



TELEPOOL TECHNICAL GUIDELINES & PROGRAM LAYOUT

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Notice:

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and automatically replaces this version.



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1. Program Layout

1.1. Delivery	File-based delivery is preferred.
1.2. Nomenclature	Only the letters or characters A - Z, a - z, -, _ and the digits 0 - 9 may be used. Spaces, special characters and German umlauts are not allowed.
1.3. Technical Prefix	There should be no technical leader or trailer on the file. Exception: If HDR material (ITU-R BT.2020) is delivered, there should be a technical color bar at the end of the file that corresponds to the program in order to ensure that the transfer characteristic is passed on correctly.
1.4. Timecode & File-start/-end	The file must start with timecode 00:00:00:00. The file should start with the first frame and end with the last frame if possible. A maximum of two seconds of black is tolerated at the end of the file.
1.5. Neutral Title Backgrounds / Textless	A maximum of 15 scenes requiring title editing should be available after the end of the program, separated by at least 10 seconds of black to the next full minute, and not delivered as a separate file. If there are more than 15 scenes, a clean version must be supplied.
1.6. Audio Requirements	The audio files must not be delivered grouped, i.e. there should always be only one channel per track. Exception IMX50. 5.1 mixes should always be delivered discrete, not as Dolby-E. TV mixes in 25 fps must comply with EBU R128. A positive True Peak Level (TPL) is invalid for all audio systems. The number of audio tracks shall be 8, 16, 24 or 32 tracks. Unused tracks shall be filled with AES-0 (mute / MOS).
1.7. Stems/DME	For stem deliveries, the 5.1 stems should be included. The stereo stems are optional. 5.1 stems should be provided as separate 6-track stems for dialog (D), music (M) and effects (E), Stereo stems as 2-track stems.
1.8. Video Requirements	All files must be delivered in original frame rate and aspect ratio. Color sampling and resolution must correspond to the highest available standard. Upscaling of the original film material is not permitted. Non-standard image geometry or formats that have been altered, downscaled or zoomed compared to the original format will not be accepted. Exceptions (e.g. pan & scan) must be discussed in advance with the material coordination.

1.9. Commercial Breaks	Commercial breaks are not accepted.
1.10. Video Level	There must be no invalid signal levels in the program (e.g. ultra black, illegal colors).
1.11. Grading	The production must be completely balanced in color and density. Stylistic elements are permitted, provided they are explainable in terms of content (look, character). In order to prevent possible complaints from third party customers in the case of artistic choices, it is recommended in such cases to request a written statement from the production, director or cameraman.
1.12. UHD HDR/SDR	For UHD HDR delivery, an SDR version must always be included.

2. MASTER FORMATS

<p>2.1. UHD Formats</p>	<p>ProRes 4444 XQ (PQ)</p> <p>ProRes 4444 (PQ & SDR)</p> <p>ProRes 422 HQ (SDR)</p> <p>XAVC QFHD Intra Class 300 (PQ & SDR)</p>
<p>2.2. HDR Metadata</p>	<p>HDR content must be delivered at least with static HDR10 metadata, that contain the following information:</p> <ul style="list-style-type: none"> • Mastering Display Color Primaries • White Point • Min. & max. Mastering Display Luminances • maxFALL & maxCLL <p>Static HDR10 metadata can be stored in the file header or delivered as a separate sidecar file (.xml or .txt). Alternatively, dynamic HDR10+ or Dolby Vision metadata are accepted</p>
<p>2.3. HD Formats</p>	<p>ProRes 4444</p> <p>ProRes 422 HQ</p> <p>XDCAM HD 422</p>
<p>2.4. SD Formats</p>	<p>IMX 50</p>
<p>2.5. Separate Audio Files</p>	<p>WAV files with 24 bit, 48 kHz and unique naming (track routing).</p> <p>The files are to be delivered packed as a ZIP archive, whereby the individual tracks of corresponding audio systems are to be combined into one ZIP file (e.g. 5.1.zip and 2.0.zip).</p>
<p>2.6. Subtitle Files</p>	<p>Subtitle files must be delivered in EBU STL format and be TC-identical to the feature.</p>

