



Advanced Field Technique and Theory

Fayetteville Public Television
101 W. Rock Street
Fayetteville, AR 72701
faypublic.tv
479-444-3433

Welcome!

Welcome to FPTV's advanced Field class where you are taught how to use our Advanced cameras that offer more features and better recording capabilities than our Basic Field Cameras. Additionally you will be taught more basics of cinematography that will help you take your videos to the next level. You will have hands on experience with these cameras and then will be asked to take a short assessment upon the ending of this class.

The Advanced Field camera that is available for use is the Sony NX100 camera. This camera offers a fixed lens with focal lengths ranging from 9,3 mm to 111,6 mm.. Additionally, it offers intuitive manual controls over every setting that you would like to adjust.

The first steps that should be taken are as follows:

- 1) Attach the Dead Cat noise dampener to the shotgun microphone.
- 2) Attach the small XLR cable to the microphone XLR port and to the camera XLR input.
- 3) Attach the battery to the rear of the camera.
- 4) Remove lens cap.
- 5) Insert SD Card(s).
- 6) Power on Camera.
- 7) Flip out the screen monitor.

After these steps are completed, you should be ready to begin recording. However, since this is an advanced class, let's go into the nitty gritty of how to fine tune your image.

The Trifecta of Exposure:

There are three main components of setting your camera's exposure manually. They are:

- 1) Aperture (Iris)
- 2) Gain (ISO)
- 3) Shutter Speed (Shutter Angle)

All of these components can be leveraged to control your camera's exposure in one way or another. We will now break them down step by step.

Gain/ISO:

ISO, standing for International Standards Organization, is used as a measurement of the sensitivity of your sensor to light. The term for ISO is actually referred to as Gain on this camera. They accomplish the same thing; they simply are referred to under different names. Gain/ISO is very useful for getting proper exposure because it is a very quick and easy way and, if done correctly, will allow your camera to perform better under low-light while not degrading your image. To adjust the Gain of the Sony camera turn the camera on and press the Gain button at the bottom of the camera. This will highlight the Gain number on the screen. To adjust it up or down use the scroll button directly to the left of the Gain button. You can push this button up or down. You should see the number going up or down and the picture correspondingly getting brighter or darker.

It is important, however, not to turn your Gain/ISO up too high. Turning the Gain up will result in very “noisy” and “grainy” video that is harder to color correct and work with in post-production. It is best to choose a set Gain or ISO number that you want your whole video to be at and leave your Gain at that spot so that your whole video has the same grain level.



Shutter Speed:

The next way to manipulate how much light your camera takes in is through shutter speed. Digital cameras have adjustable shutter times that can be turned up or down in order to take in or cut out light. When you adjust the shutter speed you are adjusting the time duration that the shutter is open to let light open. Shutter speed is



measured in tenths and hundredths of a second. So if you have a shutter speed of 50 you are allowing the shutter to be open for 1/50th of a second.

The general rule for shutter speed is to keep it at double your framerate. So if you are shooting at 30 fps (frames per second) then your shutter speed should be at 60.

To adjust the shutter speed of the Advanced Field camera press the button at the bottom of the camera labeled Shutter. The Shutter Speed number should now be highlighted on the camera monitor. In the same way that we adjusted the Gain, we can push the adjustment knob at the bottom either up or down to adjust the shutter speed to be faster or slower.

Aperture:

Aperture is the last, and probably the most important, part to properly understand and control exposure. Aperture, in contrast to ISO and Shutter Speed, is actually controlled on the lens of this camera. It is the ring that is farthest to the back of the lens and closest to the camera. Twisting it clockwise will close down the aperture and make the picture darker. Twisting the ring counter-clockwise will open the aperture and make your picture brighter.



Aperture is measured in what are called F Stops. F Stops are measurements that help us quantify how much light is being collected by the camera lens. Every time an F Stop is changed you are either adding or subtracting a stop of light. The chart for F Stops is located below.

