

# **SMPTE STANDARD**

for Television —

# **Element and Metadata Definitions for the SDTI-CP**



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## **1 Scope**

This standard specifies the formats of the elements and metadata used by the SDTI content package format standard (SDTI-CP).

This standard defines element and metadata formats where they are simply specified or where a publicly available reference is available. It is not intended that this document provide detailed specifications for complex formats which may have broader application.

## **2 Normative references**

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

AES3-1992 (R1997), Digital Audio Engineering — Serial Transmission Format for Two-Channel Linearly Represented Digital Audio Data

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

SMPTE 291M-1998, Television — Ancillary Data Packet and Space Formatting

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

SMPTE 312M-2001, Television — Splice Points for MPEG-2 Transport Streams

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

SMPTE 328M-2000, Television — MPEG-2 Video Elementary Stream Editing Information

SMPTE 330M-2004, Television — Unique Material Identifier (UMID)

SMPTE 336M-2001, Television — Data Encoding Protocol using Key-Length-Value

SMPTE 337M-2000, Television — Format for Non-PCM Audio and Data in an AES3 Serial Digital Interface

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

ISO/IEC 13818-2:2000, Information Technology — Generic Coding of Moving Pictures and Associated Audio Information: Video

### 3 Introduction

Each type of element and metadata listed below includes an element or metadata type value. This type value is not related to the data type values specified in SMPTE 305.2M. The SDTI data type defines an item type, whereas this standard specifies element and metadata types.

The ranges of element and metadata type values for each item shall be as follows:

- Picture item: Element type range = 01<sub>h</sub> to 0F<sub>h</sub> inclusive.
- Audio item: Element type range = 10<sub>h</sub> to 1F<sub>h</sub> inclusive.
- Auxiliary item: Element type range = 20<sub>h</sub> to 77<sub>h</sub> inclusive.
- System item: Element type range = 78<sub>h</sub> to 7F<sub>h</sub> inclusive.
- System item: Metadata type range = 80<sub>h</sub> to FF<sub>h</sub> inclusive.

A type value of 00<sub>h</sub> is not a valid value for either elements or metadata.

Elements types defined for use in the auxiliary item may be used in picture or audio items where so stated.

## 4 System elements

### 4.1 Control code element

Type value = 78<sub>h</sub>

Reserved but not yet defined.

## 5 Picture elements

### 5.1 MPEG-2 picture element

Type value = 01<sub>h</sub>

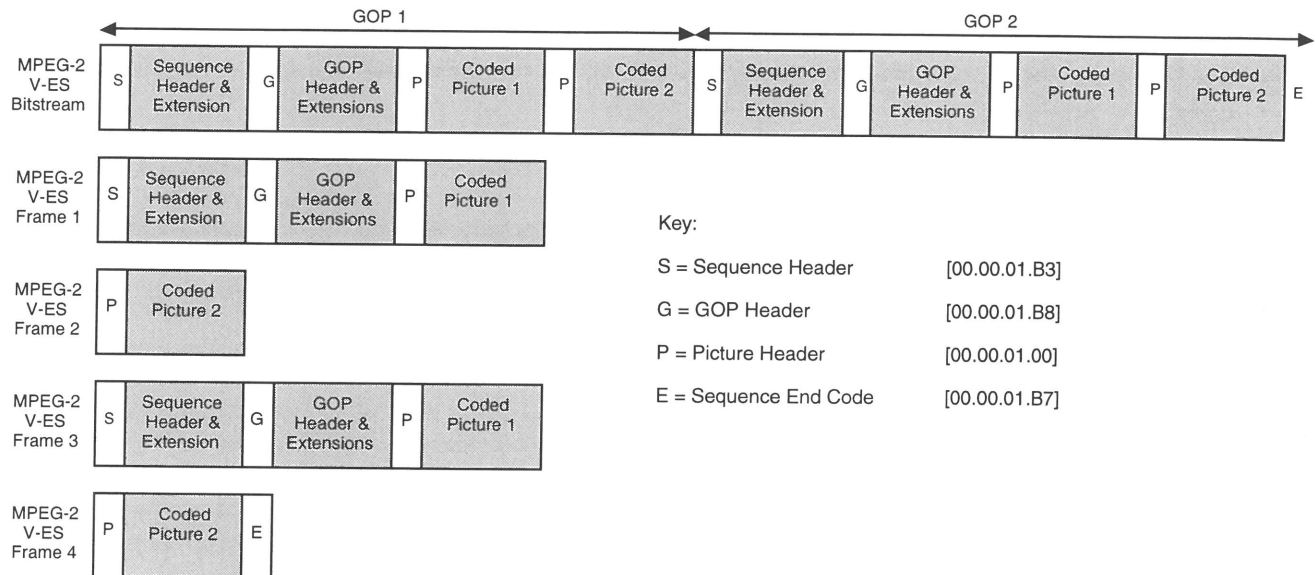
The MPEG-2 picture element shall be defined by the MPEG-2 video elementary stream (V-ES) of any profile or level according to ISO/IEC 13818-2.

