Rico Pfirstinger

THE Fujifilm X-T2

120 X-Pert Tips

to Get the Most Out of Your Camera

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1. YOUR X-T2 SYSTEM

To start off, here's a brief overview of the buttons and controls on your Fujifilm X-T2:

Fig. 1: **X-T2 frontal view:** front command dial with integrated button (1), Fn button (2), AF assist lamp/self-timer indicator lamp (3), X-Trans sensor (4), electronic lens contacts (5), lens release button (6), focus selector (7), flash sync connector (8)

Fig. 2: **X-T2 top view (with XF18–55mmF2.8–4 R LM OIS):** on/off switch (1), shutter release button (2), Fn button (3), exposure compensation dial (4), shutter speed dial with stacked metering mode selection dial (5), view mode button (6), hot shoe (7), aperture ring (8), focus ring (9), diopter adjustment dial (10), ISO dial with stacked DRIVE mode dial (11)

pretty much any power source with a USB port, such as your laptop or your cell phone charger.

TIP 4 Make sure that your camera and lenses are running with the latest **firmware**.

Fujifilm keeps improving the firmware of the X-T2 and XF/XC lenses.

- In order to check which firmware version is installed in your camera and lens, switch on the camera while pressing and holding the DISP/BACK button.
- Use this link [03] to find and download the latest firmware versions for your camera and lenses. There, you can also find current versions of Fuji's application software, such as RAW File Converter EX.
- A step-by-step video guide illustrating the firmware upgrade process is available here [04]. MacOS users can find detailed firmware download instructions here [05]. Windows users can use this link [06].

TIP 5 Things to remember when **updating your firmware:**

- Always use card slot number 1 for firmware updates.
- If you can't find a new firmware version on Fuji's firmware update page, there's a good chance that your web browser is still caching an older version of this page. In this case, either delete your browser cache or force your browser to reload the webpage from the server.
- Make sure that your computer doesn't change the name of firmware files you download due to naming conflicts caused by previous firmware versions that are still residing in your download folder. The correct file name of the camera firmware for your X-T2 is always FWUP0010.DAT.

- Make sure your battery is fully charged when updating your firmware.
- Always copy new firmware files for your camera or lenses into the top directory of your SD memory card, and always use cards that have been freshly formatted in your camera. After you have copied the firmware to the card, make sure to properly unmount the card from your computer before removing it.
- If you want to update the firmware for a specific lens, make sure that lens is attached to the camera when you initiate the update process.
- To start the update process for your camera or a lens, switch on the camera while pressing and holding the DISP/BACK button and follow the instructions on the screen.
- Never switch the camera off during the update process. The camera will tell you when the update is complete. Only then can you safely switch it off.

If the firmware of your camera or lens needs to be updated due to compatibility issues, the camera may alert you of this when you switch it on. If that's the case, download the new firmware from the website links provided in tip 4 and update your camera and/or lens.

Use fast **memory cards** with at least 80 MB/s write speed. TIP 6

Turbo-charge your camera and its built-in buffer memory by using the fastest UHS-I and UHS-II memory cards available. SanDisk, Lexar and Toshiba offer cards with nominal write speeds of 80 MB/s or higher.

The X-T2 also supports the superfast UHS-II standard, which offers transmission speeds of up to 300 MB/s. Unlike the X-Pro2, UHS-II is available in both SD card slots of your X-T2.

Fig. 5:
Fast **SanDisk Extreme Pro** SD memory cards with a 95 MB/s read and write speed are popular workhorses for many serious X-series users.

Fig. 6:
For maximum performance, I recommend you use lightning-fast UHS-II cards, like a **Lexar Professional 2000x,** Toshiba Exceria Pro, or SanDisk Extreme Pro UHS-II.

TIP 7 | Working with **Dual Card Slots:**

Your X-T2 offers two SD card slots numbered "1" and "2". This means that you can use two SD cards at the same time.

Please note:

- The primary SD card slot of your X-T2 is always slot #1. If you are only working with a single SD card, always put it in this slot.
- Firmware upgrades are only supported in slot #1.
- Both slots support UHS-II, making them suitable for very fast memory cards such as *Lexar Professional 2000x, Toshiba Exceria Pro,* or *SanDisk Extreme Pro UHS-II (280 MB/s).*

Using two memory cards at the same time gives you three different options to configure how image data is transferred to your SD cards. To do so, select SET UP > SAVE DATA SET-UP > CARD SLOT SETTING (STILL IMAGE) and pick one of the following options:

- **SEQUENTIAL:** In this default mode, the camera saves all image data (RAW and JPEG) to a manually selected card slot. To change the slot, choose SET UP > SAVE DATA SET-UP > SWITCH SLOT (SEQUENTIAL).
- **BACKUP:** In this mode, the X-T2 is sending all image data (RAW and JPEG) to both slots at the same time, creating a backup copy that can be useful when one of the cards gets lost or suffers data loss. In this mode, the overall data transfer rate is limited by the slower of the two cards that are in use. This can become a performance issue in situations that require many images being taken with high burst rates while shooting FINE+RAW, so make sure that the cards in both slots are equally fast.
- **RAW/JPEG:** This setting splits the image data up by saving RAW files to slot #1 and JPEGs to slot #2, so this setting is only useful when you are shooting FINE+RAW or NORMAL+RAW. If you shoot RAW-only or JPEG-only, RAW/JPEG mode turns into BACKUP mode, saving your RAW or JPEG data to both cards at the same time.

I always recommend shooting FINE+RAW. If you follow this advice, selecting RAW/JPEG mode (and using the fastest UHS-II cards available in slots #1 and #2, respectively) will give you the best camera performance in terms of continuous burst rates.

However, RAW/JPEG data save mode also has its quirks:

- Splitting up RAW and JPEG image data to slots #1 and #2 only works in regular shooting mode (i.e., when you take a new picture), not when you are using the camera's

Fig. 8: **Dust spots** on the sensor made visible: this sensor badly needs cleaning.

TIP 11 **Do-it-yourself sensor cleaning** for tough sensor spots:

When the built-in sensor-cleaning function doesn't do a proper job, you have three basic options for cleaning the sensor by yourself:

- Touchless cleaning
- Dry cleaning
- Wet cleaning

Touchless cleaning involves using a blower, like the *Giotto's Rocket-air Blower,* to rid the sensor of dust particles. An important feature of such devices is a filter in the intake valve that prevents contaminated (dusty) air from being blown against the sensor.

Important: *Don't use compressed air from aerosol cans that contain propellants. Particles could hit the sensor like tiny projectiles and damage it!*

Fig. 9: Touchless sensor cleaning: **Rocket-air Blower**

A popular means to **dry clean** the sensor is the Pentax Sensor Cleaning Kit. The sticky head of this funny-looking cleaning device picks up dust and dirt from the sensor surface and transfers it to sticky paper sheets that are included with the product.

Fig. 10:
Dry cleaning:
Pentax Sensor Cleaning Kit

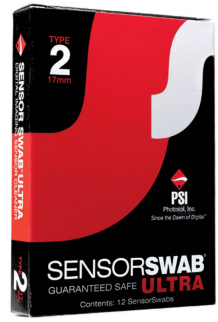

Fig. 11:
Wet cleaning:
sensor swab from
Photographic Solutions

Tough sensor dirt (like water or oil stains) requires wet cleaning with a *sensor swab*. Suitable products are offered by companies likes *Photographic Solutions* and *Visible Dust*. They consist of wipers that are wetted with special cleaning fluids (such as *Eclipse*). Wipe one side of the swab from left to right over the full width of the sensor, and then from right to left with the other side of the swab. Your X-T2 requires swabs that match APS-C-sized sensors. At Photographic Solutions, this translates into product size number 2.

Inexpensive and effective alternatives to products from Visible Dust or Photographic Solutions are APS-C-sized swabs from the Asian brand VSGO.

There's a small chance that the spots are caused by dust particles enclosed *behind* the protective surface of the sensor. If some spots simply won't go away, the camera needs to be serviced by Fujifilm. In some countries the first sensor cleaning is even free of charge.

TIP 15 The optical image stabilizer (OIS) has its quirks!

With the exception of the XF16–55mmF2.8 R LM WR zoom, all XF and XC zoom lenses feature built-in optical image stabilization (OIS). Switch on the OIS to prevent camera shake and blurry images in situations that require you to take handheld shots at a slower-than-usual shutter speed. XF lenses offer a dedicated OIS on/off switch on the lens barrel. The OIS in XC lenses is controlled through a camera menu.

For handheld shots, an old rule of thumb recommends using shutter speeds that are at least as fast as the reciprocal of the full-frame-equivalent focal length that is in use. For example, with a 50mm lens and an APS-C crop factor of 1.5, the minimum safe shutter speed for handheld camera use would be *[1/(50 × 1.5)]s = 1/75s*. In other words, when you are shooting handheld with a 50mm lens and don't want shaky images, you should use shutter speeds at least as fast as 1/75s. Or you can use the OIS to add a few more stops.

Of course, rules of thumb don't apply to everybody. Some users have quite steady hands and some are rather shaky. The settings and equipment that work for me may not work for you. However, the OIS will always give you a few extra stops of shutter-speed headroom.

In SHOOTING SETTING > IS MODE, you can choose between two basic OIS modes:

- **OIS mode 1** (CONTINUOUS) is the default setting. It's always stabilizing the image, even when you are just looking through the viewfinder before you press the shutter button.
- **OIS mode 2** (SHOOTING ONLY) only engages when you fully depress the shutter button to take an image.

Please note that the OIS can also *introduce* camera shake, especially at fast shutter speeds. This adverse effect is more

likely to occur in OIS mode 1 than in mode 2. However, OIS mode 1 is more effective when used at very slow shutter speeds, such as 1/15s, 1/8s, or even 1/4s.

Fig. 14: The **optical image stabilizer** of the XF50–140mm in action: Thanks to a slow shutter speed of 1/6s, I could still use ISO 800 for this night shot. Even at a full-frame equivalent of 210mm, the OIS was able to successfully compensate for any camera shake caused by my hands.

These are my recommendations for using the OIS:

- Only use (switch on) the OIS when necessary. When you are using fast shutter speeds that don't require image stabilization, you can safely turn the OIS off to eliminate it as a potential interference.
- I prefer to use the OIS in mode 2 ("shooting only"). Mode 1 is useful at very slow shutter speeds and when you are using very long focal lengths because the camera will also stabilize the live view image, making it easier to compose and focus a shot.

Fig. 19: A **Canon-compatible TTL extension cord** works with the X-T2. However, since the extra power line for Fuji's tiny EF-X8 flash unit isn't looped through, this flash can only be used directly on the camera's hot-show mount.

TIP 24 | Issues regarding **Canon TTL flash devices**

Canon-compatible flash devices (e.g., flash units or radio transmitters) can lead to an overload of the X-Pro2's processor and result in overheating (you'll see the related overheating warnings if this happens), so there's reason to believe that the X-T2 may also be affected. It's caused by incompatible Canon/Fuji TTL flash protocols that are routed through compatible flash contacts, as described in the previous tip.

This problem can even occur when you are using your Canon-compatible flash gear in full manual mode without any expectation of TTL exposure control. You might want a simple trigger signal, but what you get are colliding protocols with adverse side effects.

Should you encounter these problems with your gear, you have three basic choices:

- Stop using your Canon-compatible TTL flash or transmitter and replace it with simpler devices that only use a central trigger contact.

- Tape the TTL contacts of your flash devices, leaving only the central trigger contact. This ensures that the only electric connection between the camera and the flash or transmitter is the flash trigger contact.
- Use an adapter that isolates the flash sync signal and blocks all other hot-shoe pin connections to your flash device. This is like taping TTL pins, just more convenient. Suitable adapters are available for only a few dollars.

Please note that flawless flash operation is only guaranteed when you use devices that explicitly support the Fujifilm X flash system and protocol. Alternatively, you can also use simple, manual flash devices and transmitters that only use the camera's central trigger contact. Other flash devices (that were originally made for other camera brands and systems) may also work in full manual mode, but there's no guarantee for it. Proceed at your own risk.

Remote shutter release: three options for the X-T2 TIP 25

Now and then you may encounter situations that require you to remotely release the shutter without vibration. A quick-and-dirty method is using the camera's self-timer with a delay of either two or ten seconds, although a better way is using a remote shutter release. Your X-T2 features three different ports to connect remote shutter releases:

- A **mechanical thread** in the shutter button allows you to connect a traditional cable release.
- There's an **RR-90 port** (Micro-USB port) that is compatible with a variety of electronic remote controls.
- You can connect electronic remote shutter releases to the camera's **microphone port** (a 2.5mm input).

