Metadata reference tables

Standard Exif Tags

These are the Exif tags as defined in the Exif 2.3 standard.

IFD1 tags are not listed seperately. All IFD0 tags may also be present in IFD1, according to the standard. The second part of the Exiv2 key of an IFD1 tag is `Thumbnail` (instead of `Image`), the other two parts of the key are the same as for IFD0 tags.

Tag (hex)	Tag (dec)	IFD	Key		Type	Tag description
0x000b	11	Image	Exif.Image.ProcessingSoftware	✓	Ascii	The name and version of the software used to post-process the picture.
0x00fe	254	Image	Exif.Image.NewSubfileType	✗	Long	A general indication of the kind of data contained in this subfile.
0x00ff	255	Image	Exif.Image.SubfileType	✗	Short	A general indication of the kind of data contained in this subfile. This field is deprecated. The

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					NewSubfileType field should be used instead.
0x0100	256	Image	Exif.Image.ImageWidth	Long	The number of columns of image data, equal to the number of pixels per row. In JPEG compressed data a JPEG marker is used instead of this tag.
0x0101	257	Image	Exif.Image.ImageLength	Long	The number of rows of image data. In JPEG compressed data a JPEG marker is used instead of this tag.
0x0102	258	Image	Exif.Image.BitsPerSample	Short	The number of bits per image component. In this standard each component of the image is 8 bits, so the value for this tag is 8. See also <SamplesPerPixel>. In JPEG compressed data a JPEG marker is used instead of this tag.
0x0103	259	Image	Exif.Image.Compression	Short	The compression scheme used for the image data. When a primary image is JPEG compressed, this designation is not necessary and is omitted.

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					When thumbnails use JPEG compression, this tag value is set to 6.
0x0106	262	Image	Exif.Image.PhotometricInterpretation	Short	The pixel composition. In JPEG compressed data a JPEG marker is used instead of this tag.
0x0107	263	Image	Exif.Image.Thresholding	Short	For black and white TIFF files that represent shades of gray, the technique used to convert from gray to black and white pixels.
0x0108	264	Image	Exif.Image.CellWidth	Short	The width of the dithering or halftoning matrix used to create a dithered or halftoned bilevel file.
0x0109	265	Image	Exif.Image.CellLength	Short	The length of the dithering or halftoning matrix used to create a dithered or halftoned bilevel file.
0x010a	266	Image	Exif.Image.FillOrder	Short	The logical order of bits within a byte
0x010d	269	Image	Exif.Image.DocumentName	Ascii	The name of the document from which this image was

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					scanned
0x010e	270	Image	Exif.Image.ImageDescription	Ascii	A character string giving the title of the image. It may be a comment such as "1988 company picnic" or the like. Two-bytes character codes cannot be used. When a 2-bytes code is necessary, the Exif Private tag <UserComment> is to be used.
0x010f	271	Image	Exif.Image.Make	Ascii	The manufacturer of the recording equipment. This is the manufacturer of the DSC, scanner, video digitizer or other equipment that generated the image. When the field is left blank, it is treated as unknown.
0x0110	272	Image	Exif.Image.Model	Ascii	The model name or model number of the equipment. This is the model name or number of the DSC, scanner, video digitizer or other equipment that generated the image. When the field is left blank, it is treated as unknown.
0x0111	273	Image	Exif.Image.StripOffsets	Long	For each strip, the byte offset

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					of that strip. It is recommended that this be selected so the number of strip bytes does not exceed 64 Kbytes. With JPEG compressed data this designation is not needed and is omitted. See also <RowsPerStrip> and <StripByteCounts>.
0x0112	274	Image	Exif.Image.Orientation	Short	The image orientation viewed in terms of rows and columns.
0x0115	277	Image	Exif.Image.SamplesPerPixel	Short	The number of components per pixel. Since this standard applies to RGB and YCbCr images, the value set for this tag is 3. In JPEG compressed data a JPEG marker is used instead of this tag.
0x0116	278	Image	Exif.Image.RowsPerStrip	Long	The number of rows per strip. This is the number of rows in the image of one strip when an image is divided into strips. With JPEG compressed data this designation is not needed and is omitted. See also <StripOffsets> and <StripByteCounts>.

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0x0117	279	Image	Exif.Image.StripByteCounts	Long	The total number of bytes in each strip. With JPEG compressed data this designation is not needed and is omitted.
0x011a	282	Image	Exif.Image.XResolution	Rational	The number of pixels per <ResolutionUnit> in the <ImageWidth> direction. When the image resolution is unknown, 72 [dpi] is designated.
0x011b	283	Image	Exif.Image.YResolution	Rational	The number of pixels per <ResolutionUnit> in the <ImageLength> direction. The same value as <XResolution> is designated.
0x011c	284	Image	Exif.Image.PlanarConfiguration	Short	Indicates whether pixel components are recorded in a chunky or planar format. In JPEG compressed files a JPEG marker is used instead of this tag. If this field does not exist, the TIFF default of 1 (chunky) is assumed.
0x0122	290	Image	Exif.Image.GrayResponseUnit	Short	The precision of the information

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					contained in the GrayResponseCurve.
0x0123	291	Image	Exif.Image.GrayResponseCurve	Short	For grayscale data, the optical density of each possible pixel value.
0x0124	292	Image	Exif.Image.T4Options	Long	T.4-encoding options.
0x0125	293	Image	Exif.Image.T6Options	Long	T.6-encoding options.
0x0128	296	Image	Exif.Image.ResolutionUnit	Short	The unit for measuring <XResolution> and <YResolution>. The same unit is used for both <XResolution> and <YResolution>. If the image resolution is unknown, 2 (inches) is designated.
0x0129	297	Image	Exif.Image.PageNumber	Short	The page number of the page from which this image was scanned.
0x012d	301	Image	Exif.Image.TransferFunction	Short	A transfer function for the image, described in tabular style. Normally this tag is not necessary, since color space is specified in the color space information tag (<ColorSpace>).

