File Delivery Specifications for **Nine / International / SVOD:**

These combined technical specifications list the five versions of the programme which shall be supplied:

1. Nine local/domestic version: HD ProRes (& UHD ProRes, if commissioned) & Audio Stems.
2. Nine local/domestic version: mxf XD-CAM 422 HD.
3. International Seamless version: ProRes.
4. International Seamless version: low res proxy .mp4 (720p x 1280)
5. SVOD Seamless version: trimmed – no board/textless – programme only: HD ProRes (& UHD ProRes, if commissioned)

All programme versions shall be supplied via an agreed file delivery mechanism, or on a physical hard drive. Hard drive to be NTFS formatted, and USB 3.0 speed is preferable. A USB-powered drive is also preferred. The hard drive must contain external labelling of contents.

Common Video Requirements:

The Product will be of the highest quality suitable for HDTV and/or UHDTV television broadcast and streaming without further processing of picture or sound as to which the Licensee will be the sole judge.

High Definition is a 1080 active line, 1920 pixel wide, 25 frames per second, 2:1 interlaced signal produced in agreement with the specifications of ITU-R BT.709.

Ultra High Definition is a 2160 active line, 3840 pixel wide, 25 or 50 frames per second, progressive scan signal produced in agreement with the specifications of ITU-R BT.2020 and ITU-R BT.2100.

Any originated 24 frame (23.98p) product shall be converted to 25 (50i/50p) by means of a speed change, not a standards conversion using frame interpolation or motion compensation.

Any native 59.94i or 59.94p product shall be converted to 50i/50p by a Ph.C or motion vector compensated standards conversion.

If the 59.94i/p material essentially contains an embedded 23.98 fps programme via 3:2 pull-down, then that 23.98 frame product must be first extracted from the 59.94i/p master via 3:2 cadence detection & removal. Then the resulting 23.98 fps programme can be speed changed to 25 (50i/50p) by the normal method of speed change.

In addition to the HD versions of the programme, Nine may request UHDTV versions, if commissioned or available. Native framerate versions may also be requested for SVOD purposes.

Common Audio Requirements:

- Audio Loudness on the Stereo soundtrack shall measure -24LKFS. True Peak (TP) not to exceed -2dB TP.
- Audio Loudness on the 5.1 soundtrack shall measure -24LKFS. True Peak (TP) not to exceed -2dB TP.

Compliance to -24LKFS using only the *dialog* component of the mix is acceptable and encouraged, using the 'Dialog Intelligence' feature of many loudness correction devices.

To this aim, a suitable BS.1770-4 compliant loudness meter will be used as the measuring instrument. See OP59 for more detail. http://www.freetv.com.au/

Correct audio sync is to be maintained at all times with the video.

1. **Nine Local/Domestic Version – ProRes – HD & UHD:**

The programme shall be supplied in High Definition (HD), as the TEXTED breaks version, with any Textless material at the tail of the programme, 1 minute after end credits. (See below for examples of Texted & Textless)

The HD file format shall be the **1080/50i ProRes422 (HQ)** 184 Mbit/sec codec, *with up to* 16 PCM audio tracks, supplied as a .mov file. The 16:9 Aspect Ratio image shall occupy full screen height, and use interlaced scan, Upper Field First, even if the production format is 25p.

If a UHDTV version is commissioned, the format shall be supplied as **2160/25p ProRes422 (HQ)** at 737 Mbit/sec or a **2160/50p ProRes422 (HQ)** 1475 Mbit/sec codec, *with up to* 16 PCM audio tracks, supplied as a .mov file.

If the UHD version is produced in **HDR** (High Dynamic Range, PQ, SMPTE2084, BT.2100), then a **SDR** (Standard Dynamic Range) tone-mapped version shall also be supplied (BT.2020).

For UHD, decision on the capture, production & editing frame rate of either 25p or 50p is to be based on creative intent at the discretion of the producers, depending on the 'look' required. i.e. 25p for traditional cinematic effect, suitable for drama; or 50p for everything else. Note that the 50p format can act as a 'container', encompassing the 25p material within, with the advantage that any credit roll or special effects can be created in the 50p domain, obtaining the best of both worlds. Effectively, even if you shoot in 25p, finish in post as 50p. This is encouraged.