3. SPECIFICATIONS MASTER FORMATS

3.1. APPLE PRORES 4444 XQ (UHD PQ)

Container	QuickTime (.mov)	
File naming	Only the letters or characters A - Z, a - z, -, _ and the digits 0 - 9 may be used. Spaces, special characters and German umlauts are not allowed.	
Program start	First frame (no technical credits, no black)	
Start timecode (first frame)	00:00:00:00	
Codec	Apple ProRes 4444 XQ	
Frame rate	23.976p, 24p, 25p or 50p	
Scan type	Progressive	
Data rate	~ 1591 Mbit/s (23.976p + 24p), 1659 Mbit/s (25p), 3318 Mbit/s (50p)	
Resolution	3840 x 2160	
Aspect ratio	16:9	
Video signal format	YUV/RGB or YUVA/RGBA	
Chroma subsampling	4:4:4	
Color range	YUV/YUVA Limited, RGB/RGBA Full	
Color space	ITU-R BT.2020	
Bit depth	10 or 12 bit (up to 16 bit for alpha channel)	
HDR Standard	Perceptual Quantizer (PQ): SMPTE ST 2084, ITU-R BT.2100	
	Mastered for 1000 nits Peak Luminance and at least delivered with static HDR10 metadaten (s. 2.2)	
Audio coding	PCM, discrete tracks	
Number of audio tracks	8, 16, 24 or 32 mono tracks, 1 channel per track	
Sample rate	48 kHz	
Bit depth	24 bit	
Audio track assignment	Original Version	Dubbed Version
A1	Stereo Mix – L / Original Version	Stereo Mix – L / Dubbed Version
A2	Stereo Mix – R / Original Version	Stereo Mix – R / Dubbed Version
A3	Stereo Mix – L / M&E	Stereo Mix – L / Original Version
A4	Stereo Mix – R / M&E	Stereo Mix – R / Original Version
A5	5.1 Mix – FL / Original Version	5.1 Mix – FL / Dubbed Version
A6	5.1 Mix – FR / Original Version	5.1 Mix – FR / Dubbed Version
A7	5.1 Mix – C / Original Version	5.1 Mix – C / Dubbed Version
A8	5.1 Mix – LFE / Original Version	5.1 Mix – LFE / Dubbed Version
A9	5.1 Mix – SL / Original Version	5.1 Mix – SL / Dubbed Version
A10	5.1 Mix – SR Original Version	5.1 Mix – SR Dubbed Version
A11	5.1 Mix – FL / M&E	5.1 Mix – FL / Original Version
A12	5.1 Mix – FR / M&E	5.1 Mix – FR / Original Version
A13	5.1 Mix – C / M&E	5.1 Mix – C / Original Version
A14	5.1 Mix – LFE / M&E	5.1 Mix – LFE / Original Version
A15	5.1 Mix – SL / M&E	5.1 Mix – SL / Original Version
A16	5.1 Mix – SR / M&E	5.1 Mix – SR / Original Version
A17 – A32	Optional for other languages with above track assignment	
Unused audio tracks must contain AES-0 (mute)		
Deviating audio track assignments must be discussed with RTL on a case-by-case basis.		

