SMPTE STANDARD

Quad 3 Gb/s Serial Digital Interface for Stereoscopic Image Transport

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Approved
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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 Standards Operations Manual.

SMPTE ST 425-6 was prepared by Technology Committee 32NF.

Intellectual Property

At the time of publication no notice had been received by SMPTE claiming patent rights essential to the implementation of this Engineering Document. However, attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. SMPTE shall not be held responsible for identifying any or all such patent rights.

Introduction

This section is entirely informative and does not form an integral part of this Standard.

There is a need in the industry to have an interface for transporting stereoscopic images complying with the 4:2:2 and 4:4:4 10-bit or 12-bit image formats referenced by SMPTE ST 425-3, each of which can be transported by a dual-link SMPTE ST 424 serial interface.

Each Left Eye and Right Eye image is mapped onto four data streams according to the rules defined in SMPTE ST 425-3. The resulting eight data streams are then mapped into four 3G SDI links. Figure 1 gives an overview of the image mappings for 1080-line images and Figure 2 gives an overview of the image mappings for 2160-line images.

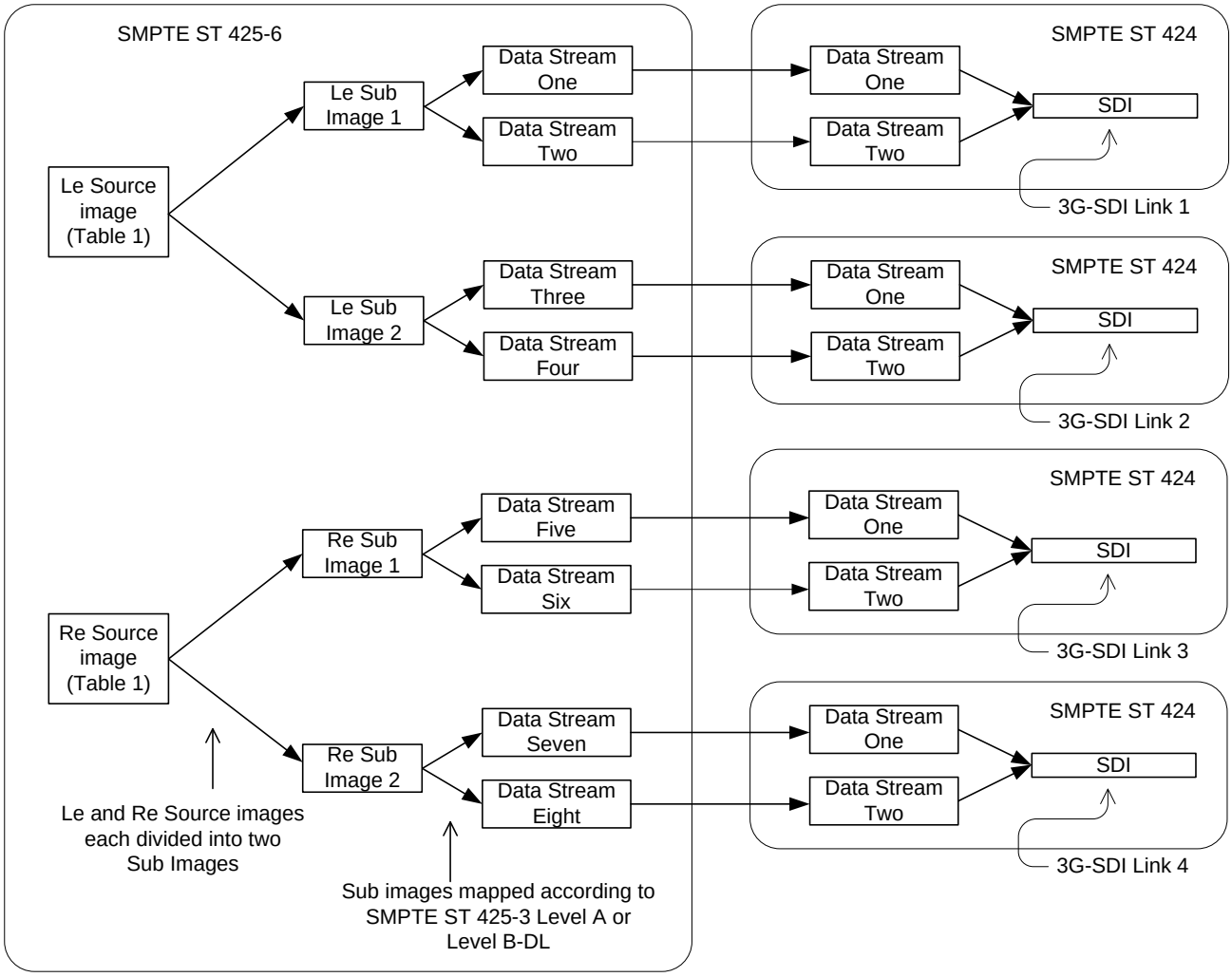

Figure 1 – Overview of the 1080-line Image Mapping

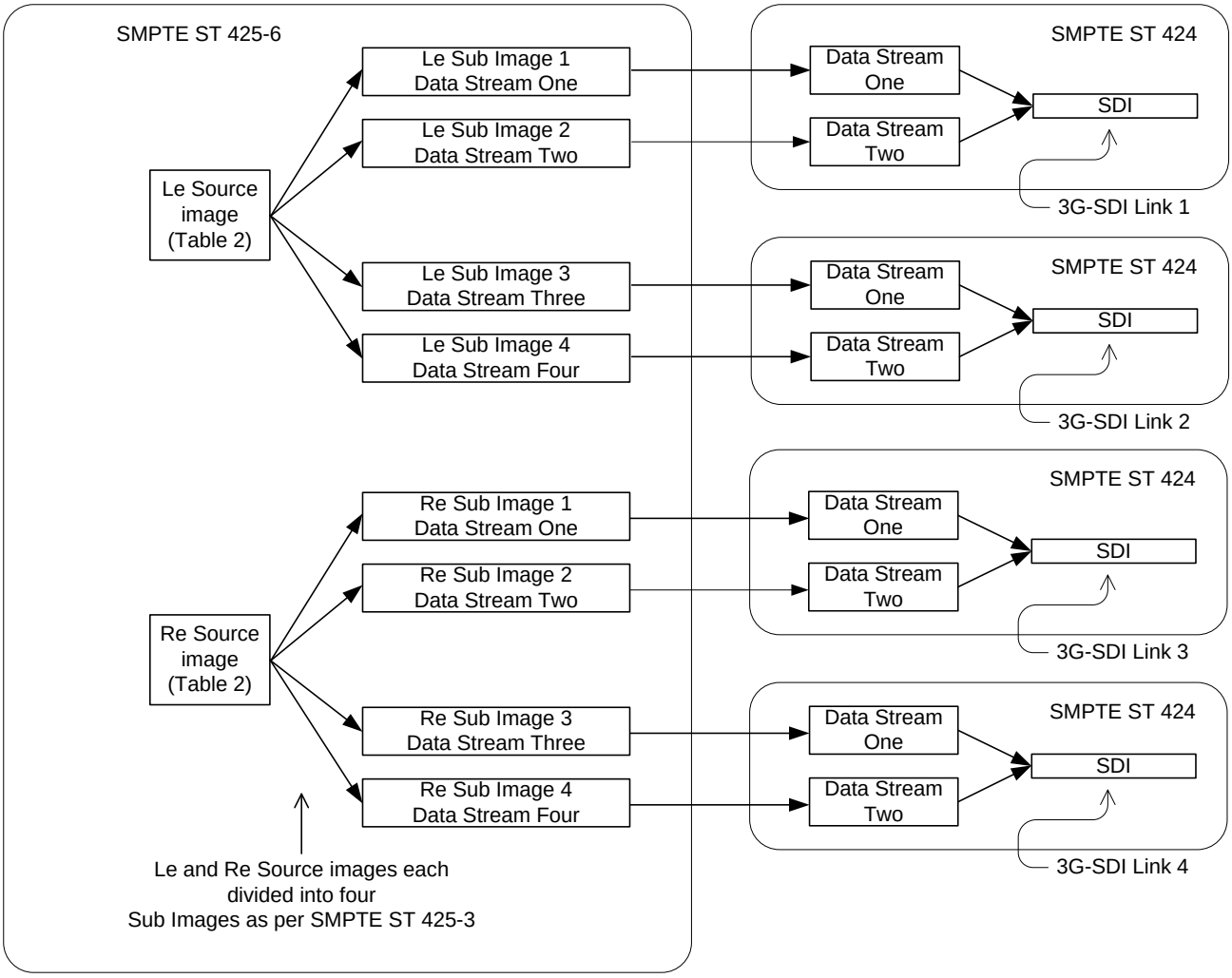

Figure 2 – Overview of the 2160-line Image Mapping

This standard also defines the payload identifier that will identify the Left/Right (L/R) eye images, audio and other associated ancillary data.

1 Scope

