INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

H.262

Amendment 5
(05/99)

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Infrastructure of audiovisual services – Coding of moving video

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Information technology – Generic coding of moving pictures and associated audio information: Video

Amendment 5

ITU-T Recommendation H.262 – Amendment 5

(Previously CCITT Recommendation)

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INTERNATIONAL STANDARD 13818-2

ITU-T RECOMMENDATION H.262

INFORMATION TECHNOLOGY – GENERIC CODING OF MOVING PICTURES AND ASSOCIATED AUDIO INFORMATION: VIDEO

AMENDMENT 5

Summary

This amendment defines the addition of high level for the 4:2:2 profile. It should be noted that this 4:2:2 profile was added with Amendment 2 (to ITU-T Rec. H.262 | ISO/IEC 13818-2), but only main level was defined at that time.

Source

The ITU-T Recommendation H.262, Amendment 5 was approved on 27 May 1999. The identical text is also published as ISO/IEC International Standard 13818-2, Amendment 5.

FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the ITU. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation the term *recognized operating agency (ROA)* includes any individual, company, corporation or governmental organization that operates a public correspondence service. The terms *Administration*, *ROA* and *public correspondence* are defined in the *Constitution of the ITU (Geneva, 1992).*

INTELLECTUAL PROPERTY RIGHTS

The ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. The ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, the ITU had received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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ITU-T RECOMMENDATION

INFORMATION TECHNOLOGY – GENERIC CODING OF MOVING PICTURES AND ASSOCIATED AUDIO INFORMATION: VIDEO

AMENDMENT 5

1) Clause 8

a) Replace Table 8-4 with:

Table 8-4 – Escape profile_and_level_indication identification

profile_and_level_indication	Name
10001111 to 11111111	(Reserved)
10001110	Multi-view profile @ Low level
10001101	Multi-view profile @ Main level
10001100	(Reserved)
10001011	Multi-view profile @ High1440 level
10001010	Multi-view profile @ High level
10000110 to 10001001	(Reserved)
10000101	4:2:2 profile @ Main level
10000011 to 10000100	(Reserved)
10000010	4:2:2 profile @ High level
10000000 to 10000001	(Reserved)

b) *Replace Table 8-11 with:*

Table 8-11 – Upper bounds for sampling density

Level	Spatial resolution layer		Profile						
			Simple	Main	SNR	Spatial	High	4:2:2	Multi
High	Enhancement	Samples/line Lines/frame Frames/s		1920 1152 60			1920 1152 60	1920 1152 60	1920 1152 60
	Lower	Samples/line Lines/frame Frames/s		–			960 576 30	–	1920 1152 60
High-1440	Enhancement	Samples/line Lines/frame Frames/s		1440 1152 60		1440 1152 60	1440 1152 60	–	1440 1152 60
	Lower	Samples/line Lines/frame Frames/s		–		720 576 30	720 576 30	–	1440 1152 60
Main	Enhancement	Samples/line Lines/frame Frames/s	720 576 30	720 576 30	720 576 30		720 576 30	720 608[a)] 30	720 576 30
	Lower	Samples/line Lines/frame Frames/s	–	–	–		352 288 30	–	720 576 30
Low	Enhancement	Samples/line Lines/frame Frames/s		352 288 30	352 288 30			–	352 288 30
	Lower	Samples/line Lines/frame Frames/s		–	–			–	352 288 30

In the case of single layer or SNR scaled coding, the limits specified by "Enhancement layer" apply.

a) 512 lines/frame for 525/60, 608 lines/frame for 625/50.

c) Replace Table 8-12 with:

Table 8-12 – Upper bounds for luminance sample rate (samples/s)

Level	Spatial resolution layer	Profile						
		Simple	Main	SNR	Spatial	High	4:2:2	Multi-view
High	Enhancement		62 668 800			62 668 800 (4:2:2) 83 558 400 (4:2:0)	62 668 800	62 668 800
	Lower		–			14 745 600 (4:2:2) 19 660 800 (4:2:0)	–	62 668 800
High-1440	Enhancement		47 001 600		47 001 600	47 001 600 (4:2:2) 62 668 800 (4:2:0)	–	47 001 600
	Lower		–		10 368 000	11 059 200 (4:2:2) 14 745 600 (4:2:0)	–	47 001 600
Main	Enhancement	10 368 000	10 368 000	10 368 000		11 059 200 (4:2:2) 14 745 600 (4:2:0)	11 059 200	10 368 000
	Lower	–	–	–		– 3 041 280 (4:2:0)	–	10 368 000
Low	Enhancement		3 041 280	3 041 280			–	3 041 280
	Lower		–	–			–	3 041 280
In the case of single layer or SNR scaled coding, the limits specified by "Enhancement layer" apply.								

