

**SONY**

# An Introduction to Log Shooting

## What creative benefits does S-Log offer?

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Originally developed for high-end digital cinematography, S-Log is now revolutionising the creative possibilities for everyone. It's truly a game changer.



# The exciting world of Log shooting and digital cinematography



The S-Log image prior to grading may appear flat, but information in both shadows and highlights is preserved.



After colour grading, the image becomes far more vivid - the superior information captured by S-log allows you to achieve the creative look you desire.

These days, we often hear the words “digital cinematography”, referring to file-based shooting using a camera with a large-format sensor. Rapid advancements in movie shooting, including Sony’s flagship 8K F65 camera, have made it possible to capture levels of image quality that were absolutely unthinkable in the past. We are entering a new world with digital cinema on the cusp of blasting past film quality.

Log shooting is attracting attention in this new world. Because Log was originally a gamma curve<sup>1</sup> in digital cinema, it was often used to shoot movies and commercials. The art of colour grading from Log<sup>2</sup> images has long been a key component of digital cinematography, one which is now attracting much wider interest due to the inclusion of S-Log in Sony’s PXW-FS7 and FS5, as well as  $\alpha$ 7 series 4K digital interchangeable-lens cameras and even Cyber-shot cameras. It is amazing that Log shooting, originally only available on high-end cameras costing more than 100,000 euros, is now available to almost everyone. All that it requires is a bit of knowledge about post-production to reap the many benefits of this powerful feature.

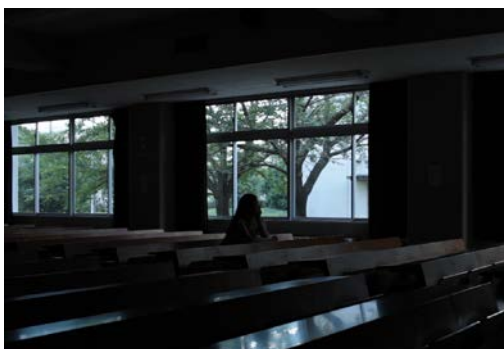
# Log shooting for more beautiful footage

Log was originally a technology for digitizing movie film. It was then used in digital cinematography as a gamma curve to record, as much as possible, information captured by the large-format sensor. In other words, Log captures footage with a wider colour gamut, dynamic range, and tonal range than traditional recording does. Because of this, it provides far more flexibility in post-production to create the specific look you require. However, it's crucial to understand that when you first import your footage it will appear to be lacking in contrast, colour saturation, and texture. Only when you begin experimenting with colour grading will you appreciate the flexibility provided by S-Log to achieve the results you want. Personally, I find this colour grading to be a lot of fun. Colour grading is not limited to how you play with time, but also how you manipulate space. The creative possibilities of S-Log are sure to hook you.

In other words, even though Log is meant for colour grading, because shooting movies in Log opens up a new realm of possibilities for handling colour, it is something completely other than a just another means of recording and editing video.



Scenes which were impossible to fully capture before, such as those with strong sunlight and dark shadows can be captured in far more detail using S-log.

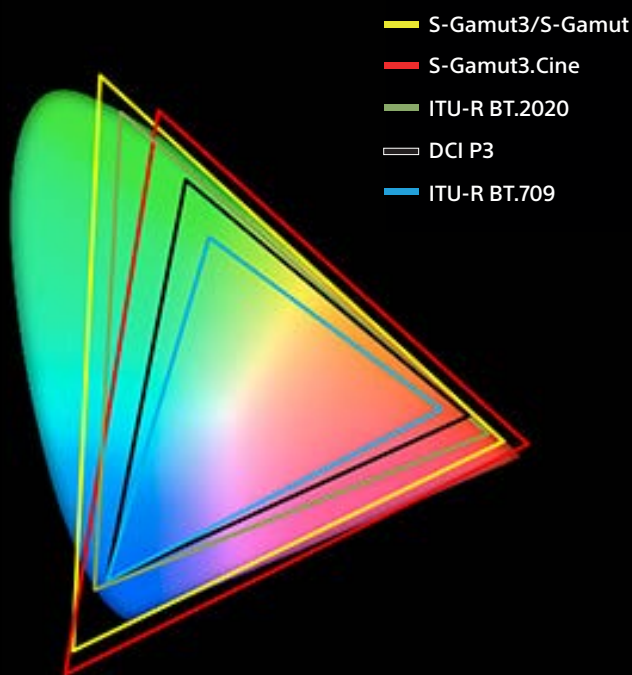


## The significance of capturing a wide range of tones

The tone area captured in Log gamma shooting is vast. Normal video footage contains 7 to 9 stops, but Log can capture 12 to 15 stops of tones. Log specs are especially effective for subjects that tend to experience loss of details in shadows or overblown highlights. Log can be advantageous for scenes that were nearly impossible to shoot well before, such as scenes with clouds, the sky and people's shadows in settings with backlight or with strong sunlight, and produce rich gradations in highlights and shadows. The advantages of shooting in Log are apparent in shots of everything from landscapes to people.