Electronic shutter releases are available in tethered and wireless versions. Wireless options always consist of a

2. USING THE FUJIFILM X-T2

2.1 READY, SET, GO!

New users often ask about how to achieve the perfect settings for their camera. Short answer: there are no perfect settings. If they existed, Fuji could have saved us the trouble of navigating the menu options and simply implemented those ideal settings as the factory default.

Obviously, this short answer isn't satisfactory to readers of this book, so here's a more thorough one:

- Years of practical experience with digital Fujifilm cameras have lead me to suggest a set of recommended basic settings that are meant to provide good overall performance and as much flexibility as possible.
- Many settings (such as film simulation modes, color saturation, contrast, sharpness, noise reduction, film grain effect, etc.) belong in the "JPEG settings" category. They don't affect the RAW files; only the out-of-camera JPEGs that are generated during RAW conversion. These settings aren't global or camera-specific—they are image-specific and each image should be adjusted individually.
- In addition to the recommended standard settings, there are a number of shortcuts and key combinations that can make choosing the optimal camera settings for any situation much easier.

TIP 26 **Recommended settings** for your X-T2

There is no perfect set of basic camera settings that could suit all users in all situations. However, the following settings will allow you to use the X-T2 in a flexible manner with good overall performance:

- **Auto-ISO** is a convenient option with three presets that can be selected by setting the ISO dial to "A" and selecting one of three Auto-ISO choices (AUTO1–3) with SHOOTING SETTING > ISO AUTO SETTING. The corresponding Auto-ISO fine-tuning is available for each Auto-ISO preset by pressing the right selector button. There, you can adjust DEFAULT SENSITIVITY (I suggest 200), MAX. SENSITIVITY (I suggest 12800) and MIN. SHUTTER SPEED. Don't worry: even at the upper limit of ISO 12800, images made with the X-Trans sensor are quite good. When you are using Auto-ISO, you should pick a suitable minimum shutter speed with MIN. SHUTTER SPEED. A popular setting for the minimum shutter speed is 1/60s, but you can change this parameter to anything between 1/4s and 1/500s. Using a stabilized (OIS) lens, speeds slower than 1/60s are definitely a realistic option for this camera. With fast-moving objects, faster speeds are recommended to avoid unwanted motion blur. My personal minimum shutter speed settings for AUTO1, AUTO2, and AUTO3 are 1/60s (landscape), 1/200s (portraits), and 1/500s (action).

- Always select **FINE+RAW** under IMAGE QUALITY SETTING > IMAGE QUALITY or in the Quick menu. This will get you high-resolution out-of-camera JPEGs (digital prints) *and* flexible RAW files (digital negatives). Using the RAW files, you can create a variety of diverse JPEGs with different looks and settings using the camera's built-in RAW converter (PLAYBACK MENU > RAW CONVERSION). Specifically, you can adjust JPEG parameters such as white balance, film simulations, contrast, brightness, noise reduction, and color saturation. This enables you to create different versions of a shot from a single RAW file; for example, you can make both color and black-and-white versions of the same image, including different contrast settings. You don't have to worry about choosing the perfect JPEG settings prior to taking a shot

because you can always change and optimize those settings afterward in the camera's internal RAW converter.

- As a typical standard setting, most photographers use **single shot drive** (select S on the DRIVE dial) and **single shot autofocus** (AF-S; select S with the focus selector at the front of the camera).

- The most flexible and accurate AF-S setting is **Single Point AF** (AF/MF SETTING > AF MODE > SINGLE POINT). This mode allows you to select the area of the image where the camera should be focused. To accomplish this, use either the focus stick or select AF/MF SETTING > FOCUS AREA, then use the selector keys (arrow keys) or the focus stick to pick one of the 91 or 325 available AF frames. There, you can change the size of the selected AF frame by turning any of the command dials. *Pressing* (not turning) the rear command dial resets the frame to its default size. Pressing the DISP/BACK button (or the focus stick) selects the central (default) AF frame. Press OK or half-press the shutter button to confirm your selection. The camera will use this frame in AF-S and AF-C modes as its focus area as soon as you press or half-press the shutter button.

- Unlike most DSLR cameras, the X-T2 uses a **hybrid autofocus system:** a blend of contrast detection autofocus (CDAF) and phase detection autofocus (PDAF). The main burden still rests on the CDAF, which covers all AF frames (most of the sensor area). The PDAF is only covered by the central AF frames (about 40% of the sensor area). It's faster, but only works in sufficiently good light. Both AF methods work most precisely with a small AF frame, but work faster and more reliably with a large AF frame. This leads to an obvious conflict of interest. My basic AF frame size rule is: always select an AF frame that is as large as possible, but as small as necessary.

- Set your X-T2 to maximum performance by selecting SET UP > POWER MANAGEMENT > PERFORMANCE > BOOST. This option is *not* enabled by default, so you have to manually select it. Only **Boost mode** unleashes the full potential of the camera, offering the fastest available live view readout and best autofocus performance. This mode also uses up more energy, so make sure to always carry one or two fully charged replacement batteries.

- To further improve AF performance, you can select AF/MF SETTING > PRE-AF > ON. **Pre-AF** makes the camera focus on whatever is covered by the currently selected AF frame or zone, even when the shutter button is *not* pressed or half-pressed. This can save valuable split seconds when you actually take a shot, but it also means that the camera is using up more energy. Worse, in this mode the lens is always focusing on something, so it may make distracting noises. For these reasons, I *don't* recommend using Pre-AF as your default setting. Only use it under special circumstances.

- Set AF/MF SETTING > RELEASE/FOCUS PRIORITY to FOCUS for both AF-S and AF-C. **Focus Priority** makes sure that the camera records a picture only when the autofocus thinks that it has locked onto a target. In RELEASE mode, the X-T2 will take the shot even if the autofocus couldn't find a lock. Please note that if you are using AF+MF mode, AF-S will always operate with release priority. By the way: my recommended default setting for AF/MF SETTING > AF+MF is ON.

- If you want to quickly take a series of single shots, I recommend selecting SET UP > SCREEN SET-UP > IMAGE DISP. > OFF in order to not interrupt your flow. However, I *normally* set **Image Display** to 0.5 SEC, because I like to see a quick preview of the final image that represents the camera's dynamic range (DR) settings. To cancel an

focal length in SHOOTING SETTING > MOUNT ADAPTOR SETTING. This ensures that the EXIF [21] data will show the proper focal length.

- Do you sometimes shoot with very slow shutter speeds lasting several seconds? In this case, I recommend setting IMAGE QUALITY SETTING > LONG EXPOSURE NR > ON to improve the quality of your results. In this mode, the X-T2 performs a so-called dark-frame subtraction [22] to reduce noise and eliminate hot pixels. With this process, the total exposure time is doubled because the camera is taking the shot twice: once normally and once with a closed shutter curtain. The second shot is then subtracted from the first to improve the overall result.

- I recommend *not* using the AUTO setting for the **brightness control for the EVF** because it tends to show an overly bright live view image in bright sunlight and a very subdued image when it's dark. Instead, I set SET UP > SCREEN SET-UP > EVF BRIGHTNESS > MANUAL with a setting of 0. I use the same setting for the rear LCD.

- For the purpose of this book, we assume that SHUTTER AF and SHUTTER AE (in the SET UP > BUTTON DIAL SETTING menu) are both set to ON, which is also the X-T2's factory default setting. This ensures that autofocus and exposure (including the working aperture) are locked when you half-press the shutter button, so the camera is primed for the least possible shutter lag once you continue to fully press the shutter button.

- I select SET UP > BUTTON DIAL SETTING > COMMAND DIAL SETTING > S.S. F to ensure that the X-T2 stays in line with other X-series cameras that use the front command dial to adjust the shutter speed, and the rear command dial to adjust the aperture (when a lens without an aperture ring is used). All related recommendations in this book are based on this setting.

Avoiding the camera menus: **practical shortcuts** for your X-T2 TIP 27

Navigating nested camera menus can be cumbersome. That's why the X-T2 offers the Quick menu (Q button) and user-configurable Fn keys that can provide direct access to important and frequently used camera functions and settings.

The X-T2 also offers seven custom user settings (C1 through C7) that can hold groups of frequently used camera settings. You can select one of these groups (or profiles) via the Quick menu or an appropriately configured Fn key. C1 through C7 aren't camera *modes;* they are memory locations. Each one conveniently stores a configured profile. Use these as shortcuts to immediately change your current camera settings to another predefined set of options.

Finally, the X-T2 offers a so-called MY MENU, where you can arrange frequently used menu items on configurable menu pages for quick and easy access.

Speaking of shortcuts—there are plenty, and most of them are available at your fingertips:

- Pull up the Quick menu, then press and hold the Q button again for a few seconds to directly open the configuration menu for your custom user settings (C1 to C7).
- Press and hold the Q button while the Quick menu is *not* open to directly access the Quick menu configuration page. In this mode, you can customize the Quick menu to meet your personal requirements. You can assign one of more than two dozen different settings to any of the 16 available Quick menu elements. If you don't need 16 shortcuts, you can even select NONE to reduce the size of the Quick menu and make it easier to navigate.
- Press and hold the MENU/OK button to lock the selector keys and the Q button. Press and hold the MENU/OK button again to remove the key lock.

- To see where the Fn buttons are located and what's assigned to each of them, simply press and hold the DISP/BACK button. In this menu, you can also reassign all Fn buttons.
- To confirm a new menu selection in shooting mode, you can either press the MENU/OK button or half-press the shutter button.
- Half-press the shutter button to switch from playback mode to shooting mode.
- Half-press the shutter button during an ongoing image preview (SET UP > SCREEN SET-UP > IMAGE DISP.) to immediately cancel the preview.
- Half-press the shutter button for a few seconds to wake-up the camera from sleep mode.
- In AF-S shooting mode (with Single Point AF) or MF mode, press the rear command dial to zoom into the currently active AF frame. When zoomed-in, you can choose between two magnification levels by turning the command dial.
- Press and hold the rear command dial in MF mode to cycle between the different manual focus assist modes: standard, focus peaking, and digital split image.
- You can move the selected AF frame or zone around with the four selector (arrow) keys. Press the DISP/BACK button to reset the position of the AF frame or AF zone to the center. You can change the size of the selected AF frame or zone by turning one of the command dials. To reset the size of the AF frame or zone to default, press one of the command dials.
- Press and hold the focus stick in shooting mode to access the focus stick options. You can choose to deactivate the stick completely, activate the stick by pressing it, or keep

it activated continually. For this book, we choose the latter option (ON) to ensure that the focus stick is always directly available.

- Press the focus stick in shooting mode to access the focus frame and focus zone selection screen. Here, you can move the active focus frame or zone around with the focus stick and change its size by turning one of the command dials. In this selection screen, you can press the focus stick again to center the focus frame or zone.
- In shooting mode, you can move the focus stick directly in eight directions to change the position of the active focus frame or zone. However, you can't change their size before pressing the focus stick.
- In playback mode (while viewing an image), use the front command dial to browse through the images that are on file.
- During playback, you can turn the rear command dial to zoom in and out of an image. By pressing the DISP/BACK button, you can always directly return to the standard-size view. Press the rear command dial to zoom into a 100% view of a shot. When you are zoomed-in, pressing the dial again returns the camera to its regular view, displaying the full image.
- While displaying a RAW image in playback mode, you can press the Q button to directly access the built-in RAW converter. This function allows you to create new JPEG versions of your image with different settings.
- In playback mode, press the upper selector button to view the first of two information pages that show additional shooting parameters and the position of the focus point. This function is not available in the FAVORITES display mode.

TIP 37 Using the **Natural Live View**

The so-called Natural Live View is a display mode that disables the WYSIWYG simulation of JPEG settings such as Film Simulation, Highlight Tone, Shadow Tone, or Color. Instead, it will display a live view image with increased dynamic range in the highlights and shadows, and with natural colors that are supposed to resemble what our eyes would see through an optical viewfinder. It will also set the live view to Auto white balance, so there will be no simulation of any white balance settings or presets in the live view. However, all current JPEG and white balance settings will still be applied to the *actual image* that's recorded.

To set the camera to Natural Live View mode, select SET UP > SCREEN SET-UP > PREVIEW PIC. EFFECT > OFF. This setting enables generic-looking previews for color, black-and-white, and sepia shots that do *not* reflect the look of the actual JPEG results. This makes Natural Live View particularly useful: you can see what's going on in the dark parts of a high-contrast scene while composing the shot.

Important: *The Natural Live View of the X-T2 extends highlight dynamic range by two stops, rendering the live histogram inaccurate when shooting with DR100%, DR200%, or DR-Auto dynamic range settings.*

2.3 EXPOSING RIGHT

It's not the job of the camera to find and set the right exposure; it's the job of the photographer. That said, the X-T2 features the usual set of AE (auto exposure) modes: aperture priority A, shutter priority S, and program AE P.