AUDIO

All audio tracks shall be present as individual mono audio essences, not as stereo pairs.

The audio configuration shall be a Stereo Full Mix on tracks 1 & 2 ($L_t R_t$ or $L_o R_o$), a 5.1 Surround Sound Full Mix on tracks 3 to 8 inclusive, and Stereo Music and Effects (M+E) on tracks 9 & 10. *If available*, 5.1 M+E on tracks 11 to 16 is desirable.

Any supplied 5.1 audio shall be mixed in such a way that it will create an acceptable downmix to 2.0 stereo L_t and R_t, if required, using industry standard downmix parameters.

- The audio track layout for this programme configuration shall be:

  1. Stereo Left Full Mix
  2. Stereo Right Full Mix

  3. 5.1 Front Left
  4. 5.1 Front Right
  5. 5.1 Centre
  6. 5.1 LFE*
  7. 5.1 Left Surround
  8. 5.1 Right Surround

  9. M+E Stereo Left
  10. M+E Stereo Right

  11. M+E 5.1 Front Left
  12. M+E 5.1 Front Right
  13. M+E 5.1 Centre
  14. M+E 5.1 LFE*
  15. M+E 5.1 Left Surround
  16. M+E 5.1 Right Surround

  Note on LFE use/misuse:
  The LFE Channel should be used as intended; as an occasional low frequency special effects channel only, and not simply for bass that is filtered off from the main channels.

Audio WAV files to be supplied of individual stems, with the same duration as the domestic video master:

  1. Dialogue
  2. Music
  3. Effects
  4. VO / Narration (if present)

An ID/Clapper Board should be present at the head of the file for identification purposes, with the title of the programme/episode number, *exactly as it appears on-screen*. In addition, the Clapper Board shall include:

- Duration of Programme.
- Audio Status and Track Layout
- Version (Local / Domestic)

<u>Required Layout/Timecode:</u>
00:58:00:00 – Start of file: [Black Video / Mute Audio]
00:58:30:00 – Colour Bars (75%) & 1 kHz Audio Tone (All relevant tracks which contain audio, -20dB)
00:59:30:00 – ID/Clapper Board
00:59:50:00 – Countdown
00:59:58:00 – Black
01:00:00:00 – Start Of Programme

If programme is already compiled into segments (i.e. Domestic Version), then the head of each segment shall have a 10 second countdown. Each segment shall start on an even timecode number (i.e. Segment two might start at T/C 01:09:00:00). There should be a <u>minimum 20 seconds of black</u> between segments, not including countdown.

Compiled programmes are required to contain a 3-5 second texted playoff, which can consist of a still or moving graphic, listing the title of the programme, or title & episode of the programme if appropriate.

'C' classified programmes must also contain 5 sec. playons at the start of segments as well as playoffs.

2. Nine Local/Domestic Version - .mxf XD-CAM:

An .mxf encoded version of the local/domestic programme is to be supplied *in addition to* the ProRes422 version, to facilitate ease and expediency when content is delivered to the National Playout Centre (NPC). [See separate .mxf XD-CAM 422 HD 1080/50i delivery specifications.]

This mxf XD-CAM 422 file can contain 8, 10 or 16 audio channels with the audio channel layout listed above.

3. International Seamless version – ProRes

The programme shall be supplied in High Definition (HD), as the TEXTED seamless version, with any Textless material at the tail of the programme, 1 minute after end credits. (See below for examples of Texted & Textless)

The HD file format shall be the **1080/50i ProRes422 (HQ)** 184 Mbit/sec codec, *with up to* 16 PCM audio tracks, supplied as a .mov file. The 16:9 Aspect Ratio image shall occupy full screen height, and use interlaced scan, Upper Field First, even if the production format is 25p.

AUDIO

All audio tracks shall be present as individual mono audio essences, not as stereo pairs.

