

# SMPTE STANDARD

## Format for Non-PCM Audio and Data in AES3 — Carriage of Metadata of Serial ADM (Audio Definition Model)



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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.

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## Intellectual Property

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## Introduction

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

Recommendation ITU-R BS.2076 specifies the Audio Definition Model (ADM), which is the audio-related metadata used to play back audio programs of an advanced sound system. The ADM can be stored in the BW64 audio file specified in Recommendation ITU-R BS. 2088 along with audio signals.

Linear PCM audio signals are widely conveyed utilizing the AES3 standard. SMPTE ST 337:2015 defines how to convey non-PCM audio and data in the AES3 format.

This standard provides the method based on SMPTE ST 337:2015 to convey the Serial ADM metadata accompanying synchronized audio signals over multiple AES3 interfaces.

## 1 Scope

This standard specifies the method used to convey Serial ADM metadata with synchronized audio signals in professional applications using the AES3 serial digital audio interface. This standard supports only subframe mode of SMPTE ST 337.

## 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 that, through their references in this text, constitute the 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.

AES3-3-2009, AES Standard for Digital Audio — Digital Input-Output Interfacing — Serial Transmission Format for Two-Channel Linearly Represented Digital Audio Data — Part 3: Transport

SMPTE ST 337:2015, Format for Non-PCM Audio and Data in an AES3 Serial Digital Audio Interface

SMPTE ST 338:2016, Format for Non-PCM Audio and Data in AES3 — Data Types  
Amendment 1:2019 to SMPTE ST 338:2016

Recommendation ITU-R BS.2125 (01/2019), A serial representation of the Audio Definition Model  
<https://www.itu.int/rec/R-REC-BS.2125/en>

Internet Engineering Task Force (IETF) RFC 1952 (05/1996), GZIP file format specification version 4.3  
[online viewed 2018-12-04] <http://tools.ietf.org/html/rfc1952>

## 4 Terms and Definitions

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

### 4.1 Serial ADM metadata

metadata in the ADM metadata frame specified in Recommendation ITU-R BS.2125

### 4.2 Data burst

one of a continuous sequence of preambles and payload pairs, which implement the data stream format specified in SMPTE ST 337

### 4.3 `changedMetadata_flag`

flag to indicate whether or not the Serial ADM metadata have a difference between the previous and current ADM metadata frames (see Section 5.2.2.3)

### 4.4 `assemble_flag`

flag to indicate whether or not the `assemble_info` word and the method used to convey the Serial ADM metadata using multiple Data bursts are used (see Section 5.2.2.4)

### 4.5 `format_flag`

flag to indicate whether or not the `format_info` word and the optional encoding format type of the Serial ADM are used (see Section 5.2.2.5)

### 4.6 chunk

subset of metadata elements in the ADM metadata frame as specified in Recommendation ITU-R BS.2125

### 4.7 `multiple_chunk_flag`

flag to indicate the status of the ADM metadata frame divided into multiple chunks (see Section 5.2.2.6)

### 4.8 `assemble_info`

data space for information used to convey the Serial ADM metadata by multiple Data bursts and to assemble separated parts of the Serial ADM metadata in the `burst_payload` (see Section 5.3.2)

#### **4.9 in\_timeline\_flag**

flag to indicate the availability of the conveying method using the multiple Data bursts in the multiple in-timeline mode (see Section 5.3.2.2.1)

#### **4.10 over\_track\_flag**

flag to indicate the availability of the conveying method using the multiple Data bursts in the multiple over-track mode (see Section 5.3.2.2.2)

#### **4.11 track\_numbers**

parameter to indicate the number of AES3 tracks used in the multiple over-track mode (see Section 5.3.2.2.2)

Note 1 to entry: The value of (track\_numbers +1) indicates the number of AES3 tracks used.

#### **4.12 track\_ID**

index to express the order of AES3 tracks used in the multiple over-track mode (see Section 5.3.2.2.3)

#### **4.13 format\_info**

data space for information about optional encoding format types of the Serial ADM metadata in the burst\_payload (see Section 5.3.3)

#### **4.14 SADM\_metadata\_container**

data space to contain the Serial ADM metadata in the burst\_payload (see Section 5.3.4)

#### **4.15 multiple in-timeline mode**

method used to convey the Serial ADM metadata using the multiple continuous Data bursts in the same AES3 track (see Section 6.4)

#### **4.16 multiple over-track mode**

method used to convey the Serial ADM metadata using the multiple simultaneous Data bursts in different AES3 tracks (see Section 6.5)

## **5 Data burst Structure to Convey the Serial ADM metadata**

### **5.1 General**

The Serial ADM metadata shall be mapped to the AES3 interfaces as defined in SMPTE ST 337. This section defines additional constraints.

### **5.2 burst\_preamble**

#### **5.2.1 General**

The six-subframe version shall be used.