- **Aperture priority** A will automatically set a suitable shutter speed to match a preset aperture based on your exposure.
- **Shutter priority** S will automatically set a suitable aperture to match a preset shutter speed based on your exposure.
- **Program AE** P will automatically set a suitable aperture and shutter speed combination based on your exposure.
- **Auto-ISO** can contribute a suitable ISO setting (within predefined limits). In digital cameras, ISO is the level of signal amplification applied to an image that has been recorded by the camera's sensor. ISO impacts the brightness of the final image.

It is important to understand that these auto exposure (AE) modes (including Auto-ISO) are not responsible for correctly exposing images; exposure is always the responsibility of the photographer. AE modes automatically fill variables (such as the shutter speed in aperture priority A) in a way that matches the exposure you've set manually. Auto exposure will only deliver good results if the photographer is exposing correctly.

Exposing correctly—how does this work?

Don't panic! Unlike conventional DSLR cameras, the mirrorless X-T2 makes things easy. Four different metering modes (multi, spot, center-weighted, and average), the WYSIWYG live view, and the live histogram help you find the correct exposure for any given scene. The most important tool is the exposure compensation dial, which allows you to correct the metered exposure up to ±3 EV in convenient steps of 1/3 EV. EV means Exposure Value, and 1 EV is equivalent to one full aperture stop. The correct exposure isn't what the camera is metering; it's what *you* make of the metering by adjusting the exposure compensation dial.

TIP 38 Choosing the right **metering method**

There are four different metering methods available to measure the amount of light that goes through the lens and hits the image sensor.

- **Average** metering calculates an unweighted average of the total light that hits the entire sensor area.
- **Spot** metering only considers two percent of the sensor area. The metering area covers a medium-sized autofocus frame in the center of the image. Alternatively, you can link spot metering to the size and position of the active autofocus frame (in SINGLE POINT AF and MF mode).
- **Center-weighted** metering is a crossbreed between average and spot metering. While it encompasses the entire image area, it puts special emphasis on the image center.
- **Multi** or **matrix** metering calculates a weighted average of the total light that hits the sensor. The weight is a result of 256 metering areas (the matrix) that the camera evaluates and compares to typical scenarios, which is why multi metering is considered "smarter" than the other methods. For example, multi metering is designed to recognize when you are shooting against the sun.

Average, spot and center-weighted metering return exposure recommendations based on middle gray. In other words, when you take a picture of a black wall and then a picture of a white wall, the results will both look middle gray. This means:

- If you want the black wall to actually look black in the resulting image, you have to manually adjust the exposure downward.
- If you want the white wall to actually look bright white in the resulting image, you have to manually adjust the exposure upward.

Fig. 21: This illustration shows a black sheet of paper and a white sheet of paper. Both were photographed with the camera's spot metering without any exposure correction. As you can see, the camera delivered a **middle-gray exposure** in both cases. In order to get an image that reflects the actual brightness of the subject, the metered exposure has to be adjusted.

Fujifilm recommends a correction of +1 EV when you are shooting in snowfields, or –2/3 EV when you are shooting subjects in spotlight. Instead of these rules, I recommend a more precise and methodical course of action using the live view and the live histogram. To minimize corrective adjustments, it's best to select a metering method that fits the subject or the job at hand:

- **Multi** metering is a general-purpose method. Since it is supposed to be "smarter" than the other methods, there's a good chance that you won't have to apply any corrective adjustments to the proposed exposure.
- **Average** and, to a lesser degree, **center-weighted** metering are rather neutral metering methods that will likely stay more consistent despite small changes in composition (or framing) than multi metering and spot metering. I recommend average metering if you want to take a series of shots of the same subjects under similar conditions. In such cases, average metering will help you keep the exposure consistent.
- **Spot** metering bases its measurements on one particular spot of the overall image. This means you have to work very precisely to make sure you are metering the appro-

You have two basic options:

- Set the shutter-speed dial to **T** (Time) and then use the front command dial to set the shutter speed. In order to avoid camera shake, use a remote shutter release or the self-timer to take the shot.
- Set the shutter speed dial to **B** (Bulb), then press and hold the shutter for as long as you want the camera to expose. Obviously, it makes sense to use a remote shutter release that can be locked for the duration of the shot.

For good-quality results, make sure to set IMAGE QUALITY SETTING > LONG EXPOSURE NR > ON. By doing so, the camera will perform a dark-frame subtraction [22] depending on what ISO and exposure time you used. Dark-frame subtraction doubles the effective exposure duration, so be patient.

Fig. 23: A **long exposure** of 30 seconds taken in T mode. Make sure to use a tripod for these kinds of shots.

Long exposures in bright daylight TIP 48

In order to achieve long exposure times under normal daylight conditions, you can't just stop down the lens—even at f/22, your shutter speed would still be too fast. Besides, diffraction blur is kicking it beyond f/10, so stopping down beyond this point is only recommended when it cannot be avoided.

To realize long shutter speeds in good light, it's best to use a so-called ND filter [36], or neutral density filter. This is a fancy name for a simple gray filter that you can put in front of the lens to block a portion of the light from reaching the sensor.

For example, a filter with an ND 3.0 specification will extend your exposure time by a factor of about 1000 (or 10 f-stops). This means that by using such a filter, a scene that would normally require a shutter speed of 1/50s at f/8 can be shot at the same aperture with an exposure time of 20 seconds.

However, there's a catch: since your X-T2 is equipped with a rather weak infrared cut filter in front of the sensor, long exposures (typically one minute or longer) in bright daylight should be performed with a regular neutral density (ND) filter and a dedicated IR cut filter in front of the lens. This will help you avoid false colors. A few ND filters already include an IR cut filter.

ISO settings—what's the deal? TIP 49

The meaning of ISO in the digital realm is often misunderstood. Higher ISO settings *don't* increase the sensor's sensitivity. The sensor in your X-T2 is calibrated to its native ISO 200 (based on the popular SOS standard) [37], and this remains the same no matter what ISO you set in the camera.

To be clear, there's no difference between taking a shot with f/5.6 and 1/60s at either ISO 100 or at ISO 25600. In both cases the sensor is exposed to the exact same amount of light (or photons). The amount of light (the real exposure) is solely determined by aperture and shutter speed.

So what exactly is ISO doing? ISO determines the amount of *signal amplification* that's applied to the image. ISO 200, the sensor's native setting, is equivalent to the camera's basic calibration. At ISO 400, the signal (or sensor data) is amplified by one aperture stop to brighten the image and increase its exposure. At ISO 800, the amplification amounts to two stops, and so on. At ISO 25600, the additional amplification of the light recorded by the sensor amounts to seven stops. It's not surprising that image quality decreases when ISO amplification increases; noise and artifacts are amplified along with the actual image data.

The amplification we are talking about means brightening the image by increasing its exposure. If you are familiar with external RAW converters such as Lightroom, you know there's an exposure slider. Moving this slider to the left or right changes the exposure (and hence the ISO) of an image. So the concept of ISO amplification isn't limited to the camera itself—it's part of the entire workflow from exposure via RAW file (digital negative) to the final JPEG or TIFF file (digital print).

If you take a shot with an ISO 800 setting, you're telling the camera to expose the image two stops darker than it would at its base ISO of 200, then amplify (brighten) that image two stops to compensate for the underexposure.

Regarding image quality and ISO, there's a basic rule: lower ISO settings lead to higher-quality results—hence the general recommendation to keep the ISO settings as low as possible. However, we obviously can't shoot with ISO 200 all the time, especially in low-light situations.

There are two basic methods to amplify a digital image:

- **Analog/digital hybrid amplification *prior* to writing the RAW file:** This method applies a mix of analog and digital signal processing to amplify or push the image to the brightness level that corresponds to the ISO setting. The digitized result of this process is then saved as a RAW file.
- **Digital amplification (push) *after* writing the RAW file:** This method changes the brightness of an image during RAW processing, *after* the RAW file has been written. The metadata (aka instructions) in the RAW file will tell the RAW converter what to do. You can also use your X-T2's built-in RAW converter to adjust the brightness (and hence, ISO) of an image after it's been recorded, or by moving your external RAW converter's exposure slider.

Digital amplification during RAW processing is beneficial because it's reversible. If the amplification (exposure) is too strong, you can always adjust it. ISO (aka exposure amplification) is a volatile aspect of the photography process because it can be changed anytime: in-camera, prior to writing the RAW file, or later during RAW processing.

The sensor in your X-T2 is a so-called ISOless sensor. This means there's no relevant quality difference between conventional signal amplification prior to writing a RAW file and digital amplification later during RAW conversion. This is great, because it allows you to digitally increase the ISO (aka brightness/exposure) of your shots during RAW processing, either in-camera or with external software such as Lightroom. Pushing the exposure up later in Lightroom won't look any different than choosing a higher ISO setting when you take the shot.

Don't forget: ISO is just an amplification of the image signal. Using the misomatic, the amount of light that reaches the sensor is solely determined by your manual aperture and shutter speed settings. It always stays the same, regardless of the automatic ISO setting chosen by the camera. In misomatic mode, the only exposure variable is the amount of signal amplification (aka ISO), and with an ISOless sensor, this variable can also be adjusted later during RAW conversion. In this context, choosing DR200% ensures that there's ample leeway for after-the-fact exposure corrections of at least ±1 EV.

TIP 53 ISO-Bracketing: it's just a gimmick!

ISO bracketing (set the DRIVE dial to BKT and select SHOOTING SETTING > DRIVE SETTING > BKT SETTING > BKT SELECT > ISO BKT) is only available in JPEG mode, so the camera won't keep RAW files. It's just a gimmick: the camera takes a single exposure with the selected ISO setting, then creates two additional JPEGs with different ISO settings, one higher and one lower than the original setting.

ISO bracketing is just a digital push and pull operation on the intermediate RAW file (which is deleted after all three JPEGs have been generated). You could achieve the same result by shooting a single pic in FINE+RAW mode and then using the camera's built-in RAW converter to generate a second JPEG with the PULL command, and a third one with the PUSH command.

A better alternative to ISO bracketing is AE BKT. This option actually takes three different exposures and keeps the corresponding RAW files.

TIP 54 Extending the dynamic range

If the dynamic range of a subject is larger than the dynamic range of the camera's sensor and image processing, one of the following phenomena occurs:

- The highlights of the image are blown out or appear too bright (overexposed).
- Midtones appear too dark (underexposed) and shadows lose detail in the blackness.

In both cases, the shot's exposure is imbalanced. Sadly, it's very difficult (if not impossible) to restore blown highlights. It's much easier to lift underexposed midtones and blocked shadows. This procedure is called tone-mapping. Certain tonal values of the original exposure are reassigned and changed, either by employing a tone curve or by using a more complex mathematical procedure known as adaptive tone-mapping.

In order to record the full tonal range of a high-contrast subject, it's best to expose the image in a way that preserves the color and texture of the bright parts of the photo. Of course, doing so can lead to an image with underexposed midtones and blocked shadows that need further processing in order to look natural and realistic. You can correct these issues with most external RAW converters.

While every RAW converter is different, most programs offer functions to selectively change the exposure of a shot. For example, you can change the overall exposure with the exposure slider, and you can restore blown highlights with a highlight recovery slider. Most converters also offer sliders that only target shadow tones.

The DR function of the X-T2 can help you automate this tone-mapping procedure. It works in two stages:

- The RAW file is exposed one (DR200%) or two (DR400%) stops darker in order to preserve bright highlights of a scene.
- During the following RAW conversion in the camera, the underexposed shadows and midtones are digitally amplified by one (DR200%) or two (DR400%) stops to restore their natural brightness, while the (already correctly exposed) highlights are mostly left alone.

The resulting JPEG from the camera has undergone a selective exposure correction. The DR function restores the shadows and midtones of a shot that was initially exposed one or two stops darker to preserve the highlights of the scene. Looking at the resulting JPEGs, this leads to an effective gain in dynamic range (DR): one additional stop of highlight DR at DR200%, and two stops of additional highlight DR at DR400%.

In DR-Auto mode, the camera will automatically select a suitable DR setting. Please note that in this mode, the X-T2 will choose either DR100% (no highlight DR expansion) or DR200% (one stop highlight DR expansion). DR400% (two stops highlight DR expansion) is only available when it is manually selected.

You can change the DR settings of your camera in the Quick menu or by selecting IMAGE QUALITY SETTING > DYNAMIC RANGE and then either AUTO, DR100%, DR200%, or DR400%.

Fig. 26: These examples show the same shot with **DR100%** (left) and **DR400%** (right). At DR100%, the dark llama (our main subject) is correctly exposed, but the much brighter colors in the background are almost completely blown because they were outside of the camera's dynamic range. In the DR400% version of the shot, the exposure (brightness) of the llama didn't change. However, the bright background is now perfectly colored and textured.