The audio configuration shall be a Stereo Full Mix on tracks 1 & 2 ($L_t R_t$ or $L_o R_o$), a 5.1 Surround Sound Full Mix on tracks 3 to 8 inclusive, and Stereo Music and Effects (M+E) on tracks 9 & 10. *If available*, 5.1 M+E on tracks 11 to 16 is desirable.

Any supplied 5.1 audio shall be mixed in such a way that it will create an acceptable downmix to 2.0 stereo L_t and R_t, if required, using industry standard downmix parameters.

- The audio track layout for this programme configuration shall be:

1. Stereo Left Full Mix
2. Stereo Right Full Mix

3. 5.1 Front Left
4. 5.1 Front Right
5. 5.1 Centre
6. 5.1 LFE*
7. 5.1 Left Surround
8. 5.1 Right Surround

9. M+E Stereo Left
10. M+E Stereo Right

11. M+E 5.1 Front Left
12. M+E 5.1 Front Right
13. M+E 5.1 Centre
14. M+E 5.1 LFE*
15. M+E 5.1 Left Surround
16. M+E 5.1 Right Surround

Note on LFE use/misuse:
The LFE Channel should be used as intended; as an occasional low frequency special effects channel only, and not simply for bass that is filtered off from the main channels.

An ID/Clapper Board should be present at the head of the file for identification purposes, with the title of the programme/episode number, *exactly as it appears on-screen*. In addition, the Clapper Board shall include:

- Duration of Programme.
- Audio Status and Track Layout
- Version (International / Seamless)

Required Layout/Timecode:
00:58:00:00 – Start of file: [Black Video / Mute Audio]
00:58:30:00 – Colour Bars (75%) & 1 kHz Audio Tone (All relevant tracks which contain audio, -20dB)
00:59:30:00 – ID/Clapper Board
00:59:50:00 – Countdown
00:59:58:00 – Black
01:00:00:00 – Start Of Programme

4. International Seamless version: low res proxy .mp4 (720p x 1280)

A proxy file of the International Seamless version shall be provided, as .mp4 with a resolution of 720 x 1280, progressive scan. Frame rate of either 25p or 50p is acceptable. Video bitrate can be in the range of 4 Mb/s. The audio track shall be the stereo full mix and can be 160 kb/s AAC.

5. SVOD Seamless version

A trimmed 'Picture to Picture' version suitable for Subscription Video On Demand services shall be supplied. There shall be only 1 second of black at the start of the file before programme start, and 1 second of black after programme finish. No breaks, ID/Clapper Boards, test signals or textless material shall be supplied on this SVOD version.

The programme shall be supplied as the TEXTED version.

The HD file format shall be the **1080/50i ProRes422 (HQ)** 184 Mbit/sec codec, with 8 PCM audio tracks, supplied as a .mov file. The 16:9 Aspect Ratio image shall occupy full screen height, and use interlaced scan, Upper Field First, even if the production format is 25p.

If a UHDTV version is commissioned, the format shall be supplied as **2160/25p ProRes422 (HQ)** at 737 Mbit/sec or **2160/50p ProRes422 (HQ)** 1475 Mbit/sec codec, with 8 PCM audio tracks, supplied as a .mov file. Note: Native production framerate versions may be requested if different from 25p or 50p listed above.

If the UHD version is produced in **HDR** (High Dynamic Range, PQ, SMPTE2084, BT.2100), then a **SDR** (Standard Dynamic Range) tone-mapped version shall also be supplied (BT.2020).

For UHD, decision on the capture, production & editing frame rate of either 25p or 50p to be based on creative intent at the discretion of the producers, depending on the 'look' required. i.e. 25p for traditional cinematic effect, suitable for drama; or 50p for everything else. Note that the 50p format can act as a 'container', encompassing the 25p material within, with the advantage that any credit roll or special effects can be created in the 50p domain, obtaining the best of both worlds. This is encouraged.

AUDIO

All audio tracks shall be present as individual mono audio essences, not as stereo pairs.

The audio configuration shall be a Stereo Full Mix on tracks 1 & 2 ($L_t R_t$), and 5.1 Surround Sound Full Mix on tracks 3 to 8 inclusive.