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0x0131	305	Image	Exif.Image.Software	Ascii	This tag records the name and version of the software or firmware of the camera or image input device used to generate the image. The detailed format is not specified, but it is recommended that the example shown below be followed. When the field is left blank, it is treated as unknown.
0x0132	306	Image	Exif.Image.DateTime	Ascii	The date and time of image creation. In Exif standard, it is the date and time the file was changed.
0x013b	315	Image	Exif.Image.Artist	Ascii	This tag records the name of the camera owner, photographer or image creator. The detailed format is not specified, but it is recommended that the information be written as in the example below for ease of Interoperability. When the field is left blank, it is treated as unknown. Ex.) "Camera owner, John Smith; Photographer, Michael Brown; Image creator, Ken James"

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0x013c	316	Image	Exif.Image.HostComputer	Ascii	This tag records information about the host computer used to generate the image.
0x013d	317	Image	Exif.Image.Predictor	Short	A predictor is a mathematical operator that is applied to the image data before an encoding scheme is applied.
0x013e	318	Image	Exif.Image.WhitePoint	Rational	The chromaticity of the white point of the image. Normally this tag is not necessary, since color space is specified in the colorspace information tag (<ColorSpace>).
0x013f	319	Image	Exif.Image.PrimaryChromaticities	Rational	The chromaticity of the three primary colors of the image. Normally this tag is not necessary, since colorspace is specified in the colorspace information tag (<ColorSpace>).
0x0140	320	Image	Exif.Image.ColorMap	Short	A color map for palette color images. This field defines a Red-Green-Blue color map (often called a lookup table) for palette-color images. In a

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					palette-color image, a pixel value is used to index into an RGB lookup table.
0x0141	321	Image	Exif.Image.HalftoneHints	Short	The purpose of the HalftoneHints field is to convey to the halftone function the range of gray levels within a colorimetrically-specified image that should retain tonal detail.
0x0142	322	Image	Exif.Image.TileWidth	Short	The tile width in pixels. This is the number of columns in each tile.
0x0143	323	Image	Exif.Image.TileLength	Short	The tile length (height) in pixels. This is the number of rows in each tile.
0x0144	324	Image	Exif.Image.TileOffsets	Short	For each tile, the byte offset of that tile, as compressed and stored on disk. The offset is specified with respect to the beginning of the TIFF file. Note that this implies that each tile has a location independent of the locations of other tiles.
0x0145	325	Image	Exif.Image.TileByteCounts	Short	For each tile, the number of (compressed) bytes in that tile.

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					See TileOffsets for a description of how the byte counts are ordered.
0x014a	330	Image	Exif.Image.SubIFDs	Long	Defined by Adobe Corporation to enable TIFF Trees within a TIFF file.
0x014c	332	Image	Exif.Image.InkSet	Short	The set of inks used in a separated (PhotometricInterpretation=5) image.
0x014d	333	Image	Exif.Image.InkNames	Ascii	The name of each ink used in a separated (PhotometricInterpretation=5) image.
0x014e	334	Image	Exif.Image.NumberOfInks	Short	The number of inks. Usually equal to SamplesPerPixel, unless there are extra samples.
0x0150	336	Image	Exif.Image.DotRange	Byte	The component values that correspond to a 0% dot and 100% dot.
0x0151	337	Image	Exif.Image.TargetPrinter	Ascii	A description of the printing environment for which this separation is intended.

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0x0152	338	Image	Exif.Image.ExtraSamples	Short	Specifies that each pixel has m extra components whose interpretation is defined by one of the values listed below.
0x0153	339	Image	Exif.Image.SampleFormat	Short	This field specifies how to interpret each data sample in a pixel.
0x0154	340	Image	Exif.Image.SMinSampleValue	Short	This field specifies the minimum sample value.
0x0155	341	Image	Exif.Image.SMaxSampleValue	Short	This field specifies the maximum sample value.
0x0156	342	Image	Exif.Image.TransferRange	Short	Expands the range of the TransferFunction
0x0157	343	Image	Exif.Image.ClipPath	Byte	A TIFF ClipPath is intended to mirror the essentials of PostScript's path creation functionality.
0x0158	344	Image	Exif.Image.XClipPathUnits	SShort	The number of units that span the width of the image, in terms of integer ClipPath coordinates.
0x0159	345	Image	Exif.Image.YClipPathUnits	SShort	The number of units that span the height of the image, in terms of integer ClipPath

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					coordinates.
0x015a	346	Image	Exif.Image.Indexed	Short	Indexed images are images where the 'pixels' do not represent color values, but rather an index (usually 8-bit) into a separate color table, the ColorMap.
0x015b	347	Image	Exif.Image.JPEGTables	Undefined	This optional tag may be used to encode the JPEG quantization and Huffman tables for subsequent use by the JPEG decompression process.
0x015f	351	Image	Exif.Image.OPIProxy	Short	OPIProxy gives information concerning whether this image is a low-resolution proxy of a high-resolution image (Adobe OPI).
0x0200	512	Image	Exif.Image.JPEGProc	Long	This field indicates the process used to produce the compressed data
0x0201	513	Image	Exif.Image.JPEGInterchangeFormat	Long	The offset to the start byte (SOI) of JPEG compressed thumbnail data. This is not used for primary image JPEG data.

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0x0202	514	Image	Exif.Image.JPEGInterchangeFormatLength	Long	The number of bytes of JPEG compressed thumbnail data. This is not used for primary image JPEG data. JPEG thumbnails are not divided but are recorded as a continuous JPEG bitstream from SOI to EOI. Appn and COM markers should not be recorded. Compressed thumbnails must be recorded in no more than 64 Kbytes, including all other data to be recorded in APP1.
0x0203	515	Image	Exif.Image.JPEGRestartInterval	Short	This Field indicates the length of the restart interval used in the compressed image data.
0x0205	517	Image	Exif.Image.JPEGLosslessPredictors	Short	This Field points to a list of lossless predictor-selection values, one per component.
0x0206	518	Image	Exif.Image.JPEGPointTransforms	Short	This Field points to a list of point transform values, one per component.
0x0207	519	Image	Exif.Image.JPEGQTables	Long	This Field points to a list of offsets to the quantization tables, one per component.

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0x0208	520	Image	Exif.Image.JPEGDCTables	Long	This Field points to a list of offsets to the DC Huffman tables or the lossless Huffman tables, one per component.
0x0209	521	Image	Exif.Image.JPEGACTables	Long	This Field points to a list of offsets to the Huffman AC tables, one per component.
0x0211	529	Image	Exif.Image.YCbCrCoefficients	Rational	The matrix coefficients for transformation from RGB to YCbCr image data. No default is given in TIFF; but here the value given in Appendix E, "Color Space Guidelines", is used as the default. The color space is declared in a color space information tag, with the default being the value that gives the optimal image characteristics Interoperability this condition.
0x0212	530	Image	Exif.Image.YCbCrSubSampling	Short	The sampling ratio of chrominance components in relation to the luminance component. In JPEG compressed data a JPEG marker is used instead of this tag.

