Technical Specification for the Delivery of Television Programmes as Files to SVT

Version 5.1

Delivery of Television Programmes as Files to SVT

This document includes the technical parameters that High Definition (HD) and Standard Definition (SD) programmes, delivered using **files**, must meet to be acceptable by SVT. It is set out as follows:

- Part 1 – Video and Sound quality and Quality Control (QC) requirements;
- Part 2 – Additional technical requirements for **file** programme delivery;
- Part 3 – Additional SVT-specific requirements.

If comparing documents, SVT uses the same naming of the sections' headings as those used by Digital Production Partnership (DPP) Broadcasters in the UK, *but SVT's requirements in the sections differ.*

The current version of this document is available via https://b2b.svt.se/program/komplett-leverans/technical-specifications.html.

An *informative* small checklist, regarding delivery of television programmes as **files** to SVT, may be found via the same weblink as above. However, *it is this large technical specification that is the normative document.*

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Part 1 – General Requirements

Technical Requirements

Assessment of quality is highly subjective, and therefore dependent on the nature of the programme. Some of the quality requirements are expressed in relative terms ('reasonable', 'not excessive' etc.), and it will be necessary to make a judgement as to whether the quality expectations of the intended audience will be fulfilled.

Photosensitive Epilepsy and Quality Control

SVT is not subject to prevent photosensitive epilepsy by regulation – see section 3.2.

Radio Act – Access for People with Disabilities

SVT is subject to the provisions of the Radio Act to terms set out in the charter between SVT and the state. Hence, programme makers are required to consider the needs of people with hearing or visual impairments *especially regarding dialogue, voiceovers and when mixing sound,* as well as when generating onscreen text, subtitles and graphics.

1. Video Technical Requirements

1.1. Video Formats

1.1.1. Ultra-High Definition

Ultra-High Definition (UHD) programmes are not accepted by SVT.

1.1.2. High Definition

Independently of SVT's current transmission format 720p/50, SVT requires delivery of programmes in each programme's native production video format. The native production video format should preferably be chosen in the following priority order.

50 Hz motion portrayal programmes delivered for SVT transmission must be:

- 1280 x 720 pixels in an aspect ratio of 16:9;
- 50 frames per second, progressive scan – known as 720p/50;
- colour sub-sampled at a ratio of 4:2:2;
- specified in ITU-R BT.1847.

Or (optionally, regarding 50 Hz motion portrayal):

- 1920 x 1080 pixels in an aspect ratio of 16:9;
- 25 frames per second (50 fields) interlaced – known as 1080i/25;
- colour sub-sampled at a ratio of 4:2:2;
- specified in ITU-R BT.709.

25 Hz motion portrayal programmes delivered for SVT transmission must be:

- 1920 x 1080 pixels in an aspect ratio of 16:9;
- 25 frames per second, progressive scan (or progressive scan segmented frame) – known as 1080p/25 (or 1080PsF/25);
- colour sub-sampled at a ratio of 4:2:2;
- specified in ITU-R BT.709.

1.1.3. Standard Definition

Where agreed by SVT, legacy SD programmes delivered for SVT transmission must be:

- 720 x 576 pixels with the centred 702 x 576 pixels in an aspect ratio of 16:9;
- 25 frames per second (50 fields) interlaced – known as 576i/25;

- colour sub-sampled at a ratio of 4:2:2;
- specified in ITU-R BT.601.

Note: SD video has a picture area with a minimum of 702 x 576 pixels, where the 702-pixel wide picture must be centred in the active 720-pixel wide line. The picture information may extend the full width of the 720-pixel wide line, providing the image shape is not distorted.

1.2. Signal Parameters

In a video signal, each primary component (R', G' and B') should lie between 0 and 100% of the video range between expected black level and expected peak level.

1.2.1. Video Level Tolerance

The recommendations in EBU R 103, Video Signal Tolerance in Digital Television Systems, must be followed.

The R'G'B' components and the corresponding Luminance (Y') signal, should not normally exceed the "Preferred Min. / Max." range in the table below.

Measuring equipment should indicate an 'Out-of-Gamut' occurrence only after the error exceeds 1% of an integrated area of the active image.

System Bit-depth	(Narrow) Range in Digital Code Values		
	Expected Video Range	Preferred Min. / Max.	(Total Video Range)
8-bit	16 - 235	5 - 246	(1 – 254)
10-bit	64 - 940	20 - 984	(4 – 1019)

Colour gamut 'legalisers' should be used with caution as they may create artefacts. It is recommended not to 'legalise' video signals before all signal processing has been carried out.

1.2.2. High Dynamic Range

High Dynamic Range (HDR) programmes are not accepted by SVT.

1.2.3. Blanking

HD images must fill the active picture area. No 'blanking errors' are permitted.

A two-pixel tolerance is permitted during complex overlay sequences where key signals, graphic overlays or other effects do not fully cover the background image. Where animated key signals or overlays cause moving highlights at the edge of the active image it is preferable to blank these pixels completely. A note of the timecodes and reasons for these errors should accompany the delivered programme.

1.2.4. Field Dominance

Cuts in interlaced scanned material must happen on frame boundaries (i.e. between field 2 and field 1). Motion on PsF (Progressive scan Segmented Frame) material must occur between segment 2 and segment 1. Be aware though, that certain legacy SD video codecs, e.g. the DV-based (SMPTE ST 314), internally use a structure where field 2 is supposed to be presented before field 1.

It is preferred to shoot with progressive scan for 50 Hz motion portrayal (e.g. 720p/50), hence also, possible to shoot material at 1080p/50. When this is done, the correct Two-Frame Marker phasing (SMPTE ST 2051) must be maintained to not introduce cuts between field 1 and field 2 if subsequently converting to interlace scanned video formats – e.g. 576i/25 or 1080i/25.

1.3. Video Line-Up

1.3.1. ITU-R BT.2100 UHD Programmes

ITU-R BT.2100- and ITU-R BT.2020-based Ultra-High Definition (UHD) programmes are not accepted by SVT.

1.3.2. SMPTE ST 2036-1 UHD, HD and SD Programmes

Ultra-High Definition (UHD) programmes, e.g. SMPTE ST 2036-1 based, are not accepted by SVT.

Regarding HD and SD programmes, the use of colour bars for File delivery is optional. If used, 100% colour bars (100/0/100/0) that fill the active picture area must be used. Legacy SMPTE pattern bars are not acceptable.

1.4. Origination

50 Hz motion portrayal material should preferably be originated with progressive scan (or, optionally, with interlaced scan).

50 Hz and 25 Hz motion portrayal may be mixed within a 50 Hz motion portrayal programme if it is required for editorial reasons or the nature of the programme requires material from varied sources.

EBU R 118, Tiering of Cameras for use in Television Production, is used to assess the suitability of cameras. Cameras for HD programmes must meet or exceed the parameters of HD Tier 2J.

1.4.1. DSLR Cameras

DSLR cameras are only acceptable for time-lapse sequences, stop-frame animation and other specialist requirements such as infra-red and hostile conditions. They are not suitable for use as video cameras unless they have EBU R 118 test report results that meet or exceed the HD Tier 2J requirements. Exceptions can be made for covert shoots or dangerous locations at the discretion of SVT.

1.4.2. Drones and Remotely Operated Cameras

Cameras attached to devices such as drones must meet the requirements in EBU R 118 unless agreed with SVT in advance.

Unless a drone or remote rig has adequate image stabilisers it is recommended that the camera attaché has a higher resolution than needed to allow electronic stabilisation to be carried out during post-production.

Programme producers are required to ensure drones and other remotely operated cameras are only controlled by trained operators. Producers should be aware of specific local and territorial restrictions and regulations.

1.5. Film for HD and UHD Acquisition

Super-16 Film is not considered to be HD no matter what processing or transfer systems are used.

The following 35 mm Film types and stock are acceptable for HD acquisition:

- 3 perf – any exposure index although an exposure index of 250 or less is preferred;
- 2 perf – only if daylight stock with an exposure index of 250 or less is used.

To avoid causing problems with HD transmission encoding, film should be well exposed and not forced more than one stop.

Requirements regarding Ultra-High Definition (UHD) acquisition are not specified by SVT.

1.6. Post Production

Electronically generated moving graphics and effects (such as rollers, DVE moves, wipes, fades and dissolves) must be generated and added with 50 Hz motion portrayal to prevent unacceptable judder in 50 Hz motion portrayal programmes.