The MPEG-2 picture element shall comprise the MPEG V-ES for one video frame together with all the MPEG-2 header information (including extensions) required to support the independent decoding of each picture.

The key start codes for MPEG-2 video elementary streams are:

- Sequence header (S): 00, 00, 01, B3;
- GOP header (G): 00, 00, 01, B8;
- Picture header (P): 00, 00, 01, 00;
- Sequence end code (E): 00, 00, 01, B7.

An example V-ES bitstream is shown in figure 1. The MPEG-2 V-ES bit stream is simply formatted into a data block as indicated in the figure. No other data is required.



**Figure 1 – Example formatting of a V-ES into MPEG-2 element frames**

It is recommended that the MPEG-2 picture element complies with SMPTE 328M (MPEG-2 elementary stream editing information). The following informative list of points summarizes the provisions of that standard for the repetition of MPEG-2 GOP and sequence header information.

- If the picture to be formatted is not an I-picture, then the data from the picture header code up to, but not including, either the next GOP or picture header is formatted into a block;
- If the picture to be formatted is an I-picture, then the data from the sequence, GOP and picture headers up to, but not including, either the next GOP or picture header is formatted into a block;
- It is recommended that the sequence header information be repeated at each I-picture with the information placed immediately prior to the GOP header information. Thus information about the sequence is readily available following any editing process. If sequence header information were not repeated so frequently, then edit processes may easily remove this information making downstream processing more difficult or even impossible;
- A sequence end code shall be retained with the end of the last picture in the sequence. After editing, a new sequence end code shall be added to the end of a sequence if it does not already exist.

The sequence of pictures is per the MPEG-2 picture bit stream including any discontinuity which may result from the use of B-pictures. Any picture stream timing metadata in the system Item shall reflect the decoded picture display sequence and thus the timing may appear discontinuous in the event of B-frames.

The byte alignment of both MPEG-2 and SDTI-CP is identical and this alignment is maintained in this standard. However, it should be noted that the bit stream orders of MPEG-2 and SDI differ in that the MPEG-2 bitstream is MSB first, whereas the SDI bit stream is LSB first.

NOTE – SMPTE RP 204 provides templates for the use of this element in SMPTE 326M together with a definition of a SMPTE label to identify the element complexity for interchange.

## 6 Audio elements

### 6.1 8-channel AES3 element

Type value = 10<sub>h</sub>

The data format of each channel of the 8-channel AES3 element is defined by the AES3 interface specification. Although the AES3 specification is limited to 2 channels, the 8-channel AES3 element is able to carry up to eight individual channels of AES3 data transparently. The I/O to the element will typically use AES3 twin-channel interfaces. Each AES3 channel may contain either linear PCM audio or data according to the AES3 specification.

The data format for an 8-channel AES3 element is shown in figure 2. The element data area shall contain AES3 audio or data samples for the period of the picture frame as close as possible.

Up to 8 channels of AES3 data shall be multiplexed on a word-by-word basis; i.e., the first word (W) of each channel (Ch) is multiplexed into the sequence:

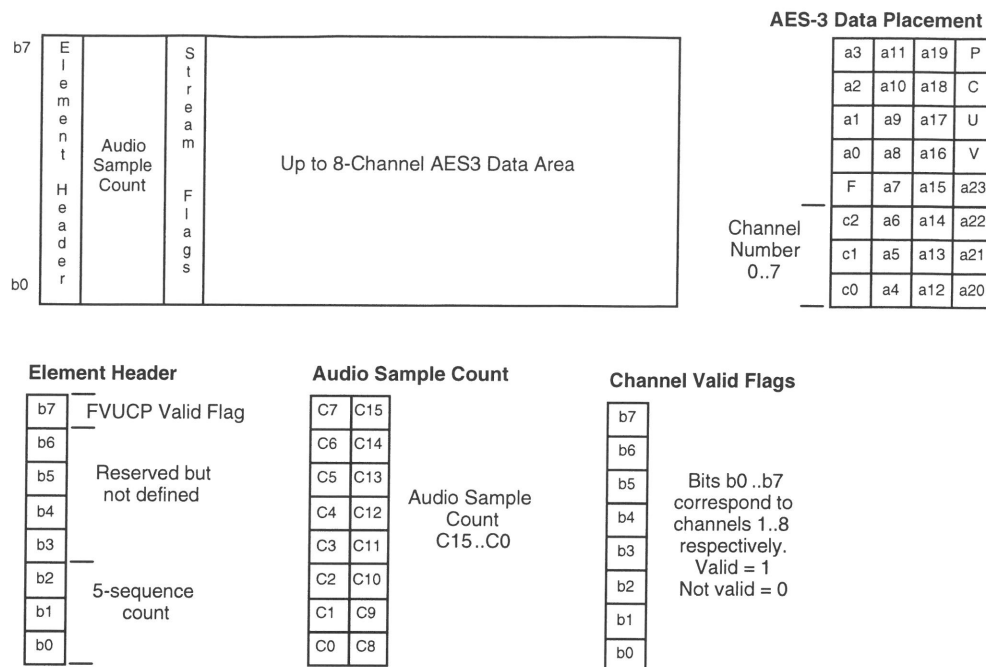
W1 Ch1, W1 Ch2, W1 Ch3, W1 Ch4, W1 Ch5, W1 Ch6, W1 Ch7, W1 Ch8

W2 Ch1, W2 Ch2, W2 Ch3, W2 Ch4, W2 Ch5, W2 Ch6, W2 Ch7, W2 Ch8

etc.

