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Part 2: Extensions

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

Partie 2: Extensions

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This document was prepared by ITU-T (as Rec. ITU-T T.801) and drafted in accordance with its editorial rules, in collaboration with Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

This third edition cancels and replaces the second edition (ISO/IEC 15444-2:2021), which has been technically revised.

The main changes are as follows:

— Support for progression order extensions.

A list of all parts in the ISO/IEC 15444 series can be found on the ISO and IEC websites.

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CONTENTS

		Page
1	Scope	1
2	Normative references	1
3	Definitions	2
4	Abbreviations	4
5	Conventions	4
6	General description	4
6.1	Extensions specified by this Recommendation | International Standard	5
6.2	Relation between extensions	6
Annex A – Compressed data syntax, extension		8
A.1	Extended capabilities	8
A.2	Extensions to Rec. ITU-T T.800 | ISO/IEC 15444-1 marker segment parameters	8
A.3	Extended marker segments	16
Annex B – Variable DC offset, extension		35
B.1	Variable DC offset flow	35
B.2	Inverse DC offset	35
B.3	Forward DC offset (informative)	35
Annex C – Variable scalar quantization, extension		37
C.1	Variable scalar quantization	37
C.2	Variable scalar dequantization for irreversible filters	37
C.3	Variable scalar quantization for irreversible filters (informative)	37
Annex D – Trellis coded quantization extensions		39
D.1	Introduction to TCQ	39
D.2	Sequence definition	40
D.3	Forward TCQ quantization (informative)	41
D.4	Inverse quantization (normative)	42
D.5	Lagrangian rate allocation (informative)	45
Annex E – Visual masking, extensions		50
E.1	Introduction to visual masking (informative)	50
E.2	Point-wise extended non-linearity (informative)	50
E.3	Decoding with visual masking	52
E.4	Encoding with visual masking (informative)	53
E.5	Setting parameters (informative)	53
E.6	Compatibility with other technologies (informative)	53
Annex F – Arbitrary decomposition of tile-components, extensions		54
F.1	Wavelet sub-bands	54
F.2	Equation, text and decomposition updates	55
F.3	Inverse discrete wavelet transformation for general decompositions	64
F.4	Forward discrete wavelet transformation for general decompositions (informative)	71
Annex G – Whole-sample symmetric transformation of images, extensions		78
G.1	Wavelet transformation parameters, definitions and normalizations	78
G.2	Whole-sample symmetric (WS) wavelet transformations reconstruction	78
G.3	Whole-sample symmetric (WS) wavelet transformation decomposition (informative)	81
G.4	Examples of WS wavelet transformations (informative)	82
Annex H – Transformation of images using arbitrary wavelet transformations		85
H.1	Wavelet transformation parameters and normalizations	85
H.2	Arbitrary (ARB) wavelet transformation reconstruction procedures	85
H.3	Arbitrary (ARB) wavelet transformation decomposition procedures (informative)	91
H.4	Examples of ARB wavelet transformations (informative)	94

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Page

Annex I – Single sample overlap discrete wavelet transform, code-block anchor point and progression order extensions ... 98
I.1 Introduction to single sample overlapping ... 98
I.2 The code-block anchor points (CBAP) extension ... 98
I.3 The SSO extension ... 102
I.4 The TSSO extension ... 110
I.5 Combining the SSO and TSSO extensions (informative) ... 111
Annex J – Multiple component transformations, extension ... 112
J.1 Introduction to multiple component transformation concepts ... 112
J.2 Overview of inverse processing ... 112
J.3 Transformations ... 118
Annex K – Non-linear transformation ... 128
K.1 Signalling the use of the non-linear transformations ... 128
K.2 Non-linear transformation specifications ... 129
Annex L – Region of interest coding and extraction, extensions ... 133
L.1 Decoding of ROI ... 133
L.2 Description of the Scaling based method ... 133
L.3 Region of interest mask generation ... 134
L.4 Remarks on region of interest coding ... 138
Annex M – JPX extended file format syntax ... 139
M.1 File format scope ... 139
M.2 Introduction to JPX ... 139
M.3 Greyscale/Colour/Palette/multi-component specification architecture ... 142
M.4 Fragmenting the codestream between one or more files ... 143
M.5 Combining multiple codestreams ... 145
M.6 Using reader requirements masks to determine how a file can be used ... 149
M.7 Extensions to the JPX file format ... 156
M.8 Differences from the JP2 binary definition ... 157
M.9 Conformance ... 157
M.10 Key to graphical descriptions (informative) ... 161
M.11 Defined boxes ... 161
M.12 Dealing with unknown boxes ... 210
M.13 Using the JPX file format in conjunction with other multi-media standards (informative) ... 210
M.14 Decomposing an XML document into multiple boxes ... 211
Annex N – JPX file format extended metadata definition and syntax ... 213
N.1 Introduction to extended metadata ... 213
N.2 Additional references for extended metadata ... 213
N.3 Scope of metadata definitions ... 213
N.4 Metadata syntax ... 214
N.5 Defined boxes ... 215
N.6 Metadata definitions ... 217
N.7 Fundamental type and element definitions ... 258
N.8 JPX extended metadata document type definition ... 284
N.9 JPX extended metadata XML Schema ... 304
Annex O – Examples and guidelines, extensions ... 347
O.1 Arbitrary decomposition examples ... 347
O.2 Odd Tile Low Pass First (OTLPF) convention ... 368
O.3 Multiple component collection example ... 369
O.4 Background to enhancement of quantization ... 379
O.5 Wrapping JPEG XR (Rec. ITU-T T.832 | ISO/IEC 29199-2) Codestreams by the JPX file format ... 379
O.6 Representing floating point numbers within JPEG 2000 ... 382
O.7 Working with ROI Description boxes ... 383

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Page

Annex P – Block coder extensions 384
P.1 Selective arithmetic coding bypass (lazy mode) 384
P.2 Enhancement of selective arithmetic coding bypass (fast mode) 384
Bibliography 386