# Advantages to shooting in a wide colour gamut

As was explained above, Log is a gamma curve that maximizes a sensor's performance. When shooting in Log, you can set not only the gamma curve, but the colour gamut as well. The colour gamut is the range of recordable colour, and put simply, the wider it is, the more colour information is recorded. The colour gamut used in the video field is ITU-R BT.709<sup>3</sup> (hereafter referred to as 709 standard). This standard is used in digital TV broadcasts and many different media. When using S-Log 2<sup>4</sup> for shooting, you can shoot in the S-Gamut colour gamut<sup>5</sup>. This is a very wide<sup>5</sup> colour gamut, as you can see in the figure. The reason that the colour saturation looks so flat in this video is that the footage captured with a wide colour gamut is played back on a monitor that conforms to the 709 standard, which cannot reproduce all of the colours that were actually recorded. Of course, the final product will be finished to conform to the 709 standard. However, this image shows that recording more colour information than is available in 709 standard allows you to utilize a versatile form of grading that uses rich colour information in post-production.



## Log and RAW concepts

RAW still image and video files contain the most recorded data. RAW shooting capability is available on most cameras including compact cameras when capturing single still images. If you want an image to look particularly good, it is best to shoot in RAW. However, because it consumes massive amounts of data, RAW is far more demanding of storage capacity (for recording and back-up), computing power and perhaps above all, time. The scale of data places heavy demands on any workflow and pre-planning is essential to ensure timely delivery of dailies, back-ups and post-production such as editing and grading. Log shooting allows users to achieve comparable results to RAW's creative flexibility with a much less demanding workflow.

## 709 colour gamut is easily reproduced with 3D LUT

When shooting in Log, colour grading is necessary after shooting in order to display the footage on a 709 standard monitor. LUT<sup>6</sup> (Lookup Table) is used during this process. Recently, LUT has often been used to refer to a single set of data that converts footage shot in Log to the 709 standard, but the phrase originally referred to any of a variety of conversion tables. Because complex colour conversions are carried out for each colour gamut, three-dimensional LUT is currently the mainstay, and is now called 3D LUT. LUT makes it easy to express footage shot in Log with the colour gamut in the 709 standard even for beginners, while such as adjustment of the tone curve, hue, and colour saturation without using LUT can be complex for them. Users can convert footage shot in S-Log to the 709 standard using LUT available on the internet. Although we will touch on specific methods for using LUT later, this shows that LUT can be used easily to convert Log footage to the 709 standard.

Lately, LUT spec shooting monitors have had an increased presence in the market, for viewing Log footage with LUT applied to conform to the 709 standard. If there are people who use LUT simply to check 709 standard images, there are also people who use LUT during the first step of colour grading. Various LUT can be used to suit workflow style to achieve final colour.

# Actual shooting and colour grading in S-Log2

Now, let's try actually using S-Log to shoot a scene that would result in highlight blowout and loss of shadow details in traditional video shooting.

Application image © 2015 Westend Film & TV



## Excellent colour grading capability using S-Gamut/S-Log2



One Picture Profile available is S-Gamut/S-Log2, this Picture Profile is intended for colour grading, with a wide colour gamut that can withstand the rigors of movie production. If you plan on grading during production, this Picture Profile is a good recording option. S-Gamut/S-Log2 is preset in Picture Profile menu PP7, and advanced settings should be left unchanged.

## Log shooting

Because it is difficult to determine exposure and focus in Log shooting due to low-contrast images, it is a good idea to apply a LUT. There are a number of ways to check the image. With the FS5 and  $\alpha$ 7S II, a shooting assist function (Gamma Display Assist) can be used to display the image in 709 format on the camera's viewfinder and LCD panel. S-Log Gamma Display Assist can also be found on the CLM-FHD5 Clip-on Monitor.

The CLM-FHD5 Clip-on Monitor is recommended for its S-Log monitor display assist function, ease of use, and reasonable price.





## Determining exposure in Log shooting

Because the exposure is more difficult to determine when looking at footage in Log shooting compared with normal video shooting, many people are unsure of what to do about exposure when shooting. The first thing you should remember about the S-Log2 standard is that the 18%<sup>7</sup> gray is shot at a video level of 32% as a base.

There are a few methods to check the exposure when shooting movies, such as by using the waveform, zebra display, and false colour<sup>8</sup>. You can use the CLM-FHD5 Clip-on Monitor to check the approximate 32% levels using false colour.

However, there may be situations where you can't check the exact exposure and use waveforms when shooting video. Log shooting has advantages in

those situations, as well. The FS5's S-Log2 has a very wide dynamic range of 14 stops, has a high tolerance for highlights, and prevents most clipping. We take advantage of this tolerance. If you're monitoring by using the actual Log image, you probably feel that you can continue raising the exposure. Data ends up within the scope of the histogram due to Log shooting's high tolerance for highlights. Of course, you need to thoroughly check the histogram to ensure that highlights in the areas you want to capture are not blown out.

You can also ensure that noise is not noticeable by recording footage by brighter than standard, and then darkening it during grading. For example, you can shoot at 1 EV brighter than the standard S-Log2 exposure and then darken the footage at the same value during grading. However, it should be noted that the dynamic range will be narrowed by half in such situations. In other words, you can change the balance of noise and dynamic range.