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0x0213	531	Image	Exif.Image.YCbCrPositioning	Short	The position of chrominance components in relation to the luminance component. This field is designated only for JPEG compressed data or uncompressed YCbCr data. The TIFF default is 1 (centered); but when Y:Cb:Cr = 4:2:2 it is recommended in this standard that 2 (co-sited) be used to record data, in order to improve the image quality when viewed on TV systems. When this field does not exist, the reader shall assume the TIFF default. In the case of Y:Cb:Cr = 4:2:0, the TIFF default (centered) is recommended. If the reader does not have the capability of supporting both kinds of <YCbCrPositioning>, it shall follow the TIFF default regardless of the value in this field. It is preferable that readers be able to support both centered and co-sited positioning.
0x0214	532	Image	Exif.Image.ReferenceBlackWhite	Rational	The reference black point value

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					and reference white point value. No defaults are given in TIFF, but the values below are given as defaults here. The color space is declared in a color space information tag, with the default being the value that gives the optimal image characteristics Interoperability these conditions.
0x02bc	700	Image	Exif.Image.XMLPacket	Byte	XMP Metadata (Adobe technote 9-14-02)
0x4746	18246	Image	Exif.Image.Rating	Short	Rating tag used by Windows
0x4749	18249	Image	Exif.Image.RatingPercent	Short	Rating tag used by Windows, value in percent
0x800d	32781	Image	Exif.Image.ImageID	Ascii	ImageID is the full pathname of the original, high-resolution image, or any other identifying string that uniquely identifies the original image (Adobe OPI).
0x828d	33421	Image	Exif.Image.CFARepeatPatternDim	Short	Contains two values representing the minimum rows and columns to define the repeating patterns of the color filter array

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0x828e	33422	Image	Exif.Image.CFAPattern	Byte	Indicates the color filter array (CFA) geometric pattern of the image sensor when a one-chip color area sensor is used. It does not apply to all sensing methods
0x828f	33423	Image	Exif.Image.BatteryLevel	Rational	Contains a value of the battery level as a fraction or string
0x8298	33432	Image	Exif.Image.Copyright	Ascii	Copyright information. In this standard the tag is used to indicate both the photographer and editor copyrights. It is the copyright notice of the person or organization claiming rights to the image. The Interoperability copyright statement including date and rights should be written in this field; e.g., "Copyright, John Smith, 19xx. All rights reserved.". In this standard the field records both the photographer and editor copyrights, with each recorded in a separate part of the statement. When there is a clear distinction between the

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					photographer and editor copyrights, these are to be written in the order of photographer followed by editor copyright, separated by NULL (in this case since the statement also ends with a NULL, there are two NULL codes). When only the photographer copyright is given, it is terminated by one NULL code. When only the editor copyright is given, the photographer copyright part consists of one space followed by a terminating NULL code, then the editor copyright is given. When the field is left blank, it is treated as unknown.
0x829a	33434	Image	Exif.Image.ExposureTime	Rational	Exposure time, given in seconds.
0x829d	33437	Image	Exif.Image.FNumber	Rational	The F number.
0x83bb	33723	Image	Exif.Image.IPTCNAA	Long	Contains an IPTC/NAA record
0x8649	34377	Image	Exif.Image.ImageResources	Byte	Contains information embedded by the Adobe Photoshop application

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0x8769	34665	Image	Exif.Image.ExifTag	Long	A pointer to the Exif IFD. Interoperability, Exif IFD has the same structure as that of the IFD specified in TIFF. ordinarily, however, it does not contain image data as in the case of TIFF.
0x8773	34675	Image	Exif.Image.InterColorProfile	Undefined	Contains an InterColor Consortium (ICC) format color space characterization/profile
0x8822	34850	Image	Exif.Image.ExposureProgram	Short	The class of the program used by the camera to set exposure when the picture is taken.
0x8824	34852	Image	Exif.Image.SpectralSensitivity	Ascii	Indicates the spectral sensitivity of each channel of the camera used.
0x8825	34853	Image	Exif.Image.GPSTag	Long	A pointer to the GPS Info IFD. The Interoperability structure of the GPS Info IFD, like that of Exif IFD, has no image data.
0x8827	34855	Image	Exif.Image.ISOSpeedRatings	Short	Indicates the ISO Speed and ISO Latitude of the camera or input device as specified in ISO 12232.

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0x8828	34856	Image	Exif.Image.OECF	Undefined	Indicates the Opto-Electric Conversion Function (OECF) specified in ISO 14524.
0x8829	34857	Image	Exif.Image.Interlace	Short	Indicates the field number of multifield images.
0x882a	34858	Image	Exif.Image.TimeZoneOffset	SShort	This optional tag encodes the time zone of the camera clock (relativeto Greenwich Mean Time) used to create the DataTimeOriginal tag-valuewhen the picture was taken. It may also contain the time zone offsetof the clock used to create the DateTime tag-value when the image wasmodified.
0x882b	34859	Image	Exif.Image.SelfTimerMode	Short	Number of seconds image capture was delayed from button press.
0x9003	36867	Image	Exif.Image.DateTimeOriginal	Ascii	The date and time when the original image data was generated.
0x9102	37122	Image	Exif.Image.CompressedBitsPerPixel	Rational	Specific to compressed data; states the compressed bits per pixel.

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0x9201	37377	Image	Exif.Image.ShutterSpeedValue	SRational	Shutter speed.
0x9202	37378	Image	Exif.Image.ApertureValue	Rational	The lens aperture.
0x9203	37379	Image	Exif.Image.BrightnessValue	SRational	The value of brightness.
0x9204	37380	Image	Exif.Image.ExposureBiasValue	SRational	The exposure bias.
0x9205	37381	Image	Exif.Image.MaxApertureValue	Rational	The smallest F number of the lens.
0x9206	37382	Image	Exif.Image.SubjectDistance	SRational	The distance to the subject, given in meters.
0x9207	37383	Image	Exif.Image.MeteringMode	Short	The metering mode.
0x9208	37384	Image	Exif.Image.LightSource	Short	The kind of light source.
0x9209	37385	Image	Exif.Image.Flash	Short	Indicates the status of flash when the image was shot.
0x920a	37386	Image	Exif.Image.FocalLength	Rational	The actual focal length of the lens, in mm.
0x920b	37387	Image	Exif.Image.FlashEnergy	Rational	Amount of flash energy (BCPS).
0x920c	37388	Image	Exif.Image.SpatialFrequencyResponse	Undefined	SFR of the camera.
0x920d	37389	Image	Exif.Image.Noise	Undefined	Noise measurement values.
0x920e	37390	Image	Exif.Image.FocalPlaneXResolution	Rational	Number of pixels per

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					FocalPlaneResolutionUnit (37392) in ImageWidth direction for main image.
0x920f	37391	Image	Exif.Image.FocalPlaneYResolution	Rational	Number of pixels per FocalPlaneResolutionUnit (37392) in ImageLength direction for main image.
0x9210	37392	Image	Exif.Image.FocalPlaneResolutionUnit	Short	Unit of measurement for FocalPlaneXResolution(37390) and FocalPlaneYResolution(37391).
0x9211	37393	Image	Exif.Image.ImageNumber	Long	Number assigned to an image, e.g., in a chained image burst.
0x9212	37394	Image	Exif.Image.SecurityClassification	Ascii	Security classification assigned to the image.
0x9213	37395	Image	Exif.Image.ImageHistory	Ascii	Record of what has been done to the image.
0x9214	37396	Image	Exif.Image.SubjectLocation	Short	Indicates the location and area of the main subject in the overall scene.
0x9215	37397	Image	Exif.Image.ExposureIndex	Rational	Encodes the camera exposure index setting when image was captured.

