SMPTE ST 352:2013
Revision of
SMPTE ST 352:2011

SMPTE STANDARD

Payload Identification Codes For Serial Digital Interfaces

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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 Part XIII of its Operations Manual.

SMPTE ST 352 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 document.

This standard defines the structure of the 4-byte payload identifier that is used to describe aspects of the payload carried on the SMPTE Serial Digital Interface (SDI). The payload identifier is transmitted as a SMPTE ST 291-1 ancillary data packet.

1 Scope

This standard defines the specification of a 4-byte payload identifier that describes aspects of the payload carried on the SMPTE Serial Digital Interface (SDI) such as: the digital interface standard; picture rate; sampling structure; aspect ratio; colorimetry; bit depth and channel or link assignment. Other application specific aspects of the payload such as audio channel usage, may optionally be described in application specific documents that reference SMPTE ST 352.

The payload identifier is applicable to all serial digital interfaces and all payloads that produce a directly viewable image on a display device. Furthermore, the viewable image must be a recognizable representation of the source image content.

The payload identifier is mandatory for some reference standards and optional in other reference standards. Refer to the applicable reference standards for further information on mandatory or optional usage of the SMPTE ST 352 payload identifier.

The standard defines how the payload identifier is placed into a 10-bit ancillary data packet according to SMPTE ST 291-1.

It also specifies the repetition rate of the ancillary data packet, and provides the preferred horizontal and vertical location for the placement of the packet in different digital interfaces.

The standard defines values for some of the bit fields of each byte of the 4-byte payload identifier, although the values for other bit fields can have custom definitions.

The standard also defines the Payload Identification Code assignment process and associated on-line register for Byte 1 Values. See Annex A for details on how to register new values.

Annex B and Annex C define the assigned Payload Identification codes and byte 2, 3 and 4 values for legacy systems.

Annex D shows the mapping of the payload identifier from the ancillary data packet structure of SMPTE ST 291-1 to the K-L-V data structure of SMPTE ST 336 as a fixed-length data pack.

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.

3 Normative References

The following standard contains provisions which, through reference in this text, constitute provisions of this standard. At the time of publications, 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 291-1:2011, Ancillary Data Packet and Space Formatting

4 Glossary of Terms

4.1
Channel
In some cases, a digital interface offers sufficient capacity to be able to carry more than one payload. In this case, each payload becomes a channel of the digital interface.

4.2
Interface Transport
The data structure defined by an interface for the purpose of synchronizing the transport words at the receiver. This comprises primarily of the EAV and SAV words. The transport data is usually expressed as a 10 bit word.

4.3
Link
In some cases, the picture raster exceeds the capacity available at the digital interface. In these cases, two or more digital interfaces can be used to provide the total capacity required where each digital interface is a single link of the combined interface set.

4.4
Payload
The picture, or part of a picture, carried in the active picture area of a digital interface and comprising a matrix of horizontal and vertical pixels. The matrix usually comprises a multiplex of luma and color difference components that can be viewed on a display device as a recognizable representation of the source image content. The picture can be a part picture or be a combination of small pictures. The picture does not need to use all the bits of the interface although those bits that are not used must be defined.

4.5
Picture Raster
The matrix of samples that represents a digital video picture.

4.6
Picture Rate
The Picture Rate value is the frame rate of the originating source image.

4.7
Recommended
Throughout this standard the term Recommended is intended to indicate a preferred usage of bit fields. Specific applications may deviate from the recommended usage.

4.8
Reserved
Throughout this standard the term Reserved is intended to indicate that values are undefined, or may be defined in application specific documents. The default value for Reserved is 0.

4.9
Required
Throughout this standard the term Required is intended to indicate a mandatory usage of bit fields. Specific applications may not deviate from the required usage.

4.10
Sampling
Refers to the horizontal arrangement of picture samples, notably the arrangement of multiplexing the various luma, color difference and other data samples.

4.11
Scanning
This is the action of reading the data structure of the interface in a predetermined order for transmission. It also refers to the mapping of the picture raster to the interface for transmission. The scanning of the picture raster and the interface transport are often closely related, the notable exceptions being the PsF scanning (progressive picture on an interlaced interface).

5 Payload Identifier Packet Definition

The payload identifier shall be 4 bytes long and shall be used to identify the payload carried on a digital interface transport.

5.1 General Payload Identifier Format

Table 1a shows the overall structure of the payload identifier.

Within a specific reference standard or document, a single byte 1 value shall identify payload formats having an identical number of active lines (active line count).

The values of the remaining 3 bytes are determined by the specific requirements of the application, and shall be defined such that:

- bit-fields identified as **Required** shall be applied without modification
- bit-fields identified as **Recommended** should be applied without modification where applicable
- bit-fields identified as **Reserved** may be defined on a case-by-case basis in specific application standards or other documents that reference SMPTE ST 352.

It should be noted therefore that some of the definitions in Table 1b — and the subsequent definition of specific bit fields that follow — are provisions only and that the actual definition may vary on a case by case basis depending on the value given in byte 1. Decoders shall not assume that the definitions in Table 1b and the following sections are the only provisions for bytes 2, 3 and 4.

Table 1c shows how each byte is formatted into a complete 10-bit ancillary data packet.

The precise definition of all payload identifiers defined prior to 2008 and not contained in a separate reference standard, are documented in Annex B and Annex C of this standard. Precise definitions for bytes 2, 3 and 4 of payload identifiers defined since 2008 shall be provided for each application in the reference standard that specifies the payload.

Table 1a – Generalized payload identifier byte definitions for digital transports

<table>
<tr><th>Bits</th><th>Byte 1</th><th>Byte 2</th><th>Byte 3</th><th>Byte 4</th></tr>
<tr><td>Bit 7</td><td>Version identifier</td><td rowspan="2">Application specific (line or picture related information)</td><td rowspan="2">Application specific (sampling or aspect ratio related information)</td><td rowspan="8">Application specific (channel assignment, bit depth related or other information)</td></tr>
<tr><td>Bit 6</td><td rowspan="7">Payload and digital interface standards</td></tr>
<tr><td>Bit 5</td><td rowspan="4">Picture rate</td><td rowspan="4">Sampling structure identification</td></tr>
<tr><td>Bit 4</td></tr>
<tr><td>Bit 3</td></tr>
<tr><td>Bit 2</td></tr>
<tr><td>Bit 1</td></tr>
<tr><td>Bit 0</td></tr>
</table>