3.2. APPLE PRORES 4444 (UHD PQ)

Container	QuickTime (.mov)	
File naming	Only the letters or characters A - Z, a - z, -, _ and the digits 0 - 9 may be used. Spaces, special characters and German umlauts are not allowed.	
Program start	First frame (no technical credits, no black)	
Start timecode (first frame)	00:00:00:00	
Codec	Apple ProRes 4444	
Frame rate	23.976p, 24p, 25p or 50p	
Scan type	Progressive	
Data rate	~ 1061 Mbit/s (23.976p + 24p), 1106 Mbit/s (25p), 2212 Mbit/s (50p)	
Resolution	3840 x 2160	
Aspect ratio	16:9	
Video signal format	YUV/RGB or YUVA/RGBA	
Chroma subsampling	4:4:4	
Color range	YUV/YUVA Limited, RGB/RGBA Full	
Color space	ITU-R BT.2020	
Bit depth	10 or 12 bit (up to 16 bit for alpha channel)	
HDR Standard	Perceptual Quantizer (PQ): SMPTE ST 2084, ITU-R BT.2100	
	Mastered for 1000 nits Peak Luminance and at least delivered with static HDR10 metadaten (s. 2.2)	
Audio coding	PCM, discrete tracks	
Number of audio tracks	8, 16, 24 or 32 mono tracks, 1 channel per track	
Sample rate	48 kHz	
Bit depth	24 bit	
Audio track assignment	Original Version	Dubbed Version
A1	Stereo Mix – L / Original Version	Stereo Mix – L / Dubbed Version
A2	Stereo Mix – R / Original Version	Stereo Mix – R / Dubbed Version
A3	Stereo Mix – L / M&E	Stereo Mix – L / Original Version
A4	Stereo Mix – R / M&E	Stereo Mix – R / Original Version
A5	5.1 Mix – FL / Original Version	5.1 Mix – FL / Dubbed Version
A6	5.1 Mix – FR / Original Version	5.1 Mix – FR / Dubbed Version
A7	5.1 Mix – C / Original Version	5.1 Mix – C / Dubbed Version
A8	5.1 Mix – LFE / Original Version	5.1 Mix – LFE / Dubbed Version
A9	5.1 Mix – SL / Original Version	5.1 Mix – SL / Dubbed Version
A10	5.1 Mix – SR Original Version	5.1 Mix – SR Dubbed Version
A11	5.1 Mix – FL / M&E	5.1 Mix – FL / Original Version
A12	5.1 Mix – FR / M&E	5.1 Mix – FR / Original Version
A13	5.1 Mix – C / M&E	5.1 Mix – C / Original Version
A14	5.1 Mix – LFE / M&E	5.1 Mix – LFE / Original Version
A15	5.1 Mix – SL / M&E	5.1 Mix – SL / Original Version
A16	5.1 Mix – SR / M&E	5.1 Mix – SR / Original Version
A17 – A32	Optional for other languages with above track assignment	
Unused audio tracks must contain AES-0 (mute)		
Deviating audio track assignments must be discussed with RTL on a case-by-case basis.		

3.3. APPLE PRORES 4444 (UHD SDR)

Container	QuickTime (.mov)	
File naming	Only the letters or characters A - Z, a - z, -, _ and the digits 0 - 9 may be used. Spaces, special characters and German umlauts are not allowed.	
Program start	First frame (no technical credits, no black)	
Start timecode (first frame)	00:00:00:00	
Codec	Apple ProRes 4444	
Frame rate	23.976p, 24p, 25p or 50p	
Scan type	Progressive	
Data rate	~ 1061Mbit/s (23.976p + 24p), 1106Mbit/s (25p), 2212Mbit/s (50p)	
Resolution	3840 x 2160	
Aspect ratio	16:9	
Video signal format	YUV/RGB or YUVA/RGBA	
Chroma subsampling	4:4:4	
Color range	YUV/YUVA Limited, RGB/RGBA Full	
Color space	ITU-R BT.709	
Bit depth	10 or 12 bit (up to 16 bit for alpha channel)	
Audio coding	PCM, discrete tracks	
Number of audio tracks	8, 16, 24 or 32 mono tracks, 1 channel per track	
Sample Rate	48 kHz	
Bit depth	24 bit	
Audio track assignment	Original Version	Dubbed Version
A1	Stereo Mix – L / Original Version	Stereo Mix – L / Dubbed Version
A2	Stereo Mix – R / Original Version	Stereo Mix – R / Dubbed Version
A3	Stereo Mix – L / M&E	Stereo Mix – L / Original Version
A4	Stereo Mix – R / M&E	Stereo Mix – R / Original Version
A5	5.1 Mix – FL / Original Version	5.1 Mix – FL / Dubbed Version
A6	5.1 Mix – FR / Original Version	5.1 Mix – FR / Dubbed Version
A7	5.1 Mix – C / Original Version	5.1 Mix – C / Dubbed Version
A8	5.1 Mix – LFE / Original Version	5.1 Mix – LFE / Dubbed Version
A9	5.1 Mix – SL / Original Version	5.1 Mix – SL / Dubbed Version
A10	5.1 Mix – SR Original Version	5.1 Mix – SR Dubbed Version
A11	5.1 Mix – FL / M&E	5.1 Mix – FL / Original Version
A12	5.1 Mix – FR / M&E	5.1 Mix – FR / Original Version
A13	5.1 Mix – C / M&E	5.1 Mix – C / Original Version
A14	5.1 Mix – LFE / M&E	5.1 Mix – LFE / Original Version
A15	5.1 Mix – SL / M&E	5.1 Mix – SL / Original Version
A16	5.1 Mix – SR / M&E	5.1 Mix – SR / Original Version
A17 – A32	Optional for other languages with above track assignment	
Unused audio tracks must contain AES-0 (mute)		
Deviating audio track assignments must be discussed with RTL on a case-by-case basis.		

