International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

H.221

Amendment 1

(09/2005)

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Infrastructure of audiovisual services – Transmission multiplexing and synchronization

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Frame structure for a 64 to 1920 kbit/s channel in audiovisual teleservices

Amendment 1: Support for 14 kHz audio bandwidth extension of G.722.1 Annex C in H.221

ITU-T Recommendation H.221 (2004) – Amendment 1

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ITU-T Recommendation H.221

Frame structure for a 64 to 1920 kbit/s channel in audiovisual teleservices

Amendment 1

Support for 14 kHz audio bandwidth extension of G.722.1 Annex C in H.221

Summary

This Amendment adds the BAS code signalling and H.221 multiplex allocation to support Annex C/G.722.1 (14 kHz audio bandwidth extension of the G.722.1) in H.320 systems.

Source

Amendment 1 to ITU-T Recommendation H.221 (2004) was approved on 13 September 2005 by ITU-T Study Group 16 (2005-2008) under the ITU-T Recommendation A.8 procedure.

FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 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.

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In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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As of the date of approval of this Recommendation, 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.

ITU-T Recommendation H.221

Frame structure for a 64 to 1920 kbit/s channel in audiovisual teleservices

Amendment 1

Support for 14 kHz audio bandwidth extension of G.722.1 Annex C in H.221

1) Clause 4.2.5

This change describes the bit allocation for Annex C/G.722.1 at the standardized rates of 24, 32, and 48 kbit/s.

[Begin Change]

…

ITU-T Rec. G.722.1 provides two bit rates, 24 kbit/s or 32 kbit/s, and uses a frame size of 20 ms. This results in either 480 bits (60 octets) or 640 bits (80 octets) in any one frame respectively. The bit rate may be changed at any 20 ms audio frame boundary. Alignment of H.221 audio mode changes with a submultiframe boundary is required by 3.2/H.221. Figures 5h and 5i illustrate the bit allocation of the two G.722.1 frames for a bit rate of 32 kbit/s and 24 kbit/s respectively.

Bit allocation for Annex C/G.722.1 at 24 and 32 kbit/s shall be identical to bit allocation for G.722.1 at these rates. Bit allocation for Annex C/G.722.1 at 48 kbit/s shall be identical to bit allocation for G.722 at 48 kbit/s.

…

[End Change]

2) Annex A

These changes supply capabilities and commands for Annex C/G.722.1.

[Begin Change]

Annex A

Definitions and tables of BAS values

The definitions of BAS values are given in this annex, and the corresponding numerical values are listed in Tables A.1 and A.2. In these tables, the column header gives the attribute designation as bits (b_0, b_1, b_2); the left-hand column gives the decimal value of bits [b_3, b_4, b_5, b_6, b_7]; for example, "Dig-loop" has the value (010) [10100]. All unassigned values are reserved, as are values marked (R).

