Delivery specifications for programs.

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1 GENERAL

This document covers the technical requirements for programs commissioned in High Definition (HD) which are to be transmitted by Talpa TV. Talpa TV offers the option of electronic delivery by means of transferring computer files via the Internet, further described in sections 3 and 4. If the requirements included in this document are not fulfilled, Talpa TV retains the right to refuse or adapt the received production.

2 SPECIFICATIONS FOR THE COMPUTER FILE

The content is packaged in an MXF file containing compressed image and audio data. The file must be delivered in MXF format using 'Operational Pattern 1a', which is specified in the following section.

2.1 REFERENCES

A submission must at least comply with the following standards and recommendations:

SMPTE 377M-2009	Material Exchange Format (MXF) – File Format Specification
SMPTE 378M-2004	Material Exchange Format (MXF) – Operational pattern 1A (Single Item, Single Package)
SMPTE 379M-2010	Material Exchange Format (MXF) – MXF Generic Container
SMPTE 381M-2005	Material Exchange Format (MXF) – Mapping MPEG Streams into the MXF Generic Container
SMPTE 382M-2007	Material Exchange Format – Mapping AES3 and Broadcast Wave Audio into the MXF Generic Container
ITU-R BT.709-5-2004	Parameter values for the HDTV standards for production and international program exchange
ITU-R BT.1702-2005	Guidance for the reduction of photosensitive epileptic seizures caused by television
EBU R122-2007	Material Exchange Format Time Code Implementation
RDD 9-2009	MXF Interoperability Specification of Sony MPEG Long GOP Products
EBU R95-2016	Safe Areas for 16:9 Television Production

Generic program genres must comply with the following loudness recommendation. See section 2.3.5 which describes the exception for high quality films and television series.

EBU R 128-2014	Loudness normalisation and permitted maximum level of audio signals

2.2 VIDEO

2.2.1 FORMAT

The frame-rate is 25 frames and 50 fields per second (1080i/25 or 1080psf/25) with a resolution of 1920x1080. The video codec is MPEG-2 XDCAM HD 422 Long GOP 50 (50 Mbit/sec).

2.2.2 ASPECT RATIO

The primary format for the material is 16F16, filling a 16:9 screen vertically and horizontally without geometric mismatch. Sub-formats which can be viewed without distortion in 16F16 are permitted. The aspect ratio must be marked identically in MPEG essence, MXF metadata as well as the metadata file. In the case of the active picture ratio being 2.35:1 (21:9) or 1.85:1, the picture should be centred vertically between black bars in a 16:9 frame, filling the width of the frame with no geometric distortion.

2.2.3 ADDITIONAL SIGNALS

Ancillary data enclosed in the horizontal or vertical blanking such as VITC is ignored.

2.2.4 ILLEGAL COLOURS

Illegal colours may not be present in the video signal. Video parameters must comply strictly with ITU R BT.709-5. Files which do not comply with this specification will be rejected.

2.2.5 FIELD DOMINANCE

A complete video frame must consist of an odd line field followed by an even line field. Material may be originated with either interlaced or progressive scan. Cuts in material must happen on frame boundaries (between field 2 and field 1 of the next frame). Motion on Progressive Segmented Frame (PSF) material must always occur between field 2 and field 1 of the next frame (field 1 dominance). It is possible to shoot material at 1080p/50. If this is done, the correct 2-frame marker phasing must be maintained when down-converting to 1080i/25 or 1080psf/25.

2.2.6 TIME CODE

The file shall feature one continuous, ascending time code as defined according to the Time Code Track in the Material Package of the MXF file. The time code of the MPEG-2 GOP headers must also be continuous and shall correctly indicate the coded image sequence. Any VITC in the recording will be ignored.