Table 1b – Default payload identifier field definitions

<table>
<tr><th>Bits</th><th>Byte 2</th><th>Byte 3</th><th>Byte 4</th></tr>
<tr><td>Bit 7</td><td>(Required)
Interlaced (0) or progressive (1) transport</td><td>(Recommended)
Image aspect ratio
4:3 (0) or 16:9 (1)</td><td rowspan="3">(Recommended)
Channel assignment
Single-link or
ch1 of multi-channel (0_h),
ch2 of multi-channel (1_h),
ch3 of multi-channel (2_h),
ch4 of multi-channel (3_h),
ch5 of multi-channel (4_h),
ch6 of multi-channel (5_h),
ch7 of multi-channel (6_h)
ch8 of multi-channel (7_h)</td></tr>
<tr><td>Bit 6</td><td>(Required)
Interlaced (0) or progressive (1) picture</td><td>Reserved</td></tr>
<tr><td>Bit 5</td><td>Reserved</td><td>Reserved</td></tr>
<tr><td>Bit 4</td><td>Reserved</td><td>Reserved</td><td>Reserved</td></tr>
<tr><td>Bit 3</td><td rowspan="4">(Required)
Picture rate</td><td rowspan="4">(Required)
Sampling structure identification</td><td>Reserved</td></tr>
<tr><td>Bit 2</td><td>Reserved</td></tr>
<tr><td>Bit 1</td><td rowspan="2">(Recommended)
Bit depth
8-bit (0_h), 10-bit (1_h)
or 12-bit (2_h),
Reserved (3_h)</td></tr>
<tr><td>Bit 0</td></tr>
</table>

Table 1c – Payload identifier ancillary data packet format

	b9 (MSB)	b8	b7	b6	b5	b4	b3	b2	b1	b0 (LSB)
Ancillary data flag (ADF)	0	0	0	0	0	0	0	0	0	0
	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1
Data ID (DID)	not b8	EP	0	1	0	0	0	0	0	1
Secondary data ID (SDID)	not b8	EP	0	0	0	0	0	0	0	1
Data count (DC)	not b8	EP	0	0	0	0	0	1	0	0
Payload (byte 1)	not b8	EP	Version ID	Payload identifier						
Picture rate and scanning (byte 2)	not b8	EP	I/P transport	I/P picture	0	0	Picture rate			
Sampling structure (byte 3)	not b8	EP	4:3/16:9	0	0	0	Sampling structure			
Special options (byte 4)	not b8	EP	Channel			0	0	0	Bit depth	
Checksum	not b8	Sum of b0~b8 of DID through to payload byte 4.								

EP = even parity for b0 through b7.

Notes:

1. Since the payload bytes use the two LSB.s of the 10-bit packet format, care needs to be taken when handling the payload identifier in 8-bit systems.

2. Equipment designed in compliance with previous revisions of this standard might not adhere to the bit 8 and bit 9 formatting shown in Table 1c, the payload information is conveyed by b7 through b0 only.

5.2 Byte 1: Payload and Digital Interface Identification

This first byte shall identify the combination of payload format and digital interface transport.

Within a specific reference standard or document the byte 1 value shall identify payload formats having an identical number of active lines (active line count).

Where 2 or more active line counts exist within a single reference standard or document, a separate byte 1 value shall be assigned to each format (e.g. SMPTE ST 292-1).

These provisions shall not exclude standards or documents from organizations other than SMPTE using the same byte 1 value as the SMPTE standard for the same interface specification.

Some digital interfaces can carry a number of different payload formats at the same transport bit rate. Furthermore, payload formats can now be mapped onto several digital interface transports. Within a specific reference standard or document (e.g. SMPTE ST 372), the byte 1 value shall also identify the digital interface transport mapping structure. Where 2 or more digital interface transport mapping structures exist within a single reference standard or document (e.g. SMPTE ST 425-1 or Recommendation ITU-R BT.1120), a separate byte 1 value shall be assigned to combinations of payload format and mapping structure.

By identifying the combination of both the payload format and its associated digital interface, it is possible to correctly identify the supported format and mappings purely from inspection of the first byte of the payload identifier.

Implementers should be aware that some legacy implementations complying with previous version of this standard may not comply with the full form of the above provision.

By way of example, the following list illustrates the combination of payload format and digital interface transport for a number of currently registered payload identifiers. This information is taken from the SMPTE ST 352 byte 1 register and is repeated here for convenience.

Byte 1 Value	Payload Definition	Reference Standard	Description	Status
84h	SMPTE ST 292-1	SMPTE ST 292-1	720-line video payloads on a 1.5 Gb/s (nominal) serial digital interface	In Force
85h	SMPTE ST 292-1	SMPTE ST 292-1	1080-line video payloads on a 1.5 Gb/s (nominal) serial digital interface	In Force
87h	SMPTE ST 372	SMPTE ST 372	1080-line video payloads on a dual-link 1.5 Gb/s (nominal) serial digital interface	In Force
88h	SMPTE ST 425-1	SMPTE ST 425-1	720-line video payloads on a Level A 3 Gb/s (nominal) serial digital interface	In Force
89h	SMPTE ST 425-1	SMPTE ST 425-1	1080-line video payloads on a Level A 3 Gb/s (nominal) serial digital interface	In Force
8Ah	SMPTE ST 425-1	SMPTE ST 425-1	SMPTE ST 372 dual-link 1080-line payloads on a Level B 3 Gb/s (nominal) serial digital interface	In Force

The values for byte 1 are contained in a register published on line at SMPTE RA < www.smpte-ra.org>. Readers are encouraged to check the online site for the current registered byte 1 values for each payload format and interface combination. See Annex A for information on the process required to obtain registration of Byte 1 values

Once assigned, byte 1 values cannot be re-purposed if the specific payload identification code is deprecated in the future.

The first byte of the payload identifier shall have a non-zero value for all valid payloads. Thus, the first byte can be used to address up to 127 payload and digital interface standards.

Bit 7 of byte 1 shall be used to define the payload identification version:

- b7 = 1 identifies version 1 based on this standard;
- b7 = 0 identifies version 0 (historical codes) based on SMPTE ST 352 as trial published in the July 2001 issue of the SMPTE Journal (see Annex C).

Bits b6 to b0 of byte 1 shall be used to identify the combination of payload format and digital interface transport.

5.3 Byte 2: Picture Rate and Scanning Method

The second byte shall be used to identify the Picture Rate and the picture and transport scanning methods as shown in Table 1b.

Bit b7 shall be used to identify whether the digital interface uses a progressive or interlaced transport structure such that:

b7 = 0 shall identify an interlaced transport

b7 = 1 shall identify a progressive transport

Bit b6 shall be used to identify whether the picture has a progressive or interlace structure such that.

b6 = 0 shall identify an interlaced structure

b6 = 1 shall identify a progressive structure

Note: PsF payloads are identified by a progressive scanning of the payload transported over an interlaced digital interface transport carrying the progressive payload as a first and second picture segment within the transport frame duration. These first and second picture segments are indicated by the first and second field indicators in the digital interface transport.

