RP 204-2000

SMPTE RECOMMENDED PRACTICE

SDTI-CP MPEG Decoder Templates

1 Scope

This practice defines decoder templates for the encoding of SDTI content packages (SDTI-CP) with MPEG coded picture streams.

The SDTI-CP comprises a standard for the package format and a further standard for the definition of elements and metadata. The combination of these two standards results in a very flexible means of transferring content over the SMPTE 305M (SDTI) transport which would demand an unnecessarily complex receiver/decoders if all possibilities were met. The purpose of this practice is to provide appropriate limits to the requirements for a receiver/decoder in order to allow practical working devices to be supplied to meet the needs of defined operations.

Additional MPEG templates are expected to be added to this practice as the standard matures. It is recommended that each new template is a superset of previous templates so that any decoder defined by a template in this document can operate with both the defined template and all subsets.

2 Normative references

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

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

ANSI/SMPTE 298M-1997, Television — Universal Labels for Unique Identification of Digital Data

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

SMPTE 305M-1998, Television — Serial Data Transport Interface

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

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

SMPTE 331M-2000, Television — Element and Metadata Definitions for the SDTI-CP

ISO/IEC 13818-2:1996, Information Technology — Generic Coding of Moving Pictures and Associated Audio Information: Video and Amendment 2:1997 (MPEG-2, 4:2:2@ML)

ISO/IEC 13818-2:1996, Amendment 2:1997 (MPEG-2, 4:2:2P@ML)

3 General

This practice defines templates for SDTI-CP decoders based on MPEG picture coding. All templates defined in this document shall have the class name of MPEG template with a value of 01_h.

The template is identified by ANSI/SMPTE 298M, universal label, having the names and values as defined in table1.

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Table 1 – Specification of the MPEG content package label

Byte No.	Description	Value (hex)
1	Object identifier	06_h
2	Label size	$0E_h$
3	ISO organization	$2B_h$
4	Designation: SMPTE	34_h
5	Registry: Labels	04_h
6	Labels category: Interchange	01_h
7	Labels registry	01_h
8	Registry version	01_h
9	Wrapper labels	01_h
10	Simple wrapper labels	01_h
11	Standard: CP	01_h
12	CP version	01_h
13	Template class: MPEG-2	01_h
14	Template type	XX_h
15	Template extension	XX_h
16	Zero fill	00_h

The default case of the template type value is 00_h, which defines no exclusive decoder template type shall apply from this document. A non-zero template type value indicates a template type specified in this document. Specification of a non-zero template type value defines that the content package meets an upper encoding limit in terms of operation modes in combination with the elements and metadata types. A non-zero template type also defines the minimum performance of a suitable decoder. Therefore, a template type defines the lowest capabilities of an SDTI-CP decoder so that an encoder can always expect a predefined performance in absence of any other specific information.

There are cases where an encoder may have prior knowledge of a decoder capability beyond the specified decoder template. This is particularly true in closed systems where decoders have a known performance. An encoder may encode more than is defined by the decoder template with such prior knowledge. Clearly, caution should be exercised if any encoder encodes more than the decoder template as unexpected effects may occur dependent on the decoder.

To define whether an encoded content package lies within, or exceeds, the template type, the universal label has a template extension word. This word is set to 00_h if the content package lies within the limits set by the template type value. The template extension word may be set to 01_h if the content package exceeds the defined template type under the following conditions:

– the extensions are backwards compatible and will not cause decoder failure of those elements and metadata which lie within the template; and

– the set of extensions does not cause the content package to fall under another template type.

4 MPEG-2 baseline template

This template is provided for receiver/decoders operating with MPEG-2 4:2:2P@ML encoded pictures accompanied by an 8-channel uncompressed audio capability. It specifies a receiver/decoder capable of only basic operating modes.

This template type has the value of 01_h.

Receivers/decoders specified to this template shall meet or exceed the capabilities specified below.

4.1 Format capability

The minimum decoder format compliance is specified below.

The following list defines the format limitations of this template:

– Transfer modes: 0 (synchronous) only.

– Timing modes: 0 (normal) and 2 (dual).

– No multiplexing (channel handle = 0000_h).

– Forward error correction is supported (FEC active flag = 1).

– The order of items shall be system, picture, audio, and auxiliary.

– Operates only on SMPTE 305M at 270 Mb/s.

4.2 Element types

The minimum list of element types which shall be decoded is as follows:

– One MPEG-2 video stream element according to element definition 6.1, type: 01_h. The MPEG picture coding is limited to MPEG-2 4:2:2P@ML and MPEG-2 MP@ML according to ISO/IEC 13818-2 (video) and ISO/IEC 13818-2 amendment 2 (MPEG-2 4:2:2P@ML). The element may contain user data according to SMPTE 328M.

– One AES3 8-channel audio element according to element definition 7.1, type: 10_h. This template supports only uncompressed AES3 audio.

– One general data auxiliary element according to element definition 8.3, type: 22_h.

4.3 Metadata types

The minimum list of metadata types which shall be decoded as follows:

– SMPTE 12M time code metadata according to metadata definition 9.2, type = 81_h.

– MPEG-2 picture editing metadata according to metadata definition 9.5, type = 84_h.

– AES3 audio editing metadata according to metadata definition 9.6, type = 85_h.