

AVA Documents
Document Sharing Hub

SMPTE STANDARD

for Television — MPEG-2 Video Elementary Stream Editing Information



Page 1 of 8 pages

1 Scope

This standard defines the MPEG video elementary stream (ES) information to facilitate seamless edits under defined circumstances. The video ES, as defined by the MPEG standards, is supplemented with additional information for professional studio applications. Supplementary information will be carried within the sequence header and the user data area of the video ES. This standard defines the data to be carried and the location of the data.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

ANSI/SMPTE 293M-1996, Television — 720 × 483 Active Line at 59.94-Hz Progressive Scan Production — Digital Representation

ANSI/SMPTE 296M-1997, Television — 1280 × 720 Scanning, Analog and Digital Representation and Analog Interface

SMPTE 12M-1999, Television, Audio and Film — Time and Control Code

SMPTE 274M-1998, Television — 1920 × 1080 Scanning and Analog and Parallel Digital Interfaces for Multiple Picture Rates

SMPTE 309M-1999, Television — Transmission of Date and Time Zone Information in Binary Groups of Time and Control Code

SMPTE 326M-2000, Television — SDTI Content Package Format (SDTI-CP)

SMPTE 327M-2000, Television — MPEG-2 Video Recoding Data Set

SMPTE RP 186-1995, Video Index Information Coding for 525- and 625-Line Television Systems

SMPTE RP 202, Video Alignment for MPEG-2 Coding

ISO/IEC 13818-2:1996, Information Technology — Generic Coding of Moving Pictures and Associated Audio Information: Video

ITU-R BT.601-5 (10/95), Studio Encoding Parameters of Digital Television for Standard 4:3 and Wide-Screen 16:9 Aspect Ratios

ITU-R BT.656-4 (02/98), Interfaces for Digital Component Video Signals in 525-Line and 625-Line Television Systems Operating at the 4:2:2 Level of Recommendation ITU-R BT.601 (Part A)

3 MPEG ES

ISO/IEC 13818-2 defines the characteristics of the MPEG elementary stream (ES). When used in a professional environment where seamless edits (splices) are required, supplementary data needs to be carried by the bit stream.

3.1 General

Seamless frame accurate editing of compressed video is most easily accomplished with use of short GOP structures. Longer GOP structures can be edited by decoding and reencoding, by transcoding to shorter GOP structures, or with more involved processing, edited directly. The best approach will be determined by a range of application-specific considerations.

3.2 Sequence header

ISO/IEC 13818-2 does not define the repetition frequency of the sequence header. To be compliant with this standard, the sequence header shall exist at every I frame.

3.3 VBV_delay

An accurate vbv_delay value shall be carried in the video elementary stream. The value of 0xffff shall not be allowed. The vbv_delay value may be relied upon for remultiplexing elementary streams into transport streams.

4 MPEG ES-syntax elements

The following syntax elements, and the functional descriptions, shall be inserted in the MPEG ES in the user data area:

4.1 V/H coding phase

The current implementation of MPEG does not specify the horizontal and vertical coding phase. This standard requires that the vertical and horizontal coding phase be known in order for decoding and peripheral equipment to process correctly the signal.

V and H coding information shall be included only for SDTV signals where the coding phase is not compliant with SMPTE RP 202. For HDTV signals, H/V coding phase information is defined by SMPTE RP 202.

4.2 Time code

Provision is made for the insertion of two time codes complying with SMPTE 12M. At least one time code, reference date time stamp (as defined in SMPTE 326M) shall be carried as a means of maintaining

synchronization with other content or metadata streams. Carriage of a second time code is optional. Compliant decoders shall have the capability to decode the two time codes.

4.3 Picture order

Picture order information specifies the picture duration and is the equivalent to the PTS/DTS present in the MPEG transport stream. Picture order value is counted by field units. Picture order information will be used by multiplexers and remultiplexers to know the picture duration and to be able to parse the repeat_first_field information. In some cases, the latency of the system will be minimized using the picture order information.

4.4 Video index

Video index, as defined by SMPTE RP 186, shall be carried if present on the baseband signal. Information carried by video index should be preserved during any coding, recoding, editing, or transcoding process. It is envisioned that the data described in the forthcoming SMPTE metadata dictionary (SMPTE RP 210) will be handled by the transport mechanism described in SMPTE 326M. These parametric data will include all of the parameters currently coded in video index, although the data representation of some items may be different.

4.5 Ancillary data

Data that is carried in the vertical interval of the baseband signal should be preserved. Ancillary data may consist of more than 23 consecutive zeros. To prevent this condition, a marker shall be inserted every 22 bits.

4.6 History data

History data, consisting of original and subsequent encoding parameters that may be useful in transcoding or reencoding, may be carried by the bit stream. SMPTE 327M defines the content of the history data information. History data may consist of more than 23 consecutive zeros. To prevent this condition, a marker shall be inserted every 22 bits.

4.7 User data

User data is defined by ISO/IEC 13818-2.