Regarding programmes delivered in 1080p/25 (or 1080PsF/25), all moving graphics and effects must be generated and added with 25 Hz motion portrayal.

1.6.1. Video Codecs used for Post Production

Intra-frame based post-production codecs used to edit HD programmes should be at least 160 Mb/s. It is however acceptable to use the native camera codec provided the codec is constant throughout the production workflow.

1.6.2. Film Motion or ‘Film Effect’

It is not acceptable to shoot with 50 Hz motion portrayal interlace scan and add a film motion effect in post-production. Where film motion is a requirement, progressive capture in 25 Hz motion portrayal (25p or 25PsF) is the only acceptable method.

Conversion from 50 progressive frames per second material to 25 progressive frames per second is permitted, preferably by dropping every other frame, provided that the frame rate conversion process does not produce excessive motion judder or image softening or visible frame blending; and that an appropriate camera shutter speed has been used.

1.6.3. Frame Rate Conversion

When standards converted material is included in a programme, e.g. from 60/1.001 Hz motion portrayal to 50 Hz motion portrayal, motion compensated (sometimes known as Motion Predictive or Motion Vector) standards conversion is required.

Use of non-linear editing platform hardware or software standards conversion is not permitted for whole programmes, but may be used for short inserts at the discretion of SVT.

De-interlacing processing should be carried out via multi-field (five-field or greater) de-interlace or motion compensated de-interlace.

Speed change is the preferred method of changing between 24/1.001 fps and 25 fps standards. Due attention must be given to the audio, i.e. resampling.

Content acquired at 24/1.001 fps which has been converted to 60/1.001 (interlace as well as progressive) via the '2:3:2:3 pull down' process, should first have the repeated fields/frames removed to produce the original frame rate. The resulting video can then be replayed faster at 25 fps.

1.6.4. Up-Conversion to UHD

Requirements regarding Ultra-High Definition (UHD) are not specified by SVT.

1.7. Picture Aspect Ratio

All HD programmes must fill a 16:9 screen vertically and horizontally without geometric distortion. The following exceptions may be allowed, but SVT must give permission before shooting commences.

1.7.1. 'Cinemascope Ratios' as Letterbox

Programmes may be delivered with an active picture in cinema ratios (e.g. 2.39:1 or 1.85:1), centred vertically between black bars in a 16:9 frame, filling the width of the frame according to SMPTE RP 199 with no geometric distortion.

1.7.2. Floating Images

Short sequences of images surrounded by black borders (floating images) may be used for artistic effect. However, widescreen consumer TV sets operating in Auto Zoom / Auto Mode often interpret large black borders at the top and bottom of the screen as letterbox, so are likely to enlarge the picture. The resulting unpredictable zooming can be annoying for the viewer and undermine the artistic intent. If used, the black space around floating images must be consistent across sequences of images.

1.7.3. 'Pillar-Boxed' HD Material

Some pillar-boxed material is acceptable where it has been acquired on a medium that has the capability to be transferred to a legitimate HD resolution, for example, 35mm film shot using 4 perf at an aspect ratio narrower than 16:9. The pictures must be centrally framed in a 16:9 raster according to SMPTE RP 199 with no geometrical distortion.

1.8. Archive Material

Archive material must meet all the technical requirements in this document, including those for up-converted SD video where relevant.

1.8.1. General Quality

Archive material must be taken from the best available source, and any improvement or restoration work which could reasonably be expected must be done (for example grading, dropout repair or audio equalisation).

1.8.2. Up-Converted SD Material

Care must be taken with SD archive material to deliver the best possible quality after up-conversion. In general, standard definition pictures must look no worse than the original after being up converted, post processed and down converted for delivery on SD services. Only high quality up-conversion processes will achieve this.

Standard definition video contains a half-line at top and bottom on alternate fields. This must be removed on up-conversion to HD, or it will be visible flickering at top and bottom of the HD frame.

Any VITC or switching signals visible at the top of SD material must be removed.

Any line blanking from SD signals must not appear in the HD conversion.

1.8.3. Picture Aspect Ratio

Archive material should be zoomed to fill the 16:9 raster where possible without compromising the artistic intention, the image quality or composition, alternatively it may be presented in a pillar-box format, which:

- may be of an intermediate ratio between 4:3 and 16:9, but must be of consistent width across sequences;
- must be centrally framed in the 16:9 raster according to SMPTE RP 199;
- must show no geometrical distortion;
- must have clean and sharp pillar-box edges (i.e. any video or film edge artefacts may need to be blanked);
- must be black outside the active picture.

1.8.4. Safe Areas

Any archive captions or on-screen-text already in the archive material should be kept within the caption safe area if possible. Exceptions should be noted and accompany the delivered programme.

1.9. Use of Lower Resolution Images

To maintain a high standard and meet audience expectations, the amount of material of a lower resolution than the commissioned format is limited to 25% of the programme's total duration. Lower resolution material must not be used for large uninterrupted sections of the programme, unless agreed by SVT.

1.9.1. Non-UHD Material

Requirements regarding Non-UHD Material are not specified by SVT.

1.9.2. Non-HD Material

Some HD programmes will contain some material from standard definition originals, and sources that do not meet the HD requirements. This material is all called 'non-HD' in this document.

Non-HD material includes material acquired using the following methods or formats:

- All codecs with bit rates below those specified in EBU R 118 for HD Tier 2L;
- Cameras that do not meet the requirements of EBU R 118 for HD Tier 2J;
- Film that does not meet the required standard in section 1.5.

1.10. 3D

SVT does not accept stereoscopic 3D programmes.

1.11. Safe Areas for On-Screen Text

All on-screen text must be clear and legible and must be within the safe areas specified.

All font sizes must be legible after down conversion.

There is one primary caption safe area defined for 16:9 materials at SVT:

- The 16:9 graphics safe area for 16:9 presentation according to EBU R 95.

At the discretion of SVT, programmes such as feature films and some acquisitions may be excluded from this requirement.

1.11.1. Text Size

The minimum, 576 line-based, SD font height is 20 SD lines. Therefore, where burnt-in HD-text will be down converted, the minimum height of the text should be no less than:

- 25, 720 line-based, HD lines/pixels (to be legible after down conversion to SD);
- 40, 1080 line-based, HD lines/pixels (to be legible after down conversion to SD).

1.11.2. In-Vision Captions for Foreign Language Assets

Foreign dialogue should be free from burnt-in subtitles, i.e. should not have In-Vision Captions.

1.11.3. Safe Areas for SD On-Screen Text

Graphics Safe Area for 720 x 576 (Interlace)	Defined as percentage (%) of active picture	Pixels (inclusive). First pixel numbered 1	TV line numbers (inclusive). Line numbering as per ITU-R BT.601
16:9 Graphics Safe	90% of Width 90% of Height	37 – 684 30 – 547	- 38 – 295 (F1) & 351 – 608 (F2)

1.11.4. Safe Areas for HD On-Screen Text

Graphics Safe Area for 1280 x 720 Progressive	Defined as percentage (%) of active picture	Pixels (inclusive). First pixel numbered 1	TV line numbers (inclusive). Line numbering as per ITU-R BT.1847
16:9 Graphics Safe	90% of Width 90% of Height	65 – 1216 37 – 684	- 62 – 709

Graphics Safe Area for 1920 x 1080 Interlace/PsF	Defined as percentage (%) of active picture	Pixels (inclusive). First pixel numbered 1	TV line numbers (inclusive). Line numbering as per ITU-R BT.709
16:9 Graphics Safe	90% of Width 90% of Height	97 – 1824 55 – 1026	- 48 – 533 (F1) & 611 – 1096 (F2)

Graphics Safe Area for 1920 x 1080 Progressive	Defined as percentage (%) of active picture	Pixels (inclusive). First pixel numbered 1	TV line numbers (inclusive). Line numbering as per ITU-R BT.709
16:9 Graphics Safe	90% of Width 90% of Height	97 – 1824 55 – 1026	- 96 – 1067

1.11.5. Safe Areas for UHD On-Screen Text

Ultra-High Definition (UHD) programmes are not accepted by SVT.

2. Audio Technical Requirements

2.1. Dialogue

It is the responsibility of the producer to ensure that dialogue is easy to hear and understand by a first-time viewer who is using consumer equipment. Even viewers with slightly impaired hearing must be able to understand what is being said.

