

# CREATING LOSSLESS J2K VIDEOS WITH ADOBE MEDIA ENCODER CC 2019, v 13.1.3

## DEFINE ENCODING SETTINGS - MAKING AN ENCODING PRESET

The first thing we need to do is select the settings that we can use each time we want to create a lossless J2K .MXF video. To do this, we need to create an Encoding Preset. Go to the top Media Encoder CC menu to “Presets” and then select “Create Encoding Preset”. A new Preset window will open up. Look at the image to the right to see the settings you should choose. Each will be explained below.

### PRESET NAME AND FORMAT

First you should give the preset a meaningful name, I have chosen “**J2K-lossless (L6-8bit)**.” The main reason for this particular name is to differentiate this preset from others I was testing, which altered the broadcast profile (L6 or L7) and the Chroma and depth (8 or 10 bit) settings.

For the format, select **JPEG 2000 MXF OP1a**; as this is a new preset, it will not be based on a prior setting. Leave the remaining settings in this section as their defaults (Comments field left blank, export video and audio boxes ticked).

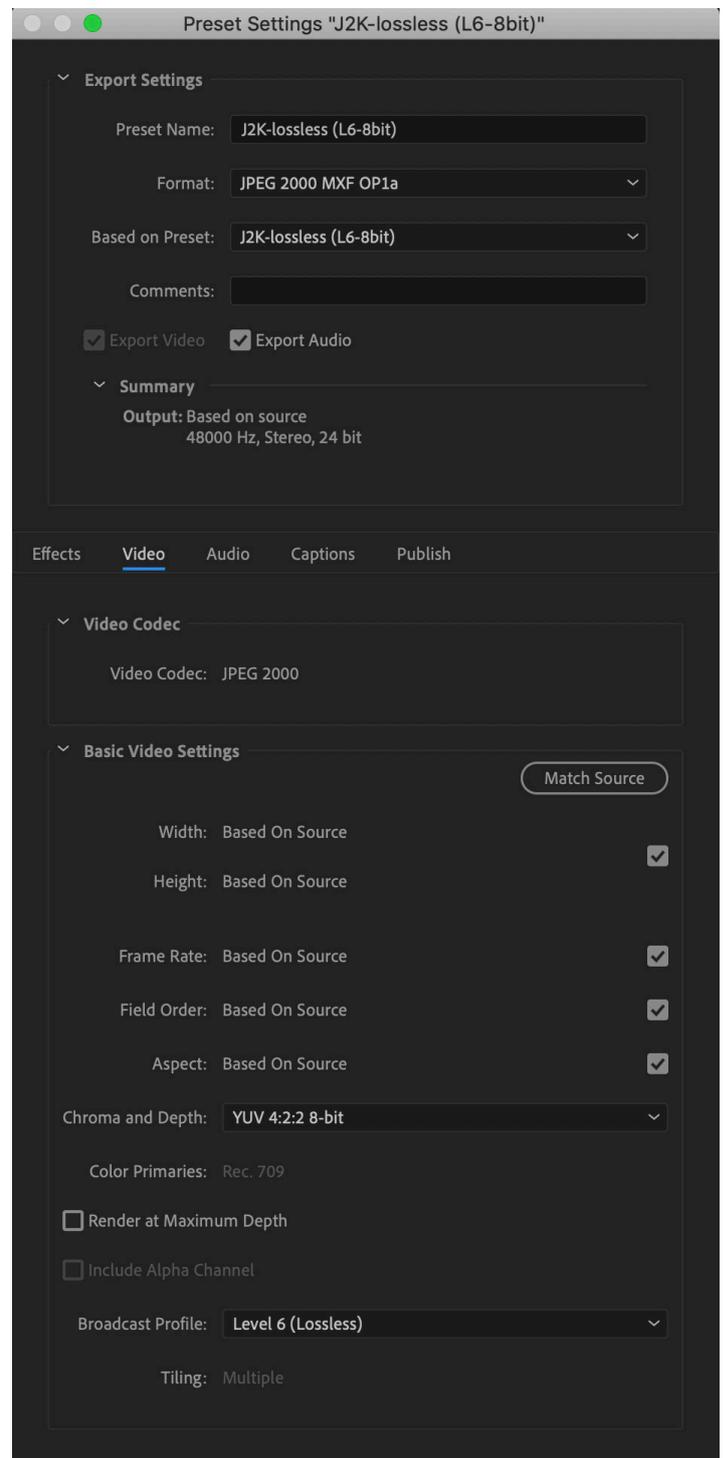
### VIDEO SETTINGS

Edit only settings in the Video and Audio tabs. Settings in the other tabs (Effects, Captions, Publish) should be left untouched.

Because we selected the **JPEG 2000 MXF OP1a** format above, the video codec will automatically be set to **JPEG 2000** in this section. The basic video settings will have changed to those appropriate for this format.

