Amendment 1:2015 to
SMPTE ST 425-5:2014

SMPTE STANDARD

Image Format and Ancillary Data Mapping for the Quad Link 3 Gb/s Serial Interface — Amendment 1

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Foreword

SMPTE (the Society of Motion Picture and Television Engineers) is an internationally-recognized standards developing organization. Headquartered and incorporated in the United States of America, SMPTE has members in over 80 countries on six continents. SMPTE's Engineering Documents, including Standards, Recommended Practices, and Engineering Guidelines, are prepared by SMPTE's Technology Committees. Participation in these Committees is open to all with a bona fide interest in their work. SMPTE cooperates closely with other standards-developing organizations, including ISO, IEC and ITU.

SMPTE Engineering Documents are drafted in accordance with the rules given in its Standard Operations Manual.

Amendment 1 to SMPTE ST 425-5:2014 was prepared by Technology Committee 32NF.

Approved
March 26, 2015

Introduction

The purpose of this amendment is to add support for UHDTV colorimetry, and to provide additional information about the size of the ancillary data space available.

Change instructions are shown in *italics*. Inserted text is shown thus. Deleted text is shown ~~thus~~.

1 Amendment of Section 3 Normative References

Replace ~~SMPTE ST 425-3: Image Format and Ancillary Data Mapping for the Dual Link 3 Gb/s Serial Interface~~ *with* Amendment 1:2014 to SMPTE ST 425-1:2011

2 Amendment of Section 4 Definition of Terms

Replace ~~SMPTE ST 425-3~~ *with* Amendment 1:2014 to SMPTE ST 425-1:2011

3 Amendment of Section 5 Image Formats

In the title row of the final column of Table 1 "2160-line Source Image Format" amend the column title as follows:

Sub Image Level B-DL Mapping Structure

4 Amendment of Section 6 Level A Mapping for 2160-line Source Images

At the end of Section 6.2 "Ancillary Data" add the paragraph:

Annex C provides information about the size of the ancillary data space available

In Section 6.2.1 "Audio Data" amend paragraph 4 as follows:

The audio data shall be mapped into the data stream pair consisting of data streams one and two first and any remaining data shall then be mapped into the data stream pair consisting of data streams three and four, then into the data stream pair consisting of data streams five and six, then into the data stream pair consisting of data streams seven and eight.

In Section 6.2.3.1 Table 6 "Payload Identifier Definitions for 2160-line Video Payload for Level A Mapping on a Quad-link 3Gb/s (nominal) Serial Interface" delete contents of Byte 3 bit 5 and bit 4

~~reserved (0)~~

Merge Byte 3 bit 5 and bit 4 into a single 2-bit field with the contents:

Colorimetry
Rec 709*1 (0)
Color VANC Packet (1)
UHDTV*2 (2)
Unknown (3)

Immediately following Table 6 "Payload Identifier Definitions for 2160-line Video Payload for Level A Mapping on a Quad-link 3Gb/s (nominal) Serial Interface" add:

Notes:

*1 Rec 709 indicates ITU-R BT709 colorimetry and is equivalent to ST 2036-1 Conventional System Colorimetry.

*2 UHDTV indicates ST 2036-1 UHDTV colorimetry and is equivalent to ITU-R BT2020 colorimetry

In Section 6.2.3.4 "Byte 3 – Sampling Structure, Aspect Ratio and Horizontal Size" delete

~~Bit 5 and bit 4 shall be set to 0h (reserved)~~

and replace with:

Bits b5 and b4 shall identify the colorimetry for the image formats identified in Table 1 such that:

b5:b4 = 0h shall identify Rec 709 colorimetry

b5:b4 = 1h shall identify that the colorimetry is defined in the Color VANC packet as referenced in ST 2048-2

b5:b4 = 2h shall identify UHDTV colorimetry

b5:b4 = 3h shall identify unknown colorimetry

In Section 6.2.3.5 "Byte 4 – Sub Image Identification and Quantization Bit Depth" amend the first sentence of the fifth paragraph as follows:

For the 3G-SDI Link 2, 3G-SDI Link 3 and 3G-SDI Link 4, bit b2 shall signal the nature of any audio data carried in the 3G-SDI Link ~~2~~ such that:

In Section 6.2.3.5 "Byte 4 – Sub Image Identification and Quantization Bit Depth" amend the third sentence of the fifth paragraph to:

