SMPTE STANDARD

for Television — Material Exchange Format (MXF) — Mapping SDTI-CP Essence and Metadata into the MXF Generic Container

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1 Scope

This standard specifies the mapping of essence and metadata conforming to SMPTE 326M to the MXF generic container. The MXF generic container is the native essence container for use in an MXF file body.

This standard specifies an SDTI-CP compatible system item as a sequence of metadata elements in the MXF generic container. The standard then describes how the SDTI-CP system item, conforming to SMPTE 326M, can be mapped into the SDTI-CP compatible system item of the MXF generic container.

This standard also specifies how SDTI-CP picture, sound and auxiliary items, conforming to SMPTE 326M, can be mapped into the MXF generic container. This includes mapping of SDTI-CP elements conforming to SMPTE 326M.

Where appropriate, this standard also defines how the MXF generic container containing the appropriate metadata and essence elements can be mapped into SMPTE 326M.

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.

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

SMPTE 331M-2004, Television — Element and Metadata Definitions for SDTI-CP

Approved
September 22, 2004

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

SMPTE 377M-2004, Television — Material Exchange File (MXF) — File Format Specification

SMPTE 379M-2004, Television — MXF Generic container

SMPTE RP 210, Metadata Dictionary Registry of Metadata Element Descriptions

3 Glossary of acronyms, terms and data types

The general glossary of acronyms, terms and data types used in the MXF specification is given in SMPTE 377M. A supplementary glossary of terms and acronyms used in the generic container is given in SMPTE 379M. They are not repeated here to avoid any divergence of meaning.

3.1 Acronyms used in this standard

SMB: System metadata bitmap
CPR: Content package rate
CPT: Content package type
CH: Channel handle
CC: Continuity count

3.2 Terms used in this standard

Little-endien: Any multi-byte value with the least significant byte first.

4 Introduction

The MXF generic container is a streamable data container structure that can be placed on any suitable transport and potentially stored. The concept of this container was based on the work done by the EBU/SMPTE Task Force in the Wrappers and Metadata subgroup. In March 1998, a SMPTE ad-hoc group was formed to study the content package (CP) format based on an initial strawman proposal. The CP format was developed from the ground up to carry picture, sound and data essence together with metadata in a structured manner primarily over the SDTI (SMPTE 305.2M) transport and is known as SDTI-CP. SDTI-CP comprises two SMPTE engineering documents:

SMPTE 326M (SDTI-CP format) which defines the container format as applied to the SDTI; and

SMPTE 331M (SDTI-CP element and metadata definitions) that defines the data which can be placed in the SDTI-CP container.

The MXF generic container is an abstraction of the CP data structure, but can be made fully compatible with SDTI-CP by using the system item data defined in this standard together with the appropriate essence mapping document where it is compliant to SMPTE 331M.

This standard specifies a version of the system item in the MXF generic container that is compatible with SMPTE 326M.

NOTE – Auxiliary items and elements in SMPTE 326M are synonymous with data items and elements in the MXF generic container.

This standard also specifies how to map SDTI-CP elements and items into the MXF generic container.

NOTE – In tables within this standard, some properties are SMPTE labels (ULs). A list of appropriate values for these properties is provided in SMPTE RP 224.

5 SDTI-CP compatible system item

The SDTI-CP compatible system item contains metadata which describes the operation of the content package in various modes and provides key metadata items related to the whole package. It can include metadata linked to essence elements in the picture, sound and data items. Finally, the SDTI-CP compatible system item includes an optional downstream control element for future possible extension.

This section defines the data structure of the SDTI-CP compatible system item.

The SDTI-CP compatible system item is a combination of fixed-length pack data and local set data elements, KLV coded according to SMPTE 336M. Throughout the remainder of this document, the SDTI-CP compatible system item will be called simply the “system item”.

5.1 System item elements

The system item shall be coded as a sequence of up to six KLV packets where each packet comprises metadata elements for different aspects of the content package.

Figure 1 illustrates the system item data structure.