3.4. APPLE PRORES 422 HQ (UHD SDR)

Container	QuickTime (.mov)	
File naming	Only the letters or characters A - Z, a - z, -, _ and the digits 0 - 9 may be used. Spaces, special characters and German umlauts are not allowed.	
Program start	First frame (no technical credits, no black)	
Start timecode (first frame)	00:00:00:00	
Codec	Apple ProRes 422 HQ	
Frame rate	23.976p, 24p, 25p or 50p	
Scan type	Progressive	
Data rate	~ 707 Mbit/s (23.976p + 24p), 737 Mbit/s (25p), 1475 Mbit/s (50p)	
Resolution	3840 x 2160	
Aspect ratio	16:9	
Video signal format	YUV	
Chroma subsampling	4:2:2	
Color range	Limited	
Color space	ITU-R BT.709	
Bit depth	10 or 12 bit	
Audio coding	PCM, discrete tracks	
Number of audio tracks	8, 16, 24 or 32 mono tracks, 1 channel per track	
Sample Rate	48 kHz	
Bit depth	24 bit	
Audio track assignment	Original Version	Dubbed Version
A1	Stereo Mix – L / Original Version	Stereo Mix – L / Dubbed Version
A2	Stereo Mix – R / Original Version	Stereo Mix – R / Dubbed Version
A3	Stereo Mix – L / M&E	Stereo Mix – L / Original Version
A4	Stereo Mix – R / M&E	Stereo Mix – R / Original Version
A5	5.1 Mix – FL / Original Version	5.1 Mix – FL / Dubbed Version
A6	5.1 Mix – FR / Original Version	5.1 Mix – FR / Dubbed Version
A7	5.1 Mix – C / Original Version	5.1 Mix – C / Dubbed Version
A8	5.1 Mix – LFE / Original Version	5.1 Mix – LFE / Dubbed Version
A9	5.1 Mix – SL / Original Version	5.1 Mix – SL / Dubbed Version
A10	5.1 Mix – SR Original Version	5.1 Mix – SR Dubbed Version
A11	5.1 Mix – FL / M&E	5.1 Mix – FL / Original Version
A12	5.1 Mix – FR / M&E	5.1 Mix – FR / Original Version
A13	5.1 Mix – C / M&E	5.1 Mix – C / Original Version
A14	5.1 Mix – LFE / M&E	5.1 Mix – LFE / Original Version
A15	5.1 Mix – SL / M&E	5.1 Mix – SL / Original Version
A16	5.1 Mix – SR / M&E	5.1 Mix – SR / Original Version
A17 – A32	Optional for other languages with above track assignment	
Unused audio tracks must contain AES-0 (mute)		
Deviating audio track assignments must be discussed with RTL on a case-by-case basis.		

