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**Information technology — MPEG  
audio technologies —**

Part 2:

**Spatial Audio Object Coding (SAOC)**

**AMENDMENT 2: SAOC reference software**

*Technologies de l'information — Technologies audio MPEG —*

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

*AMENDEMENT 2: Logiciel de référence SAOC*

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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](http://www.iso.org/directives)).

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The committee responsible for this document is ISO/IEC JTC 1, *Information technology, SC 29, Coding of audio, picture, multimedia and hypermedia information*.

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# Information technology — MPEG audio technologies —

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

### AMENDMENT 2: SAOC reference software

Add Clause 11, Reference software, as follows:

#### 11 Reference software

##### 11.1 Reference software structure

###### 11.1.1 Introduction

This Clause contains simulation software for SAOC as defined in Clauses 1 to 9 and Annexes A to G. This software has been derived from verification models used in the process of developing the standard.

Reference software is normative in the sense that it correctly implements the SAOC transcoding/decoding processes described in this part of ISO/IEC 23003. Complying with this part of ISO/IEC 23003 implementations are not expected to follow the algorithms or the programming techniques used by the reference software. Although the decoding software is considered normative, it cannot add anything to the textual technical description of SAOC included in this part of ISO/IEC 23003.

The software contained in this Clause and in Annex H is divided into three categories:

- a) **Bitstream decoding software** is catalogued in 1.2. This software accepts bitstreams encoded according to the normative specification in this part of ISO/IEC 23003 and decodes the streams into the audio signals associated with each bitstream. While this software appears in the normative part of this specification, attention is drawn to the fact that the implementation techniques used in this software are not considered normative – several different implementations could produce the same result – but the software is considered normative in that it correctly implements the MPEG Surround decoding processes described in this part of ISO/IEC 23003.
- b) **Bitstream encoding software** is catalogued in Annex H.1. This software creates bitstreams from associated audio signals. The encoders are provided as a means to obtain bitstreams with the normative syntax described in ISO/IEC 23003-2. The techniques used for encoding are not specified by this specification, and the quality and complexity of these encoders has not been optimized.
- c) **Utility software** is catalogued in Annex H.2. This software was found useful by the developers of the standard, but may not conform to the normative specifications given in this part of ISO/IEC 23003.

File locations in the source tree given in this part of ISO/IEC 23003 are expressed relative to the location of the corresponding reference software package attached to this part of ISO/IEC 23003.

### 11.1.2 Copyright disclaimer for software modules

Each source code module in this specification contains a copyright disclaimer which shall not be removed from the source code module. The generic version of this disclaimer is provided below.

Software Copyright License and Disclaimer for MPEG Standards
<p>This software module was originally developed by &lt;FN1&gt; &lt;LN1&gt; (&lt;CN1&gt;) and edited by &lt;FN2&gt; &lt;LN2&gt; (&lt;CN2&gt;), &lt;FN3&gt; &lt;LN3&gt; (&lt;CN3&gt;), in the course of development of the &lt;standard&gt; for reference purposes and its performance may not have been optimized. This software module is an implementation of one or more tools as specified by the &lt;standard&gt;.</p> <p><b>ISO/IEC gives You a royalty-free, worldwide, non-exclusive, copyright license to copy, distribute, and make derivative works of this software module or modifications thereof for use in implementations of the &lt;standard&gt; in products that satisfy conformance criteria (if any).</b></p> <p>Those intending to use this software module in products are advised that its use may infringe existing patents. ISO/IEC have no liability for use of this software module or modifications thereof.</p> <p><b>Copyright is not released for products that do not conform to audio visual and image-coding related ITU Recommendations and/or ISO/IEC International Standards.</b></p> <p>Assurance that the originally developed software module can be used (1) in the &lt;standard&gt; once the &lt;standard&gt; has been adopted; and (2) to develop the &lt;standard&gt;:</p> <p><b>&lt;CN1&gt; grants ISO/IEC all rights necessary to include the originally developed software module or modifications thereof in the &lt;standard&gt; and to permit ISO/IEC to offer You a royalty-free, worldwide, non-exclusive, copyright license to copy, distribute, and make derivative works for use in implementations of the &lt;standard&gt; in products that satisfy conformance criteria (if any), and to the extent that such originally developed software module or portions of it are included in the &lt;standard&gt;.</b></p> <p><u>To the extent that &lt;CN1&gt; owns patent rights that would be required to make, use, or sell the originally developed software module or portions thereof included in the &lt;standard&gt; in a conforming product, &lt;CN1&gt; will assure the ISO/IEC that it is willing to negotiate licenses under reasonable and non-discriminatory terms and conditions with applicants throughout the world.</u></p> <p><b>ISO/IEC gives You a free license to this software module or modifications thereof for the sole purpose of developing the &lt;standard&gt;.</b></p> <p><i>&lt;CN1&gt; retains full right to modify and use the code for its own purpose, assign or donate the code to a third party and to inhibit third parties from using the code for products that do not conform to MPEG-related ITU Recommendations and/or ISO/IEC International Standards.</i></p> <p>This copyright notice must be included in all copies or derivative works. Copyright (c) ISO/IEC 2015.</p> <p>Disclaimer: The software module is provided “as is”. In no event shall ISO, IEC or companies that originally submitted the parts of the software module be liable for any damages whatsoever (including, but not limited to, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software module. All warranties, express or implied, including but not limited to warranties of merchantability and fitness for a particular purpose are disclaimed.</p>

NOTE 1 In the text <standard> should be replaced with the appropriate International Standard, e.g. ISO/IEC 23003-2.

NOTE 2 <FN> = First Name, <LN> = Last name, <CN> = Company Name.

NOTE 3 Sentences in *italics* are not required in the statement if the original developer does not wish to be identified.

NOTE 4 Sentences in **bold** are not required in the statement if the original developer allows unrestricted use of this software.

NOTE 5 Sentences underlined should be removed when the <standard> is published.

NOTE 6 Reference to “ITU Recommendation” may be omitted when the module is deemed not to be relevant for ITU Recommendations.

## 11.2 Bitstream decoding software

### 11.2.1 Introduction

The provided bitstream decoding software is a normative reference implementation of the respective specification.