

## Notes from a gearhead

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### TrueColor for Canon XH A1

After the success of my JVC HD100 TrueColor configuration ([TrueColor 3](#), [TrueColor 2](#) and [TrueColor 1](#)) I have been asked to calibrate a few different cameras. While I can't get my hand on every possible model in the market I managed to get a Canon XH A1 some time ago and so I was able to apply the same calibrations techniques use previously on this little camcorder. I was quite impressed by the flexibility of a \$3,000 camera, I didn't quite expect the level of customization that is available. Anyway, the principla used for the A1 is the same that I apply to all cameras: do not create a look in camera, instead make the camera able to "see" the scene in the most neutral way.

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This is because HD cameras already compromise a lot in terms of color quality. If you apply transformations to the color matrix to achieve a give color look, say a simulated Bleach Bypass, you are baswically discarding color information that you will never be able to recover. On the other hand, if you capture your video at the most neutral state, you will be able to use a program like After Effects to create the look that you want with full color resolution. Think about it. When you dial a look in camera you are taking the real life colors, the "neutral look", and apply a transformation to it using color-altering techniques based on the limited processing power of the camera. Also, these alterations need to be applied in real time, something that is usually achieved by limiting the depth and precision of the calculation. Leave your footage neutral, except for necessary filters like a Polarizer, and apply the look in post where you have the maximum amount of precision and you can dial-in each parameter with extreme precision.

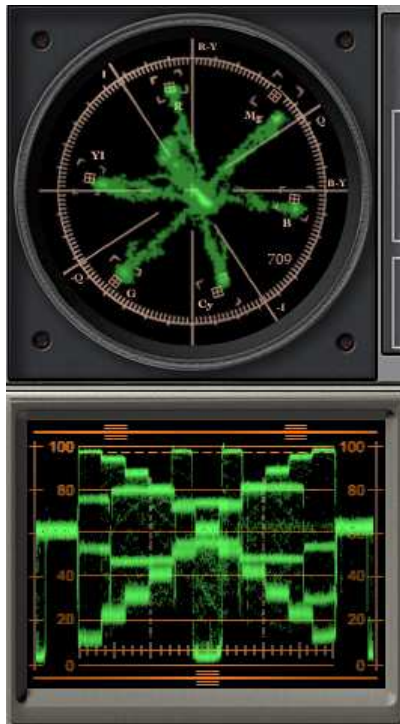
Based on this idea, TrueColor is aimed at giving you the highest latitude available from the camera, other shooters verified an increase of 1 full stop when using TrueColor for the JVC ProHD cameras, and the highest color fidelity that the camera is capable to deliver. As strange as it sounds, most cameras come out of the factory with less-than-perfect configurations. This happens at all levels and it's dictated by all kind of marketing decisions. A lot of cameras are set in a way that the manufacturer believes will create the highest impact with a prospect buyers. That doesn't always translate to the most precise configuration.

As I did with my previous configurations, the A1 was calibrated by using a radiospectrometer accurate [DSC](#) chart. Calibration is only as good as your tools. You need an objective point of view in order to see how far off the camera is. The DSC charts are individually tested to reproduce the colors of the HD standard when lit correctly. You can't use a Macbeth chart and you can't use a chart printed on your Inkjet printer. I know that \$350.00 for a chart seem like a lot but, like in everything in this industry, you get what you pay for. An accurate chart, in the right hands, can do wonders for improving image quality.

I placed the camera level on front of the chart, lit the chart with two lights placed at equal distance on both sides of the chart and measured the light hitting the chart at several points in order to get even lighting. The white balance was adjusted to matvvh the lights at around 3200K. In order to verify if TrueColor brings any improvement compared with the stock settings I selected the "CP9" scene file from the camera, a configuration meant for "Cine" shooting, and took a sample of the camera response by using a Vectorscope and Waveform monitor (WFM). The Vectorscope gives me the location of the reference colors in the spectrum. If the colors, which have been verified by DSC, don't fall in the predetermined areas of the VScope then we turn the dials in the color matrix until they are placed in the right location. This will correct any color bias in the configuration. The WFM gives us the information about the luminance of each grayscale pattern, the location of the white and the black chips. In addition we see where our gamma is. The first impression about the CP9 is "Holy crap!" what is all that stuff:



All that fuzzyness is the noise created by the “detail” circuit. Like in most video cameras, the A1 is set from factory to ultra-sharpen everything. The so-called sharpening is simply an edge-detect circuit that finds areas of high contrast and draws darker pixels into them. This creates an “edge” that some people find attractive. Turn it off. Because of the misleading terms used by camera manufacturers, words like “detail” or “sharpen”, the public is often lead to believe that if you turn off this parameter the images get blurry. Nonsense. Your images will gain a nice softer look that will not be by any means blurry. They will look more like something shot on film and you can add a little bit of detail in post, with After Effects or similar programs, and set it up with much finer control. Also, the sharpening done by After Effects is generally more subtle and better in quality than the one performed by the camera. Still skeptical? Here is the same exact chart but with the detail turned off:



So, while the image looks softer (nicer) the amount of noise is actually much, much lower. Incidentally this also turns into smaller media files as the artificial noise wrecks havoc with the compression used by the camera. By comparing the Vectorscope portion of the two images above we can also see how the TrueColor places the color chips in the right spot while the factory settings are way off. In fact the “CP9” configuration not only has the cyan and green chips way off target but all colors are quite muted.