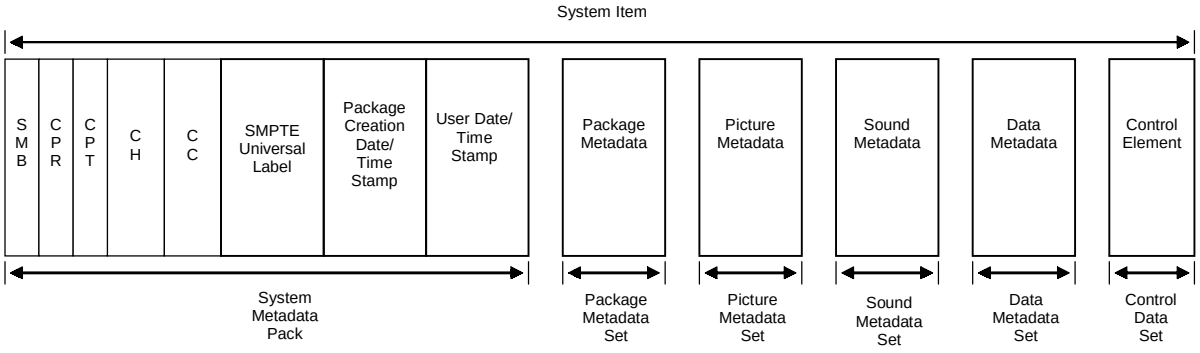

Figure 1 – Elements of the SDTI-CP compatible system item

This system item shall be divided into the following elements according to figure 1:

- A system metadata pack comprising a first 7 bytes and up to 50 further bytes (as defined by the first byte of the pack).
- A package metadata set that provides metadata for all essence elements in the content package.
- A picture metadata set that provides metadata for any essence element in the picture item. The set includes identification to link the metadata item to a specific essence element in the picture item.
- A sound metadata set that provides metadata for any essence element in the sound item. The set includes identification to link the metadata items to a specific essence element in the sound item.
- A data metadata set that provides metadata for any essence element in the data item. The set includes identification to link the metadata items to a specific essence element in the data item.
- A control data set comprising of only one data item that defines a downstream control element for the content package.

Where the system metadata pack is present in the MXF generic container it shall be the first KLV packet in every content package. As per SMPTE 326M, the content package metadata set shall immediately follow the system metadata pack. If there are no items of content package metadata, then the length field of the packet shall be zero.

As per SMPTE 326M, the presence of each of the picture, sound and data metadata sets and the control data set is determined by bits b3 to b0 of the first byte of the system metadata pack.

Where present, the order of the picture, sound and data metadata sets shall be the same as the order of the picture, sound and data items in the MXF generic container.

Where present, the control data set shall be the last KLV packet of this system item.

There shall be a maximum of one system, package, picture, sound, data or control set/pack in any CP-compatible system item.

5.2 System metadata pack

Figure 2 illustrates the first 7 data words of the system metadata pack.

