**SMPTE RP 2072:2014**
Revision of EG 32-1996

# SMPTE RECOMMENDED PRACTICE

# Emphasis and Preferred Sampling Rate for AES/EBU Digital Audio in Television



## Table of Contents





Approved
January 14, 2014

## 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 Part XIII of its Operations Manual.

SMPTE RP 2072 was prepared by Technology Committee 24TB.

## 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.

# 1 Scope

This document recommends the digital audio sampling rate and use of emphasis for television operations.

# 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; followed by formal languages; then figures; and then any other language forms.

# 3 Normative References

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

AES3-2-2009, AES Standard for Digital Audio — Digital Input-Output Interfacing — Serial Transmission Format for Two-Channel Linearly-Represented Digital Audio Data — Part 2: Metadata and Subcode

AES5-2008, AES Recommended Practice for Digital Audio — Preferred Sampling Frequencies for Applications Employing Pulse Code Modulation

# 4 Definitions

**4.1**
**Sampling Rate**
Sampling Rate is the fixed uniform rate, in samples per second, at which an audio signal being digitally encoded is sampled. It is also commonly referred to as sampling frequency, with the frequency given in Hz or kHz.

**4.2**
**Emphasis**
Emphasis or boosting the high-frequency components of a program signal before passing it through a channel whose signal-to-noise ratio (SNR) decreases at high frequencies, and complimentary de-emphasis upon recovery of the signal is used to maximize the system SNR.

# 5 Specifications

## 5.1 Sampling Rate

The sampling rate for digital audio in Television shall be either 48 kilosamples per second or 96 kilosamples per second. This can also be stated as a sample rate of 48 kHz or 96 kHz.

## 5.2 Use of Emphasis

Digital audio signals for use in Television shall not use emphasis.

## 5.3 Signaling

When the digital audio data is transported over an AES3 interface, the state of the channel status bits shall, whenever possible, accurately represent the use of 48-kHz or 96-kHz sampling rates, and the lack of emphasis.

## Annex A Bibliography (Informative)

Note: All references in this document to other SMPTE documents use the current numbering style (e.g. SMPTE ST 272:2004) although, during a transitional phase, the document as published (printed or PDF) may bear an older designation (such as SMPTE 272M-2004). Documents with the same root number (e.g. 272) and publication year (e.g. 2004) are functionally identical.

EBU Tech. 3250-E, Specification of the Digital Audio Interface (AES/EBU Interface), Third Edition 2004

SMPTE ST 272:2004, Television — Formatting AES Audio and Auxiliary Data into Digital Video Ancillary Data Space

SMPTE ST 299-1:2009, 24-Bit Digital Audio Format for SMPTE 292 Bit-Serial Interface