3.5. XAVC QFHD INTRA CLASS 300 (UHD PQ)

Container	MXF OP 1a SMPTE RDD32	
File naming	Only the letters or characters A - Z, a - z, -, _ and the digits 0 - 9 may be used. Spaces, special characters and German umlauts are not allowed.	
Program start	First frame (no technical credits, no black)	
Start timecode (first frame)	00:00:00:00	
Codec	XAVC QFHD Intra Class 300 CBG or VBR	
Frame rate	23.976p, 25p or 50p	
Scan type	Progressive	
Data rate	~ 240 Mbit/s (23.976p), 250 Mbit/s (25p), 500 Mbit/s (50p)	
Resolution	3840 x 2160	
Aspect ratio	16:9	
Video signal format	YUV	
Chroma subsampling	4:2:2	
Color range	Limited	
Color space	ITU-R BT.2020	
Bit depth	10 bit	
HDR Standard	Perceptual Quantizer (PQ): SMPTE ST 2084, ITU-R BT.2100	
	Mastered for 1000 nits Peak Luminance and at least delivered with static HDR10 metadaten (s. 2.2)	
Audio coding	PCM, discrete tracks	
Number of audio tracks	8, 16, 24 or 32 mono tracks, 1 channel per track	
Sample rate	48 kHz	
Bit depth	24 bit	
Audio track assignment	Original Version	Dubbed Version
A1	Stereo Mix – L / Original Version	Stereo Mix – L / Dubbed Version
A2	Stereo Mix – R / Original Version	Stereo Mix – R / Dubbed Version
A3	Stereo Mix – L / M&E	Stereo Mix – L / Original Version
A4	Stereo Mix – R / M&E	Stereo Mix – R / Original Version
A5	5.1 Mix – FL / Original Version	5.1 Mix – FL / Dubbed Version
A6	5.1 Mix – FR / Original Version	5.1 Mix – FR / Dubbed Version
A7	5.1 Mix – C / Original Version	5.1 Mix – C / Dubbed Version
A8	5.1 Mix – LFE / Original Version	5.1 Mix – LFE / Dubbed Version
A9	5.1 Mix – SL / Original Version	5.1 Mix – SL / Dubbed Version
A10	5.1 Mix – SR Original Version	5.1 Mix – SR Dubbed Version
A11	5.1 Mix – FL / M&E	5.1 Mix – FL / Original Version
A12	5.1 Mix – FR / M&E	5.1 Mix – FR / Original Version
A13	5.1 Mix – C / M&E	5.1 Mix – C / Original Version
A14	5.1 Mix – LFE / M&E	5.1 Mix – LFE / Original Version
A15	5.1 Mix – SL / M&E	5.1 Mix – SL / Original Version
A16	5.1 Mix – SR / M&E	5.1 Mix – SR / Original Version
A17 – A32	Optional for other languages with above track assignment	
Unused audio tracks must contain AES-0 (mute)		
Deviating audio track assignments must be discussed with RTL on a case-by-case basis.		