Bits b5 to b4 are Reserved and shall be set to 0, unless defined for application specific use in a reference application document.

Bits b3 to b0 shall be used to identify the Picture Rate in Hz in accordance with Table 2.

Table 2 – Assignment of Picture Rate values

Value	Picture rate	Value	Picture rate	Value	Picture rate	Value	Picture rate
0h	No defined value	1h	Reserved	2h	24/1.001	3h	24
4h	48/1.001	5h	25	6h	30/1.001	7h	30
8h	48	9h	50	Ah	60/1.001	Bh	60
Ch	Reserved	Dh	Reserved	Eh	Reserved	Fh	Reserved

The reserved values of Table 2 may be defined for application specific use in a reference application document.

Notes:

1. The Picture Rate can differ from the interface frame rate. For example, in the case of 1080-line payloads carried on a dual-link 1.5 Gb/s (nominal) serial digital interface, the carriage of 60 Hz; 60/1.001 Hz and 50 Hz progressive signals requires 2 links each operating at 30 Hz, 30/1.001 Hz or 25 Hz (interlaced) frame rate. In this example the Picture Rate would still be identified as 60 Hz; 60/1.001 Hz or 50 Hz progressive even though the interface frame rate is half the Picture Rate.

2. For interlaced images, the Picture Rate indicates the image frame rate. For example 30 Hz, 30/1.001 Hz or 25 Hz (interlaced) frame rate.

5.4 Byte 3: Sampling Structure Identification

The third byte shall be used to identify the sampling structure of the source image as shown in Table 1b.

Furthermore, the third byte should be used to identify the aspect ratio of the source image as shown in Table1b.

Bit b7 should be used to identify the image aspect ratio such that:

b7 = 0 should indicate a 4:3 aspect ratio

b7 = 1 should indicate a 16:9 aspect ratio

Bits b6 to b4 are Reserved and shall be set to 0, unless defined for application specific use in a reference application document.

Bits b3 to b0 of byte 3 shall be used to identify the horizontal sampling structure in accordance with Table 3

Table 3 – Assignment of sampling structure values

Value	Sampling	Value	Sampling	Value	Sampling	Value	Sampling
0h	4:2:2 ($Y/C_B/C_R$)	1h	4:4:4 ($Y/C_B/C_R$)	2h	4:4:4 (G/B/R)	3h	4:2:0
4h	4:2:2:4 ($Y/C_B/C_R$/A)	5h	4:4:4:4 ($Y/C_B/C_R$/A)	6h	4:4:4:4 (G/B/R/A)	7h	SMPTE ST 2048-2 FS
8h	4:2:2:4 ($Y/C_B/C_R$/D)	9h	4:4:4:4 ($Y/C_B/C_R$/D)	Ah	4:4:4:4 (G/B/R/D)	Bh	Reserved
Ch	Reserved	Dh	Reserved	Eh	4:4:4 (*X'Y'Z'*)	Fh	Reserved

The reserved values of Table 3 may be defined for application specific use in a reference application document.

Notes:

1. The term 4:4:4 identifies the ratio of component sampling independently of the resolution. These values apply to all picture sampling definitions including high definition pictures.

2. In the 4:2:2:4 and 4:4:4:4 fields, the A nomenclature refers to a picture channel, whereas the D nomenclature refers to a non-picture (i.e., data) channel.

5.5 Byte 4: Special Options

Byte 4 shall be used to identify extended aspects of the payload appropriate to each application. Some examples of extended aspects are shown in Table 1b and described below.

The following examples are recommendations only. Application documents are encouraged to use these examples where applicable.

Unused bits of byte 4 shall be set to 0.

5.5.1 Byte 4: Channel identification

Bits b7 to b5 should be used to identify channel identification information, but may be assigned alternate application specific meaning in standards that reference SMPTE ST 352.

When used for channel identification, Bits b7 to b5 shall be defined such that:

b7 to b5 = 0h shall identify a single channel payload or channel 1 of a multi-channel video payload;

b7 to b5 = 1h shall identify channel 2 of a multi-channel payload;

b7 to b5 = 2h shall identify channel 3 of a multi-channel payload;

…….;

b7 to b5 = 7h shall identify channel 8 of a multi-channel payload;

5.5.2 Byte 4: Bit Depth

Bits b1 to b0 should be used to identify the bit depth of the sample quantization, but may be assigned alternate application specific meaning in standards that reference SMPTE ST 352.

When used to indicate the bit depth of the sample quantization, Bits b1 to b0 shall be defined such that:

bit 1 to bit 0 = 0h shall identify 8-bit quantization per sample;

bit 1 to bit 0 = 1h shall identify 10-bit quantization per sample.

bit 1 to bit 0 = 2h shall identify 12-bit quantization per sample;

bit 1 to bit 0 = 3h undefined

Note: In the case where the bit depth field indicates 12-bits per sample, these bits have been mapped into a 10-bit interface

6 Payload Identifier Specification and Carriage

The 4-byte payload identifier shall be carried in a SMPTE ST 291-1 compliant Ancillary data packet.

6.1 Ancillary Data Specification

The ancillary data packet used by the payload identifier shall use the Type 2 data identification having a first data identification (DID) word followed by a secondary data identification (SDID) word.

The DID word shall be set to the value 41h. The SDID word shall be set to the value of 01h.

Table 4 outlines the ancillary data packet words with values where appropriate. The total size of the ancillary data packet is 11 words.

Table 4 – Ancillary data packet structure for the payload identifier

Name	Acronym	Value
Ancillary data flag (10-bit words)	ADF	000h, 3FFh, 3FFh
Data identification	DID	41h
Secondary data identification	SDID	01h
Data count	DC	04h
Payload identifier	4 words	—
Checksum	CS	—

6.2 Placement of the Ancillary Data Packet

As this packet defines a basic payload type, the recommended placement of the ancillary data packet is in the horizontal ancillary data space, immediately following an EAV word sequence.

The line number of the packet will vary according to the digital video interface to meet with existing equipment practice. The recommended line numbers for different interfaces are summarized below, but it should be noted that application specific reference documents may define a different horizontal and vertical placement for the Payload Identification Code packets.

In either case, the horizontal and vertical locations so stated are recommendations only. The actual packet location may vary on a case by case basis. Decoder manufacturers shall not depend on the recommended location for the detection and extraction of the payload packet.

Note: The line numbers given in the remainder of this section are interface line numbers which may differ from the picture source line numbers. These line number differences occur when using special raster mappings such as PsF, multi-link and multi-channel.

