Sony FX 6

firmware version 2.0

Quick Start Guide and Tips

Centre for Digital Arts

Concordia University

2022

(Revised 12/12/2022)

Contents

Introduction

Sony FX 6

Introduction

This guide summarizes key information on the Sony FX 6 in one resource.

The guide is not written for the absolute beginner but it does explain some fundamental concepts common to all video cameras.

It is ideal for the somewhat experienced person who wants to quickly familiarize themselves with the camera.

I suggest the Sony Z90 and FS5 cameras in the EV Depot for beginners.

Additional resources are referenced at the end of the guide.

Introduction

The FX 6 is a full frame sensor Sony “cinema” camera.

The image quality is fantastic and the camera can serve as a good introduction to the world of digital cinematography.

If you have never used a digital cinema camera that can import LUTs, read the section on Cine EI shooting mode carefully.

The method of exposure using a LUT described in this section, is similar to how many digital cinema cameras expose using LUTs, regardless of their manufacturer.

If you have any questions, comments or suggestions about this guide. Please email:

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Important features: Camera Specifications

In addition to NTSC and PAL options there is also a 4K **DCI** (digital cinema) 24 fps option.

4.2K Full Frame sensor: very good low light performance!

Shooting Resolutions: HD 1920 x 1080, 4K UHD 3840 x 2160, **4K DCI 4096 x 2160**

Standard frame rates (called frequency scan): NTSC: 59.94p, 29.97p, 23.98p, **PAL:** 50p, 25p, **DCI: 24p**

S &Q frame rates: 4K: 1 to 120 fps, HD: 1 to 240 fps

Recording options:

XAVC-I 4:2:2 10 bit (I Frame) for HD and 4K

XAVC-L (long G.O.P) longer recording time and lower quality, HD: 10 bit, 4K: 8 bit

4K RAW recording requires an external recorder (4K 16 bit RAW output via SDI and HDMI)

Important Features: Shooting Modes and Dual Sensitivity

Shooting Modes:

There are two shooting modes: Custom and Cine EI. If you want to shoot in Slog 3 then you must shoot in Cine EI mode. This is common to all Sony cinema cameras. In this guide, the Custom shooting mode is presented first, as it is the easiest choice.

ISO:

This is a dual sensitivity camera, meaning that the sensor is optimized for two different ISO settings called base sensitivity: Low and High. The low and high ISO ratings change according to the shooting mode. See next page.

Important Features: Dual Sensitivity ISO

Base Sensitivity Settings (higher numbers mean more sensitive to light):

Low:

Custom (709) Low: 320 ISO

Cine EI Low: 800 ISO

High:

Custom (709) High: 5000 ISO

Cine EI High: 12800 ISO

The Base Sensitivity (ISO) settings change according to the shooting mode. See the sections on Shooting Modes and Exposure.

Important Features: Editing Software Compatibility

At the CDA, and throughout the Concordia Faculty of Fine Arts, there are two video editing software options: Adobe Premiere and DaVinci Resolve.

The XAVC video files from the FX 6 can be read by Adobe Premiere in Adobe CC 2021 and up. See the section *Cine EI Option One: Exposing Slog 3 with the s709 LUT* in this guide for how to deal with colour management in Premiere 2022.

DaVinci Resolve **Studio** version 17 and up will also read these files.

The free version of DaVinci Resolve running on an Apple Intel computer will **not be able** to read the XAVC video files. You will have to convert the files to Apple Pro Res HQ. But the free version of Resolve version 17 and up running on an Apple Silicon Mac can read the files.

APR warning

When you first power up the camera, it may ask you to “execute APR”.

This is the automatic pixel restoration feature that minimizes noise in the LCD when lighting conditions change.

Put the lens cap on and press OK. It only takes 5 seconds.

If you cancel this option, do it next time. It should be performed on a regular basis.

Power and Batteries

Power button on side of camera.

AC power on the back right side of camera (bottom connector).

Smaller battery (BP-U35): 150 minutes

Larger battery: (BP-U100): 400 minutes

Shooting high frame rates will diminish the battery time.

The batteries take several hours to charge. Charge them overnight.

Recording Media

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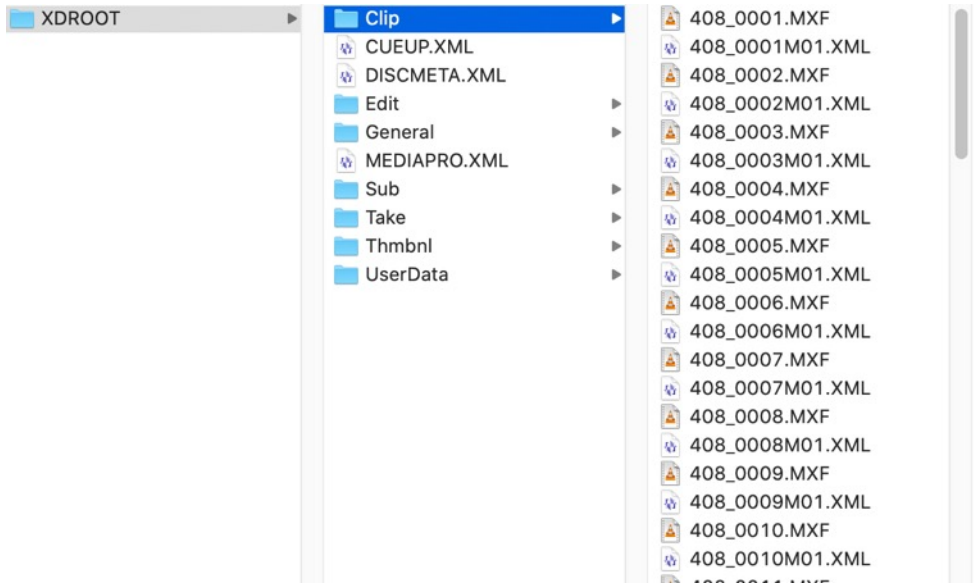
Recording Media: saving files

Connect the card reader to the computer. There is a USB C and USB A cable in the bag. The .MXF video files are contained in the XDROOT/Clip folder on the card. Simply back up those files. You can also back up the accompanying .XML files.



Recording Media: Two Codecs

The camera comes with two **160 GB CF Express A cards.**
These can record XAVC I 4K up to 120 fps.

The camera has two internal codecs:
XAVC I (I Frame)
XAVC L (Long G.O.P)

Always use the XAVC I codec unless you need the extra recording time.
XAVC I is a 4:2:2 10 bit codec in HD and 4K.

Both codecs are in the cross platform .mxf container.

Recording Media: XAVC I Recording time per card

XAVC I recording times per card:

XAVC I HD	24p:	207 min.
	30p:	168 min.
XAVC I 4K	24p:	83 min.
	30p:	66 min.

XAVC I File sizes:

XAVC I HD 30p:	950 MB per minute
XAVC I 4K UHD 24p:	1.8 GB per minute

Higher frame rates will have shorter recording times and larger file sizes.

Recording Media: XAVC L Recording time per card

Only use **XAVC L** if you require a longer recording time.

The 10 bit HD 50 Mbps image quality is very good.

The 8 bit 4K image will be noisier in low light.

XAVC L recording times per card:

XAVC L HD (35 Mbps):	500 min. (approx.)
XAVC L HD (50 Mbps):	340 min. (approx.)
XAVC L 4K (150 Mbps):	200 min. (approx.)

XAVC L file sizes are much smaller than XAVC I.

Recording Media: Codec Bit Rates

XAVC I files are easier to play back than XAVC L. However, older computers may struggle with the XAVC I 4K higher frame rate bit rates.

XAVC I bit rates:

HD and 4K 24-30p: 240-300 Mbps

HD and 4K 50-60p: 500-600 Mbps

HD and 4K UHD 120 fps: 1200 Mbps

XAVC L bit rates:

4K UHD 24-30p XAVC L (8 bit): 150 Mbps

HD 24-30p: 50 Mbps or 35 Mbps options

Recording Media: Proxy recording and Simultaneous Record

Proxy Recording:

Proxy recording creates compressed .mp4 duplicate video files while you record. I don't recommend it. The proxy files are not useful in an online/offline workflow as they do not have the identical file names of the full resolution files. I recommend creating offline files using Adobe Media Encoder and the Pro Res 422 Proxy codec.

You can turn on proxy recording in the status pages and menu if you wish.

Simultaneous Record:

If you want to have copies of the video files recording to each card simultaneously, one copy per card, turn on simultaneous record:

Menu/Project/Simul Rec/Setting/ON

The kit zoom lens

Sony FX 6

About the lens

The included lens is a Sony FE 24-105mm F4 G OSS Lens (E-mount).

F stop 4 is available throughout the range from wide to telephoto.

This lens is designed for full frame cameras.

Always use full frame lenses on this camera when shooting 4K. You can use APS C or Super 35 lenses when shooting HD but then you must change the Imager Scan setting to Super 35 (status page 1).

The zoom is manual. **The zoom rockers on the camera will not work with this lens.**

This is not a parfocal lens, the focus will change when zooming. So, it's best to use autofocus when zooming or tracking an object. See the section on focus.

About the lens

There is an Autofocus button on the side of the lens in addition to an auto or manual focus switch on the front of the camera (see the section on focusing on how to operate the camera in hybrid focus mode).

When in manual focus you can lock the focus with the large button under the ”G”.

Optical steady shot stabilization on the lens is necessary since there is no in-body camera stabilization.

Turn off the stabilization when on the camera is on a tripod.

Menu Navigation

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Menus: About the touch screen

The viewfinder (VF) is a 720p touch screen for some functions.

Because this is the only screen use it sparingly as a touch screen. Don’t use the touch screen to scroll through menus!

Use the touch screen for auto focus (see section on focusing). Otherwise, I recommend keeping your fingers off the screen!

If the screen becomes dirty, it can be cleaned only with a microfiber cloth. If it is smudged, turn the camera off and clean the LCD screen with a very slightly damp microfiber cloth (water only). Wait until it dries before turning on the camera.

Menus: Three Options

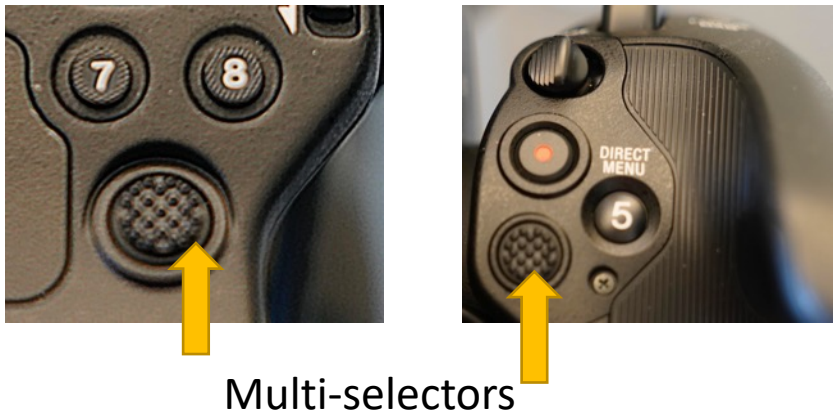
There are three different menu interfaces to change the settings in the camera. There is some redundancy between the interfaces. In this guide I usually refer to one method of changing a setting.

1. The **status pages** give quick access to the most common settings.
2. The **direct menu** gives access to the most frequently used exposure options while shooting. This is the information displayed over the image in the viewfinder.
3. The **menu** gives all the options.

Menu navigation

Once you have pressed the FULL MENU button on the side the camera you can get into two of the three menus (read on).

The easiest way to navigate the camera menus is to use the large dial on the side of the camera. Push the button in and turn the dial. Option two is using the multi-selectors on the top handle or the grip.



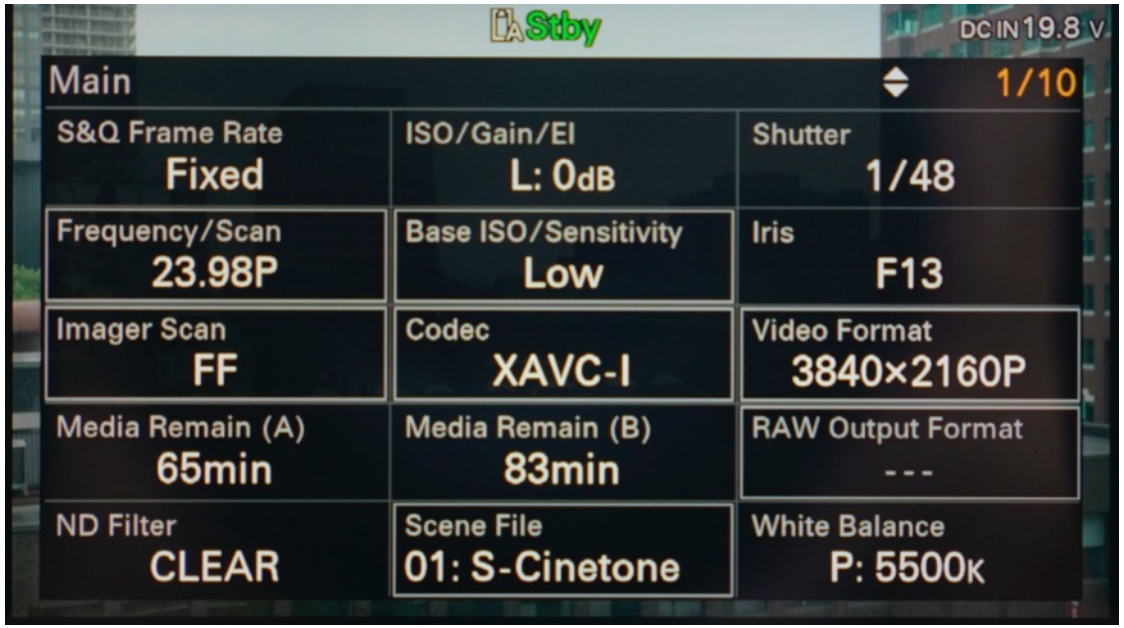
Multi-selectors

Menu dial

Access to status pages and menu.

Three Menu Options: the status pages

The status pages appear when you press the full menu button quickly: they look like this:



This menu is convenient for changing most settings before you start shooting.

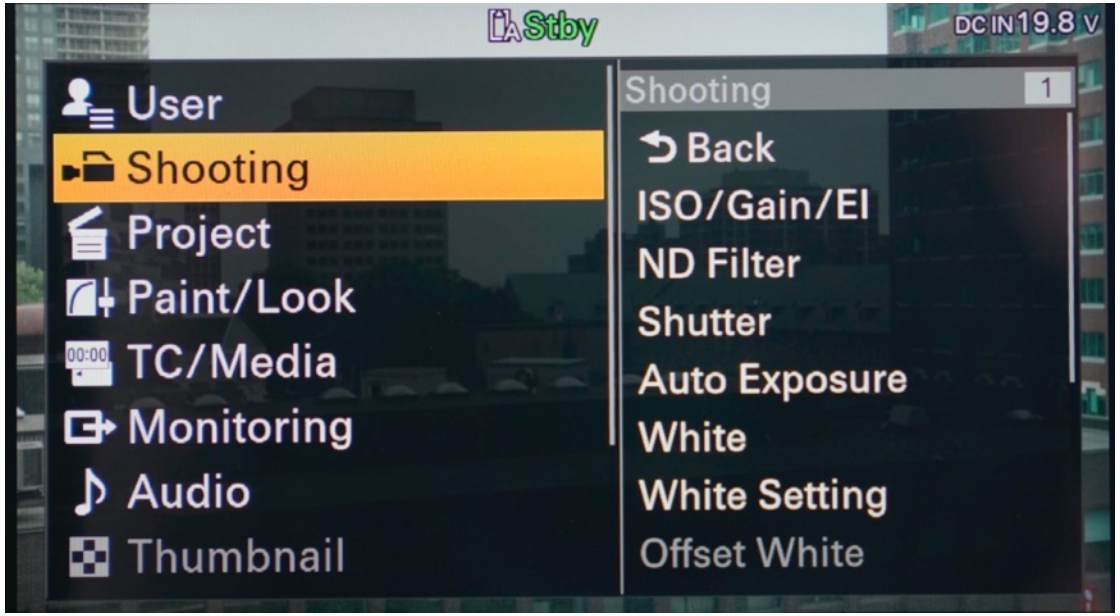
Three Menu Options: the direct menu

Press the display button on the side of the camera. On the grip of the camera, button 5 takes you to the direct menu (or button 8 on the top handle) that allows you to change aperture, shutter speed, ND filter setting, auto exposure, gain, white balance and other things directly on the display with the dial or multi-selectors.

In this image the aperture is highlighted because it is being adjusted. The direct menu is useful once you start shooting.

Three Menu Options: the menu

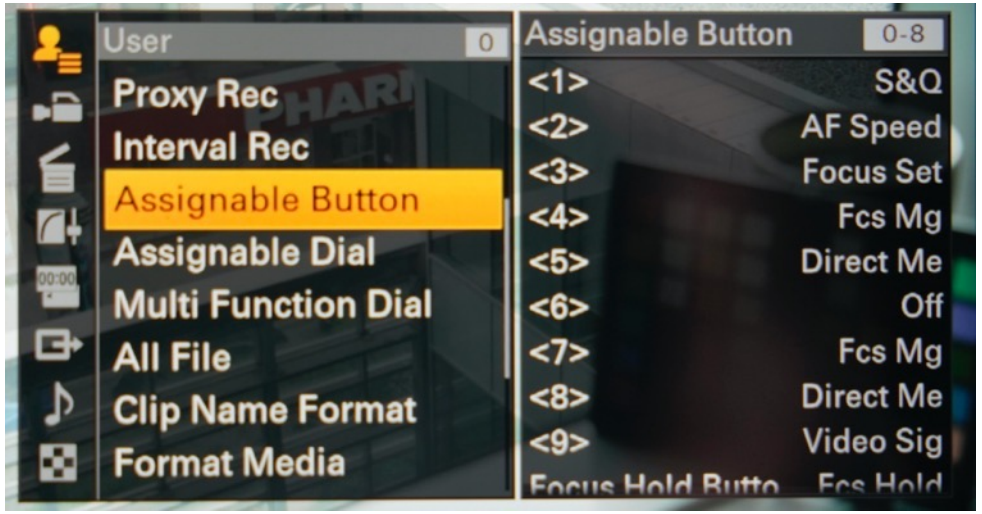
The full menu appears if you keep holding down the full menu button. It looks like this. This menu has all the options. This guide will not present them all.



Menu/ User/Assignable Button

In this guide I refer to the user assignable buttons on the camera. I am using them in their default setup but you can assign different functions to the buttons as you wish. When you get the camera from the depot it is possible that the last user has changed their function.

Go to the **Menu/User/Assignable Button**



Resetting the Camera back to the Factory Settings

You may wish to erase the menu settings left by the previous user. If many settings were changed, it may hinder following this guide. You can go back to the factory settings of the camera by selecting:

Menu/Maintenance/All Reset/Reset

The **Reset without Network** is the other option that resets all menu settings except the network settings.

Audio

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The Microphone

The camera has a rubber adapter to fit the microphone in the holder. Use it for other hyper cardioid type of microphones as well. The Sennheiser 416 can be used directly on the camera, for example.

Never use the internal camera microphone as your primary source of audio. Use the Sony ECM-VG1 super-cardioid mono condenser microphone. This is a reasonable option for recording if the subject is close to the camera (speaking no more than 6ft to 8ft away and directly at the camera).

The microphone is directional: what the camera is pointing at will be recorded.

Because the microphone is mounted on the camera it will pick up some camera noise and fan noise.

Audio: XLR Audio Inputs

There are four audio channels.

Two mono XLR inputs are on the camera handle. **Make sure the handle is attached firmly as this affects the audio input.**

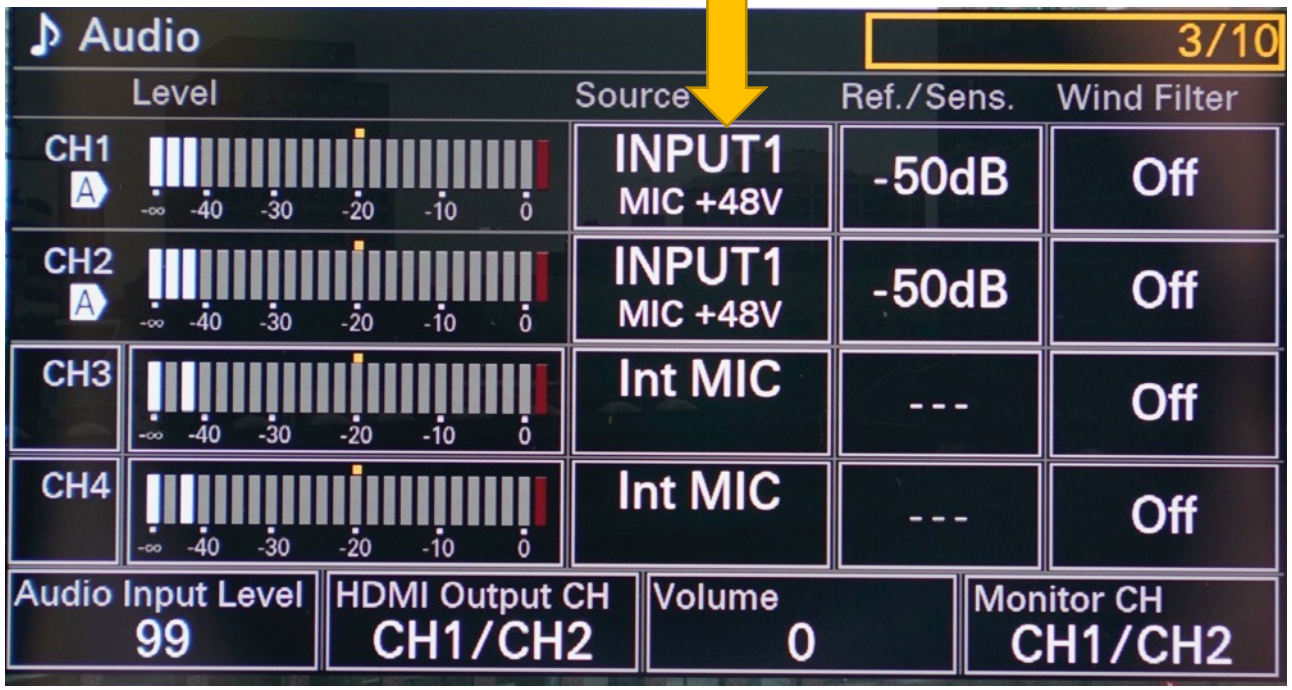
Each XLR input has three options: Line, Mic, Mic +48V.

Mic +48V is for condenser microphones like the Sony ECM- VG1.

Mic is for dynamic microphones and **Line** is for an output from an audio mixer or other line level device (output from an external recorder for example).

Audio: Input

On status page 3, change the input for the channel. In this case, I have XLR input 1 going to channels 1 and 2 for a two channel mono recording (the same sound on each channel).

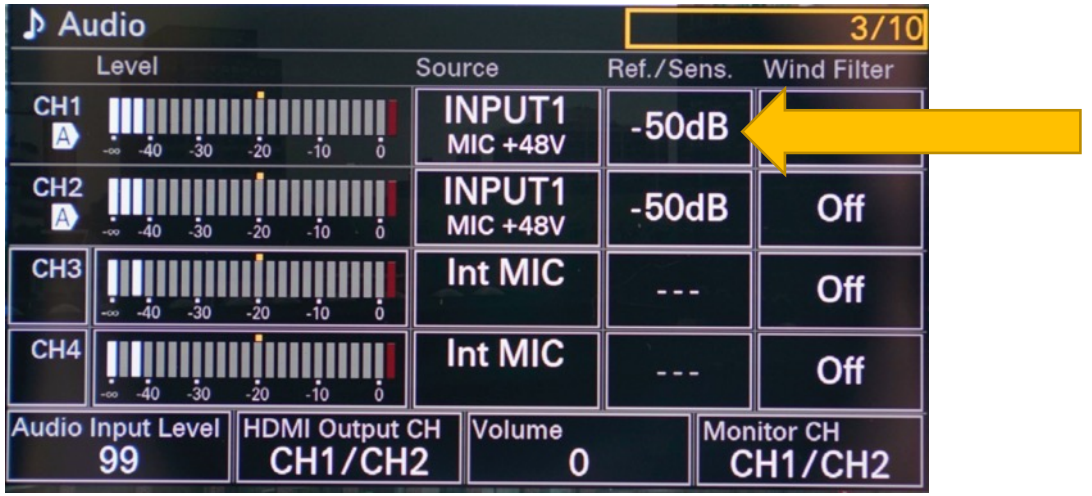


Audio: Volume Level Controls

There is a switch for automatic or manual volume level recording control. Open the door to switch from auto to manual level control and control the level.

Audio: Reference Sensitivity

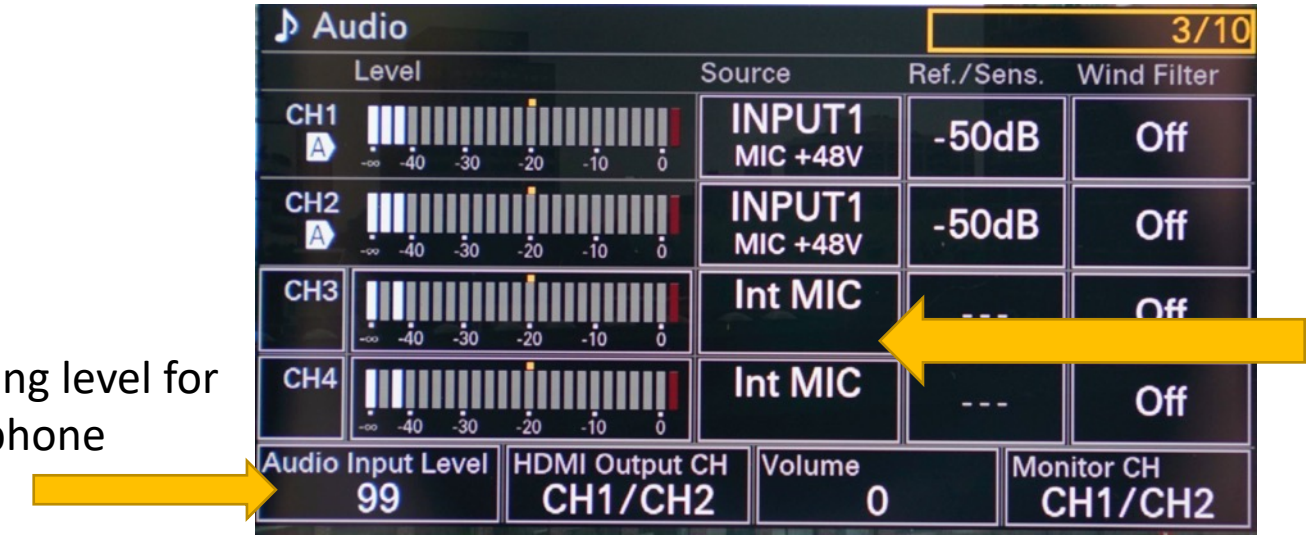
If the recording is too loud or too quiet with either auto or manual control, adjust the reference sensitivity of the channel. The default reference sensitivity is -50 dB. This is generally a good setting. Changing to a higher number like -60 dB will raise the recording level, -40 dB will lower the recording level. Change it back to -50 dB before you return the camera.



Audio: Internal camera microphone

You can record the internal camera microphone to one or more channels as a reference for synchronizing audio recorded to an external recorder (but it also helps to use a slate). By default the internal microphone level is on AUTO. The Audio Input level is the manual recording level for the internal microphone.

manual recording level for internal microphone



Internal microphone on channels 3 and 4

Audio: Low Cut option

There is a switch on the microphone for a low frequency cut to the signal. This is not necessary unless there is a persistent low hum in the environment that you want to remove.

M is no cut.
V is the low cut.
I could not find any documentation on where the low cut starts. Probably 90 Hz. Otherwise the microphone can pick up sounds as low as 40 Hz.

Audio: Headphone Jack

The headphone jack is placed on the side of the camera. The output level for the headphone jack is in the **menu/ audio/ audio output/ volume**. You can also select in that menu whether this is a stereo or mono output.

The camera kit does not come with headphones.
I recommend reserving the **Sennheiser HD 280 Pro** enclosed headphones from the EV Depot.

Audio: Fan Noise

The sensor is large and requires cooling (or heating).

Menu/Technical/Fan Control:

AUTO mode is the default for the fan. In this mode the fan may run while you are recording. If the microphone is on the camera, or near the fan, it will record this noise.

