



INTERNATIONAL STANDARD ISO/IEC 15444-2:2004
TECHNICAL CORRIGENDUM 4

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Information technology — JPEG 2000 image coding system: Extensions

TECHNICAL CORRIGENDUM 4

Technologies de l'information — Système de codage d'images JPEG 2000: Extensions

RECTIFICATIF TECHNIQUE 4

Technical Corrigendum 4 to ISO/IEC 15444-2:2004 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*, in collaboration with ITU-T. The identical text is published as ITU-T Rec. T.801 (2002)/Cor.4 (05/2006).

**INTERNATIONAL STANDARD
ITU-T RECOMMENDATION**

Information technology – JPEG 2000 image coding system: Extensions

Technical Corrigendum 4

1) Clause M.8

Add the following additional bullet item after the first item:

- The MinV field in the File Type box shall be set to 1, indicating a minor revision to the standard.

2) Clause M.11.1

a) Add the following two paragraphs after the first paragraph:

All features specified are in addition to the features defined by the JP2 file format and JPEG 2000 codestream profile 0; it is assumed that any reader capable of reading a JPX file is also capable of understanding every feature defined in the JP2 file format and decoding a JPEG 2000 profile 0 codestream.

This box shall contain an accurate specification, to the extent as known by the writer, of all features in the file and an accurate specification of the set or sets of features required to display the image as intended by the writer.

NOTE – If a JPX file contains no features other than those defined by the JP2 file format and JPEG 2000 codestream profile 0, or if the reader does not know of any features contained in the file beyond those base features, the Reader Requirements box will list zero standard features and zero vendor features.

Many features from previous revisions of this Recommendation | International Standard have been deprecated. Writers shall not include these features when creating or updating files. Readers shall ignore the contribution of those features when determining whether they can or cannot read the file.

b) Replace all instances of "Decode Completely" with "Display Contents".

3) Table M.14

Replace the entire Table M.14 with the following table. The following features only list specific, non-divisible features (no "negative" features as in the original version, and no feature combinations).

Table M.14 – Legal values of the SFⁱ field

Value	Meaning
0	File not completely understood
1	Deprecated
2	Contains multiple composition layers
3	Deprecated
4	JPEG 2000 Part 1 Profile 1 codestream as defined in ITU-T Rec. T.800 ISO/IEC 15444-1, A.10, Table A.45
5	Unrestricted JPEG 2000 Part 1 codestream as defined in ITU-T Rec. T.800 ISO/IEC 15444-1
6	Unrestricted JPEG 2000 Part 2 codestream as defined in this Recommendation International Standard
7	JPEG codestream as defined in ISO/IEC 10918-1
8	Deprecated
9	Non-premultiplied opacity channel
10	Premultiplied opacity channel
11	Chroma-key based opacity
12	Deprecated
13	Fragmented codestream where all fragments are in the file and in order
14	Fragmented codestream where all fragments are in the file but are out of order
15	Fragmented codestream where not all fragments are within the file but all are in locally accessible files

Table M.14 – Legal values of the SFⁱ field

Value	Meaning
16	Fragmented codestream where some fragments may be accessible only through a URL specified network connection
17	Compositing required to produce rendered result from multiple compositing layers
18	Deprecated
19	Deprecated
20	Deprecated
21	At least one compositing layer consists of multiple codestreams
22	Deprecated
23	Colourspace transformations are required to combine compositing layers; not all compositing layers are in the same colourspace
24	Deprecated
25	Animation
26	First animation layer does not cover entire rendered result area
27	Deprecated
28	Reuse of animation layers
29	Deprecated
30	Some animated frames are non-persistent
31	Deprecated
32	Rendered result involves scaling within a layer
33	Rendered result involves scaling between layers
34	ROI metadata
35	IPR metadata
36	Content metadata
37	History metadata
38	Creation metadata
39	JPX digital signatures
40	JPX checksums
41	Desired Graphic Arts reproduction specified
42	Deprecated
43	Deprecated
44	Compositing layer uses Any ICC profile
45	Deprecated
46	Deprecated
47	BiLevel 1 enumerated colourspace
48	BiLevel 2 enumerated colourspace
49	YCbCr 1 enumerated colourspace
50	YCbCr 2 enumerated colourspace
51	YCbCr 3 enumerated colourspace
52	PhotoYCC enumerated colourspace
53	YCKK enumerated colourspace
54	CMY enumerated colourspace
55	CMYK enumerated colourspace
56	CIELab enumerated colourspace with default parameters
57	CIELab enumerated colourspace with non-default parameters
58	CIEJab enumerated colourspace with default parameters

