SMPTE STANDARD

Dual 1.5 Gb/s Serial Digital Interface for Stereoscopic Image Transport

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Approved
June 8, 2011

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 Part XIII of its Administrative Practices.

SMPTE ST 292-2 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 Standard. 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 Engineering Document.

There is a need in the industry to have an interface for the transporting of stereoscopic images complying with 4:2:2/10-bit image formats defined by SMPTE ST 274, SMPTE ST 2048-2 and SMPTE ST 296, which can be transported by a single SMPTE ST 292-1 serial interface. This standard also defines the payload identifier that will identify the Left/Right (L/R) eye images, audio and other associated ancillary data.

This standard provides explicit labeling for 16:9 aspect ratios. Unknown aspect ratios are signaled with no further details.

1 Scope

This standard defines a means of transporting stereoscopic images (Left eye and Right eye images) using an interface consisting of two streams based on the SMPTE ST 292-1 data structure. The Left eye images are carried on one stream of the interface and the Right eye images are carried on the other stream. The stereoscopic image formats to be transported using this standard are the 4:2:2/10-bit image formats defined by SMPTE ST 274, SMPTE ST 2048-2 and SMPTE ST 296, which can be transported by a single SMPTE ST 292-1 serial interface. Audio and other associated ancillary data may also be transported. This standard also defines a payload identifier.

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

Note: All references in this document to other SMPTE documents use the current numbering style (e.g. SMPTE ST 12-2:2008) although, during a transitional phase, the document as published (printed or PDF) may bear an older designation (such as SMPTE 12M-2-2008). Documents with the same root number (e.g. 12-2) and publication year (e.g. 2008) are functionally identical.

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

SMPTE ST 12-2:2008, Television — Transmission of Time Code in the Ancillary Data Space

SMPTE ST 291:2010, Ancillary Data Packet and Space Formatting

SMPTE ST 292-1:2011, 1.5 Gb/s Signal/Data Serial Interface

SMPTE ST 297:2006, Television — Serial Digital Fiber Transmission System for SMPTE ST 259, SMPTE ST 344, SMPTE ST 292-1 and SMPTE ST 424 Signals

SMPTE ST 299-1:2009, 24-Bit Digital Audio Format for SMPTE 292 Bit-Serial Interface (NOTE: This document previously numbered SMPTE 299-2009 — Content Unchanged)

SMPTE ST 352:2011, Payload Identification Codes for Serial Digital Interfaces

4 Source Format and Interface Data Structure

This interface for stereoscopic images shall carry the Left eye and the Right eye images along with associated audio and ancillary data packets as two separate streams

The source image formats shall be the 4:2:2/10-bit image formats referenced by SMPTE ST 292-1, which can be transported by a single SMPTE ST 292-1 serial interface as shown in Table 1. The Left eye image and the Right eye image shall have the identical image pixel format structure and they shall be a stereo image pair.

The electrical or optical characteristics of each stream of the interface shall be in conformance with SMPTE ST 292-1 or SMPTE ST 297, respectively.

Table 1 – Source Image Formats

Reference SMPTE Standard	Image Format	Signal Format Sampling Structure/Pixel Depth	Frame/Field Rates	Transport
ST 274	1920 × 1080	4:2:2 ($Y'C'_BC'_R$)/10-bit	60, 60/1.001 and 50 Fields Interlaced	Interlaced
			30, 30/1.001, 25, 24 and 24/1.001 Frames Progressive	Progressive
			30, 30/1.001, 25, 24 and 24/1.001 PsF	PsF*1
ST 2048-2	2048 x 1080*2	4:2:2 ($Y'C'_BC'_R$)/10-bit	60, 60/1.001 and 50 Fields Interlaced	Interlaced
			30, 30/1.001, 25, 24 and 24/1.001 Progressive	Progressive
			30, 30/1.001, 25, 24 and 24/1.001 PsF	PsF*1
ST 296	1280 x 720	4:2:2 ($Y'C'_BC'_R$)/10-bit	60, 60/1.001, 50, 30, 30/1.001, 25, 24 and 24/1.001 Frames Progressive	Progressive

*1 PsF structure as defined in SMPTE ST 274.

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