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**IMF Deliverable Specification v2.1**

**4k/UHD HDR/SDR Deliverables**

**&**

**2k/HD HDR/SDR Deliverables**

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# Sony Pictures IMF Process and Specifications

## Background Information

### IMF (Interoperable Master Format)

IMF is a SMPTE standardized mechanism for the interchange of motion picture content between devices and facilities. An IMF is a collection of picture, audio and text files in a standardized format that have been designed to play together via one or more Composition Play Lists (CPL). The IMF may contain a number of CPL's, each of which is designed to play out a specific version of the content from the same set of files. Therefore, a particular version can be uniquely identified by the CPL that is designed to play it.

SMPTE has created a suite of documents that detail the overall specification for IMF, which includes some specific application documents that are particular to certain parameters, such as picture compression. These are listed below in "Document References".

Our specification adheres to the *SMPTE ST 2067-21:2016, Interoperable Master Format – Application #2E (extended)* standard of the IMF specification, which utilizes JPEG2000 picture compression with specific profiles and details parameters and values for HDR and WCG.

### CPL – Composition Playlist

A CPL is a set of xml instructions that directs the layout of image, audio and text assets. CPLs are used to create the version/alpha desired. Multi-component CPLs are common and all CPLs will require one Base picture asset, one Base audio asset, and optionally, text assets such as subtitles and closed captions in order to play out a version of the content. A slate identifying the CPL with the version/alpha of the content may be part of the Base image track file or may be part of a Supplemental image track file. Additional CPLs and Supplemental IMP's (see below definition) will be used to derive the texted, non-subtitled version, textless version, international version, etc.

### IMP (Interoperable Master Package)

IMP refers to a subset of assets from an IMF that are packaged for transport or that sit in a directory on a storage medium (disc, tape, etc). An IMP generally contains a CPL and only the assets required by that CPL. It is also possible to have more than one CPL if multiple versions are being transported. Sometimes IMP and IMF are used interchangeably, but the IMF is the overall collection of assets for a title in the system (think HDCamSR system) and an IMP is a subset of the IMF that is packaged for a specific delivery (think HDCamSR tape).

### Base IMF Package

Base IMF: The Base IMF is the first IMF created with the original version (OV) essence. There is only one Base IMF per title.

A Base IMF package contains all elements to play out the original version (OV) of the show and any textless material that may have been created. The base IMF package is referenced and utilized by all other IMF packages that may later be created. It generally contains the OV image track file, textless shots image track file, OV audio files, any subtitles that were in the OV, and at least one CPL. See below for a full description of the contents and formatting of the IMF base package.

### **Supplemental IMF Package (Supplemental IMP)**

A Supplemental IMF package contains elements that are to be used in conjunction with the Base IMF package. The supplemental package always contains a CPL and CPL slate, and may contain additional essence. There can be many supplemental packages for a title. If there is additional essence, the CPL is designed to play this additional essence in conjunction with the Base IMF. For example, a supplemental IMP could carry foreign inserts, foreign dubbed audio, a slate and a CPL to play them, and could be used in conjunction with the essence in the original version (OV) IMF to play out a foreign localized version. A supplemental IMP may instead contain only image, audio, text inserts and a CPL, which may be used to play out an Extended Version, or may contain only a CPL and Slate, which may be used to play out a specific edited version. It may also be designed to create a territory-specific version that omits certain sections of the original version, in which case may not contain any new essence, just a CPL that instructs a versioned playout of the Base IMF and a CPL slate. See below for a full description of the contents and formatting of a Supplemental IMF package.

### **JPEG2000**

All picture tracks in the IMF will be encoded using JPEG2000 using profiles defined in the section titled “IMF Track File Essence Specifications” in this document. This is a lossy process and therefore care should be taken to ensure a high-quality VBR encode of the image files.

### **UltraHD / HD**

The IMF may contain image track files that are UltraHD (UHD) or HD resolution depending on the source material. In general, for theatrical or TV content that was captured and mastered in 4k resolution or above, an UltraHD (UHD) image track file is applicable, whereas for source content that is lower than 4k resolution, an HD image track file is applicable. Both may have extended color gamut information.

If the title is to be mastered in high dynamic range (HDR), and the source content is lower than 4K resolution, at the discretion of Sony Pictures it may be up-scaled to UHD. *Consult with SPE prior to creating HDR content from material lower than 4K to determine if it should be up-scaled or kept as HD.*

If an IMF contains a HDR image track file, it must also contain a derived SDR image track file. *Consult with SPE prior to creating the SDR to determine the derivation methodology, metadata capture and delivery of ST 2094 metadata.*

## Metadata

Per SMPTE ST 2067-21:2016 section 6 “Image Track Files”, IMF image track files must contain metadata via specific Essence Descriptors in the MXF wrapper, that describes the image content. This includes but is not limited to SMPTE ST 2086 mastering display color volume metadata that specifies the mastering reference display parameters. See SMPTE ST 2067-21:2016 section 6 and ST 2086 for details. *Consult with SPE regarding delivery of this metadata if the IMF mastering equipment being utilized does not support the generation of this Essence Descriptor*

Per SMPTE ST 2067-21:2016 section 7 “Composition”, MaxCLL and MaxFALL values, calculated as specified, should be included in the CPL as detailed in section 7.2. *Consult with SPE regarding delivery of this metadata if the IMF mastering equipment being utilized does not support the generation of these items in the CPL.*

In the case of an IMF that contains a HDR image track file, it is required that at least one application-specific form of SMPTE ST 2094 image transform metadata be included (e.g. ST 2094-10, ST 2094-30, etc), and in some cases more than one application may be required. *Consult with SPE prior to creating an HDR IMF to determine what ST 2094 image transform metadata will be required.*

As of this writing, there is no specification for carrying 2094 metadata in the IMF itself, so this is to be delivered as a plain-text XML sidecar file until such time as this carriage is standardized in IMF.

## Base IMF Package Specifications

### Base IMF Package Contents

The Base IMF package should contain the following:

1. Base Image Track File Asset (with slate at head, formatted as below)
2. Base Audio Track File Asset(s) with MCA labels
3. Textless Image Track File Asset (with slate at head, formatted as below)
4. OV CPL
5. (Optional) OV Subtitle IMSC1 Timed Text Track File (if created for the title and if not burned-in to the image) per SMPTE ST 2067-2:2016, section 5.4 “Data Essence Track Files”
6. (Optional) OV Closed Caption IMSC1 Timed Text Track File, also per SMPTE ST 2067-2:2016, section 5.4 “Data Essence Track Files”

### Base Image and Base Audio Track File Head Format

Each Base picture and audio track file asset requires a new head format that includes the elements listed below. A visual and audio pop (1 frame of 1kHz tone) is required 10 seconds prior to FFOP in order to provide a visual reference and to guarantee sync. A 1kHz reference tone should be added over the bars & charts on the audio track file asset per the below formatting.

There is no actual time code in the IMF. The locations below are master file record time code references. For example, the first frame of the master file at time code 00:59:30:00 becomes frame 0 of an image track file with an MXF track file start of 00:00:00:00.

