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Information technology — Coding of audio-visual objects —

Part 3: **Audio**

AMENDMENT 7: SBR enhancements

Technologies de l'information — Codage des objets audiovisuels —

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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*.

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Information technology — Coding of audio-visual objects —

Part 3:
Audio

AMENDMENT 7: SBR enhancements

1.5.1.2.6

Replace the first sentence with:

> The SBR Object contains the SBR-Tool and the MPEG-4 SBR Enhancements as signalled in the SBR extension element (bs_extension_id== EXTENSION_ID_ESBR) of Annex 8.A and can be combined with the audio object types indicated in Table 1.2. If a decoder detects and supports this SBR extension element, the decoder shall process the MPEG-4 SBR Enhancements.

1.5.2.2

In Table 1.4, update the row for Object Type SBR as follows:

SBR	fs = 24/48 kHz (in/out) (SBR tool)	3	2.5	1)
	fs = 24/48 kHz (in/out) (eSBR tool)	4.5	3	1)
	fs = 24/48 kHz (in/out) (Low Power SBR tool)	2	1.5	1)
	fs = 48/48 kHz (in/out) (Down Sampled SBR tool)	4.5	2.5	1)
	fs = 48/48 kHz (in/out) (Low Power Down Sampled SBR tool)	3	1.5	1)

1.5.2.3

Replace Table 1.11 with the following:

Level	Max. channels/ object	Max. AAC sampling rate, SBR not present [kHz]	Max. AAC sampling rate, SBR present [kHz]	Max. SBR sampling rate [kHz] (in/out)	Max. PCU	Max. RCU	Max. PCU Low power SBR	Max. RCU Low power SBR
1	NA	NA	NA	NA	NA	NA	NA	NA
2	2	48	24	24/48	11	11	7	8
3	2	48	48	48/48[a]	17	11	12	8
4	5	48	24/48[b]	48/48[a]	30	31	20	23
5	5	96	48	48/96	60	33	39	23
6	7	48	24/48[b]	48/48[a]	42	41	27	30
7	7	96	48	48/96	82	44	53	30

[a] For level 3, level 4 and level 6 decoders, it is mandatory to operate the SBR tool in downsampled mode if the sampling rate of the AAC core is higher than 24 kHz. Hence, if the SBR tool operates on a 48 kHz AAC signal, the internal sampling rate of the SBR tool will be 96 kHz, however, the output signal will be downsampled by the SBR tool to 48 kHz.

[b] For one or two channels the maximum AAC sampling rate, with SBR present, is 48 kHz. For more than two channels the maximum AAC sampling rate, with SBR present, is 24 kHz.

Replace Table 1.12 with the following:

Level[a]	Max. channels/ object	Max. AAC sampling rate, SBR not present [kHz]	Max. AAC sampling rate, SBR present [kHz]	Max. SBR sampling rate [kHz] (in/out)	Max. PCU	Max. RCU	Max. PCU HQ / LP SBR[e]	Max. RCU HQ / LP SBR[e]
1	NA	NA	NA	NA	NA	NA	NA	NA
2	2	48	24	24/48	11	11	9	10
3	2	48	24/48[c]	48/48[b]	17	11	15	10
4	5	48	24/48[d]	48/48[b]	30	31	20	23
5	5	96	48	48/96	60	33	39	23
6	7	48	24/48[d]	48/48[b]	42	41	27	30
7	7	96	48	48/96	82	44	53	30

[a] Level 2, 3, 4, 6 and 7 HE AAC v2 Profile decoders implement the baseline version of the parametric stereo tool. A level 5 decoder shall not be limited to the baseline version of the parametric stereo tool.

[b] For level 3, level 4 and level 6 decoders, it is mandatory to operate the SBR tool in downsampled mode if the sampling rate of the AAC core is higher than 24 kHz. Hence, if the SBR tool operates on a 48 kHz AAC signal, the internal sampling rate of the SBR tool will be 96 kHz, however, the output signal will be downsampled by the SBR tool to 48 kHz.

[c] If Parametric Stereo data is present the maximum AAC sampling rate is 24 kHz, if Parametric Stereo data is not present the maximum AAC sampling rate is 48 kHz.

[d] For one or two channels the maximum AAC sampling rate, with SBR present, is 48 kHz. For more than two channels the maximum AAC sampling rate, with SBR present, is 24 kHz.

[e] The PCU/RCU number are given for a decoder operating the LP SBR tool whenever applicable.