List of Tables

Table A.1 – Syntax support for extensions 8
Table A.2 – Capability Rsiz parameter, extended 9
Table A.3 – Start of tile-part parameter values, extended 9
Table A.4 – Number of tile-parts, TNsot, parameter value, extended 9
Table A.5 – Coding style parameter values for the Scod parameter 10
Table A.6 – Coding style parameter values of the SGcod parameter 11
Table A.7 – Coding style parameter values of the SPcod and SPcoc parameters, extended 11
Table A.7bis – Progression order for the SGcod and Ppoc parameters 11
Table A.8 – Multiple component transformation for the SGcod parameters 11
Table A.9 – Decomposition for the SPcod and SPcoc parameters, extended 12
Table A.10 – Transformation for the SPcod and SPcoc parameters, extended 12
Table A.11 – SSO parameters, extended 12
Table A.11bis – SXcod parameter 12
Table A.11ter – Progression order change, tile parameter values 13
Table A.12 – Quantization default values for the Sqcd, Sqcc, Sqpd, and Sqpc parameters, extended 14
Table A.13 – Quantization values (irreversible transformation only), extended 14
Table A.14 – SPqcd, SPqcc, SPqpd, and SPqpc parameters (irreversible transformation only), extended 14
Table A.15 – SPqcd, SPqcc, SPqpd, and SPqpc parameters (irreversible transformation only), extended 15
Table A.16 – Region-of-interest parameter values for the Srgn parameter 15
Table A.17 – Component index parameter value for the Crgn parameter 15
Table A.18 – Region-of-interest values from SPrgn parameter (Srgn = 1 or Srgn = 2) 15
Table A.19 – List of markers and marker segments 16
Table A.20 – Variable DC offset parameter values 17
Table A.21 – Variable DC offset parameter values for the Sdco parameter 17
Table A.22 – Visual masking parameter values 18
Table A.23 – Component parameter value for the Cvms parameter 18
Table A.24 – Visual masking for the Svms parameters 18
Table A.25 – Downsampling factor styles parameter values 19
Table A.26 – Arbitrary decomposition styles parameter values 20
Table A.27 – Arbitrary transformation parameter values 21
Table A.28 – Arbitrary transformation values for the Satk parameter 22
Table A.29 –Component bit depth definition parameter values 23
Table A.30 – Component bit depth definition values for the Ncbd parameter 23
Table A.31 – Component bit depth definition values for the BDcbdi parameter 23
Table A.32 – Multiple component transformation definition parameter values 24
Table A.33 – Multiple component transformation definition values for the Imct parameter 24
Table A.34 – Multiple component collection parameter values 26
Table A.35 – Multiple component collection values for the Xmcci parameter 26

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Page

Table A.36 – Multiple component collection values for the Nmcci parameter 26
Table A.37 – Multiple component collection values for the Mmcci parameter 27
Table A.38 – Multiple component collection values for the Tmcci parameter (array-based) 27
Table A.39 – Multiple component collection values for the Tmcci parameter (wavelet-based) 27
Table A.40 – Multiple component intermediate collection parameter values 28
Table A.41 – Non-linearity transformation parameter values 29
Table A.42 – Non-linearity transformation parameter values for the Cnlt parameter 29
Table A.43 – Decoded image component bit depth parameter values for the BDnlt parameter 29
Table A.44 – Non-linearity transformation parameter values of the Tnlt parameter 30
Table A.45 – Non-linearity transformation parameter values of the STnlt parameter (Tnlt = 1) 30
Table A.46 – Non-linearity transformation parameter values of the STnlt parameter (Tnlt = 2) 30
Table A.47 – Quantization default, precinct parameter values 32
Table A.48 – Quantization precinct component parameter values 33
Table A.49 – Ccap2 syntax and semantics 33
Table A.50 – Precinct length, tile-part header parameter values 34
Table A.51 – Srlt values and semantics 34
Table A.52 – Semantics of Jrlti values when Srlt is in the range [0, 231 – 1] 34
Table D.1 – Parent LUTs for k > 0 in the trellis of Figure D.3 42
Table D.2 – Description of functional blocks in Figure D.4 42
Table D.3 – Description of functional blocks in Figure D.5 43
Table D.4 – Look-up table for A(s) 44
Table D.5 – Look-up table for S(s,qk) 44
Table D.6 – Description of functional blocks for Figure D.6 45
Table D.7 – Sub-band statistics required for LRA 46
Table D.8 – ρ_b parameters for TCQ 46
Table D.9 – Δ_b parameters for TCQ 46
Table D.10 – ρ_b parameters for SQ 47
Table D.11 – Δ_b parameters for SQ 47
Table D.12 – Description of functional blocks in Figure D.7 49
Table F.1 – Updates to contexts for significance propagation and cleanup coding passes 56
Table F.2 – Quantities for sub-band info calculation 60
Table F.3 – S(ab) and J(ab) as a function of dS(i) 64
Table F.4 – S(ab) and J(ab) as a function of dR(i) 64
Table F.5 – Characteristics for sample wavelet decomposition in Figure F.14 65
Table G.1 – Parameters for wavelet transformations 78
Table G.2 – Parameters of the 5-3 reversible wavelet transformation 83
Table G.3 – Parameters of the 13-7 reversible wavelet transformation 83
Table G.4 – Parameters of the 5-3 irreversible wavelet transformation 84
Table G.5 – Parameters of the irreversible 7-5 wavelet transformation 84
Table G.6 – Parameters of the irreversible 9-7 wavelet transformation 84
Table H.1 – Additional parameters for arbitrary wavelet transformations 85
Table H.2 – Minimum left extension length 89
Table H.3 – Minimum right extension length 89
Table H.4 – Parameters of the reversible Haar 2-2 wavelet transformation 95