SVT receives many complaints about unclear dialogue, especially when background music and effects have been used. Remember, the audience has not seen the programme before transmission and has not seen a script. If background music or sound effects are necessary, the sound mix must be made with great care. Use the so-called ‘interleaving technique’ (the music or sound effect is established in the pause between the spoken words, but is adequately attenuated during dialogue).

Ensure that the background sound is low enough that hearing-impaired audience clearly can hear what is being said. Speech and dialogue must have the highest priority!

Normal speech must be mixed with an even loudness level throughout the programme. Normal speech should be levelled close to -23 LUFS (0 LU on the relative scale) measured with the Short-term Loudness meter. However, the Programme Loudness target must be fulfilled (except regarding deliberately low loudness) and has priority over the dialogue level recommendation. Regarding dialogue mixing practises, see section 9.2 in EBU Tech 3343.

2.2. Loudness

All programmes must be mixed to comply with the EBU recommendation EBU R 128.

Programmes mixed according to the old standard will only be accepted by prior agreement with SVT. In that case, the old standard for measuring programme audio levels was the EBU Tech 3205 recommendation for Quasi Peak Programme Meters and was rendered on the Nordic Scale. 0 dBu corresponded to -18 dBFS and the integration time was set to 10 ms. Typical peak levels regarding normal speech hovered between 0 to +6 dBu and maximum programme peak level was not exceeding +11 dBu.

The programme metadata element 'Audio Comments' must be used to note whether the programme, with prior agreement, has been mixed according to the old "Nordic Scale" standard.

2.2.1. Loudness terms

EBU R 128 terms used in this document, how they are measured and the delivery requirements, are listed in the table below.

All programmes must be compliant with the 'Programme Loudness' and 'Maximum True Peak' requirements. Other parameters are given for guidance only.

Term	**Description**	**Measurement**	**Reference**
LU	Loudness Unit	1 LU ≈ 1 dB change in loudness	EBU Tech 3343
LUFS	Loudness Unit relative to Full Scale	LUFS	EBU Tech 3343
LRA	Loudness Range	LU	EBU Tech 3342
Delivery Requirements:			
Programme Loudness (EBU Tech 3341 & 3)	Loudness measured over the duration of the whole programme	LUFS	**-23.0 LUFS** ±1,0 LU (See Note 1 below).
Maximum True Peak (EBU Tech 3341 & 3)	The maximum value of the audio signal waveform.	dBTP (True Peak)	Content will fail if the maximum true peak exceeds **-1 dBTP**.
Loudness Range, for guidance only:			
Loudness Range (EBU Tech 3342 & 3)	Describes the perceptual dynamic range measured over the duration of the whole programme.	LU	Programmes should aim for an LRA of no more than **18 LU**.
Loudness Range of Dialogue	Dialogue must be acquired and mixed so that it is clear and easy to understand with minimum interference from background sounds.	LU	Speech content in factual programmes should aim for an LRA of no more than **6 LU**. A minimum separation of **8 LU** between dialogue and background is recommended. (See Note 2 below).
Note 1: Although the target loudness is -23 LUFS, in exceptional circumstances other deliberately lower target levels may be permitted by agreement with SVT. Deliberately lower target levels must be agreed with SVT before the final mix and the metadata element 'Low Loudness Flag' must be used. 'Low loudness flag' is further described in EBU Tech 3343, chapter 6.1.1. Note 2: During audio parts where dialogue and background are mixed simultaneously, measure dialogue and background separately and calculate the difference.			

In addition, regarding Short-Form Content:

Term	Description	Measurement	Reference
Delivery Requirements:			
Maximum Permitted Short-term Loudness Level	The maximum short-term loudness (S) of the programme.	LUFS	**-18.0 LUFS** (+5.0 LU on the relative scale). (See Note below).
Loudness Range, for guidance only:			
Loudness Range (EBU Tech 3342 & 3)	Describes the perceptual dynamic range measured over the duration of the content.	LU	**Not applicable**.
Note: Short-Form Content is defined as a programme of short duration, typically shorter than 30s (but up to approximately 2 minutes duration). In addition to promotional items, interstitials, stingers, bumpers and similar very short items belong to this category. Reference: EBU R 128 Supplement 1.			

2.2.2. Guidelines for True Peak Audio Levels

The following table is *only for guidance* on the true peak levels of diverse types of audio. At all times dialogue must be distinct and clear.

Material	Recommended Maximum Peaks
Dynamically Uncompressed Music	-3 dBTP
Dynamically Compressed Music (depending on degree of compression)	-10 dBTP
Heavy M & E (gunshots, warfare, aircraft, loud traffic, etc.)	-3 dBTP
Background M & E (office/street noise, light mood music etc.)	-18 dBTP

2.3. Metering Requirements

Meters must comply with the specifications in EBU Tech 3341. Programmes must be measured using the EBU Integrated (I) mode and the measurement must be applied to the whole programme (EBU Tech 3343). The optional LFE channel must be excluded from all measurements.

2.4. Stereo Audio Requirements

Stereo tracks must carry sound in the A/B (Left/Right) form.

If mono originated sound is used, it must be recorded as dual mono, so that it may be handled exactly as stereo. It must meet all the stereo standards regarding levels, balance and phase.

2.4.1. Stereo Line-Up Tones

The use of line-up tones for File delivery is optional. When used, each stereo audio pair must have either EBU stereo or GLITS line-up tone (not a mix of both). Tone must be 1 kHz (2 kHz is acceptable on M&E channels), sinusoidal, free of distortion and phase coherent between channels.

Audio files of GLITS and EBU stereo tones may be downloaded from the DPP website, http://dpp-assets.s3.amazonaws.com/wp-content/uploads/2014/01/DPPLineUpTones.zip.

Digital Audio Reference level is defined as 18dB below the maximum coding value (-18 dBFS).

2.4.2. Stereo Phase

Stereo programme audio must be capable of down-mixing to mono without causing any noticeable phase cancellation.

2.5. Surround Sound Requirements

Surround sound should be delivered as discrete tracks, i.e. preferably not as 'Dolby E'.

For programmes carrying surround sound (>2.0) it is optional to deliver an additional stereo (2.0) mix. SVT transmits a stereo audio stream in conjunction with a multichannel audio stream, but it is made from an in-house mix-down of the multichannel audio with Audio Metadata applied – i.e. stereo listeners will receive either a mix-down from the surround channels generated in SVT's playout chain or a mix-down generated in their receiver.

2.5.1. Surround Line-Up Tones UHD Programmes

Ultra-High Definition (UHD) programmes are not accepted by SVT.

2.5.2. Surround Line-Up Tones HD Programmes

The use of line-up tones for File delivery is optional. When used, all surround tracks must carry BLITS tone, as described in EBU Technical Paper 3304. An audio file of BLITS tone may be downloaded from the DPP website, http://dpp-assets.s3.amazonaws.com/wp-content/uploads/2014/01/DPPLineUpTones.zip.

2.5.3. AES Sample Timing

Very small timing differences between audio tracks in a surround programme will not be heard unless the stereo down-mix is monitored acoustically. An error of as little as one or two samples between the Left, Right and Centre channels can cause phasing and comb filtering for those listening in stereo.

Timing differences between audio channels must be no more than 0.2 samples (i.e. the timing between each channel of the six audio tracks of a surround sound signal).

2.6. Surround Sound Mixing Requirements

To help programme makers meet their responsibilities, it is important that all transmitted audio can be easily and clearly monitored by both Editorial and Technical staff during the production process.

2.6.1. Dialogue in a Surround Mix

For speech intelligibility reasons, it is preferred to use the centre channel for dialogue, a k a "film style". Note that it is not precluded to mix dialogue in left or right front channels for certain artistic purposes. In exceptional cases such as music mixing, sometimes known as "music style" with singing voice placed mainly in left and right front channels with just a little of the singing voice in the centre channel, could be accepted. Dialogue with almost equal levels in all front channels should be avoided, since it is not down-mix compatible.

When down-mixed to stereo (with down-mix metadata applied), the down-mix must have similar loudness of dialogue in relation to music and effects compared to when listening to the surround mix.

2.6.2. General Mixing Requirements

Viewers of the HD channels listening in stereo (or mono) will either hear a receiver derived automated down-mix of a surround sound programme using the Dolby Metadata parameters or an in-house derived down-mix. Some HD platforms only transmit AC-3 audio switching between Stereo or Surround. Some HD platforms also includes a Stereo stream, as well that is an automated down-mix derived in-house.