6.2.1 525- and 625-line digital interfaces, interlace

For digital interfaces having 525 or 625 lines with an interlaced (I) picture structure, the ancillary data packet shall be added once per field. The recommended location of the ancillary data packet, if ancillary data space is available, should be on the following lines:

525I (field 1): Line 13

525I (field 2): Line 276

625I (field 1): Line 9

625I (field 2): Line 322

Note: These line numbers also apply when using a 4:2:0 progressive payload on a 360 Mb/s serial digital interface or a 270 Mb/s dual link serial digital interface.

6.2.2 525- and 625-line digital interfaces, progressive

For digital interfaces having 525 or 625 lines with a progressive (P) picture structure, the ancillary data packet shall be added once per frame. The recommended location of the ancillary data packet, if ancillary data space is available, shall be on the following lines:

525P: Line 13

625P: Line 9

6.2.3 525- and 625-line mapping into the 1.5 Gb/s (Nominal) serial digital interface

When using the SMPTE ST 349 serial digital interface, the ancillary data packet shall be added once per frame. The recommended location of the ancillary data packet, if ancillary data space is available, shall be on the following lines:

525 Line 13

625 Line 9

6.2.4 750-line digital interfaces, progressive

For digital interfaces having 750-lines with a progressive picture structure, the ancillary data packet shall be added once per frame. The recommended location of the ancillary data packet, if ancillary data space is available, shall be on the following line:

750P: Line 10

6.2.5 1125-line digital interfaces, interlace and segmented-frame

For digital interfaces having 1125-lines with an interlaced or progressive segmented-frame (PsF), structure, the ancillary data packet shall be added once per field (segment). The recommended location of the ancillary data packet, if ancillary data space is available, shall be on the following lines:

1125I (field 1): Line 10

1125I (field 2): Line 572

6.2.6 1125-line digital interfaces, progressive

For digital interfaces having 1125-lines with a progressive structure, the ancillary data packet shall be added once per frame. The recommended location of the ancillary data packet, if ancillary data space is available, shall be on the following line:

1125P: Line 10

Annex A Payload Identifier Assignments Process (Normative)

Payload Identifier Byte 1 values shall be registered with SMPTE by following the process defined below. The current list of registered values shall be contained in an online register at http://www.smpte-ra.org. This register is simply a record of the use of the Byte 1 values and is an integral part of this document.

Byte 1 value registrations by SMPTE Technology Committees shall follow the process in Section A.1 below. Byte 1 value registrations by other Entities shall follow the process in Section A.2.

A.1 SMPTE Technology Committees

(1) An applicant requesting a Payload Identifier Byte 1 code value shall contact SMPTE Headquarters in writing and request a Payload Identifier Byte 1 assignment.

(2) Each submission for code assignment shall be accompanied by information that identifies the SMPTE Engineering Document in which the precise definition of the payload identifier is contained, and a brief description of usage.

An example of the format is shown below.

Requested Code Value	Reference Standard	Description
[89h]	SMPTE ST 425-1	1080-line payloads on a Level A 3 Gb/s (nominal) serial digital interface

(3) The precise definition of the payload identifier — including the assigned Byte 1 value — shall be described in the SMPTE Engineering Document identified in (2).

(4) The applicant may request a value during the development of a document. The Director of Engineering shall provisionally assign a Byte 1 value when the defining Engineering Document reaches the Committee Draft (CD) stage, prior to submission for Final Committee Draft (FCD) ballot.

Square brackets shall be placed around the proposed values in the registry and in the Engineering Document, indicating provisional assignment. The provisional status notation shall be removed when the document is elevated to Draft Publication (DP).

Note that these levels of approval (CD, FCD, and DP) are defined in the SMPTE Engineering Operations Manual.

In the event where the request for a Byte 1 value is in conflict with existing registrations or other SMPTE documents under development, and the Director of Engineering is unable to resolve that conflict, the values shall be assigned in order of their request.

Once Byte 1 values have been registered (square brackets have been removed), they cannot be re-purposed if the specific payload identification code is deprecated.

(5) Assigned and provisionally assigned payload ID Byte 1 values shall be available on the SMPTE registry Web site (http://smpte-ra.org).

A.2 Other Organizations, Companies and Individuals (External Entities)

(1) An applicant requesting a Payload Identifier Byte 1 code value shall contact SMPTE Headquarters in writing and request a Payload Identifier Byte 1 assignment.

(2) Each submission for code assignment shall be accompanied by information that provides a brief description of usage and the technical application document (e.g. external standard), in which the precise definition of the payload identifier is contained.

In the case where a preferred Byte 1 value assignment is requested, then the "Requested Code Value" field should indicate the preferred value in squared brackets.

In the case where no preference for Byte 1 value assignment is required, then the "Requested Code Value" field of the submission may be left blank.

An example of the format is shown below.

Requested Code Value	Reference Standard / Document	Description
[89h]	ITU R.BT 1120	1080-line payloads on a Level A 3 Gb/s (nominal) serial digital interface

(3) The technical application document or reference standard identified in (2) shall be provided with the submission, and all supporting documents shall be in English, accompanied by complete contact details for the Entity requesting the assignment.

(4) The applicant may request a value during the development of a document. The Director of Engineering shall assign a Byte 1 value based upon submission of draft or approved documents that clearly identifies the usage of the assigned value.

In the event where the request for a Byte 1 value is in conflict with existing registrations or other documents under development, and the Director of Engineering is unable to resolve that conflict, the values shall be assigned in order of their request.

(5) If the submitted document is a draft or in the proposal stage then square brackets shall be placed around the proposed values in the registry, indicating provisional assignment. Square brackets will only be removed once a final version of the document has been received by SMPTE Engineering HQ's.

If no final version of the document has been received within 12 months of the provisional assignment, the proposed Byte 1 values may be removed from the register and made available for other use.

Once Byte 1 values have been registered (square brackets have been removed), they cannot be re-purposed if the specific payload identification code is deprecated.

(6) Assigned and provisionally assigned payload ID Byte 1 values shall be available on the SMPTE registry Web site (http://smpte-ra.org).

Annex B Payload identifier Definitions for Existing Interfaces (Normative)

The following sections identify the payload and interface combinations for payload definitions that existed prior to 2010, that have ***not*** been moved into a reference Engineering Document.

For a complete list of payload definitions and their reference documents refer to the online register at http://www.smpte-ra.org.