2.2.7 PICTURE QUALITY

The picture must be well lit and reasonably but not artificially sharp. It needs to be free of excessive noise, grain and digital compression artefacts, flare, reflections, lens dirt, markings and obstructions, lens aberrations, black crushing and highlight compression. Hard clipping of highlights by legalisers shall not cause visible artefacts on screen. Movement needs to appear reasonably smooth and continuous and must not give rise to distortions or break-up to moving objects, or cause large changes in resolution. There shall be no noticeable horizontal or vertical aliasing, for example jagged lines and field or frame rate fluctuations. Colour rendition, especially skin tones, must be consistent throughout and be a realistic representation of the scene portrayed, unless it is altered as an editorially essential visual effect. There shall be no visible contouring, quantisation noise or artefacts caused by digital processing. Noticeable spurious signals or artefacts, for example streaking, ringing, smear, echoes, overshoots, moiré, hum or cross-talk shall not be visible. Electronically generated moving graphics and effects such as rollers, moves, wipes, fades and dissolves added to interlaced video in post-production must be generated as interlaced as well to prevent unacceptable judder.

2.2.8 PHOTOSENSITIVE EPILEPSY

Flickering or intermittent images and certain types of regular patterns can cause problems for some viewers who have photosensitive epilepsy. The supplier must take precautions according to guideline ITU-R BT.1702 to avoid the production of images that fall into this category.

2.2.9 SAFE AREAS

To allow viewers to see all displayed information, it is mandatory to make sure that important objects and texts are placed in the safe areas, as defined in EBU R 95. Disclaimers must be within these safe areas.

2.3 AUDIO

2.3.1 FORMAT

The coding of the audio channels is PCM 24 bit@48 kHz.

2.3.2 CHANNEL LAYOUT

2.3.2.1 DUTCH

The submission for 'Dutch' must occur in one of the following layouts. Additionally the 'Scripted' & 'Movies' channel layouts are allowed too.

- Stereo audio and stereo mix without dialogue (M&E) or stereo mix without voice-over (Clean), in eight channels (four AES pairs, eight tracks)

  1 = Left Stereo (Lo/Lt)
  2 = Right Stereo (Ro/Rt)
  3 = Left Stereo full mix minus narration ((Dialogue + Music & Effects) (Lo/Lt)
  4 = Right Stereo full mix minus narration ((Dialogue + Music & Effects) (Ro/Rt)
  5 = Mute
  6 = Mute
  7 = Mute
  8 = Mute

2.3.2.2 SCRIPTED & MOVIES

The submission for 'Scripted' and 'Movies' must occur in one of the following layouts:

Stereo and multi-channel surround audio in eight channels (four AES pairs, eight tracks)

1 = Left Stereo (Lo/Lt)
2 = Right Stereo (Ro/Rt)
3 = Left Front
4 = Right Front
5 = Centre
6 = Low-Frequency Effects
7 = Left Surround
8 = Right Surround

Stereo, multi-channel surround audio and stereo mix without dialogue (M&E) or stereo mix without voice-over (Clean), in sixteen channels (eight AES pairs, sixteen tracks)

1 = Left Stereo (Lo/Lt)
2 = Right Stereo (Ro/Rt)
3 = Left Stereo M&E/Clean (Lo/Lt)
4 = Right Stereo M&E/Clean (Ro/Rt)
5 = Left Front
6 = Right Front
7 = Centre
8 = Low-Frequency Effects
9 = Left Surround
10 = Right Surround
11 = Mute
12 = Mute
13 = Mute
14 = Mute
15 = Mute
16 = Mute

Stereo, multi-channel surround audio, stereo mix without dialogue (M&E) or stereo mix without voice-over (Clean) and multi-channel surround mix without dialogue (M&E) or multi-channel surround mix without voice-over (Clean), in sixteen channels (eight AES pairs, sixteen tracks)

1 = Left Stereo (Lo/Lt)
2 = Right Stereo (Ro/Rt)
3 = Left Stereo M&E/Clean (Lo/Lt)
4 = Right Stereo M&E/Clean (Ro/Rt)
5 = Left Front
6 = Right Front
7 = Centre
8 = Low-Frequency Effects
9 = Left Surround
10 = Right Surround
11 = Left Front M&E/Clean
12 = Right Front M&E/Clean
13 = Centre M&E/Clean
14 = Low-Frequency Effects M&E/Clean
15 = Left Surround M&E/Clean
16 = Right Surround M&E/Clean

2.3.2.3 NON-SCRIPTED

The submission for 'Non-scripted' must occur in the following layout:

Stereo and stereo mix without voice-over and all available elements (clean), in eight channels (four AES pairs, eight tracks)