1h identifies that ~~audio if present in the~~ 3G-SDI Link 2, 3G-SDI Link 3 and 3G-SDI Link 4 each carry a copy of the 3G-SDI Link 1 audio

5 Amendment of Section 7 Level B Dual-Link Mapping for 2160-line Source Images

At the end of Section 7.2 "Ancillary Data" add the paragraph:

Annex C provides information about the size of the ancillary data space available

In Section 7.2.3.1 Table 9 "Payload Identifier Definitions for 2160-line Video Payload for Level B-Dual Link Mapping on a Quad-link 3Gb/s (nominal) Serial Interface" replace the contents of Byte 3 bit 7 and bit 4

~~reserved (0)~~

with:

Colorimetry
(see Section 7.2.3.4)

In Section 7.2.3.4 "Byte 3 – Sampling Structure, Aspect Ratio and Horizontal Size" delete

~~Bit 7 shall be set to 0h (reserved)~~

and replace with:

Bits b7 and b4 shall identify the colorimetry for the image formats identified in Table 3 such that:

- b7,b4 = 0h shall identify Rec 709 colorimetry*1
- b7,b4 = 1h shall identify that the colorimetry is defined in the Color VANC packet as referenced in ST 2048-2
- b7,b4 = 2h shall identify UHDTV colorimetry*2
- b7,b4 = 3h shall identify unknown colorimetry

Notes:

*1 Rec 709 indicates ITU-R BT709 colorimetry and is equivalent to ST 2036-1 Conventional System Colorimetry.

*2 UHDTV indicates ST 2036-1 UHDTV colorimetry and is equivalent to ITU-R BT2020 colorimetry

In Section 7.2.3.4 "Byte 3 – Sampling Structure, Aspect Ratio and Horizontal Size" delete:

~~Bit 4 shall be set to 0h (reserved)~~

In Section 7.2.3.5 "Byte 4 – Channel Assignment and Quantization Bit Depth" amend the first sentence of the fifth paragraph as follows:

For the 3G-SDI Link 2, 3G-SDI Link 3 and 3G-SDI Link 4, bit b2 shall signal the nature of any audio data carried in the 3G-SDI Link ~~2~~ such that:

In Section 7.2.3.5 "Byte 4 – Channel Assignment and Quantization Bit Depth" amend the third sentence of the fifth paragraph as follows:

1h identifies that ~~audio if present in the~~ 3G-SDI Link 2, 3G-SDI Link 3 and 3G-SDI Link 4 each carry a copy of the 3G-SDI Link 1 audio

6 Amendment of Annex A Bibliography (Informative)

Add:

SMPTE RP 291-2:2013, Ancillary Data Space Use — 4:2:2 SDTV and HDTV Component Systems and 4:2:2 2048 ×1080 Production Image Formats

7 Amendment of Annex B Square Division of 2160-image formats (informative)

In Annex B.2 amend the first sentence as follows:

With the Level B-DL mapping, each Sub Image is then mapped into two 10-bit data streams ~~according to the Mapping Structure rules~~ as defined in ST 425-1 Level B-DL Mapping Structures which are shown in Table 1 of this standard.

8 Amendment of Annex C Document Road Map (Informative)

Amend the title line of this Annex as follows:

Annex ~~C~~D Document Road Map (Informative)

Following "ANNEX B Square Division of 2160-image formats (informative)" and before "ANNEX D Document Road map (Informative)" add:

Annex C Ancillary Data Capacity of the Quad Link Interface (Informative)

The ancillary data space available in serial digital interface transports is approximately equivalent to horizontal interval space and vertical interval space for the video format being transported. In the case of images transported on the interface specified in this standard, it is dependent on the horizontal interval space and vertical interval space for each of the Data Streams being carried on the interface, multiplied by the number of Data Streams.

SMPTE RP 291-2 provides information on the size of the ancillary data space in a SMPTE ST 425-1 Level A interface and a Level B Dual Link interface.

For 2160-line source image formats specified in this standard, the available HANC and VANC data space on the quad link interface is 4 times the HANC and VANC data space available (as shown in the tables of SMPTE RP 291-2) on a SMPTE ST 425-1 3G SDI link interface carrying the corresponding Sub Image format.

SMPTE RP 291-2 also provides a method of calculating the available ancillary data space on any interface. These calculations provide the reader with the underlying formulas used to calculate the numbers in the tables, as well as providing a mechanism to calculate the space for interfaces not covered explicitly by SMPTE RP 291-2.