Note- All time code numbers in the below sections are referenced to 24 FPS time code

**Table 1: Head Leader: Base Image and Audio Track Files**

MASTER TC REFERENCE	MXF TRACK FILE	FRAME NUMBER	ITEM DESCRIPTION
00:59:30:00 - 00:59:33:23	00:00:00:00- 00:00:03:23	0-95	Slate
00:59:34:00 - 00:59:36:23	00:00:04:00- 00:00:06:23	96-167	Black
00:59:37:00 - 00:59:46:23	00:00:07:00- 00:00:16:23	168-407	BARS, Charts & 1kHz Tone

MASTER TC REFERENCE	MXF TRACK FILE	FRAME NUMBER	ITEM DESCRIPTION
00:59:47:00 - 00:59:49:23	00:00:17:00-00:00:19:23	408-479	Black
00:59:50:00 - 00:59:50:00	00:00:20:00-00:00:20:00	480	10-pop
00:59:50:01 - 00:59:59:23	00:00:20:01-00:00:29:23	481-719	Black
01:00:00:00 - 01:00:00:00	00:00:30:00-00:00:30:00	720	First Frame Of Picture (FFOP)

### Base Image and Base Audio Track File Tail Format

Each Base picture and audio track file asset requires a tail format that includes the elements listed below. A visual and audio “tail pop” (1 frame of 1kHz tone) at the tail is required 20 seconds after the Last Frame Of Picture (LFOP) in order to provide a visual reference and to guarantee sync. After the tail pop, 5 seconds of black should follow.

**Table 2: Tail Leader: Base Image and Audio Track file Assets**

MXF TRACK FILE	DURATION	ITEM DESCRIPTION
LFOP + 00:00:00:01 - LFOP + 00:00:19:23	20 sec	Black
LFOP + 00:00:20:00 - LFOP + 00:00:20:00	1 frame	Tail sync pop (20 sec after LFOP)
LFOP + 00:00:20:01 - LFOP + 00:00:25:01	5 sec	Black

### CPL Slate for Base Package

See Appendix B for more detailed information on Base CPL slate contents.

*A slate is required at the head of each Base image track file as specified by the above formatting that will indicate the content of the image essence. The slate should contain the following data points: GMDM MOVIE OR SERIES TITLE, GMDM TITLE ABBREVIATION, GMDM ALPHA ID, VERSION, EPISODE NUMBER, GMDM EPISODE TITLE, CONTENT TYPE, TERRITORY, FRAME RANGES, PROGRAM RUNTIME, FILE TYPE, RESOLUTION, ASPECT RATIO, COLOR SPACE, ENCODING PROFILE, AUDIO ELEMENT1, AUDIO CONFIGURATION1, AUDIO ELEMENT2, AUDIO CONFIGURATION2, SUBTITLE TEXT, CC TEXT, POST FACILITY, CREATION DATE*

OPTIONAL FIELDS:

REELS, SOURCE BARCODES

WORK ORDER

PO NUMBER

SOURCE IMAGE FILENAME PREFIX (e.g. DPX filename prefix)

NOTES



Figure 1: Sample Slate Image



## Textless Track Files

Each texted Base image track file requires a corresponding textless replacement. The textless shots are to be in a single track file encompassing all textless replacements (no spacing or black between each shot) formatted as listed below. A slate must be provided at the head of the textless track file per Appendix B.

*Note: A CPL must be provided in a supplemental package that specifies the location of the inserts in relation to the main program*

## Textless Track File Formatting

There is no actual time code in the IMF. The locations below are 24 fps references based on a time stamp that can be set for first frame of MXF track files. For example, the first frame of an image track file is 0 program time, and can be stamped as 00:00:00:00.

**The textless MXF track file should have a start time stamp of 00:00:00:00**

**Table 3: Head Format: Textless Image Track File**

MXF TRACK FILE	ITEM DESCRIPTION
00:00:00:00 - 00:00:03:23	Slate
00:00:04:00 - 00:00:06:23	Black
00:00:07:00 - 00:00:07:00	First Frame of Textless

**Table 4: Tail Format: Textless Image Track File**

MXF TRACK FILE	DURATION	ITEM DESCRIPTION
LFOP + 00:00:00:01 - LFOP + 00:00:04:23	5 sec	Black

## Supplemental IMF Package Specifications

### Supplemental IMF Package Contents

The Supplemental IMF package should contain the following:

1. One Supplemental CPL
2. Supplemental CPL Slate Image Track File Asset (not required if CPL is Picture to Picture)
3. (Optional) Supplemental Image Track File Asset(s) (with slate at head, formatted as below)
4. (Optional) Supplemental Audio Track File Asset(s) with MCA labels
5. (Optional) Supplemental IMSC1 Subtitle Timed Text Track File(s)
6. (Optional) Supplemental IMSC1 Closed Caption Timed Text Track File(s)
7. (Optional) EDL(s) describing the edit points for the supplemental Image, Audio and/or Timed Text Files. EDL files can be delivered in an IMP sub folder labeled "EDL". The EDL should be labeled with a description of the content it represents (ie. *textless.edl*, *german\_inserts.edl*)

### Supplemental Image and Supplemental Audio Track File Formatting

Supplemental Image track files are generally in the form of inserts. Supplemental Audio track files shall be full length, in order to completely replace an audio track in the Base package.

There is no actual time code in the IMF. The locations below are master file record time code references. For example, the first frame of the master file at time code 00:59:30:00 becomes an audio MXF track file start of 00:00:00:00.

## Supplemental Full-Length Audio Track File Format

A CPL must be provided that specifies the substitution of the full-length audio track file for the program. If a supplemental audio track file is full length, then it is formatted the same as an OV track file:

**Table 5: Head Leader: Full Length Supplemental Audio Track File**

MASTER TC REFERENCE	MXF TRACK FILE	ITEM DESCRIPTION
00:59:30:00 - 00:59:36:23	00:00:00:00-00:00:06:23	Silence
00:59:37:00 - 00:59:46:23	00:00:07:00-00:00:16:23	1kHz Tone
00:59:47:00 - 00:59:49:23	00:00:17:00-00:00:19:23	Silence
00:59:50:00 - 00:59:50:00	00:00:20:00-00:00:20:00	10-pop
00:59:50:01 - 00:59:59:23	00:00:20:01-00:00:29:23	Silence
01:00:00:00 - 01:00:00:00	00:00:30:00-00:00:30:00	First Frame Of Picture (FFOP)

**Table 6: Tail Leader: Full Length Supplemental Audio Track File**

MXF TRACK FILE	DURATION	ITEM DESCRIPTION
LFOP + 00:00:00:01 - LFOP + 00:00:19:23	20 sec	Silence
LFOP + 00:00:20:00 - LFOP + 00:00:20:01	1 frame	Tail sync pop (20 sec after LFOP)
LFOP + 00:00:20:02 - LFOP + 00:00:25:01	5 sec	Silence

## Supplemental Image Insert Track File Format (e.g. International Localized Inserts)

*A CPL must be provided that specifies the location of the image inserts in relation to the main program.*

Image inserts should be placed in a single track file encompassing all replacements (no spacing between each shot) formatted as listed below.

A slate is placed at the head of the image insert track file; see Appendix B for slate contents.

An additional image insert track file for dubbing cards may also be included in the supplemental IMF.

**The inserts MXF track file should have a start time stamp of 00:00:00:00.**

**Table 7: Head Format: Supplemental Image Insert Track File**

MXF TRACK FILE	ITEM DESCRIPTION
00:00:00:00 - 00:00:03:23	Slate
00:00:04:00 - 00:00:06:23	Black
00:00:07:00 - 00:00:07:01	First Frame of Inserts

**Table 8: Tail Format: Supplemental Image Insert Track File**

MXF TRACK FILE	DURATION	ITEM DESCRIPTION
LFOP + 00:00:00:01 - LFOP + 00:00:04:23	5 sec	Black

### CPL Slate for Supplemental package

See Appendix B for more detailed information on slate contents for Supplemental CPL Slates

*CPL Slates are required per each supplemental CPL in each supplemental package in order to identify the alpha/version that CPL represents\*\*. This slate must be included as the first image sequence in the supplemental image track file as described in the supplemental IMP definition above. If there are no supplemental image track files in the supplemental package, then the CPL slate is its own track file. The CPL slate should be the same duration as and play in place of the picture source file slate. Therefore, the CPL slate will be the one that is visible when played in real time.*

**\*\*Note that Picture to Picture CPL's will not contain this slate. The slate information can be placed in the CPL Annotated Text field.**

**EDL (recommended)**

If an insert CPL cannot be created, a CMX3600 (File32) EDL should accompany the IMF as a sidecar in order to provide a TC location reference for accurate insert placement. The EDL should include four seconds of textless slate, three seconds of black, and all picture inserts. The destination TC represents the appropriate insert locations relative to the texted program.