The stereo mix is not transmitted on the Standard Definition channel(s) either. SD channels only transmit an automated down-mix.

The audio parameters controlled by the metadata include: centre and rear down-mix levels, and the extent of any dynamic range control applied. Therefore:

- it is essential to check the automated down-mix using a monitoring system that applies or simulates the metadata settings. Any external processor (e.g. a Dolby DP570) must be set to apply the programme's metadata;
- pre-mixed stereo content should be up-mixed, where appropriate, to match the surround sound to maintain the audio image throughout a surround broadcast. A method of up mixing approved by the broadcaster must be adopted, which anchors dialogue to the front and disperses effects around the image;
- up-mixed material must also down-mix to stereo and mono with no audible artefacts. The injudicious use of phase shifting and delay within some up-mixing algorithms may become more noticeable in the subsequent receiver down-mix process, and result in unacceptable down-mixed audio.

For general surround sound (e.g. audience reaction) phase-coherence invariably benefits both the wrap-around effect in 5.1 and the stereo down-mix. Coincident microphone techniques (e.g. crossed-pairs) tend to outperform spaced mono microphones in this context.

2.6.3. Stereo and Centre Channel Monitoring

It is essential that the mono and stereo down-mixes of a surround programme are monitored in at least equal measure to the surround mix. A large majority of viewers will be listening in stereo rather than 5.1.

2.6.4. Consistency of Image

When a surround programme contains mono content interleaved with stereo pre-recorded items, it is important to maintain the consistency of the sound image and prevent the effect of dialogue appearing to jump between Centre Only and Phantom Centre (Left/Right) only.

2.7. Dolby Metadata Settings

Programmes must be delivered together with Audio Metadata.

Use the Excel-file (the 'Programme Metadata File'), based on a template provided by SVT via https://b2b.svt.se/program/komplett-leverans/technical-specifications/downloads.html, that includes specific Dolby and Loudness metadata items.

Audio Metadata values, including SVT's subset of Dolby metadata values, must remain constant throughout a programme.

For the time being, SVT uses two alternative pre-sets of Dolby Metadata for transmission: one regarding stereo 2.0 and another regarding multichannel 5.1. Where Dolby Digital is used for transmission, the following fixed metadata values are used:

- Downmix to Lo = L + (C - 3 dB) + (Ls - 3 dB)
- Downmix to Ro = R + (C - 3 dB) + (Rs - 3 dB)
- DRC profile = Music Light

2.7.1. Guidance for Acquired Programmes and Movies

Acquired programmes and movies must be received with metadata according to section 2.7. above. If no metadata exists, the following parameters are anticipated by SVT:

Parameter	**Value**
Dialogue Level	-23 dB
Line Mode Compression	Music Light
RF Mode Compression	Music Light
Centre Down-Mix Level	-3 dB
Surround Down-Mix Level	-3 dB
Surround 3 dB Attn.	Disabled
Dolby Surround Mode	Not indicated
Preferred Stereo Down-Mix	Lo/Ro Preferred
Surround Phase Shift	Disabled

2.8. Sound to Vision Synchronisation

The relative timing of sound to vision should not exhibit any perceptible error. Sound must not lead or lag the vision by more than 5 ms.

2.8.1. Audio / Video Sync Markers

The following, regarding sync markers, is optional.

To assist in maintaining A/V sync through the post-production process, a 'sync plop' should be used which must meet the following conditions:

- the sync plop must be between timecode 09:59:57:06 and 09:59:57:08;
- the audio plop must be 1 kHz tone in all channels (82.5 Hz in the LFE channel) at -24 dBFS (-18 dBFS is acceptable for stereo programmes);
- the duration of the vision flash must be 2 frames to allow it to pass through standards conversion successfully;
- the duration of the audio plop must be 1 frame, starting on the first frame of the vision flash. It must be synchronous across all audio channels and with the video flash (within ±5 ms).

If an end sync plop is used it must be no closer than 10 seconds to the end of the programme and comply with the relevant points above.

> *Note: The above is applicable in the case of 50 Hz motion portrayal via interlaced video (25i) as well as 25 Hz motion portrayal via progressive scan (25p) or progressive scan segmented frame (25PsF). Regarding 50 Hz motion portrayal via progressive scan video (50p) – see the table in section 4.1. in the document 'Technical Specification for the Delivery of Television Programmes as Files to SVT'.*

3. Quality Control (QC)

It is the responsibility of the production company to ensure programmes meet the technical and editorial requirements of the commission.

3.1. General Quality

All programmes are expected to reach a high standard of video and audio quality. This does not mean low quality material cannot be used. Archive and specialist low quality material used in context is acceptable. If there is any doubt, contact SVT for advice.

3.1.1. General Video Quality

The picture must be well lit and reasonably, but not artificially, sharp.

The picture must be free of excessive noise, grain and digital compression artefacts.

The picture must be free of excessive flare, reflections, lens dirt, markings and obstructions (e.g. lens hood), and lens aberrations.

Movement must appear reasonably smooth and continuous, and must not give rise to distortions or break-up to moving objects, or cause large changes in resolution.

The picture must be free of excessive black crushing and highlight compression. Hard clipping of highlights (e.g. by legalisers) must not cause visible artefacts on screen.

There must be no noticeable horizontal or vertical aliasing, i.e. jagged lines, or field-rate or frame-rate fluctuations in fine detail.

Colour rendition, especially skin tones, must be consistent throughout, and provide a realistic representation of the scene portrayed unless it is altered as an editorially essential visual effect.

The picture must be stable and continuous – i.e. no jumps, movements, shifts in level or position. There should be no flash frames or very short shots unless editorially essential.

There must be no visible contouring / artefacts caused by digital processing. Quantisation noise must not be apparent.

There must be no noticeable spurious signals or artefacts e.g. streaking, ringing, smear, echoes, overshoots, moiré, hum, cross-talk etc.

3.1.2. General Audio Quality

Sound must be recorded with appropriately placed microphones, giving minimum background noise and without peak distortion.

The audio must be free of spurious signals such as clicks, noise, hum and any analogue distortion.

The audio must be reasonably continuous and smoothly mixed and edited.

Audio levels must be appropriate to the scene portrayed and dynamic range must not be excessive. They must be suitable for the entire range of domestic listening situations.

Surround and Stereo audio must be appropriately balanced and free from phase differences which cause audible cancellation in mono.

The audio must not show dynamic and/or frequency response artefacts due to the action of noise reduction or low bit rate coding systems.

Audio that has previously been lossy bit reduced must not be used, due to causing cascade coding artefacts.

3.1.2.1. Speech intelligibility (audibility)

Speech intelligibility (audibility) must be ensured, with the minimum of interference from music and sound effects. If SVT determines that the speech intelligibility is insufficient, the programme is rejected and sent back for re-mix. Alternatively, will SVT add subtitles to parts with poor intelligibility. SVT has the full mandate to make this decision.

3.1.3. UHD Programmes

Ultra-High Definition (UHD) programmes are not accepted by SVT.

3.2. Photosensitive Epilepsy (PSE)

Flickering or intermittent lights and certain types of repetitive visual patterns can cause serious problems for viewers who are prone to photosensitive epilepsy. Children and teenagers are particularly vulnerable.

SVT is not subject, by regulation, to prevent photosensitive epilepsy.

3.2.1. PSE testing

See supplement 'A Product Guide for File-Based Photo Sensitive Epilepsy Testing' in the document 'Technical Specification for the Delivery of Television Programmes as Files to SVT'.

3.2.2. PSE – broadcast warnings

Verbal and/or on-screen text warnings may be used at the beginning and during the programme if demonstrable attempts have been made to correct or replace the images, and the relevant content is completely integral and necessary to the context of the programme, and permission to use the relevant content has been cleared by SVT.

3.2.3. UHD Programmes

Ultra-High Definition (UHD) programmes are not accepted by SVT.

3.3. Automated Quality Control (AQC)

To carry out Automated Quality Control (AQC) is not mandated, but recommended. Any device that carries out AQC tests based on the EBU QC Test Items, see https://ebu.io/qc/, can be used.

If AQC is carried out, the production company must ensure that all technical and editorial warnings or comments are acted on or noted. Mandatory requirements must be acted on or rectified. An AQC report in PDF form, to be delivered with the programme, is not mandated, but recommended.