The format of the bits in each word is defined in figure 2.





**Figure 2 – Format of the 8-channel AES3 element**

The channel number shall be defined by bits c2 to c0. These bits define 8 states where '0' represents channel 1 and '7' represents channel 8.

The F bit shall indicate the first AES3 sub-frame of an AES3 block. This bit shall be 1 if the word is the start of the AES3 block, else it shall be 0.

NOTE – Equipment exists with the previous definition of the F bit but because of the inability to apply this bit properly, there were at least two different interpretations. Equipment conforming to the above definition may be easily distinguished because the F bit is not static for every sample as was the case for the previous definition.

The 24 bits of the AES3 specification shall be directly mapped into bits a0 to a23. The V, U, C and P bits shall be directly mapped as shown in figure 2.

For the AES3 element header:

- Bit b7 indicates if the FVUCP bits are active. A value of 0 indicates that the FVUCP bits are not used. A value of 1 indicates that the FVUCP bits are valid and useable.
- Bits b6 to b3 are not defined but reserved for future use.
- Bits b2 to b0 define a 5-sequence count. In a content package based on the 525/59.94 system, the count shall be a (modulo 5 + 1) count over the range 1 to 5. In a content package based on the 625/50 system, or any other system where the audio sample count is a consistent integer value over the content package period, the count shall be set to 0. All AES3 data channels within the same element shall have the same 5-sequence count number.

In the particular case of content packages based on 525/59.94 systems, the 5-sequence count defines one of the following sets of sample numbers per content package depending on whether it is frame or field based:

| Sequence No. | 30/1.001 | 60/1.001 |
|--------------|----------|----------|
| 1            | 1602     | 801      |
| 2            | 1601     | 801      |
| 3            | 1602     | 800      |
| 4            | 1601     | 801      |
| 5            | 1602     | 801      |

The audio sample count is a 16-bit count in the range 0 to 65535 and represents the number of samples in each channel. All channels within the element shall have the same sample count value.

The channel valid flag word has 8 bits, b0 to b7, which reflect the validity of the AES3 data in corresponding channels 1 to 8. A channel valid flag bit shall be set to 1 if the channel contains valid AES3 data else it shall be set to 0. The AES3 data area shall always be present for all 8 channels whether valid or not.

## 7 Auxiliary elements

### 7.1 VBI line element

Type value = 20<sub>h</sub>

The VBI line element carries one or more lines from the vertical blanking interval. The VBI line element has a header that identifies whether the source is interlaced or progressive and a number to identify the number of VBI lines carried.

Each VBI line is created from one line of the vertical blanking interval. Each line starts with a VBI information word followed by the 8-bit words from the whole of the VBI line.

Details of the VBI line element structure are shown in figure 3.

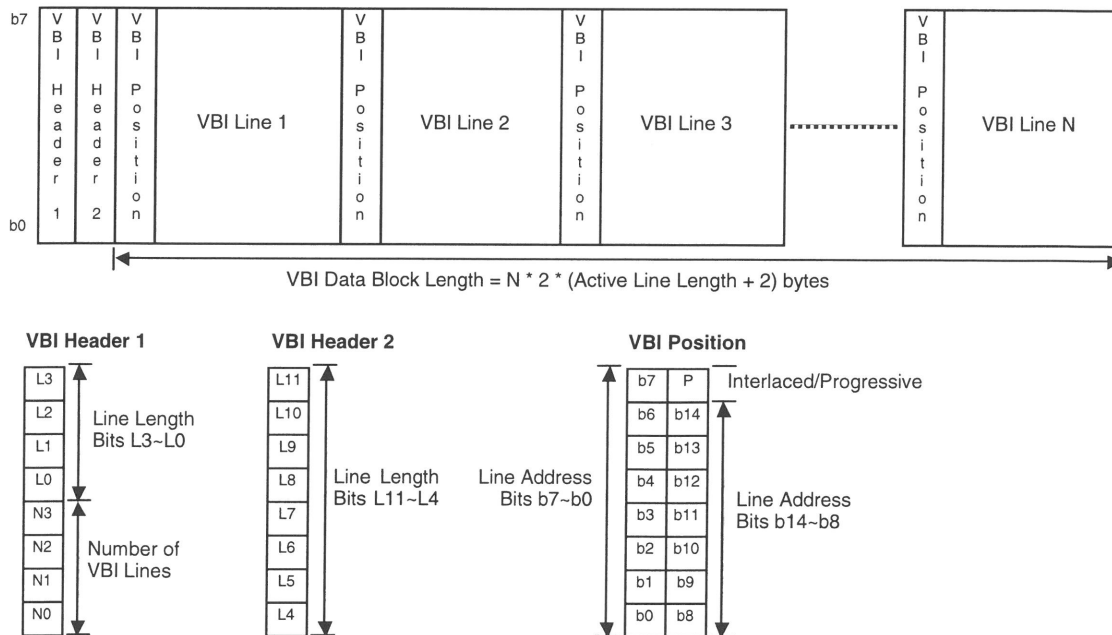


Figure 3 – Format of the VBI line element

The order of the VBI lines shall be as they are displayed on a viewing device.