Table A.1/H.221 – BAS numerical values

	(000)	(001)	(010)	(011)	(100)	(101)	(110)	(111)
[0]	neutral[a)]	64k	Video-off	LSD-off	neutral	var-LSD	Restrict_L	class (R)
[1]	capex	2 × 64k	H.261-on	LSD_300	A-law	LSD_300	Restrict_P	class (R)
[2]	(R)	3 × 64k	H.263-on	LSD_1200	μ-law	LSD_1200	NoRestrict	class (R)
[3]	(R)	4 × 64k	video-MPEG-1-on	LSD_4800	G.722-64	LSD_4800	G.723.1[b)]	class (R)
[4]	A-law, 0U	5 × 64k	H.264-on	LSD_6400	G.722-48	LSD_6400	G.729	class (R)
[5]	μ-law, 0U	6 × 64k	MLP-8k	LSD_8000	G.728	LSD_8000	G.722.1-32 (cap)	class (R)
[6]	G.722, m1[a)]	384k	encryp-on	LSD_9600	(R)	LSD_9600	G.722.1-24 (cap)	class (R)
[7]	Au-off, U[a)]	2 × 384k	encryp-off	LSD_14.4k	SM-comp	LSD_14.4k	G.722.1 Annex C-48 (cap)	class (R)
[8]	(R)	3 × 384k	H.262S-on	LSD_16k	128k	LSD_16k	G.722.1 Annex C-32 (cap)	family (R)
[9]	(R)	4 × 384k	H.262M-on	LSD_24k	192k	LSD_24k	G.722.1 Annex C-24 (cap)	family (R)
[10]	G.723.1	5 × 384k	DOP	LSD_32k	256k	LSD_32k	(R)	family (R)
[11]	G.729	1536k	DCP	LSD_40k	320k	LSD_40k	(R)	family (R)
[12]	(R) G-4k	1920k	DOIP	LSD_48k	512k	LSD_48k	(R)	family (R)
[13]	G.722.1 Annex C-48	128k	DCIP	LSD_56k	768k	LSD_56k	(R)	family (R)
[14]	G.722.1 Annex C-32	192k	PRAO	LSD_62.4k	Null	LSD_62.4k	(R)	family (R)
[15]	G.722.1 Annex C-24	256k	PRAC	LSD_64k	1152k	LSD_64k	(R)	Table_A.6
[16]	(R)	320k	freeze-pic	MLP-off	1B	MLP-4k	(R)	Table_A.2
[17]	(R)	loss i.c.	Fast-update	MLP-4k	2B	MLP-6.4k	(R)	H.230
[18]	A-law, 0F[a)]	(R)	Au-loop	MLP-6.4k	3B	var-MLP	(R)	Table_A.4
[19]	μ-law, 0F[a)]	(R)	Vid-loop	var-MLP	4B	MLP_Set 1	(R)	SBE numbers
[20]	A-law, F6[a)]	(R)	Dig-loop	MLP-14.4k	5B	H.261-QCIF	(R)	SBE characters
[21]	μ-law, F6[a)]	(R)	Loop-off	MLP-22.4k	6B	H.261-CIF	(R)	SBE (R)
[22]	(R)	(R)	(R)	MLP-30.4k	Restrict_required	1/29.97	(R)	SBE (R)
[23]	(R)	512k	SM-comp	MLP-38.4k	6B-H0-comp	2/29.97	(R)	SBE (R)
[24]	G.722, m2[a)]	768k	not-SM-comp	MLP-46.4k	H0	3/29.97	(R)	cap-mark
[25]	G.722, m3[a)]	(R)	6B-H0-comp	MLP-16k	2H0	4/29.97	(R)	start-MBE
[26]	Au-40k (R)	1152k	not-6B-H0-comp	MLP-24k	3H0	H.263(2000)	(R)	(R)
[27]	G.722.1-32	(R)	Restrict	MLP-32k	4H0	video-MPEG-1	(R)	(R)
[28]	G.722.1-24	(R)	derestrict	MLP-40k	5H0	MLP_Set2	(R)	(R)
[29]	G.728[a)]	1472k	(R)	MLP-62.4k	1472k	esc-CF (R)	(R)	(R)
[30]	(R)	(R)	(R)	MLP-64k	H11	encryp.	(R)	ns-cap
[31]	Au-off, F[a)]	(R)	(R)	var-LSD	H12	MBE-cap	(R)	ns-comm

[a)] Use of these codes in the 56 kbit/s environments is defined in Annex B.

[b)] Use of H.223 AL2 CRC is required as specified in 4.2.

…

A.1 Audio command values (000)

For audio bit position illustrations, see clause 4. Abbreviations "G.711", "G.722" and so on refer to Recommendations.

Neutral	Neutralized I-channel, containing only FAS and BAS; all other bits are to be ignored at the receiver[1].
Capex	Transmitted by a Channel Aggregation Unit (see ITU-T Rec. H.244).
Au-off, U	Switches off G.711/722/728 audio (but not Au-ISO as in Table A.2) and switches off the frame structure in the I-channel; all the I-channel is available for use under commands other than (000)[n][1, 2].
Au-off, F	Switches off G.711/722/728 audio (but not Au-ISO as in Table A.2); FAS and BAS in use (mode 9); 62.4 kbit/s in the I-channel available for use under commands other than (000)[n].
A-law, 0U	G.711 audio at 64 kbit/s, A-law, no framing (Mode 0U)[2].
A-law, 0F	G.711 audio at 56 kbit/s, A-law, truncated to 7 bits in bits 1-7, with FAS and BAS in bit 8; bit 8 is set to zero at the PCM audio decoder (Mode 0F).
μ-law, 0U	G.711 audio at 64 kbit/s, μ-law, no framing (Mode 0U)[2].
μ-law, 0F	G.711 audio at 56 kbit/s, μ-law, truncated to 7 bits in bits 1-7, with FAS and BAS in bit 8; bit 8 is set to zero at the PCM audio decoder (Mode 0F).
A-law, F6	Audio according to ITU-T Rec. G.711 at 48 kbit/s, A-law truncated to 6 bits, with FAS and BAS in bit 8 (use only according to 13.4/H.242).
μ-law, F6	Audio according to ITU-T Rec. G.711 at 48 kbit/s, μ-law truncated to 6 bits, with FAS and BAS in bit 8 (use only according to 13.4/H.242).
G.722, m1	G.722 7 kHz audio at 64 kbit/s, no framing (mode 1)[2].
G.722, m2	G.722 7 kHz audio at 56 kbit/s, in bits 1-7 (mode 2).
G.722, m3	G.722 7 kHz audio at 48 kbit/s, in bits 1-6 (mode 3).