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Page

Table H.5 – Parameters of the reversible 2-6 wavelet transformation 95
Table H.6 – Parameters of the reversible 2-10 wavelet transformation 95
Table H.7 – Parameters of the irreversible 6-10 wavelet transformation 96
Table H.8 – Parameters of the irreversible 10-18 wavelet transformation 96
Table M.1bis – Brand Values for JPEG XR Codestreams 142
Table M.1 – Example expression 151
Table M.2 – Expanded expression 151
Table M.3 – Example factored expression 151
Table M.4 – Example of a Reader Requirements expressions for Equations M-6 and M-7 153
Table M.5 – Example of a Reader Requirements box for Equations M-6 and M-7 153
Table M.6 – Reader Requirements table for Equations M-10 and M-11 154
Table M.7 – Reader Requirements box data for Equations M-10 and M-11 154
Table M.8 – Reader Requirements box data for Equations M-16 and M-17 155
Table M.9 – Example Reader Requirements box to test 155
Table M.10 – Table intentionally left blank 156
Table M.11 – Items which can be extended through Recommendations | International Standards 156
Table M.12 – Items which can be extended by registration 157
Table M.13 – Boxes defined within this Recommendation | International Standard 163
Table M.14 – Legal values of the SFi field 165
Table M.15 – Format of the contents of the Reader Requirements box 167
Table M.16 – Format of the contents of the Data Reference box 168
Table M.17 – Format of the contents of the Fragment List box 169
Table M.18 – Format of the contents of the Cross-Reference box 170
Table M.19 – Legal C values 171
Table M.20 – BPC and BPCi parameters 172
Table M.21 – Format of the contents of the Image Header box 172
Table M.22 – Legal METH values 176
Table M.23 – Legal APPROX values 177
Table M.24 – Format of the contents of the Colour Specification box 177
Table M.24bis – Nominal maximum sample values 177
Table M.25 – Additional legal EnumCS values 178
Table M.26 – Format of the contents of the METHDAT field for the Enumerated method 179
Table M.27 – Format of the contents of the METHDAT field for the Any ICC method 180
Table M.28 – Format of the contents of the METHDAT field for the Vendor Colour method 180
Table M.28bis – Format of the METHDAT field for the Parameterized method 181
Table M.29 – Standard illuminant values for CIELab 182
Table M.29bis – Default Offset Values and Encoding of Offsets for the CIELab Colourspace 182
Table M.30 – Format of the contents of the EP field for CIELab (EnumCS = 14) 183
Table M.30bis – Default Offset Values and Encoding of Offsets for the CIEJab Colourspace 184
Table M.31 – Format of the contents of the EP field for CIEJab (EnumCS = 19) 184
Table M.32 – Colours indicated by the Asoci field 185
Table M.33 – Otyp field values 186
Table M.34 – Format of the contents of the Opacity box 186
Table M.35 – Format of the contents of the Codestream Registration box 188

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Page

Table M.35bis – Allowed values for the pixel format 189
Table M.35ter – Common floating point formats (informative) 189
Table M.36 – Format of the contents of the Composition box 190
Table M.37 – Format of the contents of the Composition Options box 191
Table M.38 – Ityp field values 192
Table M.39 – Format of the contents of the Instruction Set box 192
Table M.40 – Format of the contents of the INSTi parameter in the Instruction Set box 194
Table M.40bis – Encoding of the ROT field 194
Table M.41 – Format of the contents of the Association box 196
Table M.42 – ANi field values 196
Table M.43 – Format of the contents of the Number List box 196
Table M.44 – Legal Filter types 197
Table M.45 – Format of the contents of the Binary Filter box 198
Table M.46 – Format of the contents of the Graphics Technology Standard Output box 199
Table M.47 – Legal Ri values 199
Table M.48 – Allowed Rtypi values 200
Table M.49 – Format of the contents of the ROI Description box 200
Table M.49bis – Interpreting the 2 bit D field of Rtypi for quadrilateral refinements 201
Table M.50 – Legal Styp values 202
Table M.51 – Legal Ptyp values 203
Table M.52 – Format of the contents of the Digital Signature box 203
Table M.53 – Format of the contents of the Multiple Codestream box 208
Table M.54 – Format of the contents of the Multiple Codestream Info box 209
Table N.1 – Format of the contents of the Image Creation box 215
Table N.2 – Format of the contents of the Content Description box 216
Table N.3 – Format of the contents of the History box 216
Table N.4 – Format of the contents of the Intellectual Property Rights box 217
Table N.5 – Format of the contents of the Image Identifier box 217
Table N.6 – Image Source values 219
Table N.7 – Scene type values 219
Table N.8 – Sensor technology values 222
Table N.9 – Exposure program values 228
Table N.10 – Metering mode values 228
Table N.11 – Scene illuminant values 229
Table N.12 – Back light values 229
Table N.13 – Auto focus values 230
Table N.14 – Name description values 252
Table N.15 – Date description values 254
Table N.16 – Additional name description values 258
Table N.17 – Address component type values 264
Table N.18 – Address type values 264
Table N.19 – Phone number type values 265
Table N.20 – Name component type values 268
Table N.21 – Latitude reference values 276

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Page

Table N.22 – Latitude values ... 276
Table N.23 – Longitude reference values ... 276
Table N.24 – Longitude values ... 277
Table N.25 – GPS Status values ... 277
Table N.26 – GPS Measure mode values ... 277
Table N.27 – GPS Speed reference unit values ... 277
Table N.28 – Direction reference values ... 278
Table N.29 – GPS Destination distance reference unit values ... 278
Table O.1 – Sub-band labels for Figure O.15. ... 352
Table O.2 – Mapping between ROT and SPATIAL_XFRM_SUBORDINATE ... 381
Table P.1 – Selective arithmetic coding bypass (default); (the same as Table D.9 of ITU-T T.800 | ISO/IEC 15444-1) ... 384
Table P.2 – Example of two bit planes (fast mode) ... 385

