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Part 5: Uncompressed audio in MPEG-4 file format

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

A list of all parts in the ISO/IEC 23003 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Information technology — MPEG audio technologies —

Part 5:
Uncompressed audio in MPEG-4 file format

1 Scope

This document defines how uncompressed audio is carried in files in the family of standards based on the ISO base media file format. This includes mono, stereo and multi-channel audio in Linear Pulse Code Modulation (LPCM) format with various word lengths and sampling rates, and also floating point format. Such representations also occur in other container formats, such as RIFF WAV or AIFF.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 14496-12, *Information technology — Coding of audio-visual objects — Part 12: ISO base media file format*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 14496-12 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Technical overview

ISO/IEC 14496-12 shall be used as framework for the extensions described in this document. The extensions included in this document provide the necessary specifications to carry uncompressed audio in that framework.

5 Uncompressed audio support

5.1 PCM configuration

5.1.1 Definition

Box types: 'pcmC'

Container: Audio sample entry

Mandatory: Yes, if codingname of SampleEntry is 'ipcm' or 'fpcm'

Quantity: Zero or one

This box may appear in an audio sample entry to document the PCM format of the audio stream. It is mandatory in audio sample entries for integer formats indicated by 'ipcm' and floating-point formats indicated by 'fpcm'. The PCM samples have big-endian byte ordering, unless indicated otherwise by format_flags. The integer format uses the two's complement representation. The floating-point format represents PCM samples as defined by IEEE 754 with full-scale at a magnitude of 1.0.

A 'sample' (sometimes called an access unit) according to ISO/IEC 14496-12 that corresponds to this sample entry is commonly called a PCM audio frame. It is defined as a concatenated set of PCM samples, one per channel, each occupying the indicated number of bits without any intervening bits, that correspond to the same sample time. The ChannelLayout as defined in ISO/IEC 14496-12 is mandatory if the PCM channel count is larger than one. The channel count is given in the AudioSampleEntry or in the ChannelLayout, if present. The order of the channels is also established by the ChannelLayout, if present.

5.1.2 Syntax

```
aligned(8) class PCMConfig extends FullBox('pcmC', version = 0, 0) {
   unsigned int(8) format_flags;
   unsigned int(8) PCM_sample_size;
}
```

5.1.3 Semantics

format_flags is a field of flags that modify the default PCM sample format. Undefined flags are reserved and shall be zero. The following flag is defined:

0x01 indicates little-endian format. If not present, big-endian format is used.

PCM_sample_size is the size in bits of each PCM sample.

For the integer format, PCM_sample_size shall take a value from the set 16, 24, 32.

For the floating point format, PCM_sample_size shall take a value from the set 32, 64.

