



HD: Summary of Delivery Formats

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Description	<p>All programmes that are part of the BBC High Definition Trial will be required to deliver to the specifications in the BBC High Definition Technical Standards documents.</p> <p>This document is a summary of the key requirements for High Definition delivery during the trial. Its aim is to highlight the changes made to the Standard Definition Standards document. The page numbers refer to the relevant sections of the full HD Trial Delivery Standards.</p>		
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SUMMARY OF DELIVERY FORMATS For the BBC High Definition Trial

All programmes that are part of the BBC High Definition Trial will be required to deliver to the specifications in the BBC High Definition Technical Standards documents.

This document is a summary of the key requirements for High Definition delivery during the trial. Its aim is to highlight the changes made to the Standard Definition Standards document. The page numbers refer to the relevant sections of the full HD Trial Delivery Standards.

BBC Worldwide (or other co-producers) may also require High Definition delivery. Although every effort has been made to keep the BBC Television and the BBC Worldwide standards the same, there may be some variations. It is possible to discuss variation of the delivery standards where different requirements cause unacceptable editorial or technical compromise.

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High Definition technology, formats and equipment are still relatively new and we expect changes and updates to occur. The BBC's use of proprietary compression formats such as HDCam tape and DolbyE audio encoding should not be considered an endorsement of these products or that the implied compression techniques will always be acceptable for programme mastering. Both HDCam and DolbyE should be used with care and multi-generation copying should be avoided.

1. Delivery Format

- 1.1. Programmes for the HD trial must be delivered on HDCam tape. HDCamSR and HDD5 are currently not acceptable.
- 1.2. Programmes must be acquired, post produced and delivered in high definition. HD programmes may contain a maximum of 25% non high definition material (that is, SD or standard definition material see 2.1 below).
- 1.3. To achieve the best possible quality of up-converted standard definition material, particular care should be taken and only high quality up-conversion equipment should be used. Use of "in VTR" up converters or up conversion using non-linear editing software is not acceptable.

2. Standard Definition

- 2.1. The following formats are considered to be standard definition:
 - o All standard definition video formats

- HDV from all manufactures
- Cameras with image sensors under 1/2"
- Frame based recording formats below 100Mbs
- Intra-frame based recording formats below 50Mbs
- Super16 film whether transferred to tape in high definition or not
- 35mm film transferred to standard definition tape formats
- Non linear editing codecs with bit rates below 160Mbs
- Live contributions via links at less than 60Mbs (MPEG2)

3. Video Standards

- 3.1. The BBC will accept High Definition programme acquired using either of the following:
- 1920 x 1080 interlace at 25 frames a second (now called 1080i25) or
 - 1920 x 1080 progressive at 25 frames a second (now called 1080p25)
- 3.2. All delivered high definition master tapes must be 1080i25 (whether acquired 1080p25 or 1080i25). Rollers and moving captions must be added in 1080i25 to prevent unacceptable judder.
- 3.3. Definition Film Effect. Most High Definition cameras can capture in both Interlace and Progressive modes. It is not acceptable to add film effect to high definition images for high definition delivery. Where film motion is a requirement, progressive capture is the preferred method.
- 3.4. Technical standards are fully detailed ITU-R BT.709-5

4. Action and Caption safe areas

Action and caption safe areas for High Definition programmes are the same as the safe areas for standard definition delivery:

Action should be protected for 14:9 display
Captions should be protected for 4:3 display

5. Audio

There is no change to the general audio requirements. Line-up, levels and audio to video synchronisation remain the same as the requirements for standard definition delivery. There are two possible audio delivery options though:

- 5.1. Stereo delivery
- There is no change to the audio delivery requirements for High Definition programmes delivered in stereo
 - Tracks 1&2 - Stereo main audio Left (A1) and Right (A2)
 - Tracks 3&4 - Not required
- 5.2. Multi-channel (5.1) Delivery

- When multi-channel audio is required it should be encoded using Dolby E.
- Tracks 1&2 - Stereo main audio Left (A1) and Right (A2)
- Tracks 3&4 – Dolby E encoded
- Within the Dolby E stream the tracks must be ordered as follows:

Dolby Track	Audio Track
1	Left
2	Right
3	Centre
4	LFE (optional)
5	Surround Left
6	Surround Right
7	Not required
8	Not required

- Dialnorm settings between -22 and -26 are acceptable.

5.3. Multi-channel (5.1) timing on tape

- The Dolby E encoded signal should be in sync with the stereo signal ON TAPE. This positioning allows further processing to be done to the final tape if required. The DolbyE signal will be advanced by 1 frame in the play-out chain to compensate for the Dolby decoder delay

5.4. Dolby E Stream

- The Dolby E stream on audio tracks 3 & 4 should be continuous from -30 seconds (30 seconds before start of programme) until 10 seconds after the end of the programme

6. Delivery and Technical Review

- 6.1. Only a high definition version of the programme is required for transmission during the trial. A digibeta (standard definition) copy will be made after the high definition version has passed technical review. The number of the digibeta tape will be supplied for all paperwork. This process only applies to the trial period and the process will be reviewed at the end.
- 6.2. If a transmission tape has to be recalled after technical review for any reason, it is the responsibility of the programme supplier to ensure the digibeta version is removed as well. Normally a new high definition version of the programme will be technically reviewed and a new digibeta copy made. If very late changes to a programme are required requests for transmission tapes should be made in the usual way.