Table M.14 – Legal values of the SFⁱ field

Value	Meaning
59	CIEJab enumerated colourspace with non-default parameters
60	e-sRGB enumerated colourspace
61	ROMM–RGB enumerated colourspace
62	Non-square samples
63	Deprecated
64	Deprecated
65	Deprecated
66	Deprecated
67	GIS metadata XML box
68	JPSEC extensions in codestream as specified by ISO/IEC 15444-8
69	JP3D extensions in codestream as specified by ISO/IEC 15444-10
70	Deprecated
71	e-sYCC enumerated colourspace
72	JPEG 2000 Part 2 codestream as restricted by baseline conformance requirements in M.9.2.3
73	YPbPr(1125/60) enumerated colourspace
74	YPbPr(1250/50) enumerated colourspace
Other values	Reserved for ISO use

4) Table M.15

Change the label "EM" in row 2 to "FUAM".

5) Tables M.19 and M.20

Combine Tables M.19 and M.20 into a single table (M.19) and delete Table M.20.

6) Table M.21, value of "C" field

Change the value of the "C" field to "See Table M.19".

7) Clause M.11.5.1, definition of Uncompressed data

Replace the paragraph defining "Uncompressed" (Table M.19) with the following:

Uncompressed. Picture data is stored in component interleaved format, encoded at the bit depth as specified by the BPC field. This value is only permitted for codestreams where all components are encoded at the same bit depth. When the bit depth of each component is not a multiple of 8, component values shall be packed into bytes so that no bits are unused between components. However, the value of the first component of each sample shall begin on a byte boundary and padding bits having value zero shall be inserted after the last component of the sample as necessary to fill out the remaining bits to the next byte boundary. When multiple component values are packed into a byte, the first component shall appear in the most significant bits of the byte. When a component is larger than a byte, its most significant bits shall appear in earlier bytes.

8) Clause A.3.1, Table A.21

Add the following clarification:

IEEE numbers as used in the ISO/IEC 15444-2 codestream have to be written in big-endian order, using the following bit-assignments for encoding the floating point numbers:

SEEE EEEE EMMM MMMM MMMM MMMM MMMM MMMM

for single precision IEEE numbers, where S = sign bit, E = exponent bits, M = mantissa bits

SEEE EEEE EEEE MMMM MMMM MMMM MMMM MMMM MMMM MMMM MMMM MMMM
 MMMM MMMM MMMM

for double precision IEEE numbers, where S = sign bit, E = exponent bits, M = mantissa bits

NOTE 2 – This encoding requires typically an endian-swap on little-endian machines, and is typically the native encoding for big-endian machines.

9) Clause A.3.7

a) *Replace the entire paragraph (Usage) as follows:*

Usage: Present only if the multiple component transformation capability bit in the Rsiz parameter (see A.2.1) is a one value. Main and first tile-part header of a given tile. An MCT marker segment in a tile-part header overrides a main header MCT segment for that tile if and only if the ten low-order bits of the Imct fields of both marker segments are identical.

b) *Replace the entire paragraph (Imct) as follows:*

Imct: Multiple component transformation index value, array type, and parameter size. An MCT marker segment, or series, with a given Imct value in the tile-part header overrides a main header MCT marker segment, or series, if and only if the ten low-order bits (index, and transformation type) of the Imct values of both markers are identical.

c) *In Table A.32, entry SPmctⁱ, replace "Table A.33" by "Variable, Array of types as indicated in Table A.33".*

10) Clause A.3.8

a) *In Table A.34, entry Imcc, replace "Values" entry "1-255" by "0-255".*

b) *In Table A.34, entry Tmccⁱ, replace "Values" entry "Table A.35" by "Table A.38 or Table A.39".*

11) Clause A.3.10, description of Lnlt parameter

a) *Replace formula (A-7) by:*

$$Lnlt = 6 + \begin{cases} 0 & Tnlt = 0 \\ 15 & Tnlt = 1 \\ 11 + (N_{points} \cdot \Psi_{Tval}) & Tnlt = 2 \end{cases}$$

NOTE – Specifying a non-linearity transform with Tnlt = 0 allows a transformation to be explicitly disabled.

b) *In Table A.45, description of E, S, A values, add the following note that E, S and A must not be zero:*

NOTE – E, S, and A parameters must not be zero as the non-linearity transformation defined by formula (K-2) is otherwise not well-defined.

12) Clause K.2.1.2

a) *In Formulae K-2 and K-5, add brackets around the fractions.*

b) *Replace Formula K-4, definition of A_s, by:*

$$A_s = \frac{f_y}{f_z^E} \times A$$