

Be Prepared!

How to do
Night Photography Preparation

By Jürgen M Lobert

This eBook is for people starting out with night photography or those who want to brush up on the basics. It outlines how to prepare for a successful night shoot by getting the necessary equipment and changing camera settings that are important and different from daytime photography.



Personal Preparation

It is difficult for us to see in the dark. Fiddling in the dark or with a flashlight, trying to find ISO, aperture, white balance settings is frustrating and wasting time that could be spent taking photos. Night photography, especially with artificial lights, needs frequent changes of the basic settings, because the brightness and dynamic range of the scenery changes often. And all of that in darkness.

The photographer is strongly encouraged to practice the below settings and specifically to change them in darkness, so that the use of flashlights is unnecessary or much reduced. This can be done at home on the living room couch: turn the lights off, but leave them on in adjacent rooms, then take photos pointing the camera into bright rooms, then out the dark window. Do this often and change settings using different trade-offs between exposure time, aperture and ISO. Adjust white balance so the image looks like what you see with your eyes.

The goal is to learn using your camera blindly, in the dark, without having to go through menus or figuring out where which button or dial is to change the settings. This is particularly true for workshops where any time searching for settings will take away time the instructor can spend with you on composition, right settings etc.

Equipment Needs

Camera

- A camera with the ability for manual exposure (aperture, ISO, exposure time, white balance). Just about any DSLR, mirrorless, SLR camera will work for this.
- Remove the strap or tie it down to prevent movement by wind (which can blur long exposure images).
- Don't forget to charge your battery before the photo shoot.



Tripod

- Use a [sturdy tripod](#); with individual leg adjustments. Ball-heads are more flexible than 3-way heads, and **much** easier to use in darkness.
- Use Velcro strips to hold the timer / intervalometer and camera strap etc. to prevent them from moving in the wind.

Lenses

- Most common range is below 100 mm full frame (70 mm crop sensor). Wide angles are often used. You will rarely zoom in further, as lens motion is amplified. A combination of 14-24 and 24-70mm (full frame, 11-20 and 12-50 cropped sensor) is most useful to get started. Wide apertures (f/2.8 or less) are only needed for astro-landscape photography (shooting the Milky Way etc.)
- Remove any filters, they create reflections and flares.
- Bring your lens hoods! They avoid flares from bright street lights.

Intervalometer or Timer

- Many night exposures are longer than 30 seconds, but many cameras (and internal intervalometers) are still limited to 30 s exposure time.
- Intervalometers are more powerful than remote on/off control. They are a must-have for star trails, where the camera takes back-to-back photos with only 1 s interval.
- The layout on the right is recommended. Don't use detachable cables (the device can fall off unseen) or overly complicated layouts. Use off-brands, they are 1/10th of the expense compared to camera brand devices. [Here is one for Nikon cameras](#), search the one for your brand/model.
- If your camera provides long exposures up to at least a few minutes, you are all set. These cameras often have a TIME mode (e.g. Nikon, to be found after the BULB mode or in the menu), which allows you to press the shutter button to start the exposure, then press it again to stop it, while you time the shot with your phone or watch. Other cameras have a built-in BULB timer (e.g. Canon), which is in the menu and times need to be set in that menu as well. More modern cameras (Nikon, Fuji) provide long exposures up to 15 minutes (Nikon) or an hour (Fuji) with the regular exposure time setting.



Flashlights

- Get a [DIM, red light](#) (pen light or key chain light) for camera or lens adjustments, these won't blind you and don't show up in other people's shots.
- Bring a [\(multi-level\) brightness](#) or [colored](#) flashlights for light painting.
- Be considerate of others when using flashlights! Minimize use, do not blind yourself.
- Head lamps are **strongly** discouraged. They create a very flat field of view when walking and it is only a matter of time until you blind somebody with it.

Other stuff

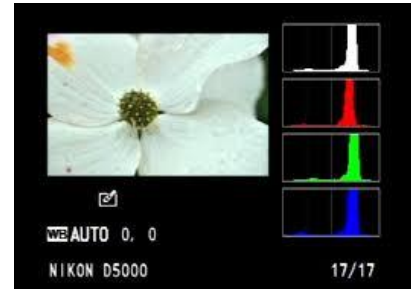
- A practical bag to carry your equipment. [Backpacks](#) are most useful, as they are out of the way. Don't leave your bag on the ground and walk away. Put them under the tripod, if needed.



- Hiking boots, water, snacks, suitable clothing (it's cooler at night and you are standing around without moving),
- A [microfiber cloth](#) to clean your lens, 1-2 spare (charged!) batteries. Camera batteries drain much faster with long exposures.