1 = Left Stereo (Lo/Lt)
2 = Right Stereo (Ro/Rt)
3 = Left Stereo full mix minus narration ((Dialogue + Music & Effects) (Lo/Lt)
4 = Right Stereo full mix minus narration ((Dialogue + Music & Effects) (Ro/Rt)
5 = Music undipped – Left stereo
6 = Music undipped – Right Stereo
7 = Effects – Left Stereo
8 = Effects – Right Stereo
9 = Dialogue (Quotes)
10 = Narration (voice-over)
11 = Mute
12 = Mute

2.3.3 AUDIO CHANNEL DISTRIBUTION ASPECTS

Channels 1 and 2 form a stereo pair. In case of mono audio, the Left channel must be identical to the Right channel. In case of multi-channel surround sound recordings, these tracks are applied discretely in addition to the stereo tracks. Stereo program audio must be capable of mixing down to mono without causing any noticeable phase cancellation of essential audio information, dialogue in particular. Left and Right stereo can contain either a straightforward stereo mix (Lo/Ro) or a mix which is compatible with Dolby Surround/ProLogic and similar systems (Lt/Rt). The use of a Lo/Ro-mix is nevertheless strongly preferred.

Multi-channel surround sound mixes must be able to be down-mixed to stereo in Lo/Ro mode using standard mix parameters (-3 dB for both Centre and Surround) without causing annoying artefacts or listening fatigue. Dialogue jumping between Centre Only and Phantom Centre (Left/Right) must be avoided. The mix calibration must be identical for all channels, which means that 3 dB pre-correction of the surround channels for a movie theatre must be removed. It is strongly recommended to only make use of the LFE channel if the signal levels of the other channels, including the from multi-channel surround sound signal derived stereo down-mix, would otherwise lead to overloads. All audio channels must be in sync. Transmission by Talpa TV in SD video resolution and in streaming applications currently carries the stereo signal only.

2.3.4 LOUDNESS LEVEL FOR GENERIC GENRES

For generic genres which include news, games, talk shows, sitcoms, entertainment, music programs and documentaries, the loudness level of the content must comply with EBU R128, based on the following specifications:

Program Loudness	-23.0 LUFS (±0.5 LU)
Maximum True Peak Level	-1 dBTP
Maximum Momentary Loudness	No restriction
Maximum Short-Term Loudness	+6 LU recommended
Maximum Loudness Range	No restriction

Limitations of the modulations are determined using the Maximum Short-Term Loudness parameter. Exceeding the recommended value is acceptable if it serves essential creative needs that nevertheless do not force the viewer to lower the volume control level in a domestic environment. Based on performance in practice, future versions of this delivery specification may be adjusted for options as well as permitted maximum values.
The audio needs to be consistently mixed and edited. Dialogue must be acquired and mixed so that it is clear and easy to understand while listening on the same comfortable listening level and must not lead to perceptual differences with the average dialogue level generally found in interrupting commercials. Loudness levels must be appropriate to the scene portrayed, suitable for domestic listening situations.

Segments of programs meant to be transmitted adjacent to commercial breaks or other programs which can be considered as individual program material, should have an integrated loudness close to -23 LUFS, so that the transition will not lead to annoyance. Examples are idents, leaders, reviews and promos for the next episode. It is strongly recommended to normalise these segments in the total mix. Similar segments which are non-adjacent may deviate according to creative needs as long as they do not push a volume control change by the viewer.

The production company will be seriously blamed if mixing techniques are used or additional signals are added to the content which deliberately leads to considerable loudness differences between multi-channel surround audio and its derived down-mix or which leads to manipulation of the loudness measurement in general.

2.3.5 LOUDNESS LEVEL FOR HIGH QUALITY FILMS AND SERIES

For the genre films and television series it is strongly recommended to supply the highest quality mixes made by the original audio engineer. If possible, this craftsperson creates a dedicated dynamical mix adjusted for television use in a domestic environment. If such a mix is not available, there is a strong preference to supply the original theatrical mix instead of an automatically performed dynamically processed version. If necessary, this mix which will be specifically adapted for high quality television transmission in the ingest stage of Talpa TV according to R 128 s4.

The audio may comply with ITU-R BS.1864, EBU R 128 or ATSC A/85, but this is not required. The sound needs to be consistently mixed and edited. Dialogue must be acquired and mixed so that it is clear and easy to understand on the same comfortable listening level. Loudness levels must be appropriate to the scene portrayed.

