

Guide to Gamma settings on the Sony F55 camera.

by John Hoare - DoP

"Gammas" are how TV cameras record the darkest to the brightest objects in the scene.

Advice to producers - the 30 second version

I don't have time for a grade; I want a finished picture straight out of the camera Use Standard Gamma 5 (STD5)

I / my editor will be grading it on our in-house edit suite Use Hypergamma.

It's being finished in a dedicated grading suite, by a full-time colourist Use S-log

The F55 offers 3 categories of gammas: Standard, HyperGamma, and S-log.

Standard gamma:

7-stop dynamic range. When you want "the blacks 0%, and the highlights 100%", straight out of the camera. Pros: it gives you legal (>= 100%) tv signal with no grading. Cons: there is much less room for manoeuvre to change the look / correct exposure errors. Highlights are less natural.

- **STD5 R709** Rec709 is the most commonly used gamma; it's the default HDTV standard gamma. It's the only *standard* gamma I ever use.
- **STD1:** DVW camcorder equivalent. Has lowest slope near black (for low noise and black-crushing).
- **STD2** x4. Somewhere between Std1 and Std3
- **STD3** x3.5
- **STD4** 240M
- **STD6** x5.0

HyperGamma:

10-stop dynamic range. Sony's useful half-way house between Standard Gamma and S-log; it captures much more light and dark shades than rec709, it renders highlights more naturally (less colour-shift), and it is gradeable using tools bundled with all popular NLEs. Two are optimised for 100% white clip in a TV workflow (HG 1 and 2), and four for the 109% white clip generally used in traditional film style workflow (HG 3 to 8). I don't shoot any straight-to-air stuff so I always use 109%.

- **HG1 3250G36** Good for low-light: brighter mid-tones. Use if workflow clips everything at 100%.
- **HG2 4600G30** Where extra dynamic range is more important (capturing bright objects). Use if post clips everything at 100%.
- **HG3 3259G40** Close to HG1, but clipping at 109% not 100%.
- **HG4 4609G33** Close to HG2, but clipping at 109% not 100%.
- **HG7 8009G40** 800% range. Good for low-light: brighter mid-tones.
- **HG8 8009G33** 800% range. Where extra dynamic range is more important.

How to read these hypergamma codes: eg "8009G33" breaks down as:

- **800** means 800% range of exposure is captured
- **9** means it clips at 109%, giving you 9% more data to interpret a given scene. **0** clips at 100%
- **G33** means you should expose an 18% reflectance gray-card at 33% on the vectorscope.

Cinegamma Tip: If you are mixing Sony cameras on set, some using hypergammas (F5, FS7) and some cinegammas (FS5, FS700) then note:

- Cinegamma 1 is the same as Hypergamma 4.
- Cinegamma 2 is the same as Hypergamma 2.

I couldn't find other Cinegammas which have Hypergamma equivalents.

So, if I'm cutting between an F55 and an FS5, I set the F55 to *HG4* and the FS5 to *Cine1*.

S-Log:

14-stop dynamic range. Exploits the full range of the F55 chip, but should be graded by an experienced colourist. Watch for highlight clipping (it has no shoulder roll-off); read up before shooting. Sony says S-log2 and 3 have 1300% dynamic range.

S-Log2 places *18% gray* at 32%.

S-Log3 places *18% gray* at 40%.

The current **sweet-spot for Log shooting is S-gamut.cine/S-log3**. S-gamut.cine is considerably easier to grade than other Sony

colour-gamuts, and it emulates Arri Alexa's beautiful natural colour-renditions (notably in desaturating highlights). Sony wrote this [white paper](#) giving an overview for DITs and colourists. Art Adams has written a [nice overview of his tests](#). To avoid noisy shadows in S-log3, the consensus is to over-expose by around 1.5 stops; especially for dark scenes.

Pulling some quotes from [Alister Chapman's summary](#): *SLog3 mimics film a little more closely than SLog2 (Cineon was designed to mimic film, SLog2 is designed to maximise data recorded from a video sensor). This means that SLog3 has a density response similar to film. Which in turn means that your exposure will be brighter than SLog2.*

SLog3 is allocating more data to the mid to low range than SLog2, so shadows and darker mid tones will have slightly more levels per stop than SLog2. Also mid tones will look brighter as the exposure is slightly brighter.

In post production as the curve is so close to Cineon you will be able to use almost any Cineon compatible LUTs or Looks. It's also very, very close to Arri's Log-C curve so LUTs designed for Log-C will work very well with SLog3 and Sgamut3.cine making it much easier for many colourists to transition from cameras like the Alexa or a film based workflow to material from the F5/F55.

Further reading:

- [Sony's S-Log2 and Dynamic Range Percentages](#) by Andy Shipsides
- [Detailed analysis of F5/F55 dynamic range and gammas](#) by DoP Art Adams
- [Understanding Gamma, Cinegamma, Hypergamma and S-Log](#) by Alister Chapman at [xdcam-user.com](#)
- [When should I use a Cinegamma or Hypergamma?](#) by Alister Chapman

More good advice from Sony's F5/F55 [bulletin board](#):

Nate Weaver: *It's pretty simple. Hypergammas make an image that is kind of "ready to go" from an editorial standpoint. It's intended for people who like to paint their cameras and create in-camera what gets seen in the final product. Intended for minimal color correction.*

S-Log on the other hand is intended for folks who want the cleanest, un-adultrated image going into post. Full sensor dynamic range, no matrix "looks" in the camera, no sharpening, nothing. The philosophy of "raw" but still recorded into a video signal. It also assumes there is somebody in post who has the tools and skills to make a pretty image, most likely a colorist.

Alister Chapman: *I would add to what Nate says above in that Hypergammas are fairly flat and do grade very well, yet not quite the full range of the sensor. The mid range in the Hypergammas is still reasonably linear and close to standard gammas. As a result the*

normal grading or color correction tools found in most edit applications will be able to manipulate the footage quite well. Footage recorded using a full log curve can be tough to grade with tools designed for standard gammas, you adjust the mids and the highlights blow out really quickly. Log is best graded either with dedicated log grading tools, normally a dedicated grading package that has log corrections. Or you need to de-log the footage first so that you can use normal linear corrections.

So if your not going to go in to a dedicated grading suite then Hypergammas may give a better final result. If however you are planning on a full grading stage with proper grading tools in your post production workflow then Log gives the greatest flexibility without the data overhead of using raw.