The two other options are: **MINIMUM** and **OFF IN RECORD**.

I recommend **OFF IN RECORD** if you are shooting in a cinema style with short takes. The camera will have time to cool between takes.

MINIMUM will work better for long takes/documentary/interviews. The noise will be consistent but low. Consistent low fan noise is much easier to remove from an audio track than a noise that varies in volume.

Audio: Other Microphone Options

The microphone wind cover on the Sony ECM- VG1 can help reduce wind noise. In the audio basic menu there is also a wind cut option for each channel.

However, the **CDA field recording kit** is a superior option for recording audio outdoors. It includes a blimped Sennheiser 416.

Wireless microphones can be a better choice for indoor interviews (or outdoors on a calm day) depending on the person and what they are wearing. Reserve the **Sennheiser AVX** wireless microphone kit.

If you need more XLR inputs reserve the **Sony XLR-K3M** adapter and mount it to the hot shoe on the handle.

Shooting Modes: Introduction

Sony FX 6

Shooting Modes: Custom and Cine EI

There are two shooting modes: **Custom** and **Cine EI**.

This guide will explain these two options in detail.

Custom mode also appears in the menu/status pages as **Custom (709**).

Custom mode will create video files that will not require much correction in postproduction. In **Custom** mode, the image looks normal in the viewfinder. You can judge exposure largely by what you see.

In **Custom** mode, you have a choice of **Scenes**. These are different gamma curves and looks that affect the exposure and colour saturation. The best Scene is **S-Cinetone**.

Shooting Modes: Custom and Cine EI

Cine EI mode is common to all Sony cinema cameras.

Cine EI mode is for shooting **Slog 3**. Shooting in Slog 3 provides an increase in the luminance range of the exposure (15 stops of dynamic range). It has more dynamic range than shooting in Custom shooting mode with the S-Cinetone **Scene**.

When working in Cine EI mode you can apply a **LUT** to the viewfinder and on the SDI/HDMI outputs. Working with a LUT makes exposing Slog 3 much easier than shooting Slog with other non-cinema Sony cameras. Slog 3 images require more work in postproduction to normalize and correct, but you can also use a LUT for correction.

Cine EI mode can also be used when recording a RAW file to an external recorder.

Shooting Modes: Custom and Cine EI

This guide covers the shooting modes in two separate sections, but even if you are only interested Cine EI mode also read the Custom shooting mode section.

Many of the exposure controls are the same for both shooting modes.

Custom Shooting Mode Settings

Sony FX 6

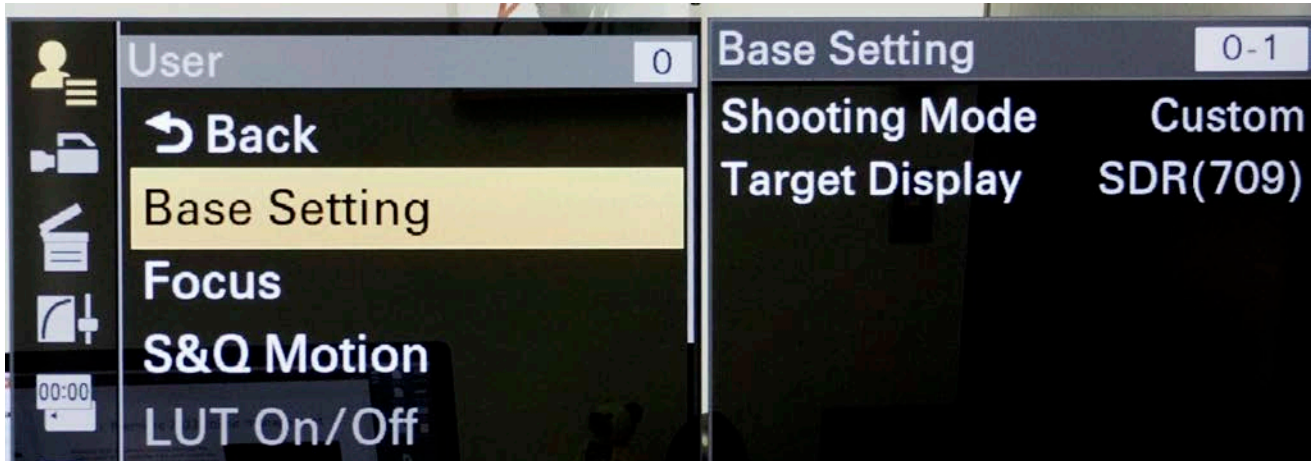
Custom Shooting Mode: Base Settings

In **Menu/User/Base Setting** pick **SDR (BT.709)** for the **Target Display**.

This guide only covers shooting in the Rec.709 colour space, called **SDR(BT.709)** in this camera. The majority of display devices in the world are Rec.709 devices.

HDR(HLG) target display is chosen when you are shooting for extra bright HDR TVs. There will be a separate guide on shooting HDR and dealing with HDR in postproduction.

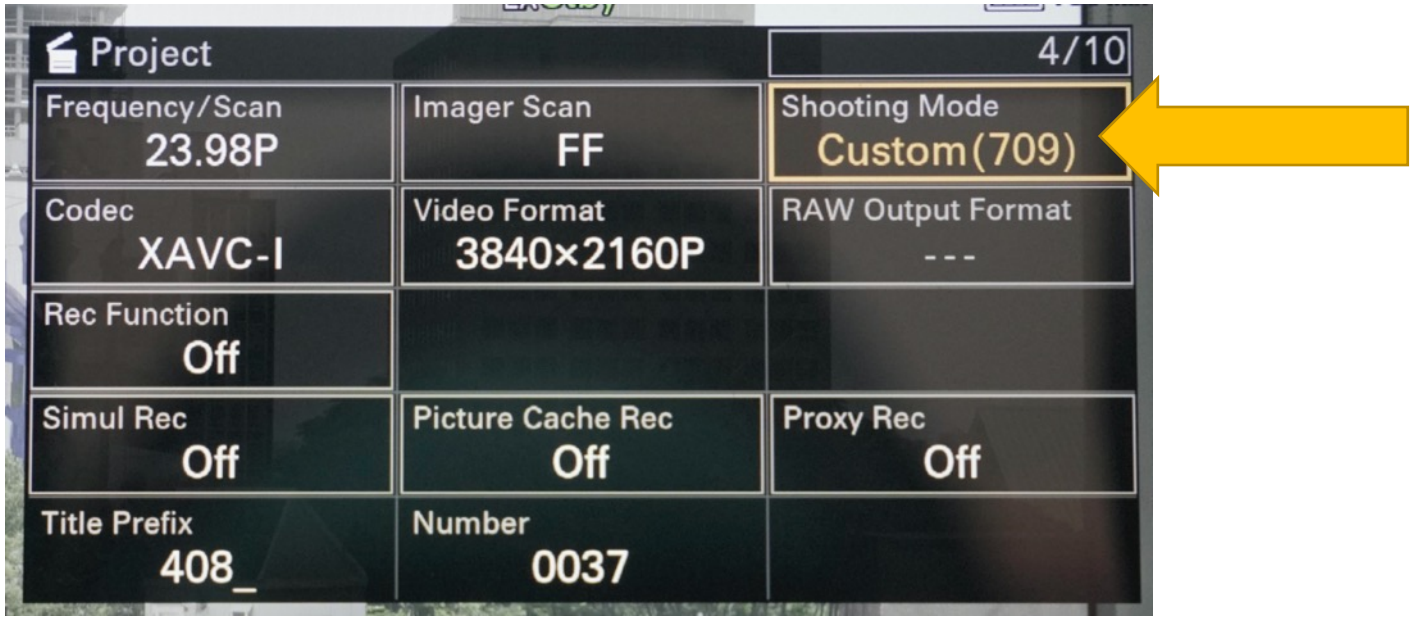
Then in this menu, or in the status pages, pick the **Custom** Shooting Mode.



Custom Shooting Mode: Project Settings

Once the Menu/User/Base Setting/Target Display is set to **SDR(BT.709)** setting, Custom mode will appear as **Custom (709)** in the status pages.

On status page 4, you can also change the Shooting Mode. This is the project page. Look at the other selections on this page: 4K UHD at 23.98p using the full sensor of the camera and the best internal codec (XAVC I). See next page for details.



Custom Shooting Mode: Project Menu

Status page 4/ Project Settings:

Shooting Mode: **CUSTOM (709)** Change this first!

Imager Scan: **FF**

This means full frame: using the full sensor. Always shoot full frame unless you are shooting HD with Super 35 or APS C lenses.

Codec: **XAVC I**

Always choose XAVC I unless you need more recording time.

Video Format: this is the image resolution. Set it according to your project.

Frequency/Scan: this is the frame rate.

See next page for details on image resolutions and frame rates.

Image Resolutions: three options

1. **4K UHD 3840 x 1080** is the 4K broadcast/web standard. The aspect ratio is 16:9, the same as HD video.

2. **4K DCI 4096 x 2160** is only for cinema. The aspect ratio is 17:9. Web versions will have to be cropped or pillar-boxed.

3. **HD 1920 x 1080** is the HD broadcast/web standard.

Keep in mind that all displays (screens, projectors) in the EV depot are HD.

There are NO 4K displays. There are no HDR displays.

You can shoot in 4K UHD and output a HD version because the aspect ratio is the same: 16:9. But only shoot 4K if you know (hope) that the project will one day be displayed in 4K. For a class assignment, just shoot HD unless your professor demands 4K as 4K generates significantly larger file sizes.

Frame Rates: Frequency/Scan

The camera calls standard frame rates **frequency/scan.**

For **4K UHD or HD** pick one of the two **NTSC** frame rates: 23.98p and 29.97p.

With large sensor CMOS cameras like the FX6, motion looks better when shooting at 29.97p.

29.97p also looks better on (NTSC) TVs, computer screens and data projectors.

23.98p is useful in lower light as it increases exposure time.

For **4K DCI** pick: 24p

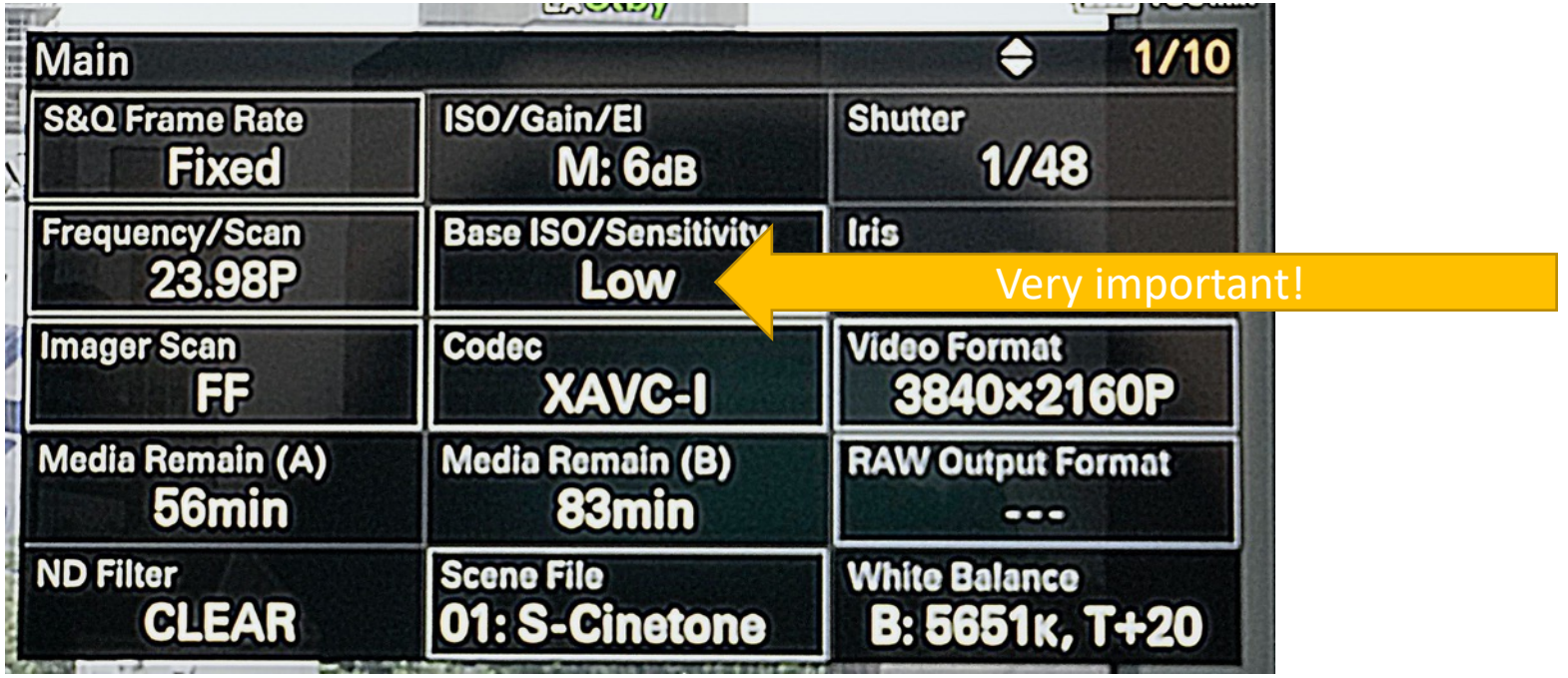
When in **PAL** nations pick: 25p

I consider 59.94p a high NTSC frame rate. I only shoot this as a special effect. You can pick it as a S & Q rate as well. The same thing applies for 50p for our PAL friends. Some people like to use these frame rates for sports/action. They are broadcast standards so they are included with the standard rates.

S & Q frame rates are covered in another section of this guide. These are frame rates higher or lower than the standards. S &Q frame rates **4K**: 1 to 120 fps, **HD**: 1 to 240 fps

Custom Shooting Mode: Main settings

In this image, you can see that there is some duplication of settings from status page 4, the frame rate (frequency/scan), Imager Scan and Codec. But on this page you can set the Scene File, Base ISO/Sensitivity and the Shutter. See next page.



Custom Shooting Mode: Main Settings

Scene File/ S-Cinetone. This is the best choice! More about this later.

Shutter: always set to twice the frame rate: 1/48 for 23.98p and 1/60 for 29.97p.

The **ECS** shutter speeds are for eliminating rolling lines when shooting monitors, screens and projections.

Base ISO/ Sensitivity: there are two choices, Low or High

When shooting in **Custom** mode: the **Low** Base setting is: 320 ISO and the **High** Base setting is 5000 ISO. The higher ISO number is more sensitive to light. See next page for detail.

Custom Shooting Mode: Two Base ISO settings

Most video cameras have one optimal ISO setting that corresponds to the sensitivity of the camera's CMOS imaging sensor. At this setting, the camera is able to get the most dynamic (luminance) range possible out of the sensor.

The FX 6 camera is a dual sensitivity camera so it performs very well at two distinct Low and High ISO settings. There is a slight increase in image noise at the High setting.

When shooting in **Custom** mode, the Base Low sensitivity is the lowest ISO possible on the camera. You can only add ND to cut sensitivity. Always try to start with this ISO setting when shooting outdoors or in bright settings.

Ideally, try to shoot with either the Low or High setting without GAIN or ISO adjustments. **Adjusting ISO or GAIN is the same thing.** See the section on Custom mode: Exposure ISO and GAIN.

Custom Shooting Mode: Selecting a Scene File

When in **Custom(709)** Shooting Mode, there are four preset **Scenes** (looks) to choose from: **Still, Standard, ITU 709 and S-Cinetone**.

S-Cinetone is a new gamma curve and color matrix based on the look of Sony's Venice cinema camera. The look is similar to shooting Slog 3 with the s709 LUT applied.

S-Cinetone is the best preset choice because it has the most highlight information. Exposed optimally, it will provide 11 stops of dynamic range. This means that one image can have details in the shadows and the highlights of the image, a relatively new development in video imaging.

In terms of dynamic range, S-Cinetone sits between the standard Rec.709 Scenes (6 stops) and shooting Slog 3 (15 stops) in Cine EI mode.

The FX line of cameras and the A7sIII and Alpha 1 have the **S-Cinetone** scene.

Custom Shooting Mode: the other Scenes

Still is high contrast Scene with saturated colours. Avoid it! Superficially it can look great but it gives you no room to adjust in post if the exposure is incorrect. Oversaturated colours will also look noisy in the shadow areas.

Standard is a lower contrast, less saturated look than S-Cinetone but with aggressive highlight compression. Extreme highlights can start to have a colour shift.

ITU 709 has more contrast and colour saturation than **Standard** but nowhere close to the extreme look of **Still**. The image looks similar to S-Cinetone in the shadows and mids but both **Standard and ITU 709** lack the highlight details of S-Cinetone. They have around 6 stops of dynamic range.

Standard and **ITU 709** work well in a situation without extreme highlights, a controlled lighting situation.

If none of these scenes match the “look” you want, move on to Cine EI Shooting Mode and shoot in Slog 3 (see the section on Cine EI shooting mode).

Custom Shooting Mode: Exposure

Sony FX 6

Exposure: Base ISO/Sensitivity

As explained in the section on Custom mode settings, the FX 6 camera is a dual sensitivity camera so it performs optimally at two distinct Low and High ISO settings. These settings change with the Shooting Mode. The ISO settings for Custom Shooting mode are in bold, below:

Base Low:

Custom (709) Low: 320 ISO

Cine EI Low: 800 ISO

Base High:

Custom (709) High: 5000 ISO

Cine EI High: 12800 ISO

Exposure: Base ISO/Sensitivity

When shooting in **Custom** mode, Base Low is the lowest ISO possible on the camera. You can only add ND to cut sensitivity. Always try to start with this ISO setting when shooting outdoors or in bright settings.

Ideally, try to shoot with either the Base Low or High setting without GAIN or ISO adjustments.

The FX6 allows you to switch between displaying/adjusting ISO or GAIN on the L,M and H preset switches on the side of the camera.

Adjusting ISO or GAIN does the same thing. It's much easier to use GAIN than ISO. See next page.

Exposure: ISO and GAIN

GAIN is the traditional control on video cameras since video has always used an electronic sensor. GAIN amplifies the signal of the sensor to make the image brighter and this increases image noise. **It's easy to use GAIN because you know that 0 dB will not affect your image.** 3 dB or 6 dB of GAIN will be acceptable.

ISO is traditionally a rating of the sensitivity of a film stock. **ISO** is used in digital photo/videography to preserve a continuity between film stock and electronic sensors. It is convenient to use ISO if you are using a handheld light meter with ISO measurements.

On a video camera, ISO and GAIN adjustments do the same thing: amplify the signal from the sensor.

Most video camera sensors have one sensor rating, one sensitivity. The FX 6 has two: Base low and high. Any ISO setting below or above those two base sensitivities is an adjusted signal.

Always make sure you have no ND filter applied before increasing GAIN or ISO.

Exposure: Gain Preset Settings

Menu/Shooting/ISO/Gain/EI:

This sets whether the **L,M,H** switch on the side of the camera uses GAIN or ISO presets settings.

Change the **Mode** to **dB** for **GAIN.**

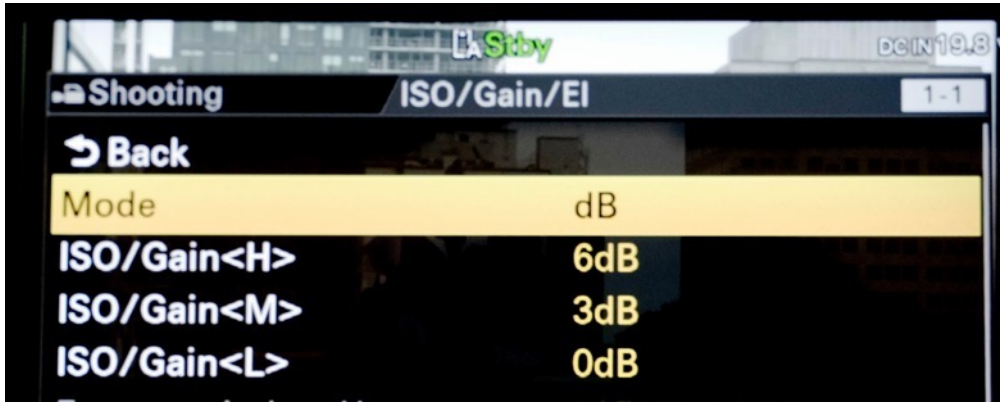
The image on the left shows how I like to set the GAIN presets for the three options.

L must always be **0 dB**.

H should not go above **6dB** of GAIN.

Change to the Base High ISO Setting (5000 ISO) if 6 dB of GAIN is insufficient.

In the Base High setting try not to add any GAIN (or, once again, no more than 6 dB).



Exposure: GAIN settings

3 dB of GAIN has been applied to this shot. The base ISO is low (320 ISO) and the lens is wide open at f 4.5. The best option would be to increase the amount of light on the subject but if this cannot be done, then a small amount or GAIN can be applied. The window has been deliberately overexposed.

Base Low ISO

3 dB of Gain (M preset setting)

Exposure: ISO Preset settings (really important)

Using ISO is more complicated. Look at these examples for Custom Shooting mode:

When using ISO at the Base Low setting (320 ISO), try not to amplify the signal to more than double the base ISO: 640. 800 ISO can look OK too.

When using the Base High setting (5000 ISO): try not amplify at all or beyond 10000 ISO.

There is a point where amplifying the Base Low signal (320 ISO) makes the image look noisier than switching to the Base High setting (5000 ISO) even if you need to add a ND filter to that Base High exposure.

Changing the ISO to 5000 when in the Base Low setting is **NOT** the same thing as switching to the Base High (5000 ISO) setting. Increasing ISO on the Base Low to 2500 ISO creates **much more image noise** than switching to the Base High setting even though the Base High setting is 5000 ISO. The Base High setting looks incredibly good!

Exposure: Changing GAIN and ISO in smaller increments

The L,M,H switch provides an easy way to change your GAIN or ISO in presets but you can also change in smaller increments using the direct menu.

The ISO/GAIN button on the side of the camera will allow you to adjust in smaller increments in the direct menu.

The GAIN or ISO rating will highlight in the display.

This actually changes the preset setting for whatever preset you are on at the time of the change: L, M or H.

Exposure: Judging Image Noise

Be strict about your use of GAIN or ISO for optimal image quality.

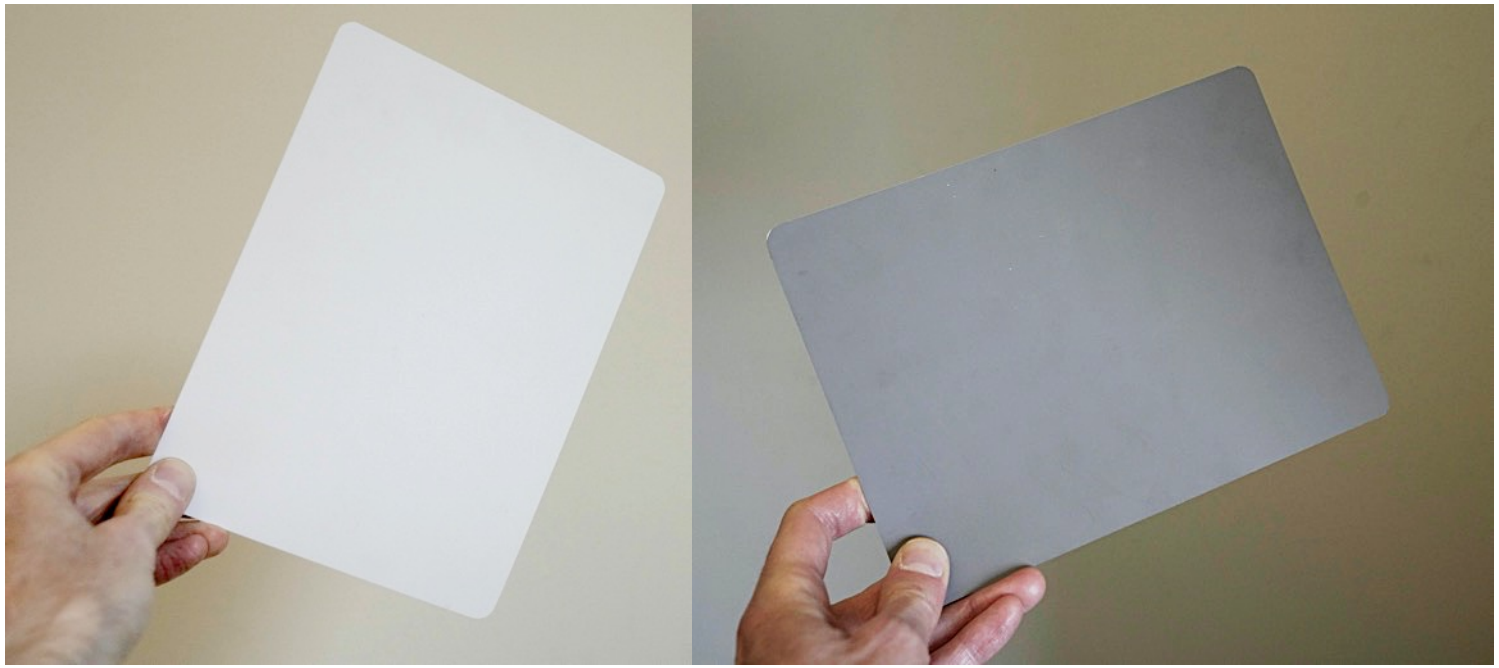
You cannot judge image noise in the 720p LCD viewfinder. It is too small.

Image noise appears first in the shadow areas of an image.

If you are working in a studio consider attaching a large HDMI screen to the camera to judge noise. This is critical when shooting green screen backgrounds.

Exposure: White/Gray card

A really useful item, that you can purchase cheaply at a camera shop, is a white/gray card.
It is a 90 percent white card and 18 percent (middle gray) gray card.
The white side reflects 90 % of the light hitting it and the gray card only reflects 18 %.
Both sides can be used for setting exposure and the white side for white balance.
The gray side provides the camera with a neutral low contrast subject for an accurate exposure reading.



The 18 percent gray card appears in the middle (roughly at value 50) of the waveform monitor when exposed. This is because our sensitivity to light is logarithmic.
Different LUTs or Scenes will demand different exposures.

Exposure: Manual White Balance

Once your Shooting mode, Scene, Base sensitivity and Shutter speed are set, set the White balance.

To perform a manual white balance, switch the setting on the side of the camera to **A or B.**

Set the iris exposure to auto (in the direct menu) or expose correctly and hold a white card in front of the lens. Try to fill the frame with the white card but allow light to fall on it.

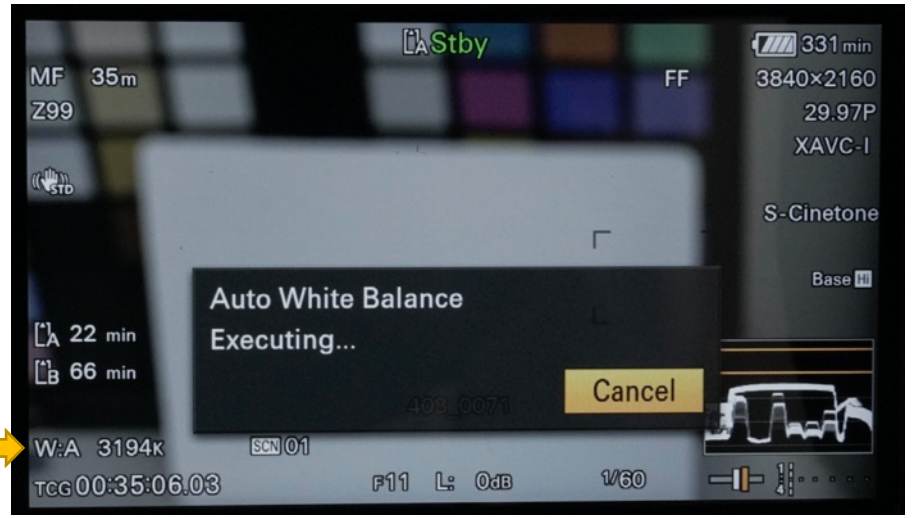
Press the **WB SET** button on the front of the camera. It will take a few moments for the white balance to be executed.