Segments of television drama series meant to be transmitted adjacent to commercial breaks or other programs which can be considered as individual program material, should have an integrated loudness reasonably close to the average Voice Level of the whole mix, so that the transition will not lead to annoyance. Examples are idents, leaders, reviews and promos for the next episode. Similar segments which are non-adjacent may deviate according to creative needs as long as they do not push a volume control change by the viewer.

2.3.6 LOW LOUDNESS LEVEL CONTENT

A production may consciously use low level audio, for example, in content that consists mainly or entirely of background sounds. This is a creative option which for this purpose is supported in the workflow of Talpa TV. If the submitting party asks to apply the so-called low loudness level treatment, the ingest process accepts that material has a lower program loudness level than -23 LUFS.

2.3.7 AUDIO QUALITY

Sound must be recorded with appropriately placed microphones, giving minimum background noise. The audio shall have no peak level clipping and be free of spurious signals such as clicks, hum and any other avoidable distortion. The sound needs to be consistently mixed and edited. The audio must not show dynamic and/or frequency response artefacts as a result of the action of noise reduction or low bit rate coding. The timing difference between sound and vision shall not cause any perceptible error.

3 SUBMISSION OF INTERNATIONALLY EXCHANGED PROGRAMS

Files can be submitted using Signiant MediaShuttle or SmartJog. Full support of these protocols, accessibility and proper functioning of the server cannot be guaranteed. Please contact your Talpa Network's Content Traffic Coordinator for details.

3.1 SUBTITLING

If subtitling information is available, please provide it with the submission. Examples are subtitling text files and time code information when subtitling must be visible.

3.2 SCRIPTS

If a script is available, please provide it with the submission.

3.3 START TIME

The video file shall start with a colour bar combined with a 1 kHz tone at timecode 00:01:00:00 followed by a slate which contains all relevant information of the content. The program needs to start at time code 00:02:00:00.

4 SUBMISSION OF TALPA TV SPECIFICALLY PRODUCED PROGRAMS

Files can be submitted using Signiant MediaShuttle. The internet address of this server will be provided together with the access account information. Full support of these protocols, accessibility and proper functioning of the server cannot be guaranteed. The submission must be stored in the root directory, not in a sub folder. Please contact your Talpa Network's Content Traffic Coordinator for details.

4.1 FILE NAMING CONVENTION

The name of the MXF file needs to be unique, representing the content (title and episode number) and the date of broadcasting (DD-MM-YYYY), separated by underscores (_). File names must consist of the UTF-8 character set, using numbers (0-9), upper case letters (A-Z), lower case letters (a-z) and hyphens. Characters with diacritical marks such as é, è, ë or ö may not be used. Spaces are not permitted in file names and must be replaced by a hyphen (-). Text is not case sensitive. The maximum length of the entire file name is 100 characters. The (_) character is used exclusively as separator. The extension for the MXF file with the material must be "mxf".

An example of a file name would be:
doktertinus_34_03-12-2016.mxf

4.2 CLEAN AUDIO

Programs must include audio channels which contains the full mix minus the Dutch narration, if such a voice-over is present in the full mix.

4.3 SUBTITLING, CREDITS AND TEXTLESS

If subtitling information is available, please provide it with the submission. Examples are subtitling text files and time code information when subtitling must be visible. The program must include closing credits and the Talpa TV corporate logo. A guideline document is available on request. All textless elements must be incorporated at the tail of the program or episode. After the closing credits the following should be included: five seconds of black video and subsequently a slate that contains program information to indicate that textless material starts from here. The complete closing credits without the graphics of the end credits should also be part of the submission.

4.4 SCRIPTS

If a script is available, please provide it with the submission.

4.5 START TIME AND BREAKS

The program needs to start at time code 00:02:00:00. Between program parts, black screen with muted audio is not preferred. If black screen is inserted, the duration must be less than two seconds. No objects such as text are allowed in the black screens. Time codes that refer to the breaks must be provided and can be sent by e-mail to the address program.traffic@talpanetwork.com.

4.6 DELIVERY TIME

The delivery must take place ten office days before transmission, at the latest. In case of a new production facility, a test file is required to be submitted as early as possible which enables Talpa TV to check for technical compliance.