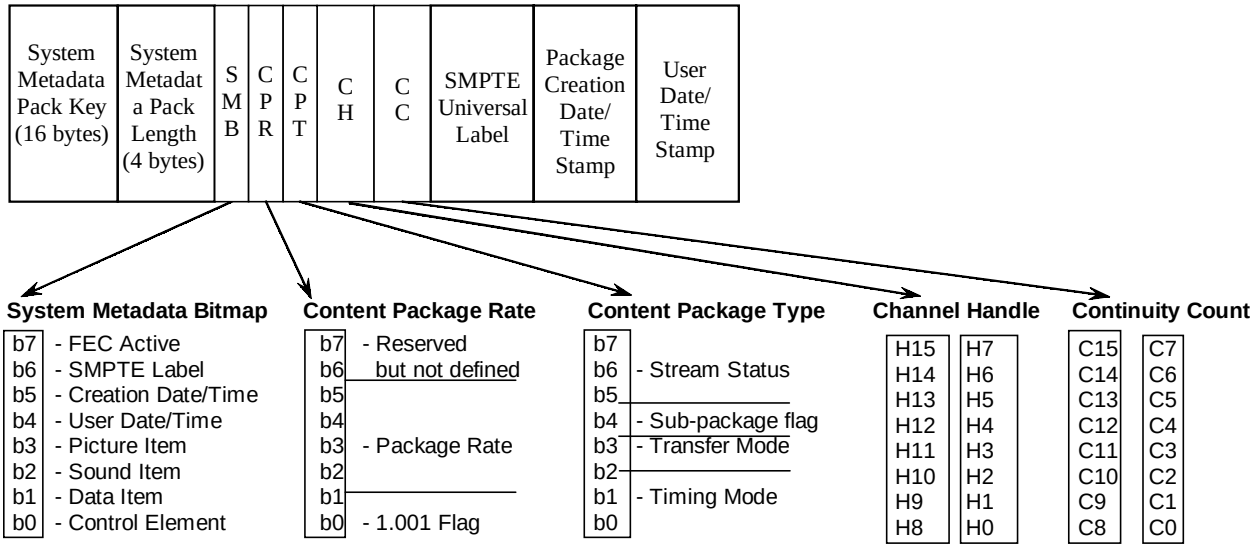

Figure 2 – System metadata pack structure

5.2.1 System metadata pack key

The system metadata pack key is defined in table 1.

Table 1 – Specification of the key for the system metadata pack

Byte No.	Description	Value (hex)	Meaning
1	Object Identifier	06h	
2	Label size	0Eh	
3	Designator	2Bh	ISO, ORG
4	Designator	34h	SMPTE
5	Registry Category Designator	02h	Sets & packs
6	Registry Designator	05h	Fixed length Packs
7	Structure Designator	01h	Sets & Packs Registry
8	Version Number	01h	Version 1 of the registry
9	Item Designator	0Dh	Organisationally Registered
10	Organisation	01h	AAF Association
11	Structure	03h	MXF Generic container Keys
12	Structure Version	01h	MXF-GC Version 1
13	Item Type Identifier	04h	CP-compatible system item
14	System Scheme Identifier	01h	SDTI-CP, Version 1
15	Metadata Element Identifier	01h	System Metadata Pack
16	Reserved	00h	

NOTE – The term ‘fixed-length’ pack in SMPTE 336M is a misnomer since it clearly covers data packs whose length is defined, but variable. In this case, the pack item lengths are fixed, but the presence of a pack item depends on the first byte.

5.2.2 System metadata pack length

The system metadata pack length field shall use 4-byte BER long-form encoding (83.xx.yy.zz).

5.2.3 System metadata pack value

A description of the component parts in the system metadata pack value field now follows:

The system metadata pack comprises up to 57 bytes defined by the following pack items as illustrated in figure 2:

- A system metadata bitmap word (1 byte);
- A content package rate word (1 byte);
- A content package type word, including stream status flags (1 byte);
- A channel handle word (2 bytes);
- A continuity count word (2 bytes);
- A SMPTE Universal label (16 bytes);
- A creation date/time stamp (17 bytes); and
- A user date/time stamp (17 bytes).

These component parts are briefly described in the following paragraphs. The full description of each component part is to be found in SMPTE 326M.

The first component fields of the system metadata pack shall be completed as follows:

5.2.3.1 Core fields

System metadata bitmap:

b7 = 0 (FEC not used),
b6 = 1 (SMPTE Universal label is present, see below)
b5 = 1 (creation date/time stamp is present) [Note 1]
b4 = 0 or 1 (user date/time stamp) [Note 1]
b3 = 0 or 1 (picture item present) [Note 1]
b2 = 0 or 1 (sound item present) [Note 1]
b1 = 0 or 1 (data item present) [Note 1]
b0 = 0 or 1 (control element present) [Note 1]

[Note 1]: The value depends on the application specification.

Content package rate: completed to reflect the correct value as defined in SMPTE 326M

Content package Type:

Stream status = 0, or 1~6 as required [the first value is the default]
Sub-package flag = 0
Transfer mode = 0 (default value) [Note 2]
Timing mode = 0 (default value) [Note 2]

Channel handle = 0 (default value)

Continuity count = modulo 65536 count as per SMPTE 326M [Note 3]

[Note 2]: These bits do not have the definition specified in SMPTE 326M and have no defined meaning in the MXF generic container. They shall be set to the default value of zero.

