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TECHNICAL CORRIGENDUM 3

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Information technology — MPEG audio technologies —

Part 1:
MPEG Surround

AMENDMENT 1: Conformance testing

TECHNICAL CORRIGENDUM 3

Technologies de l'information — Technologies audio MPEG —

Partie 1: Ambiance MPEG

AMENDEMENT 1: Essai de conformité

RECTIFICATIF TECHNIQUE 3

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Replace all conformance sequences attached to ISO/IEC 23003-1:2007/Amd.1:2008 with the sequences attached to this document.

In 8.5.2.2 MPEG Surround decoders replace the descriptions of the modules of Figure AMD1.2 — Block diagram of the MPEG Surround conformance test procedure with the following text below, where the changes are highlighted in grey background:

The relevant modules are:

- QMF inversion filtering: This module applies a polyphase correction filter that approximates the inverse of the equivalent QMF filterbank in the decoder under test. The delay imposed by this module is given by: $delay = 64 \cdot \left(\frac{K-1}{2} \right)$, where $K = 25$ is the length of the polyphase filter. The polyphase filter matrix $\mathbf{H}(k,l)$ of size $64 \times K$ is tabulated in Table AMD1.2. The polyphase filtering step consists of the operation which maps a time signal $x(n)$ to $y(n)$, where $y(k+64i) = \sum_{l=0}^{K-1} \mathbf{H}(k,l)\, x\left(k+64(i-l)\right), \quad k = 0,1,\ldots,63.$ This module is not active for conformance bitstreams that use PCM as downmix signal.

- store / read: for the first half of the conformance test sequences this module stores the output of the QMF and in parallel routes it to the reference MPEG Surround decoder. For the second half of the conformance test sequences the signal that was stored from the first half is fed to the reference MPEG Surround decoder again.

- MPEG Surround payload extraction: This module extracts the MPEG Surround bitstream from the conformance test sequence and feeds it to the reference MPEG Surround decoder.

- Reference MPEG Surround decoder: This module is the reference MPEG Surround decoder according to clause 1 through 7 and annexes A and B.

- comparison test: This module calculates the difference signals between the output from the decoder under test and the internal reference. The maximum amplitude of the difference signal as well as the RMS of the difference signal are calculated. The conformance criteria are specified with respect to PCM-sample in the range –32768 .. 32767.

Replace Tables AMD1.5, AMD1.6, AMD1.7 and AMD1.8 with the corrected versions below, where the changes are highlighted by gray background:

Table AMD1.5 — List of MPEG Surround conformance test sequences with MPEG-4 AAC profile downmix

Sequence		aac_mps_oneicc	aac_mps_param_4	aac_mps_param_5	aac_mps_param_7	aac_mps_param_10	aac_mps_param_14	aac_mps_param_20	aac_mps_param_28	aac_mps_qmf	aac_mps_quant_0
downmix coder	AOT	2	2	2	2	2	2	2	2	2	2
	extAOT	--	--	--	--	--	--	--	--	--	--
	backwards compatible	--	--	--	--	--	--	--	--	--	--
	SBR present	--	--	--	--	--	--	--	--	--	--
	SSC Embedding	--	--	--	--	--	--	--	--	--	--
	number of channels	2	2	2	2	2	2	2	2	1	2
	sampling frequency	48000	48000	48000	48000	48000	48000	48000	48000	48000	48000
	frame length	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024
time slots / frame		16	16	16	16	16	16	16	16	16	16
parameter bands		28	4	5	7	10	14	20	28	28	28
tree configuration		2	2	2	2	2	2	2	2	0	2
quantization mode		0	0	0	0	0	0	0	0	0	0
one ICC		1	0	0	0	0	0	0	0	0	0
arbitrary downmix		0	0	0	0	0	0	0	0	0	0
arbitrary tree		0	0	0	0	0	0	0	0	0	0
surround gain		2	2	2	2	2	2	2	2	2	2
LFE gain		1	1	1	1	1	1	1	1	1	1
downmix gain		4	4	4	4	4	4	4	4	4	4
matrix comp. mode		0	0	0	0	0	0	0	0	0	0
temp shape config		0	0	0	0	0	0	0	0	0	0
decorr config		0	0	0	0	0	0	0	0	0	0

energy based qu.		0	0	0	0	0	0	0	0	0	0
3D stereo		0	0	0	0	0	0	0	0	0	0
number of LFE bands		2	1	1	1	1	2	2	2	2	2
residual coding		0	0	0	0	0	0	0	0	0	0
arbitrary downmix residual		0	0	0	0	0	0	0	0	0	0
residual sampling rate		--	--	--	--	--	--	--	--	--	--
number of residual frames		--	--	--	--	--	--	--	--	--	--
number of residual bands		--	--	--	--	--	--	--	--	--	--
tttModeLow		1	1	1	1	1	1	1	1	--	1
tttLow start band		0	0	0	0	0	0	0	0	--	0
tttLow stop band		28	4	5	7	10	14	20	28	--	28
tttModeHigh		0	0	0	0	0	0	0	0	--	0
tttHigh start band		--	--	--	--	--	--	--	--	--	--
tttHigh stop band		--	--	--	--	--	--	--	--	--	--
test procedure		maxDiff / RMS									
High Quality	Diff max	14	16	16	14	14	14	14	14	-	14
	RMS max	0.819	0.819	0.824	0.905	0.821	0.819	0.816	0.819	-	0.818
Low Power	Diff max	86	54	54	62	108	56	194	102	-	102
	RMS max	1.713	1.644	1.635	1.674	1.817	1.671	2.360	1.698	-	1.698

Table AMD1.6 — List of MPEG Surround conformance test sequences with MPEG-4 AAC profile downmix (ctd.)

