

# JOE KANE PRODUCTIONS

Web: <http://www.videoessentials.com>

E-Mail: [joekane@att.net](mailto:joekane@att.net)



## DVE – UHD Version 0.9

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DVE - UHD V 0.9 is a joint production of Image Essence, LLC, Gary Demos, and JKP, Joe Kane. It marks JKP's entry into the UHD domain with test and demonstration material in both 4096 by 2160 format, known as 4K in the program production world, and the 3840 by 2160 format, known as 2160p or UHD in the consumer world. The 2160p format is one of two pixel count arrays currently specified for UHD. We'll eventually be addressing the other UHD format, 4320p, but not in this release of materials. The ITU and CEA initially called the consumer format UHD but we've since noticed the CEA has gone back to including 4K as part of the consumer name.

The real 4K format has been a part of the program production world for some 20 plus years. The idea of a higher resolution format for consumers started out as 4096, using one of the vertical resolutions options in the 4K professional formats, 2160. It has a 1.89:1 aspect ratio. The 2160 version of 4K is found in Digital Cinema projectors. When consumer connectivity of the 4096 by 2160 pixel count became an issue it was dropped back to a slightly lower number, 3840 by 2160; a pixel count number set out in the ITU-R BT.1769 document in 2008. The 3840 by 2160p format also offers fairly easy up conversion from 1080p so it might be considered a better fit for existing HD content.

The materials on the USB stick are divided into two categories, test signals and still images. The images are there for test and demonstration purposes. There is a separate spreadsheet titled JKP-UHD Test Materials listing the contents and providing some additional details about each item. We'll also be publishing .pdf documents with more detailed descriptions of the test patterns and images. These documents will be found on the <http://www.videoessentials.com/> web site under the category of Products. Look for DVE - UHD V 0.9.

A number of the test images will have the initials EBD - Extended Bit Depth. Up to this point in the consumer world of distributed video the bit depth has been 8 bits. - We are including a number of test signals at that bit depth. While a larger bit depth is required for extended or high dynamic range (EDR or HDR), these images have not been set up for any specific approach to presenting EDR or HDR. They can be processed for either EDR or HDR. We are calling some of the test patterns high dynamic range, HDR, and they are named and described accordingly.

All of the materials presented are in the RGB domain. Most of the test patterns are not primary color dependent and should work in any color space, with possible exceptions of bit depth. The .tif and .dpx images have been color timed for ITU-R BT.709 color space and ITU-R BT.1886 gamma.

Most of the sales of this set of materials will be occur directly from Scenic Labs, <http://www.sceniclabs.com/> or through the JKP web site at <http://www.videoessentials.com/uhd> In either case you can register for e-mail notes on documentation and or updates to the program. If this product was purchased through another organization we encourage you to register your copy at <http://www.videoessentials.com/register> so we can keep you up to date.

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## Images

JKP .nef Files – 7360 by 4912 images from our Nikon D800E camera with a bit depth of 14 bits. The files are 16 bits with about a 1.5:1 aspect ratio. The metadata in these files will tell you much about how they were shot. Images are presented as ‘RAW’ files with the intention of giving the user an ability to determine what various systems might do to or with RAW files in transforming them to the UHD domain. Most of the images have been selected specifically to illustrate EDR or HDR capabilities. They were all recorded in the sRGB color space.

JKP EBD (Extended Bit Depth) 16 bit Images – These are examples of what we’ve done in processing the RAW images. The 7360 by 4912 .nef files have been pulled into Photoshop with color and level correction based on viewing them in sRGB or Rec 709 color space with a gamma of 2.4. Black is set at level 0. They have been cropped to a 1.89:1 or 1.78:1 aspect ratio and down converted to the 16 bit .tif format at either 4096 by 2160, marked as 16 bit 4K in the file name, or 3840 by 2160, marked as 16 bit 2160p. All of the images should have some potential of being set up to exhibit higher dynamic range capability.

JKP EBD (Extended Bit Depth) 10 bit Images – The 7360 by 4912 .nef files have been pulled into Photoshop with color and level correction based on viewing them in sRGB or Rec 709 color space and a gamma of 2.4. Black is set at level 0. They have been cropped to a 1.89:1 or 1.78:1 aspect ratio and down converted to the 10 bit .dpx format at either 4096 by 2160, marked as 10 bit 4K in the file name, or 3840 by 2160, marked as 10 bit 2160p. Part of presenting 10 bit images is for demonstration of how much better they can look than 8 bit images and or the potential loss in going from 16 bits to 10 bits.

JKP 2160p 8 bit images in the .bmp, .jpg and .png formats. This represents further compression of the .nef images to an 8 bit 4:4:4 image format, where black is at 0 and white is allowed to go as high as 255 in an 8 bit word. The 3840 by 2160 16 bit source files were converted to an 8 bit .png format then converted to two forms of .jpg and on form of .bmp. One of the jpg folders is labeled with an alt in the name. It is hoped among the options presented at least one will function on current UHD sets. Caution!, what you see from the USB input may not represent what you might see if they were being presented at the HDMI input. Testing for a difference will likely require an external computer to convert the file format(s) to something conveyed over an HDMI connection. One image is 4288 by 2848 instead of 3840 by 2160.

## Test Patterns:

JKP\_4K\_16 bit-TP\_HDR – a set of 227 high dynamic range, 4096 by 2160 test patterns at 16 bit half float RGB, 48 bits per pixel, as described in the spreadsheet

JKP\_2160p\_16 bit-TP\_HDR – a set of 227 high dynamic range, 3840 by 2160 test patterns at 16 bit half float RGB, 48 bits per pixel, as described in the spreadsheet

JKP\_2160p-8bit-B0 files in .bmp, two types of .jpg, and .png These 8 bit test patterns, in different formats, are designed to work with most consumer TV sets at the USB input. Black is at zero in these patterns. The level of white may go as high as 255 in some of the patterns. You’ll find some sets will only see one of the formats. Others will see more. The .bmp format has been included as several 2160p pattern generators can take .bmp files as image source files. The patterns are described in the spreadsheet.

JKP\_2160p-8bit-B16 files in .bmp, two types of .jpg, and .png These 8 bit test patterns, in different formats, are designed to work with most consumer TV sets at the USB input. Black is at level 16. Information is allowed to go below black, but no further down than level 1. The level of white is 235 but certain patterns may go above white, as high as level 254. You’ll find some sets will only see one of the formats. Others will see more. The .bmp format has been included as several 2160p pattern generators can take .bmp files as image source files. The patterns are described in the spreadsheet.