[Note 3]: The continuity count is not strictly required in many applications of an MXF file because the header metadata should correctly describe the timeline of the essence container. However, to maintain compatibility with the SDTI-CP system item definition, the continuity count shall comply with SMPTE 326M.

5.2.3.2 SMPTE Universal label

The SMPTE Universal label used in the system metadata pack identifies the MXF generic container and its payload. The value of this UL should be as defined in table 3 of SMPTE 379M.

NOTE – The SMPTE UL value in the MXF file then becomes a link to all content packages in the MXF generic container having the same UL value.

5.2.3.3 Creation date/time stamp

A creation date/time stamp value should be entered in the system metadata pack according to SMPTE 326M. Note that the format of this item is defined by the first byte which has the metadata type value of ‘81h’ (timecode) or ‘82h’ (date-timecode) as defined in SMPTE 331M-2000. In compliance with SMPTE 331M, of the 17 bytes available, only the first 9 bytes are used and the last 8 bytes are zero-filled.

5.2.3.4 User date/time stamp

A user defined date/time stamp value may be entered in the system metadata pack according to SMPTE 326M. The format of this item is identical to that described for the creation date/time stamp.

5.2.4 Package, picture, sound and data metadata sets and the control data set

The first metadata set is the package metadata set which contains metadata for the package as a whole; such as, for example, a time code. This metadata does not require a 'link' item as each metadata item of the set is related to the package as a whole rather than any individual part.

The subsequent metadata sets are picture, sound and data metadata sets. They are only present if the associated picture, sound or data item is present in the content package. Each metadata set has zero or more 'link' metadata items which link each metadata item in the set to the associated essence element in the picture, sound or data item.

Note that these metadata sets have no formal class structure. Instead, each metadata item is coded in a metadata set with a local tag value for identification and a 'link' metadata item that provides a unique link for subsequent metadata items to the associated essence element.

Where present, the last data set shall be the control data set. Although coded as a data set, this set shall contain only one control data item for compatibility with SMPTE 326M.

Each set shall be coded as a KLV local set. Figure 3 illustrates the basic structure of the package, picture, sound and data metadata sets and the control data set.

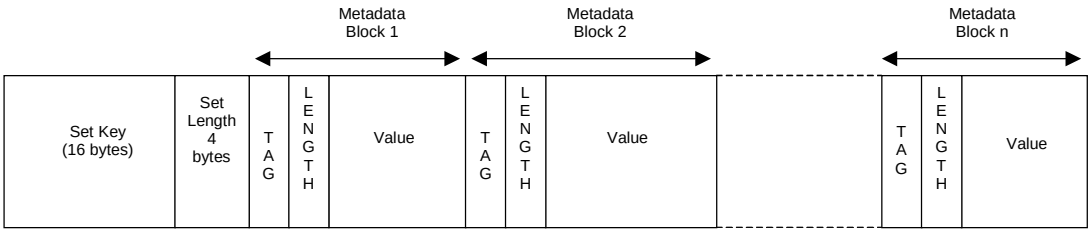

Figure 3 – Structure for the package, picture, sound and data metadata sets

5.2.5 Metadata and control data set keys

The metadata and control data set keys are defined in table 2.

Table 2 – Specification of the key for the system item sets

Byte No.	Description	Value (hex)	Meaning
1	Object Identifier	06h	
2	UL size	0Eh	
3	Designator	2Bh	ISO, ORG
4	Designator	34h	SMPTE
5	Registry Category Designator	02h	Sets & packs
6	Registry Designator:	Package, Picture, Sound & Data Metadata Sets = 43h Control data set = 63h	Metadata sets (43h) = 1-byte tag, 2-byte length Control set (63h) = 1-byte tag, 4-byte length