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0x9216	37398	Image	Exif.Image.TIFFEPStandardID	Byte	Contains four ASCII characters representing the TIFF/EP standard version of a TIFF/EP file, eg '1', '0', '0', '0'
0x9217	37399	Image	Exif.Image.SensingMethod	Short	Type of image sensor.
0x9c9b	40091	Image	Exif.Image.XPTitle	Byte	Title tag used by Windows, encoded in UCS2
0x9c9c	40092	Image	Exif.Image.XPComment	Byte	Comment tag used by Windows, encoded in UCS2
0x9c9d	40093	Image	Exif.Image.XPAuthor	Byte	Author tag used by Windows, encoded in UCS2
0x9c9e	40094	Image	Exif.Image.XPKeywords	Byte	Keywords tag used by Windows, encoded in UCS2
0x9c9f	40095	Image	Exif.Image.XPSubject	Byte	Subject tag used by Windows, encoded in UCS2
0xc4a5	50341	Image	Exif.Image.PrintImageMatching	Undefined	Print Image Matching, description needed.
0xc612	50706	Image	Exif.Image.DNGVersion	Byte	This tag encodes the DNG four-tier version number. For files compliant with version 1.1.0.0 of the DNG specification, this tag should contain the bytes: 1,

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					1, 0, 0.
0xc613	50707	Image	Exif.Image.DNGBackwardVersion	Byte	This tag specifies the oldest version of the Digital Negative specification for which a file is compatible. Readers shouldnot attempt to read a file if this tag specifies a version number that is higher than the version number of the specification the reader was based on. In addition to checking the version tags, readers should, for all tags, check the types, counts, and values, to verify it is able to correctly read the file.
0xc614	50708	Image	Exif.Image.UniqueCameraModel	Ascii	Defines a unique, non-localized name for the camera model that created the image in the raw file. This name should include the manufacturer's name to avoid conflicts, and should not be localized, even if the camera name itself is localized for different markets (see LocalizedCameraModel). This string may be used by reader software to index into per-model preferences and replacement

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					profiles.
0xc615	50709	Image	Exif.Image.LocalizedCameraModel	Byte	Similar to the UniqueCameraModel field, except the name can be localized for different markets to match the localization of the camera name.
0xc616	50710	Image	Exif.Image.CFAPlaneColor	Byte	Provides a mapping between the values in the CFAPattern tag and the plane numbers in LinearRaw space. This is a required tag for non-RGB CFA images.
0xc617	50711	Image	Exif.Image.CFALayout	Short	Describes the spatial layout of the CFA.
0xc618	50712	Image	Exif.Image.LinearizationTable	Short	Describes a lookup table that maps stored values into linear values. This tag is typically used to increase compression ratios by storing the raw data in a non-linear, more visually uniform space with fewer total encoding levels. If SamplesPerPixel is not equal to one, this single table applies to all the samples for each pixel.

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0xc619	50713	Image	Exif.Image.BlackLevelRepeatDim	Short	Specifies repeat pattern size for the BlackLevel tag.
0xc61a	50714	Image	Exif.Image.BlackLevel	Rational	Specifies the zero light (a.k.a. thermal black or black current) encoding level, as a repeating pattern. The origin of this pattern is the top-left corner of the ActiveArea rectangle. The values are stored in row-column-sample scan order.
0xc61b	50715	Image	Exif.Image.BlackLevelDeltaH	SRational	If the zero light encoding level is a function of the image column, BlackLevelDeltaH specifies the difference between the zero light encoding level for each column and the baseline zero light encoding level. If SamplesPerPixel is not equal to one, this single table applies to all the samples for each pixel.
0xc61c	50716	Image	Exif.Image.BlackLevelDeltaV	SRational	If the zero light encoding level is a function of the image row, this tag specifies the difference between the zero light encoding level for each row and the baseline zero light encoding

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					level. If SamplesPerPixel is not equal to one, this single table applies to all the samples for each pixel.
0xc61d	50717	Image	Exif.Image.WhiteLevel	Short	This tag specifies the fully saturated encoding level for the raw sample values. Saturation is caused either by the sensor itself becoming highly non-linear in response, or by the camera's analog to digital converter clipping.
0xc61e	50718	Image	Exif.Image.DefaultScale	Rational	DefaultScale is required for cameras with non-square pixels. It specifies the default scale factors for each direction to convert the image to square pixels. Typically these factors are selected to approximately preserve total pixel count. For CFA images that use CFALayout equal to 2, 3, 4, or 5, such as the Fujifilm SuperCCD, these two values should usually differ by a factor of 2.0.
0xc61f	50719	Image	Exif.Image.DefaultCropOrigin	Short	Raw images often store extra

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					pixels around the edges of the final image. These extra pixels help prevent interpolation artifacts near the edges of the final image. DefaultCropOrigin specifies the origin of the final image area, in raw image coordinates (i.e., before the DefaultScale has been applied), relative to the top-left corner of the ActiveArea rectangle.
0xc620	50720	Image	Exif.Image.DefaultCropSize	Short	Raw images often store extra pixels around the edges of the final image. These extra pixels help prevent interpolation artifacts near the edges of the final image. DefaultCropSize specifies the size of the final image area, in raw image coordinates (i.e., before the DefaultScale has been applied).
0xc621	50721	Image	Exif.Image.ColorMatrix1	SRational	ColorMatrix1 defines a transformation matrix that converts XYZ values to reference camera native color space values, under the first

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					calibration illuminant. The matrix values are stored in row scan order. The ColorMatrix1 tag is required for all non-monochrome DNG files.
0xc622	50722	Image	Exif.Image.ColorMatrix2	SRational	ColorMatrix2 defines a transformation matrix that converts XYZ values to reference camera native color space values, under the second calibration illuminant. The matrix values are stored in row scan order.
0xc623	50723	Image	Exif.Image.CameraCalibration1	SRational	CameraCalibration1 defines a calibration matrix that transforms reference camera native space values to individual camera native space values under the first calibration illuminant. The matrix is stored in row scan order. This matrix is stored separately from the matrix specified by the ColorMatrix1 tag to allow raw converters to swap in replacement color matrices based on UniqueCameraModel tag, while