So here are the settings for TrueColor XH A1. Enjoy!

Parameter	Value
GAM Gamma	N
KNE Knee	M
BLK Black	P
PED Pedestal	-9
SET Setup	-9
SHP Sharpness	-9
HDF Hor.Detail	M (default)
DHV Detail HV Balance	0 (default)
COR Coring	0
NR1 Noise Reduction 1	0
NR2 Noise Reduction 2	0
CMX Color Matrix	N
CGN Color Gain	0
CPH Color Phase	0
RGN Red Gain	-7
GGN Green Gain	3
BGN Blue Gain	12
RGM Red Green Matrix	40
RBM Red Blue Matrix	-12
GRM Green Red Matrix	6
GBM Green Blue Matrix	0
BRM Blue Red Matrix	12
BGM Blue Green Matrix	-3

Now for the bad news. I did this a few months ago for a client. I don't have a A1 so I can't updated these setting or provide more information. If you need help post below and I'll do my best to answer.

If you find these settings useful, consider making a [donation](#) via Paypal. It will help sponsoring this website and encourage future developments.

Tags:

This entry was posted on Thursday, March 13th, 2008 at 4:23 pm and is filed under [TrueColor](#). You can follow any responses to this entry through the [RSS 2.0](#) feed. You can [leave a response](#), or [trackback](#) from your own site.

### 13 Responses to “TrueColor for Canon XH A1”

1. *kevin* Says:

[March 16th, 2008 at 11:32 pm](#)

Great stuff. Thank you for sharing!

2. *René* Says:

[March 19th, 2008 at 9:11 am](#)

Thank you! Much appreciated.

3. *zck* Says:

[March 21st, 2008 at 3:11 pm](#)

Hi, been following the thread on dvinfo. Do you have the latest update to the configuration. btw. thanks in advance 😊

4. *pciccone* Says:

[March 21st, 2008 at 3:31 pm](#)

You're very welcome. The last configuration is the one above, just change the pedestal to -7

5. *Budi Satriawan* Says:

[April 2nd, 2008 at 9:39 am](#)

Thanks for your sharing. I will try

6. *Camera presets, getting the look in camera or in Post / Bonnie Blink Productions* Says:

[April 4th, 2008 at 12:11 pm](#)

[...] reading Paolo Ciccone's article on his TruColor preset for the Canon XH-A1, I began to rethink whether it is better to use a camera [...]

7. *pciccone* Says:

[April 4th, 2008 at 12:43 pm](#)

Not sure if there is a conclusion to this post but my point of view is explained in this other post: <http://paolociccone.com/blog/?p=27>

8. *Steve Speed* Says:

[May 22nd, 2008 at 2:00 am](#)

Paulo,

Great preset. Absolutely no blue colour cast here!

I've been shooting with the sharpness turned down to -9 for quite some time as I found it to improve the performance of the HDV codec. This obviously has a knock on effect in grading and any future compression for delivery.

It's a shame that camera manufacturers have conditioned users to think over sharpened images are desirable.

9. *pciccone* Says:

[May 22nd, 2008 at 10:56 pm](#)

Thanks Steve.

– Paolo

10. *James Lynch* Says:

[May 23rd, 2008 at 12:43 pm](#)

Paulo, Thank you for your great technical work with the XH A1! I just wish you had one to tinker with more. Above you mention that on the latest update the pedestal on TruColor should be set at -7. Is the purpose of this to pull out more detail from the shadows? If not, how could more detail be shown? Congratulations on the great work! James

11. *pciccone* Says:

[May 23rd, 2008 at 12:50 pm](#)

@James, yes raising the pedestal will give you a little more detail in the blacks without washing out the image. Initially I used the DSC charts black chip to set the level for the pedestal but there is a little bit of reflectivity, probably not more than 1% from that chip. The right way of setting the pedestal would be to set the 0 IRE for the cavity black. Raising the pedestal basically corrects for the minimal reflectivity of the black, non-cavity, chip.

12. *James Lynch* Says:

[May 23rd, 2008 at 4:37 pm](#)

Paolo, Thanks for the explanation. How far do you think the pedistal or the toe could be pushed without washing out the image on TruColor? James

13. *pciccone* Says:

[May 23rd, 2008 at 5:02 pm](#)

Hard to know without having the camera but you should notice this. Many time the dark tones seem too dark in the display or even in your NLE. But, if you add a bit of color correction and see that you gain definition in areas that seemed perfectly black, than you know that the camera was recording something there, ergo you were not crushing the blacks. A bit of testing should give you the answer that you're looking for.

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