Byte No.	Description	Value (hex)	Meaning
7	Structure Designator	01h	Sets & Packs Registry
8	Version Number	01h	Version 1 of the registry
9	Item Designator	0Dh	Organizationally Registered
10	Organisation	01h	AAF Association
11	Structure	03h	MXF generic container keys
12	Structure Version	01h	MXF-GC version 1
13	Item Type Identifier	04h	CP-compatible system item
14	System Scheme Identifier	01h	SDTI-CP, version 1
15	Metadata Element Identifier	02h~06h	Package metadata set = 02h Picture metadata set = 03h Sound metadata set = 04h Data metadata set = 05h Control data set = 06h
16	Metadata Block Count	xxh	Number of metadata blocks in the element (zero for the control data set))

The package, picture, sound and data metadata sets embed the 'metadata block count' byte into the set key to maintain compatibility with SMPTE 326M. The control data set does not require a 'metadata count' byte and byte 16 is set to zero for the control data set only.

5.2.6 Metadata and control data set length

Each metadata and control data set length field shall use 4-byte BER long-form encoding (83.xx.yy.zz).

NOTE – The control set has data blocks with 4-byte big-endien length fields that can exceed the capability of 4-byte BER long-form encoding. However, in practice, the range is sufficient.

5.2.7 Metadata and control data set values

A metadata set shall comprise one or more metadata items. Each item of a set consists of a 1-byte tag as followed by a 2-byte or 4-byte item length and completed by the metadata value. The item length shall be 2-bytes for data blocks in the picture, sound and data metadata sets and 4-bytes in the control data set.

The common structures for data blocks in system item metadata sets are illustrated in figure 4.

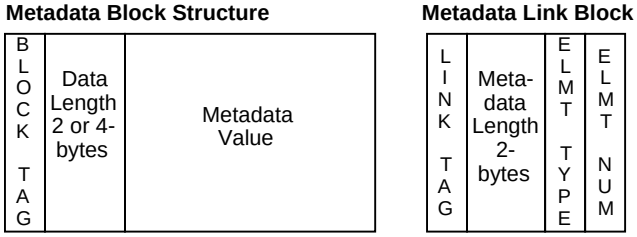

Figure 4 – Structure for metadata items including the metadata link item

5.2.7.1 Metadata link item

Picture, sound and data metadata items must be preceded by a metadata ‘link’ item which provides a link between the metadata in the system item set and the associated essence element in a picture, sound and data item. A metadata ‘link’ item will occur at least as many times as there are essence elements to link. Each time a metadata ‘link’ item is found, the immediately following metadata items will all refer to the linked essence element until the next metadata ‘link’ item is found or the set is complete.

The value of the link metadata item is defined in SMPTE 331M. In SMPTE 326M, the coding of this item does not include a length field. For consistency, this field has been added in this specification. The value of this length field is ‘0002h’.

5.2.7.2 Tag values

The tag value for any metadata block is as defined in SMPTE 331M.

5.2.7.3 Length values

The length value of package, picture, sound or data metadata items shall be 2-bytes encoded as big-endien.

The length value of a control data item shall be 4-bytes encoded as big-endien.

5.3 System item relationship to the MXF header metadata

5.3.1 Mapping track numbers to metadata elements

The header metadata may include descriptors to describe the metadata in one or more of the CP-compatible system item metadata elements used. The track number value shall be defined as described in the MXF generic container specification (SMPTE 379M).

5.3.2 Use of descriptors for CP-compatible metadata elements

The system metadata pack and the control data set are the only CP-compatible system item metadata elements that may require a header metadata descriptor set. The package, picture, sound and data metadata sets use a pre-defined scheme as defined in this standard. Each metadata element has a unique track number as defined in the previous section.

Where a metadata element requires more than one descriptor set, then the multiple descriptor set defined in SMPTE 377M (MXF format) shall be used to reference each individual descriptor set

5.3.3 Descriptors for CP-compatible metadata elements

The appropriate header metadata package should have a descriptor for the ‘creation date/time’ item. The header metadata package should have a descriptor for the ‘user date/time’ item where that item is present.

The definition of the descriptor for both date/time items follows in table 3. Note that this descriptor is a file descriptor as defined in annex D of SMPTE 377M. The last four rows of this table are new metadata items added specifically for this date/time descriptor.