For an interlaced scanned system, this shall be in the following order:

[VBI 1, 1st field], [VBI 2, 2nd field],

[VBI 3, 1st field], [VBI 4, 2nd field],

[VBI 5, 1st field], [VBI 6, 2nd field].

For a progressive scanned system, this shall be in the following order:

VBI 1, VBI 2, VBI 3, VBI 4, VBI 5, VBI 6.

In the VBI header words:

- Bits N3 to N0 of the first word shall define the number of VBI lines. The allowable values shall be in the range 0 to 6.
- Bits L3 to L0 of the first word together with bits L8 to L11 of the second word form a 12 bit count value which identify the length of the VBI lines. All VBI lines in one element shall have the same length.

In the VBI position word:

- Bits b14 to b8 of the second word and bits b7 to b0 of the first word form a line number range of 0 to 32767. The line address number shall represent an absolute line number for both Interlaced and Progressive line numbering systems.
- Bit b7 of the second word (P) is set to '0' for Interlaced scan and '1' for progressive scan.

A line address value of "0" means that no line number has been defined. Any line address number outside the vertical interval period for the picture scanning system is invalid and may cause unspecified effects in receiving equipment.

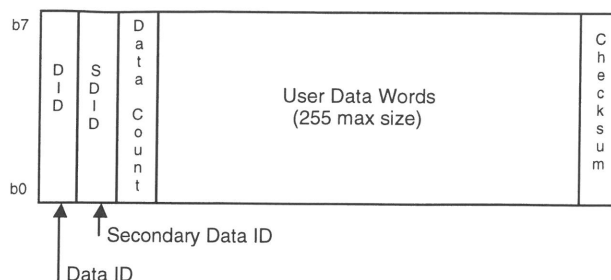
## 7.2 Ancillary data packet element

Type value = 21<sub>h</sub>

Ancillary data packets are defined by SMPTE 291M. This format carries only the 8 LSBs of each word of the ANC data packets and removes the ADF word sequence. Where there is more than one ANC packet, they shall be packed in sequence with no padding words or gaps between the packets. Reformatting to the full 10-bit word resolution together with the addition of the ADF sequence to the head of each ANC packet is the responsibility of the output formatting device.

Ancillary data packets carry data identification codes (DID and SDID) which identify the type of payload. The values for these codes are defined in the appropriate SMPTE standards and recommended practices.

The format of a type 2 ancillary data packet is shown in figure 4. The format may carry type 1 ancillary data by replacing the secondary DID word with the data block number.

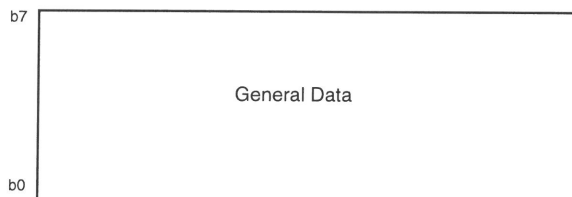


**Figure 4 – Format of the ancillary data packet element (Type 2 shown)**

### 7.3 General data element

Type value =  $22_h$

The general format shown in figure 5 is used to carry all free-form data types which do not have a separate auxiliary item element type value. These data types, including those of an IT nature (Word processing files, Hypertext etc), may require format identification through associated metadata in the system item.



**Figure 5 – Format of the general data element**

The auxiliary item may contain several general data elements with the same type identifier. These are distinguished with the element number which shall match the element type and number used in any associated metadata packet.

### 7.4 BWF element

Type value =  $40_h$

Reserved for the broadcast wave format (BWF), but not defined.

### 7.5 JFIF element

Type value =  $41_h$

Reserved for the JPEG file interchange format (JFIF) element, but not defined.

### 7.6 TIFF element

Type value =  $42_h$

Reserved for the tagged image file format (TIFF), but not defined.

## 8 System item metadata definitions

The following metadata definitions may be used in the system item to describe, as appropriate, either the entire content package, or any element or combination of elements in the picture, audio, or auxiliary items.

NOTE – Metadata definitions have both a local identifier defined by the type value and a global identifier which is the key in the SMPTE metadata dictionary (SMPTE RP 210.4). Both identifiers are referencing the same metadata specification defined in this document. The reason for the short type value used in the SDTI content package is for ease of parsing the data at the high speeds used by the SDTI transport. There is also a gain in packing density and hence simplified storage requirements on high-speed silicon. But it should be noted that most metadata items specified in this standard may be expanded to the full K-L-V construct using the key from the metadata dictionary. This fully expanded K-L-V construct may then be used as a basis for the common interchange of metadata items between different applications.