List of Figures

Figure 6-1 – Decoder block diagram ... 7
Figure A.1bis – Coding style default syntax ... 10
Figure A.1 – Variable DC offset syntax ... 16
Figure A.2 – Visual masking syntax ... 17
Figure A.3 – Downsampling factor styles syntax ... 18
Figure A.4 – Arbitrary decomposition styles syntax ... 19
Figure A.5 – Arbitrary transformation default syntax ... 20
Figure A.6 – Component bit depth definition syntax ... 22
Figure A.7 – Multiple component transformation definition syntax ... 23
Figure A.8 – Multiple component collection syntax ... 25
Figure A.9 – Multiple component transformation ordering syntax ... 28
Figure A.10 – Non-linearity point transformation syntax ... 28
Figure A.11 – Quantization default, precinct syntax ... 31
Figure A.12 – Quantization precinct component syntax ... 32
Figure A.13 – Precinct length, tile-part header syntax ... 34
Figure B.1 – Placement of the DC offset with multiple component transformation ... 35
Figure B.2 – Placement of the DC offset without multiple component transformation ... 35
Figure D.1 – Scalar quantizers used for TCQ ... 39
Figure D.2 – Union quantizers for TCQ ... 40
Figure D.3 – Trellis showing node indices ... 40
Figure D.4 – Forward TCQ processing ... 41
Figure D.5 – Full inverse processing for TCQ indices ... 43
Figure D.6 – Approximate dequantization of TCQ indices ... 45
Figure D.7 – Lagrangian rate allocation ... 48
Figure E.1 – System diagram for point-wise extended masking extension ... 50
Figure E.2 – Non-uniform quantization for self-contrast masking ... 51
Figure E.3 – Causal neighbourhood ... 52
Figure F.1 – Possible splits of sub-bands ... 55
Figure F.2 – Parameters for the GET_HOR_DEPTH and GET_VER_DEPTH procedures ... 56
Figure F.3 – The GET_HOR_DEPTH and GET_VER_DEPTH procedures ... 57

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Page

Figure F.4 – Parameters for the SET_SUBBAND_INFO procedure 58
Figure F.5 – The SET_SUBBAND_INFO procedure 58
Figure F.6 – Parameters for the RECUR_INFO procedure 59
Figure F.7 – The RECUR_INFO procedure 59
Figure F.8 – Parameters for the INIT_□ procedure 60
Figure F.9 – Procedure for setting maximum number of sub-levels, □(lev) 61
Figure F.10 – Parameters for the INIT_S_R procedure 61
Figure F.11 – Upper level procedure for defining S(ab) and R(lev) 62
Figure F.12 – Parameters for the LEV_S procedure 63
Figure F.13 – Procedure for defining S(ab) 63
Figure F.14 – Sample wavelet decomposition with labelled sub-bands 64
Figure F.15 – Parameters for the MOD_IDWT procedure 65
Figure F.16 – The MOD_IDWT procedure 66
Figure F.17 – Parameters for the MOD_2D_SR procedure 66
Figure F.18 – The MOD_2D_SR procedure 67
Figure F.19 – Parameters for the MOD_2D_INTERLEAVE procedure 67
Figure F.20 – The MOD_2D_INTERLEAVE procedure 68
Figure F.21 – Parameters for the 2D_HV_INTERLEAVE procedure 68
Figure F.22 – The 2D_HV_INTERLEAVE procedure 69
Figure F.23 – Parameters for the 2D_H_INTERLEAVE procedure 70
Figure F.24 – The 2D_H_INTERLEAVE procedure 70
Figure F.25 – Parameters for the 2D_V_INTERLEAVE procedure 71
Figure F.26 – The 2D_V_INTERLEAVE procedure 71
Figure F.27 – Parameters for the MOD_FDWT procedure 71
Figure F.28 – The MOD_FDWT procedure 72
Figure F.29 – Parameters for the MOD_2D_SD procedure 72
Figure F.30 – The MOD_2D_SD procedure 73
Figure F.31 – Parameters for the MOD_2D_DEINTERLEAVE procedure 73
Figure F.32 – The MOD_2D_DEINTERLEAVE procedure 74
Figure F.33 – Parameters for the 2D_HV_DEINTERLEAVE procedure 74
Figure F.34 – The 2D_HV_DEINTERLEAVE procedure 75
Figure F.35 – Parameters for the 2D_H_DEINTERLEAVE procedure 76
Figure F.36 – The 2D_H_DEINTERLEAVE procedure 76
Figure F.37 – Parameters for the 2D_V_DEINTERLEAVE procedure 76
Figure F.38 – The 2D_V_DEINTERLEAVE procedure 77
Figure G.1 – Parameters of the 1D_SR_WS procedures 79
Figure G.2 – The 1D_SR_WS procedure 79
Figure G.3 – Parameters of the 1D_FILTR_WS procedure 80
Figure G.4 – Parameters of the 1D_FILTR_WS procedure 80
Figure G.5 – Parameters of the 1D_SD_WS procedure 81
Figure G.6 – The 1D_SD_WS procedure 81
Figure G.7 – Parameters of the 1D_FILTD_WS procedure 82
Figure G.8 – Parameters of the 1D_FILTD_WS procedure 82
Figure H.1 – Parameters of the extended 1D_SR_ARB procedure 86