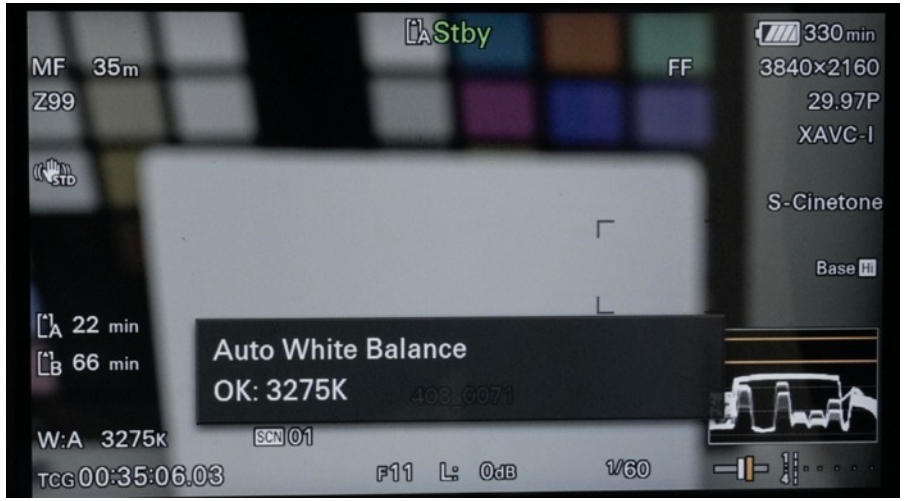
Exposure: White Balance

You must perform a white balance each time your lighting source changes.

The colour temperature remains stored in the **A or B** setting and is indicated in the display.

As an aside, note the information in this display: 4K UHD at 29.97p, Full Frame, XAVC I, Custom shooting mode with S-Cinetone scene, Base High sensitivity, 1/60th shutter speed and no GAIN applied. This is a good setup.





Exposure: Preset White Balance

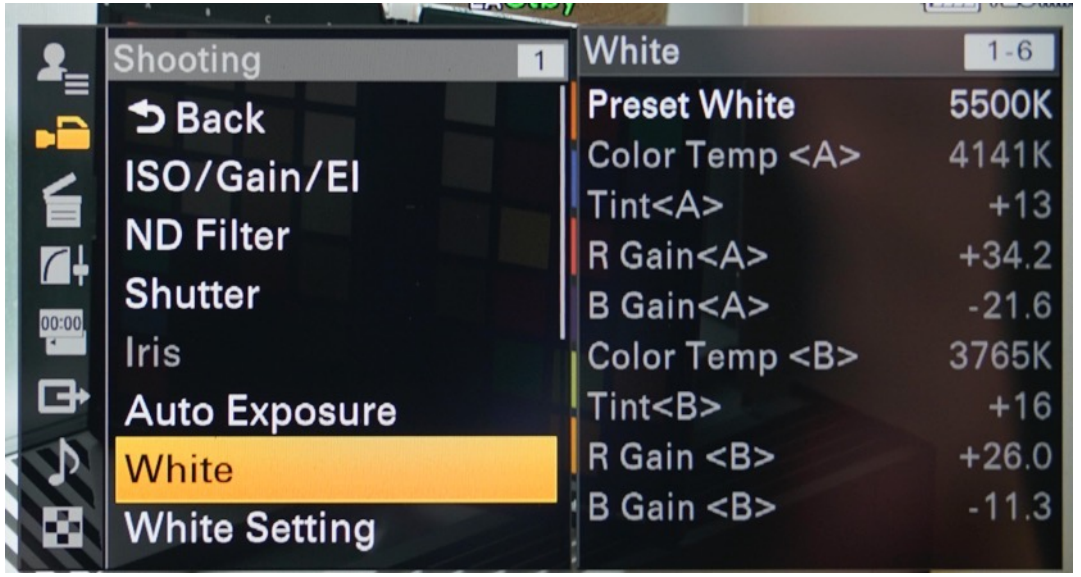
Turn the switch on the side to **Preset.**

Go into the **Full menu: Shooting/White/Preset White** and set the color temperature to your liking.

Common Color Temperature Settings:

LCD monitor: 6500K
Daylight (at mid-day): 5500 K
Florescent indoor: 4300K
Tungsten Indoor light: 3200K

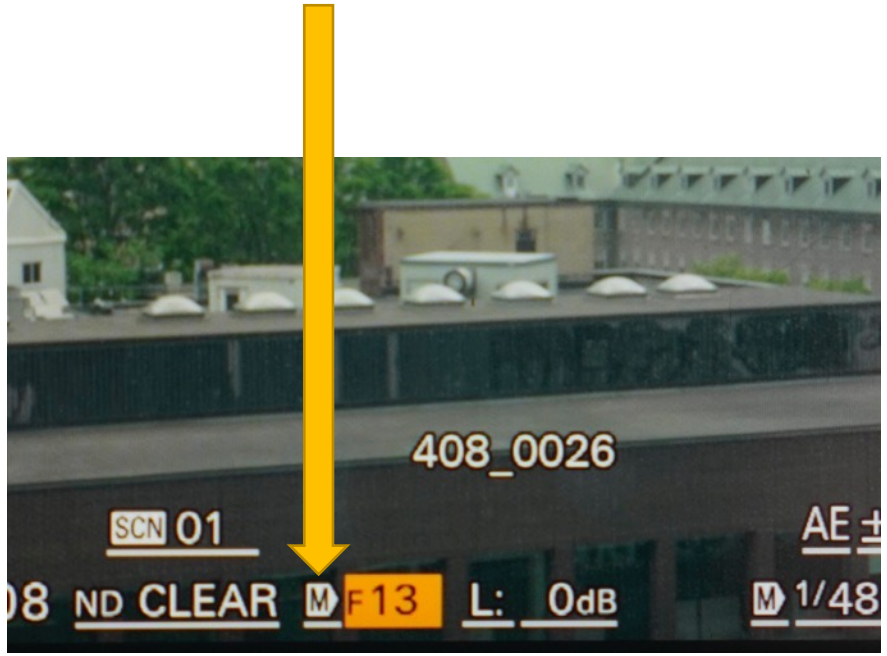
Street lights (not LED) : 3200K
Incandescent indoor light: 2500K



Exposure: Iris control

Manual control of the iris (aperture) can be quickly performed by pressing the iris button on the side of the camera and then using the wheel on the handgrip, handle or dial on the front of the camera.

Shifting slightly to the left with the multi-selector or dial will highlight the M next to the iris setting. Change this to A for auto exposure.

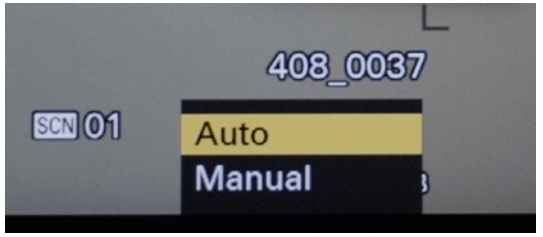


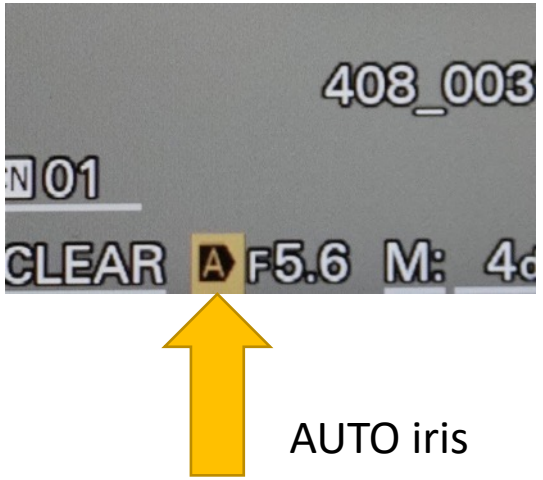
Exposure: AUTO Iris

There is no “one button” AUTO exposure mode with this camera but that is not a bad thing!

When shooting video we don’t want the camera to randomly change shutter speed since this will change how motion appears. The shutter should remain at twice the frame rate unless you want a motion special effect. Don’t automate the shutter!

With video, auto exposure should ideally control the iris. Put the IRIS on AUTO in the direct menu for this to happen.





AUTO iris

Exposure: AUTO ND instead of AUTO Iris

Another good option is to automate the ND filter instead of automating the iris.

ND filters are used to cut light to the sensor. They are mostly used when you cannot lower the exposure in any other way. Make sure that you never have any GAIN applied before using ND filters.

Using ND filters does not affect image quality at all.

Using a ND filter can also allow you to select the manual iris setting you want for the desired depth of field, not an iris setting that is dictated by the exposure. This method works well because this camera is able to apply incremental amounts of ND.

There are three ways to use the ND filters: **preset, variable and auto.**

Exposure: ND Presets

The traditional way to work with ND filters is by selecting a preset. There is a section for ND on the side of the camera.

Turn **ND ON**

Press **ND AUTO** button until it goes off (if a light was on).

Switch to **ND PRESET**: this allows you to toggle between the three ND preset settings (made in the Full Menu/Shooting menu/ND Filter).

Pressing the **ND ON +** will cycle up through the three presets

Pressing the **CLEAR –** will cycle down through the three presets and also allow you to choose CLEAR (no ND filter).

When no ND is applied, a light will appear on the **CLEAR** button.

Exposure: ND Presets

The ND preset settings can also appear in the display and can be changed with the direct menu as well.

Changing presets in the middle of a shot will be noticeable. Don’t do it.

Presets are not the best way to work with ND. Read on.

Exposure: Variable ND filter adjustment

This is the best way to work with the ND filters. Sony developed this technology.

Press the **ND ON** button

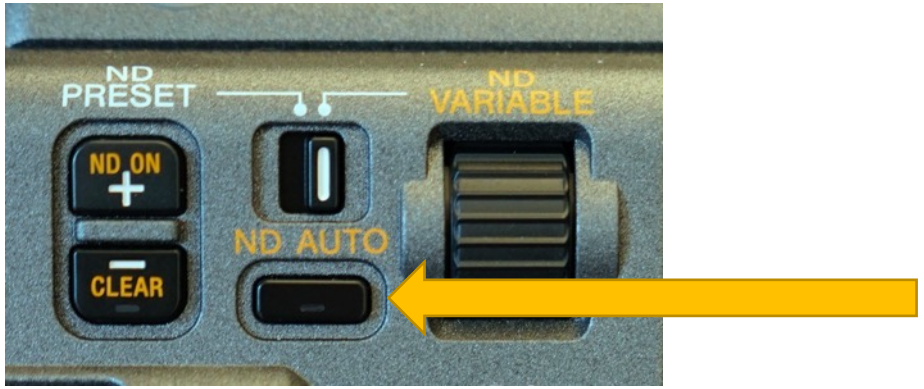
Turn the ND switch to **ND Variable** and then adjust the dial.

This way you can maintain the manual iris setting you want while applying incremental amounts of ND. You can also make ND adjustments while shooting.

The ND AUTO is even more helpful (next page).

This dial becomes your exposure control.

Exposure: ND Auto



The best way to maintain a consistent manual iris setting is to use ND Auto.

Keep the iris on Manual.

Press the **ND ON** button, switch it to **ND Variable** and then hold down the AUTO ND button until **AUTO ND** appears in the LCD display. A light goes on the button as well.

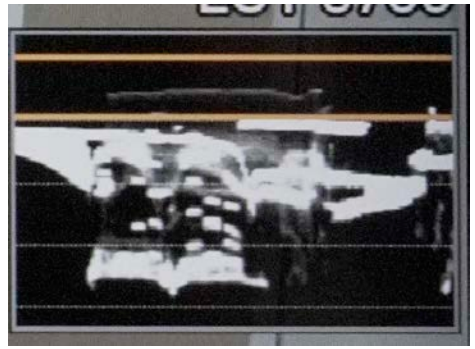
Now the camera will vary the strength of the ND filter automatically to maintain your chosen iris setting (providing of course that your iris setting is overexposing the image). In AUTO ND, **the lowest option is ¼.** It does not go to ”clear”. You always have some amount of ND filter applied.

The display will warn you if the light is low (meaning that you are underexposing by having the ¼ ND applied).

Exposure: the Waveform Monitor

I don’t tend to display the vectorscope or histogram in the VF. But I often use the waveform monitor.

The waveform monitor shows luminance values in the image. It can be read from left to right, exactly like the subjects in the image.



The lines on the waveform monitor from bottom to top are:

0, 25, 50, 75, 100.

0 is black and 100 is white.

The monitor shows values above 100 to 109, these are overexposed areas of the image. Values below 0 are invisible.

Because the waveform monitor is so small in the VF, it helps to use Zebra levels to hit precise targets.

Exposure: Zebra

Zebra stripes and levels are used to judge overexposure.

They can be turned on with Zebra button on the side of the LCD. Striped lines appear over the image to indicate overexposure at 100 percent IRE or at another value.

Button 9 turns on the waveform monitor (or histogram or vectorscope as you keep pressing it) in the display.

The zebra level settings (there are two) will appear in the waveform monitor as yellow lines.

If you turn on the stripes in the Zebra menu (next page), they will appear over the image. I usually avoid this.

Exposure: Zebra Stripes

Menu/Monitoring/Zebra:

There are two Zebra levels. Zebra 2 level should always be at 100 percent to judge overexposure.

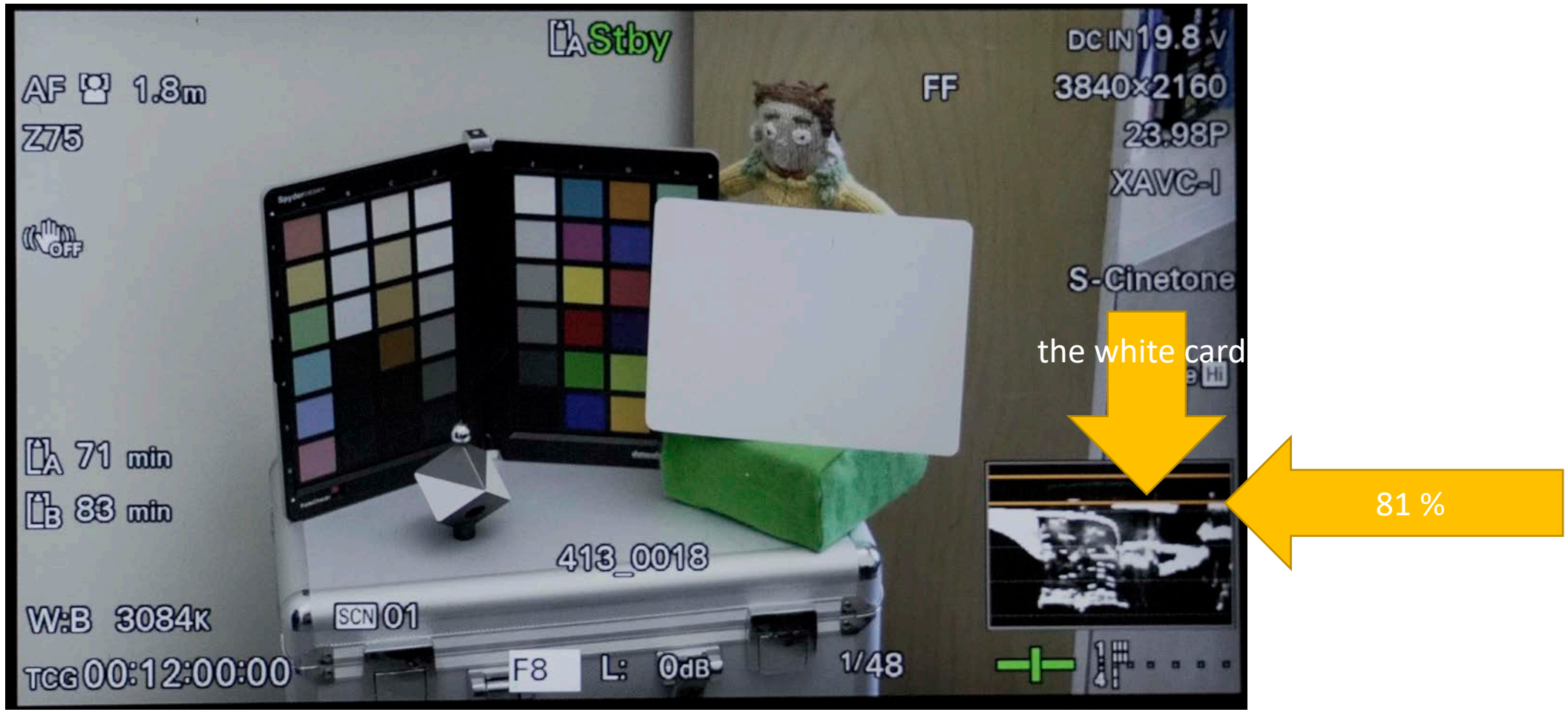
But Zebra level 1 can be set to another amount to judge exposure.

For example, here I have set level 1 to 81 percent for exposing a white card in Custom shooting mode using the S-Cinetone scene.

The Setting “Off” refers to Zebra stripes appearing over the image.

Exposure: Zebra Level

In this image, the white card is being exposed at 81 percent.



Exposure: S-Cinetone Exposure

With the **S-Cinetone** gamma curve, contrast changes occur with exposure: contrast increases in the shadows and decreases in the highlights (starting at 70 IRE).

Underexposing will create an more contrasty image, and overexposing will create a less contrasty, more subdued, image.

You can judge exposure simply by looking in the viewfinder. However, it can be useful to use Zebra level settings, as I just illustrated, to help determine exposure.

The next page offers some suggestions for exposure.

Exposure: S-Cinetone Exposure

For a slightly underexposed image, Alister Chapman suggests exposing a white card at 81 percent.

The white card can be exposed as high as 88 percent and as low as 78 percent on the waveform monitor.

Skin tones can be exposed as low as 60 percent and as high as 70 percent.

It is much easier to use a white card to judge exposure manually than skin tones.

Auto IRIS exposure will also work well with S-Cinetone. You can add an adjustment to autoexposure if you wish.

Expsosure: S-Cinetone Exposure

This image was exposed in a mixed lighting situation in Custom Shooting Mode with the S-Cinetone scene. Middle range skin tones were exposed at 65 percent on the waveform monitor.

Avoid overexposing or blowing out highlights, especially on skin tones. There are tools to diffuse lighting in the EV Depot. Look a the “Light Disks, Scrims and Flags” section in the Patron Portal.

Don’t just borrow lights. Borrow the equipment to diffuse the light if necessary.

Focusing

Sony FX 6

Focusing: Manual, Hybrid and Total Auto

With the Sony kit lens (or other Sony lenses) working in conjunction in the camera, there are three possible focus “modes”: manual, hybrid, and total auto.

Leaving aside the “total” manual option, because it is largely redundant, this section will concentrate on the Hybrid and Total Auto Focus modes.

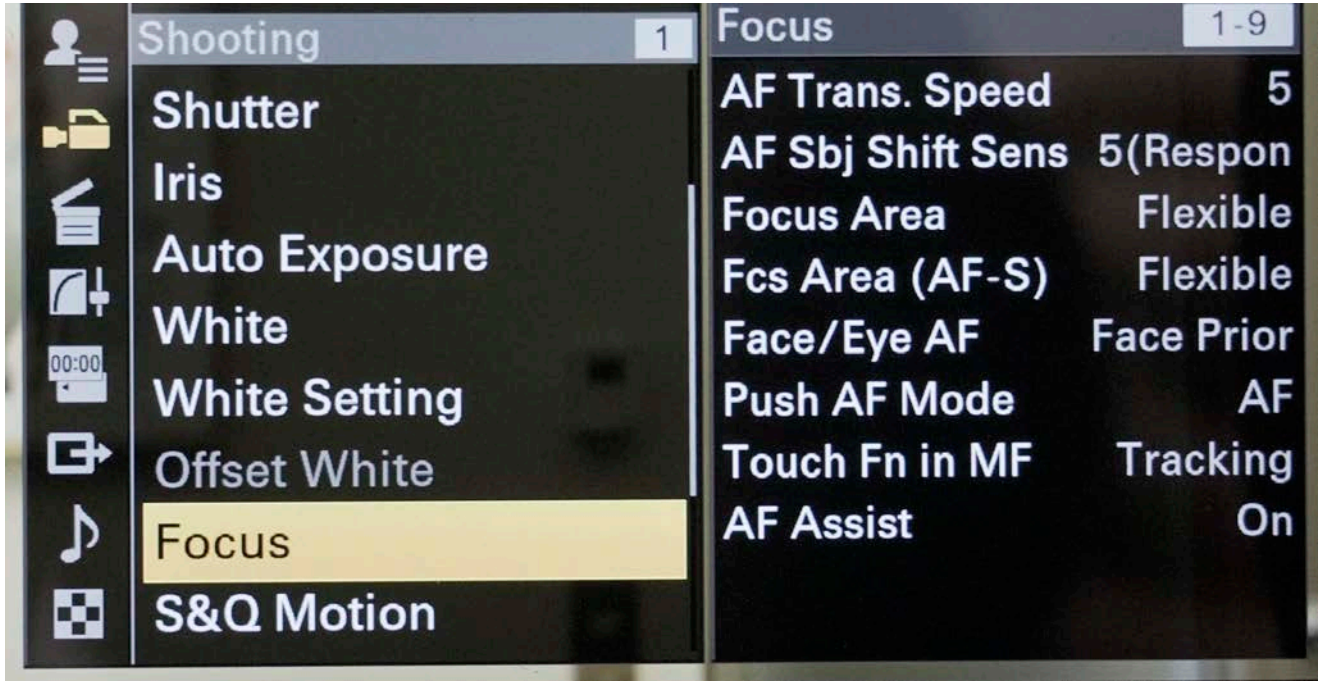
Hybrid mode focusing allows you to easily switch between manual and auto focus. There is no other camera where this switch is so intuitive!

In **Total Auto Focus**, manual focus is technically possible, but not practical. The focus tracking option is quite different in this mode.

Both modes have their uses, but the Hybrid mode is the most flexible.

Focusing: Menu Settings

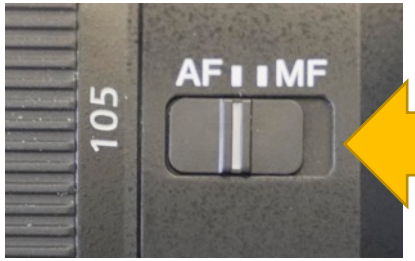
Here are the menu settings in **Menu/Shooting/Focus** for the options discussed in this section. There are many more options but I am concentrating on one method. I will look at some of these settings in detail but take the time to enter these settings if you want to follow this method.



Focusing: Hybrid Focus

In **Hybrid** mode, leave the lens on AF and change the focus switch on the front of the camera to MAN.

You can focus manually with the focus ring on the lens and also use the PUSH AUTO button when you want to auto focus.



Lens on AF

Focus switch on MAN

Push for Auto focus.

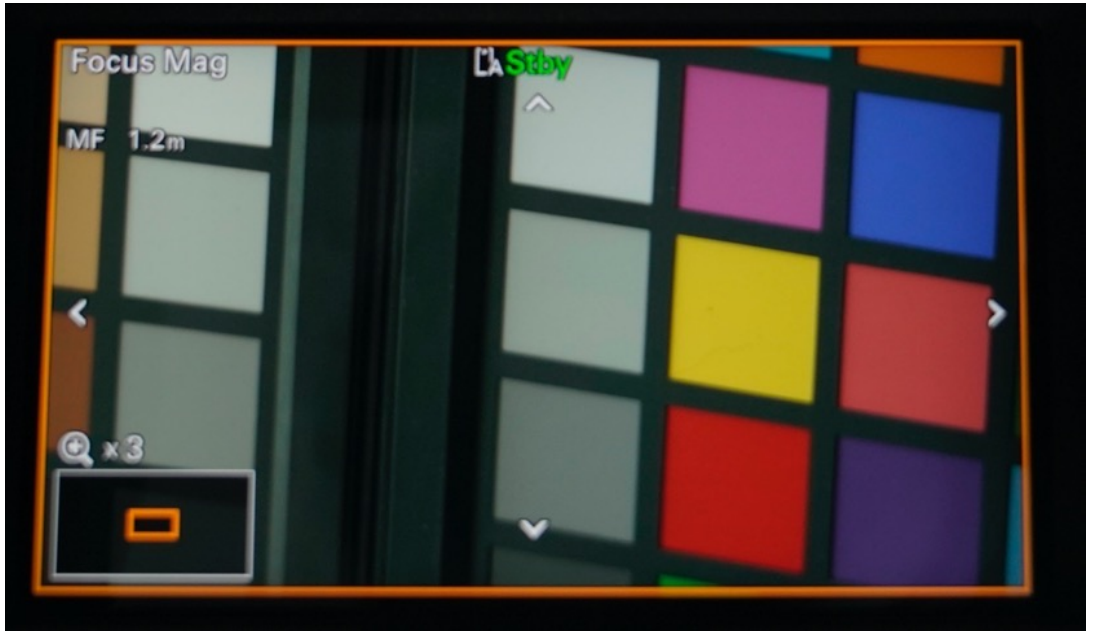
Focusing: Manual Focus

In **Hybrid** mode, simply turn the focus ring on the lens to begin focusing manually.

There are two aids to help.

Button 7 on top handle enables the focus magnifier in the VF. Push twice to increase magnification.

The Focus Peaking button is on the side of viewfinder (VF), if you prefer that aid.



Focusing: Total Auto Focus mode

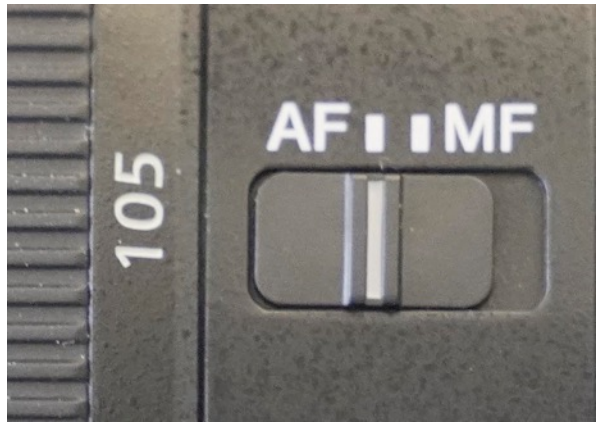
If you have the lens on **AF** and the Focus switch on the camera on **AUTO**, then you are in **TOTAL AUTO FOCUS**.

In this mode, it is not practical to manually focus. You can push the PUSH AUTO button on the front of the camera to temporarily enable manual focus but as soon as you stop pushing it, the camera goes back to auto focus. It is not practical to keep holding down this button to manually focus.

So, this mode is for auto focus only.

AUTO on camera.

AF on lens.



Focusing: Two Types of Auto Focus

With the menu/shooting/focus settings, that I showed on page 84, **there are two types of auto focus**: flexible spot auto focus and auto focus tracking.

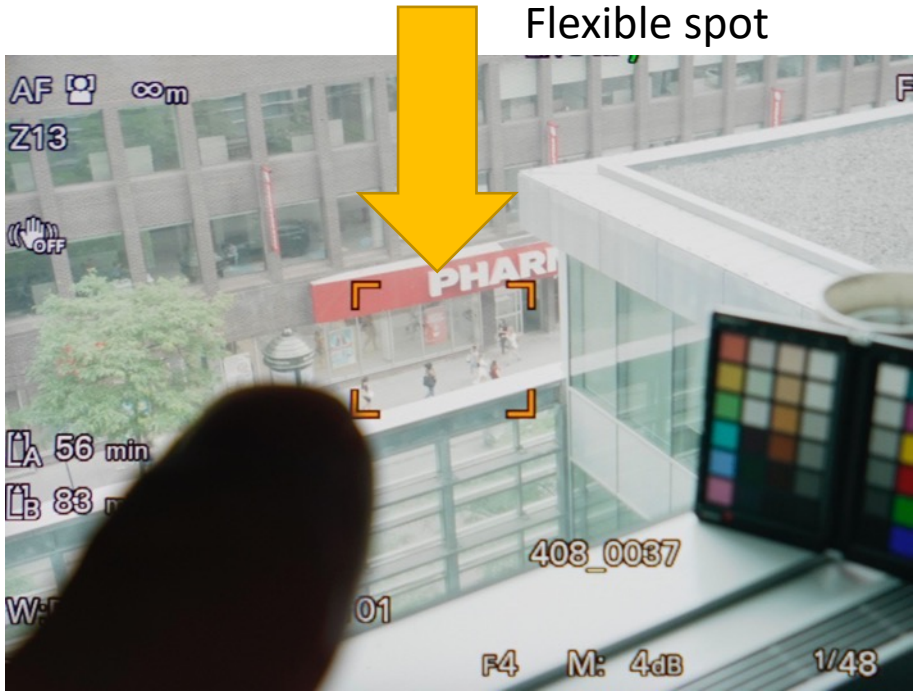
Button 3 on the side of the camera toggles between the two auto focus types, flexible spot and focus tracking, whether you are in Hybrid or Total Auto Focus mode.