The first 8-byte group of the key is the SMPTE metadata dictionary designator value and is set to the value:

06.0E.2B.34.01.01.01.vv<sub>h</sub>

where vv<sub>h</sub> is the version of the SMPTE metadata dictionary at the time of registration of the item.

The second 8-byte group of the key is the metadata dictionary tag value and this is the value indicated in the metadata definitions below. Some metadata items defined below have specialized and complex data structures with no entry in the metadata dictionary.

### 8.1 Metadata link item

Local type value = 80<sub>h</sub>

Tag value = 01.07.01.03.00.00.00.00<sub>h</sub>

This special metadata item shall be used to link subsequent metadata items to their respective elements. The format differs from the general metadata construct and consists simply of 3 bytes which shall be in the sequence:

metadata type, element type, element number.

In any picture, audio or auxiliary metadata set, a metadata link item shall be present immediately following any nonzero metadata count value. All metadata following a metadata link item shall refer to the defined element until the occurrence of the next metadata link item.

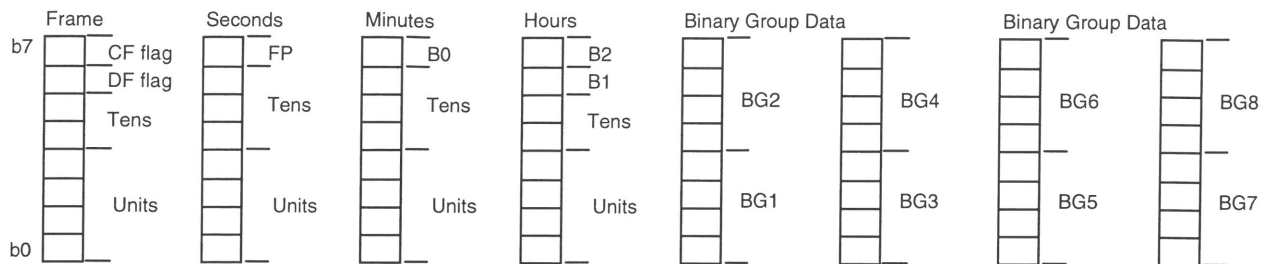
### 8.2 SMPTE 12M time code metadata

Type value = 81<sub>h</sub>

Tag value = 07.02.01.01.01.04.00.00

This metadata consists of a 16 byte field with the first 8 bytes coded with the data from the SMPTE 12M time code specification and is shown in figure 6. The last 8 bytes of the metadata format shall be null filled.

Note that the metadata is organized as LSB first to comply with SDI convention.



**Figure 6 – Illustration of the time code data format**

The order of transmission is bit b0 of the leftmost word first finishing with bit b7 of the rightmost word.

A list of the abbreviated terms in figure 6 and their full names follows:

- CF flag: Color frame flag;
- DF flag: Drop frame flag;
- FP: Field phase (NTSC), Binary group flag 0 (PAL);
- B0: Binary group 0 (NTSC), Binary group 2 (PAL);
- B1: Binary group 1 (NTSC and PAL);
- B2: Binary group 2 (NTSC), Field phase (PAL).

### 8.3 SMPTE 309M date-time stamp metadata

Type value = 82<sub>h</sub>

Tag value = 07.02.01.01.01.03.00.00

This metadata consists of a 16-byte field with the first 8 bytes coded according to the SMPTE 309M specification with a time, time zone, and date fields. The last 8 bytes of the metadata format shall be null filled.

The mapping of data from SMPTE 309M to the SDTI-CP metadata format is identical to that described in 8.2 (SMPTE 12M time code).

### 8.4 SMPTE UMID metadata

Type value = 83<sub>h</sub>

Tag value = 01.01.0t.mi.00.00.00.00

(where: t = essence type, m = material number creation method and i = instance number creation method).

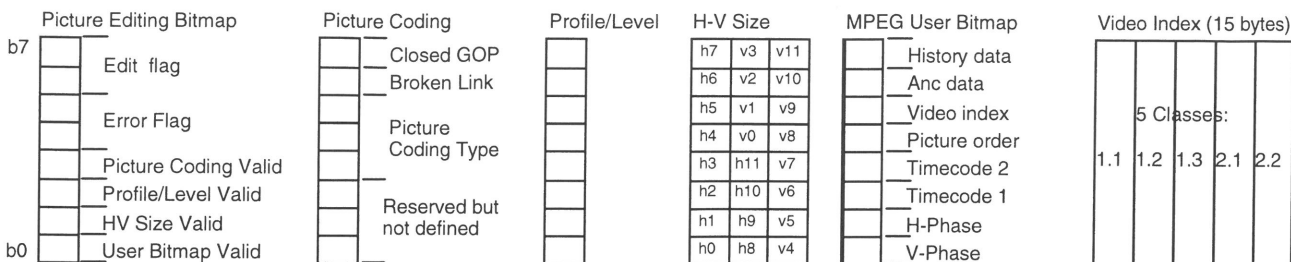
The UMID is defined in SMPTE 330M. It may be a basic UMID with a total length of 32 bytes or an extended UMID with a total length of 64 bytes. Both UMID types are defined as an integrated K-L-V construct with the last 4 bytes of the key discarded.