3.6. XAVC QFHD INTRA CLASS 300 (UHD SDR)

Container	MXF OP 1a SMPTE RDD32	
File naming	Only the letters or characters A - Z, a - z, -, _ and the digits 0 - 9 may be used. Spaces, special characters and German umlauts are not allowed.	
Program start	First frame (no technical credits, no black)	
Start timecode (first frame)	00:00:00:00	
Codec	XAVC QFHD Intra Class 300 CBG or VBR	
Frame rate	23.976p, 25p or 50p	
Scan type	Progressive	
Data rate	~ 240Mbit/s (23.976p), 250Mbit/s (25p), 500Mbit/s (50p)	
Resolution	3840 x 2160	
Aspect ratio	16:9	
Video signal format	YUV	
Chroma subsampling	4:2:2	
Color range	Limited	
Color space	ITU-R BT.709	
Bit depth	10 bit	
Audio coding	PCM, discrete tracks	
Number of audio tracks	8, 16, 24 or 32 mono tracks, 1 channel per track	
Sample rate	48 kHz	
Bit depth	24 bit	
Audio track assignment	Original Version	Dubbed Version
A1	Stereo Mix – L / Original Version	Stereo Mix – L / Dubbed Version
A2	Stereo Mix – R / Original Version	Stereo Mix – R / Dubbed Version
A3	Stereo Mix – L / M&E	Stereo Mix – L / Original Version
A4	Stereo Mix – R / M&E	Stereo Mix – R / Original Version
A5	5.1 Mix – FL / Original Version	5.1 Mix – FL / Dubbed Version
A6	5.1 Mix – FR / Original Version	5.1 Mix – FR / Dubbed Version
A7	5.1 Mix – C / Original Version	5.1 Mix – C / Dubbed Version
A8	5.1 Mix – LFE / Original Version	5.1 Mix – LFE / Dubbed Version
A9	5.1 Mix – SL / Original Version	5.1 Mix – SL / Dubbed Version
A10	5.1 Mix – SR Original Version	5.1 Mix – SR Dubbed Version
A11	5.1 Mix – FL / M&E	5.1 Mix – FL / Original Version
A12	5.1 Mix – FR / M&E	5.1 Mix – FR / Original Version
A13	5.1 Mix – C / M&E	5.1 Mix – C / Original Version
A14	5.1 Mix – LFE / M&E	5.1 Mix – LFE / Original Version
A15	5.1 Mix – SL / M&E	5.1 Mix – SL / Original Version
A16	5.1 Mix – SR / M&E	5.1 Mix – SR / Original Version
A17 – A32	Optional for other languages with above track assignment	
Unused audio tracks must contain AES-0 (mute)		
Deviating audio track assignments must be discussed with RTL on a case-by-case basis.		

3.7. APPLE PRORES 4444 (HD)

Container	QuickTime (.mov)	
File naming	Only the letters or characters A - Z, a - z, -, _ and the digits 0 - 9 may be used. Spaces, special characters and German umlauts are not allowed.	
Program start	First frame (no technical credits, no black)	
Start timecode (first frame)	00:00:00:00	
Codec	Apple ProRes 4444	
Frame rate	23.976p, 24p, 25p or 50i	
Scan type	Progressive, Interlaced (upper field first)	
Data rate	~ 264 Mbit/s (23.976p + 24p), 275 Mbit/s (25p + 50i)	
Resolution	1920 x 1080	
Aspect ratio	16:9	
Video signal format	YUV/RGB or YUVA/RGBA	
Chroma subsampling	4:4:4	
Color range	YUV / YUVA Limited, RGB / RGBA Full	
Color space	ITU-R BT.709	
Bit depth	10 or 12 bit (up to 16 bit for alpha channel)	
Audio coding	PCM, discrete tracks	
Number of audio tracks	8, 16, 24 or 32 mono tracks, 1 channel per track	
Sample rate	48 kHz	
Bit depth	24 bit	
Audio track assignment	Original Version	Dubbed Version
A1	Stereo Mix – L / Original Version	Stereo Mix – L / Dubbed Version
A2	Stereo Mix – R / Original Version	Stereo Mix – R / Dubbed Version
A3	Stereo Mix – L / M&E	Stereo Mix – L / Original Version
A4	Stereo Mix – R / M&E	Stereo Mix – R / Original Version
A5	5.1 Mix – FL / Original Version	5.1 Mix – FL / Dubbed Version
A6	5.1 Mix – FR / Original Version	5.1 Mix – FR / Dubbed Version
A7	5.1 Mix – C / Original Version	5.1 Mix – C / Dubbed Version
A8	5.1 Mix – LFE / Original Version	5.1 Mix – LFE / Dubbed Version
A9	5.1 Mix – SL / Original Version	5.1 Mix – SL / Dubbed Version
A10	5.1 Mix – SR Original Version	5.1 Mix – SR Dubbed Version
A11	5.1 Mix – FL / M&E	5.1 Mix – FL / Original Version
A12	5.1 Mix – FR / M&E	5.1 Mix – FR / Original Version
A13	5.1 Mix – C / M&E	5.1 Mix – C / Original Version
A14	5.1 Mix – LFE / M&E	5.1 Mix – LFE / Original Version
A15	5.1 Mix – SL / M&E	5.1 Mix – SL / Original Version
A16	5.1 Mix – SR / M&E	5.1 Mix – SR / Original Version
A17 – A32	Optional for other languages with above track assignment	
Unused audio tracks must contain AES-0 (mute)		
Deviating audio track assignments must be discussed with RTL on a case-by-case basis.		