**Figure 2: Example Textless EDL**

(Deliver as a CMX3600 (File32) EDL sidecar if a CPL cannot be created)

LIST	ITEM			PROG START	PROG END	LOC STAMP START	LOC STAMP END
TITLE: TEXTLESS							
FCM: NON-DROP FRAME							
001 textless	*SLATE	V	C	00:00:00:00	00:00:04:00	00:59:30:00	00:59:34:00
002 textless	*BLACK	V	C	00:00:04:00	00:00:07:00	00:59:34:00	00:59:37:00
003 textless	*INSERT1	V	C	00:00:07:00	00:00:30:01	01:02:46:10	01:03:09:11
004 textless	*INSERT2	V	C	00:00:30:01	00:02:54:21	01:03:15:18	01:05:40:14
005 textless	*INSERT3	V	C	00:02:54:21	00:03:15:21	01:20:23:21	01:20:44:21

## UltraHD HDR (3840x2160) IMF Track File Essence Specs

**Table 9: UHD HDR BASE IMF Track File Specifications**

Format	SMPTE ST 2067-21:2016, "IMF App#2E" (extended)
Image Track File	Base OV File
Image Track File Type	MXF (SMPTE ST 2067-5)
Image Essence	JPEG2000
Profile Level	4K IMF-L ML6@SL4
Image Width	3840
Image Height	2160
MXF Track File Start	00:00:00:00
Color Encoding	RGB
Color space	BT.2020 Full Range (IMF Color 7)
EOTF	SMPTE ST 2084 (PQ)
Bit Depth	12 bits
Mastering Display Luminance	4000 nits
Data Max Luminance	Uncapped
Display Aspect Ratio	16:9
Frame Rate	24000/1001
Scanning Type	Progressive
MXF Metadata	<p>All metadata specified in section 6 of SMPTE ST-2067-21:2016, including but not limited to SMPTE ST 2086 (Master Display Color Volume) metadata, encoded as essence descriptors in the image MXF track file.</p> <p>If cannot encode per ST 2067-21:2016, provide as side car</p>
CPL Metadata	<p>All metadata specified in section 7 of SMPTE ST-2067-21:2016, including but not limited to MaxCLL and MaxFALL</p> <p>ST 2086 (Master Display Color Volume) information in the Annotation area. Must agree with the essence descriptors in the image MXF file</p>
Metadata	<p>ST 2094 Image Transform Metadata.</p> <p>Dolby Vision (ST 2094-10) metadata XML must always be provided.</p> <p>Consult with SPE for other ST 2094 applications that may be pertinent.</p> <p>As there is no current method to author this information into an IMF, provide as side car XML</p>

Format	SMPTE ST 2067-21:2016, "IMF App#2E" (extended)
Audio Track File	Base OV File
Audio Track File Type	MXF (SMPTE ST 2067-5)
Audio Track File Formatting	Per SMPTE ST 2067-2: One audio track file per element type per audio configuration. In addition, all audio channels in a track file must be unique assignments. If an element contains audio channels with the same channel assignment, these are to be wrapped in their own audio track file(s).
MXF Track File Start	00:00:00:00
Audio Essence	BWF (.WAV)
Sampling Rate	48.00 kHz or 96.00 kHz
Bit Depth	24 bits
Allowed Audio Configurations (one MXF track file per audio configuration)	Mono, Lt-Rt, 5.1, 7.1
AudioChannelLabelSubDescriptor, SoundfieldGroupLabelSubDescriptor, GroupOfSoundfieldGroupsSubDescriptor (if applicable).	SMPTE ST 2067-2, ST 2067-8, ST 428-12, ST 377-4
MCATitle, MCATitleVersion and MCAEpisode values	<p>SMPTE ST 2067-2.</p> <p>MCATitle is the registered title in the SPE database (GMDM/Tekzone).</p> <p>MCAEpisode is used for television content and is the registered name and episode number in the SPE database.</p> <p>MCATitleVersion is the version (cut) of the audio in the audio track file. This is not ALPHA. Alpha is used in CPL only. Values are in Table 12 and in the file naming document on Tekzone. Consult SPE for correct value.</p> <p>Please see <a href="https://tekzone.spe.sony.com">Tekzone</a> &lt;<a href="https://tekzone.spe.sony.com">https://tekzone.spe.sony.com</a>&gt; or consult SPE for the correct values and abbreviations. Table 12 in this document contains some of the most-used values.</p> <p>Note that the version and alpha of a composition are depicted in the CPL file name and metadata, not in the track file metadata.</p>



Format	SMPTE ST 2067-21:2016, "IMF App#2E" (extended)
MCAAudioContentKind and MCAAudioElementKind values	SMPTE ST 2067-2  MCAAudioContentKind values are listed in the file naming document on Tekzone. Typical values are Mono Optional (OPM), Narration (NAR), Dialog (DX), Music (MX), Effects (FX).  MCAAudioElementKind values are also listed in the file naming document. Typical values are Composite Mix (CM), Music and Effects (ME), Dialog/Music/Effects (DME)
Region/Language Tag	RFC5646 tag. See Appendix D

## UltraHD SDR (3840x2160) IMF Track File Essence Specs

Table 10: UHD SDR *BASE* IMF Track File Specs

Format	SMPTE ST 2067-21:2016, "IMF App#2E" (extended)
<b>Image Track File</b>	<b>Base OV File</b>
Image Track File Type	MXF (SMPTE ST 2067-5)
Image Essence	JPEG2000
Profile Level	4K IMF-L ML6@SL3
Image Width	3840
Image Height	2160
MXF Track File Start*	00:00:00:00
Color Encoding	YCbCr / 4:2:2
Color space	BT.709 (IMF Color.3)
Bit Depth	10 bits
Display Aspect Ratio	16:9
Frame Rate	24000/1001
Scanning Type	Progressive
<b>Audio Track File</b>	<b>Base OV File</b>
Audio Track File Type	MXF (SMPTE ST 2067-5)
Audio Track File Formatting	Per SMPTE ST 2067-2: One audio track file per element type per audio configuration. In addition, all audio channels in a track file must be unique assignments. If an element contains audio channels with the same channel assignment, these are to be wrapped in their own audio track file(s).
MXF Track File Start	00:00:00:00
Audio Essence	BWF (.WAV)
Sampling Rate	48.00 kHz or 96.00 kHz
Bit Depth	24 bits
Allowed Audio Configurations (one MXF track file per audio configuration)	Mono, Lt-Rt, 5.1, 7.1
AudioChannelLabelSubDescriptor, SoundfieldGroupLabelSubDescriptor, GroupOfSoundfieldGroupsSubDescriptor (if applicable).	SMPTE ST 2067-2, ST 2067-8, ST 428-12, ST 377-4

