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Information technology — MPEG audio technologies —

Part 6:
Unified speech and audio coding reference software

Technologies de l'information — Technologies audio MPEG —

Partie 6: Logiciel de référence pour le codage unifié parole et audio

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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 or www.iec.ch/members_experts/refdocs).

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This document was prepared by 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 and IEC websites.

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Information technology — MPEG audio technologies —

Part 6:
Unified speech and audio coding reference software

1 Scope

This document contains simulation software for the Unified speech and audio coding standard as defined in ISO/IEC 23003-3.

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 23003-3, *Information technology — MPEG audio technologies — Part 3: Unified speech and audio coding*

3 Terms and definitions

No terms and definitions are listed in this document.

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

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

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

4 Reference software structure

4.1 General

This software has been derived from reference models used in the process of developing of ISO/IEC 23003-3.

Reference software is normative in the sense that it correctly implements the USAC decoding processes described in ISO/IEC 23003-3. Complying ISO/IEC 23003-3 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 USAC included in ISO/IEC 23003-3.

The software contained in this document is divided into several categories:

a) **Bitstream decoding software** is catalogued in Clause 5. This software accepts bitstreams encoded according to the normative specification in ISO/IEC 23003-3 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 USAC decoding processes described in ISO/IEC 23003-3. The decoder software implementation is provided at https://standards.iso.org/iso-iec/23003/-6/ed-1/en.

b) **Bitstream encoding software** is catalogued in <u>Annex A</u>. The software creates compressed bitstreams from associated audio signals. The techniques used for encoding are not specified this document. The encoder software implementation is provided at <u>https://standards.iso.org/iso-iec/23003/-6/ed-1/en</u>.

c) **Utility software** is catalogued in <u>Annex B</u>. This software was found useful by the developers of this document, but may not conform to the normative specifications given in ISO/IEC 23003-3.

The software as source code package can be found at <u>https://standards.iso.org/iso-iec/23003/-6/ed-1/en</u>.

4.2   Copyright disclaimer for software modules

Each source code module in this specification contains copyright disclaimer which shall not be removed from the source code module.

The generic version of this disclaimer is provided below:

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This software module was originally developed *by <FN1> <LN1> (<CN1>) and edited by <FN2> <LN2> (<CN2>), <FN3> <LN3> (<CN3>),* in the course of development of the <standard> 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 <standard>.

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

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

— Sentences <u>underlined</u> should be removed when the <standard> is published.

— Reference to "ITU Recommendation" may be omitted when the module is deemed not to be relevant for ITU Recommendations.

5 Bitstream decoding software

5.1 General

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

5.2 USAC decoding software

Location	Content
mpegD_usac\usacEncDec\	Unified Speech and Audio Decoder
mpegD_usac\mp4spatialdec\	MPEG Surround 2-1-2 Decoding Module

Annex A
(informative)

Bitstream encoding software

A.1 General

The bitstream encoding software provided at https://standards.iso.org/iso-iec/23003/-6/ed-1/en may be used to create compressed bitstreams with the normative syntax as described in ISO/IEC 23003-3. The techniques used for encoding are not specified by this document.

Encoder implementations available as an electronic attachment to this part of ISO/IEC 23003-3 are listed below. Attention is called to the fact that neither quality nor complexity had been fully optimized.

— **Reference Model Encoder (RM)** creates compressed bitstreams with the normative syntax as described in ISO/IEC 23003-3. The performance of this encoder should not be taken as indicative of that which can be obtained from implementations where quality and computational optimization are given priority.

— **Common Encoder (JAME)** creates compressed bitstreams with the normative syntax as described in ISO/IEC 23003-3. The encoder software has been optimized to deliver its best quality at mono operating modes.

A.2 USAC encoding software

Location	Content
mpegD_usac\usacEncDec\	Unified Speech and Audio Encoder (RM)
mpegD_usac\mp4spatialenc\	MPEG Surround 2-1-2 Decoding Module
mpegD_usac\MPEG_Ref_Enc_Contrib\	Further alternative encoding modules
mpegD_usac\usacJameEnc	Unified Speech and Audio Encoder (JAME)