### 8.5 MPEG-2 picture editing metadata

Type value = 84<sub>h</sub>

Tag value: Not available.

Figure 7 illustrates the data structure of the MPEG-2 picture editing metadata.



**Figure 7 – Format of the MPEG-2 picture editing metadata**

The transmission order is lsb first to comply with the SDTI specification.

The format is now defined in pseudo-code representation based on byte transmission order. Values in square brackets indicate the size of the data field in bytes. Note that the data within a byte is ordered in relation to the diagram and does not imply the order of bit stream transmission.

```
MPEG-2_Picture_Editing_Metadata()
```

```
{
    picture_edit_bitmap [1]
    picture_coding_parameters [6]
    video_index [15]
    extension_data [var]
}
```

```
picture_edit_bitmap()
```

```
{
    edit_flag                2 bits
    error_flag               2 bits
    picture_coding_valid     1 bit
    profile_level_valid      1 bit
    HV_size_valid            1 bit
    user_bitmap_valid        1 bit
}
```

```
edit_flag (bits b7 b6)
```

```
00 : No edit
```

```
01 : Pre-picture edit
```

```
    (the previous element is no longer related to the current element)
```

```
10 : Post-picture edit
```

```
    (the following element is no longer related to the current element)
```

```
11 : Single frame picture
```

```
    (neither the previous nor the following elements are related to the current element)
```

```
error_flag (bits b5 b4)
```

```
00 : error status not known
```

```
01 : concealed error
```

```
10 : uncorrected error
```

```
11 : no error
```

```
if(picture_coding_valid == 1)
```

```
{
    picture_coding_data()
    {
        closed_gop                1 bit (as MPEG)
        broken_link               1 bit (as MPEG)
        picture_coding_type       3 bits (as MPEG, MSB in bit b5)
        reserved but not defined  3 bits
    }
}
```

```

    }
    else
        picture_coding_data [1]: non valid data

    if(profile_level_valid == 1)
    {
        profile_level          8 bits (as MPEG, MSB in bit b7)
    }
    else
        profile_level [1]: nonvalid data

    if(HV_size_valid == 1)
    {
        HV_size()
        {
            horizontal_size      12 bits (bits h11 to h0 as defined in figure 7)
            vertical_size        12 bits (bits v11 to v0 as defined in figure 7)
        }
    }
    else
        HV_size [3]: non valid data

    if(user_bitmap_valid == 1)
    {
        mpeg_user_data_bitmap()
        {
            History Data:      active = 1, not active = 0
            Ancillary Data:    active = 1, not active = 0
            Video Index:       active = 1, not active = 0
            Picture Order:     active = 1, not active = 0
            Timecode 2:        active = 1, not active = 0
            Timecode 1:        active = 1, not active = 0
            H-Phase:           active = 1, not active = 0
            V-Phase:           active = 1, not active = 0
        }
    }
    else
        mpeg_user_data_bitmap [1]: non valid data
    }

```

NOTE – MPEG User Data is specified in SMPTE 328M.

```

video_index()
{
    video_index_class_1.1 [3]
    video_index_class_1.2 [3]
    video_index_class_1.3 [3]
    video_index_class_2.1 [3]
    video_index_class_2.2 [3]
}

```

NOTE – Video\_index\_class data is defined in SMPTE RP 186.

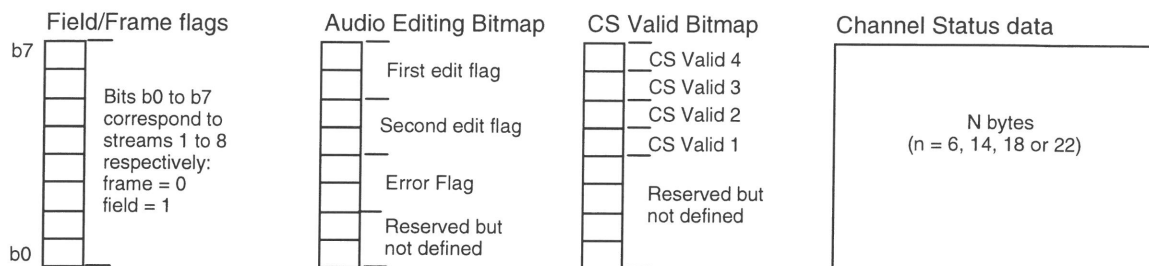
## 8.6 8-channel AES3 editing metadata

Type value = 85<sub>n</sub>

Tag value: Not available.



Figure 8 illustrates the data format of the 8-channel AES3 editing metadata. This metadata is designed to describe the 8-channel AES3 element (type 10<sub>n</sub>). The channel status data shall represent the default channel status of the audio data streams within the 8-channel AES3 element.