Format	SMPTE ST 2067-21:2016, "IMF App#2E" (extended)
MCATitle, MCATitleVersion and MCAEpisode values	<p>SMPTE ST 2067-2.</p> <p>MCATitle is the registered title in the SPE database (GMDM/Tekzone).</p> <p>MCAEpisode is used for television content and is the registered name and episode number in the SPE database.</p> <p>MCATitleVersion is the version (cut) of the audio in the audio track file. This is not ALPHA. Alpha is used in CPL only. Values are in Table 12 and in the file naming document on Tekzone. Consult SPE for correct value.</p> <p>Please see <a href="https://tekzone.spe.sony.com">Tekzone</a> &lt;<a href="https://tekzone.spe.sony.com">https://tekzone.spe.sony.com</a>&gt; or consult SPE for the correct values and abbreviations. Table 12 in this document contains some of the most-used values.</p> <p>Note that the version and alpha of a composition are depicted in the CPL file name and metadata, not in the track file metadata.</p>
MCAAudioContent Kind and MCAAudioElementKind values	<p>SMPTE ST 2067-2</p> <p>MCAAudioContentKind values are listed in the file naming document on Tekzone. Typical values are Mono Optional (OPM), Narration (NAR), Dialog (DX), Music (MX), Effects (FX).</p> <p>MCAAudioElementKind values are also listed in the file naming document. Typical values are Composite Mix (CM), Music and Effects (ME), Dialog/Music/Effects (DME)</p>
Region/Language Tag	RFC5646 tag. See Appendix D

## HD SDR (1920x1080) IMF Track File Essence Specs

Table 11: HD *BASE* IMF Track File Specs

Format	SMPTE ST 2067-20:2016 "IMF App2"
<b>Image Track File</b>	<b>Base OV File</b>
Image Track File Type	MXF (SMPTE ST 2067-5)
Image Essence	JPEG2000
Profile Level	2K IMF-L ML6@SL3
Image Width	1920
Image Height	1080
MXF Track File Start	00:00:00:00
Color Encoding	YCbCr / 4:2:2
Color space	BT.709 (IMF Color.3)
Bit Depth	10 bits
Display Aspect Ratio	16:9
Frame Rate	24.00 24000/1001 25 30000/1001 50 60000/1001
Scanning Type	Progressive
<b>Audio Track File</b>	<b>Base OV File</b>
Audio Track File Type	MXF (SMPTE ST 2067-5)
Audio Track File Formatting	Per SMPTE ST 2067-2: One audio track file per element type per audio configuration. In addition, all audio channels in a track file must be unique assignments. If an element contains audio channels with the same channel assignment, these are to be wrapped in their own audio track file(s).
MXF Track File Start	00:00:00:00
Audio Essence	BWF (.wav)
Sampling Rate	48.00 kHz or 96.00 kHz
Bit Depth	24 bits
Allowed Audio Configurations (one MXF track file per audio configuration)	Mono, Lt-Rt, 5.1, 7.1
AudioChannelLabelSubDescriptor, SoundfieldGroupLabelSubDescriptor, GroupOfSoundfieldGroupsSubDescriptor (if applicable).	SMPTE ST 2067-2, ST 2067-8, ST 428-12, ST 377-4

MCATitle, MCATitleVersion and MCAEpisode values	<p>SMPTE ST 2067-2.</p> <p>MCATitle is the registered title in the SPE database (GMDM/Tekzone).</p> <p>MCAEpisode is used for television content and is the registered name and episode number in the SPE database.</p> <p>MCATitleVersion is the version (cut) of the audio in the audio track file. This is not ALPHA. Alpha is used in CPL only. Values are in Table 12 and in the file naming document on Tekzone. Consult SPE for correct value.</p> <p>Please see <a href="https://tekzone.spe.sony.com">Tekzone</a> &lt;<a href="https://tekzone.spe.sony.com">https://tekzone.spe.sony.com</a>&gt; or consult SPE for the correct values and abbreviations. Table 12 in this document contains some of the most-used values.</p> <p>Note that the version and alpha of a composition are depicted in the CPL file name and metadata, not in the track file metadata.</p>
MCAAudioContent Kind and MCAAudioElementKind values	<p>SMPTE ST 2067-2</p> <p>MCAAudioContentKind values are listed in the file naming document on Tekzone. Typical values are Mono Optional (OPM), Narration (NAR), Dialog (DX), Music (MX), Effects (FX).</p> <p>MCAAudioElementKind values are also listed in the file naming document. Typical values are Composite Mix (CM), Music and Effects (ME), Dialog/Music/Effects (DME)</p>
Region/Language Tag	RFC5646 tag. See Appendix D

## CPL's Required To Be Delivered:

### 1. Base OV CPL

Required CPL with Base Image (OV) and textless track file following immediately after the tail leader of the image track file.

The audio configuration as follows:

- 1) OV Native Language Lt-Rt
- 2) M&E Lt-Rt
- 3) OV Native Language 5.1

- 4) Optional M&E A Mono (if available)
- 5) Optional M&E B Mono (if available)

In a visual editor, this would look something like:

Video 1	ALPHA_D_UHD_16x9_LB_185_XVICC_2398_TXT_ENG_00.mxf	ALPHA_D_UHD_16x9_LB_11
Audio 1	ALPHA_D_UHD_16x9_LB_185_XVICC_2398_TXT_ENG_ENG_D5_00.mxf [A1]	ALPHA_D_UHD_16x9_LB_11
Audio 2	ALPHA_D_UHD_16x9_LB_185_XVICC_2398_TXT_ENG_ME_D5_00.mxf [A2]	ALPHA_D_UHD_16x9_LB_11
Audio 3	ALPHA_D_UHD_16x9_LB_185_XVICC_2398_TXT_ENG_S1_00.mxf [A3]	ALPHA_D_UHD_16x9_LB_11
Audio 4	ALPHA_D_UHD_16x9_LB_185_XVICC_2398_TXT_ENG_OPME_AB_00.mxf [A4]	ALPHA_D_UHD_16x9_LB_11
Audio 5		
Audio 6		
Audio 7		
TT 1		

2. **Texted Non-Subtitled CPL**, where the textless material is placed into the main program to remove the subtitled sections.

The audio track files to be included and played simultaneously by the Base OV CPL are as follows (each of the below is its own audio track file). Track files are to be packaged in the order below

- 1) OV Native Language Lt-Rt
- 2) M&E Lt-Rt
- 3) OV Native Language 5.1
- 4) Optional M&E A Mono (if available)
- 5) Optional M&E B Mono (if available)

3. **iP2P CPL**: this is the main program (OV) only, including one second of black at head and tail

The audio track files to be included and played simultaneously by the iP2P CPL are as follows (each of the below is its own audio track file):

- 1) OV Native Language Lt-Rt
- 2) OV Native Language 5.1

## CPL Metadata:

The following CPL metadata fields should be populated:

- Content Title
  - GMDM title
  - EIDR Title ID
- Content Version List
  - EIDR Level 3 (include Level 1 & Level 2 as part of this list)
  - EIDR ID (This is EIDR number inclusive of the “10.5240” prefix)
  - EIDR LabelText (Short description of the EIDR)
- Content Originator

- Content owner (s) (This is the entity that created the content, not always the distributor)
- Content Kind
  - Feature, Episodic, Trailer, Short
- Issuer
  - Sony Pictures Entertainment
- Annotation
  - ST 2086 Color Volume Metadata (must agree with what has been put into the essence descriptors in the MXF wrapper)
- Markers
  - *Markers are to be added to the CPL per SMPTE ST 2067-3:2016 “Interoperable Master Format, Composition Play List”, Sections 6.13 and 6.14. Specific values are in Table 21: Marker Labels*
- MaxFALL (If HDR) (in CPL extension per ST 2067-21)
- MaxCLL (If HDR) (in CPL extension per ST 2067-21)