1	1.4	2	2.8	4	5.6	8	11	16	22
---	-----	---	-----	---	-----	---	----	----	----

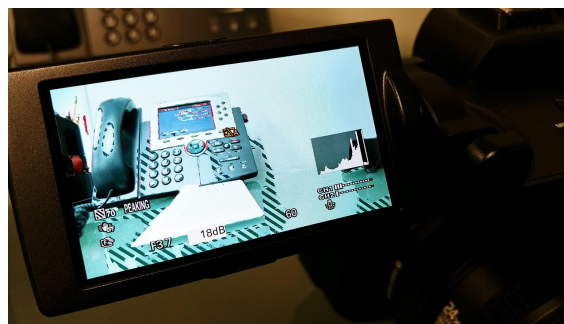
F Stops operate in a way that can be thought of as backwards to many people. The higher the number that your F Stop is at then the smaller your aperture gets. If you have an aperture that you have set to F 1.8 then that aperture is going to very open and taking in a lot of light. Adversely, if you close down the aperture to cut down on light coming in then your aperture is going to be higher on the scale, likely around the F 16 or F 22 mark.

Focus:

The camera's focus is controlled by the largest ring toward the front of the lens. Twisting the ring to counter-clockwise will make the plane of focus shift farther away; adversely twisting the ring clockwise will shift the focus plane closer to the camera. It is up to you to leverage the ability to focus on different subjects in your frame accordingly to illustrate what you are trying to say through the camera effectively.



Zebra:



When a portion of your image is overexposed this camera notifies you through the method of what are called Zebras. Zebras are projected by the camera on areas of your footage that are overexposed or "blown out". When something is completely overexposed it means that there is no data left in that area. Even if you try to recover it in post production it is impossible. Zebras help guard you against overexposing to a certain degree.

If you would like to adjust the Zebra settings or just turn them off, press the menu button and navigate to the "Display Set" tab > Zebra > and from here you can adjust the settings for zebras.

Focus Peaking:

Focus Peaking, like Zebras, is a video assist function that helps the user more accurately measure what exactly he or she is recording. Focus Peaking is a function that highlights the parts of the frame that are in focus using dots



of varying colors. Focus Peaking is a great way to make sure that you are in focus without the need of zooming in and checking the blurriness of your subject. Notice how the speaker in the picture is highlighted red indicating that it is in focus.

To adjust the settings of Focus Peaking press the Menu button > “Display Set” tab > Peaking > and from here you can adjust the settings of focus peaking.

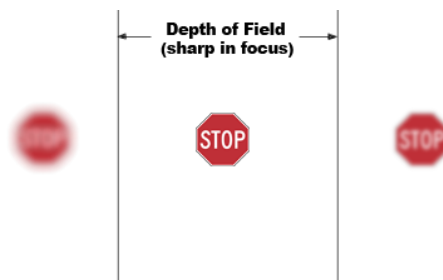
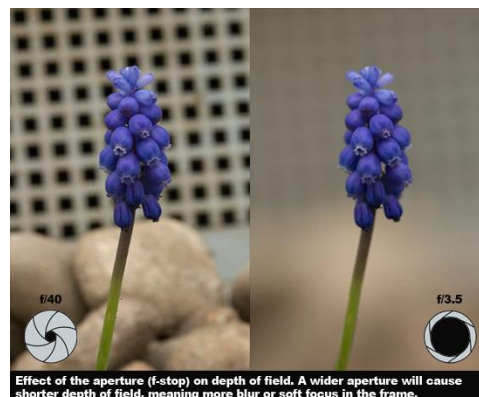
Zoom:

The zoom on this camera can be controlled several different ways. The first, and the way that offers the most control, is manually twisting the zoom ring. Twisting it clockwise will zoom the lens out and give you a wider shot. In the same way, twisting the zoom ring counter-clockwise will zoom the lens in and give you a tighter shot. The next way would be on the top handle. Next to the “Rec Start/Stop” button you should see a zoom control toggle. Pushing the top of the button, labeled “T”, will zoom in and pushing the bottom of the button, labeled “W”, will zoom the lens out. Lastly, the hand cradle on the right of the camera has the same servo zoom function that the top handle has. Pressing these buttons will zoom in and out exactly how the top handle zoom buttons worked.



Depth of Field:

Additionally, you can use the aperture of the camera to decrease your depth of field. Depth of field is defined as the area that your camera can focus on at one time. A shallow depth of field will make it so that only one subject can be in focus at a time. Adversely, having a wider depth of field will allow the camera to focus on more than one subject at a time. A shallow depth of field is used quite commonly in film and TV as it provides separation and depth in a frame. The rule for depth of field and aperture is that as you increase the size of the aperture



the shallower your depth of field becomes. So if you wanted to achieve a shallow depth of field in a shot you would need to open your aperture in order to let in more light. Of course this will brighten your image quite substantially and can also lead to overexposure. This can be counteracted through the use of neutral density which will be explained later.