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Page

Figure H.2 – Extended procedure 1D_SR_ARB 87
Figure H.3 – Parameters of the 1D_SCALER procedure 87
Figure H.4 – Parameters of the 1D_STEPR procedure 88
Figure H.5 – Procedure 1D_STEPR 88
Figure H.6 – Parameters of the 1D_EXT_WS procedure 89
Figure H.7 – Parameters of the 1D_EXT_CON procedure 89
Figure H.8 – Parameters of the 1D_UPDATER_REV procedure 90
Figure H.9 – Parameters of the 1D_UPDATER_IRR procedure 90
Figure H.10 – Parameters of the extended 1D_SD_ARB procedure 91
Figure H.11 – Extended procedure 1D_SD_ARB 92
Figure H.12 – Parameters of the 1D_STEPD procedure 92
Figure H.13 – Procedure 1D_STEPD 93
Figure H.14 – Parameters of the 1D_UPDATED_REV procedure 93
Figure H.15 – Parameters of the 1D_UPDATED_IRR procedure 94
Figure H.16 – Parameters of the 1D_SCALED procedure 94
Figure H.17 – Lifting implementation for forward half-sample symmetric wavelet transformations 97
Figure I.1 – Precincts of one reduced resolution (modified Figure B.8 of Rec. ITU-T T.800 | ISO/IEC 15444-1) 99
Figure I.2 – Codeblocks and precincts in sub-band b from four different tiles 100
Figure I.3 – The IDWT_SSO Procedure 103
Figure I.4 – The 2D_SR_SSO procedure 104
Figure I.5 – Parameters of the 1D_FILTR_SSO procedure 104
Figure I.6 – The FDWT_SSO procedure 106
Figure I.7 – The 2D_SD_SSO procedure 107
Figure I.8 – Parameters of the 1D_FILTD_SSO procedure 108
Figure I.9 – Position of SSO blocks 109
Figure I.10 – Tiling of the reference grid diagram 111
Figure J.1 – Inverse multiple component transformation processing 113
Figure J.2 – Procedure MCO_TRANSFORM 114
Figure J.3 – A single multiple component collection transformation (MCC_TRANS) stage 115
Figure J.4 – Procedure MCC_TRANS 116
Figure J.5 – A single component collection transformation (CC_TRANS) stage 117
Figure J.6 – Procedure CC_TRANS 117
Figure J.7 – SERM implementation of reversible decorrelation transformation 121
Figure J.8 – SERM implementation of forward reversible decorrelation transformation 122
Figure J.9 – Irreversible dependency transformation 123
Figure J.10 – Forward irreversible dependency transformation 124
Figure J.11 – Reversible dependency transformation 125
Figure J.12 – Forward reversible dependency transformation 126
Figure K.1 – Non-linear transformation application during decoding 128
Figure K.2 – Example gamma-type forward non-linear transformation 130
Figure L.1 – Rectangular mask on the reference grid 135
Figure L.2 – Elliptic mask on the reference grid 135
Figure M.1 – Example fragmented JPX file where all fragments are in the same file 144
Figure M.2 – Example fragmented JPX file where some fragments are stored in other files or resources 145

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Page

Figure M.3 – Example combination of two codestreams into a single compositing layer 146
Figure M.4 – Example of the box description figures 161
Figure M.5 – Example of the superbox description figures 161
Figure M.6 – Boxes defined within a JPX file 162
Figure M.7 – Organization of the contents of the Reader Requirements box 165
Figure M.8 – Organization of the contents of a Data Reference box 168
Figure M.9 – Organization of the contents of a Fragment Table box 168
Figure M.10 – Organization of the contents of a Fragment List box 169
Figure M.11 – Organization of the contents of a Fragment table box 170
Figure M.12 – Organization of the contents of an Image Header box 171
Figure M.13 – Organization of the contents of a Codestream Header box 173
Figure M.14 – Organization of the contents of a Compositing Layer Header box 174
Figure M.15 – Organization of the contents of a Colour Group box 175
Figure M.16 – Organization of the contents of a Colour Specification box 176
Figure M.17 – Organization of the contents of the METHDAT field for the Enumerated method 178
Figure M.18 – Organization of the contents of the METHDAT field for the Any ICC method 180
Figure M.19 – Organization of the contents of the METHDAT field for the Vendor Colour method 180
Figure M.19bis – Organization of the METHDAT field for the Parameterized method 181
Figure M.20 – Organization of the contents of the EP field for the CIELab (EnumCS = 14) 181
Figure M.21 – Organization of the contents of the EP field for the CIEJab (EnumCS = 19) 183
Figure M.22 – Organization of the contents of an Opacity box 185
Figure M.23 – Organization of the contents of a Codestream Registration box 187
Figure M.23bis – Layout of the Pixel Format Box 188
Figure M.24 – Organization of the contents of a Composition box 190
Figure M.25 – Organization of the contents of a Composition Options box 191
Figure M.26 – Organization of the contents of an Instruction Set box 191
Figure M.27 – Organization of the contents of an INST field within an Instruction Set box 192
Figure M.28 – Example of ROI specific metadata associated with one or more images 195
Figure M.29 – Example of Multiple XML documents associated with one or more images 195
Figure M.30 – Example of a Labelled XML document 195
Figure M.31 – Example of a labelled image 195
Figure M.32 – Organization of the contents of an Association box 196
Figure M.33 – Organization of the contents of a Number List box 196
Figure M.34 – Organization of the contents of a Label box 197
Figure M.35 – Organization of the contents of a Binary Filter box 197
Figure M.36 – Organization of the contents of the Desired Reproductions box 198
Figure M.37 – Organization of the contents of the Graphics Technology Standard Output box 198
Figure M.38 – Organization of the contents of the ROI Description box 199
Figure M.39 – Organization of the contents of a Digital Signature box 202
Figure M.40 – Organization of the contents of a MPEG-7 Binary box 204
Figure M.41 – Organization of the contents of a Compositing Layer Extensions box 205
Figure M.42 – Organization of the Compositing Layer Extensions Info box 207
Figure M.43 – Organization of the contents of a Multiple Codestream box 208
Figure M.44 – Organization of the contents of a Multiple Codestream Offsets box 208