Camera Settings

- Set your camera to shoot RAW image format (or RAW+JPG). It has much more latitude in recovering highlights and shadows and gives you the best image quality
- Turn autofocus off, the camera can't focus well in the dark
- Learn to use LiveView and zooming in with +/- controls for focusing.
- Turn auto-ISO off, we want to control the ISO setting.
- Turn motion compensation (VR/VC/OS/IBIS...) off, it blurs images when on a tripod
- Turn off LENR = Long Exposure Noise Reduction (default: ON), it is a long delay after each photo, which you don't need when shooting at low ISO.
- For shutter speed / exposure time, use your camera times up to 30 seconds, then use the intervalometer and the camera in BULB mode. Stick to full minutes to keep adjustments easy.
- White balance: set it to "K" (Kelvin temperature): 5500 is daylight, twilight is 6000-10000. At night, white balance temperature drops quickly to 3450. Use cloudy (civil), shade (nautical) and incandescent (city) if you don't have the K setting.
- Set your LCD screen brightness to -3 (darker), it is too bright at night and makes you think the photo is well exposed when it is underexposed.
- Image review: turn on highlight clipping indicator and RGB (not just the white) histogram, maybe also the shooting info.



Consideration

- You are not alone at night
 - Be considerate of residents, workers, fellow citizens and other photographers
 - Don't be noisy, don't litter, don't vandalize or remove items.
 - Don't wildly shine your light around, keep it down and spot on your equipment
 - Ask to make sure you don't ruin somebody's 8-minute light painting
 - Your LCD shows up in other people's shots: shade it with your body, or turn it off, it drains the battery.
- Your tripod is larger than you think, don't turn around and knock someone out!
- You may be watched, be friendly to people and law enforcement approaching you
 - But know your rights, too. If in doubt, walk away, it's just a photo.

Exposure Settings

ISO

- Do not use auto-ISO, it doesn't work at night. You want to control it and shoot at the lowest ISO necessary for the scenery
- Set camera to lowest native ISO (most common: 100, some are 64 or 200)
 - Exceptions: want longer exposure or even less noise: ISO 50 (32)
 - Not enough light, don't want to expose for 20 minutes: go up to ISO 200 or 400
 - Star dots and Milky Way: 800 to 6400; try to minimize ISO, shoot wider aperture

Aperture

Choose the aperture for creative reasons or to compromise on exposure time

- Shallow DOF: low f-stop: 2.8 - 4, focus on your main object
- All in focus: higher f-stop: 8-16 (also gives you nice starbursts from lights), focus perceptually about 1/3 into the scenery
- Startrails? Balance light and DOF: f/5.6, focus on the stars
- Milky Way and star points: f/1.8-2.8, focus on the stars

Exposure time / shutter speed

With ISO low and aperture chosen for creative reasons, exposure time is defined

- All you need to do is figure out exactly how long you need to expose
- For star dots (no trails): use the rule of 400: 400/focal length (sec) for full frame; 300/focal length for crop sensor cameras. The rule of 200 is more conservative

Focusing

To focus in darkness, there are a few different methods to use.

- To compose, use a flashlight to illuminate the scenery, use LiveView to see your composition or take a test shot at high ISO and a few seconds
- While in LiveView, illuminate the point to focus on. Zoom in with +/- controls on that spot, focus, then get out of LiveView
- Use a cheap laser pointer (to measure distances from your home improvement store) to see a sharp dot and not ruin anybody's photos.
- Take a small light and put it where you want to focus, then focus on that light (pointing at the camera), retrieve it and take your shot.
- For star points, star trails, Milky Way, aurora, zodiacal light etc., you need to focus on the stars. Pick the brightest one you can see, open your aperture and go to high ISO to increase brightness.

High ISO Preview (be HIP, save time)

Don't waste 10 minutes just to figure out that it wasn't enough or too much. Here is how to determine your exposure time (for a given aperture/ISO combination):

- Set ISO 6 stops higher, which gives you exposure time 6 stops shorter
 - Example: your native ISO is 100
 - 6 stops higher is: → 200 → 400 → 800 → 1600 → 3200 → **6400**
 - An exposure time of 1 second at ISO 6400 is as bright as 1 minute at ISO 100 (60" → 30" → 15" → 8" → 4" → 2" → 1").
- With camera at ISO 6400, figure out how many seconds you need for the right exposure. "Right exposure" means that you expose to the right, without clipping any desired highlights. Use your RGB histogram for this. This step is trial and error, but costs only seconds.
 - Example: you determined 3" exposure time at ISO 6400 for best exposure
 - Set your camera back to ISO 100 and the seconds become minutes (in this example: 3 minutes).

1 second at ISO 6400 becomes 1 minute at ISO 100!

- My camera's lowest ISO is 200!
 - 6 stops up: ISO 12800. 1" at 12800 is the same as 1 minute at ISO 200.
- My camera's lowest ISO is 50 (or: I want to shoot at ISO 50 for noise and longer time)
 - 6 stops up: ISO 3200. 1" at 3200 is the same as 1 minute at ISO 50.
- I changed my mind, instead of f/11, I want to shoot at f/8 (or f/16)
 - 11 to 8 is +1 stop more light: select half the exposure time (double for f/16)

Practice this! Make it second nature, especially if you shoot outside the city in darker environments. Also, it becomes much easier, if you stick to full stops for the settings:

Exposure time: 1 - 2 - 4 - 8 - 15 - 30 - 60 (seconds or minutes)
 ISO: 50 - 100 - 200 - 400 - 800 - 1600 - 3200 - 6400
 Aperture: 2.8 - 4.0 - 5.6 - 8 - 11 - 16 - 22 (doubling = 2 stops!)

Enjoy Night Photography, it is serene and beautiful

