JVC

3D-LUTs file for J-Log1 of

GY-HC500series, GY-HC900series and GY-LS300

Reference Manual

Version 1.0

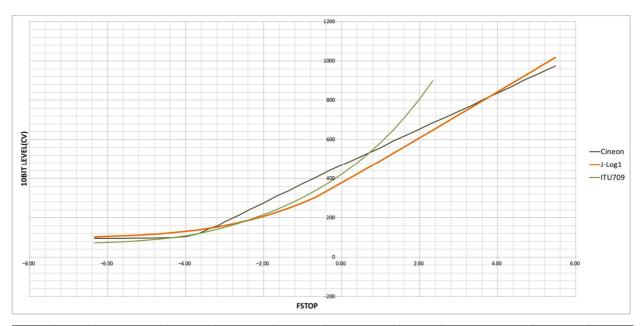19th August 2020

I n d e x

1. J-Log1 and 3D-LUT files

GY-HC500 series, GY-HC900 series and GY-LS300 enables to record J-Log1 gamma log characteristics. When J-Log1 gamma is selected, contrast characteristics become lower compared to the Rec.709 specifications, since 800% dynamic range is coded in flat characteristics of the logarithmic curve as shown below. Also, because no color correction is applied, displayed video will result in low contrast with thin coloration on a monitor with Rec.709 color space. Log characteristics are said to be close to negative film characteristics.

Normally, in post-production color grading is applied to recordings made using the log characteristics with non-linear editing software and/or plug-in grading software. This grading work is equivalent to film processing.

Thus, grading is required with video recorded using J-Log1 gamma as it cannot be displayed on a conventional monitor with the correct coloration. Hence, in order to view videos recorded using the log characteristics on a conventional monitor with Rec.709 specifications without uncomfortable coloration a set of files called 3D-LUT – each of which is created in advance using lookup table by converting R, G, B log data to match the Rec.709 characteristics – is made available.

Preset 3D-LUTs can be used with non-linear and grading tools, which are capable of adjusting tone curve to achieve videos with appropriate coloration on a monitor with Rec.709 color space and DCI-P3 color space, making it a useful starting point for color grading.

0% (BLACK)			Reflection 2%			Reflection 18%			Reflection 90%			Reflection 800%		
IRE	10bit Code	8Bit Code	IRE	10bit Code	8Bit Code	IRE	10bit Code	8Bit Code	IRE	10bit Code	8Bit Code	IRE	10bit Code	8Bit Code
3.7 %	96	24	10.3 %	154	39	35.9 %	379	95	66.5 %	646	162	108.8 %	1017	254

J-Log1 to Rec709

In order to maintain the 800% dynamic range achieved with the J-Log1 gamma even after converting to Rec.709 specifications, the characteristics of preset 3D-LUTs are also capable of achieving gamma characteristics without knee compression or clipping for gradation of scene reflectivity ratio from 100% to 800%, and for gamma to output 75IRE or 85IRE for 100% reflectivity ratio against 100IRE for 100% reflectivity ratio under Rec.709 specifications. Also, 3D-LUTs are capable of achieving corrected coloration characteristics relative to the converted gamma characteristics so that images can be viewed with a monitor with Rec. 709 specifications without incompatible color reproducibility.

J-Log1 to DCI-P3

Because J-Log1 shoots at a maximum dynamic range of 800%, it is a question of how to tone-map it to express it as DCI gamma 2.6.

Shoot an image with subject reflectance of 100% using J-Log1 and then apply the newly developed LUT, the leeway of 100% or more can be decided by the value of IRE set for output. For instance, if a 100% subject reflectance is outputted at 100 IRE, the remaining image input with subject reflectance of over 100% between 100 to 800% will be compressed into a mere 9% or less in the super white range. As a result, no gradation will remain.

We have prepared two LUTs, one with a knee characteristic that outputs 100% subject reflectance at 75 IRE and another that outputs 100% subject reflectance at 85 IRE.

The image created using 75 IRE knee characteristics LUT can achieve high gradients for whites so the image will not be overexposed however will be low in contrast. On the contrary, with the 85 IRE knee characteristics LUT one can get images with higher contrast but can be overexposed. Users can choose the one that matches the scene or preference.

Even if the highlights are gently compressed with knee, the tone mapping will have minimum colors around the hue of knee highlights. These LUTs can be used as a basic tone, which can be adjusted to match tones for each scene by using functions like tone curve or other grading tools as needed.

These DCI-P3 LUTs are the color achieved by gamut converting J-Log1 chromaticity point and white to DCI-P3 chromaticity point and white.
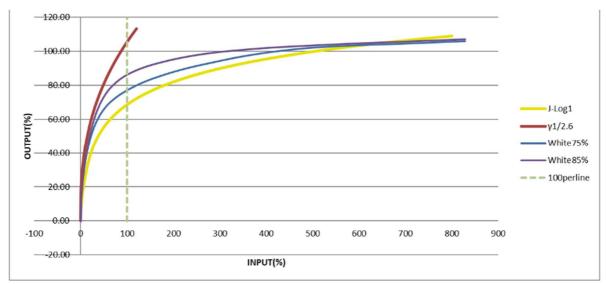
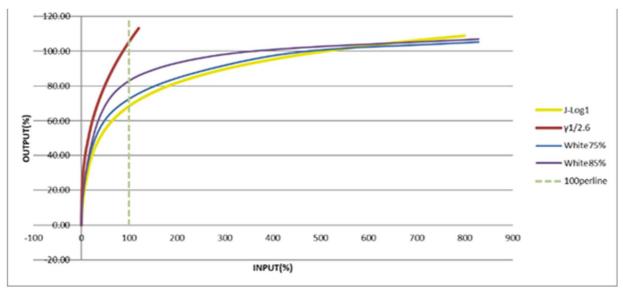Fig.2 Knee white variations for system gamma 1.2 of DCI-P3 LUT.