Make certain **Match Source** is selected, this will automatically tick all the boxes below (if they are not already), retaining the width, height, frame rate, field order, and aspect of the input video.

Chroma should be set to **YUV 4:2:2** with a depth of **8-bit**. In the rare case your original video has a colour depth of **10-bit**, select the **10-bit** option. To determine the bit depth of a video, use MediaInfo (<https://mediaarea.net/en/MediaInfo>); the file’s bit depth is listed in the output metadata report.

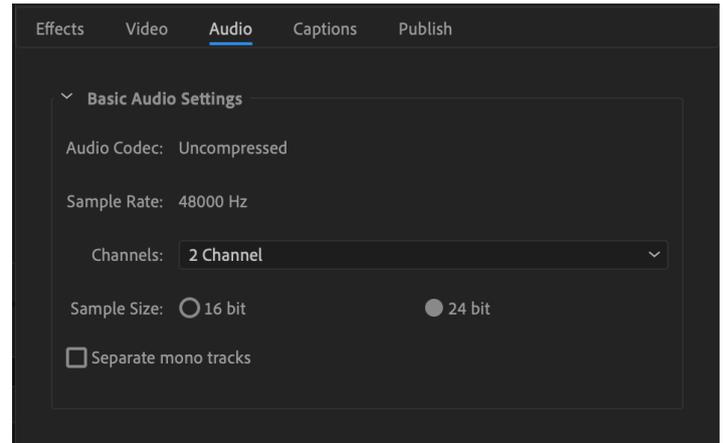


Set the Broadcast Profile to **Level 6 (Lossless)**. This determines the maximum sampling and bit rates for the output file.

## AUDIO SETTINGS

There are not many adjustments that need to be made to the audio settings (*see image at right*). The Audio Codec will already be set to **Uncompressed** with a Sample Rate of **48,000 Hz**, due to the choice of the video format of JPEG 2000 MXF OP1a.

Make certain the Channels field is set to **2**. If you are given a video that has been recorded with surround sound, there could be as many as 6 channels. Our standard is to have 2 channel stereo audio output for our .MXF files. 6 channel video files have caused problems for editing/playback in programs such as Adobe Premiere, etc.

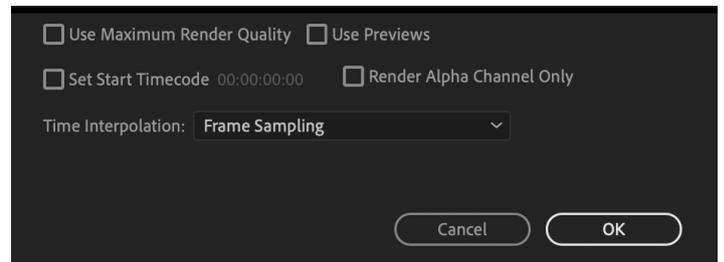


Set the sample size to **24 bit**.