Additionally, the other factor that affects depth of field is the focal length that you are using. This Sony camera contains focal lengths ranging from 9.3 to 111.6 mm. If you keep the camera zoomed out it will be much harder to create a shallow depth of field. If you do wish to create a shallow depth of field then your best bet would be to zoom the camera in about halfway, around the 50 - 60mm range, and focus the camera.

Neutral Density:

Neutral Density, in short, can be thought of as sunglasses for your camera. This camera offers internal neutral density in the form of a switch on the side of the camera. When this switch is flipped, a piece of neutral density glass is placed in front of the camera sensor that cuts down the light entering the camera.

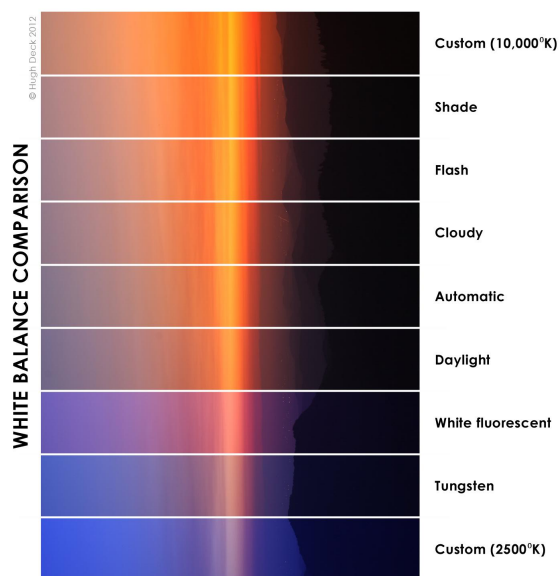
In simpler terms, neutral density can be thought of as darkened glass used to decrease exposure when other options are not available. This can be extremely useful for



accomplishing a shallow depth of field because it allows you to open your aperture up while having none of the overexposure that comes with that action. To adjust the neutral density on the camera, locate the switch on the side. It is probably set to "clear". Switch it up into one of the three options and observe the difference. You should see the frame exposure drop as the darkened glass is applied to the camera. The camera offers Neutral Density in 1/4, 1/16, and 1/64 levels, respectively. Pushing the switch up one spot will cut one stop of light. Pushing it up again will cut another stop of light. Finally, pushing it to the third spot will cut two more stops of light.

White Balance:

White balance, while some regard as unimportant, is a critical aspect of shooting a picture that accurately reproduces what is seen in real life. White balance is a setting on cameras that will drastically change the way that the camera reads colors. What you are doing when you adjust the white balance is that you are adjusting what the camera sees as white. There you can either choose for the camera to view sunlight as white, or you can choose for the camera to see fluorescent light as true white. Cameras sometimes use presets to distinguish between the different color temperatures. You might see some cameras using terminology like “Tungsten” or “Daylight” to define different color temperatures. Generally, though, most cameras will allow you to manually step up or down on the white balance scale. As you can see from the pictures below, the lower your number is then the bluer your image will become. The opposite, of course, is true as well.



Lens Language: Zooming vs Moving

The term lens language refers to the specific type of feel that a specific lens will have. Lenses are measured in focal lengths. They usually range from 8mm to somewhere around 600mm. This scale is used to interpret the telescopic ability of the lens. For example, an 8mm will have a very wide field of view. This is a standard type of focal length on a GoPro. Focal lengths around the 50mm - 150mm are usually what portrait photographers opt for. They throw the background out of focus nicely and render facial

features very accurately. Beyond just how much they zoom in, each focal length distorts and affects the picture differently. A wide angle lens will distort facial features and open the room (or the space you are shooting in) up and make it feel much more spacious. On the other hand, a lens at 85mm will render facial features very accurately but will also compress the background. Take a look at the examples below of a photographer who framed a woman the same way but used different focal lengths.



Notice how the change in focal length greatly affects not only the background but also how her face and body look. The 10mm shot makes her nose look larger and her arms look thinner than on any of the higher focal lengths. In addition, the shots that are of a longer focal lengths simply *feel* farther away than the shots that are close up. The short focal lengths you can feel the closeness to the model.

NOTES
