INTERNATIONAL STANDARD ISO/IEC 11172-2:1993

TECHNICAL CORRIGENDUM 3

Published 2003-11-01

Information technology — Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s —

Part 2: Video

TECHNICAL CORRIGENDUM 3

Technologies de l'information — Codage de l'image animée et du son associé pour les supports de stockage numérique jusqu'à environ 1,5 Mbit/s —

Partie 2: Vidéo

RECTIFICATIF TECHNIQUE 3

Technical Corrigendum 3 to ISO/IEC 11172-2:1993 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information.*

ICS 35.040

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In 1.2, replace the list of Normative references with:

"

ITU-T T.81:1992 | ISO/IEC 10918-1:1994, *Information technology — Digital compression and coding of continuous-tone still images: Requirements and guidelines*

ISO/IEC 11172-1:1993, *Information technology — Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s — Part 1: Systems*

ISO/IEC 11172-3:1993, *Information technology — Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s — Part 3: Audio*

ITU-R BT 470-6:1998, *Conventional television systems*

ITU-R BR.648, *Digital Recording of audio signals*

ITU-R BT.601-5, *Studio encoding parameters of digital television for standard 4:3 and widescreen 16:9 aspect ratio*

ITU-R BO.955-3, *Satellite sound broadcasting to vehicular, portable and fixed receivers in the range 500-3 000 MHz*

ITU-T H.261:1993, *Video codec for audiovisual services at p×64 kbit/s*

ITU-T J.17:1988, *Pre-emphasis used on Sound-Programme Circuits*

IEC 60461:1986, *Time and control code for video tape recorders*

IEC 60908:1999, *Audio recording — Compact disc digital audio system*

IEEE 1180:1990, *IEEE Standard Specifications for the Implementations of 8 by 8 Inverse Discrete Cosine Transform*

"

In 2.1, delete definitions on audio coding:

2.1.3-2.1.10, 2.1.12, 2.1.15, 2.1.17, 2.1.21, 2.1.23, 2.1.35, 2.1.36, 2.1.47, 2.1.52, 2.1.55, 2.1.61, 2.1.62, 2.1.67, 2.1.69, 2.1.70, 2.1.72, 2.1.7.4-2.1.7.6, 2.1.81-2.1.83, 2.1.87-2.1.90, 2.1.94, 2.1.96, 2.1.102, 2.1.109, 2.1.116, 2.1.123, 2.1.126-2.1.128, 2.1.133, 2.1.135, 2.1.138, 2.1.140-2.1.144, 2.1.148, 2.1.149.

*In 2.1, replace definition 2.1.66 (**frame**) with:*

"

2.1.66
frame [video]: image data represented by lines of spatial information of a video signal. For progressive video, these lines contain samples starting from one time instant and continuing through successive lines to the bottom of frame. For interlaced video, a frame consists of two fields, a top field and bottom field. One of this fields commence one field period later than the other.

"

In subclause 2.4.3.6, replace:

"

motion_horizontal_backward_code -- motion_horizontal_backward_code is decoded according to table B.4. The decoded value is required (along with backward_f - see 2.4.4.2) to decide whether or not motion_horizontal_backward_r appears in the bitstream.

motion_horizontal_backward_r -- An unsigned integer (of backward_r_size bits - see 2.4.4.2) used in the process of decoding backward motion vectors as described in 2.4.4.2.

motion_vertical_backward_code -- motion_vertical_backward_code is decoded according to table B.4. The decoded value is required (along with backward_f) to decide whether or not motion_vertical_backward_r appears in the bitstream.

"

with

"

motion_horizontal_backward_code -- motion_horizontal_backward_code is decoded according to table B.4. The decoded value is required (along with backward_f - see 2.4.4.3) to decide whether or not motion_horizontal_backward_r appears in the bitstream.

motion_horizontal_backward_r -- An unsigned integer (of backward_r_size bits - see 2.4.4.2) used in the process of decoding backward motion vectors as described in 2.4.4.3.

motion_vertical_backward_code -- motion_vertical_backward_code is decoded according to table B.4. The decoded value is required (along with backward_f - see 2.4.4.3) to decide whether or not motion_vertical_backward_r appears in the bitstream.

"

In subclause 2.4.4.3, replace:

"

Second, the value of the backward motion vector for the macroblock shall be reconstructed from the retrieved backward motion vector information, and the backward motion vector reconstructed for the previous macroblock using the same procedure as for calculating the forward motion vector in B-pictures. In this procedure, the variables needed to find the backward motion vector are substituted for the variables needed to find the forward motion vector. The variables and coded data elements used to calculate the backward motion vector are:

"

with

"

Second, the value of the backward motion vector for the macroblock shall be reconstructed from the retrieved backward motion vector information, and the backward motion vector reconstructed for the previous macroblock using the same procedure as for calculating the forward motion vector in B-pictures. In this procedure, the variables needed to find the backward motion vector substitute the variables needed to find the forward motion vector. The variables and coded data elements used to calculate the backward motion vector are:

"

In Annex A, replace:

"

The 8 by 8 inverse discrete cosine transform for I-pictures and P-pictures shall conform to IEEE Draft Standard, P1180/D2, July 18, 1990. For B-pictures this specification may also be applied but may be unnecessarily stringent. Note that clause 2.3 of P1180/D2 "Considerations of Specifying IDCT Mismatch Errors" requires the specification of periodic intra-coding in order to control the accumulation of mismatch errors. The maximum refresh period requirement for this part of ISO/IEC 11172 shall be 132 intra-coded pictures or predictive-coded pictures as stated in 2.4.4.5, which is the same as indicated in P1180/D2 for visual telephony according to CCITT Recommendation H.261 [5].