Sequence		aac_mps_quant_1	aac_mps_quant_2	aac_mps_quant_3	aac_mps_res	aac_mps_shape_ges	aac_mps_shape_stp	aac_mps_smooth	aac_mps_tree_5151	aac_mps_tree_5152	aac_mps_tree_525
downmix coder	AOT	2	2	2	2	2	2	2	2	2	2
	extAOT	--	--	--	--	--	--	--	--	--	--

	backwards compatible	--	--	--	--	--	--	--	--	--	--
	SBR present	--	--	--	--	--	--	--	--	--	--
	SSC Embedding	--	--	--	--	--	--	--	--	--	--
	number of channels	2	1	1	2	2	2	2	1	1	2
	sampling frequency	48000	48000	48000	48000	48000	48000	48000	48000	48000	48000
	frame length	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024
time slots / frame		16	16	16	16	16	16	16	16	16	16
parameter bands		28	28	28	28	28	28	28	28	28	28
tree configuration		2	0	0	2	2	2	2	0	1	2
quantization mode		0	1	2	0	0	0	0	0	0	0
one ICC		0	0	0	0	0	0	0	0	0	0
arbitrary downmix		0	0	0	0	0	0	0	0	0	0
arbitrary tree		0	0	0	0	0	0	0	0	0	0
surround gain		2	2	2	2	2	2	2	2	2	2
LFE gain		1	1	1	1	1	1	1	1	1	1
downmix gain		4	4	4	4	4	4	4	4	4	4
matrix comp. mode		0	0	0	0	0	1	0	0	0	0
temp shape config		0	0	0	0	2	1	0	0	0	0
decorr config		0	0	0	0	0	0	0	0	2	0
energy based qu.		0	0	0	0	0	0	0	0	0	0
3D stereo		0	0	0	0	0	0	0	0	0	0
number of LFE bands		2	2	2	2	2	2	2	2	2	2
residual coding		0	0	0	1	0	0	0	0	0	0
arbitrary downmix residual		0	0	0	0	0	0	0	0	0	0
residual sampling rate		--	--	--	48000	--	--	--	--	--	--
number of residual frames		--	--	--	1	--	--	--	--	--	--

number of residual bands		--	--	--	7,7,7,7	--	--	--	--	--	--
tttModeLow		1	--	--	1	1	1	1	--	--	1
tttLow start band		0	--	--	0	0	0	0	--	--	0
tttLow stop band		28	--	--	28	28	28	28	--	--	28
tttModeHigh		0	--	--	0	0	0	0	--	--	0
tttHigh start band		--	--	--	--	--	--	--	--	--	--
tttHigh stop band		--	--	--	--	--	--	--	--	--	--
test procedure		maxDiff / RMS									
High Quality	Diff max	12	10	10	18	32	14	14	12	16	14
	RMS max	0.836	0.843	0.845	0.825	0.833	0.848	0.821	0.843	0.875	0.818
Low Power	Diff max	50	168	106	20	74	18	40	166	36	102
	RMS max	1.710	1.847	1.793	1.221	1.832	1.251	1.658	1.664	1.595	1.698

Table AMD1.7 — List of MPEG Surround conformance test sequences with MPEG-4 High Efficiency AAC profile downmix

Sequence		heaac_mps_oneicc	heaac_mps_param_4	heaac_mps_param_5	heaac_mps_param_7	heaac_mps_param_10	heaac_mps_param_14	heaac_mps_param_20	heaac_mps_param_28	heaac_mps_qmf	heaac_mps_quant_0
downmix coder	AOT	2	2	2	2	2	2	2	2	2	2
	extAOT	5	5	5	5	5	5	5	5	5	5
	backwards compatible	--	--	--	--	--	--	--	--	--	--
	SBR present	1	1	1	1	1	1	1	1	1	1
	SSC Embedding	--	--	--	--	--	--	--	--	--	--
	number of channels	2	2	2	2	2	2	2	2	1	2
	sampling frequency	48000	48000	48000	48000	48000	48000	48000	48000	48000	48000
	frame length	2048	2048	2048	2048	2048	2048	2048	2048	2048	2048
time slots / frame		32	32	32	32	32	32	32	32	32	32