Table 3 – Date/time descriptor

Item Name	Type	Len	Local Tag	UL Designator	Req ?	Meaning	Default
Date/Time Descriptor	Set Key	16		See Table 13 in SMPTE377M and Table 4 below	Req	Defines the Date/Time Descriptor set	
Length	BER Length	Var			Req	Set length	
Instance UID	UUID	16	3C.0A	01.01.15.02	Req	Unique ID of this instance	
Generation UID	UUID	16	01.02	05.20.07.01.08	Opt	Generation Identifier	
Linked Track ID	UInt32	4	30.06	06.01.01.03.05	Opt	Link to (i.e. value of) the Track ID of the track in this Package to which this Descriptor applies.	
Sample Rate	Rational	8	30.01	04.06.01.01	Req	The field or frame rate of the Essence Container	
Container Duration	Length	8	30.02	04.06.01.02	Opt	The number of samples of the Essence Container (measured at the Sample Rate)	
Essence Container	UL	16	30.04	06.01.01.04.01.02	Req	The UL identifying the Essence Container described by this descriptor. Listed in SMPTE RP224	
Codec	UL	16	30.05	06.01.01.04.01.03	Opt	UL to identify a codec compatible with the Essence Container. Values are listed in SMPTE RP224	
Locators	StrongRefArray (Locators)	8+16 n	2F.01	06.01.01.04. 06.03	Opt	Ordered array of strong references to Locator sets If present, essence may be located external to the file. If there is more than one locator set an MXF Decoder shall use them in the order specified.	
Date/Time Rate	Rational	8	35.01	04.04.01.02.01	Opt	Defines the Date/Time rate where this differs from the essence container rate	Sample Rate
Date/Time Drop Frame	Boolean	1	35.02	04.04.01.02.02	Opt	TRUE if drop-frame is active	FALSE
Date/Time Embedded	Boolean	1	35.03	04.04.01.02.03	Opt	Is it embedded in other data?	TRUE
Date/Time Kind	UL	16	35.04	04.04.01.02.04	Req	Date/Time format kind. Values are listed in SMPTE RP224	

Table 4 – Byte values for the date/time descriptor key

Set Name	Byte 14	Byte 15
SMPTE331M Time and Date/Time Item	01h	46h

6 Mapping the SDTI-CP system item to the MXF generic container

This section describes how the contents of the SDTI-CP system item shall be mapped to the MXF generic container. The 8-bit data words extracted from an SDTI-CP interface are those data words that reside between the SDTI-CP separator and end code words. The separator and end code words are used in SDTI-CP to provide unique start and stop code words for each CP item as defined in SMPTE 326M and are not considered as part of this mapping process.

6.1 System item mapping

In SDTI-CP, the system item is a single composite data format that must be parsed and divided into the metadata elements defined in section 5.1. These elements are each KLV coded with keys, lengths and values as follows.

6.1.1 System item element keys

In the MXF generic container, the 16-byte system item keys are created for each element, as a pack or set, and integrate a number of bytes defined in the system item of SDTI-CP as follows.

For each system item element, the key values shall be as defined in table 1 and table 2 with the following notes:

- The registry designator value (byte 6) of the key shall correctly represent the format of the metadata element.
- Byte 13 of the key shall be set to the system item type value (04h) for all metadata elements.
- Byte 14 of each key is the system item scheme identifier. For all keys, the value shall be ‘01h’ identifying the scheme as SDTI-CP compatible.
- The system item element number is identified in byte 15 and the values lie in the range ‘01h’ to ‘06h’. The sequence of the elements at the SDTI-CP interface port shall follow the rules defined by SMPTE 326M. The values in byte 15 of the key can be used to bring together the system item elements of the MXF generic container back into the composite form used in SDTI-CP.
- For the package, picture, sound and data metadata sets only, the metadata count value of SDTI-CP shall be entered into byte 16. The value shall be in the range ‘00h’ to ‘7Fh’ inclusive. The metadata count value is not included in the value fields of the system item. For the system metadata pack and any control set, byte 16 shall be set to ‘00h’.

6.1.2 System item element lengths

The system item elements are all coded as separate KLV packets each of which uses 4-byte BER long-form encoding (83.xx.yy.zz). Each element length must be created after parsing by calculation of the length of the relevant element value. The length value in the SDTI-CP interface gives the length of the composite CP system item and is of no practical use for this calculation.

