

Manual Exposure for Full Sun

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The sun's brightness can vary with the clarity of the air that it passes through. But for most of the day and at most latitudes "broad daylight" can be assumed to be a constant. And broad daylight means any situation where the full sun is shining directly on your subject, even when it's partly cloudy or when some of the scene is in partial shade.

Broad daylight is where the Sunny 16 rule is useful - **1/ISO seconds @ f/16** (or equivalent). The rule is easy to remember. Many of us can do the "or equivalent" part in our head. Although Sunny 16 is close, it's not perfect.

Sunny 16 is almost the same as EV 15 as described in the [Exposure value](#) (EV) Wikipedia article which covers a more general case and many different lighting conditions. Table 1 is based on ISO 100. In Table 2 the article recommends EV 15 for "Typical scene in full or slightly hazy sunlight (distinct shadows)" which is broad daylight. The following table is extracted from that article's Table 1.

	<----- f-number ----->										
EV	1	1.4	2	2.8	4	5.6	8	11	16	22	ISO
13	1/8000	1/4000	1/2000	1/1000	1/500	1/250	1/125	1/60	1/30	1/15	25
14	1/16000	1/8000	1/4000	1/2000	1/1000	1/500	1/250	1/125	1/60	1/30	50
15	1/32000	1/16000	1/8000	1/4000	1/2000	1/1000	1/500	1/250	1/125	1/60	100
16		1/32000	1/16000	1/8000	1/4000	1/2000	1/1000	1/500	1/250	1/125	200
17			1/32000	1/16000	1/8000	1/4000	1/2000	1/1000	1/500	1/250	400

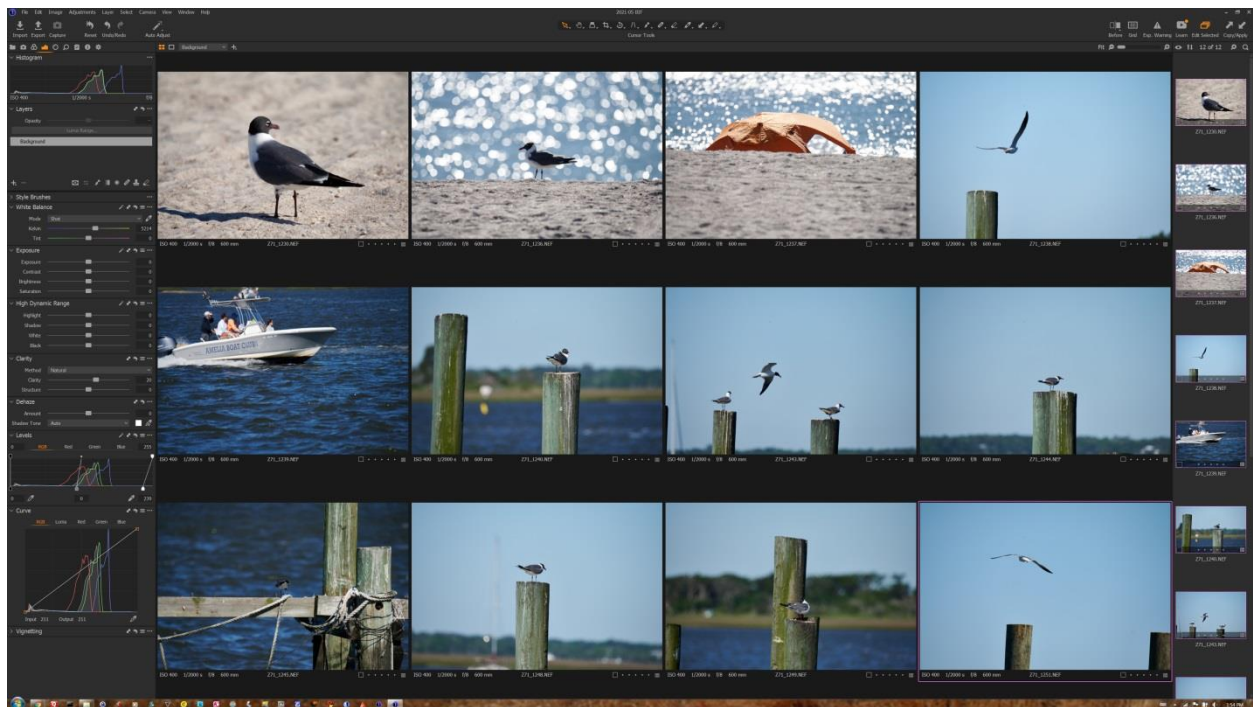
On any EV row, the shutter speed and aperture combination will produce an image with the same brightness and range of raw values.

EV 15 at f/16 recommends **1/125s** at ISO 100, not 1/100s. That's only a 1/3 stop difference but it helps keep the white feathers on a bird (just about the brightest reflector where you might want to retain highlight detail) from blowing out in the raw file.

The EV table in the article is based on ISO 100. You can make it easier to use a different ISO by looking at the **ISO** column to pick a different **EV**.