## THE REMAINING SETTINGS

The remaining settings located underneath the tab area should all be left with the default settings (*see image at right*). This means that the following boxes should all be left unticked: Use Maximum Render Quality, Use Previews, Set Start Timecode, and Render Alpha Channel Only.

Leave the Time Interpolation set to Frame Sampling. This settings handles motion smoothing if you change the output file's frames per second.



## EXPLANATION OF THE SETTINGS

**JPEG 2000 MXF OP1a** is the MXF (Material Exchange Format) Operational Pattern 1a (OP1a), with lossless JPEG 2000 in a generic container (*for more information: <https://www.loc.gov/preservation/digital/formats/fdd/fdd000206.shtml>*).

**YUV 4:2:2** with a depth of **8 bit** is the parameter used by DAMSmart! **Y** (or often **Y'**) stands for the luma, or brightness, component; **U** and **V** are the two colour components. YUV colour encoding takes into consideration human perception thus creating an output that has masked any human-noticable distortions (*for more information: <https://en.wikipedia.org/wiki/YUV>*).

**4:2:2** denotes the vertical and horizontal subsampling (*for more information: [https://poynton.ca/PDFs/Chroma\\_subsampling\\_notation.pdf](https://poynton.ca/PDFs/Chroma_subsampling_notation.pdf)*).

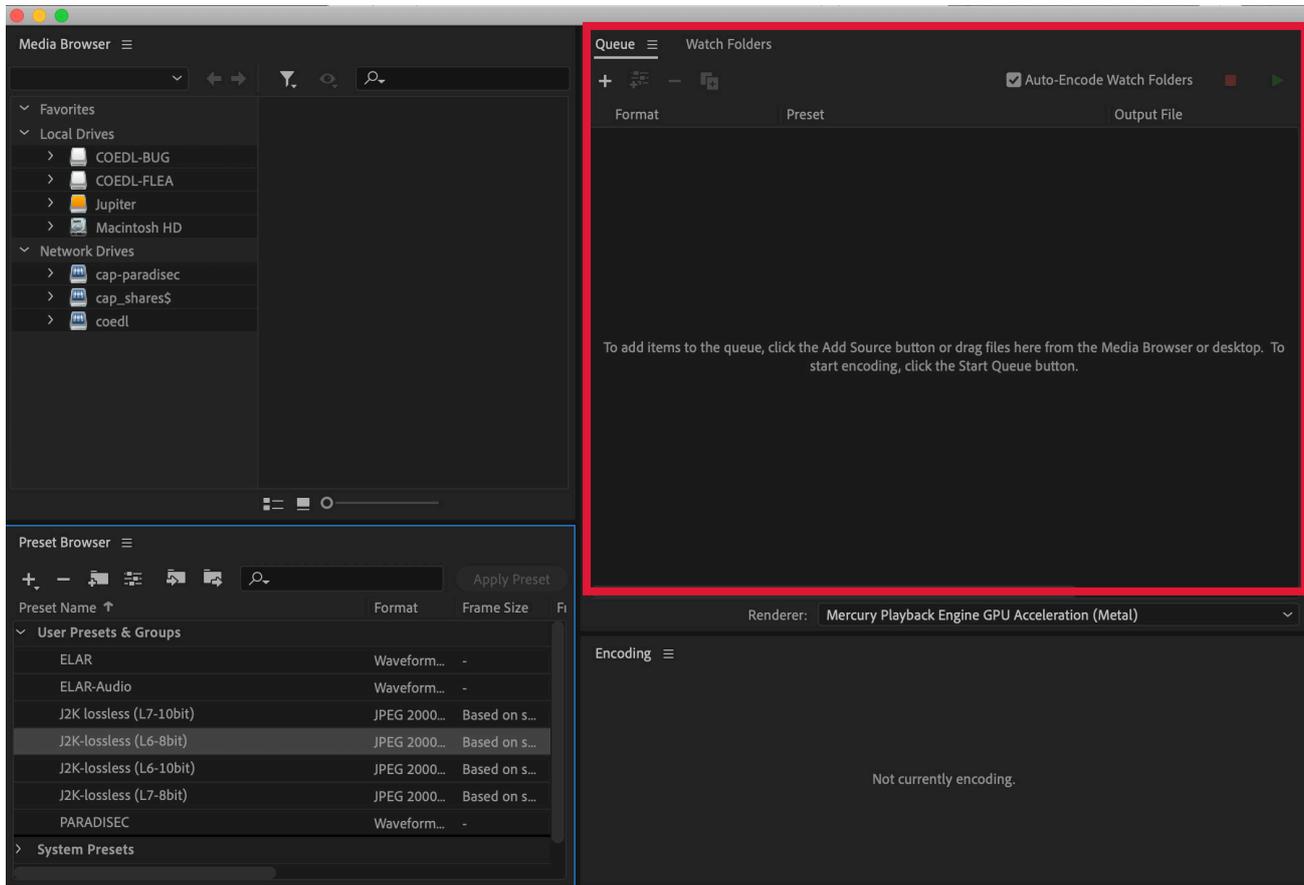
**8-bits** per channel is typically the bit depth for many of the original .MOV, .MTS, .AVI, .MP4 video files we handle. Using a 10-bit depth would needlessly increase the file-size while adding no improved quality.