Extending the dynamic range for RAW shooters TIP 55

RAW shooters typically set the camera to DR100% and perform the tone-mapping of their shots later during RAW processing. DR100% provides a realistic live view and live histogram (WYSIWYG).

The typical strategy of a RAW shooter is to expose toward the highlights of a high-contrast scene, making sure that there's sufficient color texture in the bright parts of the shot. This can result in an image with dark midtones and blocked shadows. However, while blown highlights are hard to restore, blocked shadows can be lifted (pushed) later. Getting balanced results from scenes with a very high dynamic range can be done in almost any external RAW conversion software.

Here's what to do:

- Use the live view and live histogram to adjust the exposure in a way that ensures that the important highlights of your scene don't blow. This will preserve the highlights, but it may also lead to darkened midtones and blocked shadows that you have to deal with later during the RAW conversion of your shot.
- Enhance darkened shadows and midtones by selectively lifting their exposure in your RAW conversion software. For example, you could first lift the overall exposure and then restore the highlights with a highlight-recovery slider, or you could only lift the shadow tones with a shadow-tone slider. You can also combine both methods; many RAW converters are quite flexible and offer several sliders to selectively change the exposure. Lightroom and Adobe Camera RAW (ACR), for example, feature five different controls (exposure, whites, blacks, shadows, and highlights) to perform this task. Whenever you change an exposure slider, you are effectively changing the ISO

Fig. 29: On the other hand, there are instances where you may want to concentrate on the bright parts of a high-contrast scene. In such cases, a fixed DR100% setting is in order while you are exposing to the highlights (Provia, DR100%).

The two above examples illustrate that DR-Auto is not a "smart" setting; it cannot predict what the photographer has in mind. In both cases, DR-Auto would have picked DR200%—definitely not an optimal setting in either case.

Important: *The X-T2 tries to simulate the effect of manually set dynamic range expansion settings (DR200%, DR400%) in the live view and live histogram. However, automatic DR expansion via DR-Auto is* ***not*** *simulated in the live view. Instead, the live view and live histogram will show you a DR100% simulation, even when DR-Auto eventually decides to take the shot at DR200%.*

In the expanded ISO 100 setting, the live view and live histogram show the dynamic range of an ISO 200 shot, giving you the false impression of one stop more highlight dynamic range. Only when you half-press the shutter, the live view will change to display the actual dynamic range. However, in this stage, there's no live histogram available.

Fig. 30: **Comparing dynamic range settings:** The upper-left sample shows our scene taken with ISO 100 (aka DR50%). Highlight dynamic range is very poor; most bright parts of the image are blown.

The upper-right image shows the same scene taken with ISO 200 and DR100%. Even though there's one additional stop of highlight DR, many parts of the shot are still without structure.

On the lower left, you can see an ISO 400/DR200% version of the scene, which is giving us another stop of highlight dynamic range. In this example, the clouds and the sky are already looking much better.

The lower-right example is an ISO 800/DR400% version of our scene, which has two added stops of highlight dynamic range compared to a standard ISO 200/DR100% shot. Here, everything is smooth and shiny, with plenty of texture in the clouds and no discoloration of the sky.

Using the DR function for high-key and portrait photography TIP 58

High-key photography [40] delivers images with tones that mostly occupy the right half of the histogram. High-key images can be achieved by lighting a scene brightly

TIP 59 Creating **HDR images** with the X-T2

A popular method of capturing high-contrast scenes is HDR photography. HDR [41] means High Dynamic Range: multiple images of the scene are taken at different exposure levels and then merged into a single image with extended dynamic range. The latter can be facilitated with specialized software, such as HDR Efex Pro by NIK/Google or Photomatix Pro by HDRsoft.

Typically, HDR requires a minimum of two different exposures of a scene, but some photographers don't stop there. They take five, seven, or even nine different exposures, each separated from the other by (usually) one stop or EV (exposure value).

Here's a procedure that you can use to quickly generate nine different exposures of a scene:

- Put the X-T2 on a tripod or a similar device. If your lens features an OIS, make sure to turn it off.
- Connect a remote shutter release or set the self-timer to 2 seconds to avoid camera shake.
- Set the camera to aperture priority A.
- Choose a low ISO setting (such as 200). Don't use ISO 100, though!
- Deactivate any DR expansion by setting the dynamic range to DR100%.
- Select a suitable aperture for your shot and scene and use manual focus. This ensures that all nine images will be focused exactly the same. If you like, you can also use adapted manual focus lenses.
- Set the DRIVE dial to BKT and select AE BKT with a variation of ±1 in the SHOOTING SETTING > DRIVE SETTING > BKT SETTING menu to activate the camera's auto exposure bracketing.
- Select AVERAGE exposure metering.

Having prepared the camera for HDR, you can now follow these steps to capture the actual images:

- Set the exposure compensation dial to neutral (0) and press the shutter release. Make sure to either use a remote shutter release or the self-timer. The camera will now record the first three shots of the scene, with exposure levels of 0 EV, –1 EV, and +1 EV.
- Set the exposure compensation dial to –3 EV and press the shutter release. The camera is now recording three more images that deviate –4 EV, –3 EV, and –2 EV from the original exposure.
- Finally, set the exposure compensation dial to +3 EV. After releasing the shutter, you'll get three more exposures, this time with +2 EV, +3 EV, and +4 EV.

This procedure results in nine different exposures that you can merge using the HDR software of your choice that will result in an image with an additional dynamic range of ±4 EV.

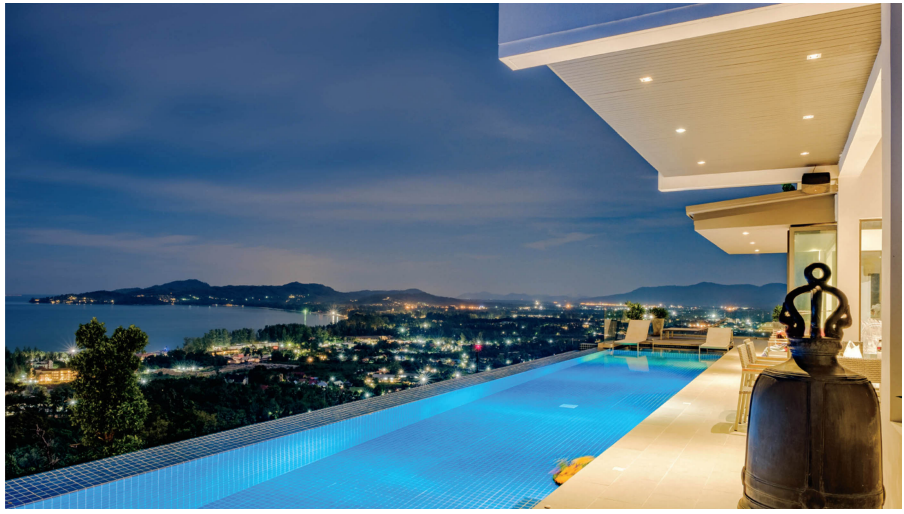

Fig. 34: This **HDR image** consists of two RAW shots that were taken with an exposure difference of 5 EV and merged in Adobe Lightroom.

everything within the DOF zone will look pixel-sharp even when the image is magnified to a 100% view. Please don't confuse manual zone focusing with Zone AF—they are completely different.

Here's a zone-focusing example: using an 18mm lens, manually set a distance of 15 feet and stop down to f/6.4. The DOF bars will show a depth-of-field zone that begins at around 12 feet and ends at around 30 feet. This means that everything located in this zone (between 12 and 30 feet) will appear equally in focus in the final image. All you have to do is make sure that your subject is within that zone when you press the shutter button.

A special case of manual zone focusing is setting the hyperfocal distance [46]. This is the distance setting with the maximum DOF (all the way to infinity). Again, the electronic DOF scale can be very helpful: all you have to do is manually set the distance where the blue DOF bar on the right touches the infinity mark. For example, using an 18mm lens at f/16, the hyperfocal distance is at about 16 feet, with the pixel-sharp DOF zone extending from nine feet to infinity.

Fig. 38: Setting the **hyperfocal distance** with the electronic distance and DOF scale: instead of focusing on a predetermined distance, manually change the focus distance until the blue DOF bar touches the infinity mark on the right end of the scale. This gives us the hyperfocal distance for a given aperture and focal length. This image shows the hyperfocal distance of a wide-angle lens at f/9 for both the PIXEL BASIS format (left) and FILM FORMAT BASIS format (right).

Please note that depth of field is very much dependent on the circle of confusion [13] (CoC). Fujifilm uses a very conservative CoC that guarantees pixel-sharp results even when the DOF zone is viewed at 100% magnification on a computer screen. Fuji is literally using the sensor's maximum resolution as a benchmark. In PIXEL BASIS mode, everything that's located within the electronic DOF zone will be rendered at least as sharp as the sensor can resolve it. In the age of pixel peeping, this is as good as it can get.

It's important to know that the engraved analog distance and DOF scales on the XF14mmF2.8, XF16mmF1.4, and XF23mmF1.4 lenses follow a different rule: the FILM FORMAT BASIS option. They are based on a less conservative circle of confusion that is several aperture stops more generous than the electronic PIXEL BASIS scale. You can change the electronic scale to FILM FORMAT BASIS (and hence use a less conservative scale with all your lenses) in the AF/MF SETTING > DEPTH-OF-FIELD SCALE menu.

Manual focus assistants: focus peaking and digital split image TIP 68

The X-T2 features two MF assistants:

- **Focus Peaking** (or Focus Peak Highlight) emphasizes the edges of objects when they are in focus. This method is especially useful in concert with longer focal lengths and bright lenses with a tiny DOF.
- **Digital Split Image** tries to simulate the split image indicator of analog SLRs. It works best with vertical lines (or horizontal lines when the camera is held in portrait orientation). It uses the sensor's PDAF-enabled area, which is why the digital split image is just as large as the area covered by the central PDAF frames.

To quickly switch between the two MF assistants, you can press and hold the rear command dial for about a second while you are in MF mode.

- If you want to take face detection exposure metering out of the equation, you can set the camera to manual exposure mode M. While metering will still be affected in this mode, the exposure itself will not. Alternatively, you can use the AE-L button to meter and lock the exposure and prohibit face detection from interfering with it as long as AE-L is active. You can still adjust your locked exposure with the exposure compensation dial.
- Face detection works with the full sensor area, and thus only employs CDAF. PDAF and its predictive capabilities aren't available. This means that AF-C tracking of moving objects doesn't work as well as it could. In other words, face detection isn't the best option to use when tracking an athlete or a child running toward the camera. It's better to use the camera's conventional AF-C mode with one of the central AF frames or an appropriate AF zone.
- Spot, center-weighted, and average metering aren't available when face detection is active. The camera is always using a derivate of multi metering.
- When face detection fails to detect a face in the scene, the camera will automatically fall back to the selected AF mode: Single Point, Zone, or Wide/Tracking. At the same time, exposure metering reverts back to regular multi metering.
- AF-Lock is not available when face detection is active.
- Face detection can be assigned to one of the X-T2's function (Fn) buttons. Personally, I tend to assign it to the lower selector button.

Fig. 40: **Face detection** is best for stationary scenes with one or more people looking at the camera. For people who are moving toward the camera, better use one of the central AF frames or an AF zone in concert with the X-T2's tracking autofocus (AF-C).

The X-T2 has improved face detection accuracy due to an added, optional eye-detection feature. Eye detection is only available in AF-S mode. To activate it, select either FACE ON/LEFT EYE PRIORITY or FACE ON/RIGHT EYE PRIORITY. You can also select FACE ON/EYE AUTO to make the camera focus on the eye that's closest to the camera, or select FACE ON/EYE OFF to deactivate eye detection during face detection.

In the viewfinder, the camera will highlight a detected eye with a small square and focus on it when you half-press the shutter button. In my experience, it doesn't hurt to leave this feature on all the time. I usually set it to EYE AUTO. However, don't forget that it's only available in AF-S mode.

Using **AF-Lock** TIP 74

In AF-S or AF-C mode, pressing the AF-Lock button locks the current distance setting. In SET UP > BUTTON/DIAL SETTING > AE/AF LOCK MODE, you can configure the button to

function as an on/off switch (which is always my choice) or to work only as long as it is being pressed.

When AF-Lock is active, the camera won't refocus when the shutter button is half or fully depressed. Instead, it will keep the focus at the previously locked distance. This is convenient when you want to take multiple shots of a non-moving subject in quick succession. With AF-Lock, you don't have to refocus every time to take another image. AF-Lock decouples autofocus and exposure metering: as long as AF-Lock is on, half-pressing the shutter button will only meter and lock the exposure, not the focus. Of course, this only applies if SHUTTER AF (in the SET UP > BUTTON/DIAL SETTING menu) is in its default ON position.