## Folder Structure and File Naming

Folders and files contained in the IMF should adhere to the following specification:

- File and directory names shall be case sensitive
- File and directory names shall consist only of the following 8-bit ASCII characters: a-z, A-Z, 0-9, “\_” (underscore), “-” (dash), and “.” (dot)
- Filenames will not contain whitespace and will begin with alphanumeric characters (a-z, A-Z, 0-9)

**Table 12: Key To Naming Abbreviations**

\*For any other needed abbreviations, please see the file naming procedures on [Tekzone](https://tekzone.spe.sony.com) <<https://tekzone.spe.sony.com>>

ABBREV	MEANING
D	Domestic Theatrical
I	International Theatrical
TXT	Texted
TXTNONSUB	Texted, non subtitled
TXTLS	Textless
HD	1920x1080
UHD	3840x2160 (implies SDR)
HDR	HDR (implies 3840x2160)
DTLR	Domestic Trailer
ITLR	International Trailer
71	7.1 audio configuration
51	5.1 audio configuration
DS	Lt-Rt audio configuration
M	Monaural audio configuration
ME	Music and Effects
OPM	Mono Optional (track file)
OPTAB	M+E Mono Optionals A and B (Used for a CPL that plays both mono optional A and B)
NAR	Narration
DIA or DX	Dialog



## CPL Naming

All CPL's must be named according to the below CPL naming guidelines. The CPL file name must include the UUID of the CPL, the Gold Inventory Record barcode number, and the GMDM Title Abbreviation of the title that the CPL represents. The GMDM Title Abbreviation is available on [Tekzone](https://tekzone.spe.sony.com) <<https://tekzone.spe.sony.com>>

**A typical CPL file name is formatted as follows:**

```
CPL_<GoldBarcode>_<GMDMAlphaID>_<GMDM Title
Abbreviation>_<Version>_<2D/3D>_<HD/UHD/HDR>_<Aspect Ratio>_<ColorSpace>_<Frame
Rate>_<Sample Rate>_<Audio Language/Element 1>_<Audio Configuration 1>_<Audio
Language/Element 2>_<Audio Configuration 2>_<Audio Language/Element 3>_<Audio Configuration
3>_<Audio Language/Element 4>_<Audio Configuration 4>_<TXT/TXTNONSUB/TXTLS>_<Text Language
>_<UUID>.xml
```

NOTE: One would only use "2D" if the title were a 3D title in order to unambiguously distinguish the 2D CPL from the 3D CPL. *If the title is 2D only, leave this field blank.*

NOTE: The GMDMAlphaID can be less than 7 numbers. In these cases pad the beginning with zeroes to make the value contain seven numbers

The language or audio element is placed in front of each audio configuration rather than having a global language indicator. This is done in order to properly label foreign masters, which might have a combination of languages (e.g. French and English). If no element is stated, it is assumed to be a composite mix.

**Feature Example:** Cloudy With a Chance of Meatballs 2 - OV HD master, Domestic version, 2D, 16x9LB 2.40, Rec709 color space, texted non-subtitled, Lt-Rt, M+E Lt-Rt, English 5.1, M+E optionals

```
CPL_IMF9466024_1234567_CLRELE_D_2D_HD_LB240_REC709_2398_48K_ENG_DS_ME_DS_ENG_51_OPT
_M_OPT_M_TXTNONSUB_ENG_9e9979b2-2a8f-424a-98a9-ee05be1ed070.xml
```

**HDR Feature Example:** Pixels - OV HDR Master, Domestic Version, 16x9LB 2.39, Rec2020 color space, texted, Lt-Rt, M+E Lt-Rt, English 5.1, M+E optionals:

```
CPL_IMF9898272_1234567_PIXELS_D_HDR_LB239_REC2020_2398_48K_ENG_DS_ME_DS_ENG_51_OPTA
B_M_TXT_ENG_bcff65d9-98f6-4d95-baf8-ef18acc43aad.xml
```

**Television and Trailer CPLs should contain a TV Episode or Trailer Version ID:**

```
CPL_<GoldBarcode>_<GMDMAlphaID>_<GMDM Title Abbreviation>_<Version>_<2D/3D>_<Episode/P
art/Trailer>_<HD/UHD>_<Aspect Ratio>_<ColorSpace>_<Frame Rate>_<Sample Rate>_<Audio
Language/Element 1>_<Audio Configuration 1>_<Audio Language/Element 2>_<Audio Configuration
```

2>\_<Audio Language/Element 3>\_<Audio Configuration 3>\_<Audio Language/Element 4>\_<Audio Configuration 4>\_<TXT/TXTNONSUB/TXTLS>\_<Text Language >\_<UUID>.xml

**Television Example:** Breaking Bad Episode 208 -- UHD Master, 16x9 FF 1.78, Rec709 color, texted subtitled, Lt-Rt, M+E Lt-Rt and English 5.1

CPL\_IMF9324321\_1234567\_BREBAD\_D\_EP208\_UHD\_FF178\_REC709\_2398\_48K\_ENG\_DS\_ME\_DS\_ENG\_51\_TXT\_ENG\_a7286340-5b0a-11e4-af01-0002a5d5c51b.xml

**HDR Television Example:** Breaking Bad, Episode 208 -- HDR Master, 16x9 FF 1.78, Rec2020 color, texted subtitled, Lt-Rt, M+E Lt-Rt and English 5.1

CPL\_IMF9324322\_1234567\_BREBAD\_D\_EP208\_HDR\_FF178\_REC2020\_2398\_48K\_ENG\_DS\_ME\_DS\_ENG\_51\_TXT\_ENG\_b6175239-4a9z-00d3-ze90-0011b4c4b42a.xml

**Trailer Example:** Amazing Spiderman, Domestic Trailer 7, 16x9 LB 2.40, Rec709 color space, texted subtitled, Mono Narration, Mono Dialogue, Mono Mx, Mono Fx.

CPL\_IMF9792231\_1234567\_AMSPMA\_D\_DTLR7\_UHD\_LB240\_REC709\_2398\_48K\_ENG\_M\_NAR\_ENG\_M\_DIA\_M\_MX\_M\_FX\_TXT\_ENG\_a13d379b-106d-4c18-8010-6a8ed6f8d155.xml

**Trailer Example:** Amazing Spiderman, International Trailer C, 16x9 LB 2.40, Rec709 color space, texted subtitled, Mono Narration, Mono Dia, Mono Mx, and Mono Fx.

CPL\_IMF9792235\_1234567\_AMSEMA\_I\_ITLRC\_UHD\_LB240\_REC709\_2398\_48K\_ENG\_M\_NAR\_ENG\_M\_DIA\_M\_MX\_M\_FX\_TXT\_ENG\_b56d372c-203e-5g15-2030-4c3ef6s8e253.xml

**HDR Trailer Example:** Amazing Spiderman, International Trailer C, HDR Version, 16x9 LB 2.40, Rec2020 color space, texted subtitled, Mono Narration, Mono Dia, Mono Mx, and Mono Fx.

CPL\_IMF9792236\_1234567\_AMSPMA\_I\_ITLRC\_HDR\_LB240\_REC2020\_2398\_48K\_ENG\_M\_NAR\_ENG\_M\_DIA\_M\_MX\_M\_FX\_TXT\_ENG\_a45c261b-192d-4f04-1929-3b2de5r7d142.xml

## Image Track File Naming

Each Image MXF track file in an IMF package must be named according to the below guidelines. It is understood that some machines may have a limitation on the ability to adhere to the below specification. However, it is requested that naming follows as close as possible to the below.