B.1 483/576-Line Interlaced Payloads on 270 Mb/s and 360 Mb/s Serial Digital Interfaces

Table B.1 – Payload identifier definitions for 483/576-line interlaced payloads on 270 Mb/s and 360 Mb/s serial digital interfaces

Bits	Byte 1	Byte 2	Byte 3	Byte 4
Bit 7	1	Reserved	Image aspect ratio 4:3 = 0, 16:9 = 1	Reserved
Bit 6	0	Interlaced (0) picture	Horizontal sampling 720 = 0, 960 = 1	Reserved
Bit 5	0	Reserved	Reserved	Reserved
Bit 4	0	Reserved	Reserved	Reserved
Bit 3	0	Picture rate (see Table 2)	Sampling structure (see Table 3)	Reserved
Bit 2	0			Reserved
Bit 1	0			Reserved
Bit 0	1			Bit depth 8-bit (0) or 10-bit (1)

When identifying 483/576-line interlaced payloads on 270 Mb/s and 360 Mb/s serial digital interfaces, the following limitations shall apply:

- The Picture Rate shall only use the values 5h (25 Hz) and 6h (30/1.001 Hz) in accordance with Table 2.
- Bit 6 of byte 2 shall be set to a value of 0 to identify an interlaced payload.
- The sampling structure identification shall only use the value of '0h' to identify a 4:2:2 ($Y/C_B/C_R$) payload.
- Bit 7 of byte 3 shall be used to identify a 4:3 image aspect ratio (0), or a 16:9 image aspect ratio (1).
- Bit 6 of byte 3 shall be used to identify 720 active Luma samples (0) or 960 active Luma samples (1) as defined by the horizontal Luma sample count.
- Identification of the quantization value may be specified in bit b0 of byte 4. The default value is 0 identifying a payload quantization resolution of 8 bits.

B.2 483/576-Line Extended Payloads on 360 Mb/s Single-Link and 270 Mb/s Dual-Link Serial Digital Interfaces

Table B.2 – Payload identifier definitions for 483/576-line extended payloads on 360 Mb/s single-link and 270 Mb/s dual-link serial digital interfaces

<table>
<tr><th>Bits</th><th>Byte 1</th><th>Byte 2</th><th>Byte 3</th><th>Byte 4</th></tr>
<tr><td>Bit 7</td><td>1</td><td>Reserved</td><td>Image aspect ratio
4:3 = 0, 16:9 = 1</td><td>Reserved</td></tr>
<tr><td>Bit 6</td><td>0</td><td>Interlaced (0) or progressive (1) picture</td><td>Horizontal sampling
720 = 0, 960 = 1</td><td>Channel assignment
Ch1 (0) or Ch2 (1)</td></tr>
<tr><td>Bit 5</td><td>0</td><td>Reserved</td><td>Reserved</td><td>Reserved</td></tr>
<tr><td>Bit 4</td><td>0</td><td>Reserved</td><td>Reserved</td><td>Reserved</td></tr>
<tr><td>Bit 3</td><td>0</td><td rowspan="4">Picture rate
(see Table 2)</td><td rowspan="4">Sampling structure
(see Table 3)</td><td>Reserved</td></tr>
<tr><td>Bit 2</td><td>0</td><td>Reserved</td></tr>
<tr><td>Bit 1</td><td>1</td><td>Reserved</td></tr>
<tr><td>Bit 0</td><td>0</td><td>Bit depth
8-bit (0) or 10-bit (1)</td></tr>
</table>

When identifying 483/576-line progressive payloads on 360 Mb/s single-link and 270 Mb/s dual-link serial digital interface transports, the following constraints shall apply:

- The Picture Rate shall only use the values 9h (50 Hz) and Ah (60/1.001 Hz) in accordance with Table 2.
- Bit 6 of byte 2 shall be set to a value of 1 to identify a progressive payload.
- The sampling structure identification shall only use the values 3h (4:2:0) for single link 360 Mb/s transports and 0h (4:2:2) for 270 Mb/s dual-link transports.
- Bit 7 of byte 3 shall be used to identify a 4:3 image aspect ratio (0), or a 16:9 image aspect ratio (1).
- Bit 6 of byte 3 shall be used to identify 720 active Luma samples (0) or 960 active Luma samples (1) as defined by the horizontal Luma sample count.
- In the case of a dual-link 270 Mb/s transport, the channel assignment value in bit b6 of byte 4 shall be set to a value of 0 for the first link and to 1 for the second link. In the case of a single-link 360 Mb/s transport, the channel value shall be set to a value of 0.
- Identification of the quantization value may be specified in bit b0 of byte 4. The default value is 0 identifying a payload quantization resolution of 8 bits.

When identifying 483/576-line 4:4:4:4 interlaced payloads on a 270 Mb/s dual-link serial digital interface transport, the following constraints shall apply:

- The Picture Rate shall only use the values 5h (25 Hz) and 6h (30/1.001 Hz) in accordance with Table 2 SMPTE ST 352.

- Bit 6 of byte 2 shall be set to a value of 0 to identify an interlaced payload.
- The sampling structure identification shall only use the values 5h (4:4:4:4 Y/C_B/C_R/A), 6h (4:4:4:4 G/B/R/A), 9h (4:4:4:4 Y/C_B/C_R/D) or Ah (4:4:4:4 G/B/R/D).
- When bit 7 of byte 3 is 0, the image aspect ratio shall be 4:3 and when bit 7 of byte 3 is 1, the image aspect ratio shall be 16:9.
- The channel assignment value in bit b6 of byte 4 shall be set to a value of 0 for the first link and to 1 for the second link.
- Identification of the quantization value in bit b0 of byte 4 is optional. The default value is 0 identifying a payload quantization resolution of 8 bits.

B.3 483/576-Line Payloads on a 540 Mb/s Serial Digital Interface

Table B.3 – Payload identifier definitions for 483/576-line payloads on a 540 Mb/s serial digital interface

<table>
<tr><th>Bits</th><th>Byte 1</th><th>Byte 2</th><th>Byte 3</th><th>Byte 4</th></tr>
<tr><td>Bit 7</td><td>1</td><td>Reserved</td><td>Image aspect ratio
4:3 = 0, 16:9 = 1</td><td>Reserved</td></tr>
<tr><td>Bit 6</td><td>0</td><td>Interlaced (0) or progressive (1) picture</td><td>Reserved</td><td>Reserved</td></tr>
<tr><td>Bit 5</td><td>0</td><td>Reserved</td><td>Reserved</td><td>Reserved</td></tr>
<tr><td>Bit 4</td><td>0</td><td>Reserved</td><td>Reserved</td><td>Reserved</td></tr>
<tr><td>Bit 3</td><td>0</td><td rowspan="4">Picture rate
(see Table 2)</td><td rowspan="4">Sampling structure
(see Table 3)</td><td>Reserved</td></tr>
<tr><td>Bit 2</td><td>0</td><td>Reserved</td></tr>
<tr><td>Bit 1</td><td>1</td><td>Reserved</td></tr>
<tr><td>Bit 0</td><td>1</td><td>Bit depth
8-bit (0) or 10-bit (1)</td></tr>
</table>

When identifying 483/576-line interlaced and progressive payloads on a 540 Mb/s serial digital interface, at least the following list of Picture Rates and sampling structures are supported:

- The Picture Rate shall be set to the value of the 483/576-line payload as defined in SMPTE ST 347.
- The sampling structure shall be set to the value of the 483/576-line payload as defined in SMPTE ST 347. This shall include the use of the alpha channel as a carrier of data as well as video.