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Page

Figure M.45 – Organization of the contents of a Grouping box 209
Figure M.46 – Organization of the contents of a decomposed XML box 210
Figure M.47 – Organization of the contents of a XML header box 210
Figure M.48 – Example Box layout for a Decomposed XML box 212
Figure N.1 – Organization of the contents of Image Creation box 215
Figure N.2 – Organization of the contents of Content Description box 216
Figure N.3 – Organization of the contents of History box 216
Figure N.4 – Organization of the contents of Intellectual Property Rights box 216
Figure N.5 – Organization of the contents of Image Identifier box 217
Figure N.6 – Schema of the Image Creation metadata 217
Figure N.7 – Schema of the General Creation Information metadata 218
Figure N.8 – Schema of the Camera Capture metadata 220
Figure N.9 – Schema of the Device Characterization metadata 221
Figure N.10 – Schema of the Spatial Frequency Response metadata 223
Figure N.11 – Schema of the Colour Filter Array Pattern metadata 224
Figure N.12 – Schema of the Opto-electronic Conversion Function metadata 225
Figure N.13 – Schema of the Camera Capture Settings metadata 227
Figure N.14 – Schema of the Scanner Capture metadata 230
Figure N.15 – Schema of the Scanner Settings metadata 231
Figure N.16 – Schema of the Software Creation metadata 231
Figure N.17 – Schema of the Captured Item metadata 232
Figure N.18 – Schema of the Reflection Print metadata 233
Figure N.19 – Schema of the Film metadata 234
Figure N.20 – Schema of the Content Description metadata 235
Figure N.21 – Schema of the Person Description metadata 236
Figure N.22 – Schema of the Thing Description metadata 237
Figure N.23 – Schema of the Organization Description metadata 238
Figure N.24 – Schema of the Event Description metadata 239
Figure N.25 – Schema of the Participant metadata 240
Figure N.26 – Schema of the Event Relationship metadata 241
Figure N.27 – Schema of the Audio metadata 241
Figure N.28 – Schema of the Property metadata 242
Figure N.29 – Schema of the Dictionary Definition metadata 243
Figure N.30 – Schema of the History metadata 243
Figure N.31 – Schema of the Processing Summary metadata 244
Figure N.32 – Schema of the Image Processing Hints metadata 246
Figure N.33 – Schema of the Previous metadata 247
Figure N.34 – Schema of the Image Reference metadata 248
Figure N.35 – Schema of the Intellectual Property Rights metadata 249
Figure N.36 – Schema of the IPR Names metadata 252
Figure N.37 – Schema of the IPR Description metadata 252
Figure N.38 – Schema of the IPR Dates metadata 253
Figure N.39 – Schema of the IPR Exploitation metadata 254
Figure N.40 – Schema of the IPR Management Systems metadata 255

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Page

Figure N.41 – Schema of the IPR Identification metadata 256
Figure N.42 – Schema of the IPR Identifier metadata 256
Figure N.43 – Schema of the License Plate metadata 257
Figure N.44 – Schema of the IPR Contact Point metadata 257
Figure N.45 – Schema of the Image Identifier metadata 258
Figure N.46 – Schema of the non-negative double type 259
Figure N.47 – Schema of the rational type 259
Figure N.48 – Schema of the string including language attribute type 259
Figure N.49 – Schema of the degree type 260
Figure N.50 – Schema of the half degree type 260
Figure N.51 – Schema of the double size type 260
Figure N.52 – Schema of the integer size type 261
Figure N.53 – Schema of the DateTime type 262
Figure N.54 – Schema of the Address type 263
Figure N.55 – Schema of the Phone number type 264
Figure N.56 – Schema of the Email address type 265
Figure N.57 – Schema of the Web address type 266
Figure N.58 – Schema of the Person type 268
Figure N.59 – Schema of the Organization type 269
Figure N.60 – Schema of the Location type 270
Figure N.61 – Schema of the Coordinate location element 271
Figure N.62 – Schema of the Raw GPS Information element 273
Figure N.63 – Schema of the Raw GPS Information element (continued) 275
Figure N.64 – Schema of the Raw GPS Information element (concluded) 276
Figure N.65 – Schema of the Direction type 279
Figure N.66 – Schema of the Position type 280
Figure N.67 – Schema of the Point type 280
Figure N.68 – Schema of the Rect type 281
Figure N.69 – Schema of the Region type 282
Figure N.70 – Schema of the Product Details type 283
Figure N.71 – Schema of the Language attribute 283
Figure N.72 – Schema of the Timestamp attribute 283
Figure N.73 – Schema of the Comment element 284
Figure O.1 – Sample wavelet decomposition: $N_L = 3$; $I_R = 3$; $d_R() = 123$; $I_\theta = 2$, $d_\theta() = 31$; $I_S = 9$, $d_S() = 320300203$ 347
Figure O.2 – Sample wavelet decomposition: $N_L = 3$; $I_R = 3$; $d_R() = \underline{1}23$; $I_\theta = 2$, $d_\theta() = 31$; $I_S = 9$, $d_S() = 320300203$ 347
Figure O.3 – Sample wavelet decomposition: $N_L = 3$; $I_R = 3$; $d_R() = 1\underline{2}3$; $I_\theta = 2$, $d_\theta() = 31$; $I_S = 9$, $d_S() = 320300203$ 348
Figure O.4 – Sample wavelet decomposition: $N_L = 3$; $I_R = 3$; $d_R() = 12\underline{3}$; $I_\theta = 2$, $d_\theta() = 31$; $I_S = 9$, $d_S() = 320300203$ 348
Figure O.5 – Sample wavelet decomposition: $N_L = 3$; $I_R = 3$; $d_R() = 123$; $I_\theta = 2$, $d_\theta() = \underline{3}1$; $I_S = 9$, $d_S() = \underline{3}20300203$ 348
Figure O.6 – Sample wavelet decomposition: $N_L = 3$; $I_R = 3$; $d_R() = 123$; $I_\theta = 2$, $d_\theta() = \underline{3}1$; $I_S = 9$, $d_S() = 3\underline{2}0300203$ 348
Figure O.7 – Sample wavelet decomposition: $N_L = 3$; $I_R = 3$; $d_R() = 123$; $I_\theta = 2$, $d_\theta() = \underline{3}1$; $I_S = 9$, $d_S() = 32\underline{0}300203$ 349
Figure O.8 – Sample wavelet decomposition: $N_L = 3$; $I_R = 3$; $d_R() = 123$; $I_\theta = 2$, $d_\theta() = \underline{3}1$; $I_S = 9$, $d_S() = 320\underline{3}00203$ 349
Figure O.9 – Sample wavelet decomposition: $N_L = 3$; $I_R = 3$; $d_R() = 123$; $I_\theta = 2$, $d_\theta() = \underline{3}1$; $I_S = 9$, $d_S() = 3203\underline{0}0203$ 349