GMDM Title Abbreviation is available on [Tekzone](#) using the abbreviation search.

All other abbreviations are in the SPE File Naming Specifications document, which is available in the document section of [Tekzone](#).

### A typical image MXF track file name is formatted as follows:

*<IMF Barcode>\_<GMDM Title Abbreviation>\_<Version>\_<2D/3D>\_<HD/UHD/HDR>\_<Aspect Ratio>\_<ColorSpace>\_<Frame Rate>\_<TXT/TXTNONSUB/TXTLS>\_<Text Language>.MXF*

**NOTE:** One would only use “2D” if the title were a 3D title in order to unambiguously distinguish the 2D track file from the 3D track file. If the title is 2D only, leave this blank.

**NOTE:** There will not be 3D in HDR

**Feature Example:** Cloudy 2 OV master, Domestic version, 3D, 16x9LB 2.40, texted non subtitled

IMF9466024\_CLRELE\_D\_3D\_HD\_LB240\_REC709\_2398\_TXTNONSUB\_ENG.MXF

**NOTE:** For 3D image tracks, each stereo track should be named with a stereo identification for the specific eye, either “LE” or “RE”.

*<GMDM Title Abbreviation>\_<Version>\_<2D/3D>\_<HD/UHD>\_<Aspect Ratio>\_<ColorSpace>\_<Frame Rate>\_<TXT/TXTNONSUB/TXTLS>\_<Text Language>\_<Stereo Eye>.MXF*

IMF9466024\_CLRELE\_D\_3D\_HD\_LB240\_REC709\_2398\_TXTNONSUB\_ENG\_LE.MXF

IMF9466024\_CLRELE\_D\_3D\_HD\_LB240\_REC709\_2398\_TXTNONSUB\_ENG\_RE.MXF

**HDR Feature Example:** Pixels OV HDR Master, Domestic Version, 16x9LB 2.39, Rec2020 color space, texted subtitled

IMF9898272\_PIXELS\_D\_HDR\_LB239\_REC2020\_2398\_TXT\_ENG.MXF

**For Television and Trailer image track files, an additional label should be added for episode or version ID:**

*<GMDM Title Abbreviation>\_<Version>\_<2D/3D>\_<Episode/Part/Trailer>\_<HD/UHD>\_<Aspect Ratio>\_<ColorSpace>\_<Frame Rate>\_<TXT/TXTNONSUB/TXTLS>\_<Text Language>.MXF*

**Television Example:** Breaking Bad, Episode 208, REC709 color, 16x9 FF 1.78, texted subtitled

IMF9324321\_BREBAD\_D\_EP208\_UHD\_FF178\_REC709\_2398\_TXT\_ENG.MXF

**HDR Television Example:** Breaking Bad, Episode 208, HDR Version, REC2020 color, 16x9 FF 1.78, texted subtitled

IMF9324322\_BREBAD\_D\_EP208\_HDR\_FF178\_REC2020\_2398\_TXT\_ENG.MXF

**Trailer Example:** Amazing Spiderman, Trailer 7, Rec709 color, 16x9 LB 2.40, texted subtitled

IMF9792231\_AMSPMA\_D\_DTLR7\_UHD\_LB240\_REC709\_2398\_TXT\_ENG.MXF

**HDR Trailer Example:** Amazing Spiderman, Trailer 7, HDR Version, Rec2020 color, 16x9 LB 2.40, texted subtitled

IMF9792236\_AMSPMA\_D\_DTLR7\_HDR\_LB240\_REC2020\_2398\_TXT\_ENG.MXF

## Audio Track File Naming

Each Audio MXF track file in an IMF package must be named according to the below guidelines. It is understood that some machines may have a limitation on the ability to adhere to the below specification. However, it is requested that naming follows as close as possible to the below.

### A typical audio MXF track file name is formatted as follows:

*<IMF Barcode>\_<GMDM Title Abbreviation>\_<Version>\_<2D/3D>\_<HD/UHD/HDR>\_<Aspect Ratio>\_<ColorSpace>\_<Frame Rate>\_<TXT/TXTNONSUB/TXTLS>\_<Text Language>\_<Audio Language>\_<Audio Configuration>.MXF*

GMDM Title Abbreviation is available on [Tekzone](#) using the abbreviation search.

All other abbreviations are in the SPE File Naming Specifications document, which is available in the document section of [Tekzone](#).

### Note that “2D” or “3D” audio mix is only specified if it is a 3D title

### Feature Example:

Cloudy with a Chance of Meatballs 2, 3D Domestic version, Lt-Rt, M+E Lt-Rt, and English 5.1 MXF files, 23.98 fps, 48.00kHz, created April 30, 2015:

IMF9466024\_CLRELE\_D\_3D\_HD\_LB240\_REC709\_2398\_TXTNONSUB\_ENG\_ENG\_51.MXF

IMF9466024\_CLRELE\_D\_3D\_HD\_LB240\_REC709\_2398\_TXTNONSUB\_ENG\_ENG\_DS.MXF

IMF9466024\_CLRELE\_D\_3D\_HD\_LB240\_REC709\_2398\_TXTNONSUB\_ENG\_ME\_DS.MXF

### Television Example:

Breaking Bad, Domestic version, episode 208, Lt-Rt, M+E Lt-Rt, and English 5.1 MXF files, 23.98 fps, 48.00kHz, created April 30, 2015:

IMF9324321\_BREBAD\_D\_EP208\_UHD\_FF178\_REC709\_2398\_TXT\_ENG\_ENG\_51.MXF

IMF9324321\_BREBAD\_D\_EP208\_UHD\_FF178\_REC709\_2398\_TXT\_ENG\_ENG\_DS.MXF

IMF9324321\_BREBAD\_D\_EP208\_UHD\_FF178\_REC709\_2398\_TXT\_ENG\_ME\_DS.MXF

## Appendix A

### Document References

SMPTE ST 2067-2:2016 Interoperable Master Format-Core Constraints

SMPTE ST 2067-3:2016 Interoperable Master Format-Composition Playlist

SMPTE ST 2067-5:2013-Interoperable Master Format-Essence Component

SMPTE ST 2067-8:2013 Interoperable Master Format-Common Audio Labels

SMPTE ST 2067-20:2016 Interoperable Master Format-Application #2

SMPTE ST 2067-21:2016 Interoperable Master Format – Application #2 Extended (The 2016 revision incorporates HDR and related metadata)

ITU-R BT.1886 - Reference electro-optical transfer function for flat panel displays used in HDTV studio production

ITU-T T.800 - JPEG 2000 image coding system: Core coding system

SMPTE ST 2084 High Dynamic Range Electro-Optical Transfer Function of Mastering Reference Displays (PQ standard)

SMPTE ST 2086 Mastering Display Color Volume Metadata Supporting High Luminance and Wide Color Gamut Images

SMPTE ST 2094-1 Dynamic Metadata for Color Volume Transform – Core Components

SMPTE ST 2094-10 Dynamic Metadata for Color Volume Transform – Application #1

SMPTE ST 2094-20 Dynamic Metadata for Color Volume Transform – Application #2

SMPTE ST 2094-30 Dynamic Metadata for Color Volume Transform – Application #3

SMPTE ST 2094-40 Dynamic Metadata for Color Volume Transform – Application #4

IMSC1 Spec is available at: <http://www.w3.org/TR/ttml-imsc1/>

EIDR Web Site: <http://eidr.org>

EIDR technology references: <http://eidr.org/technology/>

EIDR best practices: [http://eidr.org/documents/EIDR\\_2.0\\_Best\\_Practices.pdf](http://eidr.org/documents/EIDR_2.0_Best_Practices.pdf)