parameter bands		20	4	5	7	10	14	20	28	20	20
tree configuration		2	2	2	2	2	2	2	2	0	2
quantization mode		0	0	0	0	0	0	0	0	0	0
one ICC		1	0	0	0	0	0	0	0	0	0
arbitrary downmix		0	0	0	0	0	0	0	0	0	0
arbitrary tree		0	0	0	0	0	0	0	0	0	0
surround gain		2	2	2	2	2	2	2	2	2	2
LFE gain		1	1	1	1	1	1	1	1	1	1
downmix gain		4	4	4	4	4	4	4	4	4	4
matrix comp. mode		0	0	0	0	0	0	0	0	0	0
temp shape config		0	0	0	0	0	0	0	0	0	0
decorr config		0	0	0	0	0	0	0	0	0	0
energy based qu.		0	0	0	0	0	0	0	0	0	0
3D stereo		0	0	0	0	0	0	0	0	0	0
number of LFE bands		2	1	1	1	1	2	2	2	2	2
residual coding		0	0	0	0	0	0	0	0	0	0
arbitrary downmix residual		0	0	0	0	0	0	0	0	0	0
residual sampling rate		--	--	--	--	--	--	--	--	--	--
number of residual frames		--	--	--	--	--	--	--	--	--	--
number of residual bands		--	--	--	--	--	--	--	--	--	--
tttModeLow		1	1	1	1	1	1	1	1	--	1
tttLow start band		0	0	0	0	0	0	0	0	--	0
tttLow stop band		19	4	5	7	10	13	19	22	--	19
tttModeHigh		5	0	0	0	0	5	5	5	--	5
tttHigh start band		19	--	--	--	--	13	19	22	--	19
tttHigh stop band		20	--	--	--	--	14	20	28	--	20
test procedure		maxDiff / RMS									
High Quality	Diff max	14	18	18	18	16	16	14	26	-	14
	RMS max	0.920	0.912	0.834	0.831	0.930	0.935	0.827	0.920	-	0.917
Low Power	Diff max	80	108	42	56	108	98	110	118	-	88
	RMS max	1.781	1.940	1.818	1.716	1.946	1.803	1.985	1.946	-	1.773

Table AMD1.8 — List of MPEG Surround conformance test sequences with MPEG-4 High Efficiency AAC profile downmix (ctd.)

Sequence		heaac_mps_quant_1	heaac_mps_quant_2	heaac_mps_quant_3	heaac_mps_res	heaac_mps_shape_ges	heaac_mps_shape_stp	heaac_mps_smooth	heaac_mps_tree_5151	heaac_mps_tree_5152	heaac_mps_tree_525
downmix coder	AOT	2	2	2	2	2	2	2	2	2	2
	extAOT	5	5	5	5	5	5	5	5	5	5
	Backwards compatible	--	--	--	--	--	--	--	--	--	--
	SBR present	1	1	1	1	1	1	1	1	1	1
	SSC Embedding	--	--	--	--	--	--	--	--	--	--
	number of channels	2	1	1	2	2	2	2	1	1	2
	sampling frequency	48000	48000	48000	48000	48000	48000	48000	48000	48000	48000
	frame length	2048	2048	2048	2048	2048	2048	2048	2048	2048	2048
time slots / frame		32	32	32	32	32	32	32	32	32	32
parameter bands		20	20	20	28	20	20	20	20	20	20
tree configuration		2	0	0	2	2	2	2	0	1	2
quantization mode		0	1	2	0	0	0	0	0	0	0
one ICC		0	0	0	0	0	0	0	0	0	0
arbitrary downmix		0	0	0	0	0	0	0	0	0	0
arbitrary tree		0	0	0	0	0	0	0	0	0	0
surround gain		2	2	2	2	2	2	2	2	2	2
LFE gain		1	1	1	1	1	1	1	1	1	1
downmix gain		4	4	4	4	4	4	4	4	4	4
matrix comp. mode		0	0	0	0	0	1	0	0	0	0
temp shape config		0	0	0	0	2	1	0	0	0	0
decorr config		0	0	0	0	0	0	0	0	2	0
energy based qu.		0	0	0	0	0	0	0	0	0	0
3D stereo		0	0	0	0	0	0	0	0	0	0
number of LFE bands		2	2	2	2	2	2	2	2	2	2
residual coding		0	0	0	1	0	0	0	0	0	0

arbitrary downmix residual		0	0	0	0	0	0	0	0	0	0
residual sampling rate		--	--	--	24000	--	--	--	--	--	--
number of residual frames		--	--	--	1	--	--	--	--	--	--
number of residual bands		--	--	--	7,7,7,7	--	--	--	--	--	--
tttModeLow		1	--	--	1	1	1	1	--	--	1
tttLow start band		0	--	--	0	0	0	0	--	--	0
tttLow stop band		19	--	--	15	19	19	19	--	--	19
tttModeHigh		5	--	--	5	5	5	5	--	--	5
tttHigh start band		19	--	--	15	19	19	19	--	--	19
tttHigh stop band		20	--	--	28	20	20	20	--	--	20
test procedure		maxDiff / RMS									
High Quality	Diff max	16	16	16	28	28	24	14	16	24	14
	RMS max	0.933	0.819	0.821	0.897	0.852	0.957	0.827	0.821	0.840	0.827
Low Power	Diff max	90	118	118	202	264	168	110	122	248	110
	RMS max	1.830	1.487	1.485	2.277	2.312	3.279	1.959	1.488	1.833	1.985