The following bit-fields are used:

- Bit 6 of byte 2 shall be set to a value of 0 to identify an interlaced payload and to a value of 1 to identify a progressive payload.
- Bit 7 of byte 3 shall be used to identify a 4:3 image aspect ratio (0), or a 16:9 image aspect ratio (1).
- Identification of the quantization value may be specified in bit b0 of byte 4. The default value is 0 identifying a payload quantization resolution of 8 bits.

B.4 483/576-Line Payloads on a 1.5 Gb/s (Nominal) Serial Digital Interface

Table B.4.1 – Payload identifier definitions for 483/576-line payloads on a 1.5 Gb/s (nominal) serial digital interface

Bits	Byte 1	Byte 2	Byte 3	Byte 4
Bit 7	1	Reserved	Reserved	Reserved
Bit 6	0	Reserved	Reserved	Channel assignment Ch1 active (0) or Ch1 and Ch2 active (1)
Bit 5	0	Reserved	Reserved	Reserved
Bit 4	0	Total line number 483 (0) or 576 (1)	Reserved	Image aspect ratio 4:3 (0) or 16:9 (1)
Bit 3	0	Picture rate (see Table 2)	Sampling structure (see Table B.4.2)	Mapping mode Normal mapping (0) or whole-line mapping (1)
Bit 2	1			Reserved
Bit 1	1			Reserved
Bit 0	0			Bit depth 8-bit (0) or 10-bit (1)

Table B.4.2 – Assignment of combination of sampling structure and interlaced or progressive picture

Value	Sampling Structure	Value	Sampling Structure	Value	Sampling Structure	Value	Sampling Structure
0_h	4:2:2i ($Y/C_B/C_R$) (No. 1 or 7)	1_h	4:2:2i ($Y/C_B/C_R$) (No. 2 or 8)	2_h	4:2:0p ($Y/C_B/C_R$) (No. 6 or 12)	3_h	4:4:4:4i ($Y/C_B/C_R/A$) (No. 3 or 9)
4_h	4:4:4:4i (G/B/R/A) (No.3 or 9)	5_h	4:2:2p ($Y/C_B/C_R$) (No. 4 or 10)	6_h	4:2:2p ($Y/C_B/C_R$) (No. 5 or 11)	7_h	4:2:2i × 2ch ($Y/C_B/C_R$) (No. 1 or 7)
8_h	4:2:2i × 2ch ($Y/C_B/C_R$) (No. 2 or 8)	9_h	4:2:0p ×2ch ($Y/C_B/C_R$) (No. 6 or 12)	A_h	Reserved	B_h	Reserved
C_h	Reserved	D_h	Reserved	E_h	Reserved	F_h	Reserved

When identifying 483/576-line payloads mapped onto a 1.5 Gb/s serial digital interface, the following limitations shall apply:

- Bit b4 of byte 2 shall be used to define the payload line count value as the total number of payload lines in the frame. Bit b4 shall be set to 0 to identify 483 lines and to 1 to identify 576 lines.
- The Picture Rate in Table B.4.1 shall be set to the value of the 483/576-line payload as defined in Table 1 of SMPTE ST 349.
- The sampling structure in Table B.4.2 shall be set to the value as defined in Table 1 of SMPTE ST 349.
- Bit b6 of byte 4 shall be used to identify whether only channel 1 is active or both channel 1 and 2. Bit b6 shall be set to 0 to identify channel 1 is active and shall be set to 1 to identify both channel 1 and channel 2 are active.
- Bit 4 of byte 4 shall be used to identify the image aspect ratio. Bit 4 shall be set to 0 to identify that the image aspect ratio is 4:3 and to 1 to identify that the image aspect ratio is 16:9.
- Bit 3 of byte 4 shall be used to identify the mapping mode. Bit 3 shall be set to 0 to identify normal mapping and to 1 to identify whole line mapping. SMPTE ST 349 defines the details of these mapping modes.
- Identification of the quantization value may be specified in bit b0 of byte 4. The default value is 0 identifying a payload quantization resolution of 8 bits.

Annex C Historical Payload Identifier Definitions for Existing Interfaces (Normative)

The payload identifier values defined in this annex should not be implemented in new encoder designs. The inclusion of this annex is solely to allow decoders conforming to this standard to be able to identify and decode payload identifiers that have been implemented according to the trial publication version as published in the July 2001 issue of the SMPTE Journal.

C.1 ITU-R BT.601 Payloads on SMPTE ST 259 SDI (525/625-Line Payloads)

Table C.1 – Payload identifier definitions for ITU-R BT-601 payloads on SMPTE ST 259 SDI

Bits	Byte 1	Byte 2	Byte 3	Byte 4
Bit 7	0	Reserved	Reserved	Reserved
Bit 6	0	Reserved	Reserved	Reserved
Bit 5	0	Reserved	Reserved	Reserved
Bit 4	0	Reserved	4:3/16:9	Reserved
Bit 3	0	Frame rate	Sampling structure	Reserved
Bit 2	0			Reserved
Bit 1	0			Reserved
Bit 0	1			Reserved

When identifying ITU-R BT.601 payloads on SMPTE ST 259 SDI, the following limitations shall apply:

- The frame rate shall only use the values 5h (25 Hz, 625I) and 6h (30/1.001 Hz, 525I) in accordance with the payload frame rate.
- The sampling identification shall only use the following values:
  - 0h to identify 4:2:2 I, 720 active Luma pixels per line, 270 Mb/s SDI;
  - 1h to identify 4:2:2 I, 960 active Luma pixels per line, 360 Mb/s SDI;
  - Fh to identify 4:2:2 I, 4fsc operation, 143 Mb/s (525i) or 177Mb/s (625i)
- Bit 4 of byte 3 shall only be used for sampling structures based on payloads with 720 active Luma samples. In these cases, if the bit is 0, then the source image aspect ratio is 4:3, and if the bit is 1, then the source image aspect ratio is 16:9 (i.e., anamorphic).