For the package, picture, sound and data metadata sets only, the metadata count of SDTI-CP is encapsulated into the keys. The metadata count is not included in the calculation of the length value. Thus a package, picture, sound or data metadata set may comprise simply a key followed by a length having a value of zero (and hence no value field).

In converting back to SDTI-CP, the word count in CP is a 4-byte little-endien value that defines the entire length of the SDTI-CP system item value. This composite length value is the sum of the length values of each SDTI-CP compatible system item element. However, this sum will be modified by the following:

- The presence of any metadata link items (see figure 4) since a 2-byte length value has been added to the MXF generic container where it is not present in SDTI-CP.

- The reinsertion of the metadata count values in the package, picture, sound and data metadata sets where present.

6.1.3 System item element values

The value from the SDTI-CP system metadata pack of the MXF generic container can be directly mapped from the first element of the SDTI-CP system item data area. Subsequent metadata sets are mapped as follows:

- The metadata count value is removed from the first byte of each metadata set.
- For each metadata block in each metadata set, the length value must be byte swapped from the 2-byte little-endien length values defined in SDTI-CP to the 2-byte big-endien values defined in the SDTI-CP compatible sets. The exception to this rule is the metadata link block where the 2-byte length field shall be added as new.
- Any control data set in the SDTI-CP compatible system item uses 4-byte big-endien length values. Each 4-byte little-endien length value of an SDTI-CP source shall be byte swapped to 4-byte big-endien values.

7 Mapping SDTI-CP picture, sound and auxiliary items to the MXF generic container

This section describes how the contents of the SDTI-CP system, picture sound and auxiliary items are mapped to the MXF generic container. The 8-bit data words extracted from an SDTI-CP interface are those data words that reside between the SDTI-CP separator and end code words. The separator and end code words are used in SDTI-CP to provide unique start and stop code words for each CP item as defined in SMPTE 326M and are not considered as part of this mapping process.

7.1 Picture, sound and auxiliary item mapping details

The general data structure of the SDTI-CP picture, sound and auxiliary items is shown in figure 5.

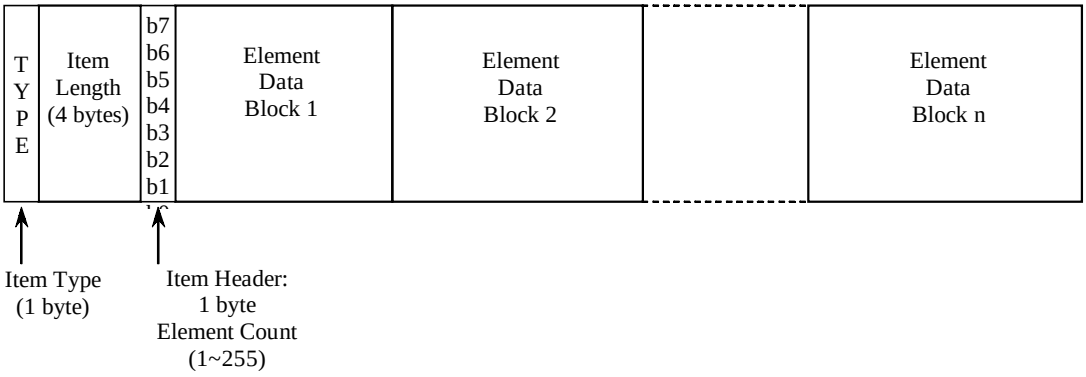

Figure 5 – Structure of SDTI-CP picture, sound and auxiliary items

7.1.1 Item keys

The picture, sound and auxiliary items of SDTI-CP have a common data structure where the Item starts with an item type word that is the same as the item value in byte 13 of a MXF generic container element key.

7.1.2 Item lengths

The item length value can be calculated from the values in the element length fields, but it is acceptable to apply the value '0' which indicates that there is no usable length value and that the end of the SDTI-CP item is defined by the presence of the SDTI end code word.