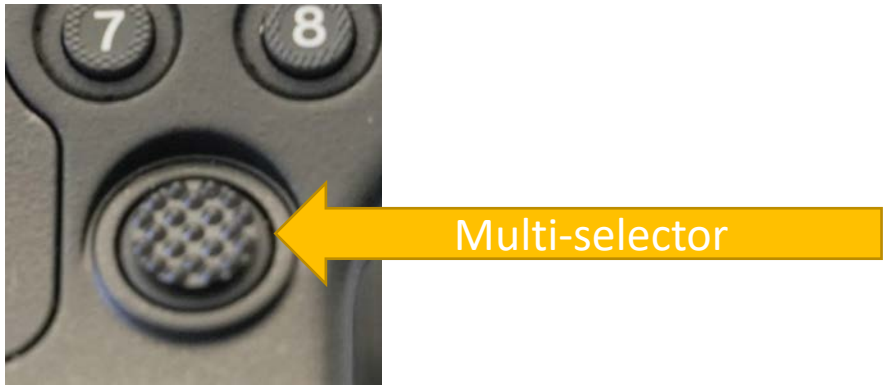
Focusing: Flexible Spot Auto Focus

Pressing button 3 will highlight the focus area. It will appear as an **orange square**.

This **flexible spot** can be moved with your finger on the LCD screen or simply tap the screen to move it to a different part of the image.

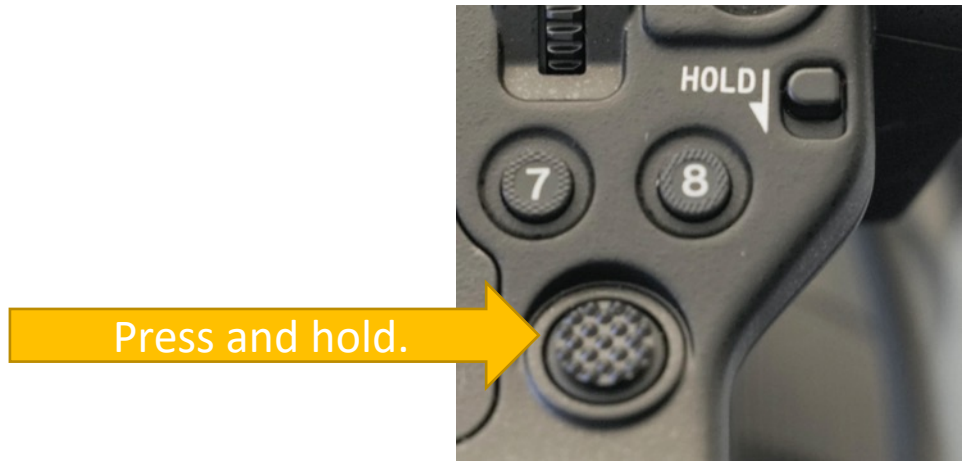
You can also adjust this **flexible spot** with the multi-selector on the top handle or hand grip.





Focusing: Default Flexible Spot Area

Menu/Shooting/Focus/Focus Area (AF-S) sets the default target area for the flexible spot in auto focus and PUSH AUTO. But if you move the flexible spot with your finger it stays at the last spot. It does not return to this default location unless you press and hold one of the multi-selectors on the camera (handle or the grip). I like to set the default location at the centre of the image.



Focusing: Other focus area options

The **Menu/Shooting/ Focus/Focus Area** specifies the target for the auto focus operation (and PUSH AUTO focus in Hybrid mode).

By default it is set to **Wide**. This is the least precise option.

You can also specify a **Zone**, that is somewhat more precise. Specifying a zone might be a good idea when filming a stage, for example, where all the subjects are on the same plane.

But, I am recommending using a **Flexible Spot** because usually there is a single subject that is the centre of your focus.

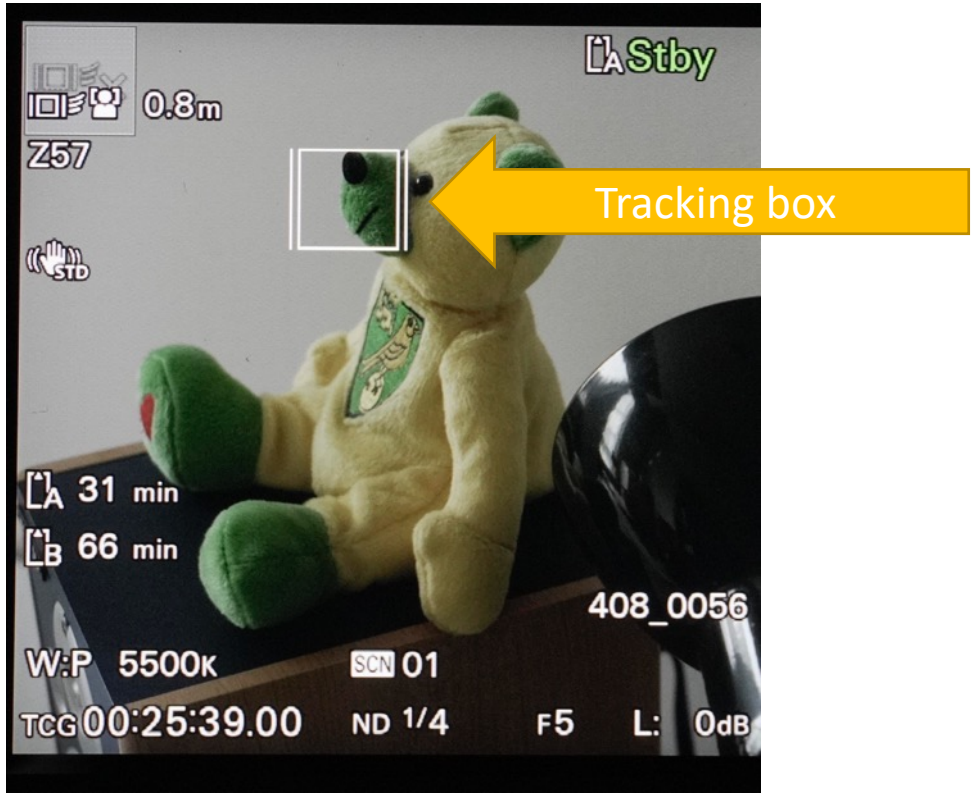
Focusing: Auto Focus Tracking

The second type of auto focus is auto focus tracking.

To **auto focus track objects,** you first have to exit the flexible spot auto focus by pressing button 3. When the flexible spot square is not orange, then you have exited that type of auto focus.

Now, simply press on an object on the touch screen. A **white box** will appear on it. The box should remain with the object as it (or the camera) moves. This is the tracking box.

You can select another object on the touch screen to begin tracking that new object.

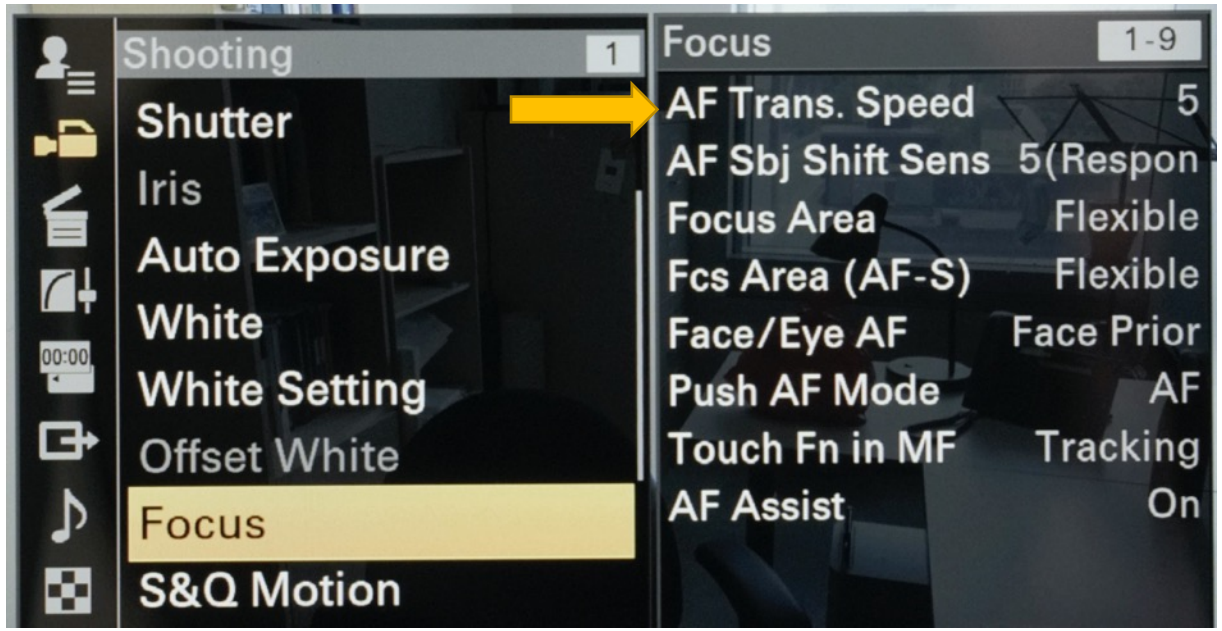


Focusing: Auto Focus Tracking AF Trans. Speed

The **Menu/Shooting/Focus/AF Trans. Speed** determines how quickly the focus changes from one object to another when you select that new object in the touch screen.

A faster setting is good for sports. A slower setting is good for a “pull focus” effect.

Caution: if another object comes in front of the object that you are tracking, the camera will change focus and start to track that object.



Focusing: Difference in Auto Focus Tracking when in Hybrid Focus and Total Auto Focus

There is a major difference between auto focus tracking in hybrid focus mode and total auto focus mode.

The settings I have chosen in Menu/Shooting/Focus give you a choice of how you want to handle the auto focus tracking by selecting Hybrid or Total Auto focus.

Menu/Shooting/Focus/Face/Eye Priority AF: with this selected (this is the default setting), the camera will automatically track faces and eyes in the frame when in TOTAL AUTO FOCUS. People will automatically become the “focus”.

See the next page for a more detailed explanation.

Focus Tracking: Difference between Hybrid Focus and Total Auto Focus

In **hybrid** focus mode, the camera can track **any object** and the focus will remain on that object.

In **total** auto focus mode, **faces and eyes have priority**. You can initially track any object but as soon as a person enters the frame, the camera will **automatically** shift focus to their face and eyes.

In **hybrid** focus mode, any object can be tracked and will remain being tracked, even if a person walks into the shot. Only if a person wanders across the tracked subject, does the auto focus tracking shift to the person.

A **white square** hovering over the object will show who/what is being tracked.

Focusing Recap: Two Auto Focus Types

When you see the orange square in the VF then the camera is in flexible spot auto focus, or, if you like, the regular auto focus with the flexible spot option chosen.

When you see the white square following an object, or the white squares following a person's eyes, then the camera is in auto focus tracking.

Be careful. If you see a white square following a person but in addition an orange square then the camera is in total auto focus mode, but still in the flexible spot auto focus. It is tracking the person, but not applying the tracking data. It is not changing the focus to that person. There should be no orange square in the VF when in auto focus tracking.

Press button 3 on the side of the camera to exit flexible spot auto focus and then press on the subject/object to track with your finger on the VF.

Cine EI Shooting Mode: Settings and Exposure

Sony FX 6

Cine EI Shooting Mode

Most of the previous section on Custom Shooting Mode Exposure applies to Cine EI mode.

The controls for iris, white balance, and ND filters are the same.

However, Cine EI is for exposing Slog 3 images so there are differences in how you arrive at the optimal exposure.

The two Base Sensitivity ISO ratings are different from Custom mode.

It is not possible to do GAIN and ISO changes in Cine EI mode, instead you can use EI ratings to generate an ”offset” on the exposure while using a LUT.

Cine EI is for shooting Slog 3

Exposing Slog 3 in Cine EI mode is different from how you may have exposed Slog 3 in other “non-cinema” Sony cameras.

This section goes through the details of how to expose Slog 3 correctly with the FX6.

If you are not familiar with the concept of LOG video look at these resources:

part five of the CDA Video Compression Moodle workshop for a detailed explanation of LOG video.

part six of the CDA Video Colour Correction workshop for how to normalize LOG clips inside Adobe Premiere, although this guide covers this topic briefly.

All Concordia Fine Arts students are enrolled in these Moodle courses. Look for them on your Moodle dashboard.

Cine EI is for shooting Slog 3

Cine EI shooting mode is for exclusively shooting Slog 3.

Slog (pronounced “S Log”) is Sony’s LOG format which has (optimally) 15 stops of dynamic luminance range, preserving detail in shadows and highlights.

Why shoot in Slog 3?

1. You have a subject that has very bright highlights and dark shadows and you need details in both of those luminance areas.
2. You want video images that have a more natural, or low contrast look.
3. You want the maximum control over how the image looks in postproduction and you have the time to spend on this task.
4. You are **not** shooting in a situation of consistent low light (no highlights at all). In such a situation, Custom mode using the **Standard** and **ITU 709** Scenes is preferred.

Cine EI: Slog 3 and LUTs

Slog video images must be “normalized”. They appear low contrast on more linear displays (like TVs and computers) as they perceive brightness in a logarithmic way, the same manner as our eyes.

The quickest normalization method is by applying a LUT, a look-up table: a file with a .cube extension that will apply color and contrast transformations to the file. LUTs can be applied in camera, in an external monitor or in postproduction software.

Usually, but not necessarily, you use the same LUT to monitor in production that you use to correct the image in postproduction.

Cine EI: Slog 3 and LUTs

The great advantage of shooting Slog 3 with the FX6 (rather than the FS5 or Z90) is that you can import a LUT or use one of the built-in LUTs to correct the image in the viewfinder (and the SDI and HDMI outputs).

Working with a LUT makes exposing the image much easier.

In this section, we will look at three options:

1. **exposing Slog 3 with the built-in s709 LUT.**
2. **importing custom LUTs**
2. **exposing Slog 3 without a LUT.**

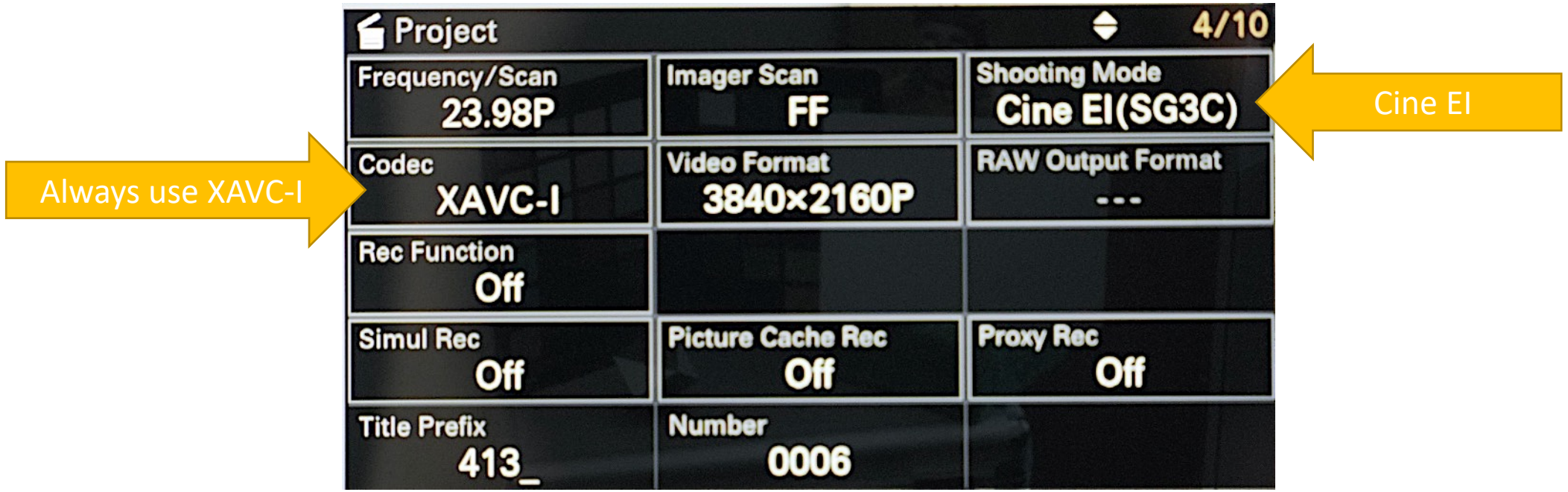
Cine EI Option One: Exposing Slog 3 with the s709 LUT

Sony FX6

Cine EI: Project Status Page Settings

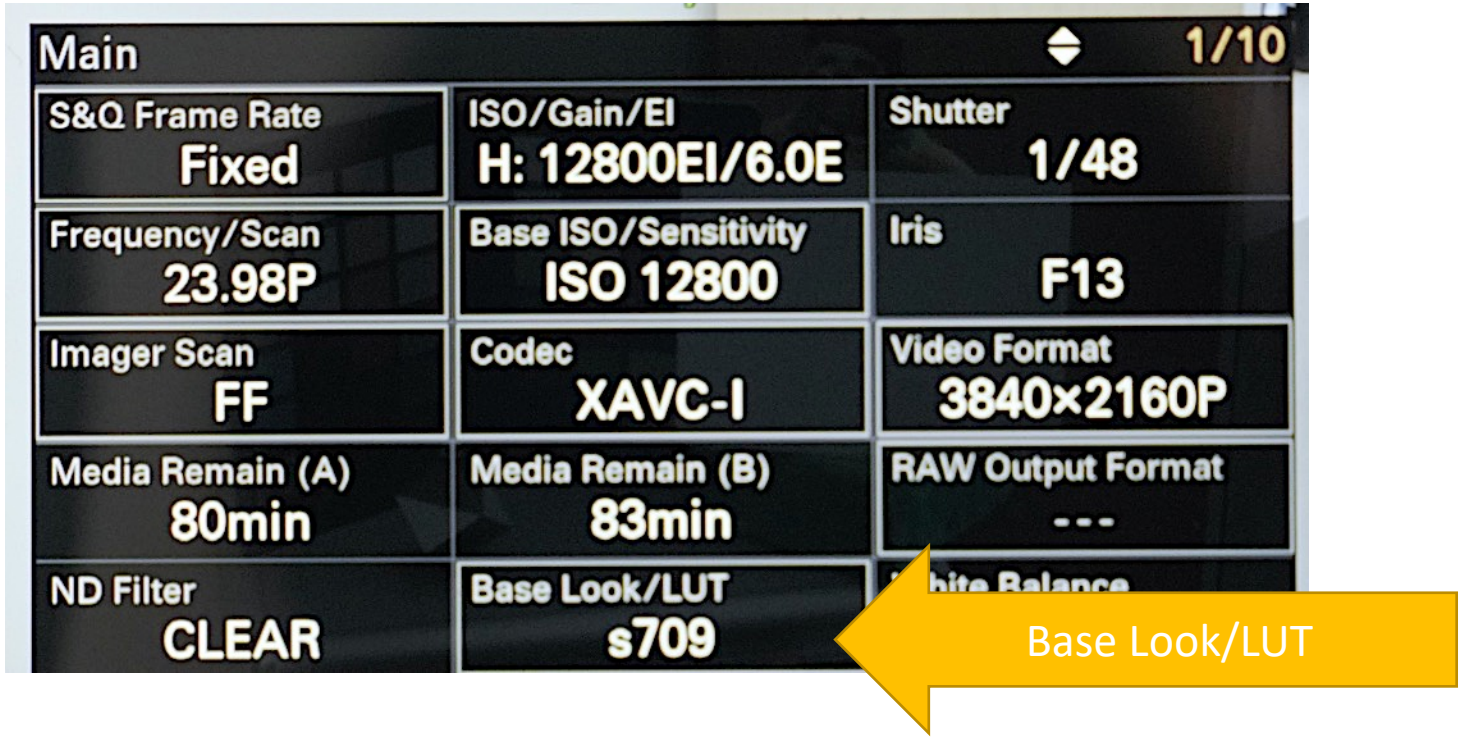
In **Menu/User/Base Setting** pick **Cine EI** as the shooting mode.

You can also go to status page 4 and change the shooting mode to Cine EI. Always choose the XAVC-I codec in Cine EI.



Cine EI: choose the built-in s709 LUT

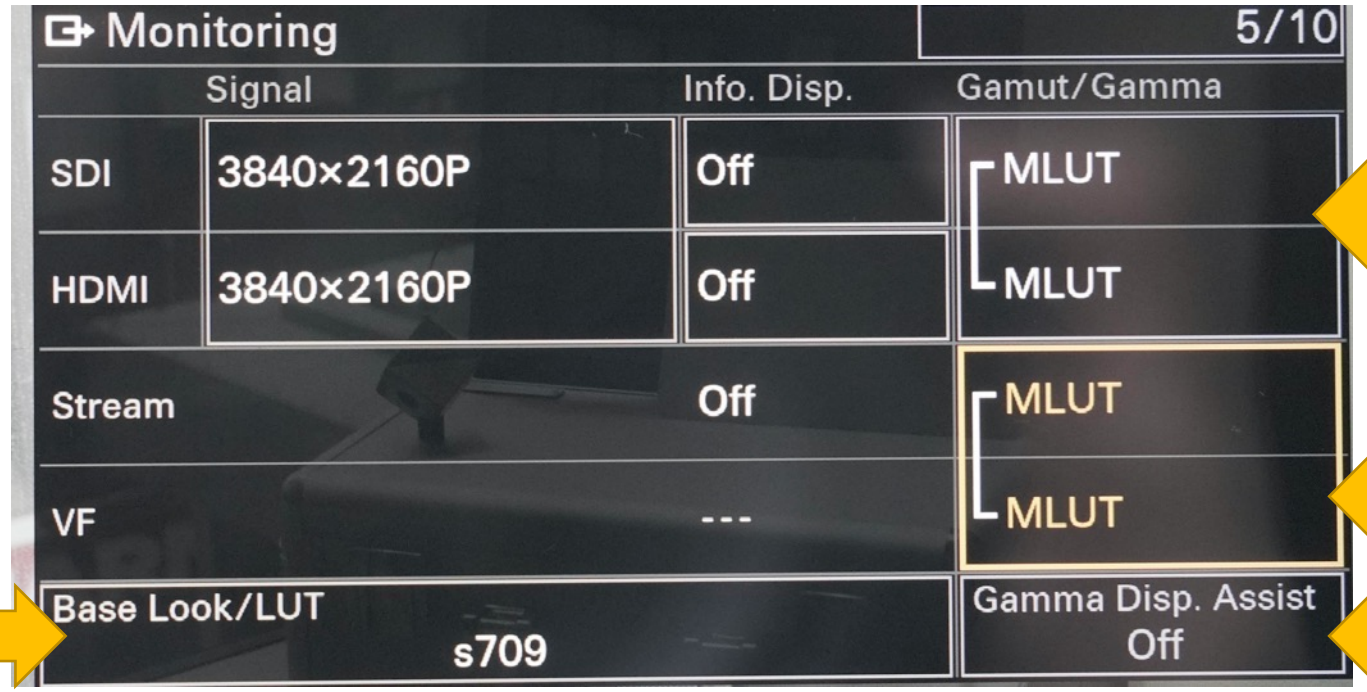
Choose the **s709** LUT on status page one. This is the default LUT.



Cine EI: Turning on a LUT in the viewfinder

Go to status page 5 to turn on the LUT for the viewfinder and the SDI and HDMI outputs.

Always turn on the LUT for the SDI/HDMI outputs when you are using the LUT in the viewfinder (even if you are not using an external monitor or recorder). **MLUT** means the selected LUT is turned ON. Make sure Gamma Disp. Assist is OFF.



LUT on outputs

LUT on viewfinder

You can also choose the LUT here.

This should be OFF

Cine EI: Turning on a LUT for the viewfinder (VF) VERY IMPORTANT!

It helps to use the waveform monitor in the VF to judge Slog 3 exposure. The waveform in the VF measures the output from the SDI and HDMI outputs, even if there is no recorder or monitor attached.

So, to avoid confusion, even if you are not using an external recorder, **turn on the LUT for the SDI and HDMI outputs if you are turning on a LUT for the viewfinder.**

This will ensure that signal measured in the waveform monitor corresponds to what you are seeing in the viewfinder: the normalized image from the s709 LUT.

Cine EI: Turning on a LUT for the viewfinder

From top to bottom on the right hand side of the display it is indicated that you are recording in Slog 3 (because the camera is in Cine EI mode), that you have the s709 LUT applied (the selected LUT) and the waveform is measuring the signal adjusted by the s709 LUT because you have a LUT turned ON for the SDI/HDMI outputs.

What is being recorded: Slog 3

s709 LUT applied to VF

Signal measured by waveform

Cine EI: Slog 3 exposure with the s709 LUT

With the s709 LUT applied, you can judge the exposure by eye in the viewfinder.
For more accurate exposure, follow these instructions from Alister Chapman:

expose a white card at 77 percent or
expose a gray card just below 50 percent.
(Chapman says 41 percent for the gray card but I found this too bright.)
To make these values appear as a line in the waveform monitor change this setting:
Menu/Monitoring/Zebra/Zebra level 1 (see next page).

The above levels are for a proper photographic 90 % white, 18 % gray card.
White paper is brighter than a 90 percent white card so expose white paper at 81 percent.
These numbers only apply to the s709 LUT. Different LUTS require different exposures.

Cine EI: Slog 3 exposure with the s709 LUT

Here is the setting in **Menu/ Monitoring/Zebra**.

Zebra Level 1 is set to 77 percent.

A line will appear in the waveform monitor at the 77 percent level.

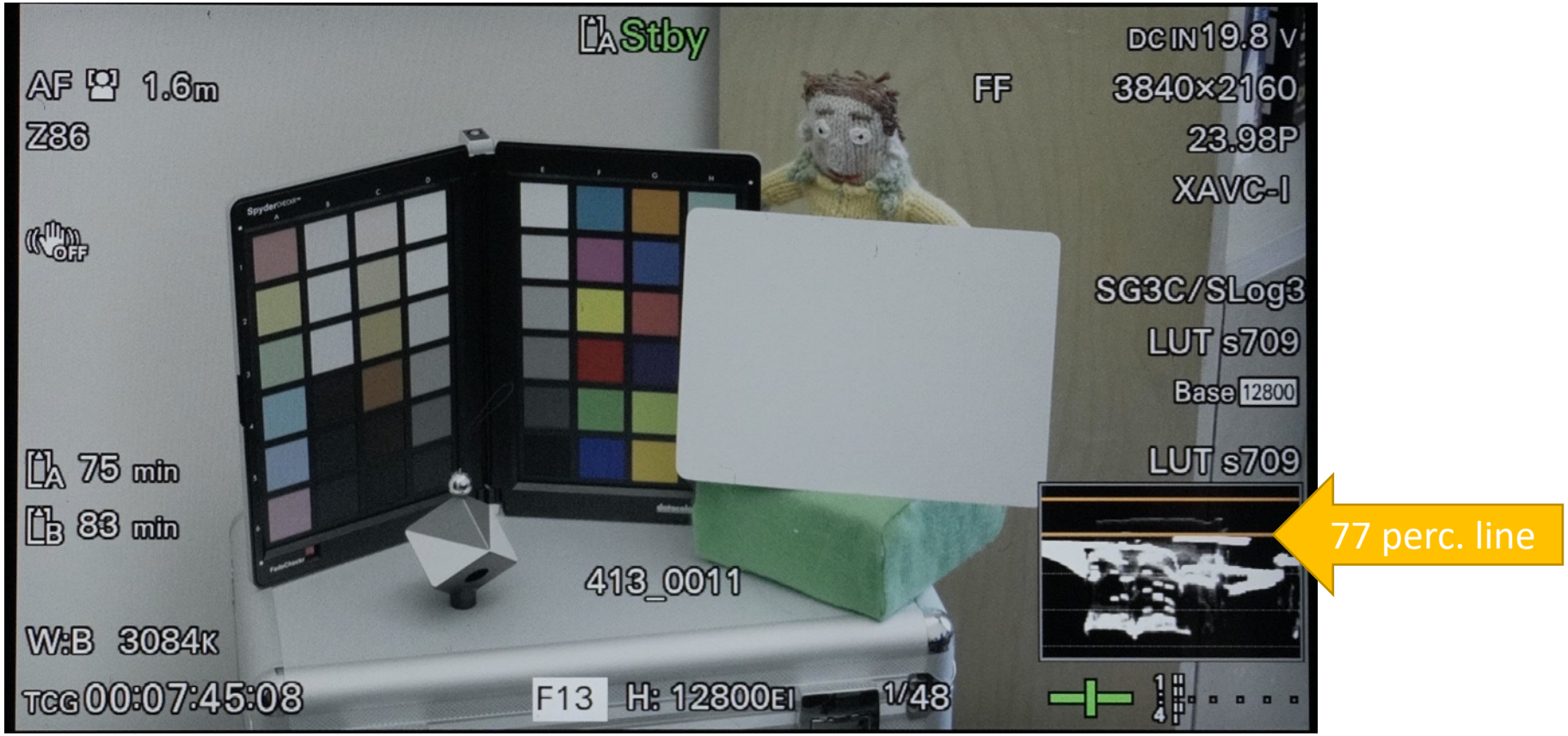
I keep Zebra 2 Levels at 100 percent to judge overexposure.