Any supplied 5.1 audio shall be mixed in such a way that it will create an acceptable downmix to 2.0 stereo L_t and R_t if required, using industry standard downmix parameters.

- The audio track layout for this SVOD programme configuration shall be:

  1. Stereo Left Full Mix
  2. Stereo Right Full Mix

  3. 5.1 Front Left
  4. 5.1 Front Right
  5. 5.1 Centre
  6. 5.1 LFE*
  7. 5.1 Left Surround
  8. 5.1 Right Surround

  *Note on LFE use/misuse:
  The LFE Channel should be used as intended; as an occasional low frequency special effects channel only, and not simply for bass that is filtered off from the main channels.
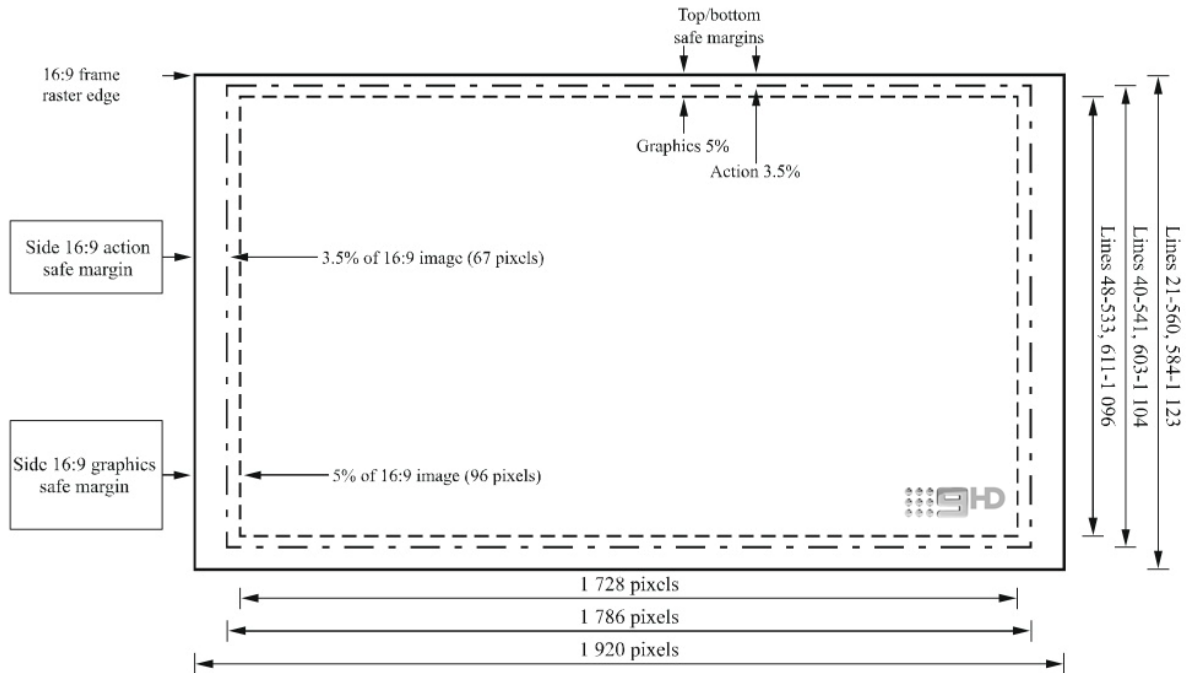
Required Layout/Timecode:
00:59:59:00 – Start of file: [Black Video / Mute Audio]
01:00:00:00 – Start Of Programme

Graphic / Action Safe Areas:

16:9 programmes should preferably be 16:9 graphic/action safe, but 14:9 graphic/action safe, or 4:3 graphic/action safe is also acceptable. Below is the 16:9 HD graphic/action safe area chart.