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Page

Figure O.10 – Sample wavelet decomposition: $N_L = 3$; $I_R = 3$; $d_R() = 123$; $I_\theta = 2$, $d_\theta() = \underline{3}1$; $I_S = 9$, $d_S() = 320300\underline{2}03$ 349

Figure O.11 – Sample wavelet decomposition: $N_L = 3$; $I_R = 3$; $d_R() = 123$; $I_\theta = 2$, $d_\theta() = \underline{3}1$; $I_S = 9$, $d_S() = 320300\underline{2}03$ 350

Figure O.12 – Sample wavelet decomposition: $N_L = 3$; $I_R = 3$; $d_R() = 123$; $I_\theta = 2$, $d_\theta() = \underline{3}1$; $I_S = 9$, $d_S() = 320300\underline{2}03$ 350

Figure O.13 – Sample wavelet decomposition: $N_L = 3$; $I_R = 3$; $d_R() = 123$; $I_\theta = 2$, $d_\theta() = \underline{3}1$; $I_S = 9$, $d_S() = 320300\underline{2}0\underline{3}$ 350

Figure O.14 – Sample wavelet decomposition: $N_L = 3$; $I_R = 3$; $d_R() = 123$; $I_\theta = 2$, $d_\theta() = 3\underline{1}$; $I_S = 9$, $d_S() = 320300203$ 351

Figure O.15 – FBI decomposition: $N_L = 5$; $I_R = 0$; $d_R() = 0$ (since $I_R = 0$, I_R and $d_R()$ get reset in Figure F.11 to $I_R = 5$ and $d_R() = 11111$); $I_\theta = 4$, $d_\theta() = 2321$; $I_S = 17$, $d_S() = 11101111111111111$ 351

Figure O.16 – FBI decomposition: $N_L = 5$; $I_R = 5$ and $d_R() = \underline{1}1111$; $I_\theta = 4$, $d_\theta() = 2321$; $I_S = 17$, $d_S() = 11101111111111111$ 353

Figure O.17 – FBI decomposition: $N_L = 5$; $I_R = 5$ and $d_R() = 1\underline{1}111$; $I_\theta = 4$, $d_\theta() = 2321$; $I_S = 17$, $d_S() = 11101111111111111$ 354

Figure O.18 – FBI decomposition: $N_L = 5$; $I_R = 5$ and $d_R() = 11\underline{111}$; $I_\theta = 4$, $d_\theta() = 2321$; $I_S = 17$, $d_S() = 11101111111111111$ 355

Figure O.19 – FBI decomposition: $N_L = 5$; $I_R = 5$ and $d_R() = 11111$; $I_\theta = 4$, $d_\theta() = \underline{2}321$; $I_S = 17$, $d_S() = \underline{1}1101111111111111$ 356

Figure O.20 – FBI decomposition: $N_L = 5$; $I_R = 5$ and $d_R() = 11111$; $I_\theta = 4$, $d_\theta() = \underline{2}321$; $I_S = 17$, $d_S() = 1\underline{11}01111111111111$ 357

Figure O.21 – FBI decomposition: $N_L = 5$; $I_R = 5$ and $d_R() = 11111$; $I_\theta = 4$, $d_\theta() = 2\underline{3}21$; $I_S = 17$, $d_S() = 111\underline{0}1111111111111$ 358

Figure O.22 – FBI decomposition: $N_L = 5$; $I_R = 5$ and $d_R() = 11111$; $I_\theta = 4$, $d_\theta() = 2\underline{3}21$; $I_S = 17$, $d_S() = 1110\underline{1}111111111111$ 359

Figure O.23 – FBI decomposition: $N_L = 5$; $I_R = 5$ and $d_R() = 11111$; $I_\theta = 4$, $d_\theta() = 2\underline{3}21$; $I_S = 17$, $d_S() = 11101\underline{1}11111111111$ 360

Figure O.24 – FBI decomposition: $N_L = 5$; $I_R = 5$ and $d_R() = 11111$; $I_\theta = 4$, $d_\theta() = 2\underline{3}21$; $I_S = 17$, $d_S() = 111011\underline{1}1111111111$ 361

Figure O.25 – FBI decomposition: $N_L = 5$; $I_R = 5$ and $d_R() = 11111$; $I_\theta = 4$, $d_\theta() = 2\underline{3}21$; $I_S = 17$, $d_S() = 1110111\underline{1}111111111$ 362

Figure O.26 – FBI decomposition: $N_L = 5$; $I_R = 5$ and $d_R() = 11111$; $I_\theta = 4$, $d_\theta() = 2\underline{3}21$; $I_S = 17$, $d_S() = 11101111\underline{1}11111111$ 363

Figure O.27 – FBI decomposition: $N_L = 5$; $I_R = 5$ and $d_R() = 11111$; $I_\theta = 4$, $d_\theta() = 2\underline{3}21$; $I_S = 17$, $d_S() = 11101111\underline{11111}111$ 364

Figure O.28 – FBI decomposition: $N_L = 5$; $I_R = 5$ and $d_R() = 11111$; $I_\theta = 4$, $d_\theta() = 23\underline{2}1$; $I_S = 17$, $d_S() = 1110111111111\underline{1}11$ 365

Figure O.29 – FBI decomposition: $N_L = 5$; $I_R = 5$ and $d_R() = 11111$; $I_\theta = 4$, $d_\theta() = 23\underline{2}1$; $I_S = 17$, $d_S() = 1110111111111\underline{11}$ 366

Figure O.30 – FBI decomposition: $N_L = 5$; $I_R = 5$ and $d_R() = 11111$; $I_\theta = 4$, $d_\theta() = 232\underline{1}$; $I_S = 17$, $d_S() = 11101111111111111$ 367

Figure O.31 – SPACL decomposition: $N_L = 4$; $I_\theta = 2$, $d_\theta() = 21$; $I_R = 0$, $I_S = 0$ 368