C.2 ITU-R BT.1358-1 Payloads on ITU-R BT.1362 SDI (525/625-Line Payloads on 270 Mb/s Dual-Link SDI)

Table C.2 – Payload identifier definitions for ITU-R BT.1358 payloads on ITU-R BT.1362 SDI

Bits	Byte 1	Byte 2	Byte 3	Byte 4
Bit 7	0	Reserved	Channel number	Reserved
Bit 6	0	Reserved		Reserved
Bit 5	0	Reserved	Reserved	Reserved
Bit 4	0	Reserved	4:3/16:9	Reserved
Bit 3	0	Frame rate	Sampling structure	Reserved
Bit 2	0			Reserved
Bit 1	1			Reserved
Bit 0	0			Reserved

When identifying the ITU-R BT.1358-1 525/625P payload on the ITU-R BT.1362 SDI, the following limitations shall apply:

- The frame rate shall only use the values 9h (50 Hz) for 625P systems and Ah (60/1.001 Hz) for 525P in accordance with ITU BT.1358.
- The sampling structure shall only use the 3h for 270 Mb/s dual-link SDI.
- In the case of dual link 270 Mb/s SDI, bits b7 and b6 of byte 3 shall define a count value in the range 0 to 3 where 0 defines single-link operation, 1 defines channel 1 of dual-link operation, and 2 defines channel 2 of dual-link operation. The value of 3 is Reserved but not defined.
- Bit 4 of byte 3 shall be used to define the source image aspect ratio for payloads with 720 active Luma samples per line. If the bit is 0, then the source image aspect ratio is 4:3 and if the bit is 1, then the source image aspect ratio is 16:9 (i.e., anamorphic).

C.3 SMPTE ST 347 (525/625-Line Payloads on 540 Mb/s SDI)

Table C.3 – Payload identifier definitions for 525/625 progressive and interlaced payloads on 540 Mb/s SDI

Bits	Byte 1	Byte 2	Byte 3	Byte 4
Bit 7	0	Reserved	Reserved	Reserved
Bit 6	0	Reserved	Reserved	Reserved
Bit 5	0	Reserved	Reserved	Reserved
Bit 4	0	Reserved	4:3/16:9	Reserved
Bit 3	0	Frame rate	Sampling structure	Reserved
Bit 2	0			Reserved
Bit 1	1			Reserved
Bit 0	1			Reserved

Only the following list of frame rates in combination with sampling structures shall be supported:

- Frame rate = 5h (25 Hz, 625I) and sampling structure = 6h (4:4:4:4 I; $Y/C_B/C_R$/Key).
- Frame rate = 6h (30/1.001 Hz, 525I) and sampling structure = 6h (4:4:4:4 I; $Y/C_B/C_R$ /Key).
- Frame rate = 5h (25 Hz, 625I) and sampling structure = 7h (4:4:4:4 I; R/G/B/Key).
- Frame rate = 6h (30/1.001Hz, 525I) and sampling structure = 7h (4:4:4:4 I; R/G/B/Key).
- Frame rate = 9h (50 Hz, 625I) and sampling structure = 4h (4:2:2 P, 4:3).
- Frame rate = Ah (60/1.001 Hz, 525I) and sampling structure = 4h (4:2:2 P, 4:3).
- Bit 4 of byte 3 shall be used to define the source image aspect ratio for payloads with 720 active Luma samples per line. If the bit is '0', then the source image aspect ratio is 4:3 and if the bit is '1', then the source image aspect ratio is 16:9 (i.e.,. anamorphic).

C.4 SMPTE ST 274 (1125-Line Payloads) on SMPTE ST 292-1 HD-SDI

Table C.4 – Payload identifier definitions for 1125-line payloads on SMPTE ST 292-1

Bits	Byte 1	Byte 2	Byte 3	Byte 4
Bit 7	0	P, I and PsF identification	Reserved	Reserved
Bit 6	0		Reserved	Reserved
Bit 5	0	Reserved	Reserved	Reserved
Bit 4	0	Reserved	Reserved	Reserved
Bit 3	0	Frame Rate	Sampling structure	Reserved
Bit 2	1			Reserved
Bit 1	0			Reserved
Bit 0	0			Reserved

When identifying the payload on SMPTE ST 274 interfaces, the following limitations shall apply:

- The frame rate shall only use the values as defined in SMPTE ST 274;
- Bits b7 and b6 of byte 2 shall define a number to identify the scanning format. The following values shall be used to define the scanning format:
  - 0h = Interlace (I). In this case, the sampling structure shall be set to 1h (4:2:2 I, 16:9);
  - 1h = Segmented frame (PsF). In this case, the sampling structure shall be set to 5h (4:2:2 P, 16:9);
  - 3h = Progressive (P). In this case, the sampling structure shall be set to 5h (4:2:2 P, 16:9);
- The value 2h is Reserved but not defined.

C.5 SMPTE ST 296 (750-Line Payloads) on SMPTE ST 292-1 HD-SDI

Table C.5 – Payload identifier definitions for 750-line video interfaces on SMPTE ST 292-1

Bits	Byte 1	Byte 2	Byte 3	Byte 4
Bit 7	0	Reserved	Reserved	Reserved
Bit 6	0	Reserved	Reserved	Reserved
Bit 5	0	Reserved	Reserved	Reserved
Bit 4	0	Reserved	Reserved	Reserved
Bit 3	0	Frame rate	Sampling structure	Reserved
Bit 2	1			Reserved
Bit 1	0			Reserved
Bit 0	1			Reserved

- The frame rate shall only use the values as defined in SMPTE ST 296.
- The sampling structure shall be set to 5h (4:2:2 P, 16:9).

C.6 SMPTE ST 349 (SD Payload Mapping into SMPTE ST 292-1)

Table C.6 – Payload identifier definitions for mapping SD interfaces into SMPTE ST 292-1 HD-SDI

Bits	Byte 1	Byte 2	Byte 3	Byte 4
Bit 7	0	Reserved	Reserved	Reserved
Bit 6	0	Reserved	Mapping mode	Reserved
Bit 5	0	Reserved	Reserved	Reserved
Bit 4	0	Reserved	4:3/16:9	Reserved
Bit 3	0	Frame rate	Sampling structure	Reserved
Bit 2	1			Reserved
Bit 1	1			Reserved
Bit 0	0			Reserved

When identifying SD payloads mapped onto SMPTE ST 292-1, the following limitations shall apply:

- The frame rate shall be set to the value of the SD interface as defined in Table 1 of SMPTE ST 349.
- The sampling structure shall be set to the value as defined in Table 1 of SMPTE ST 349.
- Bit 6 of byte 3 shall be used to identify the mapping mode. Setting bit 6 to 0 shall define normal mapping and setting bit 6 to 1 shall define whole line mapping (see SMPTE ST 349 for details on the mapping modes).
- Bit 4 of byte 3 shall only be used for sampling structures based on payloads with 720 active Luma samples. In these cases, if the bit is 0, then the source image aspect ratio is 4:3 and if the bit is 1, then the source image aspect ratio is 16:9 (i.e., anamorphic).