This standard defines a means of transporting stereoscopic images (Left eye and Right eye images) using an interface consisting of pairs of four data streams based on the SMPTE ST 425-3 data structures. The Left eye images are carried on four data streams of the interface and the Right eye images are carried on the other four data streams. The Left eye and Right eye images are each mapped onto the respective four data streams in accordance with the mapping rules of SMPTE ST 425-3.

The stereoscopic image formats to be transported using this standard are the 4:2:2 and 4:4:4 image formats enumerated in SMPTE ST 425-3. Mapping structures for the video essence and ancillary data are as defined in SMPTE ST 425-3.

This standard also defines the carriage of ancillary data such as the audio data, the audio control packets, the payload identifierand the time code.

It is not necessary for implementations to include support for all image formats, nor is it a requirement to support both mapping modes to conform to this standard. Implementers are encouraged to indicate supported formats and supported mapping modes in commercial publications.

2 Conformance Notation

Normative text is text that describes elements of the design that are indispensable or contains the conformance language keywords: "shall", "should", or "may". Informative text is text that is potentially helpful to the user, but not indispensable, and can be removed, changed, or added editorially without affecting interoperability. Informative text does not contain any conformance keywords.

All text in this document is, by default, normative, except: the Introduction, any section explicitly labeled as "Informative" or individual paragraphs that start with "Note:”