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1 It is interpreted as a command to shut off all the output of the I-channel demultiplexer except FAS, BAS and ECS (if relevant). Audio is muted accordingly. Release of this shut off is activated by a fixed rate command (namely by a command other than Var-LSD, Var-MLP). Channels other than I-channel (such as additional channel for 2B communications, or the 2nd through 6th time-slot for H_0 communications) remain unchanged.

If video or HSD was set on before this Neutral BAS command is issued, it continues to be on. For example, if video has been on in a 2B communication, and Neutral BAS command is issued, the video is transmitted only in the additional channel. If a fixed rate command for I-channel is then issued, the video also occupies all bit positions of I-channel other than those designated by the fixed rate command, and FAS and BAS positions. In case of 1B communication, video is completely excluded by this Neutral BAS command, but it will recover by, for example, the next 16 kbit/s audio command.

It is noted that no procedures for the use of neutral BAS command have been adopted.

2 These attribute values designate unframed modes. In the receive direction, reverting to a framed mode can only be achieved by recovering frame and multiframe alignment which might take up to two multiframes (320 ms).

Au-40k	Reserved for audio at less than 48 kbit/s (for example, 40 kbit/s in bits 1-5).
G.722.1-32	G.722.1 7 kHz audio at 32 kbit/s, in bits 1-4.
G.722.1-24	G.722.1 7 kHz audio at 24 kbit/s, in bits 1-3.
G.722.1 Annex C-48	G.722.1 Annex C 14 kHz audio at 48 kbit/s, in bits 1-6.
G.722.1 Annex C-32	G.722.1 Annex C 14 kHz audio at 32 kbit/s, in bits 1-4.
G.722.1 Annex C-24	G.722.1 Annex C 14 kHz audio at 24 kbit/s, in bits 1-3.
G.728	Audio at 16 kbit/s to ITU-T Rec. G.728 in bits 1 and 2 according to clause 4 (mode 7).
G.729	Audio at 8 kbit/s to ITU-T Rec. G.729 according to clause 4 (mode 8a).
G.723.1	Audio at <7 kbit/s to ITU-T Rec. G.723.1 according to clause 4 (mode 8b).
Au-4k	Reserved for audio at less than 5 kbit/s in bit 1.

…

A.5 Audio capabilities (100)

Neutral	Neutral capability: no change in the current capabilities of the terminal.
A-law	Capable of decoding audio to ITU-T Rec. G.711, A-law.
μ-law	Capable of decoding audio to ITU-T Rec. G.711, μ-law.
G.722-64	Capable of decoding audio to ITU-T Rec. G.722 (mode 1) and to ITU-T Rec. G.711.
G.722-48	Capable of decoding audio to ITU-T Rec. G.722 (modes 1, 2, 3) and to ITU-T Rec. G.711.
G.722.1-32 (cap)	Capable of decoding audio to ITU-T Rec. G.722.1 at 32 kbit/s and to ITU-T Rec. G.711.
G.722.1-24 (cap)	Capable of decoding audio to ITU-T Rec. G.722.1 at 24 kbit/s and to ITU-T Rec. G.711.
G.722.1 Annex C-48 (cap)	Capable of decoding audio to ITU-T Rec. G.722.1 Annex C at 48 kbit/s and to ITU-T Rec. G.711.
G.722.1 Annex C-32 (cap)	Capable of decoding audio to ITU-T Rec. G.722.1 Annex C at 32 kbit/s and to ITU-T Rec. G.711.
G.722.1 Annex C-24 (cap)	Capable of decoding audio to ITU-T Rec. G.722.1 Annex C at 24 kbit/s and to ITU-T Rec. G.711.
G.728	Capable of decoding audio, both to ITU-T Recs G.728 and G.711.
G.723.1	Capable of decoding audio, both to ITU-T Recs G.723.1 and G.711.
G.729	Capable of decoding audio, both to ITU-T Rec. G.729 (including Annex A) and ITU-T Rec. G.711.

Null	Capability having no significance other than as a filler. NOTE – This value may occur any number of times within a capability set transmitted towards a Single-Channel Equipment – see ITU-T Rec. H.244 (Channel Aggregation).

[End Change]

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