Broadcast profile determines the maximum sampling and bit rates of the output file. **Level 6** lossless (L6) is 520 Msamples/s and 1600Mbits/s. **Level 7** lossless (L7) is 520 Msamples /s and and unspecified Max Bitrate.

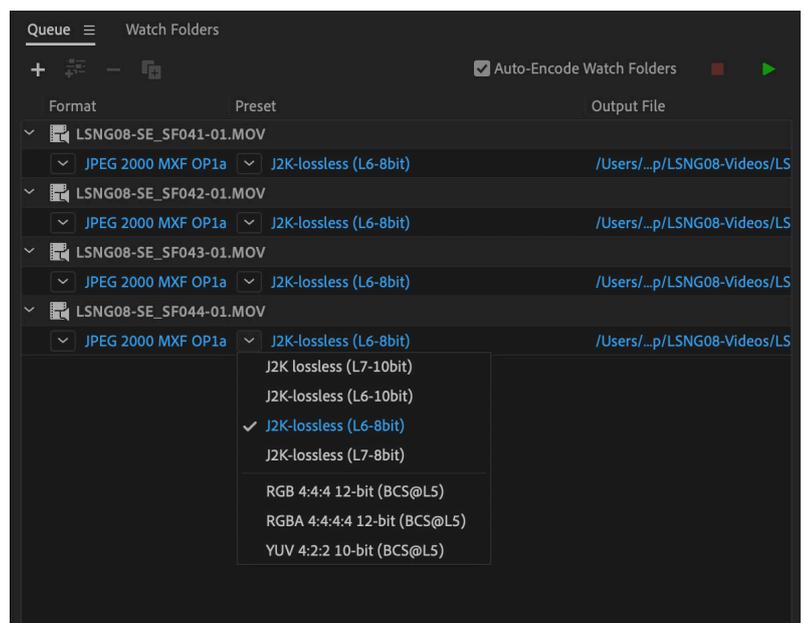
For further information of the Media Encoder export settings: <https://helpx.adobe.com/au/media-encoder/using/export-settings-reference.html>

## ADDING FILES TO MEDIA ENCODER & SELECTING PRESET

To add files to Media Encoder, you can either double click on the Queue area in upper right of the Encoder window to open a file browser, or drag and drop files to that location.