The length field is followed by the item header that is a count of the number of elements in the item. This value is located in byte 14 of a MXF generic container element key. The value of the 1-byte item header word is the number of elements in the range 1 to 127 (0 is not valid). The item header word is provided so that the number of element data blocks in the item is known in advance of parsing the item.

7.1.3 Item values

The item value in SDTI-CP is a concatenation of the SDTI-CP elements as shown in figure 5.

7.2 Essence element mapping

Each SDTI-CP compatible essence element in the MXF generic container is coded as a separate KLV packet even though the logical structure places all picture elements in a picture item, all sound elements in a sound item and all data elements in a data item.

Each SDTI-CP compatible essence element value is as defined in SMPTE 331M. This section will define only the differences in the element key values and the length values.

7.2.1 Element keys

The SDTI-CP compatible essence element keys integrate a number of component parts defined in SMPTE 326M as follows:

- The SDTI-CP item value is defined in byte 13 of each SDTI-CP compatible essence element key. Therefore, elements in the same Item can be grouped for mapping into SDTI-CP.
- The element count value that is present after the SDTI-CP word count field is preserved in byte 14 of each MXF generic container element key. Therefore, each essence element can know whether it is a single element in an item or one of two or more. The value in the GC shall be constrained to a maximum of 127.
- The element type value that is used in SDTI-CP to identify the kind of element present in the value field is preserved in byte 15 of the MXF generic container element key. The value in the GC shall be constrained to a maximum of 127.
- The element number value which is used in SDTI-CP to give a locally unique number to each element is preserved in byte 16 of the MXF generic container element key. The value in the GC shall be constrained to a maximum of 127.

7.2.2 Element lengths

MXF generic container length fields are coded as BER long-form. SDTI-CP compatible length fields shall be coded with a BER long-form length of 4 bytes (83h.xx.yy.zz).

SDTI-CP length fields are 4 byte UInt32 values coded as little-endien. The little-endien output value is therefore 'zz.yy.xx.00'.

7.2.3 Element values

Each essence element value is byte-for-byte identical in the MXF generic container and SDTI-CP.

7.2.4 Element mapping details

The element data blocks of SDTI-CP have a common data structure, shown in figure 6, where the element starts with an element type word which is the same as the element type value in byte 15 of an MXF generic container element key.

The element length value must be decremented by 1 (to allow for the removal of the element number byte) and converted to 4-byte BER long form.

The element number byte is identical to that in byte 16 of an MXF generic container element key.

The element value is identical in the SDTI-CP compatible MXF generic container and SDTI-CP.

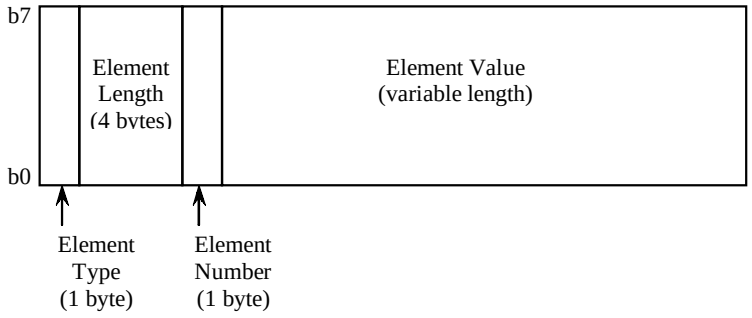

Figure 6 – Structure of SDTI-CP element data blocks

8 Length conversions

The 4-byte length fields of SDTI variable blocks are little-endian format. For each CP item, the length field is converted from 4-byte little-endian form to 4-byte BER long-form coding after any adjustments. This format conversion is easily achieved as follows:

SDTI length		BER length
ab.cd.ef.00	becomes..	83.ef.cd.ab

The first byte is '83_h' which indicates BER long-form encoding with 3 bytes to follow. The 3 bytes are the most significant of the SDTI length, thus the rightmost byte of the SDTI length ('gh') is discarded in this conversion. The remaining 3 bytes still allow a length of up to (2^24 -1) bytes which is sufficient for all foreseen applications including extremely high definition uncompressed pictures.

Annex A (informative)
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