**Figure 8 – Format of the 8-channel AES3 editing metadata**

The transmission order is LSB first to comply with the SDTI specification.

The format is now defined in pseudo-code representation based on byte transmission order. Values in square brackets indicate the size of the data field in bytes. Note that the data within a byte is ordered in relation to the diagram and does not imply the order of bit stream transmission.

```

8-Channel_AES3_Editing_Metadata()
{
    field_frame_flags [1]

    for(ch_number=0; ch_number<8; Ch_number++)
    {
        if(stream_valid_flag[ch_number] == 1)
        {
            first_edit_flag          2 bits
            second_edit_flag         2 bits
            error_flag               2 bits
            reserved but not defined  2 bits
        }
        else
            null_data                8 bits
    }

    for(ch_number=0; ch_number<8; Ch_number++)
    {
        if(stream_valid_flag[ch_number] == 1)
        {
            cs_valid_4              1 bit
            cs_valid_3              1 bit
            cs_valid_2              1 bit
            cs_valid_1              1 bit
            reserved but not defined 4 bits

            if(cs_valid_1 == 1)
            {
                for(n=0; n<6; n++)
                    cs_byte(n) [1]
            }

            if(cs_valid_2 == 1)
            {

```

```

        for(n=6; n<14; n++)
            cs_byte(n) [1]
    }

    if(cs_valid_3 == 1)
    {
        for(n=14; n<18; n++)
            cs_byte(n) [1]
    }

    if(cs_valid_4 == 1)
    {
        for(n=18; n<22; n++)
            cs_byte(n) [1]
    }
}
}
}

```

NOTE – When a picture element has 2 fields, there are 2 audio edit positions defined by the positions of each picture field. The first and second edit flags apply to the respective first and second picture fields. When a picture is a single frame, only the first edit flag value is valid. Each bit in the field\_frame\_flags is used to identify whether the corresponding channel is edited on a field or frame basis.

first\_edit\_flag (bits b7 b6)

00 : No edit

01 : Pre-picture edit(the previous element is no longer related to the current element)

10 : Post-picture edit(the following element is no longer related to the current element)

11 : Single frame picture (neither the previous nor the following elements are related to the current element)

second\_edit\_flag (bits b5 b4)

00 : No edit

01 : Pre-picture edit(the previous element is no longer related to the current element)

10 : Post-picture edit(the following element is no longer related to the current element)

11 : Single frame picture (neither the previous nor the following elements are related to the current element)

error\_flag (bits b3 b2)

00 : error status not known

01 : concealed error

10 : uncorrected error

11 : no error

NOTE – Stream\_valid\_flag[ch number] indicates the presence of an audio channel as defined by the stream valid flag bitmap in the 8-channel AES3 element.

## 8.7 Picture bit-stream splicing metadata

Type value = 86<sub>h</sub>

Tag value = 05.02.01.02.01.01.00.00<sub>h</sub>

This metadata specification may be used to describe splicing information for MPEG video elementary streams with a GOP >1.

The format is defined as follows, following MPEG-2 notation:

```

Picture_Bitstream_Splicing_Metadata()
{
    In_Point_Present [1]

```

```

Out_Point_Present [1]
Reserved [6]

If(In_Point_Present)
{
    In_Point_Splice_Type [4]
    Reserved [3]
    Closed_GOP [1]
}

If(Out_Point_Present)
{
    Out_Point_Splice_Type [4]
    Reserved [4]
}
}

```

If the `in_point_present` is 1, the associated picture element shall commence with an `in_point` as defined by SMPTE 312M with the following exception:

- The last sentence of clause 4.3.2.1 does not apply. The effect of this exception is to allow an open GOP at an `in_point`. The `closed_GOP` flag shall be used to indicate whether a closed or open GOP exists at the `in_point`.

If the `out_point_present` is 1, it indicates that the associated picture element ends with an `out_point` as defined by SMPTE 312M.

The `in_point_splice_type` is equal to the value of the `splice_type` defined in SMPTE 312M and indicates that the video elementary stream meets the constraints corresponding to the value defined in clauses 6.3.2.2 and 6.3.2.3 of SMPTE 312M.

If `closed_GOP` is 1, it indicates that the `in_point` meets the constraints defined in SMPTE 312M, clause 6.3.2.1.

The `out_point_splice_type` is equal to the value of the `splice_type` as defined in SMPTE 312M, clause 6.2.2 as it pertains to the video elementary stream.

## 8.8 MPEG decoder buffer delay metadata

Type value = 87<sub>h</sub>

Tag value = 07.02.03.01.03.01.00.00<sub>h</sub>

The decoder buffer delay metadata shall only be used to support the low latency transfer mode of MPEG video elementary streams. Its presence in low latency mode transfer provides an explicit definition of decoder buffer delay. If low latency mode is used without this metadata, the buffer delay is not defined and a decoder shall set its delay according to its own capabilities.