16:9 Graphic / Action Safe Area Chart:

Top/bottom safe margins

16:9 frame raster edge

Graphics 5%

Action 3.5%

Side 16:9 action safe margin

3.5% of 16:9 image (67 pixels)

Side 16:9 graphics safe margin

5% of 16:9 image (96 pixels)

Lines 21-560, 584-1 123
Lines 40-541, 603-1 104
Lines 48-533, 611-1 096

9HD

1 728 pixels
1 786 pixels
1 920 pixels

- Please note the position of the 9 HD Watermark in the lower right corner of image and avoid placing text supers in that position.
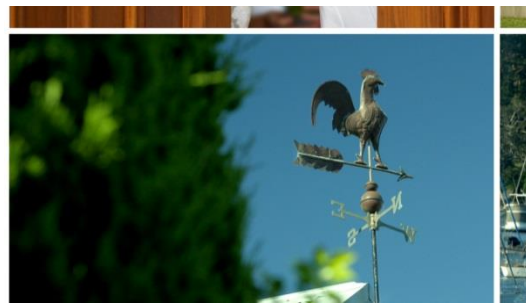
UHDTV 16:9 Graphic / Action Safe Area Chart:
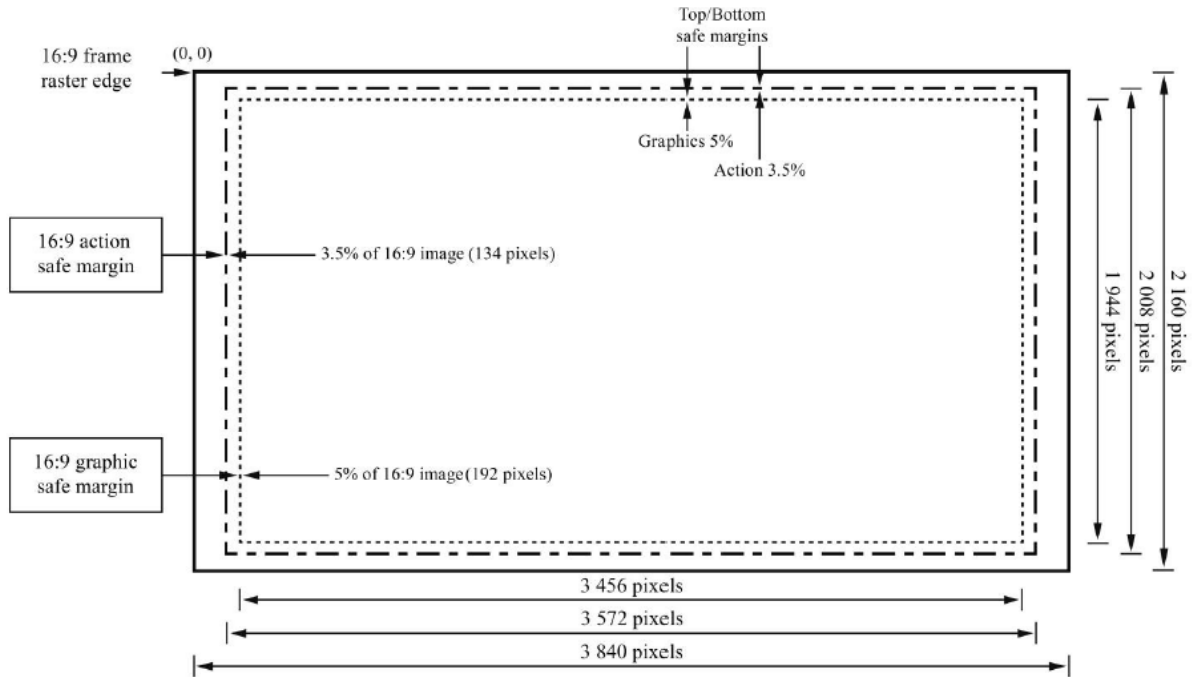
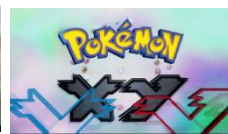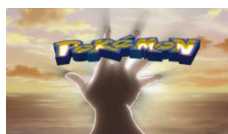### Texted/Textless example frames:

TEXTED

TEXTLESS

Texted Playoff examples:

Animated Texted Playoff example:

Please direct any questions on these technical specifications to:
Craig Mecak
Network Broadcast Media Standards & Quality Control Manager
cmecak@npcmedia.com.au
+61 2 9186 5362