In a similar fashion, can use the AE-Lock button to meter and lock exposure; in this case, half-pressing the shutter button will only change the focusing. You can even combine both AE-L and AF-L. In this case, half-pressing the shutter will only set the working aperture and prime the camera. There won't be any new metering for focus or exposure.

TIP 75 Using **AF-ON** (back-button focusing)

AF-ON is a new option that brings back-button focusing to the X-T2. Back-button focusing is a common practice with DSLR users. Simply put, AF-ON puts the X-T2's autofocus function on a function button. Press it, and the camera starts focusing. Stop pressing it, and the focusing stops at the current position until you press the AF-ON button again.

This means that AF-ON performs the same function as half-pressing the shutter button (assuming that SHUTTER AF ON is set in the SET UP > BUTTON/DIAL SETTING menu). In AF-S mode, pressing AF-ON will perform a single focus search and lock the target. In AF-C mode, AF-ON will continuously focus on a target as long as the button is pressed.

Since the X-T2 has no dedicated AF-ON button, it has to be assigned to a Fn button. To keep things simple and

comfortable, it's best to replace the AF-L button with AF-ON. To do so, press and hold the DISP/BACK button until the Fn/AE-L/AF-L BUTTON SETTING page appears. Scroll down to AF-L, press the right selector button and select AF-ON from the list of available functions.

You can press and hold AF-ON while you simultaneously release the shutter. In AF-S, pressing and holding AF-ON is focusing the camera and locking it as long as AF-ON is held, so simultaneously half-pressing or pressing the shutter button won't interfere with your locked focus. In AF-C, pressing and holding AF-ON means that the camera keeps tracking your target as long as AF-ON is held.

If you are a "religious" back-button-AF user (some DLSR converts are), you may find it more comfortable to entirely disable the shutter button's AF functionality by selecting SET UP > BUTTON/DIAL SETTING > SHUTTER AF > OFF, meaning AF-ON will be the only available method to autofocus in AF-S or AF-C mode.

In manual focus (MF) mode, AF-ON turns into Instant AF (One-Touch-AF), just like the normal AF-L button.

Focusing in poor light TIP 76

Low light can quickly lead to poor contrast, making it difficult for the camera to find and lock the correct autofocus distance. However, the amount of light that reaches the sensor depends not only on the brightness of a scene, but also on the brightness of the lens. The XF56mmF1.2 is 3.5 stops or EVs (exposure values) brighter than the XF18–55mmF2.8–4 kit zoom in its 55mm position. In other words, with the XF56mmF1.2 lens, the world looks 3.5 stops brighter to the camera's autofocus system. You can guess which lens will perform better when the light gets difficult.

Don't be confused by appearances—it's true that the live view image in the viewfinder will look equally bright with both lenses, but that's only because the camera is electron-

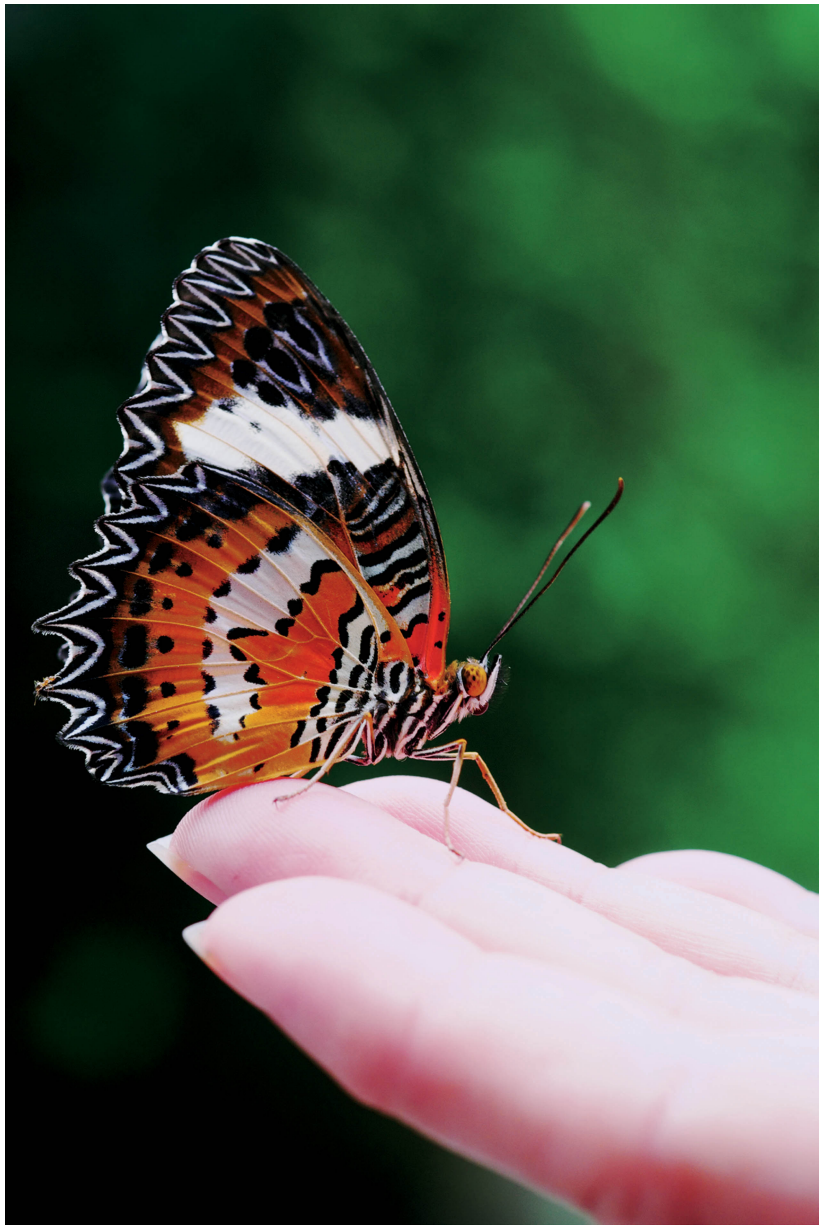

Fig. 41: **Macro shots** can be quite challenging due to their lack of DOF. That's why a tripod is highly recommended. With a little bit of luck, hand-held shots are possible, as well. This handheld snapshot was taken in 2012 with the classic X-Pro1 and an XF60mmF2.4 R.

You can add macro capability to many of your existing XF and XC lenses by using Fujifilm's electronic macro extension tubes: MCEX-11 or MCEX-16. This PDF file [49] will provide a chart that shows how these extension tubes enhance the magnification factor of each lens. Please note that the camera's electronic DOF/distance scale doesn't reflect the use of macro extension tubes.

Focusing on moving subjects (1): **the "autofocus trick"** TIP 78

Rule of thumb: Use AF-S (Single) for stationary subjects; use AF-C (Continuous) for subjects that move toward or away from the camera. But, as usual, there's no rule without an exception: meet the so-called "autofocus trick" or "shutter mash" technique:

- Set the focus selector switch to AF-S and the camera to single shot (S) using the DRIVE dial. Make sure that Boost mode is on. You might also want to use PRE-AF in this particular case. Last but not least, make sure to use the mechanical shutter.
- Use Single Point AF or Zone AF. Select an AF frame or zone position and size that cover the part of the moving subject you want to be in focus. If possible, use the inner AF frames, which, as you know, are PDAF-enabled. However, it's definitely possible to also use the outer frames that only operate with CDAF. If your composition requires them, go for it!
- Set a suitable exposure and make sure that the shutter speed is fast enough to avoid unwanted motion blur. Most action shots require shutter speeds of at least 1/1000s.
- Follow the moving subject in the viewfinder, making sure that the selected AF frame or AF zone always covers the part that needs to be in focus. Do *not* half-press the shutter button!

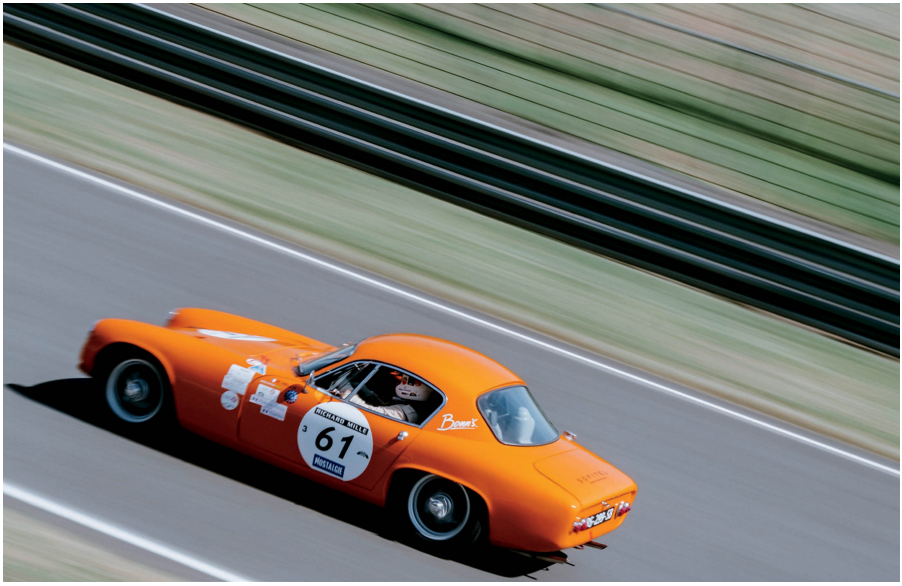

Fig. 44: **Panning** the camera in-synch with a racecar at 1/60s: the slow shutter speed resulted in f/18 and more than sufficient DOF using a focal length of 50mm.

TIP 80 Focusing on moving subjects (3): **Autofocus tracking using Single Point AF, Zone AF, or Wide/Tracking AF**

The predictive PDAF of your X-T2 uses the 49 or 169 (depending on your NUMBER OF FOCUS POINTS setting) central AF points. Predictive PDAF allows you to track moving subjects with your camera in three-dimensional space. Since the camera is able to calculate the movement of the object, it can automatically pre-focus on its future position and compensate for any inherent shutter lag.

The X-T2 also improves the predictive capabilities of the CDAF. This means that subject tracking is also available with AF frames that surround the central PDAF points, as long as the burst rate in continuous shooting mode doesn't exceed 5 frames per second. It's important to note that the hit rate of such predictions is never near 100%, but it's accurate enough to deliver good results in concert with the camera's burst mode settings.

Let's start with the **Single Point AF** and **Zone AF** modes:

- Set the focus mode selector switch to AF-C and make sure that Boost mode is on. Also make sure that the shutter type is set to the mechanical shutter (MS) in the shooting menu.
- Set the camera to burst mode (set the DRIVE dial to CL or CH). I recommend using the slower CL mode, since it displays a real-time live view image between shots and supports all AF frames.
- If you are using Single Point AF, select one of the central PDAF-enabled autofocus frames. If you use one of the outer AF frames, the camera will only use CDAF. In concert with one of the outer AF frames, you can only use the slower of the two burst modes (CL). You should still get pretty good results, though.
- If you are using Zone AF, select a zone that doesn't extend beyond the central 7×7 AF point matrix. If you use a zone that includes AF points beyond this PDAF-enabled area, the camera can only use CDAF, and only the slower of the two burst modes (CL) is available.
- Position the selected AF frame or AF zone to directly cover the subject or part of the subject that you want in focus. Half-press the shutter button, and the camera will start tracking the subject covered by the AF frame or AF zone.
- Keep the shutter button half-depressed as you follow the moving subject with the selected AF frame or AF zone.
- Fully depress the shutter when you want to start taking a series of exposures. The actual burst speed (frame rate) depends on how well the camera is able to track the subject. As the camera is taking pictures, keep the selected AF frame or AF Zone over the part of your image that is supposed to be in focus. This may be challenging at first, so practicing is important.

In the above configuration with burst mode and AF-C, the X-T2 is not adjusting the exposure between shots when SHUTTER AE is set to ON. White balance and dynamic range settings are also determined with the first shot and remain constant throughout the series.

If you want the camera to adjust exposure between shots in burst mode, select SET UP > BUTTON/DIAL SETTING > SHUTTER AE > OFF.

Fig. 45: **AF tracking** with AF-C and burst mode: The predictive autofocus was tracking one of the kids with the selected AF zone while they were running toward the camera. To make this kind of shot work, it's vital to follow the subject with the active AF frame or AF zone, making sure it's always covering the part of the subject that is supposed to be in focus.

In principle, AF-C tracking also works in single shot mode (DRIVE dial set to S, not to be confused with the AF mode selector). In this case, the camera takes a single frame when the shutter button is fully depressed, then ends the tracking.

By the way, it is perfectly normal for the hybrid AF to continuously hunt in the viewfinder during focus tracking

(in AF-C mode). Don't be irritated by the live view image changing between in focus and not in focus. It's all about the results.

