

# SMPTE STANDARD



## D-Cinema Packaging - Immersive Audio Track File

Page 1 of 14

| Table of Contents                                                              | Page     |
|--------------------------------------------------------------------------------|----------|
| <b>Foreword</b>                                                                | <b>3</b> |
| <b>Intellectual Property</b>                                                   | <b>3</b> |
| <b>Introduction</b>                                                            | <b>3</b> |
| <b>1 Scope</b>                                                                 | <b>4</b> |
| <b>2 Conformance Notation</b>                                                  | <b>4</b> |
| <b>3 Normative References</b>                                                  | <b>4</b> |
| <b>4 Terms and Definitions</b>                                                 | <b>5</b> |
| <b>5 Carrying Immersive Audio Data in the MXF Generic Container</b>            | <b>6</b> |
| 5.1 Frame Wrapping                                                             | 6        |
| 5.2 Clip Wrapping                                                              | 6        |
| 5.3 Custom Wrapping                                                            | 6        |
| 5.4 Element and Item Constraints                                               | 6        |
| <b>6 KLV Coding of Immersive Audio Data Elements</b>                           | <b>6</b> |
| 6.1 Data Element Key                                                           | 6        |
| 6.2 Length                                                                     | 6        |
| 6.3 Value                                                                      | 7        |
| <b>7 Constraints</b>                                                           | <b>7</b> |
| 7.1 General                                                                    | 7        |
| 7.2 Bitstream Constraints                                                      | 7        |
| <b>8 Label for Immersive Audio Data Essence Container Identification</b>       | <b>8</b> |
| <b>9 Immersive Audio Data Essence Descriptor</b>                               | <b>8</b> |
| <b>10 Version Number of the Data Essence Coding Item UL in the Primer Pack</b> | <b>9</b> |
| <b>11 SMPTE Label for Immersive Audio Data Essence Coding</b>                  | <b>9</b> |
| <b>12 Immersive Audio Data Essence SubDescriptor</b>                           | <b>9</b> |
| 12.1 Immersive Audio Version                                                   | 10       |
| 12.2 Max Channel Count                                                         | 10       |
| 12.3 Max Object Count                                                          | 10       |
| 12.4 Immersive Audio ID                                                        | 10       |

|                |                                        |           |
|----------------|----------------------------------------|-----------|
| 12.5           | First Frame                            | 11        |
| 12.6           | IAB Sample Rate                        | 11        |
| <b>13</b>      | <b>Packaging Constraints</b>           | <b>11</b> |
| <b>14</b>      | <b>Composition Playlist Extensions</b> | <b>11</b> |
| 14.1           | Extension Elements                     | 11        |
| 14.2           | Namespace                              | 11        |
| 14.3           | AuxData                                | 12        |
| 14.4           | DataType                               | 12        |
| <b>15</b>      | <b>CPL Extension Schema</b>            | <b>12</b> |
| <b>Annex A</b> | <b>XML Schema (informative)</b>        | <b>14</b> |

## 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 its Standards Operations Manual. This SMPTE Engineering Document was prepared by Technology Committee 21DC.

## Intellectual Property

At the time of publication no notice had been received by SMPTE claiming patent rights essential to the implementation of this Engineering Document. However, attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. SMPTE shall not be held responsible for identifying any or all such patent rights.

## Introduction

This section is entirely informative and does not form an integral part of this Engineering Document.

This document specifies a method for carrying Immersive Audio data essence, as specified in SMPTE ST 2098-2, in an MXF file based on the MXF Generic Container for use in a D-Cinema Package. While this specification is written to allow synchronization of the Immersive Audio data track with picture or sound, the synchronization mechanism is outside the scope of this document.

## 1 Scope

This standard specifies the mapping of an ST 2098-2 Immersive Audio Bitstream into an MXF file for use within a Digital Cinema Package. The MXF Generic Container (GC), as described in SMPTE ST 379:2004, is used as a normative reference for this mapping, but ST 429-18 uses Class 14 ULs which prevents full compliance. The resultant file will be referred to as an Immersive Audio Track File.

This standard specifies the Key, the Length and the Value fields of the Immersive Audio Data Element. This standard also defines the Essence Container and the Essence Descriptors.

This standard defines the SMPTE ST 429-7 Composition Playlist asset type extension required for inclusion of an Immersive Audio track.

## 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.

A conformant implementation according to this document is one that includes all mandatory provisions ("shall") and, if implemented, all recommended provisions ("should") as described. A conformant implementation need not implement optional provisions ("may") and need not implement them as described.

Unless otherwise specified, the order of precedence of the types of normative information in this document shall be as follows: Normative prose shall be the authoritative definition; Tables shall be next; then formal languages; then figures; and then any other language forms.

## 3 Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this engineering document. At the time of publication, the editions indicated were valid. All standards are subject

to revision, and parties to agreements based on this engineering document are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

SMPTE ST 377:2004<sup>1</sup>, Television — Material Exchange Format (MXF) — File Format Specification

SMPTE ST 379:2004, Television — Material Exchange Format (MXF) — MXF Generic Container

SMPTE ST 400:2012, SMPTE Labels Structure

SMPTE ST 429-3:2007, D-Cinema Packaging — Sound and Picture Track File

SMPTE ST 429-7:2006, D-Cinema Packaging — Composition Play List

SMPTE ST 2029:2009, Uniform Resource Names for SMPTE Resources

SMPTE 2098-2:2019, Immersive Audio Bitstream Specification

[XML] World Wide Web Consortium (W3C) (2004 February 4). Extensible Markup Language (XML) 1.0 (Third Edition)

[XML Schema Part 1: Structures] World Wide Web Consortium (W3C) (2004, October 28). XML Schema Part 1: Structures (Second Edition)

[XML Schema Part 2: Datatypes] World Wide Web Consortium (W3C) (2004, October 28). XML Schema Part 2: Datatypes (Second Edition)

[RFC 2396] Internet Engineering Task Force (IETF) (1996, November). RFC 2396 — Uniform Resource Identifiers (URI): Generic Syntax

## 4 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

The general glossary of acronyms, terms and data types used in the MXF specification is given in SMPTE ST 377 and is supplemented in SMPTE ST 379. These glossaries are not repeated here to avoid any divergence of meaning.

The reader is also directed to the glossary terms defined in SMPTE ST 429-7.

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<sup>1</sup> The reference to SMPTE ST 377:2004 and SMPTE ST 379:2004 are intentional. SMPTE ST 377-1:2011 and SMPTE ST 379-1:2009 or future versions are not appropriate for use with this document.