The “Setting” option determines the zebra stripe overlay on the image. Here it is the zebra 2 level.

You can also turn this setting off for no overlays.

Cine EI: Slog 3 exposure with the s709 LUT

In this image the white card is lined up with the 77 percent line in the waveform monitor. This is the optimal exposure for Slog 3 with the s709 LUT applied.



Cine EI: Base Sensitivity and EI

When you are exposing Slog3 images with a LUT applied, **it is easiest** to keep the EI preset at the same value as the base sensitivity ISO value.

In the image you can see that the Base High Sensitivity ISO and the EI preset value are the same: 12800. However, you can make adjustments. Read on.

Cine EI: What is EI?

ISO is the camera's sensitivity to light. The camera has two ISO (Base Sensitivity) settings in Cine EI: Base Low (800 ISO) and Base High (12800 ISO).

You cannot change the ISO (or add GAIN). The ISO will always be one of these two settings.

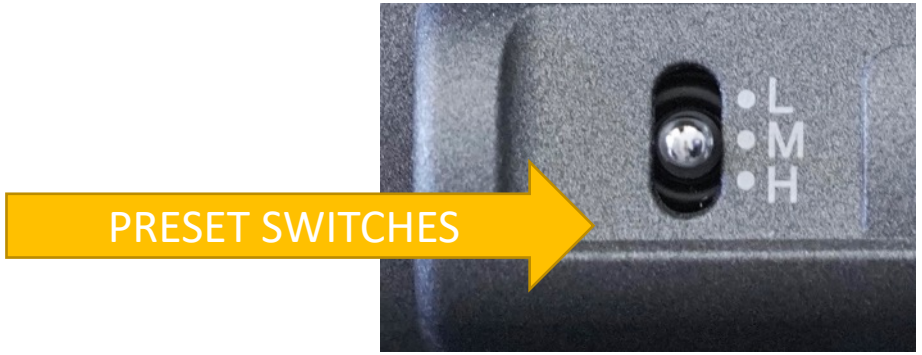
Iris, ND filters, and the shutter speed change the actual exposure, the amount of light getting to the camera's sensor. I adjust iris and ND values but always keep the shutter at twice the frame rate unless I want a special effect.

EI stands for exposure index. It is an **offset** that is applied to the exposure.

When you are changing the EI preset on the camera, you are changing the brightness of the LUT that you applied.

You can choose a lower EI preset value than the Base ISO to slightly overexpose the image. This is useful for reducing image noise at the Base High Sensitivity setting (12800 ISO).

Cine EI: EI Presets



In Cine EI mode, you have to use the Base Low (800 ISO) or Base High sensitivity (12800 ISO). **You cannot change the ISO** as you can in Custom shooting mode.

In Cine EI mode, the **L,M and H ISO/GAIN preset switches** on the side of the camera control **EI** (exposure index) ratings. **They do not change ISO or GAIN**. The EI presets control the brightness of the LUT.

You can change these EI preset settings in **Menu/Shooting/ISO/GAIN/EI** or by using the direct menu.

The next page describes how you may want to set these presets.

Cine EI: EI Presets

Alister Chapman suggests the following setup for the L, M, H EI presets.

Preset **H** setting exposes Slog 3 normally: using the same EI setting as the same Base Sensitivity (ISO) setting.

Preset **M** or **L** changes the brightness of the LUT. Lowering the EI value below the Base Sensitivity value will lower the brightness of the LUT, you will then have to increase exposure (open up the iris) to expose the Slog 3 image correctly.

Base Low Sensitivity (800 ISO):

L: 200 EI/ 4.0 E

M: 400 EI/ 5.0 E

H: 800 EI/ 6.0 E

Base High Sensitivity (12800 ISO):

L: 3200 EI/ 4.0 E

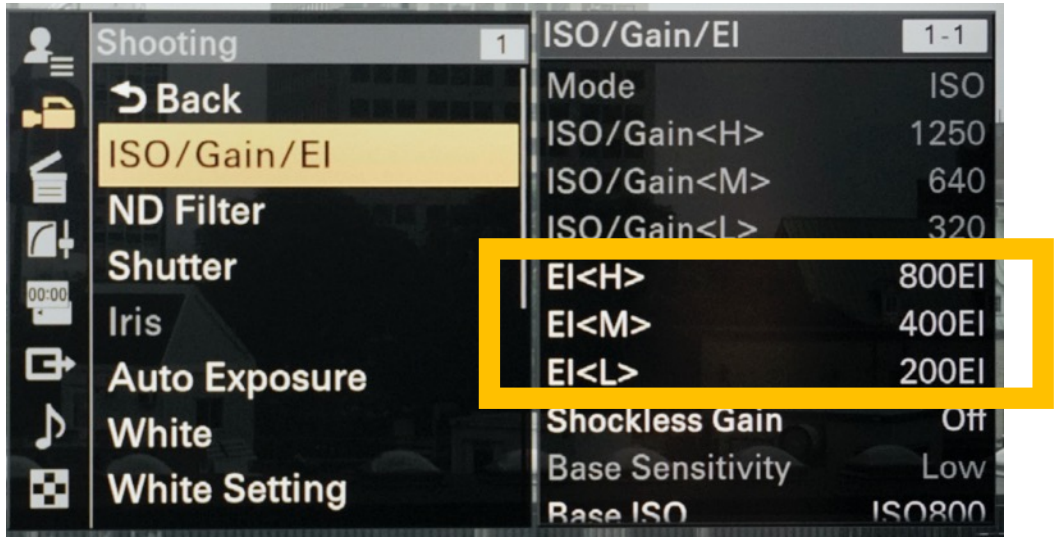
M: 6400 EI/ 5.0 E

H: 12800 EI/ 6.0 E

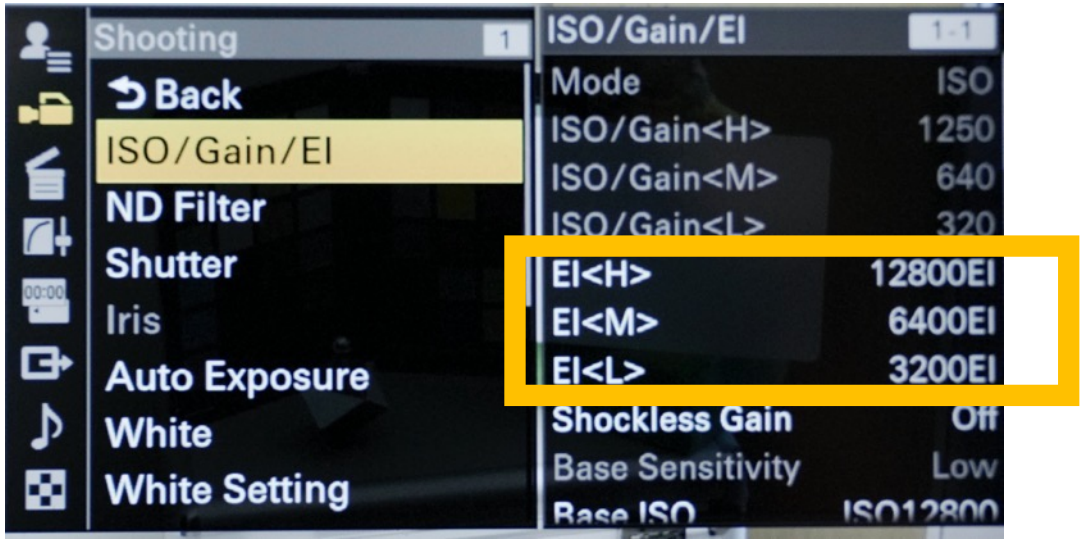
Cine EI: EI Presets

Here is how the presets have been entered in Menu/Shooting/ISO/Gain/EI:

At Base Low ISO (800 ISO):



At Base High ISO (ISO 12800):



Cine EI: EI Presets and Overexposure

When working with all Sony cameras, you can always slightly overexpose Slog 3 images **but you never want to underexpose them**.

Overexposing slightly can diminish image noise, since it increases the shadow luminance range, or pushes the image information out of the image shadow areas that have the most noise.

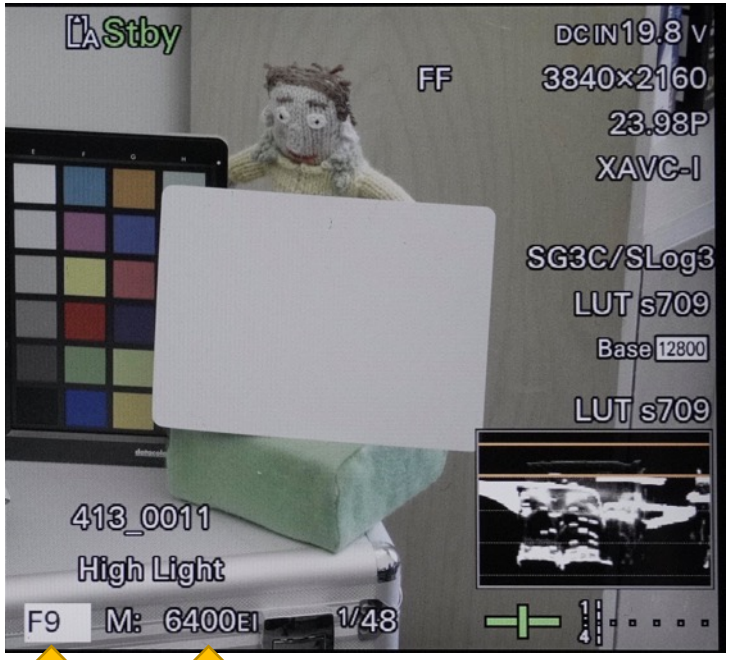
Overexposing using the EI Presets is **most useful** when working in Base High Sensitivity 12800 ISO. There will be some image noise so they may benefit from being **slightly** overexposed. Don’t lower the ISO below the lowest recommended preset value: 3200 ISO.

Images exposed at the Base Low Sensitivity (800 ISO) have very little noise and generally will not need a different EI preset value.

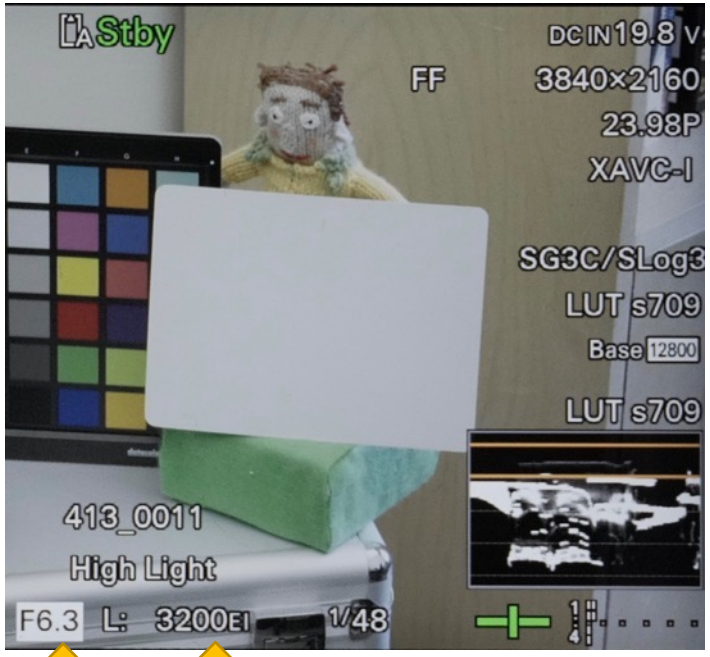
Cine EI: EI Presets

Once you have the EI preset applied you can then determine the correct exposure using the 77 percent line for the white card. In these VF details you can see how the iris value changes as the EI preset changes. Also, the luminance values become a little more compressed in the waveform monitor as you increase the exposure.

Same EI and Base ISO.

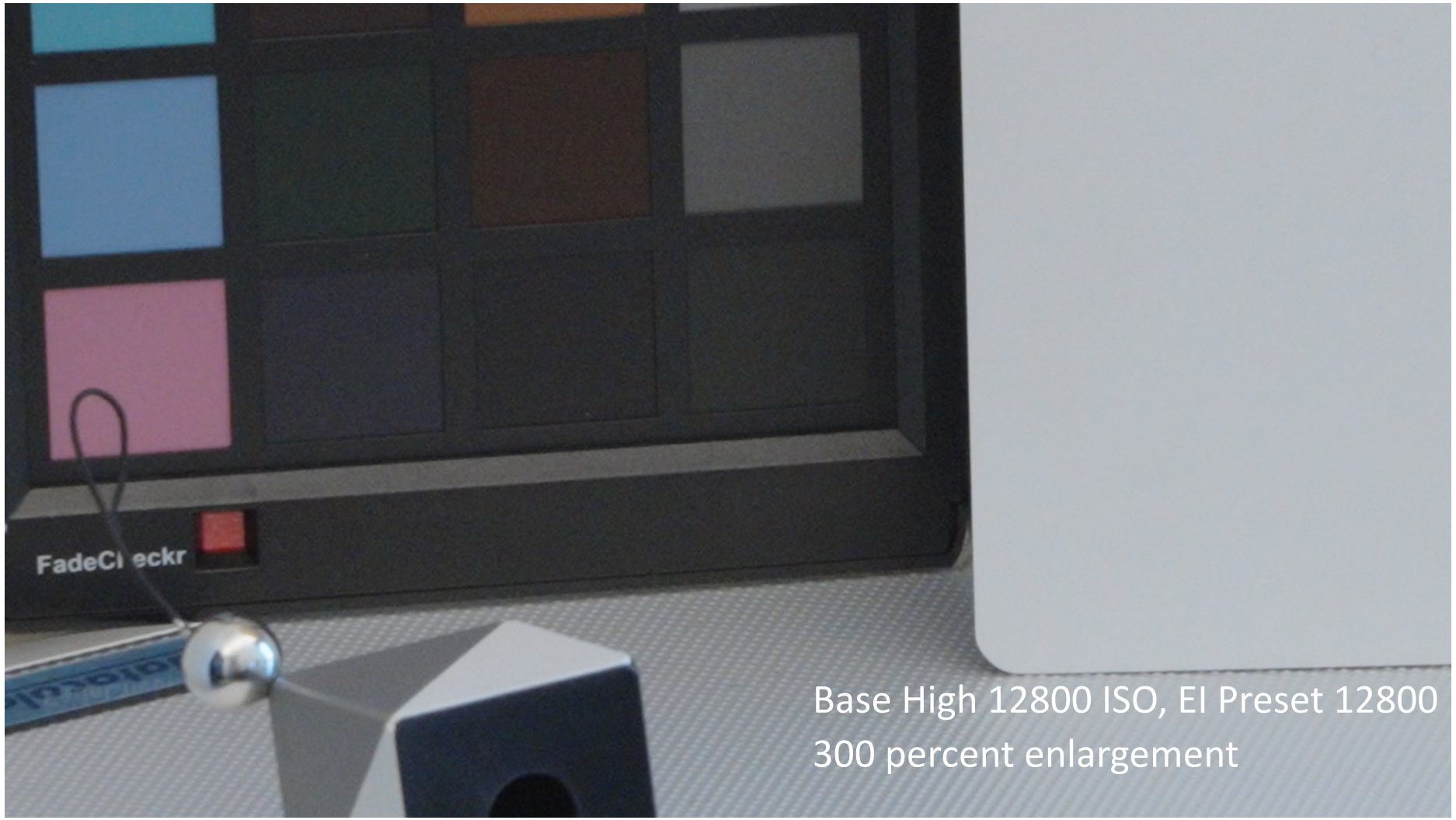


Overexposing slightly.



Overexposing more.

Cine EI: EI Presets and Image Noise



Cine EI: EI Presets and Image Noise

Cine EI: auto exposure and Cine EI

It is better to use manual exposure when shooting in Cine EI.

The camera’s auto exposure does not take into account the EI rating, so if the EI preset value is different from the Base Sensitivity ISO rating, the auto exposure will be incorrect.

Shooting with the same EI value as the ISO, the auto exposure should work correctly but keep in mind that fluctuations in exposure during the shot can make “normalizing” the Slog 3 images more difficult.

In general, it is better to use Custom shooting mode when using auto iris exposure.

Cine EI: colour grading with the s709 LUT

In Cine EI mode, when you have the s709 LUT applied in the viewfinder (and SDI/HDMI outputs), the file will nevertheless be recorded to the camera as a low contrast Slog 3 file.

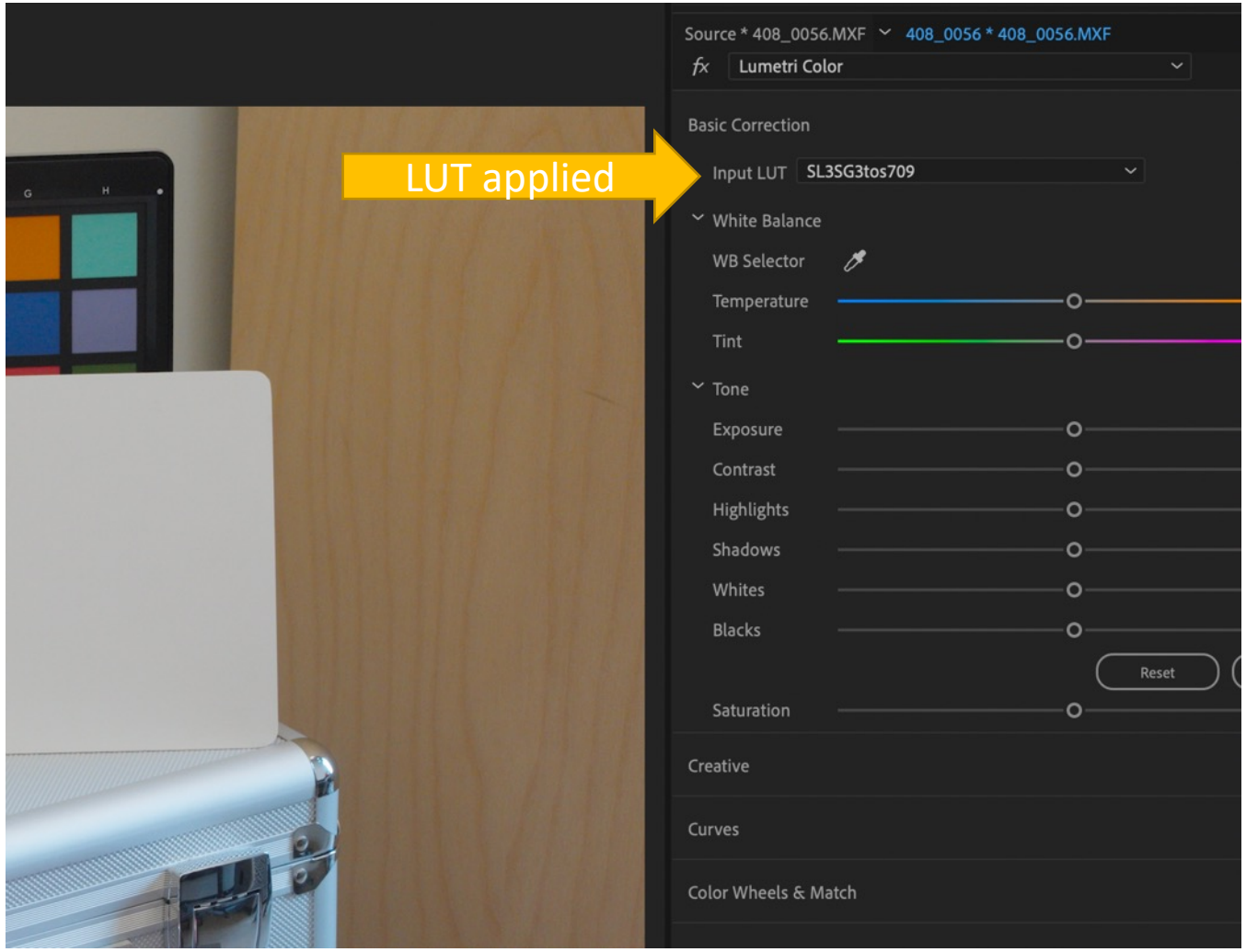
The LUT is not “baked in”. It is only used for monitoring. You must correct the image in postproduction by reapplying the s709 LUT, another LUT, or correcting the image from scratch.

The s709 LUT is available from Sony on this page:

https://pro.sony/en_CA/technology/professional-video-lut-look-up-table

The s709 LUT is not completely neutral. It has a certain look. Shooting with the S-Cinetone look in Custom mode will make images similar to Cine EI mode with the s709 LUT. I don’t recommend it, but you can shoot in both modes in the same project . Some colour correction is required to match the files and it can be difficult.

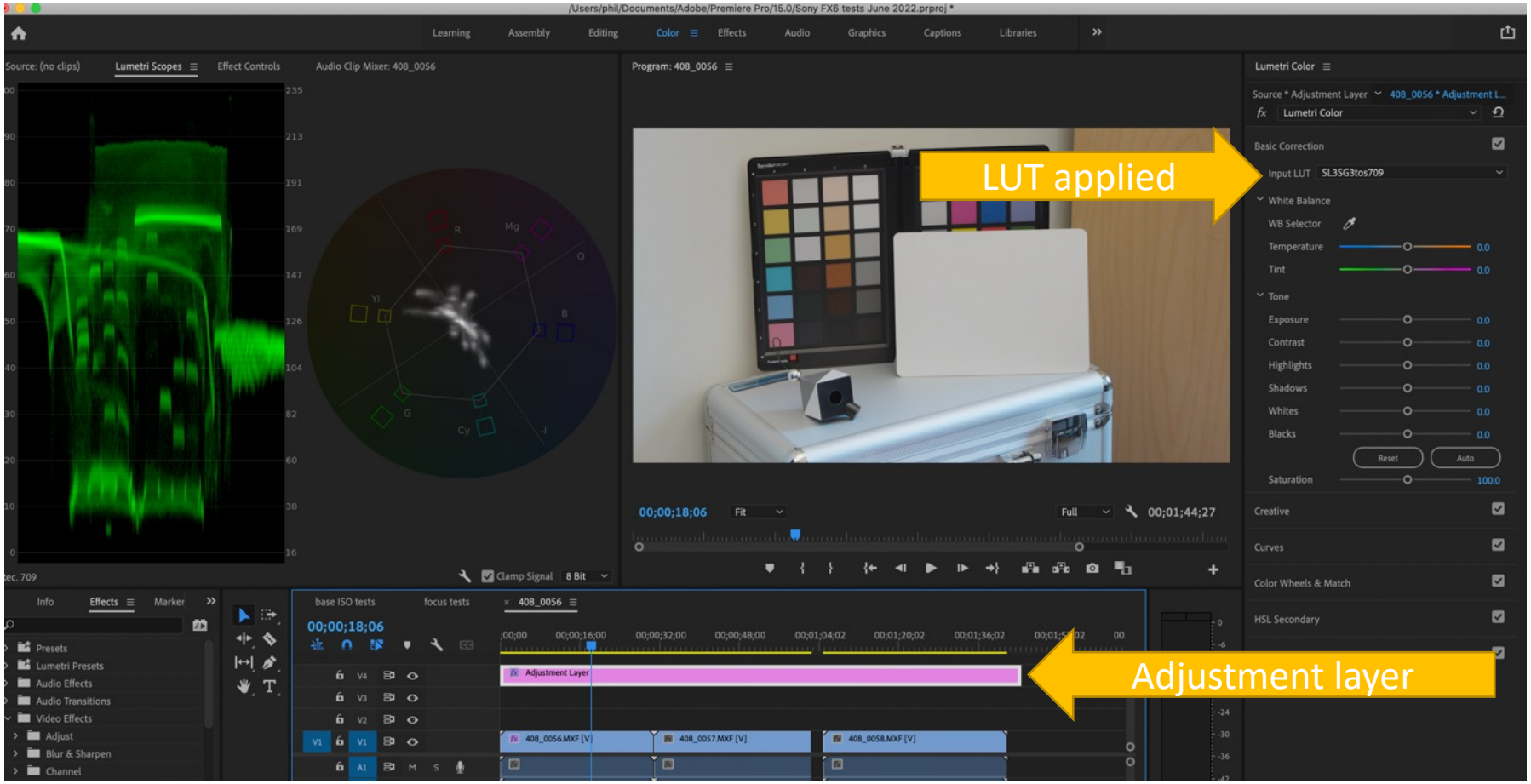
Cine EI: Applying the s709 LUT in Adobe Premiere CC 2021



Here I have applied the s709 LUT to a clip using the Lumetri Color tool.

If you want to normalize an entire sequence in Premiere you can add an adjustment layer and apply just one instance of the Lumetri color tool to that layer (see next page). This saves a lot of processing power.

Cine EI: Adobe Premiere CC 2021 adjustment layer



Here I have an adjustment layer with the s709 LUT applied. I am using only one instance of the Lumetri color tool to normalize all the clips underneath the layer.

When making an adjustment layer, make sure to have the project window selected, not the sequence.

Cine EI: Premiere 2022 colour management

Premiere 2022 now interprets the colour space of a video file when it is imported into the software. So, in addition to a sequence having a working colour space, every imported video file is automatically assigned a Media colour space. Using this Media colour space, video files (shot in Log) become automatically normalized to the sequence colour space without having to apply a LUT.

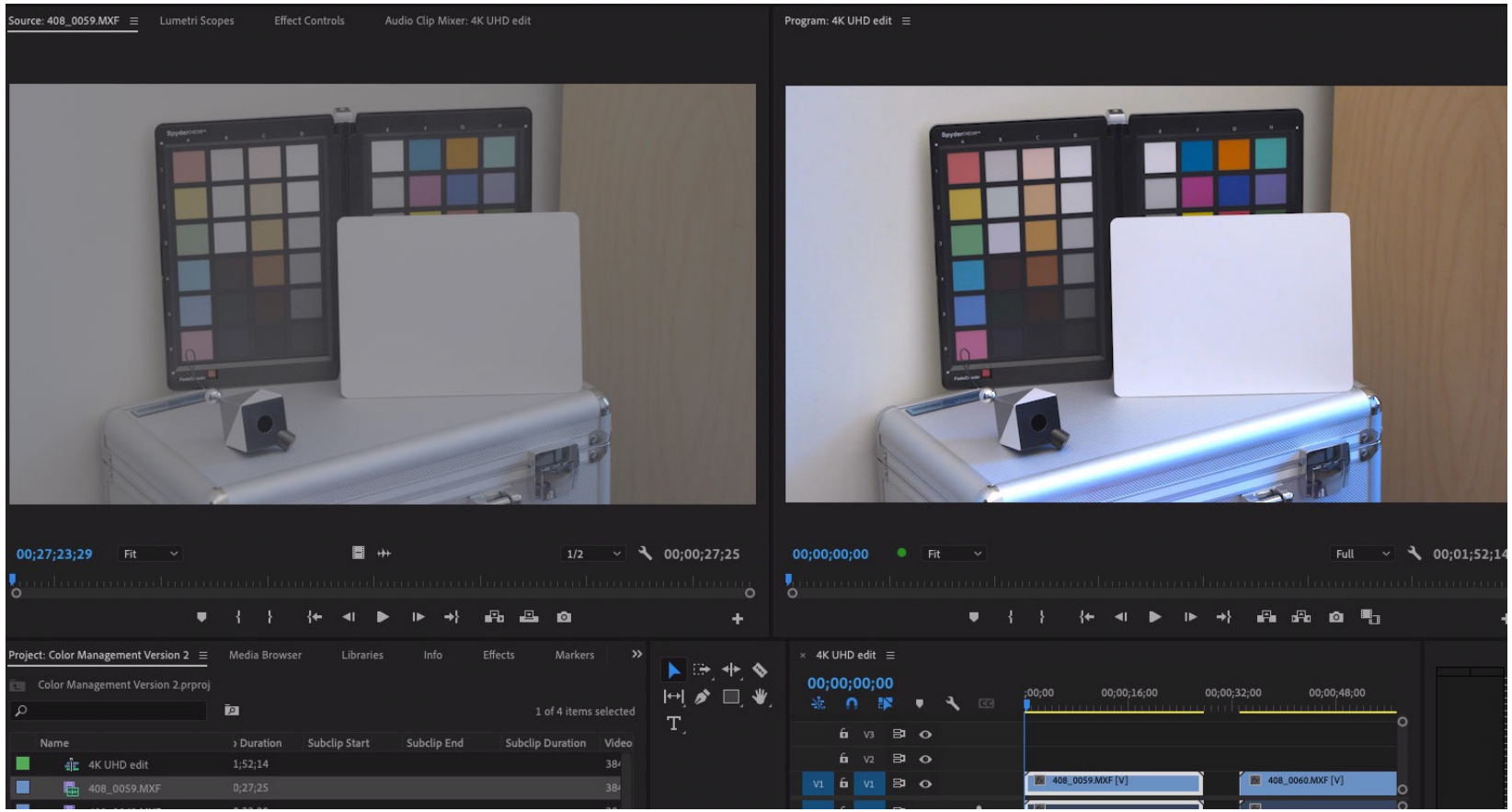
In this guide we are focused on shooting videos in the Rec.709 colour space: in Custom shooting mode by selecting **SDR(BT.709)** as the Target Display and in Cine EI mode by normalizing the Slog 3 image with the **s709** LUT (base look).

