.
- ✓ I tried different shutter speed values until this rich, classic underexposed feel was achieved.
- ✓ Compose with some color in the background to catch the eye.



B.13 CANDLELIGHT SHOTS

I often use an underexposed fill-in flash to give some additional life to my candlelight shots; but this is completely optional. Camera should be on a tripod and your subject should hold perfectly still.

- ✓ Set Exposure mode to Manual; 1.5 seconds and the f/stop wide open (smallest number)
- ✓ ISO to 400
- ✓ Flash Compensation to -2 (optional; for fun try it both ways)
- ✓ Fire away! (No pun intended.)



B.14 STAR TRAILS

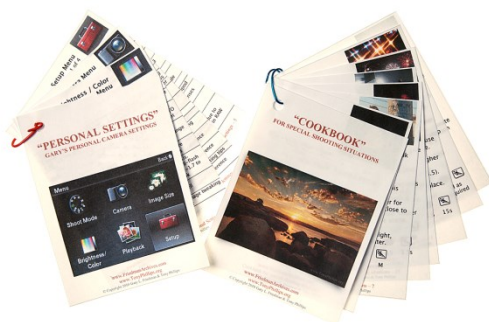
This is the only shot in this chapter that didn't look this way right out of the camera. Read about how I did it in my blog: <http://bit.ly/1JO6W6E>



Appendix C TIP CARDS

A Special Bonus Feature for your camera bag. Just download, print, cut, and laminate!

Early on in this book I spoke about the camera's built-in help screens, and how it really was more useful as a memory jog for people who once knew what it had to say, rather than as a teaching aid.



Well, I believe in memory jogs. And I also know that readers of my previous books had printed out many parts of the book (especially the “My Personal Camera Settings” and “A Cookbook for Special Shooting Situations”) so they can be a handy reference in their camera bags.

Well, here's a gift for you. Australian Photographer Tony Phillips (www.TonyPhillips.org) has created a set of cards which summarize the most popular parts of my book that people used to print. (Think it's an easy task to get complex ideas across using the least number of words? Well, it's not!) And so, below is a link to a .zip file you can download which contains .pdfs formatted for both A4 and US Letter-sized paper. All you have to do is print them out, cut them up, laminate them, and keep the deck in your camera bag as a happy reminder of the fun you've had reading this book and learning about your camera. Think of it as a gift from Tony and me.

You can download the .zip file from here:

<http://bit.ly/1ROII2B>

Enjoy!

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