

SMPTE STANDARD

Audio Channel Assignments for Digital Television Recorders (DTRs)



Table of Contents	Page
Foreword	2
Intellectual Property	2
Introduction.....	2
1 Scope	3
2 Conformance Notation	3
3 Normative References	3
4 Definitions	4
5 General Specification	5
5.1 DTRs with a One-to-One Correspondence Between I/O Connections and Audio Tracks	5
5.2 Audio Channel to Audio Track Assignments	5
5.3 DTRs with Four Audio Tracks and Four AES3 I/O Connections	10
6 Identifying Track Assignments in Descriptive Metadata	10
Annex A Commonly Used Audio Channel and Audio Signal Connection Assignments for Multichannel Audio Programs (Informative).....	11
Annex B Advisory Notes on Package Labels (Informative)	12
Annex C EBU R-123 on Track Allocation for File Exchange (Informative).....	13

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 Administrative Practices.

SMPTE Standard 2035 was prepared by Technology Committee 10E.

Intellectual Property

At the time of publication no notice had been received by SMPTE claiming patent rights essential to the implementation of this Standard. 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 replaces SMPTE 320M (Channel Assignments and Levels on Multichannel Audio Media) and SMPTE EG 26 (Audio Channel Assignments for Digital Television Tape Recorders with AES/EBU Digital Audio Input. This document combines the information in SMPTE 320M and SMPTE EG 26 with that in EBU R48 (Allocation of Audio Channels in the D-1 Digital Television Tape-Recording Format) and with ITU Recommendation ITU-R BS.775-2 (Multichannel Stereophonic Sound System with and without Accompanying Picture).

It also includes several other recent operating practices, so becomes a more comprehensive document than any of its antecedents. The audio track capacity of digital TV recorders has expanded beyond that of the early machines; this document extends specific assignments to twelve tracks. Each case reflects a current or prior broadcast practice or convention, and in some cases the same set of audio channels may be arranged in more than one layout in order to accommodate existing practice. There are several reasons to use the AES/EBU signal to transport non-PCM audio data, such as rate reduced audio data, so these assignments are included as well.

1 Scope

This Standard specifies the allocation of audio channels to the audio tracks of a digital television recorder for purposes of identification, program distribution and interchange. These allocations are depicted as track layout "cases" in Table 1, such that a track layout may be uniquely specified by stating the case number and letter referenced in Table 1 of this standard. The specifications below are suitable for use in applications such as program delivery specifications.

In cases where there is a one to one correspondence between the audio tracks and the AES3 input and output connections, this Standard specifies the allocation of the audio signals within the AES3 I/O signal pairs to the audio tracks, depending on the operating mode of the AES3 I/O as indicated by its Channel Status data. This allocation also applies when AES3 I/O is via embedded audio as specified in SMPTE 272M and SMPTE 299.

This standard covers practices that have evolved in both the entertainment and news / sports environments

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 which, 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.

AES3-2003, AES Standard for Digital Audio Engineering — Serial Transmission Format for Two-Channel Linearly Represented Digital Audio Data

SMPTE 272M-2004 Television — Formatting AES/EBU Audio and Auxiliary Data into Digital Video Ancillary Data Space

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

SMPTE 337-2008, Format for Non-PCM Audio and Data in an AES3 Serial Digital Audio Interface

4 Definitions

Some of the terms defined below come from entertainment practice, while others come from news or sports practice.

Audio Channel: A single channel of audio that may represent a monophonic program or may be part of a multi-channel audio program.

Audio Program: An Audio Program is composed of one or more Audio Channels. It may also be called a Complete Mix.

Audio Signal: The representation of one Audio Channel applied to the input and output of a digital television recorder.

Audio Track: The space on the storage media or device assigned to a specific Audio Channel

Commentary: A primarily speech or dialog-centric program element, that may also contain music and or effects specific to a single broadcaster or distributor, which is intended to be combined with an International Sound element to form a Complete Mix.

Complete Mix: A mix consisting of all the elements (e.g. music, effects and dialog) required to form a stand alone Audio Program.

Dialog: The primary speech element of a program

Effects: Sound effects.

Element: One component of a complete program, such as speech or music. It may utilize one or more audio channels.

International Sound: A mix consisting of all the elements required to form a stand alone Audio Program, except for the Commentary element. This may also be called Natural Sound.

Left total, Right total (Lt/Rt): A two channel baseband encoded signal intended to be decoded to a four or five channel (surround) signal by a matrix type decoder. The Lt/Rt signal is compatible with a two channel (stereo) signal infrastructure.

Low Frequency Effects (LFE): Sounds intended to be carried by the reduced bandwidth “.1” channel of a 5.1 channel program, which are typically reproduced by a subwoofer. In the ATSC system, the LFE channel is restricted to 120 Hz bandwidth.

Music and Effects (M&E): A complete mix, but without the dialog element(s).