5 QUICK REFERENCE GUIDE

Item	Value	Reference/remark
Container	MXF	SMPTE 377M-2009 SMPTE 379M-2010
Pattern	OP1a	SMPTE 378M-2004
Codec	MPEG-2 XDCAM HD 422 Long GOP 50	SMPTE 381M-2005
Time code		EBU R122-2007
Video format and main requirement	1080i25 or 1080psf25	ITU-R BT.709-5. Illegal colours may not be present.
Audio format	PCM 24 bit@48 kHz	SMPTE 382M-2007
Audio channel layout		Channels 1 and 2 form a stereo pair. In case of mono audio, the Left channel must be identical to the Right channel. In case of multi-channel surround sound recordings, these tracks are applied discretely. Stereo program audio must be capable of mixing down to mono without causing any noticeable phase cancellation of essential audio information, dialogue in particular. The use of a straightforward stereo mix (Lo/Ro) is strongly preferred.
Stereo audio in eight channels (four AES pairs, eight tracks)	1 = Left Stereo (Lo/Lt) 2 = Right Stereo (Ro/Rt) 3 = Mute 4 = Mute 5 = Mute 6 = Mute 7 = Mute 8 = Mute	
Stereo audio and stereo mix without dialogue (M&E) in eight channels (four AES pairs, eight tracks)	1 = Left Stereo (Lo/Lt) 2 = Right Stereo (Ro/Rt) 3 = Left Stereo M&E/Clean (Lo/Lt) 4 = Right Stereo M&E/Clean (Ro/Rt) 5 = Mute 6 = Mute 7 = Mute 8 = Mute	
Stereo and multi-channel surround audio in eight channels (four AES pairs, eight tracks)	1 = Left Stereo (Lo/Lt) 2 = Right Stereo (Ro/Rt) 3 = Left Front 4 = Right Front 5 = Centre 6 = Low-Frequency Effects 7 = Left Surround 8 = Right Surround	

Item	Value	Reference/remark
Stereo, multi-channel surround audio and stereo mix without dialogue (M&E) in sixteen channels (eight AES pairs, sixteen tracks)	1 = Left Stereo (Lo/Lt) 2 = Right Stereo (Ro/Rt) 3 = Left Stereo M&E/Clean (Lo/Lt) 4 = Right Stereo M&E/Clean (Ro/Rt) 5 = Left Front 6 = Right Front 7 = Centre 8 = Low-Frequency Effects 9 = Left Surround 10 = Right Surround 11 = Mute 12 = Mute 13 = Mute 14 = Mute 15 = Mute 16 = Mute	All audio channels must be in sync. Transmission by Talpa TV in SD video resolution and in streaming applications currently carries the stereo signal only.
Stereo, multi-channel surround audio, stereo mix without dialogue (M&E) and multi-channel surround mix without dialogue in sixteen channels (eight AES pairs, sixteen tracks)	1 = Left Stereo (Lo/Lt) 2 = Right Stereo (Ro/Rt) 3 = Left Stereo M&E/Clean (Lo/Lt) 4 = Right Stereo M&E/Clean (Ro/Rt) 5 = Left Front 6 = Right Front 7 = Centre 8 = Low-Frequency Effects 9 = Left Surround 10 = Right Surround 11 = Left Front M&E/Clean 12 = Right Front M&E/Clean 13 = Centre M&E/Clean 14 = Low-Frequency Effects M&E/Clean 15 = Left Surround M&E/Clean 16 = Right Surround M&E/Clean	

Item	Value	Reference/remark
Loudness requirements for generic genres (such as news, games, talk shows, sitcoms, entertainment, music programs and documentaries):		See text in section 2.3.4
Program Loudness	-23 LUFS (±0.5 LU)	EBU R128
Maximum Signal Level	-1 dBTP	
Maximum Momentary Loudness	No restriction	

Item	Value	Reference/remark
Maximum Short-Term Loudness	+6 LU recommended	
Maximum Loudness Range	No restriction	
Loudness requirements for high quality films and television series:		See text in section 2.3.5
Program Loudness	Not specified	
Maximum Signal Level	-1 dBTP	
Maximum Momentary Loudness	No restriction	
Maximum Short-Term Loudness	No restriction	
Maximum Loudness Range	No restriction	