3.4. Eyeball Quality Control

Eyeball QC check is mandatory to ensure video and audio quality are consistent throughout.

Listening evaluations guarantee full speech intelligibility. Evaluation must be performed at a low listening level (e.g. 57 dBC SPL/channel), using loudspeakers with a linear frequency response.

Notes of the timecodes and reasons for errors must accompany the delivered programme in a separate Excel-file (the 'Programme Metadata File') based on a template provided by SVT via https://b2b.svt.se/program/komplett-leverans/technical-specifications/downloads.html.

The video metadata elements 'Video comments' and 'Audio comments' must be used for these notes.

3.5. File Compliance (File delivery only)

A File Compliance check confirms that the file itself meets the technical requirements. A compliance check is carried out by SVT before a programme file can be accepted.

Part 2 – File Delivered Programmes

File Requirements

This part of the document details the additional technical requirements that programmes must comply with for delivery of **files**.

4. Programme Format

4.1. Programme Layout for File Delivery

All programmes delivered on file must be laid out with elements in the following pattern relative to (25 T/C) timecode:

Time-code (25 T/C)	**Duration (25 T/C)**	**Video**	**Audio**
09:59:30:00 (optional)	*20”*	*HD/SD programmes use 100% Bars (100/0/100/0)*	*HD/SD Line-up tone*
		-	-
		-	
09:59:50:00 (optional)	*At least 7”*	*Ident Clock or Slate*	*Silence*
09:59:57:06 (optional)	*2fr*	*4fr >50% white (50p)* *2fr >50% white (25i)*	*2fr 1kHz tone (50p)* *1fr 1kHz tone (25i)* *(on first white frame)*
No later than 09:59:57:08	**At least 2” 18fr**	**Black**	**Silence**
10:00:00:00*	**-**	**Programme**	**Programme**
For Multipart Programmes:			
End of part	5”	Black, freeze or ‘living hold’ after end of part	Fade or cut to silence by end of part
End of part + 5”	At least 1”	Black	Silence
Next whole minute minus 10” (optional)	7”	Ident Clock or Slate – next part	Silence
Start of part minus 3”	3”	Black	Silence
End of programme	**5”**	**Black, freeze or ‘living hold’**	**Fade or cut to silence by end of programme**
End of programme + 10” (optional)	*2fr*	*4fr >50% white (50p)* *2fr >50% white (25i)*	*2fr 1kHz tone (50p)* *1fr 1kHz tone (25i)* *(on first white frame)*
*) For programmes delivered on multiple files, 2nd and subsequent files should have programme part starting at the next ‘whole hour’ T/C with (optional) line-up and (optional) ident laid out as above with appropriate offset.			

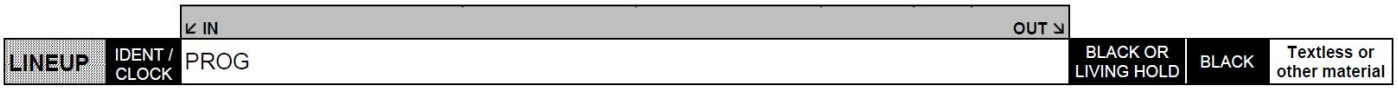
4.2. Programme Parting

There must be only one programme in each file, although a programme may be either soft or hard-parted within that file.

Only when agreed in advance with SVT, programmes in several parts may be delivered in more than one file.

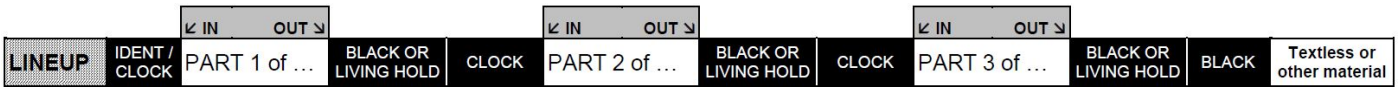
4.2.1. Single Part or Soft Parted Programme

A single part programme will always be played from the start point to the end point without interruption. Soft parting is where a programme is provided as a single continuous programme, but a broadcaster may break the transmission of the programme at several points to insert commercials or for other reasons. IN and OUT points for continuous playback must be included with the delivery metadata; suggested timecodes for breaks should not be included.



4.2.2. Hard-Parted Programme

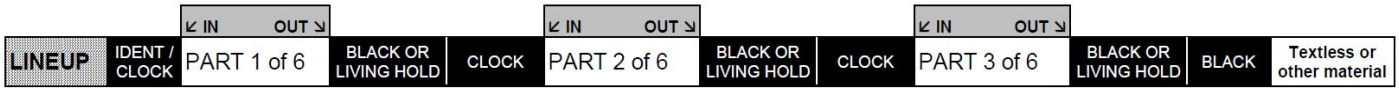
A hard-parted programme is billed and scheduled for transmission as a single entity, but is delivered as a single file containing clearly separated parts between which adverts, trails etc. could be inserted. The start timecode and duration of each part must be included in the metadata.



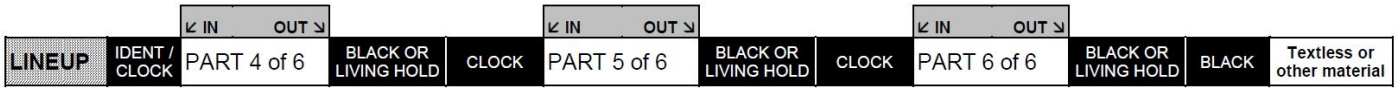
4.3. Multi-Part Programme Delivered on Multiple Files

Where a programme's delivery must be split over more than one file, it must comply with the formatting below.

File 1:



File 2:



4.4. Start and End

Note that it is usual for sound and vision to be automatically cut to air on transmission, so early vision or sound is not normally required. Vision may fade up from black starting at 10:00:00:00 if desired.

All programmes must end with a fade or cut to silence before the intended end point. Any fade out or reverb must be allowed for within the programme duration.

Black, vision freeze or 'living hold' must be held for a further five seconds (5") after the end point.

Any other programme elements after the end of the programme should not start less than one minute (1') after end of programme.

4.5. The Ident Clock or Slate

Optionally, a countdown clock or slate may precede the start of programme. A clock or slate is optional for subsequent parts of a multi-part programme.

4.6. Audio Channel Allocations HD and SD

The files must contain a group of either 4 or 16 channels, with channel allocations as in the table below.

Unused channels must carry 48 kHz, 24-bits/sample, PCM digital silence.

The EBU R 48 or R 123 code must be included in the spreadsheet Programme Metadata File, available via https://b2b.svt.se/program/komplett-leverans/technical-specifications/downloads.html, to identify the channel allocations.

EBU Ref Code	Programme Type	Audio channel numbers															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
R48: 2a	Stereo	St. L	St. R	-	-												
R123: 4b	Stereo with M&E	St. L	St. R	St. M&E L	St. M&E R												
R123: 4c	Stereo with Audio Description	St. L	St. R	St. Aud Desc L	St. Aud Desc R												
R123: 16a	Stereo, 5.1 and M&E	St. L	St. R	5.1 L	5.1 R	5.1 C	5.1 LFE	5.1 Ls	5.1 Rs	St. M&E L	St. M&E R	5.1 M&E L	5.1 M&E R	5.1 M&E C	5.1 M&E LFE	5.1 M&E Ls	5.1 M&E Rs
R123: 16b	*5.1, stereo and M&E*	*5.1 L*	*5.1 R*	*5.1 C*	*5.1 LFE*	*5.1 Ls*	*5.1 Rs*	*St. L*	*St. R*	*5.1 M&E L*	*5.1 M&E R*	*5.1 M&E C*	*5.1 M&E LFE*	*5.1 M&E Ls*	*5.1 M&E Rs*	*St. M&E L*	*St. M&E R*
R123: 16c Opt 1	Stereo, 5.1 and M&E	St. L	St. R	St. M&E L	St. M&E R	5.1 L	5.1 R	5.1 C	5.1 LFE	5.1 Ls	5.1 Rs	5.1 M&E L	5.1 M&E R	5.1 M&E C	5.1 M&E LFE	5.1 M&E Ls	5.1 M&E Rs
R123: 16c Opt 2	Stereo, 5.1 and Audio Description	St. L	St. R	St. Aud Desc L	St. Aud Desc R	5.1 L	5.1 R	5.1 C	5.1 LFE	5.1 Ls	5.1 Rs	5.1 M&E L	5.1 M&E R	5.1 M&E C	5.1 M&E LFE	5.1 M&E Ls	5.1 M&E Rs
R123: 16d	5.1 Two languages	5.1 Lang 1 L	5.1 Lang 1 R	5.1 Lang 1 C	5.1 Lang 1 LFE	5.1 Lang 1 Ls	5.1 Lang 1 Rs	-	-	5.1 Lang 2 L	5.1 Lang 2 R	5.1 Lang 2 C	5.1 Lang 2 LFE	5.1 Lang 2 Ls	5.1 Lang 2 Rs	-	-
R123: 16f	Stereo Three languages	St. Lang 1 L	St. Lang 1 R	-	-	St. Lang 2 L	St. Lang 2 R	-	-	St. Lang 3 L	St. Lang 3 R	-	-	-	-	-	-

- R48:2a, R123:4b, R123:4c, R123:16a, R123:16b, R123:16c Option 1 and R123:16c Option 2 must only be used for programmes with single language audio;
- *R123:16b (not R123:16a) is the preferred channel allocation for delivery specifically to SVT;*
- R123:16d must only be used for programmes with dual language audio;
- R123:16f must only be used for programmes with 3 different languages.