Annex D Mapping the Payload Identifier from an HANC Packet to a KLV Packet According to the Data Encoding Protocol Defined in SMPTE ST 336 (Informative)

The HANC data packet has a key–length–value (KLV) construct like that of SMPTE ST 336. The packet starts with start code; the ADF word sequence, which is a defined start code in digital video interfaces. This is followed by DID and SDID words which define the data type, a data count and the data itself (the payload identifier value). The packet is completed with a check sum to detect possible errors. If the ADF and CS words are removed, then the data structure is a key–length–value. Thus, the value of the HANC packet (i.e., the payload identifier words) can be mapped into the KLV protocol of SMPTE ST 336, as follows:

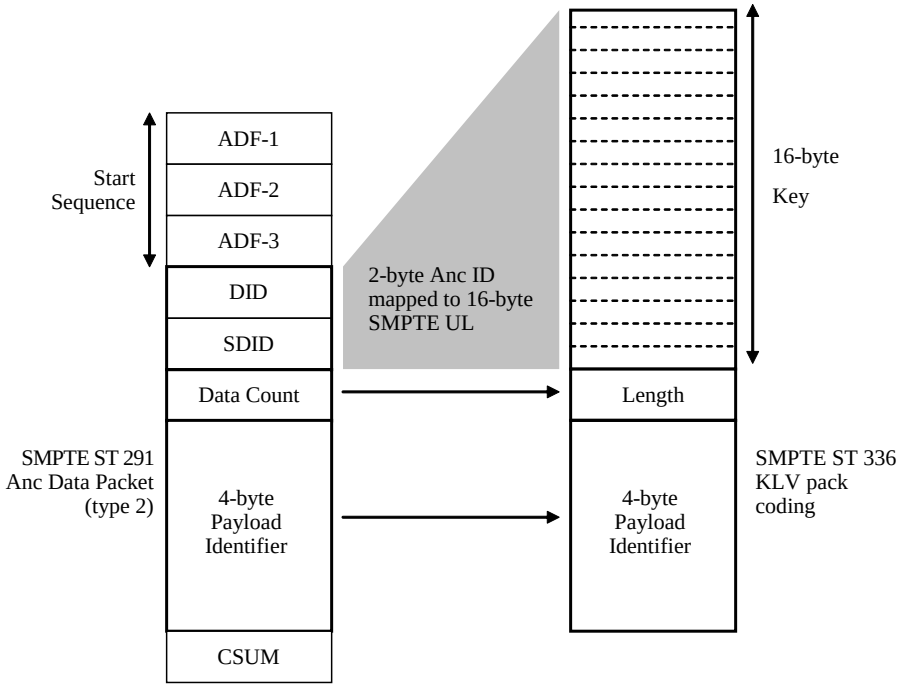

Figure D.1 – Mapping the payload identifier from an HANC packet into a KLV packet

Table D.1 – Mapping the components of an HANC packet to a KLV packet

Data structure	HANC packet	KLV protocol
Key	DID + SDID	16-byte Universal label
Length	DC	Variable length
Value	4-byte SDI payload identifier	4-byte SDI payload identifier

In mapping HANC packet data into a KLV data packet it is, of course, possible to consider mapping the whole HANC packet as the value, but this is a tunnelling process in which there are two layers of overhead, one from the HANC packet structure and one from the KLV data construct. This adds no value so the concept of heterogeneous operation where the payload is mapped into the local data construct is preferred to that of tunnelling.

The 4-byte payload identifier is a data pack comprising multiple metadata parameters in a pre-assigned form. This data pack can be added to any SMPTE data pack registry with the following guidance for the SMPTE Universal label (UL) as the pack key:

Table D.2 – Recommended value for the SMPTE UL

Byte No.	Description	Value (hex)
1	Object identifier	06_h
2	Label size	$0E_h$
3	Designation: ISO	$2B_h$
4	Designation: SMPTE	34_h
5	Registry category: Sets and packs	02_h
6	Registry designator: Fixed length packs	05_h
7	Standard: Pack standard	01_h
8	Version number	01_h
9	SMPTE registered data	01_h
10	Defining document: Anc packets	01_h
11	Ancillary data packet DID	41_h
12	Ancillary data packet SDID	01_h
13	Zero fill	00_h
14	Zero fill	00_h
15	Zero fill	00_h
16	Zero fill	00_h

Note: The above 16-byte UL value is shown for guidance only.

Annex E Bibliography (Informative)

Note: All references in this document to other SMPTE documents use the current numbering style (e.g. SMPTE ST 259:2008) although, during a transitional phase, the document as published (printed or PDF) may bear an older designation (such as SMPTE 259M-2008). Documents with the same root number (e.g. 259) and publication year (e.g. 2008) are functionally identical.

Recommendation ITU-R BT.601-6, Studio Encoding Parameters of Digital Television for Standard 4:3 and Wide-Screen 16:9 Aspect Ratios

Recommendation ITU-R BT.1358-1 (09/07), Studio Parameters of 625 and 525 Line Progressive Scan Television Systems

Recommendation ITU-R BT.1362 (02/98), Interfaces for Digital Component Video Signal in 525 and 625 Line Progressive Scan Television Systems

SMPTE ST 259:2008, Television — SDTV Digital Signal/Data — Serial Digital Interface

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

SMPTE ST 292-1:2012, 1.5 Gb/s Signal/Data Serial Interface

SMPTE ST 292-2:2011, Dual 1.5 Gb/s Serial Digital Interface for Stereoscopic Image Transport

SMPTE ST 293:2003, Television — 720 x 483 Active Line at 59.94-Hz Progressive Scan Production — Digital Representation

SMPTE ST 294:2001, Television — 720 x 483 Active Line at 59.94-Hz Progressive Scan Production — Bit-Serial Interfaces

SMPTE ST 296:2012, 1280 x 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 336:2007, Data Encoding Protocol Using Key-Length-Value

SMPTE ST 344:2000, Television — 540 Mb/s Serial Digital Interface

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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

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SMPTE ST 2036-1:2009, Ultra High Definition Television — Image Parameter Values for Program Production

SMPTE ST 2036-3:2012, Ultra High Definition Television — Mapping into Single-link or Multi-link 10 Gb/s Serial Signal/Data Interface

SMPTE ST 2047-2:2010, Carriage of VC-2 Compressed Video over HD-SDI

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

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

SMPTE ST 2048-3:2012, 4096 x 2160 Digital Cinematography Production Image Formats FS/709 – Mapping into Multi-link 10 Gb/s Serial Signal/Data Interface

SMPTE RP 175:1997, Digital Interface for 4:4:4:4 Component Video Signals (Dual Link)