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					still taking advantage of any per-individual camera calibration performed by the camera manufacturer.
0xc624	50724	Image	Exif.Image.CameraCalibration2	SRational	CameraCalibration2 defines a calibration matrix that transforms reference camera native space values to individual camera native space values under the second calibration illuminant. The matrix is stored in row scan order. This matrix is stored separately from the matrix specified by the ColorMatrix2 tag to allow raw converters to swap in replacement color matrices based on UniqueCameraModel tag, while still taking advantage of any per-individual camera calibration performed by the camera manufacturer.
0xc625	50725	Image	Exif.Image.ReductionMatrix1	SRational	ReductionMatrix1 defines a dimensionality reduction matrix for use as the first stage in converting color camera native space values to XYZ values,

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					under the first calibration illuminant. This tag may only be used if ColorPlanes is greater than 3. The matrix is stored in row scan order.
0xc626	50726	Image	Exif.Image.ReductionMatrix2	SRational	ReductionMatrix2 defines a dimensionality reduction matrix for use as the first stage in converting color camera native space values to XYZ values, under the second calibration illuminant. This tag may only be used if ColorPlanes is greater than 3. The matrix is stored in row scan order.
0xc627	50727	Image	Exif.Image.AnalogBalance	Rational	Normally the stored raw values are not white balanced, since any digital white balancing will reduce the dynamic range of the final image if the user decides to later adjust the white balance; however, if camera hardware is capable of white balancing the color channels before the signal is digitized, it can improve the dynamic range of the final image. AnalogBalance defines the

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					gain, either analog (recommended) or digital (not recommended) that has been applied the stored raw values.
0xc628	50728	Image	Exif.Image.AsShotNeutral	Short	Specifies the selected white balance at time of capture, encoded as the coordinates of a perfectly neutral color in linear reference space values. The inclusion of this tag precludes the inclusion of the AsShotWhiteXY tag.
0xc629	50729	Image	Exif.Image.AsShotWhiteXY	Rational	Specifies the selected white balance at time of capture, encoded as x-y chromaticity coordinates. The inclusion of this tag precludes the inclusion of the AsShotNeutral tag.
0xc62a	50730	Image	Exif.Image.BaselineExposure	SRational	Camera models vary in the trade-off they make between highlight headroom and shadow noise. Some leave a significant amount of highlight headroom during a normal exposure. This allows significant negative exposure compensation to be applied during raw conversion,

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					but also means normal exposures will contain more shadow noise. Other models leave less headroom during normal exposures. This allows for less negative exposure compensation, but results in lower shadow noise for normal exposures. Because of these differences, a raw converter needs to vary the zero point of its exposure compensation control from model to model. BaselineExposure specifies by how much (in EV units) to move the zero point. Positive values result in brighter default results, while negative values result in darker default results.
0xc62b	50731	Image	Exif.Image.BaselineNoise	Rational	Specifies the relative noise level of the camera model at a baseline ISO value of 100, compared to a reference camera model. Since noise levels tend to vary approximately with the square root of the ISO value, a raw converter can use this value, combined with the current ISO,

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					to estimate the relative noise level of the current image.
0xc62c	50732	Image	Exif.Image.BaselineSharpness	Rational	Specifies the relative amount of sharpening required for this camera model, compared to a reference camera model. Camera models vary in the strengths of their anti-aliasing filters. Cameras with weak or no filters require less sharpening than cameras with strong anti-aliasing filters.
0xc62d	50733	Image	Exif.Image.BayerGreenSplit	Long	Only applies to CFA images using a Bayer pattern filter array. This tag specifies, in arbitrary units, how closely the values of the green pixels in the blue/green rows track the values of the green pixels in the red/green rows. A value of zero means the two kinds of green pixels track closely, while a non-zero value means they sometimes diverge. The useful range for this tag is from 0 (no divergence) to about 5000 (quite large divergence).

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0xc62e	50734	Image	Exif.Image.LinearResponseLimit	Rational	Some sensors have an unpredictable non-linearity in their response as they near the upper limit of their encoding range. This non-linearity results in color shifts in the highlight areas of the resulting image unless the raw converter compensates for this effect. LinearResponseLimit specifies the fraction of the encoding range above which the response may become significantly non-linear.
0xc62f	50735	Image	Exif.Image.CameraSerialNumber	Ascii	CameraSerialNumber contains the serial number of the camera or camera body that captured the image.
0xc630	50736	Image	Exif.Image.LensInfo	Rational	Contains information about the lens that captured the image. If the minimum f-stops are unknown, they should be encoded as 0/0.
0xc631	50737	Image	Exif.Image.ChromaBlurRadius	Rational	ChromaBlurRadius provides a hint to the DNG reader about how much chroma blur should be applied to the image. If this

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					tag is omitted, the reader will use its default amount of chroma blurring. Normally this tag is only included for non-CFA images, since the amount of chroma blur required for mosaic images is highly dependent on the de-mosaic algorithm, in which case the DNG reader's default value is likely optimized for its particular de-mosaic algorithm.
0xc632	50738	Image	Exif.Image.AntiAliasStrength	Rational	Provides a hint to the DNG reader about how strong the camera's anti-alias filter is. A value of 0.0 means no anti-alias filter (i.e., the camera is prone to aliasing artifacts with some subjects), while a value of 1.0 means a strong anti-alias filter (i.e., the camera almost never has aliasing artifacts).
0xc633	50739	Image	Exif.Image.ShadowScale	SRational	This tag is used by Adobe Camera Raw to control the sensitivity of its 'Shadows' slider.
0xc634	50740	Image	Exif.Image.DNGPrivateData	Byte	Provides a way for camera

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					manufacturers to store private data in the DNG file for use by their own raw converters, and to have that data preserved by programs that edit DNG files.
0xc635	50741	Image	Exif.Image.MakerNoteSafety	Short	MakerNoteSafety lets the DNG reader know whether the EXIF MakerNote tag is safe to preserve along with the rest of the EXIF data. File browsers and other image management software processing an image with a preserved MakerNote should be aware that any thumbnail image embedded in the MakerNote may be stale, and may not reflect the current state of the full size image.
0xc65a	50778	Image	Exif.Image.CalibrationIlluminant1	Short	The illuminant used for the first set of color calibration tags (ColorMatrix1, CameraCalibration1, ReductionMatrix1). The legal values for this tag are the same as the legal values for the LightSource EXIF tag.
0xc65b	50779	Image	Exif.Image.CalibrationIlluminant2	Short	The illuminant used for an

