INTERNATIONAL STANDARD

ISO/IEC 23003-2

Information technology — MPEG audio technologies —

Part 2:
Spatial Audio Object Coding (SAOC)

AMENDMENT 3: Dialogue enhancement

iTeh STANDARD PREVIEW

Technologies de l'information — Technologies audio MPEG —

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

AMENDEMENT 3: Rehaussement des dialogues

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The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee 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 3: Dialogue enhancement

Add Clause 12, Spatial Audio Object Coding — Dialogue Enhancement (SAOC-DE):

12   Spatial Audio Object Coding — Dialogue Enhancement

12.1   Introduction

This Clause specifies the SAOC Dialogue Enhancement (SAOC-DE) profile. The SAOC-DE decoder processing and bitstream syntax are defined according Clauses 1 to 9 with the following modifications.

— **Basic structure of the SAOC transcoder/decoder**

Add in "Table 2 — Operation modes of the SAOC" the following text:

Table 2 — Operation modes of the SAOC

Output signal configuration	# of output channels	# of input channels	SAOC module mode	SAOC module output	MPS decoder required
mono/stereo/binaural/3-channel configuration	1, 2 or 3	1, 2 or 3	Decoder	PCM output	No
multi-channel configuration	> 2	1 or 2	Transcoder	MPS bitstream, downmix signal	Yes

— **SAOC Profiles and Levels**

Add in "Table 4 — SAOC Profiles and Levels" the following text:

Table 4 — SAOC Profiles and Levels

Profiles	Baseline profile				DE profile		LD profile		
Levels	1	2	3	4	1	2	1	2	3
Hybrid QMF bank	X	X	X	X	X	X	-	-	-
LD-QMF bank	-	-	-	-	-	-	X	X	X
Max number of residual channels	0	2	4	4	0	3	-	-	-
Max sampling rate [kHz]	48	48	48	96	48	48	48	48	48
Max number of objects	8	16	32	32	6	6	8	32	32
Max number of downmix channels	2	2	2	2	3	3	1	2	2
Min number of required output channels*)	2	2	2	2	1	1	2	2	5
Use of decorrelator	yes	yes	yes	yes	no	no	yes	yes	yes
PCU HQ decoder	12.2	20.4	33.9	67.8	12.4	22.1	8.4	20.7	39.3**)
PCU LP decoder	6.6	12.2	23.0	46.0	11.4	21.0	N/A	N/A	N/A

Table 4 *(continued)*

Profiles	Baseline profile				DE profile		LD profile		
PCU addition for transcoding	1.1	1.1	1.1	2.3	N/A	N/A	0.7	1.1	N/A
PCU reduction for integrated transcoding	-6.8	-6.8	-6.8	-6.8	N/A	N/A	-3.6	-6.5	N/A
RCU HQ decoder	5.7	9.8	13.5	17.5	6.3	12.3	3.6	4.2	17.9***)
RCU LP decoder	4.8	5.4	5.7	10.3	7.3	7.9	N/A	N/A	N/A
RCU reduction for integrated transcoding	-1.3	-1.3	-1.3	-1.3	N/A	N/A	-0.6	-1.3	N/A

Add below "Table 4 – SAOC Profiles and Levels" the following text:

MPS transcoding support for baseline and LD profile if the number of output channels > 2

Replace below "Table 4 – SAOC Profiles and Levels" the following text:

The SAOC decoder type is defined by the four conditions:

— Profile: baseline profile or LD profile

by

The SAOC decoder type is defined by the four conditions:

— Profile: baseline, LD or DE profile

Replace in "5.5 SAOC Profiles and Levels":

For all profiles and levels the following features are supported:

— Decoding to mono/stereo/binaural output

by

For baseline and low-delay profiles:

— Decoding to mono/stereo/binaural output. Transcoding to 5.1 is supported

For Dialogue enhancement profile:

— Decoding to mono/stereo/3-channel output. No transcoding to 5.1 is supported

— Multi-channel background object (MBO) processing, DCU processing, MCU processing, separation metadata and send effects interface are not supported

— Post-downmix gain processing (PDG) is supported only in combination with post(processing) re-application processing step

— Insert effects interface is supported only if no modification range control (MRC) settings are transported in the bitstream

12.2 Terms and definitions

Add in "4.4 Variables":

N_{FGO} is the number of FGOs.

$\mathbf{D}_{FGO}$ is the downmix sub-matrix for FGOs.

$\mathbf{D}_{BGO}$ is the downmix sub-matrix for BGOs.

m_{BGO} is the modification gain for BGOs.

m_{FGO} is the modification gain for FGOs.

m_G is the decoder limited modification gain.

m_G^{input} is the input modification gain.