EIDR with IMF: [http://eidr.org/documents/Using\\_EIDR\\_with\\_IMF\\_v0.9.pdf](http://eidr.org/documents/Using_EIDR_with_IMF_v0.9.pdf)

## Appendix B

### IMF Slate Tables

See below tables for detailed information regarding IMF slates

Table 13: CPL Slate for Base Package:

Slate Label	Label Definition	Label Examples	Comments
GMDM Title	Full name of the production	Breaking Bad, Season 3 The Amazing Spider-man	Episodic titles should include the season #
GMDM Title Abbreviation	Abbreviated title name established by Sony Pictures	BREBAD AMSPMA	These can be found at <a href="https://tekzone.spe.sony.com">Tekzone</a> : <a href="https://tekzone.spe.sony.com">https://tekzone.spe.sony.com</a> If not there, contact Sony to provide GMDM abbreviation
GMDM Alpha ID	Unique alpha identification number established by Sony Pictures	1234567	These can be found at <a href="https://tekzone.spe.sony.com">Tekzone</a> . If not there, contact Sony to provide GMDM Alpha ID
Version	Unique version identification	Domestic International	Refers to the cut of the show
Episode Number Trailer number	Episode identification	Episode 308 International Trailer A MOW Night 1	Use for Episodic, Trailer, and Movie of the Week identification
GMDM Episode Title	Full name of episode title	"I See You"	

Slate Label	Label Definition	Label Examples	Comments
Content Type Marketing Name	Description of composition contents	Full Length Texted with Subs  Full Length Texted/non-sub Dual Language Master Foreign Language Master (with localized inserts)	(implies text and subs are burned in to image)  (implies that there is normal text burned in but subtitles are not burned in)
Program FFOP and LFOP	First frame and last frame of program, inclusive of first/last frame of picture and audio	FFOP: 720  LFOP: 15540	Please ensure LFOP is inclusive of all audio
Program Runtime	Established temporal length of the product expressed as both HH:MM:SS:FF and the frame count including FFOP and LFOP	02:01:30:05 / 174966 frames	
Frame Rate	Program Frame Rate	23.976	
Resolution	Horizontal x Vertical Pixel Count	3840x2160  1920x1080	
Presentation Aspect Ratio	Aspect ratio of image as presented	239LB  178FF  133SM	See Appendix C for a list of accepted aspect ratios
Color Space	Color space of image data	Rec709  Rec2020	



Slate Label	Label Definition	Label Examples	Comments
EOTF	Electro-Optical Transfer Function used for this image track file	Gamma 2.4 PQ (ST 2084)	
Encoding Profile	<b>JPEG Operating levels for IMF profiles</b> <b>Rec. ITU-T T.800</b> (Table A.53/A.54)	4K IMF-L ML6@SL3  4K IMF-L ML6@SL4	4K IMF Profile Mainlevel 6 Sublevel 3  4K IMF Profile Mainlevel 6 Sublevel 4
Post Facility	Name of post production facility that creates the file	Sony Pictures Studios, Global Mastering & Servicing	
Creation Date	Date of creation as YYYYMMDD	20150305	
Territory	United States		
Audio Element 1	Composite Mix		
Audio Configuration 1	7.1, 5.1, Lt-Rt, Lo-Ro (standard stereo), Mono		
Audio Language 1	en-US	See Appendix D for constructing the RFC5646 language code	This is the primary language spoken in this audio track
Audio Element 2	M+E, M+E OPTIONAL		
Audio Configuration 2	7.1, 5.1, Lt-Rt, Lo-Ro (standard stereo), Mono		
Audio Language 2	de-DE	See Appendix D for constructing the RFC5646 language code	

Slate Label	Label Definition	Label Examples	Comments
Subtitle TT	Full or Partial		Partial implies forced subs to cover particular areas
Subtitle Language	English		
Close caption TT	Present		
Close caption Language	PFrench		
Notes (optional)	Additional notations that may provide additional information	No commercial blacks	

**Table 14: Textless Slate for Base Package:**

Slate Label	Label Definition	Label Examples	Comments
GMDM Title	Full name of the production	Breaking Bad, Season 3 The Amazing Spider-man	Episodic titles should include the season #
GMDM Title Abbreviation	Abbreviated title name established by Sony Pictures	BREBAD AMSPMA	These can be found at <a href="#">Tekzone</a> . If not there, contact Sony to provide GMDM abbreviation
Version	Version referenced by the textless shots	Domestic International	Refers to the cut of the show for which the textless material is designed
Episode Number Trailer number	Episode identification	Episode 308 International Trailer A MOW Night 1	Use for Episodic, Trailer, and Movie of the Week identification
GMDM Episode Title	Full name of episode title	"I See You"	

Slate Label	Label Definition	Label Examples	Comments
Frame Rate	Frame Rate of the textless images	23.976	
Resolution	Horizontal x Vertical Pixel Count	3840x2160 1920x1080	
Presentation Aspect Ratio	Aspect ratio of image as presented	239LB 178FF 133SM	See Appendix C for a list of accepted aspect ratios
Color Space	Color space of image data	Rec709 Rec2020	
EOTF	Electro-Optical Transfer Function used for this image track file	Gamma 2.4 PQ (ST 2084)	
Encoding Profile	JPEG <b>Operating levels for IMF profiles</b> <b>Rec. ITU-T T.800</b> (Table A.53/A.54)	4K IMF-L ML6@SL3  4K IMF-L ML6@SL4	4K IMF Profile Mainlevel 6 Sublevel 3  4K IMF Profile Mainlevel 6 Sublevel 4
Post Facility	Name of post production facility that creates the file	Sony Pictures Studios, Global Mastering & Servicing	
Creation Date	Date of image track file creation as YYYYMMDD	20150305	
Insert Count (optional)	Number of textless shots/inserts in the track file, including slate		

Table 15: CPL Slate for Supplemental Package:

Slate Label	Label Definition	Label Examples	Comments
GMDM Title	Full name of the production	Breaking Bad, Season 3 The Amazing Spider-man	Episodic titles should include the season #
GMDM Title Abbreviation	Abbreviated title name established by Sony Pictures	BREBAD AMSPMA	These can be found at <a href="#">Tekzone</a> . If not there, contact Sony to provide GMDM abbreviation
GMDM Alpha ID	Unique alpha identification number established by Sony Pictures	1234567	These can be found at <a href="#">Tekzone</a> . If not there, contact Sony to provide GMDM Alpha ID
Version	Unique version identification	Domestic International Malaysia Version Director's Cut	Refers to the version that the supplemental package is designed to create.
Episode Number Trailer number	Episode identification	Episode 308 International Trailer A MOW Night 1	Use for Episodic, Trailer, and Movie of the Week identification
GMDM Episode Title	Full name of episode title	"I See You"	

Slate Label	Label Definition	Label Examples	Comments
Content Type Marketing Name	Description of composition contents	Full Length Texted with Subs  Full Length Texted/non-sub Dual Language Master Foreign Language Master (with localized inserts)	(implies text and subs are burned in to image)  (implies that there is normal text burned in but subtitles are not burned in)
Program FFOP and LFOP	Frame range between the first frame and last frame of program, inclusive of both first and last frame of picture	FFOP: 720  LFOP: 15540	Please ensure LFOP is inclusive of all audio
Program Runtime	Established temporal length of the product expressed as both HH:MM:SS:FF and the frame count including FFOP and LFOP	02:01:30:05 / 174966 frames	
Frame Rate	Program Frame Rate	23.976	
Resolution	Horizontal x Vertical Pixel Count	3840x2160  1920x1080	
Presentation Aspect Ratio	Aspect ratio of image as presented	239LB  178FF  133SM	See Appendix C for a list of accepted aspect ratios