The keywords "shall" and "shall not" indicate requirements strictly to be followed in order to conform to the document and from which no deviation is permitted.

The keywords, "should" and "should not" indicate that, among several possibilities, one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required; or that (in the negative form) a certain possibility or course of action is deprecated but not prohibited.

The keywords "may" and "need not" indicate courses of action permissible within the limits of the document.

The keyword “reserved” indicates a provision that is not defined at this time, shall not be used, and may be defined in the future. The keyword “forbidden” indicates “reserved” and in addition indicates that the provision will never be defined in the future.

Unless otherwise specified, the order of precedence of the types of normative information in this document shall be as follows: Normative prose shall be the authoritative definition; Tables shall be next; followed by formal languages; then figures; and then any other language forms.

3 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.

SMPTE ST 12-2:2014, Transmission of Time Code in the Ancillary Data Space

SMPTE ST 352:2013, Payload Identification Codes for Serial Digital Interfaces

SMPTE ST 425-3:2014, Image Format and Ancillary Data Mapping for the Dual Link 3 Gb/s Serial Interface

4 Definitions

4.1
HANC
Horizontal Ancillary Data Space is the Ancillary Data Space located during the horizontal interval of a video line. The expressions HANC or HANC space are used interchangeably throughout the document

4.2
Stereoscopic Image Pair
Two uncompressed images representing a Left eye (Le) image and a Right eye (Re) image which are coincident in time having identical sampling structure, raster resolution, pixel depth and colorimetry.

