
**Information technology — MPEG
audio technologies —**

**Part 2:
Spatial Audio Object Coding (SAOC)**

Technologies de l'information — Technologies audio MPEG —

Partie 2: Codage d'objet audio spatial (SAOC)

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

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 ISO documents 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*.

This second edition cancels and replaces the first edition (ISO/IEC 23003-2:2010), which has been technically revised. It also incorporates the Amendments ISO/IEC 23003-2:2010/Amd 1:2015, ISO/IEC 23003-2:2010/Amd 2:2015, ISO/IEC 23003-2:2010/Amd 3:2015, ISO/IEC 23003-2:2010/Amd 4:2016 and ISO/IEC 23003-2:2010/Amd 5:2016 and the Technical Corrigenda ISO/IEC 23003-2:2010/Cor 1:2012 and ISO/IEC 23003-2:2010/Cor 2:2014.

The main changes compared to the previous edition are as follows:

- clarifications on SAOC-DE profile description;
- corrections to SAOC-DE profile specification;
- corrections to SAOC-DE profile;
- corrections to MPEG SAOC IS text;
- corrections to the low power mode.

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.

Introduction

In the preferred modes of operating, the SAOC system, the transmitted signal can be either mono, stereo or 3-channel. The audio objects can be represented by a mono, stereo, or 3-channel signal or have the MPEG surround (MPS) multi-channel background object (MBO) format. The additional parametric data exhibits a significantly lower data rate than required for transmitting all objects individually, making the coding very efficient. At the same time, this ensures compatibility of the transmitted signal with legacy devices.

When a multi-channel rendering setup (e.g. a 5.1 loudspeaker setup) is required, the SAOC system acts as a transcoder, converting the additional parametric data to MPS parameters, and interfaces to the MPS decoder that acts as rendering device. For certain rendering setups (e.g. a binaural or plain stereo setup), the SAOC system behaves as a decoder, using its own rendering engine. Another key feature is that the SAOC parametric data from different streams can be merged at parameter level to allow for the combination of SAOC streams, similar to the functionality of a multi-point control unit (MCU).

The International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) draw attention to the fact that it is claimed that compliance with this document may involve the use of a patent.

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Information technology — MPEG audio technologies — Part 2: Spatial Audio Object Coding (SAOC)

1 Scope

This document specifies the reference model of the spatial audio object coding (SAOC) technology that is capable of recreating, modifying and rendering a number of audio objects based on a smaller number of transmitted channels and additional parametric data.

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 23003-1:2007, *Information technology — MPEG audio technologies — Part 1: MPEG Surround*

3 Terms and definitions

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

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

audio object

input audio signal consisting of one, two or multiple channels, including multi-channel background object (MBO)

3.2

frame

time segment (3.15) to which SAOC processing is applied according to the data conveyed in the corresponding SAOCFrame() or SAOCDEFrame() syntax elements

3.3

hybrid filterbank

structure, consisting of a quadrature mirror filter (QMF) bank and oddly modulated Nyquist filter banks, used to transform time domain signals into *hybrid subband* (3.5) samples

3.4

hybrid filtering

filtering step on a quadrature mirror filter (QMF) subband signal resulting in multiple *hybrid subbands* (3.5)

Note 1 to entry: The resulting hybrid subbands can be non-consecutive in frequency.

3.5

hybrid subband

subband obtained after *hybrid filtering* (3.4) of a quadrature mirror filter (QMF) subband

Note 1 to entry: The hybrid subband can have the same time/frequency resolution as a QMF subband.