Fig.3 Knee white variations for system gamma 1.4 of DCI-P3 LUT.

2. Evaluation Monitor and Its Environment

When evaluating LUTs for DCI-P3 conversion, it is recommended to perform evaluation using a monitor compatible with DCI-P3.

When projecting movie content on a theater screen, increasing the brightness of the screen is not an easy task since images are enlarged from the projector lens. The image appears brighter, relatively, by turning the lights off to make the venue dark and allowing the viewers' pupils to dilate. Taking such facts into consideration, DCI sets the brightness specifications of white at 48cd/m^2, which is about a half the brightness of conventional monitors, to make the image appear dark.

For this reason, when evaluating in DCI mode, it is recommended to turn off the lights and make the room dark before evaluation.

Also, when evaluating a Rec709-converted LUT, it is recommended that you use a Rec709-compatible monitor for evaluation since the colors of Rec709-converted LUT are matched for viewing DCI-P3-conversion LUT on a DCI-P3-compatible monitor. However, do note that the image will appear brighter compared to DCI as conventional Rec709 has a brightness of more than $100cd/m^2$. Also, for colors with a wider gamut than Rec709, the color reproduction will be different from that of DCI-P3 LUT.

 Since the Rec709 conversion LUT is created to match the tone with DCI-P3 LUT with gamma 2.6, it is recommended to evaluate monitor gamma after converting to Rec709 at Rec1886 gamma (or gamma 2.4) for dark rooms. (Consequently, there is no need to set the monitor gamma to 2.6 when using Rec709 LUT, but to set for production gamma Rec 1886 [or gamma 2.4]) However, do note that white in Rec709 has brightness of more than $100cd/m^2$ on conventional monitors; this means that the image will display brighter when compared to DCI.

3. 3D-LUTs for GY-HC500 series, GY-HC900 series and GY-LS300 provided by JVC

3D-LUTs are available for the following common non-linear software and plug-in grading software. Please select the appropriate LUT for the grading software in use.
Please refer to below for an example workflow using 3D-LUTs. Grading of videos recorded with J-Log1 using the software featured effects instead of the 3D-LUTs is also possible.

Table.1 3D-LUTs FILES

No	MAKER	SOFT/DEVICE	PLUG IN	LUTs FileName	Format	GridSize	Camera Setting
1	Adobe/Apple	Premiere Pro CC Final Cut Pro X	Premiere Pro CC:No need FCP X：:No need	J-Log1_to_Rec709_SysG1r4_Primary_75p_32g.cube J-Log1_to_Rec709_SysG1r4_Primary_85p_32g.cube J-Log1_to_Rec709_SysG1r2_Primary_75p_32g.cube J-Log1_to_Rec709_SysG1r2_Primary_85p_32g.cube J-Log1_to_DCI-P3_SysG1r4_Primary_75p_32g.cube J-Log1_to_DCI-P3_SysG1r4_Primary_85p_32g.cube J-Log1_to_DCI-P3_SysG1r2_Primary_75p_32g.cube J-Log1_to_DCI-P3_SysG1r2_Primary_85p_32g.cube	.cube	32^3	J-Log1
2	Black Magic Avid GrassValley TV Logic	Davinci Resolve MediaComposer 7/8 EDIUS 8.2~ IS-mini	No need IS-MINI:Need IS-mini Manager Plus …etc	J-Log1_to_Rec709_SysG1r4_Primary_75p_33g.cube J-Log1_to_Rec709_SysG1r4_Primary_85p_33g.cube J-Log1_to_Rec709_SysG1r2_Primary_75p_33g.cube J-Log1_to_Rec709_SysG1r2_Primary_85p_33g.cube J-Log1_to_DCI-P3_SysG1r4_Primary_75p_33g.cube J-Log1_to_DCI-P3_SysG1r4_Primary_85p_33g.cube J-Log1_to_DCI-P3_SysG1r2_Primary_75p_33g.cube J-Log1_to_DCI-P3_SysG1r2_Primary_85p_33g.cube	.cube	33^3	J-Log1
3	Eizo	ColorEge CG248-4K CG318-4K Monitor	Color Navigater Nx	J-Log1_to_Rec709_SysG1r4_Primary_75p_33g.cub J-Log1_to_Rec709_SysG1r4_Primary_85p_33g.cub J-Log1_to_Rec709_SysG1r2_Primary_75p_33g.cub J-Log1_to_Rec709_SysG1r2_Primary_85p_33g.cub J-Log1_to_DCI-P3_SysG1r4_Primary_75p_33g.cub J-Log1_to_DCI-P3_SysG1r4_Primary_85p_33g.cub J-Log1_to_DCI-P3_SysG1r2_Primary_75p_33g.cub J-Log1_to_DCI-P3_SysG1r2_Primary_85p_33g.cub	.cub	1D-Lut 1024 + 3-DLut 33^3	J-Log1