4.3
VANC
Vertical Ancillary Data Space is the Ancillary Data Space located between SAV and EAV during the vertical interval of a video frame or field. The expressions VANC or VANC space are used interchangeably throughout the document.

5 Source Image Format

The source image formats shall be those 4:2:2 and 4:4:4, 10-bit or 12-bit image formats referenced by SMPTE ST 425-3, which can be transported by a dual-link SMPTE ST 424 serial interface as shown in Table 1 and Table 2. The Left eye image and the Right eye image shall have the identical image pixel format structure and they shall be a stereoscopic image pair.

For the carriage of stereo production image formats, the source image horizontal and vertical data structure for each Left eye (Le) and Right eye (Re), shall be as defined for those formats referenced by SMPTE ST 425-3.

Table 1 and Table 2 — repeated from SMPTE ST 425-3 for convenience — show the source formats so referenced.

Table 1 – 1080-line Source Image Formats from SMPTE ST 425-3 (Informative)

Reference SMPTE Standard	Image Format	Signal Format Sampling Structure/pixel Depth	Frame Rate
ST 274	1920×1080	4:4:4 (R'G'B'), 4:4:4:4 (R'G'B' +A)/10-bit	50, 60/1.001 and 60 Progressive
ST 2048-2	2048×1080*2	4:4:4 (R'G'B'*1), 4:4:4:4 (R'G'B'*1+A)/10-bit	48/1.001, 48, 50, 60/1.001 and 60 Progressive
ST 274	1920×1080	4:4:4 (Y'C'$_B$C'$_R$), 4:4:4:4 (Y'C'$_B$C'$_R$+A)/10-bit	50, 60/1.001 and 60 Progressive
ST 2048-2	2048×1080*2	4:4:4 (Y'C'$_B$C'$_R$), 4:4:4:4 (Y'C'$_B$C'$_R$+A)/10-bit	48/1.001, 48, 50, 60/1.001 and 60 Progressive
ST 274	1920×1080	4:4:4 (R'G'B')/12-bit	50, 60/1.001 and 60 Progressive
ST 2048-2	2048×1080*2	4:4:4 (R'G'B'*1)/12-bit	48/1.001, 48, 50, 60/1.001 and 60 Progressive
ST 274	1920×1080	4:4:4 (Y'C'$_B$C'$_R$)/12-bit	50, 60/1.001 and 60 Progressive
ST 2048-2	2048×1080*2	4:4:4 (Y'C'$_B$C'$_R$)/12-bit	48/1.001, 48, 50, 60/1.001 and 60 Progressive
ST 274	1920×1080	4:2:2 (Y'C'$_B$C'$_R$)/12-bit	50, 60/1.001 and 60 Progressive
ST 2048-2	2048×1080*2	4:2:2 (Y'C'$_B$C'$_R$)/12-bit	48/1.001, 48,50, 60/1.001 and 60 Progressive
ST 2048-2	2048×1080*2	4:2:2:4 (Y'C'$_B$C'$_R$+A)/12-bit	48/1.001, 48, 50, 60/1.001 and 60 Progressive

Notes:

*1 In this image, format R'G'B' indicates either R'G'B' or R'$_{FS}$G'$_{FS}$B'$_{FS}$.

*2 This is the maximum pixel array; the active image may not fill the maximum array.

Table 2 – 2160-line Source Image Formats from SMPTE ST 425-3 (Informative)

Reference SMPTE Standard	Image Format	Signal Format Sampling Structure/Pixel Depth	Frame Rate
ST 2036-1	3840×2160	4:2:2 (Y'C'$_B$C'$_R$), 4:2:0 (Y'C'$_B$C'$_R$)/10-bit	24/1.001, 24, 25, 30/1.001 and 30 Progressive
ST 2048-1	4096×2160	4:2:2 (Y'C'$_B$C'$_R$)/10-bit	24/1.001, 24, 25, 30/1.001 and 30 Progressive

6 Le and Re 40-Bit Virtual Interface Data Structure

Each Le and Re image of the stereoscopic image pair shall be constructed as a 40 bit virtual interface, consisting of four 10-bit data streams — data stream one, data stream two, data stream three and data stream four.