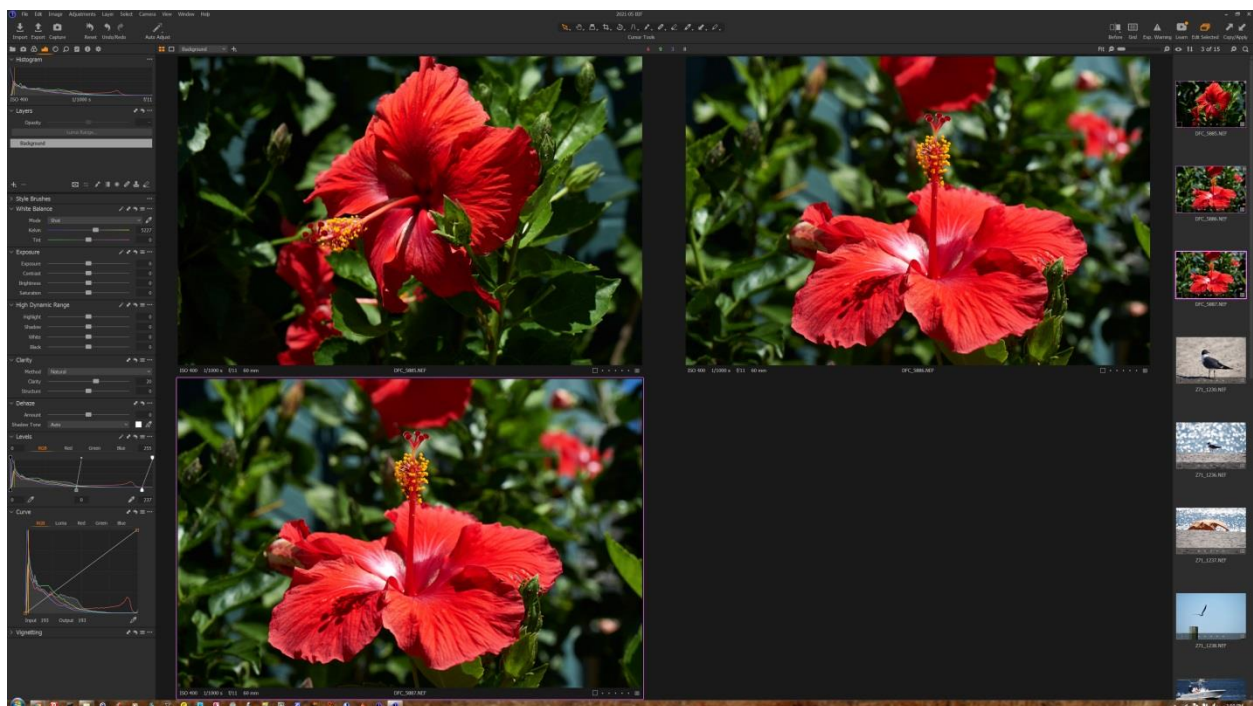
This lets you bypass the camera's meter and set a logical manual exposure and ISO combination for full manual exposure. It avoids several situations where the camera's meter can be fooled.

Here is a Capture One session with image taken in broad daylight between 9:10 and 10 AM on May 6th at the beach and the local marina on Amelia Island. All were exposed at 1/1000s @ f/11 ISO 400 (EV 17). They were all taken with a Nikon Z7 and a 150-600 Tamron G2 hand-held at 600mm.



All of the images got the same treatment - no Exposure or Brightness adjustment, no Highlight or Shadow recovery. The high end of the Luminance range was adjusted and their Clarity set to 20.

Another set was taken close to noon in Saint Marys, GA, with a Nikon Df and a 60mm f2.8D macro with the same exposure and ISO settings. They received the same post processing – almost none.



Some very experienced photographers avoid high noon and bright sunlight because they feel that the resulting harsh shadows can be difficult. But harsh lighting can also be strong and dramatic. When the lighting is softer the camera's meter is more reliable.

You can see in the illustrations below, manual exposure without reference to the camera's meter can do a proper job in direct sunlight despite the wide dynamic range in the scene.



Side Lighting

The sand is very light and the bird has dark gray feathers.



Back Lighting

Almost any in-camera metering approach would fail because the camera would attempt to lower the brightness in the out of focus highlights.



Front lighting

The camera's meter might have tried to brighten the image because of the dark background.



Mid-day top lighting

A lot depends on the latitude and time of year. It's fairly consistent from about two hours after sunrise until two hours before sunset. Moisture in the air (there is less in winter) can reduce the intensity of visible light. At about 2000 meters (6562 feet) above sea level there is about 0.3 stops of additional brightness. Haze can reduce the sun's brightness.

What really matters is the strength of the light on the subject. We can expose a fully sunlit subject for full sunlight even on a partly cloudy day. On a day with lots of clouds, if the sun is shining on white clouds, you can expose for full sunlight even though you may need some shadow recovery later in with post processing.

Precise exposure setting matters more with digital imaging and slide film when parts of the scene include reflective surfaces that are bright white like bird feathers, sea foam, white clouds, white paint or plastic. To retain texture in these surfaces we need to avoid overexposure.

Sunny 16 and the instructions posted on the old film boxes are estimates. They assume average altitudes, latitudes, dates and the time of day. But they are close enough for photographic use.

When in doubt an incident light meter can remove any uncertainty.