d) Replace Table 8-13 with:

Table 8-13 – Upper bounds for bit rates (Mbit/s)

Level	Profile						
	Simple	Main	SNR	Spatial	High	4:2:2	Multi-view
High		80			100 all layers 80 middle + base layer 25 base layer	300	– 130 both layers 80 base layer
High-1440		60		60 all layers 40 middle + base layers 15 base layer	80 all layers 60 middle + base layers 20 base layer	–	– 100 both layers 60 base layer
Main	15	15	– 15 both layers 10 base layer		20 all layers 15 middle + base layer 4 base layer	50	– 25 both layers 15 base layer
Low		4	– 4 both layers 3 base layer			–	– 8 both layers 4 base layer

e) Replace Table 8-14 with:

Table 8-14 – VBV buffer size requirements (bits)

Level	Layer	Profile						
		Simple	Main	SNR	Spatial	High	4:2:2	Multi-view
High	Enhancement 2 Enhancement 1 Base		 9 781 248			12 222 464 9 781 248 3 047 424	 47 185 920	– 15 898 480 9 787 248
High-1440	Enhancement 2 Enhancement 1 Base		 7 340 032		7 340 032 4 882 432 1 835 008	9 781 248 7 340 032 2 441 216	 –	– 12 222 464 7 340 032
Main	Enhancement 2 Enhancement 1 Base	 1 835 008	 1 835 008	– 1 835 008 1 212 416		2 441 216 1 835 008 475 136	 9 437 184	– 3 047 424 1 835 008
Low	Enhancement 2 Enhancement 1 Base		 475 136	– 475 136 360 448			–	– 950 272 475 136

f) *Replace Table 8-15 with:*

Table 8-15 – Forward compatibility between different profiles and levels

Profile and Level indication in bitstream	Decoder																
	HP @ HL	HP @ H-14	HP @ ML	Spatial @ H-14	SNR @ ML	SNR @ LL	MP @ HL	MP @ H-14	MP @ ML	MP @ LL	SP @ ML	4:2:2P @ ML	4:2:2P @ HL	MVP @ HL	MVP @ H-14	MVP @ ML	MVP @ LL
HP@HL	X																
HP@H-14	X	X															
HP@ML	X	X	X														
Spatial@H-14	X	X		X													
SNR@ML	X	X	X	X	X												
SNR@LL	X	X	X	X	X	X											
MP@HL	X						X						X[c)]	X			
MP@H-14	X	X		X			X	X					X[c)]	X	X		
MP@ML	X	X	X	X	X		X	X	X			X[b)]	X[c)]	X	X	X	
MP@LL	X	X	X	X	X	X	X	X	X	X	X[a)]	X[b)]	X[c)]	X	X	X	X
SP@ML	X	X	X	X	X		X	X	X		X	X[b)]	X[c)]	X	X	X	
ISO/IEC 11172-2	X	X	X	X	X	X	X	X	X	X	X	X[b)]	X[c)]	X	X	X	X
4:2:2@ML												X	X[c)]				
4:2:2@HL													X				
MVP@HL														X			
MVP@H-14														X	X		
MVP@ML														X	X	X	
MVP@LL														X	X	X	X

X indicates that the decoder shall be able to decode the bit stream including all relevant lower layers.

a) SP@ML decoders are required to decode MP@LL bitstreams.

b) A 4:2:2 profile@Main level decoder shall be able to decode Main profile@Main level, Main profile@Low level and Simple profile@Main level bitstreams, as well as ISO/IEC 11172-2 constrained system parameter bitstreams.

c) A 4:2:2 profile@High level decoder shall be able to decode 4:2:2P@ML, MP@HL, MP@HL-1440, MP@ML, MP@LL and SP@ML, as well as ISO/IEC 11172-2 constrained system parameter bitstreams.

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