Media Encoder allows you to batch transcode files. To assign a format to all files in your queue, simply select all of them, then under *Format* choose **JPEG 2000 MXF OP1a**. This action will map the selected format to all files. Then select your encoding preset from the drop-down menu under *Preset*; in this case mine is **J2K-lossless (L6-8bit)**. Finally, make sure to choose an appropriate location for your output files. The default is the same folder in which the originals are located. Again, this can be edited for all selected files by clicking on the output link of one of the selected files listed under *Output File*.



The final step is to simply hit the run button:



## J2K FILE ENCODING COMPARISON: DAMSMART! (DS) VS. JULIA COLLEEN MILLER (L6/L7)

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### ORIGINAL VIDEO INPUT: .MP4 - TRANSCODING OUTPUT LOSSLESS J2K .MXF

**Original .MP4** written with Handbrake 1.0.2, Codec ID: (isom/iso2/avc1/mp41); **DS .MXF** written with OpenCube MXFTk Advanced 2.3.12.0.1 (Microsoft Windows 7); **JCM .MXF** written with Adobe Systems Incorporated- Adobe Media Encoder 1.0.0.0.1 (CC 2019, v 13.1.3) (Mac OS x 5.0.15.0.1)

#### Selected General Specifications

##### File size

*Original .MP4: 122 MiB*

DS (8bit): 1.65 GiB

L6 (8bit): 1.64 GiB

L6 (10bit): 2.65 GiB

L7 (8bit): 1.64 GiB

L7 (10bit): 2.52 GiB

##### Overall bit rate

*Original .MP4: 1 170 Kbps*

DS (8bit): 16.1 Mbps

L6 (8bit): 16.1 Mbps

L6 (10bit): 25.9 Mbps

L7 (8bit): 16.1 Mbps

L7 (10bit): 24.7 Mbps

#### Selected Video Specifications

##### Bit rate

*Original .MP4: 1 000 Kbps*

DS (8bit): 14.6 Mbps

L6 (8bit): 13.8 Mbps

L6 (10bit): 23.6 Mbps

L7 (8bit): 13.8 Mbps

L7 (10bit): 22.4 Mbps

##### Bit depth

*Original .MP4: 8 bits*

DS (8bit): 8 bits

L6 (8bit): 8 bits

L6 (10bit): 10 bits

L7 (8bit): 8 bits

L7 (10bit): 10 bits

##### Compression mode:

*Original .MP4: n/a*

DS (8bit): Lossless

L6 (8bit): Lossless

L6 (10bit): Lossless

L7 (8bit): Lossless

L7 (10bit): Lossless

#### Selected Video Specifications (cont'd)

##### Bits/(Pixel\*Frame)

*Original .MP4: 0.386*

DS (8bit): 5.637

L6 (8bit): 5.317

L6 (10bit): 9.114

L7 (8bit): 5.317

L7 (10bit): 8.634

##### Stream size

*Original .MP4: 105 MiB (85%)*

DS (8bit): 1.49 GiB (90%)

L6 (8bit): 1.41 GiB (86%)

L6 (10bit): 2.14 GiB (91%)

L7 (8bit): 1.41 GiB (86%)

L7 (10bit): 2.29 GiB (91%)

#### Selected Audio Specifications

##### Format:

*Original .MP4: AAC LC*

DS (8bit): PCM, Frame (BWF)

L6 (8bit): PCM, Frame (BWF)

L6 (10bit): PCM, Frame (BWF)

L7 (8bit): PCM, Frame (BWF)

L7 (10bit): PCM, Frame (BWF)

##### Bit rate

*Original .MP4: 165 Kbps*

DS (8bit): 1 536 Kbps

L6 (8bit): 2 304 Kbps

L6 (10bit): 2 304 Kbps

L7 (8bit): 2 304 Kbps

L7 (10bit): 2 304 Kbps

##### Bit depth

*Original .MP4: n/a*

DS (8bit): 16 bits

L6 (8bit): 24 bits

L6 (10bit): 24 bits

L7 (8bit): 24 bits

L7 (10bit): 24 bits