For 1080-line images, the 40-bit virtual interfacefor each Le and Re image shall be constructed in accordance with either the Level A, or the Level B-DL mappings defined in SMPTE ST 425-3. For 2160-line images, the 40-bit virtual interfacefor each Le and Re image shall be constructed in accordance with the 2160-line mapping defined in SMPTE ST 425-3. Refer to SMPTE ST 425-3 for details of the mapping structures and mapping modes for each format.

6.1 1080-Line Level A Mapping Mode

6.1.1 Image Mapping Structures

The 1080-line source images shall be mapped into the 40-bit virtual interface of each Le and Re image according to the Level A mapping rules defined in SMPTE ST 425-3.

6.1.2 1080-Line Level A Mapping Mode – Audio Data

When present, audio data shall be mapped into the HANC space of the Le and Re virtual interface, according to the Level A audio mapping rules defined in SMPTE ST 425-3 which specifies the number of audio channels that can be mapped into each Le and Re virtual interface.

The audio data shall be mapped onto the Le virtual interface first and any remaining data shall then be mapped onto the Re virtual interface. In some applications, audio data of the Le interface may be duplicated in the Re interface.

Audio channel usage shall be further signaled using the payload identifier as defined in Section 7 of this document.

In the case where the Re interface is carrying a duplicate of the Le interface audio, the audio data and control packets shall be an exact replica of the audio carried in the Le interface — specifically the Re interface audio shall use the same audio groups as applied to the Le interface audio.

The payload identifier associated with each Le and Re interface shall indicate whether the audio data contained in the Re interface is a copy of the Le interface audio, or whether additional audio channels are being carried in the Re interface.

Using a combination of information from the payload identifier, the audio group number and the location of the audio in either the Le or Re interface, implementers can uniquely identify up to twice the number of audio channelscarried in either the Le or Re interface.

6.1.3 1080-Line Level A Mapping Mode – Time Code Data

When present, the time code shall be mapped into the HANC space of the Le virtual interface according to the Level A ancillary data mapping rules defined in SMPTE ST 425-3, and shall be in conformance with SMPTE ST 12-2.

The time code may also be mapped onto both the Le and Re virtual interfaces in which case the corresponding Time Address values shall be identical.

6.1.4 Other Ancillary Data

Other ancillary data, if present, shall be mapped into VANC or HANC space of either the Le or the Re virtual interface, according to the Level A ancillary data mapping rules defined in SMPTE ST 425-3.

Note: Refer to Annex B for information about the amount of ancillary data space available.

Ancillary data specifically intended for the Le or Re interface shall be inserted into the appropriate interface only.

6.2 1080-Line Level B-DL Mapping Mode

6.2.1 Image Mapping Structures

The 1080-line source images shall be mapped into the 40-bit virtual interface of each Le and Re image according to the Level B-DL mapping rules defined in SMPTE ST 425-3.

6.2.2 1080-Line Level B-DL Mapping Mode – Audio Data

When present, audio data shall be mapped into the HANC space of the Le and Revirtual interface, according to the Level B-DLaudio mapping rules defined in SMPTE ST 425-3 which specifies the number of audio channels that can be mapped into each Le and Re virtual interface.

The audio data shall be mapped onto the Le virtual interface first and any remaining data shall then be mapped onto the Re virtual interface. In some applications audio data of the Le interface may be duplicated in the Re interface.

Audio channel usage shall be further signaled using the payload identifier – see section 7 of this document for further details.

In the case where the Re interface is carrying a duplicate of the Le interface audio, the audio data and control packets shall be an exact replica of the audio carried in the Le interface – specifically the Re interface audio shall use the same audio groups as applied to the Le interface audio.

The payload identifier associated with each Le and Re interface shall indicate whether the audio data contained in the Re interface is a copy of the Le interface audio, or whether additional audio channels are being carried in the Re interface.