Rec.709 is the most prevalent video standard for display devices. HDR(HLG) standards (Rec.2100) are for displays that have increased brightness levels. At the moment, Concordia Fine Arts has no HDR video display equipment.

Cine EI: Premiere 2022 colour management

When you import a Slog 3 video file into Premiere 2022, you will notice that it appears washed out and low contrast in the viewer (like an uncorrected Slog 3 image) and normalized in a sequence with a Rec.709 working colour space.

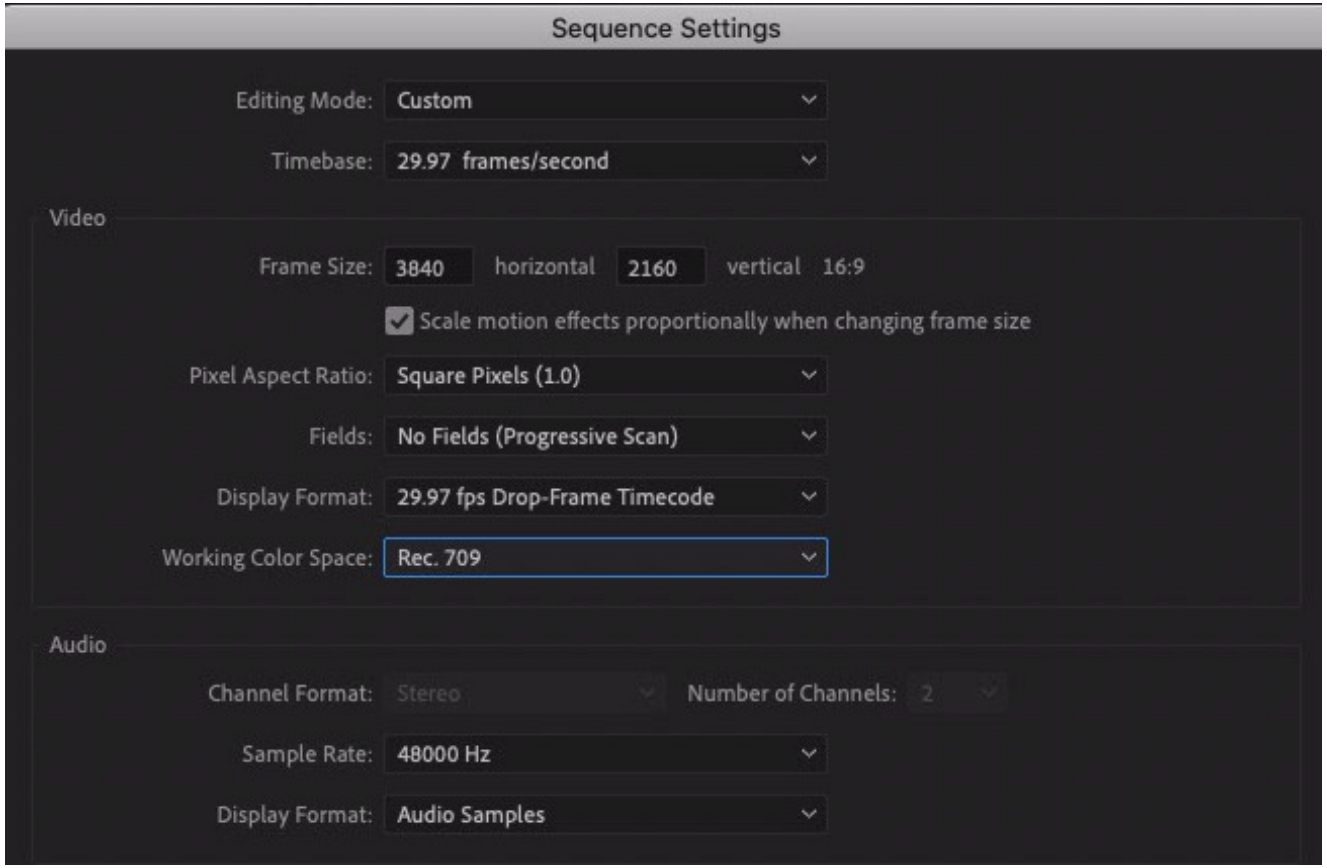
Viewer: uncorrected Slog 3 image.



Program: Corrected image In Rec.709 sequence.

Cine EI: Premiere 2022 colour management

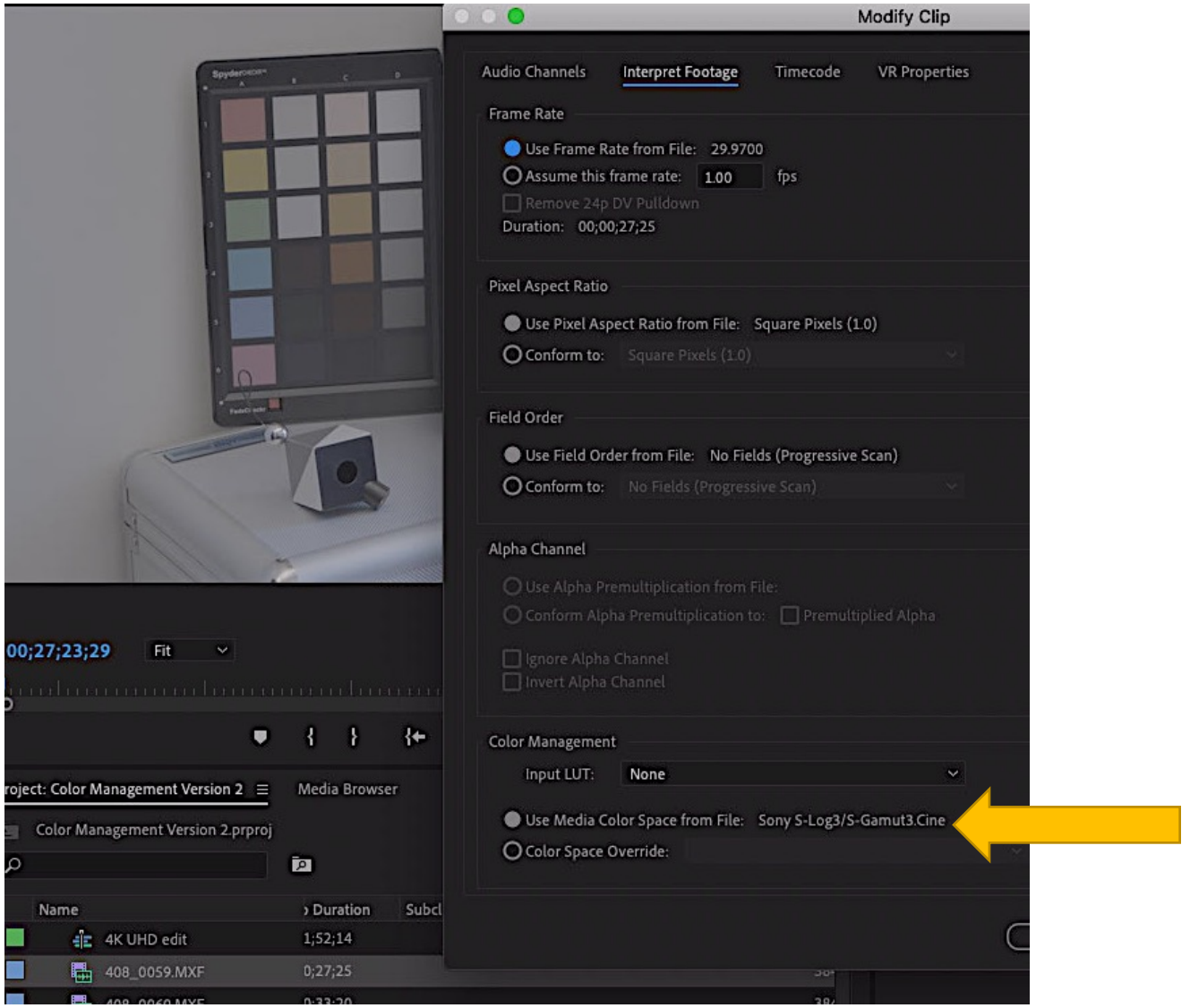
Here are the sequence settings with the Rec.709 working colour space.



Cine EI: Premiere 2022 colour management

Right clicking (or control clicking) the video file in the project window and going to **Modify/Interpret Footage** will show you how Premiere has interpreted the Media colour space of the file.

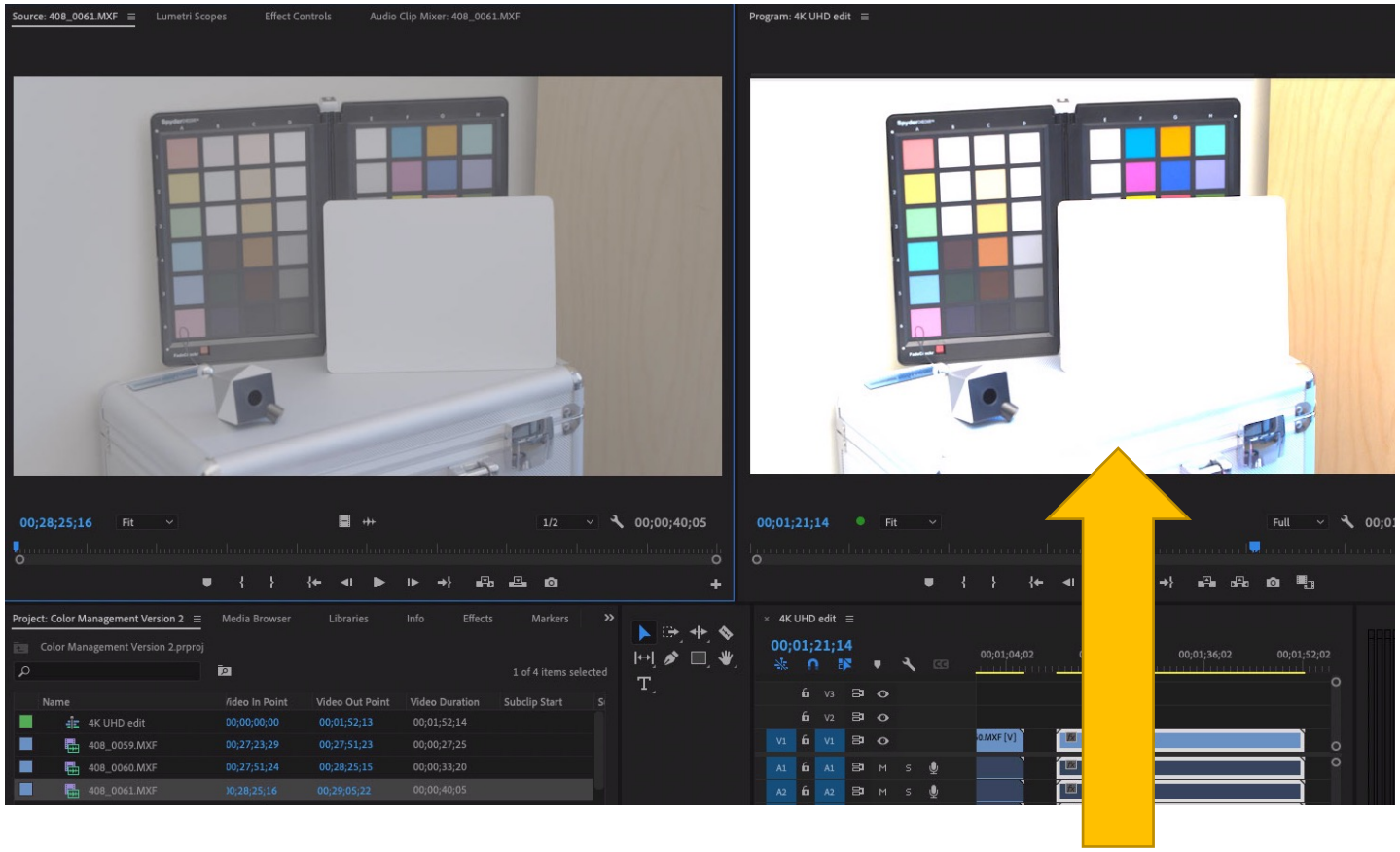
Under **Colour Management** you can see that this file has been interpreted as being shot in Sony Slog 3/S-Gamut3.Cine.



Cine EI: Premiere 2022 colour management

This default Media colour space interpretation will work fine if you have exposed Slog 3 normally, using the same EI setting as the same Base Sensitivity (ISO) setting. The image will be normalized correctly in the sequence.

But if you have offset the exposure of the LUT by using a different EI setting than the Base Sensitivity (ISO) setting, the image may not look correct. A slightly overexposed image looks much more overexposed.

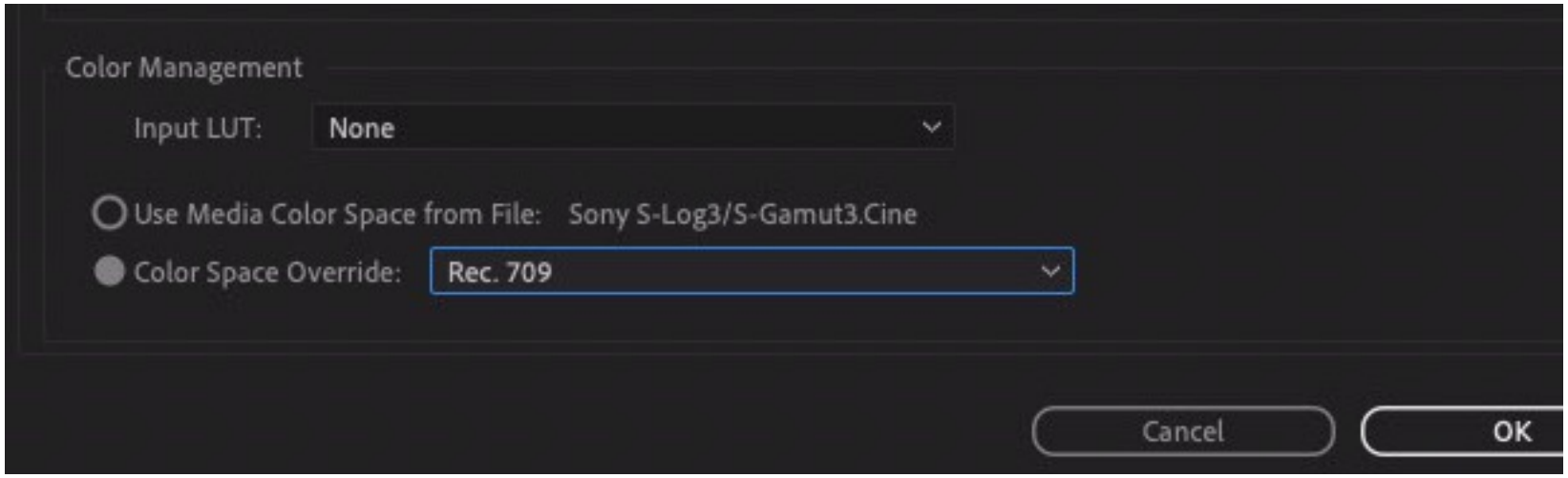


The image should not be this much overexposed.

Cine EI: Premiere 2022 colour management

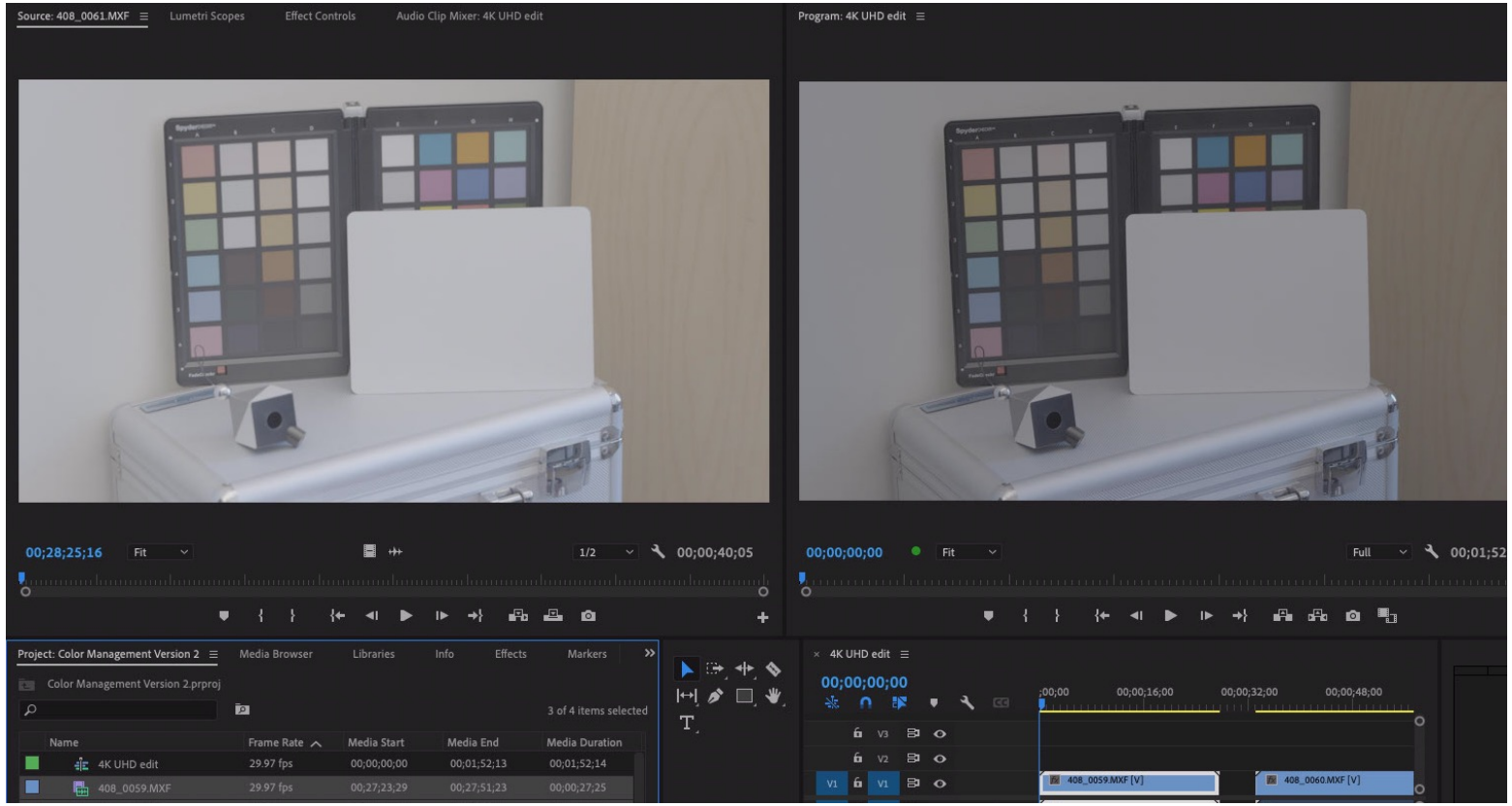
In that case, it is best to **override** the media colour space interpretation that Premiere is providing. You may also use the override when you start colour correcting because then you can either grade from scratch or grade using the imported Sony s.709 LUT.

Right click (or control click) all the video files you want to override in the project window, go to **Modify/Interpret Footage** and under **Colour Management/Colour Space Override**, select **Rec.709**.



Cine EI: Premiere 2022 colour management

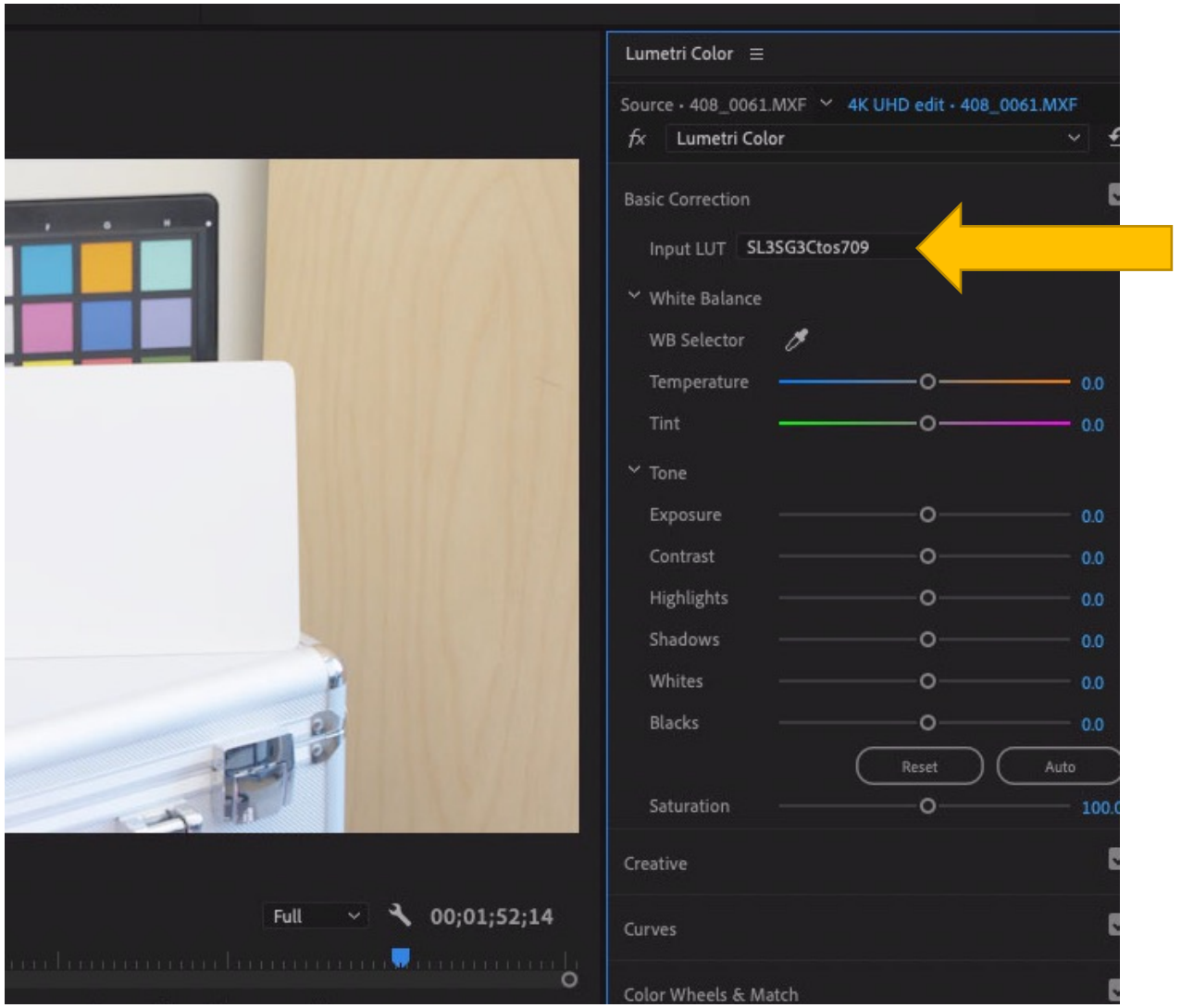
After you apply this override, then you are working with uncorrected Slog 3 images in the project and in the Rec.709 sequence. The images will look the same in the viewer and in the program window.



Cine EI: Premiere 2022 colour management

You can then import the Sony s709 LUT to correct a single clip or import the LUT on to an adjustment layer to correct the entire sequence, just as you did in Premiere 2021.

Shots taken with exposure offsets on the LUT will look correct (only slightly overexposed as you shot them) as in the image on the right.



Cine EI Option Two: Importing custom LUTs

Sony FX6

Cine EI: Using other LUTs

If you apply other built-in LUTs or custom LUTs, they will have different brightness levels and will have to exposed differently than the built-in s709 LUT.

Once a LUT is applied, you should be able to judge exposure by eye but if you want to be more accurate, look for any documentation that comes with the LUT.

Different LUTS will also have different white balance levels.

White balance once the LUT is turned ON in the camera menu.

Another FX6 built-in LUT is the 709 800 LUT.

For the 709 800 LUT: expose a white card at 90 %, gray card at 45 %.

This LUT makes the image look brighter and more contrasty.

In all cases, the video file is recorded as a neutral Slog 3 image. You are not forced to apply the same LUT in postproduction. You can use another LUT or grade from scratch.

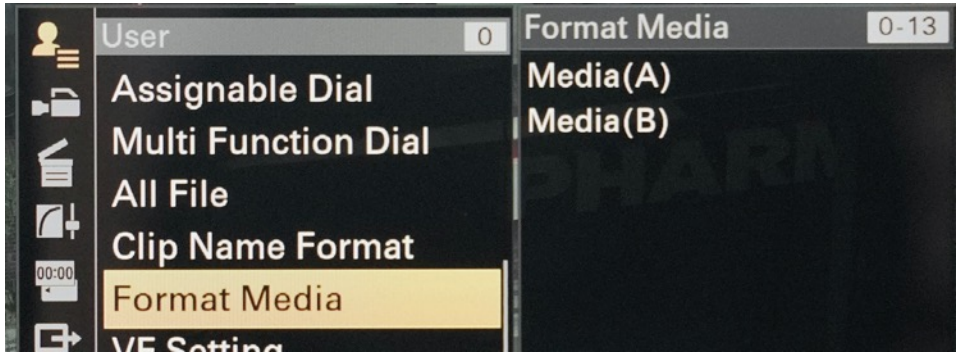
Cine EI: Loading Custom LUTs

You can load your own LUTs into the camera.

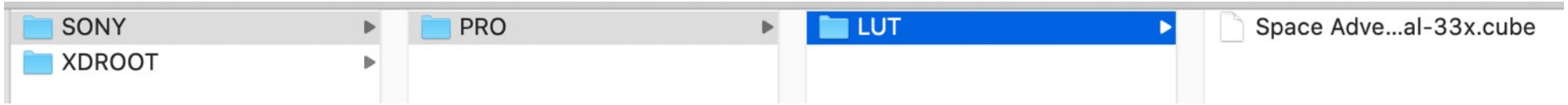
The LUTS must be 3D .cube LUTs: 17x or preferably 33x cube LUT’s designed for use with S-Log3 and SGamut3.cine. It is even better if they are designed for use with the FX6.

Put the LUTS in the location shown below on the media card in Slot B of the camera.

You may have to format Media Card B first. A quick format is fine. This erases all files!