Figure O.32 – Component collection example 370

Figure O.33 – Original image components 370

Figure O.34 – Encoder multiple component transformation decisions 371

Figure O.35 – Decorrelation transformation array (MCC0 component collection 0 parameters) 372

Figure O.36 – Dependency transformation (MCC0 component collection 1 parameters) 372

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Page

Figure O.37 – Passing through intermediate components (MCC0 component collection 2 parameters) 372
Figure O.38 – Component collections in MCC0, transformation processing stage 0 373
Figure O.39 – Decorrelation transformation array (MCC1 component collection 0 parameters) 373
Figure O.40 – MCC1 component collection 1 (7 components passed through) 374
Figure O.41 – Component collections in MCC1, transformation processing stage 1 374
Figure O.42 – MCO marker segment for inverse multiple component transformation 374

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Introduction

This Recommendation | International Standard defines a set of lossless (bit-preserving) and lossy compression methods for coding continuous-tone, bi-level, grey-scale, colour digital still images, or multi-component images.

This Recommendation | International Standard:

- specifies extended decoding processes for converting compressed image data to reconstructed image data;
- specifies an extended codestream syntax containing information for interpreting the compressed image data;
- specifies an extended file format;
- specifies a container to store image metadata;
- defines a standard set of image metadata;
- provides guidance on extended encoding processes for converting source image data to compressed image data;
- provides guidance on how to implement these processes in practice.

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INTERNATIONAL STANDARD
ITU-T RECOMMENDATION

Information technology – JPEG 2000 image coding system: Extensions

1 Scope

This Recommendation | International Standard defines a set of lossless (bit-preserving) and lossy compression methods for coding continuous-tone, bi-level, grey-scale, colour digital still images, or multi-component images.

This Recommendation | International Standard:

- specifies extended decoding processes for converting compressed image data to reconstructed image data;
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- specifies an extended file format;
- specifies a container to store image metadata;
- defines a standard set of image metadata;
- provides guidance on extended encoding processes for converting source image data to compressed image data;
- provides guidance on how to implement these processes in practice.

2 Normative references

The following Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this Recommendation | International Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies. At the time of publication, the editions indicated were valid. All Recommendations and Standards are subject to revision, and parties to agreements based on this Recommendation | International Standard are encouraged to investigate the possibility of applying the most recent edition of the Recommendations and Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The Telecommunication Standardization Bureau of the ITU maintains a list of currently valid ITU-T Recommendations.

2.1 Identical Recommendations | International Standards

- Recommendation ITU-T T.81 (1992) | ISO/IEC 10918-1:1994, *Information technology – Digital compression and coding of continuous-tone still images: Requirements and guidelines*.
- Recommendation ITU-T T.82 (1993) | ISO/IEC 11544:1993, *Information technology – Coded representation of picture and audio information – Progressive bi-level image compression*.
- Recommendation ITU-T T.84 (1996) | ISO/IEC 10918-3:1997, *Information technology – Digital compression and coding of continuous-tone still images: Extensions.*, including Rec. ITU-T T.84 (1996)/Amd.1 (1999) | ISO/IEC 10918-3:1997/Amd.1:1999, *Information technology – Digital compression and coding of continuous-tone still images: Extensions – Amendment 1: Provisions to allow registration of new compression types and versions in the SPIFF header*.
- Recommendation ITU-T T.800 (2019) | ISO/IEC 15444-1:2019, *Information technology – JPEG 2000 image coding system: Core coding system*.
- Recommendation ITU-T T.805 | ISO/IEC 15444-6, *Information technology – JPEG 2000 image coding system: Compound image file format*.
- Recommendation ITU-T T.814 (2019) | ISO/IEC 15444-15:2019, *Information technology – JPEG 2000 image coding system: High-throughput JPEG 2000*.
- Recommendation ITU-T T.832 (2019) | ISO/IEC 29199-2:2020, *Information technology – JPEG XR image coding system – Image coding specification*.

2.2 Paired Recommendations | International Standards

- Recommendation ITU-T H.273 (in force), *Coding-independent code points for video signal type identification*.

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ISO/IEC 23091-2: (in force), *Information technology – Coding-independent code points: Part 2: Video*.

2.3 Additional references

- Recommendation ITU-T T.42 (2003), *Continuous-tone colour representation method for facsimile*.
- Recommendation ITU-T T.45 (2000), *Run-length Colour Encoding*.
- IEC 61966-2-1 (in force), *Multimedia systems and equipment – Colour measurement and management: Part 2-1: Colour management – Default RGB colour space – sRGB.*
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- IETF RFC 1321 (1992), *The MD5 Message-Digest Algorithm.*
- IETF RFC 2630 (1999), *Cryptographic Message Syntax*.
- ISO 3166-1:2020, *Codes for the representation of names of countries and their subdivisions – Part 1: Country codes*.
- ISO 3166-2:2020, *Codes for the representation of names of countries and their subdivisions – Part 2: Country subdivision code*.
- ISO 10126-2:1991, *Banking – Procedures for message encipherment (wholesale) – Part 2: DEA algorithm*.
- ISO 22028-2:2013, *Photography and graphic technology — Extended colour encodings for digital image storage, manipulation and interchange — Part 2: Reference output medium metric RGB colour image encoding (ROMM RGB).*
- ISO 15076-1:2010, *Image technology colour management – Architecture, profile format and data structure – Part 1: Based on ICC.1:2010*.
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  http://www.w3.org/TR/2004/REC-xmlschema-1-20041028/
- W3C Recommendation. *XML Schema Part 2: Datatypes*, second edition (28 October 2004).
  http://www.w3.org/TR/2004/REC-xmlschema-2-20041028/

3 Definitions

For the purposes of this Recommendation | International Standard, the following definitions apply. The definitions defined in Rec. ITU-T T.800 | ISO/IEC 15444-1, clause 3 also apply to this Recommendation | International Standard, except for the terms decomposition level, sub-band and resolution, which are redefined in this clause.

3.1 **attribute**: XML construct that is a name-value pair extending or qualifying the meaning of an element.

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