Using a combination of information from the payload identifier, the audio group number and the location of the audio in either the Le or Re interface, implementers can uniquely identify up to twice the number of audio channels carried in either the Le or Re interface.

6.2.3 1080-Line Level B-DL Mapping Mode – Time Code Data

When present, the time code shall be mapped into the HANC space of the Le virtual interface according to the Level B-DL ancillary data mapping rules defined in SMPTE ST 425-3, and shall be in conformance with SMPTE 12-2.

The time code may also be mapped ontoboth the Le and Re virtual interfaces in which case the corresponding Time Address values shall be identical.

6.2.4 OtherAncillary Data

Other ancillary data if present,shall be mapped into VANCor HANCspaceof either the Le orthe Re virtual Interface,according to the Level B-DL ancillary data mapping rules defined in SMPTE ST 425-3.

Note: Refer to Annex B for information about the amount of ancillary data space available.

Ancillary data specifically intended for the Le or Re interface shall be inserted into the appropriate interface only.

6.3 2160-Line Mapping Mode

6.3.1 Image Mapping Structures

The 2160-line source images shall be mapped into the 40-bit virtual interface of each Le and Re image according to the 2160-line mapping rules defined in SMPTE ST 425-3.

6.3.2 2160-Line Mapping Mode – Audio Data

When present, audio data shall be mapped into the HANC space of the Le and Re virtual interface, according to the 2160-line audio mapping rules defined in SMPTE ST 425-3 which specifies the number of audio channels that can be mapped into each Le and Re virtual interface.

The audio data shall be mapped onto the Le virtual interface first and any remaining data shall then be mapped onto the Re virtual interface. In some applications, audio data of the Le interface may be duplicated in the Re interface.

Audio channel usage shall be further signaled using the payload identifier as defined in Section 7 of this document.

In the case where the Re interface is carrying a duplicate of the Le interface audio, the audio data and control packets shall be an exact replica of the audio carried in the Le interface — specifically the Re interface audio shall use the same audio groups as applied to the Le interface audio.

The payload identifier associated with each Le and Re interface shall indicate whether the audio data contained in the Re interface is a copy of the Le interface audio, or whether additional audio channels are being carried in the Re interface.

Using a combination of information from the payload identifier, the audio group number and the location of the audio in either the Le or Re interface, implementers can uniquely identify up to twice the number of audio channels carried in either the Le or Re interface.

6.3.3 2160-Line Mapping Mode – Time Code Data

When present, the time code shall be mapped into the HANC space of the Le virtual interface according to the 2160-line ancillary data mapping rules defined in SMPTE ST 425-3, and shall be in conformance with SMPTE ST 12-2.

The time code may also be mapped onto both the Le and Re virtual interfaces, in which case the corresponding Time Address values shall be identical.

6.3.4 Other Ancillary Data

Other ancillary data, if present, shall be mapped into VANC or HANC space of either the Le or the Re virtual interface, according to the 2160-line ancillary data mapping rules defined in SMPTE ST 425-3.

Note: Refer to Annex B for information about the amount of ancillary data space available.

Ancillary data specifically intended for the Le or Re interface shall be inserted into the appropriate interface only.

7 Payload Identifier

The payload identifier data structure shall be in conformance with SMPTE ST352 and shall be mapped onto each Le and Re interface in accordance with the mapping rules defined in SMPTE ST 425-3.

The payload identifier shall be 4 bytes where each byte has a separate significance. The first byte of the payload identifier shall have the highest significance and subsequent bytes shall define lower order video and ancillary payload information.

The recommended location for the payload identifier is defined in SMPTE ST425-3.

7.1 Byte 1 – Digital Interface and Payload Identification

Byte 1 of the payload identifier identifies the video payload and the digital interface and shall be as defined in Table 3.