3.8. APPLE PRORES 422 HQ (HD)

Container	QuickTime (.mov)	
File naming	Only the letters or characters A - Z, a - z, -, _ and the digits 0 - 9 may be used. Spaces, special characters and German umlauts are not allowed.	
Program start	First frame (no technical credits, no black)	
Start timecode (first frame)	00:00:00:00	
Codec	Apple ProRes 422 HQ	
Frame rate	23.976p, 24p, 25p, 50i oder 50p	
Scan type	Progressive, Interlaced (upper field first)	
Data rate	~ 176 Mbit/s (23.976p + 24p), 184 Mbit/s (25p + 50i), 367 Mbit/s (50p)	
Resolution	1920 x 1080	
Aspect ratio	16:9	
Video signal format	YUV	
Chroma subsampling	4:2:2	
Color range	Limited	
Color space	ITU-R BT.709	
Bit depth	10 bit	
Audio coding	PCM, discrete tracks	
Number of audio tracks	8, 16, 24 or 32 mono tracks, 1 channel per track	
Sample rate	48 kHz	
Bit depth	24 bit	
Audio track assignment	Original Version	Dubbed Version
A1	Stereo Mix – L / Original Version	Stereo Mix – L / Dubbed Version
A2	Stereo Mix – R / Original Version	Stereo Mix – R / Dubbed Version
A3	Stereo Mix – L / M&E	Stereo Mix – L / Original Version
A4	Stereo Mix – R / M&E	Stereo Mix – R / Original Version
A5	5.1 Mix – FL / Original Version	5.1 Mix – FL / Dubbed Version
A6	5.1 Mix – FR / Original Version	5.1 Mix – FR / Dubbed Version
A7	5.1 Mix – C / Original Version	5.1 Mix – C / Dubbed Version
A8	5.1 Mix – LFE / Original Version	5.1 Mix – LFE / Dubbed Version
A9	5.1 Mix – SL / Original Version	5.1 Mix – SL / Dubbed Version
A10	5.1 Mix – SR Original Version	5.1 Mix – SR Dubbed Version
A11	5.1 Mix – FL / M&E	5.1 Mix – FL / Original Version
A12	5.1 Mix – FR / M&E	5.1 Mix – FR / Original Version
A13	5.1 Mix – C / M&E	5.1 Mix – C / Original Version
A14	5.1 Mix – LFE / M&E	5.1 Mix – LFE / Original Version
A15	5.1 Mix – SL / M&E	5.1 Mix – SL / Original Version
A16	5.1 Mix – SR / M&E	5.1 Mix – SR / Original Version
A17 – A32	Optional for other languages with above track assignment	
Unused audio tracks must contain AES-0 (mute)		
Deviating audio track assignments must be discussed with RTL on a case-by-case basis.		