The exposure for this recording was controlled so that 18% gray matched around 32% waveform as a faithful base exposure for S-Log2.

The exposure was determined using the actual monitoring of Log picture, but it is important to properly check the signal level. A better approach is to turn the LUT on and off to check the image while shooting.



The CLM-FHD5 is a very affordable tool for on-set monitoring.

# Post-production using DaVinci Resolve

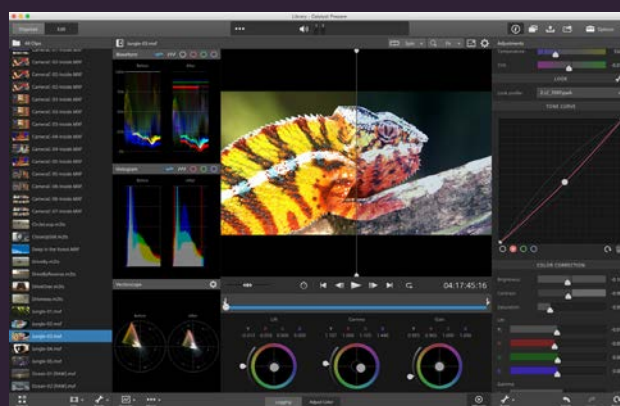
There are a variety of tools<sup>9</sup> for grading Log recording footage. Although more software tools will likely be introduced in the future, Blackmagic Design's DaVinci Resolve 12 is one of the most widely used today. DaVinci Resolve is an authentic colour grading system originally used in the movie business, and most of its functions are available for free downloading.

Here, I will not introduce how to use DaVinci Resolve, but how to handle Log footage. First you must import the LUT available from Sony's website. The latest version of Da Vinci includes the S-Log3 LUT. However, because the LUT for S-Log2 is not included, you must download it and move it to the LUT folder.

Although you can select the LUT from the options that appear when you right click on a node, I recommend using "From\_Slog2SGamut\_To\_Slog2-709" for converting only the colour gamut and then making adjustments. Why not play with the contrast yourself that may allow you to enjoy the original Log tones more? Conversely, because it is often challenging to achieve the desired results on your own for colour control, be sure to try this LUT at least once. The controls are so easy that starting your Log experience with them makes Log shooting and grading simple, so you'll feel at ease when colour grading in Log.

This time, I tried colour editing with Sony's LUT, keeping the colours somewhat subdued. Because we shot in a factory that is naturally dark, we wanted to make sure that there weren't too many strong colours in the composition. We mixed green and blue lighting and used them as touch light to keep the atmosphere a bit dark.

Sony Catalyst Prepare enables footage to be quickly viewed, LUTs applied, In and Out points added, Meta data amended and then saved, exported or transcoded to speed up the post production stage in the workflow.



Footage shot in S-Log2

Complete version with edited colour

Version with Sony "From\_Slog2SGamut\_To\_Slog2-709" LUT applied

The end result shows the amazing capability of Log shooting. In fact, many technological advances, such as Log, 4K resolution and low noise, have combined to massively expand the expressive potential of video into new realms.

Take a look at split images to the right, of raw S-Log2 footage and footage after grading. We think you'll agree You're sure to see the advantages of shooting in 4K and S-Log.



# Notes

## 1. Gamma curve

Tone curve (also known as “gamma curve” in the video industry) is common in photo editing software such as Photoshop.

## 2. Log of other companies

Various companies have different Log options. The concept behind each curve differs from company to company, and a different LUT is used for each Log.

## 3. ITU-R BT.709

The ITU-R BT.2020 standard has been established for 4K and 8K video. However, this will not be in use for some time, so ITU-R BT.709 is generally used for colour gamut currently.

## 4. S-Log2 and S-Log3

Although S-Log3 is the newer standard, it is not a successor standard, but works with colour space in ways similar to negative film scans. S-Log3 features 18% gray that is brighter than that of S-Log2 and has good tones from shadows to skin colours. S-Log3 is also easy to manually grade without using LUT.

## 5. Wide colour gamut

Although this standard has a wide colour gamut, it is limited by the colour filter of the actual camera used for shooting, so the entire colour gamut of S-Gamut is not guaranteed.

## 6. LUT

LUT is a generally used term and the 3D LUT for Sony's S-Log used in various environments is called a Look Profile.

## 7. 18% gray

A gray card, which can be purchased for about 20 euro, is useful to have.

## 8. False colour

This function displays the signal level on the monitor as a colour distribution, so for those who are not used to waveforms, it's easy to see at a glance which signal level belongs to which section.

## 9. Editing/grading software for Log

In addition to DaVinci Resolve, Adobe Premiere Pro CC and Sony Catalyst Production Suite are available. There are also plans to upgrade the current version of Edius to support Log files.

## Related Products

All of the below cameras and camcorders from Sony provide S-log capability.



F65



PMW-F55



PMW-F5



PXW-FS7



PXW-FS5



NEX-FS700R/RH

For more information on S-Log, including software downloads, please visit [www.pro.sony.eu/s-log](http://www.pro.sony.eu/s-log)

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