The decoder buffer delay metadata may be used to support low latency transfer mode for any picture, audio or auxiliary data element. The delay shall be specified as a 16-bit word representing the decoder buffer delay as a count of 90-kHz clock periods as follows:

- First byte: Bits b0 to b7 of the 16-bit count word, where bit b0 is the LSB of the first byte.
- Second byte: Bits b8 to b15 of the 16-bit count word, where b8 is the LSB of the second byte.

The 90-kHz clock shall be derived either from the 27-MHz SDTI clock by dividing it by 300, or from the 36-MHz SDTI clock by dividing it by 400.

The decoder buffer delay metadata value shall be used to define the period, in 90-kHz clock cycles, between writing the first word of an element into the decoder buffer and reading the first word of that element out of the decoder buffer. The decoder buffer delay value shall be defined as a value large enough to prevent decoder buffer underflow. The maximum decoder buffer requirement to prevent decoder buffer overflow is not specified.

8.9 KLV metadata

Type value = 88<sub>h</sub>

Tag value = 03.01.02.10.02.00.00.00<sub>h</sub>

The KLV metadata format shown in figure 9 is defined for the carriage of any metadata that is KLV coded according to SMPTE 336M. This metadata item shall be used for the coding of the whole of a single KLV data item or a single KLV data group.

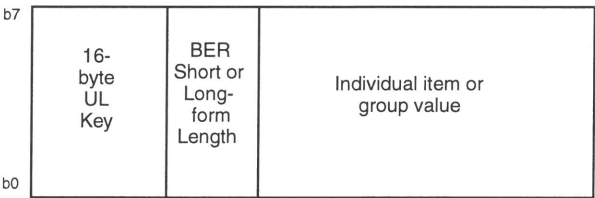


Figure 9 – KLV metadata format

The key shall be a 16-byte SMPTE UL as defined in SMPTE 336M.

The length field may be long or short form BER coded as defined by SMPTE 336M.

The value is coded as an item or a group according to the UL designator of the key as defined in SMPTE 336M.

The length of the KLV length field shall be constrained to be within the capability of the 4-byte element word count as defined in SMPTE 326M.

8.10 AES3 non-audio metadata

Type value = 89<sub>h</sub>

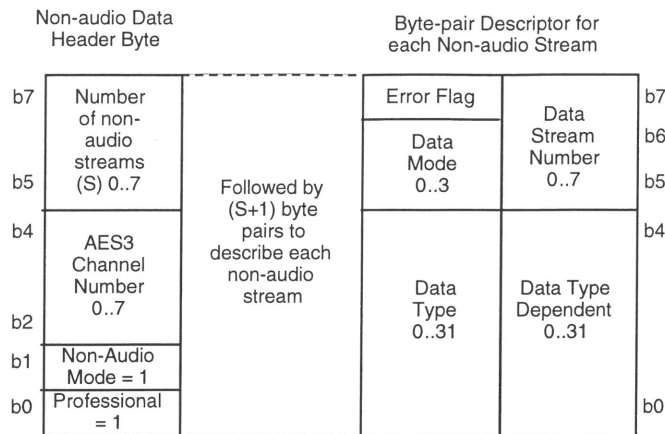
Tag value: Not available

This metadata specification may be used to describe individual channels of AES3 non-audio data in the 8-channel AES3 element (type 10h).

NOTE – If the 8-channel AES3 element carries 4 channels of AES3 non-audio data, then there will be 4 AES3 non-audio metadata items, one to describe each channel.

The AES3 non-audio metadata format shown in figure 10 identifies the payload of any AES3 non-audio data. It shall not be used to describe AES3 audio data.

Individual fields indicated in figure 10 are defined by SMPTE 337M. The values of certain fields may be specified by related SMPTE standards.



**Figure 10 – Format of AES3 non-audio metadata**

The AES3 non-audio metadata shall start with a single header byte that defines the following:

- Bit b0 shall be set to '1' to indicate professional use of the AES3 data.
- Bit b1 shall be set to '1' to indicate non-audio use of the AES3 data.
- Bits b2 to b4 shall define the channel number in the 8-channel AES3 element.
- Bits b5 to b7 shall define the number of non-audio data streams are contained within this AES3 channel.

The header byte shall be followed by a sequence of one to eight byte pairs where each byte pair uniquely describes a non-audio stream. Each byte pair contains a copy of the data fields defined in clause 6.1 of SMPTE 337M.

- Bits b0 to b4 of the first byte shall be set to indicate the "data\_type" value as specified by SMPTE 337M.
- Bits b5 and b6 of the first byte shall be set to indicate the "data\_mode" value as specified by SMPTE 337M.
- Bit 7 of the first byte shall be set to '1' to indicate that the "error\_flag" as specified by SMPTE 337M has been set to '1' within this stream of this channel of the AES3 Element.
- Bits b0 to b4 of the second byte shall be set to indicate the "data\_type\_dependent" value as specified by SMPTE 337M.
- Bits b5 to b7 of the second byte shall be set to indicate the "data\_stream\_number" of this stream as specified by SMPTE 337M.

**Annex A** (informative)  
**Bibliography**

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