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					optional second set of color calibration tags (ColorMatrix2, CameraCalibration2, ReductionMatrix2). The legal values for this tag are the same as the legal values for the CalibrationIlluminant1 tag; however, if both are included, neither is allowed to have a value of 0 (unknown).
0xc65c	50780	Image	Exif.Image.BestQualityScale	Rational	For some cameras, the best possible image quality is not achieved by preserving the total pixel count during conversion. For example, Fujifilm SuperCCD images have maximum detail when their total pixel count is doubled. This tag specifies the amount by which the values of the DefaultScale tag need to be multiplied to achieve the best quality image size.
0xc65d	50781	Image	Exif.Image.RawDataUniqueID	Byte	This tag contains a 16-byte unique identifier for the raw image data in the DNG file. DNG readers can use this tag to recognize a particular raw

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					image, even if the file's name or the metadata contained in the file has been changed. If a DNG writer creates such an identifier, it should do so using an algorithm that will ensure that it is very unlikely two different images will end up having the same identifier.
0xc68b	50827	Image	Exif.Image.OriginalRawFileName	Byte	If the DNG file was converted from a non-DNG raw file, then this tag contains the file name of that original raw file.
0xc68c	50828	Image	Exif.Image.OriginalRawFileData	Undefined	If the DNG file was converted from a non-DNG raw file, then this tag contains the compressed contents of that original raw file. The contents of this tag always use the big-endian byte order. The tag contains a sequence of data blocks. Future versions of the DNG specification may define additional data blocks, so DNG readers should ignore extra bytes when parsing this tag. DNG readers should also detect the case where data

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					blocks are missing from the end of the sequence, and should assume a default value for all the missing blocks. There are no padding or alignment bytes between data blocks.
0xc68d	50829	Image	Exif.Image.ActiveArea	Short	This rectangle defines the active (non-masked) pixels of the sensor. The order of the rectangle coordinates is: top, left, bottom, right.
0xc68e	50830	Image	Exif.Image.MaskedAreas	Short	This tag contains a list of non-overlapping rectangle coordinates of fully masked pixels, which can be optionally used by DNG readers to measure the black encoding level. The order of each rectangle's coordinates is: top, left, bottom, right. If the raw image data has already had its black encoding level subtracted, then this tag should not be used, since the masked pixels are no longer useful.
0xc68f	50831	Image	Exif.Image.AsShotICCProfile	Undefined	This tag contains an ICC profile that, in conjunction with the

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					AsShotPreProfileMatrix tag, provides the camera manufacturer with a way to specify a default color rendering from camera color space coordinates (linear reference values) into the ICC profile connection space. The ICC profile connection space is an output referred colorimetric space, whereas the other color calibration tags in DNG specify a conversion into a scene referred colorimetric space. This means that the rendering in this profile should include any desired tone and gamut mapping needed to convert between scene referred values and output referred values.
0xc690	50832	Image	Exif.Image.AsShotPreProfileMatrix	SRational	This tag is used in conjunction with the AsShotICCProfile tag. It specifies a matrix that should be applied to the camera color space coordinates before processing the values through the ICC profile specified in the AsShotICCProfile tag. The matrix is stored in the row scan

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					order. If ColorPlanes is greater than three, then this matrix can (but is not required to) reduce the dimensionality of the color data down to three components, in which case the AsShotICCProfile should have three rather than ColorPlanes input components.
0xc691	50833	Image	Exif.Image.CurrentICCProfile	Undefined	This tag is used in conjunction with the CurrentPreProfileMatrix tag. The CurrentICCProfile and CurrentPreProfileMatrix tags have the same purpose and usage as the AsShotICCProfile and AsShotPreProfileMatrix tag pair, except they are for use by raw file editors rather than camera manufacturers.
0xc692	50834	Image	Exif.Image.CurrentPreProfileMatrix	SRational	This tag is used in conjunction with the CurrentICCProfile tag. The CurrentICCProfile and CurrentPreProfileMatrix tags have the same purpose and usage as the AsShotICCProfile and AsShotPreProfileMatrix tag pair, except they are for use by raw file editors rather than

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					camera manufacturers.
0xc6bf	50879	Image	Exif.Image.ColorimetricReference	Short	The DNG color model documents a transform between camera colors and CIE XYZ values. This tag describes the colorimetric reference for the CIE XYZ values. 0 = The XYZ values are scene-referred. 1 = The XYZ values are output-referred, using the ICC profile perceptual dynamic range. This tag allows output-referred data to be stored in DNG files and still processed correctly by DNG readers.
0xc6f3	50931	Image	Exif.Image.CameraCalibrationSignature	Byte	A UTF-8 encoded string associated with the CameraCalibration1 and CameraCalibration2 tags. The CameraCalibration1 and CameraCalibration2 tags should only be used in the DNG color transform if the string stored in the CameraCalibrationSignature tag exactly matches the string stored in the ProfileCalibrationSignature tag

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					for the selected camera profile.
0xc6f4	50932	Image	Exif.Image.ProfileCalibrationSignature	Byte	A UTF-8 encoded string associated with the camera profile tags. The CameraCalibration1 and CameraCalibration2 tags should only be used in the DNG color transfer if the string stored in the CameraCalibrationSignature tag exactly matches the string stored in the ProfileCalibrationSignature tag for the selected camera profile.
0xc6f6	50934	Image	Exif.Image.AsShotProfileName	Byte	A UTF-8 encoded string containing the name of the "as shot" camera profile, if any.
0xc6f7	50935	Image	Exif.Image.NoiseReductionApplied	Rational	This tag indicates how much noise reduction has been applied to the raw data on a scale of 0.0 to 1.0. A 0.0 value indicates that no noise reduction has been applied. A 1.0 value indicates that the "ideal" amount of noise reduction has been applied, i.e. that the DNG reader should not

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					apply additional noise reduction by default. A value of 0/0 indicates that this parameter is unknown.
0xc6f8	50936	Image	Exif.Image.ProfileName	Byte	A UTF-8 encoded string containing the name of the camera profile. This tag is optional if there is only a single camera profile stored in the file but is required for all camera profiles if there is more than one camera profile stored in the file.
0xc6f9	50937	Image	Exif.Image.ProfileHueSatMapDims	Long	This tag specifies the number of input samples in each dimension of the hue/saturation/value mapping tables. The data for these tables are stored in ProfileHueSatMapData1 and ProfileHueSatMapData2 tags. The most common case has ValueDivisions equal to 1, so only hue and saturation are used as inputs to the mapping table.
0xc6fa	50938	Image	Exif.Image.ProfileHueSatMapData1	Float	This tag contains the data for

