

# SMPTE ROADMAP

## 24-Bit Digital Audio Format for SMPTE Bit-Serial Interfaces at 1.5 Gb/s and 3 Gb/s — Roadmap for the 299 Document Suite



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### Document Roadmap

The SMPTE 299 suite of documents specifies 24-Bit Digital Audio Formats for SMPTE 292 Bit-Serial Interfaces. This informative “roadmap” describes the documents in the 299 suite.

**Note that SMPTE 299-2009 has been renumbered as SMPTE ST 299-1:2009 (see below); the renumbered document is functionally identical to SMPTE 299-2009.**

**SMPTE ST 299-1:2009 provides 16 channels of embedded audio for the SMPTE family of HD-SDI standards.**

#### *Scope of SMPTE ST 299-1:2009*

1.1 This standard defines the mapping of 24-bit AES digital audio data and associated control information into the ancillary data space of a serial digital video conforming to SMPTE 292. The audio data are derived from AES3, hereafter referred to as AES audio. The AES audio data may contain linear PCM audio or non-PCM data formatted according to SMPTE 337. Not all implementations compliant with this standard may support all sampling frequencies. Manufacturers are encouraged to indicate which sampling frequencies are supported (see Annex D).

1.2 Audio sampled at a clock frequency of either 48 kHz or 96 kHz locked (synchronous) to video, is the preferred implementation for intrastudio applications. As an option, this standard supports AES audio at synchronous or asynchronous sampling rates from 32 kHz to 48 kHz.

1.3 Audio channels are transmitted in groups of four, up to a maximum of 16 audio channels in the case of 32-kHz, 44.1-kHz or 48-kHz sampling, and up to a maximum of 8 audio channels in case of 96-kHz sampling. Each group is identified by a unique ancillary data ID.

1.4 Audio data packets are multiplexed (embedded) into the horizontal ancillary data space of the Cb/Cr data stream, and audio control packets are multiplexed into the horizontal ancillary data space of the Y data stream.

**SMPTE ST 299-2:2010 provides 16 additional channels of embedded audio for ST 425 level A 3 Gb/s serial interfaces.**

#### *Scope of SMPTE ST 299-2:2010*

This SMPTE ST 299-2 standard defines a SMPTE 291M Type 1 packet structure for identifying audio channels numbered from 17 to 32, beyond the 16 channels defined in SMPTE ST 299-1. Four extended audio data packets and four extended audio control packets are identified. One of the extended audio control packets and one of the extended audio data packets is assigned to transport each of the four extended audio groups. Each extended audio group has four channels that carry up to four 24-bit audio channels with 32, 44.1, or 48-kHz sample rates, or up to two 24-bit audio channels with 96-kHz sample rate.

The purpose of defining four extended audio groups is to allow for multiplexing up to 32 audio channels into the horizontal ancillary (HANC) data space of the video source image formats mapped to a 3 Gb/s Level A serial data interface. The 3 Gb/s Level B serial data interface is capable of carrying 32 audio channels via application of SMPTE ST 299-1 to each of two 1.5 Gb/s SDI channels.

The format and location of audio data and control packets in the video data stream is identical to that of SMPTE ST 299-1, except for differences required to define extended audio groups.