As an alternative to Single Point and Zone AF, you can also use **Wide/Tracking AF** in concert with AF-C to track a moving subject. This mode enables real 3D tracking, meaning the camera isn't merely tracking a subject's changing distance to the camera (z-axis), but also its left/right (x-axis) und up/down (y-axis) movement within the image frame.

Here's how it works:

- Set the focus mode selector switch to AF-C and make sure that Boost mode is on. Also make sure that the shutter type is set to the mechanical shutter (MS) in the shooting menu.
- Set the camera to **Wide/Tracking AF** and select the slower of the two burst modes (set the DRIVE dial menu to CL). That way, 3D tracking will be available for the *entire* image frame, but it will only track objects using CDAF. If you set the DRIVE dial to CH, tracking will use PDAF, but will be limited to the smaller PDAF-enabled central area.
- Select one of the up to 91 available tracking AF points. The point you select will serve as a starting point for your tracking action, so position it in a way that suits your composition.
- To identify your target, make sure that the selected AF point covers the object you want to track and half-press the shutter button. As long as you keep the shutter button half-pressed, the camera will use pattern recognition to automatically follow the object as it moves around the frame (or as you move the camera around) with a cloud of small green AF frames.
- Fully depress the shutter button and keep it pressed to take pictures at the selected burst rate.

- Custom white balance that actually meters a white or neutral surface (like a white wall) under the current light conditions. This way, the camera can adjust the white balance to make the surface appear neutral.

Fig. 47: Two versions of the same shot, taken with different **white balance settings.** Illuminated by an iPad screen, the left image shows the somewhat cool Auto setting; the right image shows the warmer Sunny preset.

TIP 83 **Custom white balance:** a little effort can go a long way

This useful function is only available *before* you take a shot, because you are metering the white balance of the actual scene. Custom white balance allows you to calibrate the camera's white balance toward a specific object that you want to appear neutral in the final image.

Here we go:

- Select IMAGE QUALITY SETTING > WHITE BALANCE > CUSTOM(1–3) and press the RIGHT SELECTOR KEY (right arrow).
- Point the camera toward a surface that you want to use as a neutral reference, for example a white wall or a gray card [51]. Make sure that the surface is large enough to be fully covered by the white balance metering frame in

the viewfinder. Come closer to your subject or zoom in if you need to.

- Fully press the shutter button to meter and set the new custom white balance. The live view will change accordingly and simulate the adjusted color temperature. If you are happy with the result, confirm it by pressing the OK button.

You can use the same procedure with a firing flash unit. In this case, the custom white balance will meter the mix of flash-light and surrounding light that hits your neutral reference surface.

Don't worry! You are under no obligation to use the custom white balance later during RAW conversion. It's simply one of many options, and you can always adjust it later as you please. For example, you can use the built-in RAW converter with a manual KELVIN setting or one of seven white balance presets (FINE, SHADE, FLUORESCENT LIGHT 1–3, INCANDESCENT, and UNDERWATER). You can even use AUTO white balance anytime later because the camera will always save its automatic white balance metering for later use in the internal RAW converter.

Fig. 48: A **custom white balance** setting was used to take this shot. The wall behind the sofa served as a neutral reference.

Fig. 51: The distinctive look of CLASSIC CHROME has earned it much popularity in a very short time.

- PRO NEG. HI is derived from a negative film that was specifically made for portraits. It delivers accurate and pleasing skin tones with nice contrast, adding some punch to the image.
- PRO NEG. STD is the most neutral film simulation of the X-T2. Featuring flat contrast, subdued colors, and high dynamic range, it can look dull at first, but the JPEGs are usable for further post-processing. Fuji recommends this film simulation for studio portraits in a flash setup.

Fig. 52: **Antagonists:** PRO NEG. STD and VELVIA illustrate the spectrum of Fuji's different film simulation modes. On the left you can see the PRO NEG. STD version of a shot, and on the right its VELVIA cousin.

- MONOCHROME is Fuji's standard black-and-white conversion. Black-and-white photography depends on different gray levels being assigned to different colors. In order to increase the contrast, many photographers combine MONOCHROME with increased SHADOW TONE and HIGHLIGHT TONE settings. Additionally, noise reduction is decreased to reveal more detail and display more noise, which gives the appearance of film grain.
- MONOCHROME+Ye FILTER adds a digital yellow filter to the black-and-white conversion. This typically results in a slight increase of contrast because yellow parts of the color images will be represented by brighter gray tones.
- MONOCHROME+R FILTER adds a red filter to the black-and-white conversion. This means that skin tones will become brighter, which will camouflage reddish skin impurities. Conversely, blue skies will be darkened, adding contrast between clouds and the sky.
- MONOCHROME+G FILTER adds a green filter to the black-and-white conversion. This filter will add texture to skin tones and can potentially emphasize impurities.
- SEPIA results in a sepia-toned monochrome JPEG for an antique touch.

- Want to know what the Lens Modulation Optimizer (LMO) is actually doing? Take a RAW sample and process JPEGs with and without LMO in the internal RAW converter. Then, compare the results on a computer screen. Happy pixel peeping!
- Picked the wrong color space? No problem! Just reprocess the shot with the right color space.

To process RAW files in your X-T2 that aren't stored on an SD card, you have to copy them back to a card and place them in the appropriate directory. If you are using a freshly formatted card, make sure to take at least one shot in order to create the X-T2's directory structure.

The directory where you must place your RAW files is located in a folder called DCIM. It's named "xxx-FUJI," with "xxx" being a 3-digit number that reflects the overall number of shots you have already taken. An example would be 104-FUJI.

Please remember that file transfers to the camera aren't available via USB, so make sure to insert the SD card directly into your computer or use a card reader.

Fig. 60: The **built-in RAW converter** in action: The left image shows an overexposed sample shot that was recorded with the camera's default settings and DR400%. On the right, you can see the same shot processed with a PULL of –2 EV, maximized shadow contrast (SHADOW TONE +4), and VELVIA film simulation.

By the way, your X-T2 cannot process RAW files from other camera models, including other X-series models. However, you can process RAW files from other X-T2 cameras. In this case, your camera will display a parcel symbol indicating that the RAW file was created with a different X-T2.

Comparing RAW converters TIP 94

So far, we have talked a lot about the X-T2's built-in RAW converter. It's the perfect tool to create JPEGs. It's a JPEG shooter's paradise! It's also super-easy, because the built-in RAW converter utilizes the same functions and parameters available in the shooting menu. That's no surprise, because the built-in RAW converter *is* the JPEG engine of the camera! If you are a JPEG shooter, ignoring the internal converter that turns RAW files to in-camera JPEGs means overlooking the aspects of the camera that make the X-T2 so special. That's why even diehard JPEG fans should shoot with FINE+RAW. You need the RAW files to feed the engine that generates JPEGs with the colors, tonality, and overall look that you like from your Fuji camera.

What about the other half—diehard RAW shooters who don't care much about JPEGs, Fuji colors, or in-camera conversion? Those guys (I tend to be one of them from time to time) require an external RAW converter to process the RAW files on a computer. The results are often saved as uncompressed 16-bit TIFF files of more than 100MB each. Such files can be further processed in Photoshop and similar applications.

In this tip, I'll compare how certain popular external RAW processors handle specific features of the X-T2:

- **RAW File Converter EX** came free with your camera (have a look at the CD). This software is based on an older version of the Japanese Silkypix [58] RAW processor that is currently available in version 7. If you want to use all the features of this software, you should definitely upgrade

Fig. 63: MINIATURE is a popular filter that turns cityscapes into tiny model towns.

TIP 96 Using **burst mode**

In burst or Continuous mode, the camera takes a quick sequence of shots while you press and hold the shutter button. The X-T2 offers two basic speed settings: CL (3 fps, 4 fps, or 5 fps) and CH (8 fps, 11 fps with the optional Vertical Power Booster Grip, or even up to 14 fps with the electronic shutter). In principle, both speed settings work in the same way:

- White balance, autofocus, DR settings, and exposure (aperture, shutter speed, ISO) are determined for the first frame of the series and then carried over to all consecutive shots. This means that all shots of the series have the same white balance, autofocus, DR settings, and exposure.

- As usual, there's one exception: using AF-C in concert with burst shooting, the camera will refocus (track) before each frame. If SHUTTER AE is set to OFF, it will also adjust the exposure of each shot. However, white balance and DR settings are still carried over from the first frame of the series.

Shooting **motion panoramas** TIP 97

MOTION PANORAMA is a derivate of burst mode: while you pan the camera in a horizontal or vertical motion, the X-T2 takes a series of images and stitches them together in a panoramic JPEG file. You can choose between two sizes (M and L), and you can specify the direction of your panning motion (left, right, up, and down).

You can use a vertical motion horizontally by holding the camera upright. This results in a maximum image size of 9600×2160 pixels for a size L motion panorama.

Here are a few tips for getting the best results with motion panoramas:

- Since MOTION PANORAMA results in only a JPEG file (no RAW), JPEG parameters such as white balance and film simulation have to be set *before* taking the shots.
- White balance and focusing remain constant during the recording of a motion panorama. This applies to all focus modes (AF-S, AF-C, and MF). That's why it's important to set a focus distance and depth of field that work for the entire panoramic scene.
- Panoramas tend to extend over a wide area with varying light conditions and strong changes in contrast. In such cases, it's smart to shoot with an extended DR setting, such as DR200% or DR400%. In addition to that, the exposure should be set in a way that suits the entire panoramic image, not just a small part of it. The edges of a panorama are rarely representative; it's usually better

to base your exposure on the main part of the image in the middle. Motion panorama works with all four exposure modes, so shooting it in manual mode M may be the smartest option. Please note that motion panorama only works with multi metering.

- If you decide to *not* manually set exposure, white balance, and focus, point the camera towards a representative part of the panoramic scene, then lock focus, exposure, white balance, and DR by half-pressing the shutter button. Then pan to the point where you'd like to start the panning action (while holding the shutter button half-depressed), press the shutter button fully, and start panning. Don't forget that SHUTTER AE must be set to ON to lock the exposure of the panorama by half-pressing the shutter.
- Avoid scenes that contain a lot of motion. Moving objects (people, vehicles, etc.) can lead to ghosting artifacts, which is when moving objects (partially) appear in more than one spot of the final panorama.
- Keep a healthy distance to the panoramic scene. Don't shoot panoramas in close quarters. Also make sure that you have sufficient depth of field. Wide-angle lenses are better suited for this job than normal or telephoto lenses.
- Always pan with the EVF (camera held to your eye), not with the LCD display (arms stretched in front of you).
- While panning, stand parallel to the panoramic scene and always stand on level ground.
- Try to ignore the time delay that may occur between the currently recorded image and what's displayed in the EVF. Keep panning the camera in a smooth motion until the camera stops taking frames.
- Banding in the final JPEG can indicate that the shutter speed was too fast. In this case, try again with a slower shutter speed.

- Use a tripod and make sure the camera is leveled to the horizon.
- Immediately check your finished panorama in the camera's viewfinder after you have captured it. Look out for stitching errors and ghosting artifacts. Do this while you are still on location, not at home when it's too late to reshoot a panorama that went wrong.

Fig. 64: A medium-sized (6400×2160) **motion panorama** using the Velvia film simulation: The camera automatically takes as many frames as it needs to stitch the panoramic JPEG image.

Shooting video with the X-T2 TIP 98

After setting the DRIVE dial to MOVIE mode, pressing the shutter button will commence video recording in HD or 4K quality. In the MOVIE SETTING menu, you can choose between several resolutions and frame rates, set an autofocus mode (AREA or MULTI), or select a target medium for your output. Since video is still a work in progress and a new priority for Fujifilm, you can expect future firmware updates with improvements and new features down the road. On my website, Fuji X Secrets [64], I will publish updates covering significant X-T2 firmware releases, so please visit this site regularly if you do not want to miss important updates to this book.

The following notes are based on X-T2 firmware 1.10, which was released in November 2016:

- MOVIE mode is available in concert with all four **exposure modes** (P, A, S, M), so you can change both aperture and shutter speed *before* and *during* recording. However, you can't change the exposure mode during a recording. There's also full manual ISO control between ISO 200 and ISO 12800 *before* you start recording. Auto-ISO is supported, too. In this case, the camera will automatically select ISO settings between 200 and 12800 (actually, it may even be a little bit higher than 12800). Your Auto-ISO configuration for still photography (default sensitivity, max. sensitivity, min. shutter speed) is ignored in video mode. Please note that the shutter speed can never be slower than the selected frame rate. For example, at 60fps, the shutter speed has to be 1/60s or faster.

- The only **exposure metering** mode available in video mode is multi metering. In modes P, A, and S, the camera automatically adjusts the exposure during video recording. However, you can bias the exposure with the camera's exposure compensation dial before and during recording within a range of ±2 EV.