"

with

"

The 8 by 8 inverse discrete cosine transform for I-pictures and P-pictures shall conform to IEEE Draft Standard, P1180/D2, July 18, 1990. For B-pictures this specification may also be applied but may be unnecessarily stringent. Note that clause 2.3 of P1180/D2 "Considerations of Specifying IDCT Mismatch Errors" requires the specification of periodic intra-coding in order to control the accumulation of mismatch errors. The maximum refresh period requirement for this part of ISO/IEC 11172 shall be as stated in 2.4.4.5, which is the same as indicated in P1180/D2 for visual telephony according to Recommendation ITU-T H.261:1993.

"

In D.6.3.3, replace:

"

The two-dimensional DCT is defined as

$$F(u,v) = \frac{1}{4} \sum_{x=0}^{7} \sum_{y=0}^{7} f(x,y) \cos\big(\pi(2x+1)u/16\big) \cos\big(\pi(2y+1)v/16\big)$$

with: u, v, x, y = 0, 1, 2, ... 7

where   x, y = spatial coordinates in the pel domain

u, v = coordinates in the transform domain

C(u) $= 1/\sqrt{2}$ for u = 0

C(v) $= 1/\sqrt{2}$ for v = 0

$= 1$ otherwise

This transform is separable, i.e. a one-dimensional DCT transform may be applied first in the horizontal direction and then in the vertical direction. The formula for the one dimensional transform is:

$$F(u) = \frac{1}{2} C(u) \sum_{x=0}^{7} f(x) \cos\big(\pi(2x+1)u/16\big)$$

C(u) $= 1/\sqrt{2}$ for u = 0

$= 1$ otherwise

"

with

"

The two-dimensional DCT is defined as

$$F(u,v) = \frac{1}{4}C(u)C(v)\sum_{x=0}^{7}\sum_{y=0}^{7}f(x,y)\cos\left(\pi\left(2x+1\right)u/16\right)\cos\left(\pi\left(2y+1\right)v/16\right)$$

with: u, v, x, y = 0, 1, 2, ... 7

where   x, y = spatial coordinates in the pel domain

        u, v = coordinates in the transform domain

C(u)   = $1/\sqrt{2}$ for u = 0

C(v)   = $1/\sqrt{2}$ for v = 0

        = 1   otherwise

This transform is separable, i.e. a one-dimensional DCT transform may be applied first in the horizontal direction and then in the vertical direction. The formula for the one dimensional transform is:

$$F(u) = \frac{1}{2}C(u)\sum_{x=0}^{7}f(x)\cos\left(\pi\left(2x+1\right)u/16\right)$$

C(u)   = $1/\sqrt{2}$ for u = 0

        = 1   otherwise

"

In D.6.3.5, replace:

"

Table D.13 — Differential dc additional code

DIFFERENTIAL	S	ADDITIONAL CODE
-255 to -128	8	00000000 to 01111111
-127 to -64	7	0000000 to 0111111
-63 to -32	6	000000 to 011111
-31 to -16	5	00000 to 01111
-15 to -8	4	0000 to 0111
-7 to -4	3	000 to 011
3 to -2	2	00 to 01
-1	1	0
0	0	
1	1	1
2 to 3	2	10 to 11
4 to 7	3	100 to 111
8 to 15	4	1000 to 1111
16 to 31	5	10000 to 11111
32 to 63	6	100000 to 111111
64 to 127	7	1000000 to 1111111
128 to 255	8	10000000 to 11111111

"

with

"

Table D.13 — Differential dc additional code

DIFFERENTIAL	S	ADDITIONAL CODE
-255 to -128	8	00000000 to 01111111
-127 to -64	7	0000000 to 0111111
-63 to -32	6	000000 to 011111
-31 to -16	5	00000 to 01111
-15 to -8	4	0000 to 0111
-7 to -4	3	000 to 011
-3 to -2	2	00 to 01
-1	1	0
0	0	
1	1	1
2 to 3	2	10 to 11
4 to 7	3	100 to 111
8 to 15	4	1000 to 1111
16 to 31	5	10000 to 11111
32 to 63	6	100000 to 111111
64 to 127	7	1000000 to 1111111
128 to 255	8	10000000 to 11111111

"

In D.6.3.5, replace Table D.15, combination RUN = 16, LEVEL = 2:

"

16	2	000 0000 0001

"

with

"

16	2	0000 0000 0001

"

In Annex E, delete the Bibliography items [4], [5], and [6].