Table 3 – Byte 1 Video Payload and Digital Interface Identification

Mapping Nomenclature	Byte 1: Video Payload and Digital Interface Level A
Stereoscopic 1080-line video payloads on a quad 3 Gb/s serial digital interface – Level A	[99h]
Stereoscopic 1080-line video payloads on a quad 3 Gb/s serial digital interface – Level B-DL	[9Ah]
Stereoscopic 2160-line video payloads on a quad 3 Gb/s serial digital interface – Level B-DS	[9Bh]

7.2 Byte 2 – Picture Rate

Byte 2 of the payload identifier shall be in conformance with the picture rates defined in Table 2 of ST 352 and shall only use the values as permitted for the source image formats defined in SMPTE ST 425-3.

7.3 Byte 3 – Sampling Structure, Aspect Ratio and Horizontal Size

Byte 3 of the payload identifier shall be used to identify the aspect ratio, horizontal pixel array size, and sampling structure of the video payload.

For 1080-line Level A mapping, the payload ID byte 3 values shall be in conformance with the Level A payload ID rules defined for byte 3 in SMPTE ST 425-3.

For 1080-line Level B-DL mapping, the payload ID byte 3 values shall be in conformance with the Level B-DL payload ID rules defined for byte 3 in SMPTE ST 425-3.

For 2160-line mapping, the payload ID byte 3 values shall be in conformance with the Level B-DL payload ID rules defined for byte 3 in SMPTE ST 425-3.

7.4 Byte 4 – Extended Aspects

Byte 4 identifies extended aspects of the payload identifier. For the Left eye stream, bits b2 and b3 shall be reserved and set to (0h). The remaining bits shall be as defined in Table 4. For the Right eye stream, bits b7 to b0 shall be as defined in Table 4.

Note: Byte 4 values are different for the 1080-line Level A and Level B-DL mapping modes and the 2160-line mapping mode.

Table 4 – Payload Identifier Byte 4 definition

<table>
<tr><th>Bits</th><th>Byte 4
Level A mapping mode</th><th>Byte 4
Level B-DL mapping mode</th><th>Byte 4
2160-Line mapping mode</th></tr>
<tr><td>Bit 7
(MSB)</td><td>Reserved (0)</td><td rowspan="2">Channel assignment
Data stream one (0h)
Data stream two (1h)
Data stream three (2h)
Data stream four (3h)</td><td rowspan="2">Channel assignment
Data stream one (0h)
Data stream two (1h)
Data stream three (2h)
Data stream four (3h)</td></tr>
<tr><td>Bit 6</td><td>Channel assignment
Data streams one& two (0)
Data streamsthree & four (1)</td></tr>
<tr><td>Bit 5</td><td colspan="3">Interface assignment
Left Eye (0)
Right Eye (1)</td></tr>
<tr><td>Bit 4</td><td colspan="3">Reserved (0)</td></tr>
<tr><td>Bit 3</td><td colspan="3" rowspan="2">Audio – Right eye interface,
Audio not present or status unknown (0h)
Right eye interface carries a copy of Left eye audio (1h)
Right eye interface carries additional channels (2h)
Reserved (3h)</td></tr>
<tr><td>Bit 2</td></tr>
<tr><td>Bit 1</td><td rowspan="2">Bit depth
10-bit (1h),
12-bit (2h),
Other values are Reserved</td><td rowspan="2">Bit depth
10-bit (1h),
12-bit (2h),
Other values are Reserved</td><td rowspan="2">Bit depth
10-bit (1h),
Other values are Reserved</td></tr>
<tr><td>Bit 0
(LSB)</td></tr>
</table>

8 Data Stream Assignment for 3G-SDI Link 1 to 3G-SDI Link 4

Data stream one and data stream two of the Le image shall be mapped to 3G-SDI Link 1 and shall be assigned to data stream one and data stream two of SMPTE ST 424.

Data stream three and data stream four of the Le image shall be mapped to 3G-SDI Link 2 and shall be assigned to data stream one and data stream two of SMPTE ST 424.

Data stream one and data stream two of the Re image shall be mapped to 3G-SDI Link 3 and shall be assigned to data stream one and data stream two of ST 424.

Data stream three and data stream four shall be mapped to 3G-SDI Link 4 and shall be assigned to data stream one and data stream two of SMPTE ST 424.