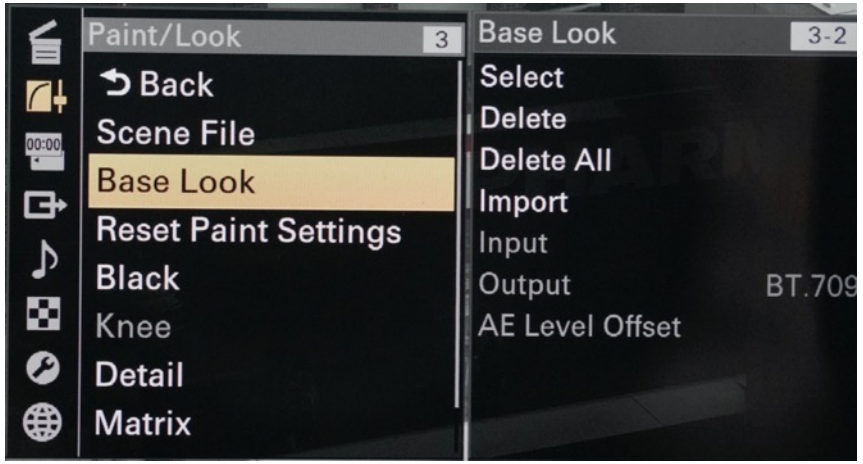
Format the card and then import the custom LUT into this location on card B:

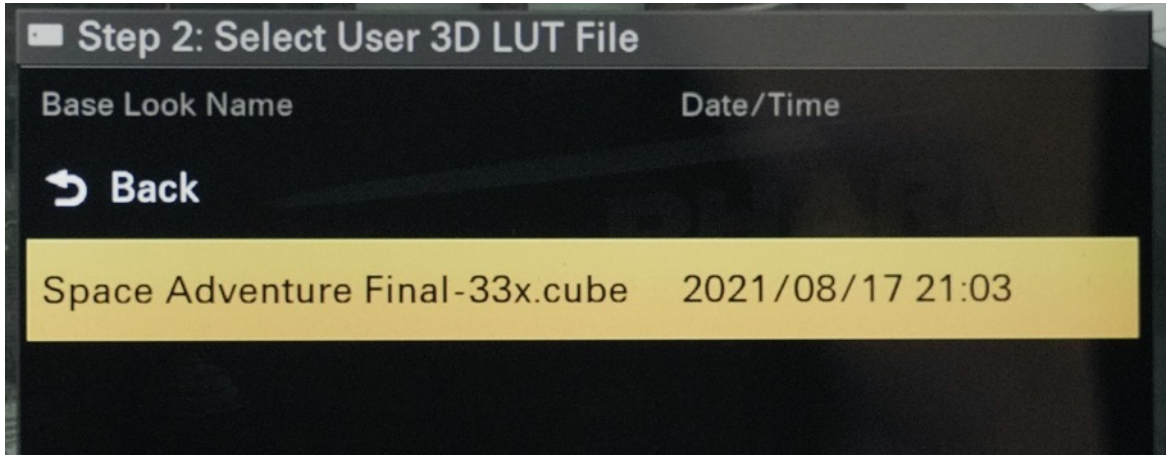


Cine EI: Loading Custom LUTs

Put card B in the camera and then go to **Menu/Paint/Look/Base Look/Import.** There are several free spaces for loading LUTs. Pick one of them (it will say NO LUT).

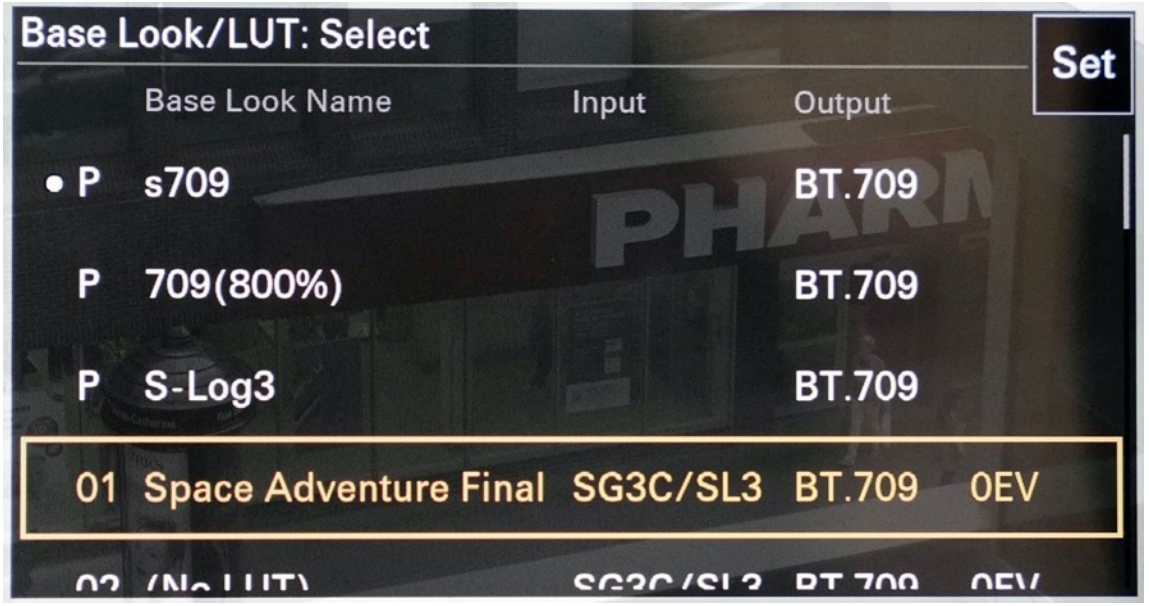
Here I am loading a LUT for a sci-fi look called “Space Adventure Final”.





Cine EI: Loading Custom LUTs

In this particular case, I chose the first free space with No LUT. The custom LUT will now appear in this list when you select a LUT on status page 1. It will appear in the VF in Cine EI mode once you have the LUT turned ON for the VF and for the SDI/HDMI outputs (as described in Cine EI: Option One).



Custom LUT on VF

LUT on outputs

Cine EI: Custom LUTs from the Sony site

The custom LUT that I use in this example was taken from the Sony site.

There are a few interesting LUTs to download here:

https://pro.sony/en_GB/technology/professional-video-lut-look-up-table

Cine EI: Gamma Display Assist

If you are using a LUT, then you don’t use the Gamma Display Assist.

You can use the Gamma Display assist if you wish, instead of the a LUT. Turning on Gamma Display Assist will make Slog 3 images look normal in the camera viewfinder. **But there is no advantage to doing this.**

Gamma Display Assist will make the image appear normal in the viewfinder but the waveform monitor will show the values of the unaltered Slog 3 image.

So, if you use want to use the waveform monitor to judge exposure, there is a mismatch between what you see in the VF and what values are being represented in the waveform monitor. This can become confusing.

Cine EI Option Three: Exposing Slog 3 without a LUT

Sony FX6

Cine EI: Slog 3 exposure without a LUT

If you are used to working with Slog 2 or 3 in other non-cinema Sony cameras, then you may prefer to shoot Slog 3 with the FX6 without a LUT applied.

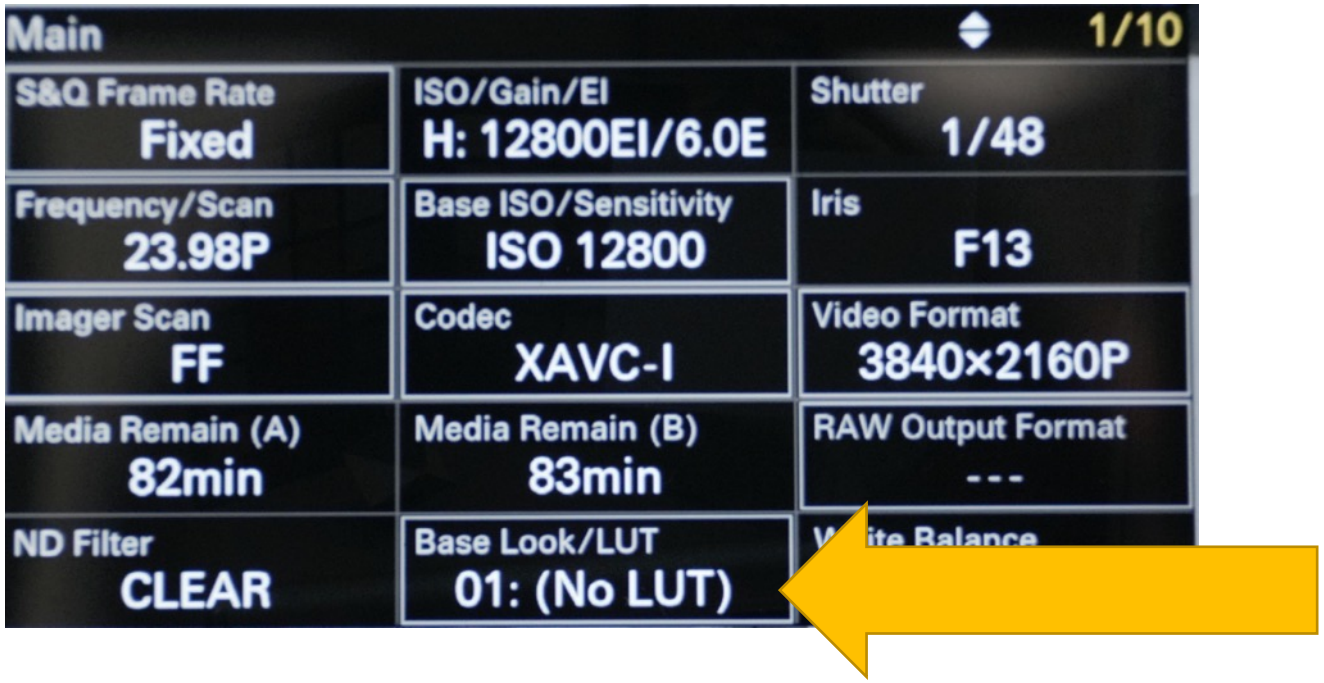
Without a LUT on for the viewfinder, the image in the VF will be low contrast and desaturated.
Without a LUT on for the SDI/HDMI outputs, the luminance values in the waveform monitor will look compressed.

I don’t recommend this method if you are new to shooting Slog 3.

Nevertheless, the following pages describe the setup and exposure.

Cine EI: Slog 3 exposure without a LUT

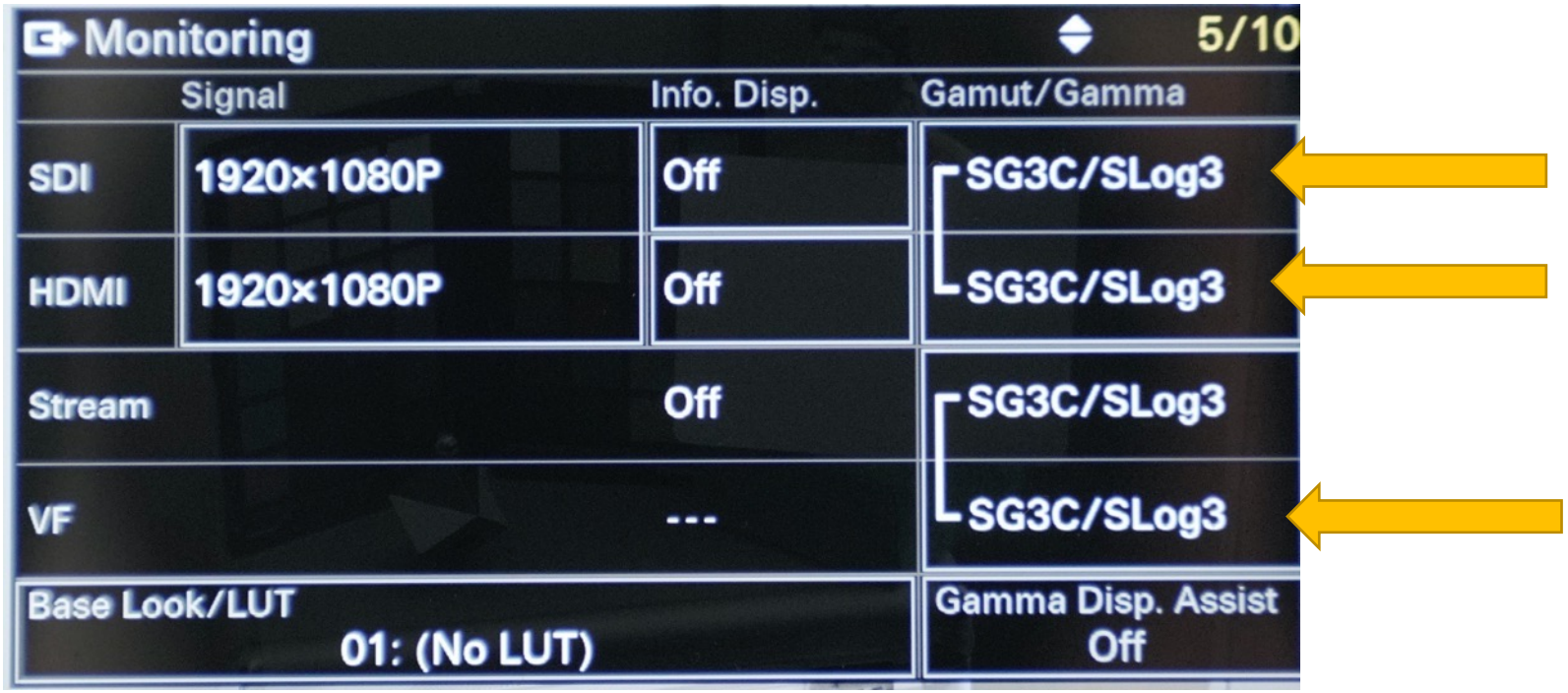
In this case, in Cine EI mode status page 1 choose the **No LUT** option under Base Look/LUT. There are several choices with No LUT since these are empty fields into which you can load custom LUTs.



Cine EI: Slog 3 exposure without a LUT

In status page 5, choose **SG3C/Slog3** for the SDI, HDMI outputs and the VF. This means that no LUT is applied to the viewfinder and the outputs. **It is very important that the settings are the same for the outputs and the VF.**

You can also verify that the Base Look/LUT is set to No LUT and that Gamma Disp. Assist is OFF.



Cine EI: Slog 3 exposure without a LUT

With the s709 LUT off, no LUT at all, Alister Chapman suggests exposing a white card at 61 percent.

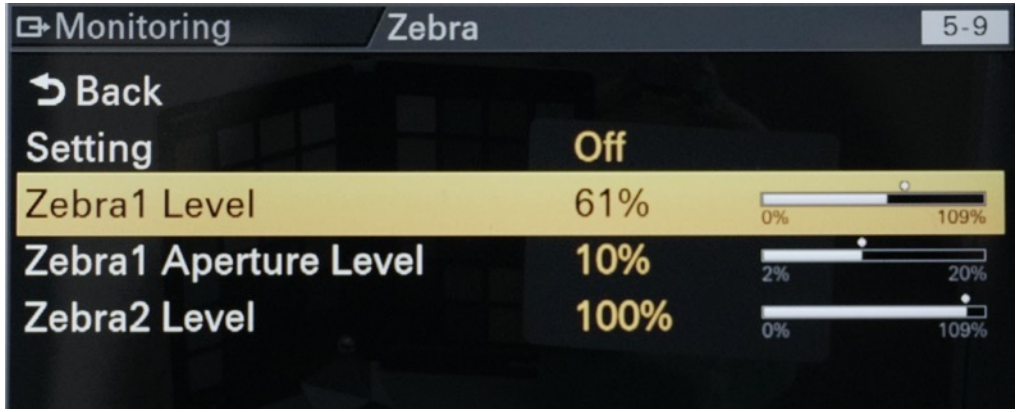
You can make these values zebra settings that will appear on the waveform monitor:

Menu/monitoring/zebra/zebra level 1

Keep zebra level 2 at 100 percent if you need to judge overexposure.

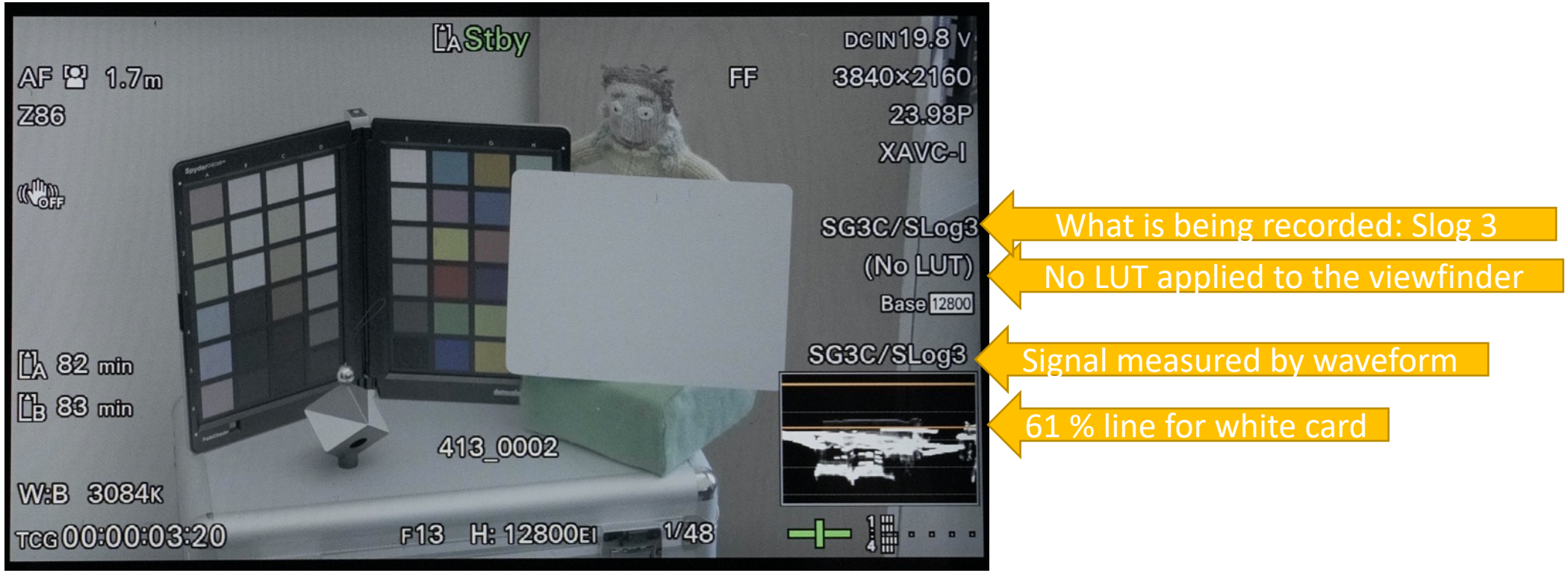
The above levels are for a proper photographic 90 % white, 18 % gray card.

Expose white paper at 63 percent.



Cine EI: Slog 3 exposure without a LUT

In this image the white card is exposed at 61 percent. The waveform monitor is reading the signal from the Slog 3 image, not the applied LUT, because there is no LUT applied to the SDI/HDMI outputs. Note that the Base Sensitivity (ISO) and EI preset match: 12800.



Cine EI: Slog 3 exposure without a LUT

In Cine EI mode, shooting without a LUT applied, you are restricted to shooting at Base Low (800 ISO) and Base High (12800 ISO) sensitivity.

There is no way to change ISO or GAIN.

The L, M and H preset switches control EI values but changing these values has NO EFFECT because there is no LUT to adjust. The EI presets only adjust the brightness of a LUT.

Your options for controlling exposure are limited to iris, ND and shutter.

S and Q Shooting

Sony FX 6

S & Q shooting

S & Q shooting is for shooting slow motion or fast motion and time lapse: something other than a standard frame rate.

S and Q slow motion shooting works by capturing the video at a different frame rate than the frame rate at which the video clip will be played back.

Shooting at high frame rates is the only way to create smooth slow motion. Video editing software has effects that allow you to slow down the speed of a clip. These effects rarely look good because the software has to invent extra frames (interpolation).

S & Q: slow motion shooting

When shooting in S & Q for slow motion, the video is captured at a higher frame rate than the frame rate at which it is played back. The length of the clip is extended on playback.

For example, if the project frame rate is 29.97 fps (30p) and the S & Q frame frame rate is 120 fps, the video clip will be four times the length of what was originally shot. A 3 minute clip shot at 120 fps will play back in 12 minutes as a 29.97 fps video clip.

All of the frames are played back, but at a different speed.

S and Q: frame rates

In 4K, you can set the frame rate between 1 fps (frames per second) to 120 fps (there is a 10 percent image crop at 120 fps).

In HD, you can set the frame rate up to 240 fps in HD but there is some image quality loss above 120 fps.

There are two frame rates to set (see images on next page):

1. the base frame rate that the clip is played back at: this is the Frequency/Scan rate on status page 1. This should be the frame rate of your project: typically NTSC rates of 23.98p or 29.97p or the DCI rate of 24p.
2. The S & Q frame rate set in Menu/Shooting/S and Q Motion. This is the number of frames per second that the camera will be recording.

S & Q: menu settings

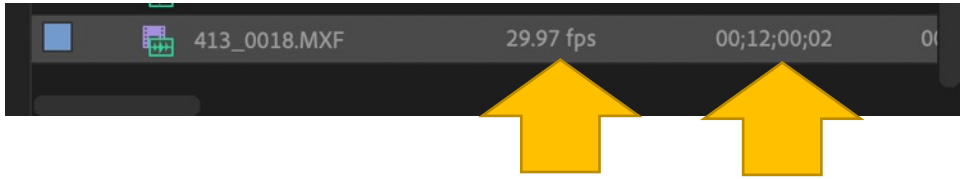
1. The base frame rate:

On status page 1, the frequency/scan has been set to 29.97 fps. This is the project frame rate and the rate at which all clips will be played back.

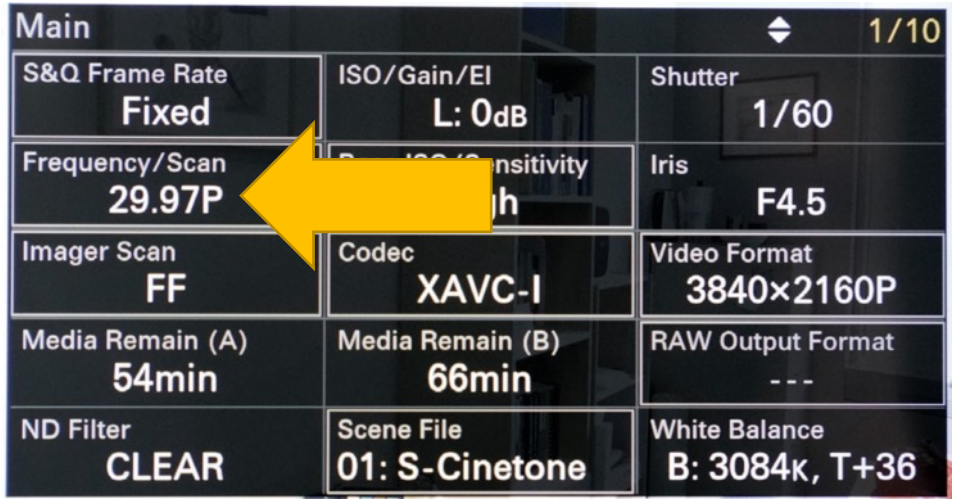
2. The S & Q frame rate:

In Menu/Shooting/S & Q Motion: Enter a S and Q frame rate.

In this case, once S and Q is turned on, the video clip will be shot at 120 fps and then played back at 29.97 fps. So, the clip will play back in Adobe Premiere (or other software) at 25 percent speed. Below is how the a clip shot for three minutes at 120 fps will appear in Premiere.



frame rate length



S and Q: button 1

Enable S and Q motion by pressing button 1 on the side of the camera.

This button toggles S and Q mode on and off.

S and Q: shutter speed VERY IMPORTANT

When you switch to S & Q mode it does not pick the correct shutter speed for you. The shutter speed will match the frame rate. This is not correct! Change the shutter speed.

Remember that when shooting standard motion or slow motion, the **shutter speed should be set to double the frame rate** for a normal amount of motion blur in the image.

So, if your S & Q rate is set to 120 fps, the shutter speed must be adjusted to $1/240^{th}$ of a second or, in this case, $1/250^{th}$ of a second because $1/240^{th}$ is not an option on this camera.

With faster shutter speeds you need more light to expose the image!

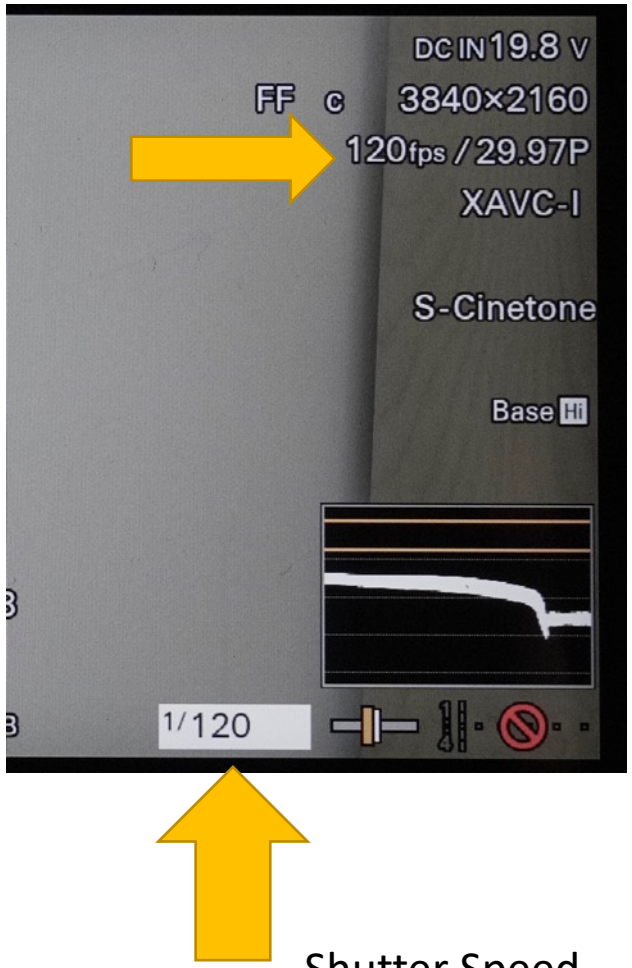
See the next page for images.

S & Q: shutter speed

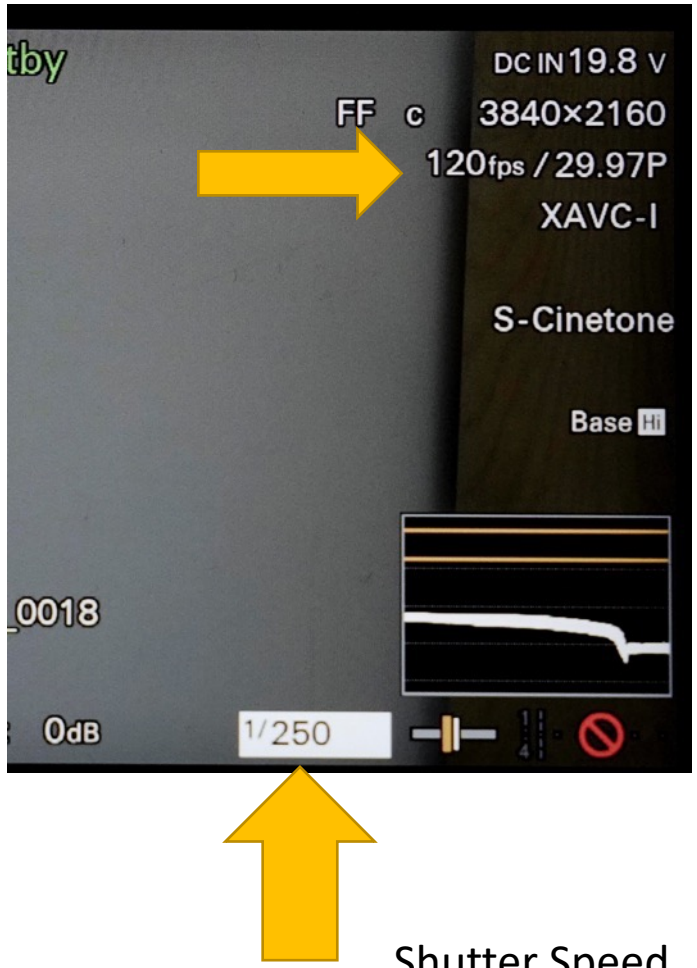
The camera will initially pick a shutter speed that matches the frame rate.

For slow motion, change the shutter speed to double the S & Q frame rate.

The S & Q frame rate is indicated in the top left, followed by the base (project) frame rate.