Slate Label	Label Definition	Label Examples	Comments
Color Space	Color space of image data	Rec709 Rec2020	
EOTF	Electro-Optical Transfer Function used for this image track file	Gamma 2.4 PQ (ST 2084)	
Encoding Profile	<b>JPEG Operating levels for IMF profiles</b> <b>Rec. ITU-T T.800</b> (Table A.53/A.54)	4K IMF-L ML6@SL3  4K IMF-L ML6@SL4	4K IMF Profile Mainlevel 6 Sublevel 3  4K IMF Profile Mainlevel 6 Sublevel 4
Post Facility	Name of post production facility that creates the file	Sony Pictures Studios, Global Mastering & Servicing	
Creation Date	Date of creation as YYYYMMDD	20150305	
Territory	United States		
Audio Element 1	Composite Mix		
Audio Configuration 1	7.1, 5.1, Lt-Rt, Lo-Ro (standard stereo), Mono		
Audio Language 1	en-US	See Appendix D for constructing the RFC5646 language code	This is the primary language spoken in this audio track
Audio Element 2	M+E, M+E OPTIONAL		
Audio Configuration 2	7.1, 5.1, Lt-Rt, Lo-Ro (standard stereo), Mono		

<b>Slate Label</b>	<b>Label Definition</b>	<b>Label Examples</b>	<b>Comments</b>
Audio Language 2	de-DE	See Appendix D for constructing the RFC5646 language code	
Subtitle TT	Full or Partial		Partial implies forced subs to cover particular areas
Subtitle Language	English		
Close caption TT	Present		
Close caption Language	PFrench		
Notes (optional)	Additional notations that may provide additional information	No commercial blacks	

## Appendix C

### Presentation Aspect Ratios

Aspect ratio in this context means presentation or display format – not the original shape or size of the film or data, but how the image appears on the screen. In most non-theatrical contexts that we service today, there is only one basic display format. Whether HD or UHD, the display is 16x9, or 1.78. Thus, these variants of the basic aspect ratio describe how various products (standard definition television, silent, sound, widescreen, anamorphic and 70mm features, as well as contemporary productions) are formatted within the 16x9 display to retain their compositional integrity. We may deploy other aspect ratios, either exceptionally or with the introduction of a new format, but these eleven characterize the presentation of most of our product to date.

**16x9 133SM - 1.33:1 Side-Matte** (“Side-Matted” is also referred to as “pillar-boxed”) is used by late silent features and standard definition television. Library sound features (pre-1952) re-mastered at 2k have also generally been manufactured in 1.33 aspect ratio.

**16x9 137SM - 1.37:1 Side-Matte** is the Academy sound aperture standard. Legacy sound features pre-1952 and re-mastered at 4k are manufactured in 1.37 aspect ratio.

**16x9 166SM - 1.66:1 Side-Matte** is the flat (spherical) presentation format for the most common post-1952 European widescreen flat format (equivalent to 1.85 in US).

**16x9 - 1.78:1 Full Frame** is the native aspect ratio of HD and UHD. It is the *de facto* aspect ratio of all picture elements in the IMF package. HD and UHD productions are often composed 1.78 full frame. Most contemporary television is 1.78 Full Frame. We are phasing out 16x9 full frame versions (pan-, tilt-and-scan) of legacy product. Legacy film and television product is now generally re-mastered to original aspect ratio and composition using matting.

**16x9 185LB - 1.85 Letter-Box** is the standard format for widescreen flat (spherical) theatrical features in the US produced post 1952.

**16x9 200LB - 2.00:1 Letter-Box** is used for certain contemporary television productions, including *House of Cards*.

**16x9 220LB - 2.20:1 Letter-Box** is the aspect ratio for theatrical features originated on 65mm flat negative for 70mm presentation, such as *Lawrence of Arabia*

**16x9 235LB - 2.35:1 Letter-Box** is used for anamorphic widescreen features with optical sound track, produced from 1953-1970.

**16x9 239LB - 2.39:1 Letter-Box**

It is important to correctly document whether a product is **2.39LB** or **2.40LB**. 2.39:1 is the ratio of modern (1971-present) anamorphic widescreen features. The actual SMPTE standard, modified from 2.35 in 1970, is @2.3976:1, but is frequently referred to as 2.40 for convenience. Modern data-centric productions are often formatted for 2.39 display and generally achieve a 2.39 picture by non-anamorphic means. The DCI standard for cinema projection is 2.39:1. There is widespread use of the



colloquial 2.40, and some products are actually physically formatted in a 2.40:1 aspect ratio, such as Blu-ray disk masters and Blu-ray disks.

### 16x9 240LB – 2.40:1 Letter-Box

It is important to correctly document whether a product is **2.39LB** or **2.40LB**. 2.39:1 is the ratio of modern (1971-present) anamorphic widescreen features. The actual SMPTE standard, modified from 2.35 in 1970, is @2.3976:1, but is frequently referred to as 2.40 for convenience. Modern data-centric productions are often formatted for 2.39 display and generally achieve a 2.39 picture by non-anamorphic means. The DCI standard for cinema projection is 2.39:1. There is widespread use of the colloquial 2.40, and some products are actually physically formatted in a 2.40:1 aspect ratio, such as Blu-ray disk masters and Blu-ray disks.

**16x9 255LB - 2.55:1 Letter-Box** represents the original Cinemascope anamorphic widescreen ratio, which had no optical soundtrack and thus was wider than 2.35:1. This ratio is only used by a few Columbia films such as *The Long Gray Line*, and it disappears completely after 1959. Anamorphic widescreen is more commonly 2.35 or 2.39.

**Table 16: X/Y Pixel Count for Side-Matted and Letter-Boxed Image Area**

Aspect Ratio	HD pixels (RP199- 2004)	UHD pixels
<b>16x9 133SM</b>	1440x1080	2880x2160
<b>16x9 137SM</b>	1480x1080	2960x2160
<b>16x9 166SM</b>	1793x1080	3586x2160
<b>16x9 178</b>	1920x1080	3840x2160
<b>16x9 185LB</b>	1920x1038	3840x2076
<b>16x9 200LB</b>	1920x960	3840x1920
<b>16x9 220LB</b>	1920x873	3840x1746
<b>16x9 235LB</b>	1920x817	3840x1634
<b>16x9 239LB</b>	1920x803	3840x1606
<b>16x9 240LB</b>	1920x800	3840x1600
<b>16x9 255LB</b>	1920x753	3840x1506

See also SMPTE RP199-2004

## Appendix D

### Determining RFC5646 Language Codes

The RFC5646 Language code is constructed by concatenating two codes: The ISO 639-1 Language Code and the ISO Alpha-2 (ISO 3166-2) Territory code. These are separated by a hyphen as follows:

<639-1 code>hyphen<alpha-2 code>

For example, for US English, the 639-1 Language code is “EN” and the alpha-2 country code is “US”, so the RFC5646 code is:

EN-US

Please access the following links to access the 639-1 code and alpha-2 code:

639-1: [http://www.loc.gov/standards/iso639-2/php/code\\_list.php](http://www.loc.gov/standards/iso639-2/php/code_list.php) (use the “639-1” column)

Alpha-2: <http://data.okfn.org/data/core/country-list>

For major reference, see the following:

<https://tools.ietf.org/html/rfc5646>

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