- **Focusing** is possible with all three modes: AF-S, AF-C, and MF. You can also switch modes during filming. AF-S sets the focus before recording starts, so there's no AF tracking during video recording. AF-C continuously adjusts the focus during video recording. If MOVIE SETTING > MOVIE AF MODE > AREA is selected, you can move the focus frame during recording with the focus stick. In MF mode, you can adjust the focus with the focus ring before or during video recording. One-Touch-AF (Instant AF) is available, but only before you start recording. Focus peaking is also available in MF mode, but you can't zoom into the image during recording. In AF-C mode, you can use the X-T2's AF-C Custom Settings to fine-tune AF-C tracking behav-

ior for the task at hand. For example, Tracking Sensitivity defines how quickly the AF-C changes its focus towards a new target that has a significantly different distance to the camera than the previous one. Pick a low value (like 0 or 1) if you want the camera to make quick focus changes to a new target. Pick a high value (like 3 or 4) if you want the autofocus to longer stay on the previous target when it moves out of the focus frame.

- **Face detection** is also currently only available for HD, not 4K movie modes. Face detection operates like AF-C, so it's continuously adjusting focus and exposure with respect to the detected face closest to the center of the scene. Eye detection is not supported.
- Sadly, there is no support for the **DR function** in video mode. There also are no "zebras" or "blinkies" to mark overexposed areas. You have to trust the live view (there is no live histogram during video recording) and adjust the exposure as necessary.
- With automatic **white balance** (AUTO), the X-T2 is continuously adjusting the white balance during video recording. You can also use one of the white balance presets or a Kelvin setting. Custom white balance is available, too.
- You can adjust the look of your videos by selecting one of the camera's 15 **film simulations**. Contrast settings (HIGHLIGHT TONE, SHADOW TONE), color and sharpness are also adjustable for video recordings.
- In 4K video mode, the X-T2 exhibits a **crop factor** of 1.17x.
- Internally on an SD card, the X-T2 is recording video in the 4:2:0 format. However, you can record 4K video to an external HDMI device in the 4:2:2 format with even better quality. **External recording** also offers an "F-Log" option, which is Fujifilm's version of a flat video profile for maximum dynamic range. F-Log videos require

Fig. 66: With plenty of surrounding light, the flash-light component takes a backseat. In this example it simply added a spark to the cat's eyes. The best flash shots are often those that aren't easy to identify as flash photography.

TIP 102 Controlling the flash-light component

If the flash-light component of your image turns out too bright or dark, you can bias the camera's TTL flash system:

- To bias the flash-light component of your shot, you can adjust the flash exposure compensation in the camera on the FLASH SETTING > FLASH FUNCTION SETTING page or on many external TTL flash units. Combining the in-camera flash compensation with an additional compensation setting on the flash unit itself will simply add up both corrections (the new EF-X500 is an exception to this rule).
- You will often get nicer-looking results by bouncing the flash off the ceiling, which makes the flash light look softer. Of course, bouncing the flash light requires much

more power, so you may need a stronger flash. It's also worth noting that bouncing the flash from a colored surface will tint the light accordingly.

- To add a tint or change the color temperature of your flash light, you can attach colored gel filters in front of your reflector. The color temperature of unfiltered flash light usually corresponds to regular daylight.
- The range of your flash unit depends on the set aperture, the ISO setting, and (of course) the power setting. In TTL mode, the camera is automatically adjusting the light output of your flash, but many flash units can also be set to manual. This way, you are the one setting the power output of the flash. In manual mode M, changing the shutter speed doesn't affect the brightness of the flash-light component of your shot. Hence, changing the shutter speed is a quick way to adjust the exposure of the surrounding-light component without messing with your carefully balanced manual flash-light setup.
- Don't forget that large lenses and lens hoods can block parts of the flash, resulting in unpleasant shadows. It's better to remove the lens hood or to use off-camera flash.
- Some wide-angle lenses cover a larger angle of view than the reflector of your flash. This results in unpleasant vignetting. In such cases, bouncing the flash light off the ceiling can be helpful. Alternatively, you can attach a diffusor to the flash reflector. Many flash units feature built-in diffusors—just don't forget to flip it on.

Rear curtain flash synchronization: what's the deal? TIP 103

Flash photographs are double exposures consisting of surrounding light and flash light. When you shoot the surrounding light with a slow shutter speed, there is the question of when the flash (with its much faster speed) should fire. Normally, the flash is fired along with the shutter opening its FRONT curtain at the *beginning* of an

exposure. However, selecting the REAR curtain makes the flash fire at the *end* of the exposure when the rear shutter curtain closes.

Naturally, moving objects change their position during the exposure of a shot. Synchronizing the flash with the rear curtain ensures that moving objects are frozen where they are at the end of the exposure as opposed to the beginning. This often results in the moving object appearing more natural in the image.

Fig. 67: **Front vs. rear curtain sync:** This examples shows the same scene photographed with front curtain sync (above) and rear curtain sync (below). The shot above shows how the flash freezes the moving vehicle at the beginning of the exposure while the shot below shows it being frozen at the end of the exposure. The rear-curtain version looks more natural and avoids the false impression of the car moving backward. This is also a good example to examine in terms of the nature of flash photographs as double exposures. You can see how the slow shutter speed captures the moving vehicle as a blurry trail of light, while the fast flash instantly freezes parts of it.

Flash synchronization: where's the limit? TIP 104

Officially, the fastest flash sync [67] speed of the X-T2 is 1/250s.

- In exposure modes P and A, the camera will never offer a shutter speed faster than 1/250s. If this is too slow for the current light conditions, the surrounding-light component will be overexposed. In this case, the shutter speed of 1/250s will be displayed in red. To avoid overexposure, stop down the lens, reduce ISO (but never below 200), or use a neutral density (ND) [36] filter in front of the lens.
- In exposure modes S and M, you are able to select shutter speeds faster than 1/250s. The X-T2 will honor these settings in flash mode, but there will be a price to pay: the resulting images will display some partial shadowing of the flash. It's often possible to use shutter speeds that are a little bit faster than 1/250s without visible negative effects—it depends on the type of flash you are using. Its power setting plays a role, as well. Proceed at your own risk!

Fig. 68: Many photographers wish to use a **flash sync speed** faster than 1/250s with their X-T2. That said, it's also possible to deliberately use very slow synch speeds to create a blurry background behind a more contoured flash-lit foreground.

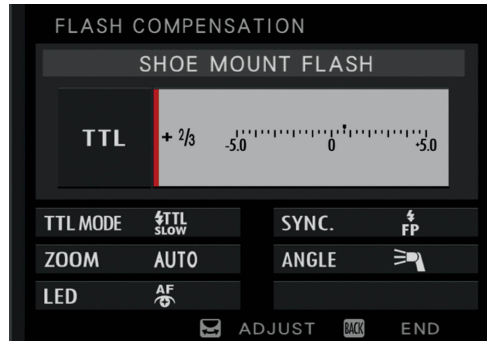

Fig. 72: With the fully featured **EF-X500** attached, the FLASH FUNCTION SETTING page adds several new items, including high-speed sync (FP), zoom settings, a reflector angle control, and control of the secondary LED, which can be used as an AF assist lamp and/or a catchlight.

You can use the EF-X500 as a single flashgun or as a master/slave in setups with multiple wireless flash units. Communication between master and slave units is light based.

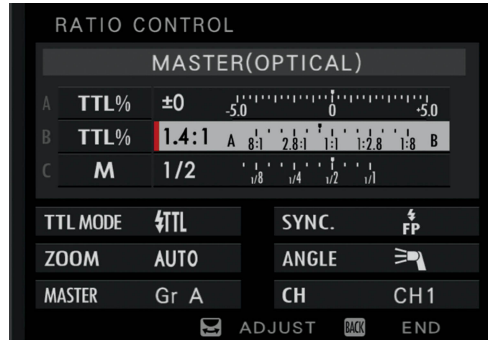

Fig. 73: In **TTL master mode,** one EF-X500 can control multiple flashguns in three independent groups (A, B, C) via a light communication protocol. Each group can be controlled via direct TTL, a ratio of another TTL group, or fully manually.

Many potential customers consider the EF-X500 disappointing, mostly because of the following reasons:

- The EF-X500 was announced in January, 2016, yet ten months and several delays later, the flash still wasn't available.
- The flash is quite large, heavy and expensive.
- Wireless TTL control is realized with outdated light communication instead of state-of-the-art radio transmission.
- Users have to buy and attach a heavy and expensive EF-X500 as a master controller to their camera.

There's hope that independent manufacturers will offer Fuji-compatible flash solutions with wireless radio TTL, multi-group support, and FP high-speed-sync in early 2017.

Generic third-party flash units TIP 109

Basically, you can use any modern flashgun from any vendor with your X-T2, as long as you are prepared to manually set its power. You can connect third-party flash units directly to the camera's hot shoe, or use a cable or a wireless (radio) triggering device.

The camera's TTL modes aren't available when you are using third-party flashes because the camera isn't *metering* the flash light, it's only *triggering* the flash. Again, the maximum sync shutter speed is 1/250s. Unofficially, faster sync speeds may sometimes be possible.

Fig. 74: Manually controlled **studio flash shot** using an Elinchrom Ranger Quadra.

Important: *Attaching Canon-compatible TTL flash equipment to the hot-shoe of the X-T2 could result in the camera overheating and performing an emergency shutdown. While Fujifilm and Canon share the same the physical hot-shoe contacts, the protocols are not compatible. In this case, either tape-off the TTL contacts of your device or use an adapter that only loops the sync signal from the camera to the flash.*

2.8 USING ADAPTED LENSES

Thanks to its short flange-back distance, the X-mount system is able to host almost every existing full-frame, medium format, cinema (Super 35 and larger), or APS-C lens. All you need is an appropriate adapter ring. This means that in addition to more than two dozen native lenses, you have access to hundreds of additional modern and legacy lenses.

Finding the right **lens adapter** TIP 110

X-mount lens adapters are available for many old and current mounts. Here are a few tips to help you find the right adapter for your third-party lens:

- Adapters are available at many price and quality levels, and you get what you pay for. Don't buy too cheap or you may end up buying twice. The German manufacturer Novoflex is setting the benchmark here, but their adapters can be more expensive than the lens you are adapting. Asian manufacturers like Kipon or Metabones enjoy a good reputation, and they all offer adapters for a wide variety of lens mounts.
- Adapted lenses can only be used as manual focus lenses. There is currently no electronic adapter that can translate between Fuji's AF protocol and the AF protocols of popular brands like Canon or Nikon.
- All adapted lenses use manual aperture settings and always operate with a manually set working aperture. This means that when you are stopping down the lens, the live view and live histogram of your X-T2 have to contend with the set aperture's reduced amount of light. It also means that adapted lenses can only be used in exposure modes A or M.
- Many modern third-party lenses that don't feature a manual aperture ring can still be mechanically adapted to your X-T2, but you can't change their aperture while they are connected to your camera via an adapter. That's why some adapters feature a mechanical replacement aperture, but the results produced by these devices will differ from the results created by the original lens.
- Modern electronic features like optical image stabilization (OIS) aren't supported since there is no communication between the X-T2 and the adapted lens. In fact, the camera believes that there's no lens attached at all.

Fig. 76: Good legacy lenses don't have to be expensive: this shot was taken with a Russian **Helios 44M-4,** a 58mmF2 lens with an M42 screw-mount. You can often find this lens online for less than 25 dollars.

TIP 116 **Speed Booster:** miracle or trick?

Speed Booster and Speed Booster Ultra from Metabones are very special adapters. They convert the focal lengths of full-frame lenses to their APS-C equivalents. This means that the adapted lens covers the same angle of view on your X-T2 as it would on a full-frame camera.

Take my *Carl Zeiss Sonnar T* 2.8/180 MM* as an example. It's a classic telephoto lens with a Contax/Yashica full-frame mount. Adapting this lens to my X-T2 *without* Speed Booster causes the results to look like images taken with a 270mmF4.2 lens on a full-frame camera. That's because there is a crop factor of 1.5 between full-frame and APS-C.

Of course, many users of full-frame lenses would like to use them on a smaller APS-C camera like the X-T2, yet keep the angle of view and depth of field constant. Speed Booster can do that for you because it reduces the focal length of the adapted lens by a factor of 0.71. With Speed Booster, my 2.8/180mm full-frame Sonnar turns into a 2/128mm APS-C lens.

Is there a price to pay? Well, yes, since Speed Booster isn't cheap. With regards to image quality, the MTF [75] of the new lens is actually improved, but there's a chance of vignetting when Speed Booster is used to adapt fast lenses. That said, the new Speed Booster Ultra improves vignetting issues that were problematic with the original Speed Booster. In any case, it's better than knock-off products such as Lens Turbo II.