For compatibility with stereo systems, any audio generated as mono must be presented as 'Dual Mono' on two phase-coherent channels, and flagged as stereo.

In the case of multiple 1-channel (mono) WAV files, the file names must match those specified above in the cells to indicate the content of the file, e.g. PG-1234567-001A-PROGRAMME_TITLE-321_ME_LS.wav indicating the left surround channel in a 5.1 (3/2/1) multichannel music and effects mix. See 'Appendix B – Naming of Audio Channels when delivering multiple mono WAV files' for naming of all channel possibilities.

4.7. Audio Channel Allocations AS-11 DPP X1

Ultra-High Definition (UHD) programmes are not accepted by SVT.

4.8. Audio Only Files

Additional audio only files related to a programme, such as Audio Description files, must be supplied as BWF (sometimes called B-WAV) files, conforming to the specification in EBU-Tech 3285, or (optionally) multiple 1-channel (mono) WAV files.

File duration and timecode must exactly match the principal video file.

All audio channels must be encoded as PCM with a sample rate of 48 kHz at a bit depth of 24 bits/sample.

4.9. Closed Captions (Subtitles)

SVT is interested in any manuscripts used during the production of the programme, or transcripts of any dialogue, for use by SVT's in-house subtitling department when creating subtitles.

Naming of associated material must adhere to the following convention:

- PG-<identifier_provided_by_SVT_including_programme_name>-<suffix_describing_content_of_file>.<extension>

Examples:

- PG-939393-001A-SA_SKA_DET_LATA-Manuscript1.doc
- PG-939393-001A-SA_SKA_DET_LATA-Manuscript2.doc
- PG-939393-001A-SA_SKA_DET_LATA-Transcript.doc
- PG-939393-001A-SA_SKA_DET_LATA-Subtitles.xif

The text describing the content of the file should only contain A-Z, 0-9, i.e. umlaut characters (e.g. Å, Ä and Ö) are not allowed.

5. File Requirements

5.1. UHD Files

Ultra-High Definition (UHD) programmes are not accepted by SVT.

5.1.1. UHD Video Codec

Ultra-High Definition (UHD) programmes are not accepted by SVT.

5.1.2. UHD High Dynamic Range

Ultra-High Definition (UHD) programmes are not accepted by SVT.

5.1.3. UHD Audio

Ultra-High Definition (UHD) programmes are not accepted by SVT.

5.1.4. UHD Additional Requirements

Ultra-High Definition (UHD) programmes are not accepted by SVT.

5.2. HD Files

The file format, i.e. the container/wrapper, shall preferably be MXF OP-1a (the layout options for a minimal simple MXF file according to SMPTE 378M, extension '.mxf'). Optionally a Quicktime Movie (extension '.mov') may be used.

5.2.1. HD Video Codec

The video essence in the file must, for 50 Hz motion portrayal, be encoded as:

- 720p50, preferably as (Avid) DNxHD 175x (a.k.a. 185x), optionally as (Panasonic) AVC-Intra 100, optionally as (Apple) ProRes 422 (HQ), all 10-bit video codecs, and optionally as (Sony) XDCAM MPEG HD422, 8-bit.
- (optionally) 1080i25, preferably as (Avid) DNxHD 185x, optionally as (Panasonic) AVC-Intra 100, optionally as (Apple) ProRes 422 (HQ), all 10-bit video codecs, and optionally as (Sony) XDCAM MPEG HD422, 8-bit.

The video essence in the file must, for 25 Hz motion portrayal, be encoded as:

- 1080p25, preferably as (Avid) DNxHD 185x, optionally as (Panasonic) AVC-Intra 100, optionally as (Apple) ProRes 422 (HQ), all 10-bit video codecs, and optionally as (Sony) XDCAM MPEG HD422, 8-bit.

5.2.2. HD Audio

All audio channels must be encoded as PCM with a sample rate of 48 kHz at a bit depth of 24 bits/sample. The audio should preferably be bundled with the video inside the container/wrapper, optionally delivered separately, see section 4.8 and 'Appendix B – Naming of Audio Channels when delivering multiple mono WAV files'.

5.3. SD Files (Legacy programmes only)

Delivery of standard definition legacy programme files must be by agreement with SVT.

The file format, i.e. the container/wrapper, shall preferably be MXF OP-1a (the layout options for a minimal simple MXF file according to SMPTE 378M, extension '.mxf'). Optionally a Quicktime Movie (extension '.mov') may be used.

5.3.1. SD Video Codec

The video essence in the file must, for 50 Hz motion portrayal, be encoded as:

- 576i25, preferably as DVCPRO50, optionally as DVCPRO25, both according to SMPTE 314M.

5.3.2. SD Audio

All audio tracks should be encoded as PCM with a sample rate of 48 kHz at a depth of 24 bits/sample, hence delivered separately, see section 4.8 and 'Appendix B – Naming of Audio Channels when delivering multiple mono WAV files'. (If interleaved audio is used, according to SMPTE 314M, then only 16 bits/sample is obtained).

5.4. Timecode

For content with 50 Hz motion portrayal (progressive and interlace), as well as for content with 25 Hz motion portrayal, a 25-counting timecode (25 T/C) must be used.

To ensure compatibility with downstream systems, timecode must be continuous.

5.5. Metadata

Metadata is the name for all the information which is not audio or video essence, but which is required to ensure that contents of the file can be identified correctly.

The metadata required is specified below and must be delivered as a separate Excel-file (the 'Programme Metadata File'), based on a template provided by SVT via https://b2b.svt.se/program/komplett-leverans/technical-specifications/downloads.html. This file can be edited with any Microsoft Excel-compatible spreadsheet application.

For each delivery of one or more files containing video essence for a specific programme, at least one Programme Metadata File containing metadata must also be included. If the metadata differs between episodes, several Programme Metadata Files can be provided.

The naming of the Programme Metadata File must adhere to the following convention:

- If all episodes are included in the delivery, the programme-id (seven numbers, 0-9) identifies the programme (series), followed by the episode part indicating that this Programme Metadata File provides information about all episodes (NNN).
- PG-3993939-NNNA-SA_SKA_DET_LATA.xls

If all episodes are not included in the delivery, the specific episodes must be included in the name, comma-separated:

- PG-3993939-001A,002A,003A-SA_SKA_DET_LATA.xls
- PG-3993939-004A-SA_SKA_DET_LATA.xls

5.5.1. Delivery Requirements in MXF

This section is not applicable in SVT context for the time being.