8.1 3G-SDI Link Interface Timing

The timing difference between the EAV / SAV of any two of 3G-SDI Link 1 to 3G-SDI Link 4 shall not exceed 400 ns at the source. This difference should be taken into consideration when designing systems and destination equipment input stages.

9 Levels of Operation (Informative)

To define the level of support for this standard, manufacturers are encouraged to indicate in publications which mapping format is supported. For example:

Stereo 1080-line Level A mapping

Stereo 1080-line Level B-DL mapping

Stereo 2160-line mapping

Manufacturers are also encouraged to indicate in publications supported audio and video formats.

Annex A Bibliography (Informative)

Note: All references in this document to other SMPTE documents use the current numbering style (e.g. SMPTE ST 274:2008) although, during a transitional phase, the document as published (printed or PDF) may bear an older designation (such as SMPTE 274M-2008). Documents with the same root number (e.g. 274) and publication year (e.g. 2008) are functionally identical.

Some of the documents mentioned below are second or more generation normative references to this standard. See Annex C for the relationships between this standard and its reference documents

SMPTE ST 12-1:2014, Time and Control Code

SMPTE RP 157:2012, Key and Alpha Signals

SMPTE ST 274:2008, Television — 1920×1080 Image Sample Structure, Digital Representation and Digital Timing Reference Sequences for Multiple Picture Rates

SMPTE ST 291-1:2011, Ancillary Data Packet and Space Formatting

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

SMPTE ST 296:2012, 1280×720 Progressive Image 4:2:2 and 4:4:4 Sample Structure — Analog and Digital Representation and Analog Interface

SMPTE ST 299-1:2009, 24-Bit Digital Audio Format for SMPTE 292 Bit-Serial Interface

SMPTE ST 299-2:2010, Extension of the 24-Bit Digital Audio Format to 32 Channels for 3 Gb/s Bit-Serial Interfaces

SMPTE ST 372:2011, Dual Link 1.5 Gb/s Digital Interface for 1920×1080 and 2048×1080 Picture Formats

SMPTE ST 424:2012, 3 Gb/s Signal/Data Serial Interface

SMPTE ST 425-1:2011, Source Image Format and Ancillary Data Mapping for the 3 Gb/s Serial Interface

SMPTE ST 435-1:2012, 10 Gb/s Serial Signal / Data Interface — Part 1: Basic Stream Distribution

SMPTE ST 2036-1:2013, Ultra High Definition Television — Image Parameter Values for Program Production

SMPTE ST 2048-1:2011, 2048×1080 and 4096×2160 Digital Cinematography Production Image Formats FS/709

SMPTE ST 2048-2:2011, 2048×1080 Digital Cinematography Production Image FS/709 Formatting for Serial Digital Interface

SMPTE ST 2051:2014, Two-Frame Marker for 48(/1.001)-Hz, 50-Hz and 60(/1.001)-Hz Progressive Digital Video Signals on 1.5 Gb/s and 3 Gb/s Interfaces

Annex B 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 a specific video format. 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 the Sub Images being carried on each of the data streams.

SMPTE RP 291-2 provides information on the size of the ancillary data space in SMPTE ST 425-1 Level A interface and Level B Dual Link interface. For SMPTE ST 425-1 Level B Dual Stream interfaces, the size of the ancillary data space is 2 times the space listed for the corresponding SMPTE ST 292-1 interface. For 1080-line source image formats, the available HANC and VANC data space on the quad link interface specified in this standard 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 with the corresponding sub-image formats being carried on each link. For 2160-line source image formats, the available HANC and VANC data space on the quad link interface specified in this standard is 8 times the HANC and VANC data space available (as shown in the tables of SMPTE RP 291-2) on a SMPTE ST 292-1 interface with the corresponding sub-image formats being carried on each link.

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.

Annex C SMPTE ST 425-6 Document Roadmap (Informative)

This road map shows the relationships between SMPTE ST 425-6 and its reference documents.