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					the first hue/saturation/value mapping table. Each entry of the table contains three 32-bit IEEE floating-point values. The first entry is hue shift in degrees; the second entry is saturation scale factor; and the third entry is a value scale factor. The table entries are stored in the tag in nested loop order, with the value divisions in the outer loop, the hue divisions in the middle loop, and the saturation divisions in the inner loop. All zero input saturation entries are required to have a value scale factor of 1.0.
0xc6fb	50939	Image	Exif.Image.ProfileHueSatMapData2	Float	This tag contains the data for the second hue/saturation/value mapping table. Each entry of the table contains three 32-bit IEEE floating-point values. The first entry is hue shift in degrees; the second entry is a saturation scale factor; and the third entry is a value scale factor. The table entries are stored in the

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					tag in nested loop order, with the value divisions in the outer loop, the hue divisions in the middle loop, and the saturation divisions in the inner loop. All zero input saturation entries are required to have a value scale factor of 1.0.
0xc6fc	50940	Image	Exif.Image.ProfileToneCurve	Float	This tag contains a default tone curve that can be applied while processing the image as a starting point for user adjustments. The curve is specified as a list of 32-bit IEEE floating-point value pairs in linear gamma. Each sample has an input value in the range of 0.0 to 1.0, and an output value in the range of 0.0 to 1.0. The first sample is required to be (0.0, 0.0), and the last sample is required to be (1.0, 1.0). Interpolated the curve using a cubic spline.
0xc6fd	50941	Image	Exif.Image.ProfileEmbedPolicy	Long	This tag contains information about the usage rules for the associated camera profile.

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0xc6fe	50942	Image	Exif.Image.ProfileCopyright	Byte	A UTF-8 encoded string containing the copyright information for the camera profile. This string always should be preserved along with the other camera profile tags.
0xc714	50964	Image	Exif.Image.ForwardMatrix1	SRational	This tag defines a matrix that maps white balanced camera colors to XYZ D50 colors.
0xc715	50965	Image	Exif.Image.ForwardMatrix2	SRational	This tag defines a matrix that maps white balanced camera colors to XYZ D50 colors.
0xc716	50966	Image	Exif.Image.PreviewApplicationName	Byte	A UTF-8 encoded string containing the name of the application that created the preview stored in the IFD.
0xc717	50967	Image	Exif.Image.PreviewApplicationVersion	Byte	A UTF-8 encoded string containing the version number of the application that created the preview stored in the IFD.
0xc718	50968	Image	Exif.Image.PreviewSettingsName	Byte	A UTF-8 encoded string containing the name of the conversion settings (for example, snapshot name) used for the preview stored in the

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					IFD.
0xc719	50969	Image	Exif.Image.PreviewSettingsDigest	Byte	A unique ID of the conversion settings (for example, MD5 digest) used to render the preview stored in the IFD.
0xc71a	50970	Image	Exif.Image.PreviewColorSpace	Long	This tag specifies the color space in which the rendered preview in this IFD is stored. The default value for this tag is sRGB for color previews and Gray Gamma 2.2 for monochrome previews.
0xc71b	50971	Image	Exif.Image.PreviewDateTime	Ascii	This tag is an ASCII string containing the name of the date/time at which the preview stored in the IFD was rendered. The date/time is encoded using ISO 8601 format.
0xc71c	50972	Image	Exif.Image.RawImageDigest	Undefined	This tag is an MD5 digest of the raw image data. All pixels in the image are processed in row-scan order. Each pixel is zero padded to 16 or 32 bits deep (16-bit for data less than or equal to 16 bits deep, 32-bit otherwise). The data for each

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					pixel is processed in little-endian byte order.
0xc71d	50973	Image	Exif.Image.OriginalRawFileDigest	Undefined	This tag is an MD5 digest of the data stored in the OriginalRawFileData tag.
0xc71e	50974	Image	Exif.Image.SubTileBlockSize	Long	Normally, the pixels within a tile are stored in simple row-scan order. This tag specifies that the pixels within a tile should be grouped first into rectangular blocks of the specified size. These blocks are stored in row-scan order. Within each block, the pixels are stored in row-scan order. The use of a non-default value for this tag requires setting the DNGBackwardVersion tag to at least 1.2.0.0.
0xc71f	50975	Image	Exif.Image.RowInterleaveFactor	Long	This tag specifies that rows of the image are stored in interleaved order. The value of the tag specifies the number of interleaved fields. The use of a non-default value for this tag requires setting the DNGBackwardVersion tag to at

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					least 1.2.0.0.
0xc725	50981	Image	Exif.Image.ProfileLookTableDims	Long	This tag specifies the number of input samples in each dimension of a default "look" table. The data for this table is stored in the ProfileLookTableData tag.
0xc726	50982	Image	Exif.Image.ProfileLookTableData	Float	This tag contains a default "look" table that can be applied while processing the image as a starting point for user adjustment. This table uses the same format as the tables stored in the ProfileHueSatMapData1 and ProfileHueSatMapData2 tags, and is applied in the same color space. However, it should be applied later in the processing pipe, after any exposure compensation and/or fill light stages, but before any tone curve stage. Each entry of the table contains three 32-bit IEEE floating-point values. The first entry is hue shift in degrees, the second entry is a saturation scale factor, and the third entry

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					is a value scale factor. The table entries are stored in the tag in nested loop order, with the value divisions in the outer loop, the hue divisions in the middle loop, and the saturation divisions in the inner loop. All zero input saturation entries are required to have a value scale factor of 1.0.
0xc740	51008	Image	Exif.Image.OpcodeList1	Undefined	Specifies the list of opcodes that should be applied to the raw image, as read directly from the file.
0xc741	51009	Image	Exif.Image.OpcodeList2	Undefined	Specifies the list of opcodes that should be applied to the raw image, just after it has been mapped to linear reference values.
0xc74e	51022	Image	Exif.Image.OpcodeList3	Undefined	Specifies the list of opcodes that should be applied to the raw image, just after it has been demosaiced.
0xc761	51041	Image	Exif.Image.NoiseProfile	Double	NoiseProfile describes the amount of noise in a raw image. Specifically, this tag models the

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					amount of signal-dependent photon (shot) noise and signal-independent sensor readout noise, two common sources of noise in raw images. The model assumes that the noise is white and spatially independent, ignoring fixed pattern effects and other sources of noise (e.g., pixel response non-uniformity, spatially-dependent thermal effects, etc.).
0x829a	33434	Photo	Exif.Photo.ExposureTime	Rational	Exposure time, given in seconds (sec).
0x829d	33437	Photo	Exif.Photo.FNumber	Rational	The F number.
0x8822	34850	Photo	Exif.Photo.ExposureProgram	Short	The class of the program used by the camera to set exposure when the picture is taken.
0x8824	34852	Photo	Exif.Photo.SpectralSensitivity	Ascii	Indicates the spectral sensitivity of each channel of the camera used. The tag value is an ASCII string compatible with the standard developed by the ASTM Technical Committee.
0x8827	34855	Photo	Exif.Photo.ISOSpeedRatings	Short	Indicates the ISO Speed and