5.5.2. Metadata Completion

Editorial metadata:

Element name	Definition and usage	Typical values
Series Title	The final title of a grouping of publishable assets with sharing identification and branding linked by common characters, subject matter, style or story. This could be a series, serial or themed grouping. 'One-Off' programmes with a single title should give it here as well as in 'Programme Title' below.	Så ska det låta, season 24
Programme Title	The title of a Programme Version for a specific purpose. Note: Programme Title may change between the point of commission/production and final delivery from post production. Note: Must indicate the version where applicable – e.g. pre/post watershed. Note: 'One-Off' programmes with a single title should give it here as well as in 'Series Title' above.	Så ska det låta
Episode Title / Episode No	Final episode name and/or number used to identify an individual episode within a Series. Not used for version information.	Episode 3
Production Number	*Given to you by SVT!* A unique number used to identify an individual Programme Episode and/or Version. *Also known as Programme ID or 'Vision-ID' internally at SVT.*	1234567-001A
Originator	Company responsible for creating the programme.	Production company AB
Copyright Year	Year in which the production was completed.	2013
Distributor	The name of the person or company/companies providing the content. May be a third party for secondary distribution rights.	Providing company AB
SVT Commissioning Unit	Unit within SVT that commissioned the programme.	SVT ATV, Göteborg

Video metadata:

Element name	Definition and usage	Typical values
Video codec	The video codec employed for the creation of the file.	DNxHD 175x (a.k.a. 185x) (720p/50, 50 Hz motion portrayal)

Picture format	The signal standard (frame resolution and aspect ratio) of the encoded file.	1280x720p/50, 16x9 (720p/50, 50 Hz motion portrayal)
Video comments	The comments which illustrate the subjective quality and any known artefacts or defects (including intentional) within the video content discovered during production / post production / or any subsequent technical QC/Review process.	

Audio metadata:

Element name	Definition and usage	Typical values
Audio Track Layout	Code indicating the audio track layout in accordance with EBU R 123 (HD) and R 48 (SD). Assumption is to always have 16 tracks (although 4 for SD). Unused tracks must contain digital silence. Note: To include valid digital silence is required. Note: This selection directly affects Secondary Language, and Tertiary Language.	R123:16b
Primary Audio Language	Primary audio language used in the Programme Version.	Swedish
Secondary Audio Language	Secondary audio language used in the Programme Version.	Finnish
Tertiary Audio Language	Tertiary audio language used in the Programme Version.	Danish
Audio Comments	The comments which illustrate the subjective quality and any known artefacts or defects (inc. intentional) within the audio content discovered during production / post production / or any subsequent technical QC/Review process. In addition: a note if the programme, with prior agreement, has been mixed according to the old “Nordic Scale” standard.	
Channel Mode & LFE	Defines which audio channels are used in the mix. Examples: 3/2/1 (3 front channels, 2 surround channels, 1 LFE channel), 2/0/0 (2 front channels only, i.e. stereo).	3/2/1
Centre Downmix Level	The change of level for the centre channel when downmixing to two-channel audio.	-3 dB

Surround Downmix Level	The change of level for the surround channels when downmixing to two-channel audio.	-3 dB
Low Loudness Flag	Signals if integrated programme loudness is intentionally lower than -23 LUFS	No

Timecode metadata:

Field name	Definition and usage	Typical values
Start of repeating group		
Part Number	Identifier for each hard part no. Note: This should indicate the part number within the entire programme even if the programme is being delivered as more than one file – e.g. one file might contain parts 3-6 only. (Not required for soft parted material).	1
Part Total	Total Programme Parts. Identifier for the total number of parts in the entire programme. (Not required for soft parted material).	2
Part SOM	Part Start of Media (SOM). Timecode for the first frame of the part.	10:00:00:00
Part Duration	Duration of the part as a timecode.	00:30:00:00
End of repeating group		
Total number of parts	This denotes the total no. of hard parts contained within the file. Hard parting is where a programme is delivered as parts separated by black (and or idents) within a file. Note: This is not to be confused with Part Total (Total Programme Parts).	1
Total programme duration	Total duration of programme. For hard parted programmes, this is the total of all part durations.	01:00:00:00

Access services metadata:

Element name	Definition and usage	Typical values
Open Captions Present	This status is to be set if the delivered programme contains any visible (in-vision) subtitles. Note: This does not include naming or place captions etc.	Yes

Open Captions Language	This describes the primary language of the in-vision subtitles.	Swedish
Signing Present	This status is to be set if the delivered programme contains any in vision signing for the hard of hearing.	No

Additional metadata:

Element name	Definition and usage	Typical values
Textless Elements Exist	Indicates whether the delivered file includes any textless elements after the end of the programme.	Yes
Programme Has Text	Indicates whether the main programme has any text or is completely 'clean'.	Yes
Programme Text Language	Primary text language used in the programme.	Swedish

Contact Information metadata:

Element name	Definition and usage	Typical values
Contact Email	The email address of the SPOC (Single Point of Contact) for the use of the recipient regarding any delivery or technical issues encountered with the delivered file.	contact@yourcompany.com
Contact Telephone No.	The direct telephone number of the SPOC (Single Point of Contact) for the use of the recipient regarding any delivery or technical issues encountered with the delivered file.	+46 8 784 00 00

Part 3 – SVT File

This part of the document details SVT's contact and delivery information and any specific or genre based technical requirements for **file** delivered programmes.

6. SVT File Delivery

6.1. File Delivered Programmes

6.1.1. Technical Responsibility and Contacts

The Duty Engineering Managers (DEMS) in SVT Media Centres are the main point of contact for technical enquiries affecting immediate (defined as 'on the day') file delivery.

Duty Engineering Managers (DEMS):

- Stockholm: +46 8 784 76 80 / mcstockholm@svt.se
- Göteborg: +46 31 83 72 50 / mcgbg@svt.se
- Malmö: +46 40 22 72 00 / mc-malmo@svt.se
- Umeå: +46 90 17 51 40 / mc-umea@svt.se

For all other enquiries, contact your commissioner or consult the SVT B2B web site https://b2b.svt.se/.

6.2. File Delivery

6.2.1. First Time Set-up

Production companies or post-production companies, who have not delivered a file to SVT before, must contact their commissioner and/or the DEMS.

6.2.2. Standard File Delivery

For problems and 'on the day' file delivery, contact the DEMS.

6.2.3. Close to Transmission Delivery

Programmes that are commissioned to deliver close to transmission will be given full instructions at the time of commission. The producers must contact their commissioner and/or the DEMS if at any time during production or post-production they believe the programme may miss the contracted delivery date.

6.3. Programme File Naming

Contact your commissioner at SVT in each programme case to receive SVT's specific programme identifier information. Use that specific programme identifier information given to you in all correspondence and delivery.

6.3.1. Programme Number Metadata Format

The specific programme identifier information given to you will be named as follows:

- A prefix identifying a programme for delivery to SVT (PG-), a programme-id (seven numbers, 0-9) identifying the programme (series), a hyphen, and an episode number (three numbers, 0-9) followed by a version-identifier (e.g. A), followed by a hyphen and the programme title in upper case (one or more characters, A-Z).
- Any spaces in the programme title must be replaced with underscore "_".
- The maximum length of the title is 238 characters.
- Filename extensions must be in lowercase.
- Umlaut characters (e.g. Å, Ä and Ö) are not permitted.

6.3.2. File Naming

Programme files delivered to SVT must be named with the, to you given, specific programme identifier information:

Requested Programme File Name Format	Example Filename	Notes
PG-1234567-001A-PROGRAMME_TITLE.xxx	PG-1300828-006A-SA_SKA_DET_LATA.mxf	xxx = mxf, mov, wav, pdf, doc, xls etc.

6.4. File Naming QC reports

The not mandated, but recommended, delivery of Quality Control (QC) reporting files follow the same naming convention as programme files with the report name as a further identifier after an underscore:

- An Automatic Quality Control (AQC) Report = _AQC
- A Photosensitive Epilepsy (PSE) Report = _PSE
- An Eyeball QC Report = _EYE

Some AQC devices combine the AQC and PSE reports and others allow manual entry for comments from the Eyeball QC. SVT accepts all options if it is clear from the file name what is included.

The not mandated, but recommended, Quality Control (AQC, PSE and Eyeball) reports delivered to SVT must have the same, by SVT to you given, specific programme identifier information:

Requested Report Name Format	Example Filename	Notes
PG-1234567-001A-PROGRAMME_TITLE_AQC.pdf	PG-1300828-006A-SA_SKA_DET_LATA_AQC.pdf	-
PG-1234567-001A-PROGRAMME_TITLE_PSE.pdf	PG-1300828-006A-SA_SKA_DET_LATA_PSE.pdf	-
PG-1234567-001A-PROGRAMME_TITLE_EYE.pdf	PG-1300828-006A-SA_SKA_DET_LATA_EYE.pdf	-
PG-1234567-001A-PROGRAMME_TITLE_AQC_PSE.pdf	PG-1300828-006A-SA_SKA_DET_LATA_AQC_PSE.pdf	-

The programme file and, if available, QC report PDFs should be put into a single folder that must have the same name as the programme file (but no extension).