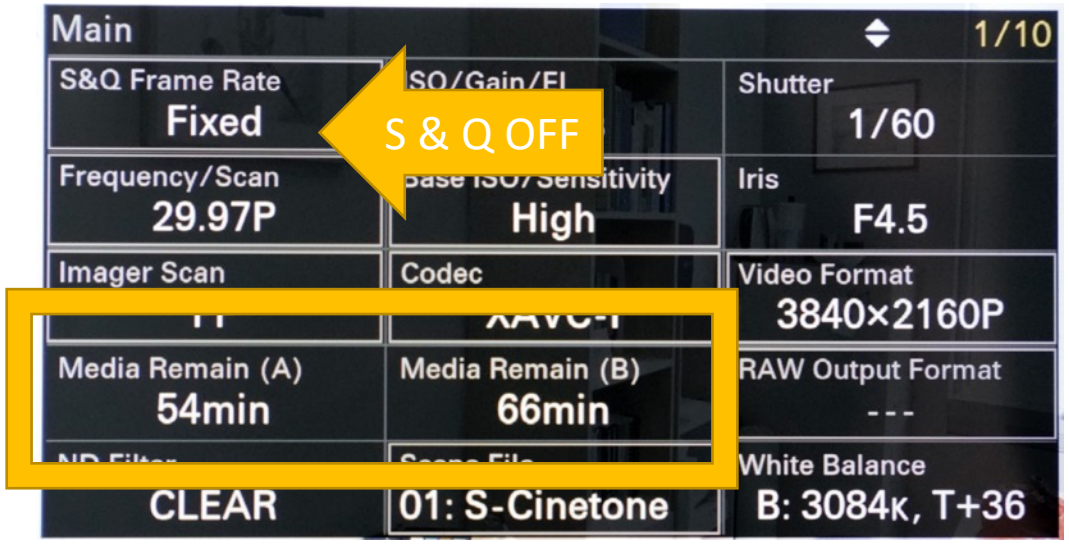
Shutter Speed WRONG !

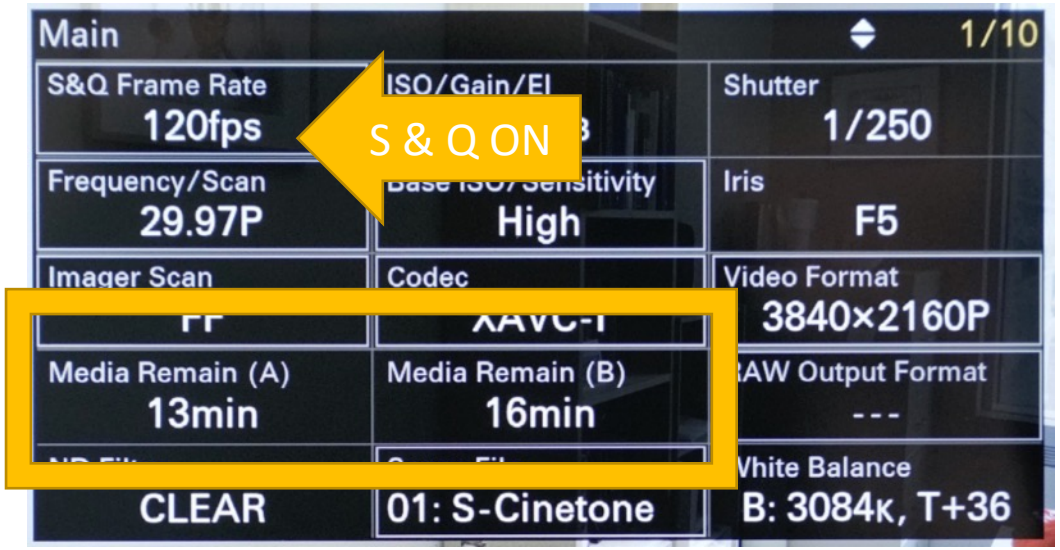


Shutter Speed RIGHT !

S & Q: Time Remaining

The time remaining on the media cards changes once S & Q motion is ON. This is based on the number of frames that are being captured. In this case, the remaining time is simply divided by four.





S & Q: shutter speed

After exiting S & Q mode, remember to change the shutter speed back to the normal setting!

S & Q: fast motion and timelapse

Setting a lower S & Q rate than the frequency/scan rate will result in fast motion. A S & Q rate of 1 fps will be timelapse.

For example, if your base (project) frame rate is 24p and you record 10 minutes at the S & Q frame rate of 12 fps, the playback time will be 5 minutes. It is two times faster.

All of the frames play back, but at a different speed.

When shooting fast motion **it is not necessary** to have the shutter speed be twice the S & Q frame rate. In the above example, I could shoot at 12 fps with a shutter speed of either 1/24th of a sec. or 1/48th of a second. At 1/48th motion is more crisp. At 1/24th there is more motion blur, and increasingly more blur as you lower the shutter speed.

If your frequency/scan rate is 24p and you record 10 minutes at S & Q speed of 1 fps, the playback time of the clip will be 24 seconds. It is 24 times faster.

Interval Recording and Time Lapse

You can also use interval recording to create timelapse sequences.

Menu/Project/ Interval Rec

The **interval time** is the amount of time between each exposure.

The **number of frames** is the amount of frames that the camera takes during the interval time.

For example, an interval time of 1 sec and the number of frames being 2, this means the camera takes two frames per second.

If you are shooting at 24p, then the camera takes 2 consecutive frames every 24 frames.

The shutter speed can be changed while recording in Interval Rec to create special effects. Extending the shutter opening time can be combined with the interval time to create blurry ghostly images of what is in motion.

If you are using auto exposure during time lapse, slow down the response time of the auto exposure system: Menu/Shooting/Auto Exposure/Speed. Set to -40 or slower.

S & Q: Interval Recording and Shutter Speed

For this image, the interval rec. settings were as illustrated below. The shutter speed was 16 F with a base frame rate of 23.98 fps. Note the motion blur on the pedestrians.

Attaching the Viewfinder Loupe

Sony FX 6

Viewfinder (VF) Specs.

The camera’s viewfinder (VF) is a 720p Rec.709 screen.

Slog 3 images look low contrast in this screen unless a LUT is applied.

The VF cannot show all the highlight detail in uncorrected Slog 3 images.

You need to apply a LUT and “normalize” the image to see the highlight details inside the Rec.709 colour space. See the section on Cine EI Shooting Mode.

Viewfinder: Flipping and Rotating Image

On the bottom of the VF there is a switch for rotating and flipping the image (very convenient if you are shooting yourself). The shade can be detached if necessary.

Viewfinder: Buttons and Shade

Three buttons on the side: display focus peaking and zebra stripes and the custom 9 button displays the waveform monitor and other scopes by default.

The shade provides sunlight protection in many situations **but you may want to use the loupe in extremely bright situations or situations where you need to see details and focus manually.**

See the following pages for attaching the loupe.

Viewfinder: Attaching the Loupe

The Sony bracket is too weak to support the loupe so first attach the more sturdy Vocas bracket. Do not attach the loupe to the VF without attaching the Vocas bracket first. The Vocas bracket allows the VF and loupe to be tilted but the VF will not have the same range of vertical positions.

The loupe can be easily removed while shooting once the bracket is in place.

The camera does not fit into the camera bag with the Vocas bracket attached. Remove it once you have finished shooting.

The process is explained step by step on the following pages.

Viewfinder: Attaching the loupe

Detach the cable for the VF from the right side of the camera.

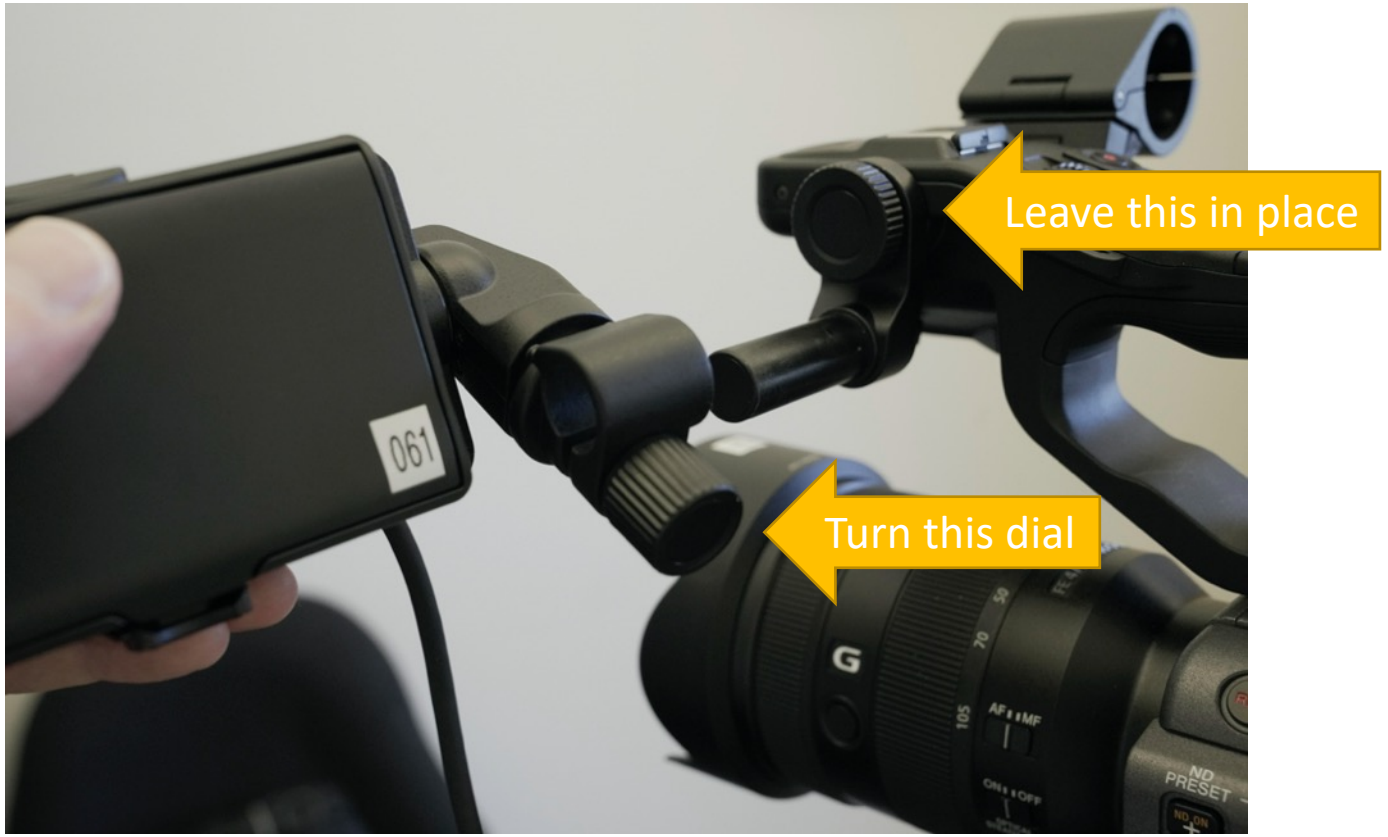
Press the sides of the plug to detach it.

Be careful as there are many small pins on this plug.

Viewfinder: Attaching the loupe

Now that the VF cable is free, detach the VF from the camera handle by turning the dial.

Leave the post that is mounted to the handle in place.



Viewfinder: Attaching the loupe

Attach the Vocas viewfinder bracket to the same post that you just removed the VF from.

Tighten with the red handle.

Viewfinder: Attaching the Loupe

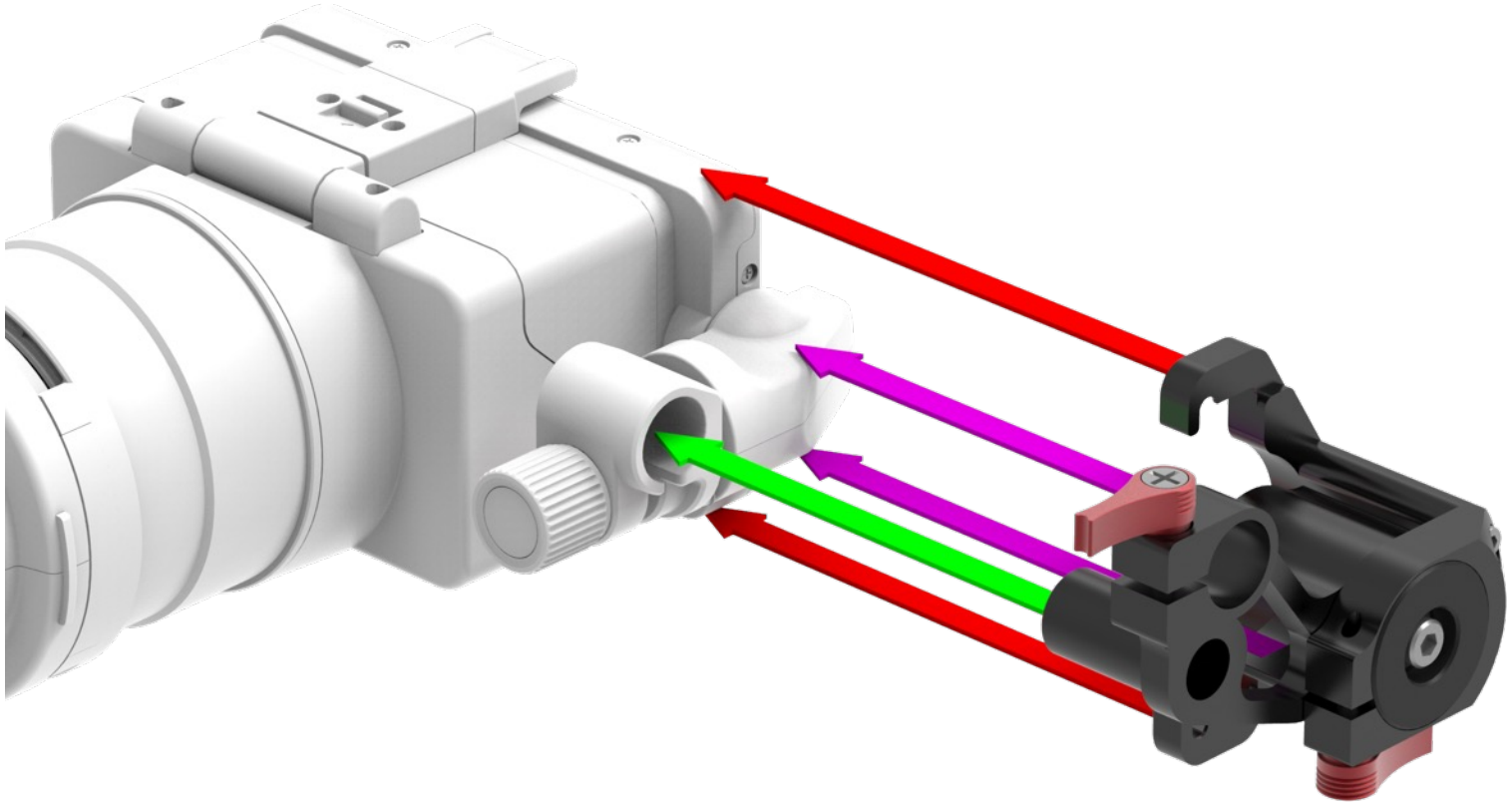
Slide the VF into the bracket.

See the following pages for more detail on this part.

Viewfinder: Attaching the Loupe

This image from Vocas, gives you a better idea of how the FX6 VF fits into the bracket.

Ignore that a loupe is already attached to the VF in this image. The VF pictured is a Sony FX6 VF.



Viewfinder: Attaching the Loupe

Tighten the VF on the bracket with the dial.

Plug the VF cable back into the camera taking care to line up the pins correctly.

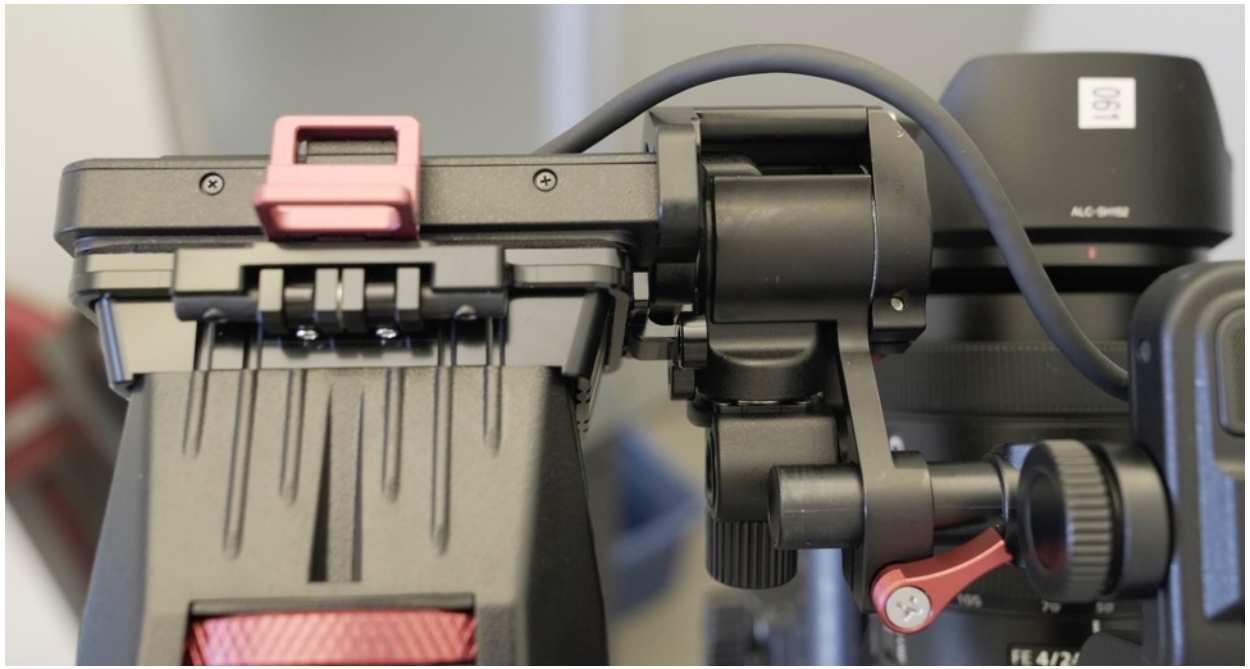
Viewfinder: Attaching the Loupe

Remove the shade from the VF and attach the Zacuto loupe on to the VF using the top clasp on the loupe.

Be careful not to scratch the VF screen.

Viewfinder: Attaching the Loupe

Here is another view with the loupe attached to the VF and the VF secure in the Vocas bracket.



Viewfinder: Take apart before packing up

Follow the procedure in reverse to detach the loupe.

When remounting the VF to the camera, once the Vocas bracket has been removed, secure the VF right at the end of the rod. This way the VF has room to turn towards the camera when it is stored in the bag.

Tripod Tips

Sony FX 6

Tripod Tips: basic advice

Tripods, having three legs, can tip. Follow this advice to avoid accidents:

Always take the camera off the tripod when moving it. The quick release plate makes this easy to do.

If you do need to shift the tripod slightly while the camera is on it, make sure you have one hand on the camera handle as you are shifting the tripod legs.

If you suspect that the camera will be in a high traffic area when shooting (a conference, for example), you can steady the legs of the tripod against sandbags (available from the EV depot). Sandbags are also useful if the surface is uneven.

Tripod tips: the Sachtler tripods

The EV depot staff will give you one of the Sachtler tripods for the Sony FX 6.
There are two models, the newer model called ACE is pictured to the right.
The ACE model is lighter and has a simpler quick release plate mechanism.

Older model

Newer model

Tripod tips: older model Sachtler base plate

The older, heavier, Sachtler tripod model **has a very powerful quick plate release spring.**
Before removing the plate, make sure the tilt and pan are locked.
To remove the quick release plate you must pull down on the small red disk attached below the red lever. Then move the lever to the left. The quick release plate should pop up.
Remove the release plate by the tripod screw.
Be careful not to get your fingers trapped between the plate and the release mechanism!
The plate snaps into place with a lot of force.

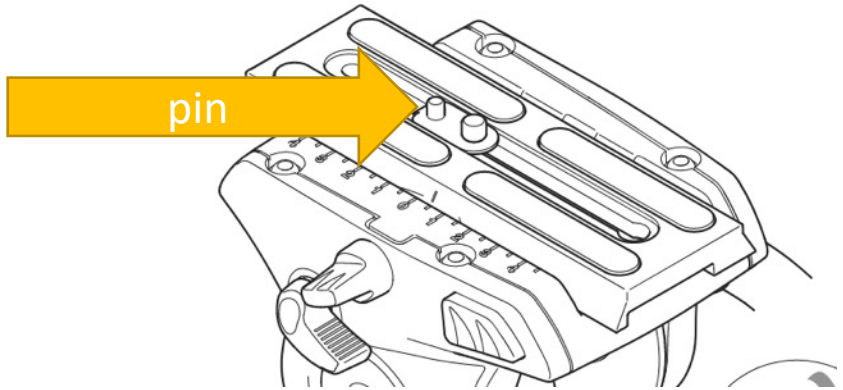
Tripod Tips: Newer Sachtler tripods

- The newer Sachtler ACE tripod has a much simpler quick release mechanism. Tighten/loosen the plate with the side screw. Press the red button to release the plate. The plate can only go into the tripod in one direction (look for the arrow).

Tripod Tips: ACE plate

In addition to a screw, the quick release plate of the ACE tripod has a pin. You can adjust the position of this pin to make sure it aligns with the hole for the pin on the bottom of the FX6.

You can also remove the pin when using the tripod with a DSLR.



Tripod Tips: adjusting the tripod head

The whole tripod head is on a bowl that can be adjusted. This is for small adjustments that cannot be done by adjusting the height of the legs.

Make sure the pan and tilt are locked. Adjust the handle at the bottom of the tripod head. Use the spirit level to ensure that the tripod is level. Line up the bubble within the circle of the level.

It’s best to do this operation without the camera mounted but if the camera is mounted **keep one hand on the camera handle.** The handle should be tight when finishing.

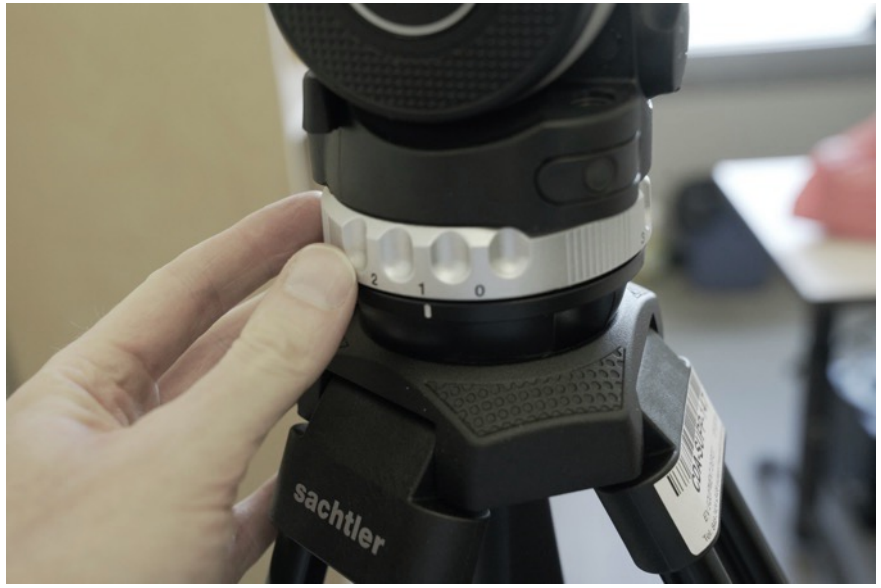
Tripod tips: legs

Once the legs are at the correct height tighten the supports between the legs. This step is easy to forget. It increases stability and is important!

Tripod Tips: Pan and Tilt

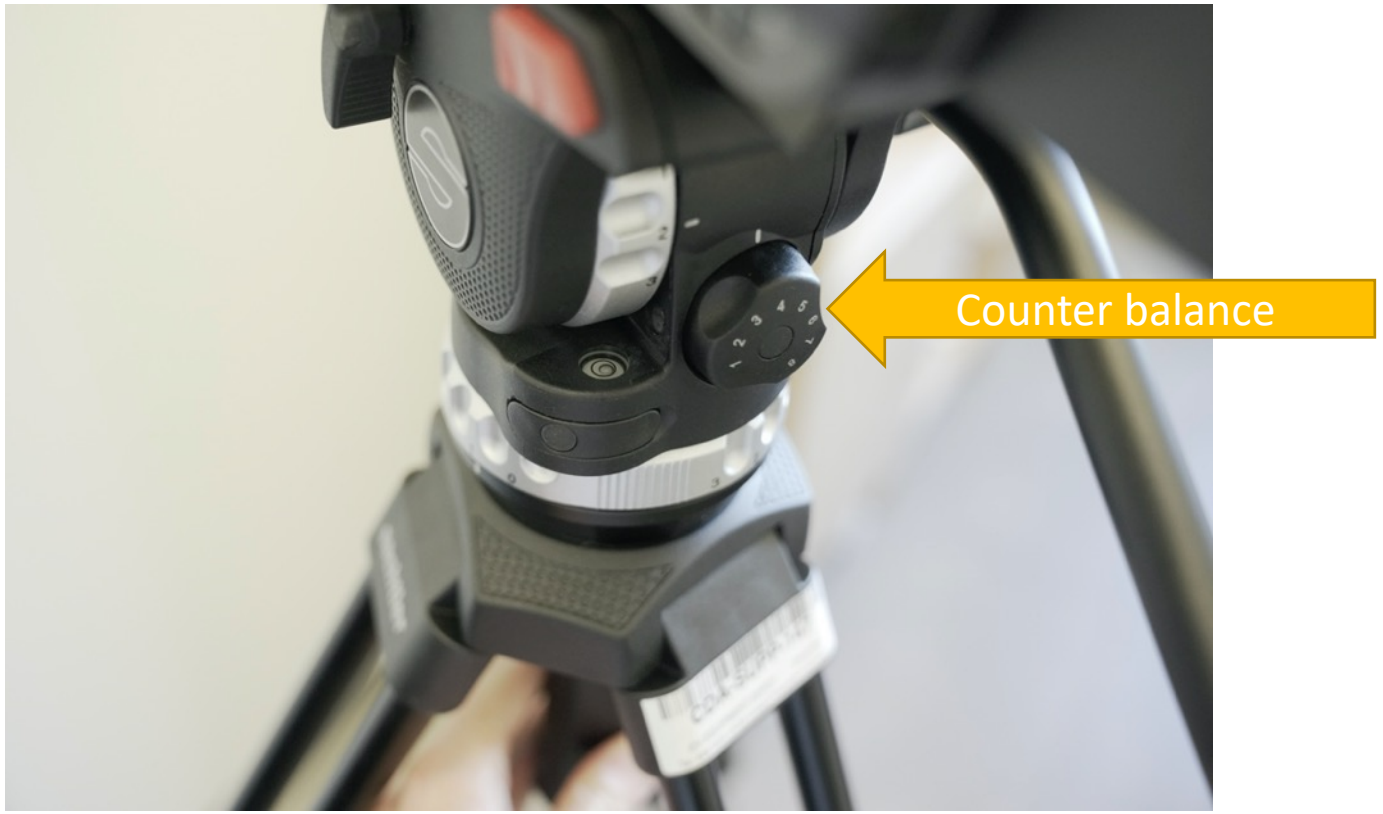
Both models have similar pan and tilt controls. Unlock the pan and tilt before adjusting. Keep one hand on the tilt handle.

The fluid head has three drag levels for tilt and pan. Zero is no drag.



Tripod Tips: counter balance

Adjust the tension on the counter balance to change how the head springs back when tilting.



Additional Resources

Sony FX6

Additional Resources: Sony User Manual

The first place to go is the Sony User Manual.

The manual defines all the aspects and options that this guide has overlooked.

Unfortunately, the language is somewhat opaque on the actual operation of the camera.

https://pro.sony/en_GB/support-resources/ilme-fx6/manual

Additional Resources: tutorials

Alister Chapman is a British cinematographer who has a lot of information on his site about the FX6 and other Sony cameras.

The exposure level advice in this guide is from his tutorials.

https://www.xdcam-user.com/category/fx6/

Doug Jensen is a nature cinematographer in the U.S. He has a lot of concise and clear video instruction on the FX6. Here are two of his videos.

The hybrid focus method in this guide is based on his tutorial.

https://www.youtube.com/watch?v=ASQXluuCWkQ

His observations on the firmware 2.0 upgrade.

https://www.youtube.com/watch?v=VSsPs49dRuo

Additional Resources: reviews

Philip Bloom is a filmmaker from the UK who offers idiosyncratic but always informative reviews on cameras with lots of scenic imagery.

These are meandering but entertaining. I have not watched them all.

His review of the camera before the firmware update:

https://philipbloom.net/blog/sonyfx6review/

His review following the firmware version 2 update:

https://www.youtube.com/watch?v=Vy0LwZqsAws

Additional Resources: LUTs

Sony LUTs:

https://pro.sony/en_CA/technology/professional-video-lut-look-up-table

Sony LUTs for the Venice camera. You can try them on Slog 3 images shot with the FX6:

https://sonycine.com/resources/luts/

Overview of other LUTs for the FX6:

https://filmplusgear.com/fx6-luts/

Thank you for reading this guide.

If you have any comments, questions or suggestions

please email:

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