Add in "4.5 Abbreviated terms":

BGO   Background Object

FGO   Foreground Object

DE   Dialogue Enhancement

12.3   Payloads for SAOC-DE

The bitstream syntax of the SAOC-DE is not compatible with the Baseline and Low Delay profiles of SAOC. The following changes are applied for SAOC-DE profile in "6.1 Payloads for SAOC":

Introduction of DE bitstream elements

Replace in "Table 5 — Syntax of SAOCSpecificConfig()":

Table 5 — Syntax of SAOCSpecificConfig()

Syntax	No. of bits	Mnemonic
SAOCSpecificConfig() {		

by

Table 5 — Syntax of SAOCDESpecificConfig()

Syntax	No. of bits	Mnemonic
SAOCDESpecificConfig() {		

Replace in "Table 20 — Syntax of SAOCFrame()":

Table 20 — Syntax of SAOCFrame()

Syntax	No. of bits	Mnemonic
SAOCFrame() {		

by

Table 20 — Syntax of SAOCDEFrame()

Syntax	No. of bits	Mnemonic
SAOCDEFrame() {		

Replace in "Table 21 — SAOCFramingInfo()":

Table 21 — Syntax of SAOCFramingInfo()

Syntax	No. of bits	Mnemonic
SAOCFramingInfo() {		

by

Table 21 — Syntax of SAOCDEFramingInfo()

Syntax	No. of bits	Mnemonic
SAOCDEFramingInfo() {		

Replace in "Table 20 — Syntax of SAOCFrame()":

Table 20 — Syntax of SAOCFrame()

Syntax	No. of bits	Mnemonic
SAOCFrame() { SAOCFramingInfo();		

by

Table 20 — Syntax of SAOCDEFrame()

Syntax	No. of bits	Mnemonic
SAOCDEFrame() { SAOCDEFramingInfo();		

Introduction of SAOC version bitstream element

Add in "Table 5 — Syntax of SAOCSpecificConfig()":

SAOCDESpecificConfig()
{
bsVersion;
    if (bsVersion == 0) {
bsSamplingFrequencyIndex;
	
	4
	
	4
		
		uimsbf
		
		uimsbf

Add in "Table 5 — Syntax of SAOCSpecificConfig()":

SAOCExtensionConfig();   } }

Add in "Table 20 — Syntax of SAOCFrame()":

SAOCDEFrame()
{
  if (bsVersion == 0) {
      SAOCDEFramingInfo();

Add in "Table 20 — Syntax of SAOCFrame()":

```
    SAOCExtensionFrame();
  }
}
```

Disabling SAOC Low Delay mode signalization

Remove from "Table 5 — Syntax of SAOCSpecificConfig()":

bsLowDelayMode;	1	uimsbf

Replace in "Table 5 —Syntax of SAOCSpecificConfig()":

if (bsLowDelayMode == 0) {		
bsFrameLength;	7	uimsbf
} else {		
bsFrameLength;	5	uimsbf
}		

by

bsFrameLength;	7	uimsbf

Replace in "Table 21 — SAOCFramingInfo()":

If (bsLowDelayMode == 0) {		
bsNumParamSets;	3	uimsbf
} else {		
bsNumParamSets;	1	uimsbf
}		

by

bsNumParamSets;	3	uimsbf

Disabling absolute energy information transport

Remove from "Table 5 — Syntax of SAOCSpecificConfig()":

bsTransmitAbsNrg;	1	uimsbf

Remove from "Table 20 — Syntax of SAOCFrame()":

```
if ( bsTransmitAbsNrg ) {
    idxNRG = EcDataSaoc(NRG, 0, numBands);
}
```

Modification on object information transport

Replace in "Table 5 — Syntax of SAOCSpecificConfig()":

bsNumObjects;	5	uimsbf

by

bsNumObjects;	3	uimsbf
bsNumFGOs;	3	uimsbf

Modification on downmix channel number signalization

Replace in "Table 5 — Syntax of SAOCSpecificConfig()":

bsNumDmxChannels;	1	uimsbf

by

bsNumDmxChannels;	3	uimsbf

Dual mode configuration information transport

Remove from "Table 5 — Syntax of SAOCSpecificConfig()":

if (bsNumDmxChannels == 1) {		
bsTttDualMode;	1	uimsbf
if (bsTttDualMode) {		
bsTttBandsLow;	5	uimsbf
bsTttBandsHigh = numBands;		Note 1
} else {		
bsTttBandsLow = numBands;		
}		
}		

Disabling post downmix gain information transport

Remove from "Table 5 — Syntax of SAOCSpecificConfig()":

bsPdgFlag;	1	uimsbf

Remove from "Table 20 — Syntax of SAOCFrame()":

if (bsPdgFlag == 1) {	
for (i=0; i<bsNumDmxChannels + 1; i++) {	
idxPDG[i] = EcDataSaoc(PDG, i, numBands);	Note 1
}	
}	

Modification on downmix information transport

Replace in "Table 20 — Syntax of SAOCFrame()":

```
idxDMG = EcDataSaoc(DMG, 0, bsNumObjects+1);
if ( bsNumDmxChannels == 1 ) {
    idxDCLD = EcDataSaoc(DCLD, 0, bsNumObjects+1);
}
```

by

```
for (i=0; i<bsNumDmxChannels + 1; i++) {
    idxDMG[i] = EcDataSaoc(DMG, 0, bsNumObjects+1);
}
```

Modification range control setting transport

Add in "Table 5 —Syntax of SAOCSpecificConfig()" the following text:

bsOneIOC;	1	uimsbf
bsDeLimitFlag;	1	uimsbf
if (bsDeLimitFlag == 1) {		
bsDeLimitFgo;	4	uimsbf
bsDeLimitBgo;	4	uimsbf
} else {		
bsDeLimitFgo = 0;		
bsDeLimitBgo = 0;		
}		