For the above example, the folder name would be: PG-1300828-006A-SA_SKA_DET_LATA

6.5. Surround Sound

SVT has no additional requirements or instructions beyond compliance to section 2.5. thru section 2.7.

6.6. End credits

SVT has no additional requirements beyond compliance to the ‘Safe Areas for On-Screen Text’ – see section 1.11.

Regarding use of branding and trademarks, contact your commissioner at SVT.

6.7. Programme Parting

SVT has no additional requirements beyond compliance to section 4.2.

6.8. SD File Programmes

Programmes that are commissioned or required to be delivered in Standard Definition must always be 16:9. Archive programmes made from entirely 4:3 content must be placed in a 16:9 raster (i.e. Pillar Box format).

6.9. UHD Programmes

Ultra-High Definition (UHD) programmes are not accepted by SVT.

6.10. 3D Delivery

SVT does not accept stereoscopic 3D programmes.

Appendix A – Version Control

DPP File:

Version	Date	Part and section	Required/Information	Update
UK DPP v5.0 File	March 2017	All	Required	See Change Log via https://www.digitalproductionpartnership.co.uk/what-we-do/technical-specifications/uhd-hd-sd-programmes/

SVT File:

Version	Date	Part and section	Required/Information	Update
SVT v1.3	February 2016	All	Required	-
SVT v5.0 File	March 2018	All	Required	File-, Live- and News-requirements are now published in three separate documents. Tape-requirements no longer exist. Naming of headings, of parts and sections, now follow those in UK DPP v5.0 File alt Live. *SVT's requirements are though different.*
SVT v5.1 File	March 2021	All	Required	Updated URL EBU R128 update.

Appendix B – Naming of Audio Channels when delivering multiple mono WAV files

Quote from section 4.6:

"In the case of multiple 1-channel (mono) WAV files, the file names must match those specified above in the cells to indicate the content of the file, e.g. PG-1234567-001A-PROGRAMME_TITLE-321_ME_LS.wav indicating the left surround channel in a 5.1 (3/2/1) multichannel music and effects mix. See 'Appendix B – Naming of Audio Channels when delivering multiple mono WAV files' for naming of all channel possibilities."

Short form naming in the table "Channel Allocations", section 4.6.	**End of file naming**	**Indicates**	**Comments**
St. L	-ST_L	Stereo Left	Main audio
St. R	-ST_R	Stereo Right	Main audio
St. M&E L	-ST_ME_L	Stereo Music & Effects Left	
St. M&E R	-ST_ME_R	Stereo Music & Effects Right	
St. Aud Desc L	-ST_AD_L	Stereo Audio Description Left	
St. Aud Desc R	-ST_AD_R	Stereo Audio Description Right	
5.1 L	-321_L	Multichannel Left (front)	Main audio
5.1 R	-321_L	Multichannel Left (front)	Main audio
5.1 C	-321_C	Multichannel Centre (front)	Main audio
5.1 LFE	-321_LFE	Multichannel Low Frequency Effects	Main audio
5.1 Ls	-321_LS	Multichannel Left Surround	Main audio
5.1 Rs	-321_RS	Multichannel Right Surround	Main audio
5.1 M&E L	-321_ME_L	Multichannel Music & Effects Left (front)	
5.1 M&E R	-321_ME_R	Multichannel Music & Effects Left (front)	
5.1 M&E C	-321_ME_C	Multichannel Music & Effects Left (front)	
5.1 M&E LFE	-321_ME_LFE	Multichannel Music & Effects Low Frequency Effects	
5.1 M&E Ls	-321_ME_LS	Multichannel Music & Effects Left Surround	
5.1 M&E Rs	-321_ME_RS	Multichannel Music & Effects Right Surround	
5.1 Lang 1 L	-321_LANG1_L	Multichannel Language 1 Left (front)	
5.1 Lang 1 R	-321_LANG1_R	Multichannel Language 1 Right (front)	
5.1 Lang 1 C	-321_LANG1_C	Multichannel Language 1 Centre (front)	
5.1 Lang 1 LFE	-321_LANG1_LFE	Multichannel Language 1 Low Frequency Effects (front)	
5.1 Lang 1 Ls	-321_LANG1_LS	Multichannel Language 1 Left Surround	
5.1 Lang 1 Rs	-321_LANG1_RS	Multichannel Language 1 Right Surround	
5.1 Lang 2 L	-321_LANG2_L	Multichannel Language 2 Left (front)	
5.1 Lang 2 R	-321_LANG2_R	Multichannel Language 2 Right (front)	
5.1 Lang 2 C	-321_LANG2_C	Multichannel Language 2 Centre (front)	
5.1 Lang 2 LFE	-321_LANG2_LFE	Multichannel Language 2 Low Frequency Effects (front)	

5.1 Lang 2 Ls	-321_LANG2_LS	Multichannel Language 2 Left Surround	
5.1 Lang 2 Rs	-321_LANG2_RS	Multichannel Language 2 Right Surround	
St Lang 1 L	-ST_LANG1_L	Stereo Language 1 Left	
St Lang 1 R	-ST_LANG1_R	Stereo Language 1 Right	
St Lang 2 L	-ST_LANG2_L	Stereo Language 2 Left	
St Lang 2 R	-ST_LANG2_R	Stereo Language 2 Right	
St Lang 3 L	-ST_LANG3_L	Stereo Language 3 Left	
St Lang 3 R	-ST_LANG3_R	Stereo Language 3 Right	

Supplements

Technical Supplement for the delivery of Surround Sound Television Programmes

The supplement by Digital Production Partnership, https://www.digitalproductionpartnership.co.uk/, is not applicable in SVT context regarding File or Live delivery. However, proposed 'Dolby E' settings are described in the document 'Technical Specification for the Delivery of Live Television Programmes to SVT'.

Technical Supplement for DPP AS-11 File Production Metadata

The supplement by Digital Production Partnership, https://www.digitalproductionpartnership.co.uk/, is not applicable in SVT context. SVT's metadata requirements regarding file delivery are specified in section 5.5. thru 5.5.2.

Technical Supplement for the delivery of Programmes with High Dynamic Range

The supplement by Digital Production Partnership, https://www.digitalproductionpartnership.co.uk/, is not applicable in SVT context. Programmes with High Dynamic Range (HDR) are not accepted by SVT.

Technical Supplement for the delivery of 3D Television Programmes

The supplement by Digital Production Partnership, https://www.digitalproductionpartnership.co.uk/, is not applicable in SVT context. 3D Television Programmes are not accepted by SVT.

Technical Supplement for Programmes Acquired on Super-16 Film

The supplement by Digital Production Partnership, https://www.digitalproductionpartnership.co.uk/, is not applicable in SVT context. SVT is not commissioning new programmes based on Super-16 film, see section 1.5.

Technical Standard for Delivery of HD Promotions & Presentation Material

The supplement by Digital Production Partnership, https://www.digitalproductionpartnership.co.uk/, is not applicable in SVT context. For the time being, HD Promotions & Presentation Material should be treated like conventional programmes, but with a, to you given, specific programme identifier after discussion with your commissioner at SVT.

Technical Standard for Subtitle Files / Subtitle Exchange Format (DPP-EBU-TT)

The supplement by Digital Production Partnership, https://www.digitalproductionpartnership.co.uk/, is not applicable in SVT context. SVT's requirements regarding Closed Captions (Subtitles) are specified in section 4.9.

Quality Control Requirements

The supplement by Digital Production Partnership, https://www.digitalproductionpartnership.co.uk/, is not applicable in SVT context. Delivery to SVT may involve, but does not mandate, the specific 'AS-11 UK DPP File Format Check', the specific 'DPP AQC Content Check' nor the specific 'DPP Eyeball QC Content Check'. SVT's requirements regarding Quality Control (QC) are specified in section 3.

Eyeball QC Report (Template)

The supplement by Digital Production Partnership, https://www.digitalproductionpartnership.co.uk/, is not applicable in SVT context. Delivery to SVT may include, but does not mandate, the specific 'Eyeball QC Report' by the DPP.

A Product Guide for File-Based Photo Sensitive Epilepsy Testing

The supplement by Digital Production Partnership, https://www.digitalproductionpartnership.co.uk/, is not applicable in SVT context. File delivery to SVT may involve, but does not mandate, use of the specific products listed by the DPP that competently perform PSE testing in the context of file-based QC.

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