3.9. XDCAM HD 422 (HD)

Container	MXF OP 1a SMPTE RDD9-2013, SMPTE 378M		
File naming	Only the letters or characters A - Z, a - z, -, _ and the digits 0 - 9 may be used. Spaces, special characters and German umlauts are not allowed.		
Program start	First frame (no technical credits, no black)		
Start timecode (first frame)	00:00:00:00		
Codec	MPEG2 422P@HL		
Frame rate	25i, 25p		
Scan type	Progressive, Interlaced (upper field first)		
Data rate	50 Mbit/s		
Resolution	1920 x 1080		
Aspect ratio	16:9		
Video signal format	YUV		
Chroma subsampling	4:2:2		
Color range	Limited		
Color space	ITU-R BT.709		
Bit depth	8 bit		
Audio coding	PCM, discrete tracks (AES-3 / SMPTE 302M)		
Number of audio tracks	8 mono tracks, 1 channel per track		
Sample rate	48 kHz		
Bit depth	24 bit		
Audio track assignment			
	Stereo –5.1 Version	Dubbed Version	Original Version
A1	Stereo Mix – L	Stereo Mix – L / Dubbed Version	Stereo Mix – L / Original Version
A2	Stereo Mix – R	Stereo Mix – R / Dubbed Version	Stereo Mix – R / Original Version
A3	5.1 Mix – FL	Stereo Mix – L / Original Version	Stereo Mix – L / M&E
A4	5.1 Mix – FR	Stereo Mix – R / Original Version	Stereo Mix – R / M&E
A5	5.1 Mix – C	Stereo Mix – L / M&E	
A6	5.1 Mix – LFE	Stereo Mix – R / M&E	
A7	5.1 Mix – SL		
A8	5.1 Mix – SR		
Unused audio tracks must contain AES-0 (mute)			
Deviating audio track assignments must be discussed with RTL on a case-by-case basis.			

3.10. IMX 50 (SD)

Container	MXF OP 1a D-10 SMPTE-356M		
File naming	Only the letters or characters A - Z, a - z, -, _ and the digits 0 - 9 may be used. Spaces, special characters and German umlauts are not allowed.		
Program start	First frame (no technical credits, no black)		
Start timecode (first frame)	00:00:00:00		
Codec	MPEG2 422P@ML		
Frame rate	25i		
Scan type	Interlaced (upper field first)		
Data rate	50 Mbit/s		
Resolution	720 x 576		
Aspect ratio	16:9 (anamorphic) or 4:3		
Video signal format	YUV		
Chroma subsampling	4:2:2		
Color range	Limited		
Color space	ITU-R BT.601		
Bit depth	8 bit		
Audio coding	PCM		
Number of audio tracks	1 track 8 channels		
Sample rate	48 kHz		
Bit depth	16 bit		
Audio track assignment			
	Stereo –5.1 Version	Dubbed Version	Original Version
A1	Stereo Mix – L	Stereo Mix – L / Dubbed Version	Stereo Mix – L / Original Version
A2	Stereo Mix – R	Stereo Mix – R / Dubbed Version	Stereo Mix – R / Original Version
A3	5.1 Mix – FL	Stereo Mix – L / Original Version	Stereo Mix – L / M&E
A4	5.1 Mix – FR	Stereo Mix – R / Original Version	Stereo Mix – R / M&E
A5	5.1 Mix – C	Stereo Mix – L / M&E	
A6	5.1 Mix – LFE	Stereo Mix – R / M&E	
A7	5.1 Mix – SL		
A8	5.1 Mix – SR		
Unused audio tracks must contain AES-0 (mute)			
Deviating audio track assignments must be discussed with RTL on a case-by-case basis.			

4. VERSION HISTORY

Version	Changes
1.8	- Company Renaming (CBC GmbH -> RTL Technology GmbH)
1.9	- Added ProRes 4444 as mastering format for UHD HDR - Added HDR-Metadata in section 2.2 - Added HDR10+ & Dolby Vision as accepted HDR-systems - Renaming of codec XAVC 4K Intra as XAVC QFHD Intra - Minor text formatting changes
2.0	- Supplement True Peak Level in section 2.0
2.1	- Supplement ZIP delivering in section 2.5

Notice:

The current valid version of this document can always be found at www.rtl-service.de/telepool.html and automatically replaces this version.