Speed Booster increases the speed (or maximum aperture) of a lens by about one stop, so you can use faster shutter speeds or lower ISO settings. For example, let's assume you need ISO 800 to shoot a scene with your full-frame DSLR at f/2.8 (wide open) with a 180mm lens and 1/1000s. On the X-T2, Speed Booster turns this lens into a 128mmF2 lens with the same angle of view. Shooting wide open (now f/2) at 1/1000s, you can drop the ISO to 400. Since full-frame sensors tend to offer an ISO advantage of about one stop over APS-C, the results from both cameras should be equivalent, because the X-T2 sensor can compensate its smaller size by applying 1 EV less ISO amplification.

Speed Booster is available for several classic mounts, such as Canon FD, Nikon G, Contax/Yashica (Zeiss), Minolta MD, Contarex, ALPA, and Leica R. Sadly, there is no Speed Booster for Leica M, because an M adapter would be too thin to house the necessary optics.

Fig. 77: Metabones **Speed Booster** with Contax mount

2.9 WIRELESS REMOTE CONTROL AND TETHERING

Fuji's own Camera Remote app works with wireless iOS and Android devices, and it allows you to remotely control your camera by providing a live view image and a touch-screen interface to set the focus point, change exposure parameters, and take a shot.

TIP 117 Using the Camera Remote App

Camera Remote allows you to control the X-T2 from an Android or iOS device running Fuji's Cam Remote app. The wireless connection is based on the camera's or smartphone's Wi-fi capabilities.

In order to use Camera Remote, you have to download and install the free Cam Remote app on your smartphone or tablet. You can find download links, instructions, and additional information at this website [76].

Important: *Make sure you use the* ***Cam Remote App*** *and not the older* ***Camera App****.*

Here's how Camera Remote works with iOS devices (it shouldn't be much different for Android users):

- Select SHOOTING SETTING > WIRELESS COMMUNICATION on your camera. The X-T2 now enters wireless mode and emits a Wi-fi signal.
- Hook up your smartphone's or tablet's Wi-fi with the camera's Wi-fi network. Each camera comes with a unique network name that you can customize in SET UP > CONNECTION SETTING > WIRELESS SETTINGS > GENERAL SETTINGS > NAME.

- Open the Cam Remote app and select Remote Control. The mobile device will now assume control over the camera and display a live view image along with options to adjust shutter speed, aperture or exposure compensation. There's also a virtual shutter button and a small shooting menu that allows you to adjust parameters like ISO, film simulation, white balance, macro, flash mode, or self-timer.
- In order to autofocus on a specific part of the live view image, double-tap with your finger on it. Focus will be confirmed with a green rectangle, and the camera will issue a confirmation beep. If no focus lock can be established, the rectangle will appear in red.
- Adjust your exposure parameters as required. The brightness of the live view will change accordingly. Please note that there's no live histogram.

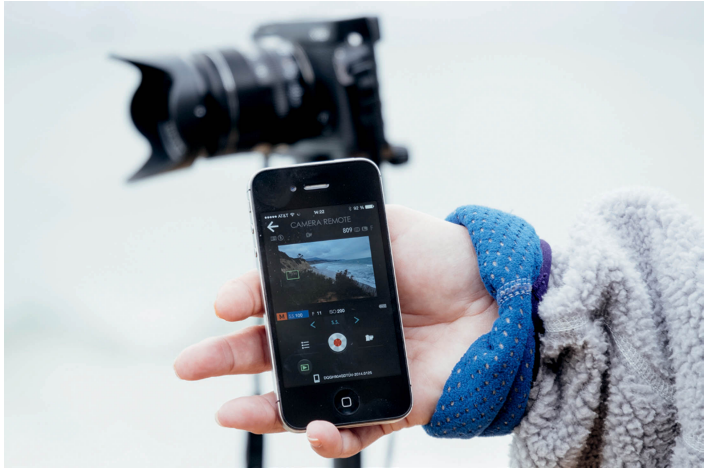

Fig. 78: **Camera Remote** offers a simple interface to control your camera with a smartphone or tablet. To autofocus, double-tap on a specific part of the WYSIWYG live view and wait for the green confirmation rectangle to appear. Sadly, there is no live histogram, and you can't magnify the live view. There is a rudimentary shooting menu, a virtual shutter button, and a playback button that allows you to review images and transfer JPEGs to your mobile device.

the older version 1.2 of HS-V5 with an X-T1, get the free update to version 1.3.

- The **Tether Shooting Plug-in PRO for Adobe Lightroom** is a new macOS and Windows plug-in for Lightroom users. It's a $79 download from Adobe [83]. The Pro version of this plug-in supports a live view image on your computer and offers controls for most camera functions. There's also a basic version of the plug-in, and owners of an older Lightroom tether plug-in for the X-T1 (plug-in version 1.2) can get a free update to the basic plug-in version 1.3 (which supports the X-T2). However, to get access to controls that go beyond releasing the shutter, you will have to get the new Pro plug-in. The good news is that the Pro plug-in also supports the X-T1, so you don't have to purchase or use different plug-ins if you are using both models.

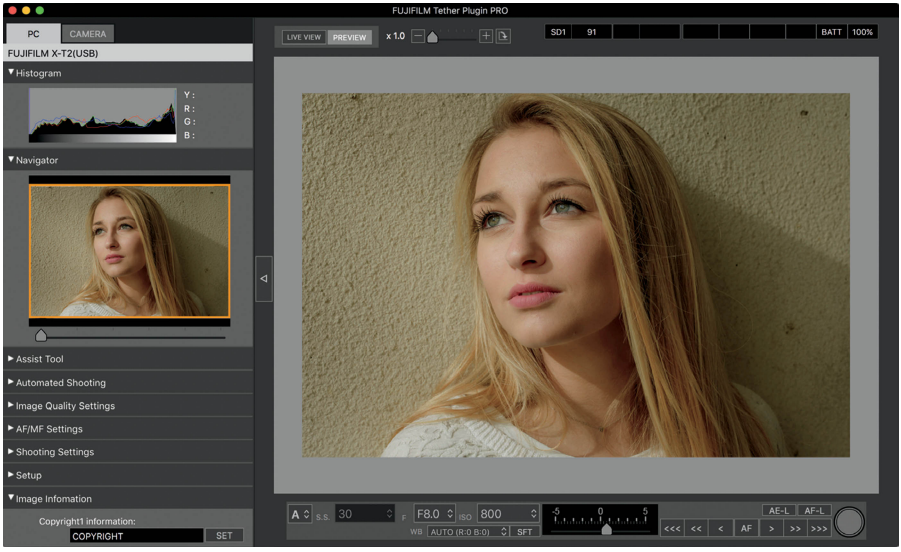

Fig. 80: The new **Tether Shooting Plug-in PRO for Adobe Lightroom** supports the X-T1 and X-T2 and offers a live view image and comprehensive control over the camera. New features include color histograms, focus stacking, expanded bracketing, and the possibility to enter copyright information. You can also save and load full camera configurations.

2.10 ANYTHING ELSE?

Hopefully, this book was able to answer many of your questions that went beyond the manual of your camera. However, this isn't the end: you can read my *X-Pert Corner* blog, participate in Fuji X forums, or join one of my Fuji X Secrets workshops.

Forums, blogs, and workshops: be a part of it! TIP 120

- High-resolution versions of selected images in this book are available in this Flickr album [84].
- At Fuji X Secrets [64], you will find articles and updates for this book that cover new firmware features. You might also be interested in reading my X-T2 first look review [85], as it contains additional information and examples explaining the X-T2's capabilities.
- My free X-Pert Corner blog covers a variety of topics about the Fujifilm X series. You will find everything from service articles that go beyond this book to First Look previews of new cameras and lenses. You can read X-Pert Corner here [86].
- There are several online forums that focus on Fujifilm's X series: The Original Fuji X Forum [87]; The Ultimate Fuji X Forum [88]; the Fuji X-Series Forum[89]; and FujiXSpot [90]. The latter forum contains a special section where I'm personally available to answer questions or discuss Fuji X-related issues. Please use this forum to contact me with questions or comments.
- Books, blogs, and forums are great, but what about a more personal touch? My site Fuji X Secrets [64] offers a series of advanced workshops for Fuji X-series users. My workshops cover topics that are similar to those in this

book, but on a more in-depth and comprehensive level, including practical demonstrations and plenty of sample images. We work in small groups, and our delegates set the agenda. It's everything you always wanted to know about X, but were afraid to ask. We are also organizing travel workshops to great photo locations: In 2015, we went to Istanbul, and in November 2016, we hosted an exclusive week-long Fuji X Secrets Ultimate workshop in Phuket, Thailand. In late May 2017, we are going to Guernsey (Channel Islands), and for November 2017, we plan an exclusive Fuji X Secrets travel workshop in New Zealand.

ONLINE REFERENCES

Websites are not run by Rocky Nook, and are subject to change without our knowledge.

If necessary, we will update these references. For an updated version of this reference list, please download the available document at:
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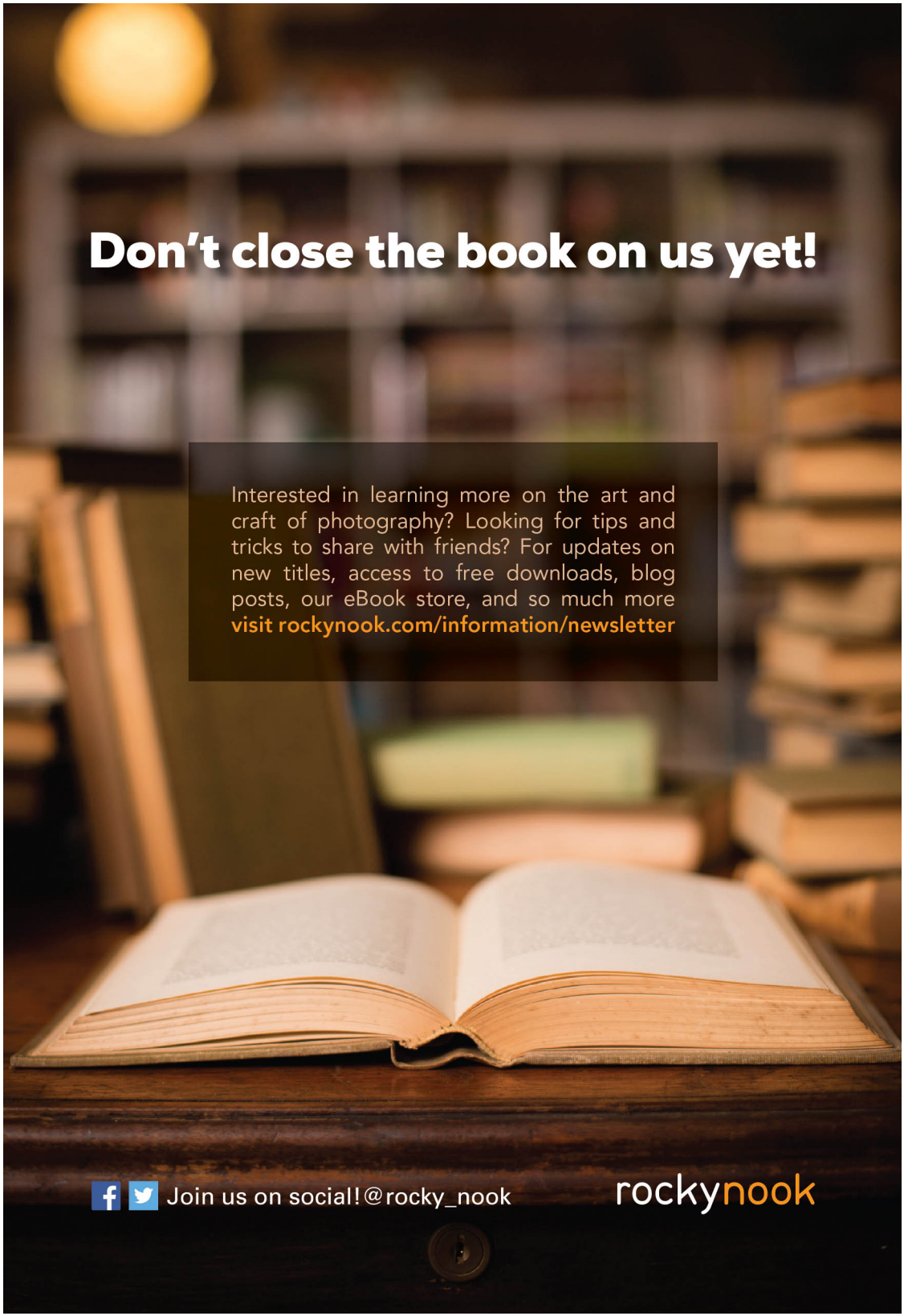
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