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					ISO Latitude of the camera or input device as specified in ISO 12232.
0x8828	34856	Photo	Exif.Photo.OECF	Undefined	Indicates the Opto-Electoric Conversion Function (OECF) specified in ISO 14524. <OECF> is the relationship between the camera optical input and the image values.
0x8830	34864	Photo	Exif.Photo.SensitivityType	Short	The SensitivityType tag indicates which one of the parameters of ISO12232 is the PhotographicSensitivity tag. Although it is an optional tag, it should be recorded when a PhotographicSensitivity tag is recorded. Value = 4, 5, 6, or 7 may be used in case that the values of plural parameters are the same.
0x8831	34865	Photo	Exif.Photo.StandardOutputSensitivity	Long	This tag indicates the standard output sensitivity value of a camera or input device defined in ISO 12232. When recording this tag, the PhotographicSensitivity and SensitivityType tags shall also

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					be recorded.
0x8832	34866	Photo	Exif.Photo.RecommendedExposureIndex	Long	This tag indicates the recommended exposure index value of a camera or input device defined in ISO 12232. When recording this tag, the PhotographicSensitivity and SensitivityType tags shall also be recorded.
0x8833	34867	Photo	Exif.Photo.ISOSpeed	Long	This tag indicates the ISO speed value of a camera or input device that is defined in ISO 12232. When recording this tag, the PhotographicSensitivity and SensitivityType tags shall also be recorded.
0x8834	34868	Photo	Exif.Photo.ISOSpeedLatitudeyyy	Long	This tag indicates the ISO speed latitude yyy value of a camera or input device that is defined in ISO 12232. However, this tag shall not be recorded without ISOSpeed and ISOSpeedLatitudezzz.
0x8835	34869	Photo	Exif.Photo.ISOSpeedLatitudezzz	Long	This tag indicates the ISO speed latitude zzz value of a

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					camera or input device that is defined in ISO 12232. However, this tag shall not be recorded without ISOSpeed and ISOSpeedLatitudeyyy.
0x9000	36864	Photo	Exif.Photo.ExifVersion	Undefined	The version of this standard supported. Nonexistence of this field is taken to mean nonconformance to the standard.
0x9003	36867	Photo	Exif.Photo.DateTimeOriginal	Ascii	The date and time when the original image data was generated. For a digital still camera the date and time the picture was taken are recorded.
0x9004	36868	Photo	Exif.Photo.DateTimeDigitized	Ascii	The date and time when the image was stored as digital data.
0x9101	37121	Photo	Exif.Photo.ComponentsConfiguration	Undefined	Information specific to compressed data. The channels of each component are arranged in order from the 1st component to the 4th. For uncompressed data the data arrangement is given in the <PhotometricInterpretation>

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					tag. However, since <PhotometricInterpretation> can only express the order of Y, Cb and Cr, this tag is provided for cases when compressed data uses components other than Y, Cb, and Cr and to enable support of other sequences.
0x9102	37122	Photo	Exif.Photo.CompressedBitsPerPixel	Rational	Information specific to compressed data. The compression mode used for a compressed image is indicated in unit bits per pixel.
0x9201	37377	Photo	Exif.Photo.ShutterSpeedValue	SRational	Shutter speed. The unit is the APEX (Additive System of Photographic Exposure) setting.
0x9202	37378	Photo	Exif.Photo.ApertureValue	Rational	The lens aperture. The unit is the APEX value.
0x9203	37379	Photo	Exif.Photo.BrightnessValue	SRational	The value of brightness. The unit is the APEX value. Ordinarily it is given in the range of -99.99 to 99.99.
0x9204	37380	Photo	Exif.Photo.ExposureBiasValue	SRational	The exposure bias. The units is

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					the APEX value. Ordinarily it is given in the range of -99.99 to 99.99.
0x9205	37381	Photo	Exif.Photo.MaxApertureValue	Rational	The smallest F number of the lens. The unit is the APEX value. Ordinarily it is given in the range of 00.00 to 99.99, but it is not limited to this range.
0x9206	37382	Photo	Exif.Photo.SubjectDistance	Rational	The distance to the subject, given in meters.
0x9207	37383	Photo	Exif.Photo.MeteringMode	Short	The metering mode.
0x9208	37384	Photo	Exif.Photo.LightSource	Short	The kind of light source.
0x9209	37385	Photo	Exif.Photo.Flash	Short	This tag is recorded when an image is taken using a strobe light (flash).
0x920a	37386	Photo	Exif.Photo.FocalLength	Rational	The actual focal length of the lens, in mm. Conversion is not made to the focal length of a 35 mm film camera.
0x9214	37396	Photo	Exif.Photo.SubjectArea	Short	This tag indicates the location and area of the main subject in the overall scene.
0x927c	37500	Photo	Exif.Photo.MakerNote	Undefined	A tag for manufacturers of Exif

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					writers to record any desired information. The contents are up to the manufacturer.
0x9286	37510	Photo	Exif.Photo.UserComment	Comment	A tag for Exif users to write keywords or comments on the image besides those in <ImageDescription>, and without the character code limitations of the <ImageDescription> tag.
0x9290	37520	Photo	Exif.Photo.SubSecTime	Ascii	A tag used to record fractions of seconds for the <DateTime> tag.
0x9291	37521	Photo	Exif.Photo.SubSecTimeOriginal	Ascii	A tag used to record fractions of seconds for the <DateTimeOriginal> tag.
0x9292	37522	Photo	Exif.Photo.SubSecTimeDigitized	Ascii	A tag used to record fractions of seconds for the <DateTimeDigitized> tag.
0xa000	40960	Photo	Exif.Photo.FlashpixVersion	Undefined	The FlashPix format version supported by a FPXR file.
0xa001	40961	Photo	Exif.Photo.ColorSpace	Short	The color space information tag is always recorded as the color space specifier. Normally sRGB

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					is used to define the color space based on the PC monitor conditions and environment. If a color space other than sRGB is used, Uncalibrated is set. Image data recorded as Uncalibrated can be treated as sRGB when it is converted to FlashPix.
0xa002	40962	Photo	Exif.Photo.PixelXDimension	Long	Information specific to compressed data. When a compressed file is recorded, the valid width of the meaningful image must be recorded in this tag, whether or not there is padding data or a restart marker. This tag should not exist in an uncompressed file.
0xa003	40963	Photo	Exif.Photo.PixelYDimension	Long	Information specific to compressed data. When a compressed file is recorded, the valid height of the meaningful image must be recorded in this tag, whether or not there is padding data or a restart marker. This tag should not exist in an uncompressed file. Since data padding is

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					unnecessary in the vertical direction, the number of lines recorded in this valid image height tag will in fact be the same as that recorded in the SOF.
0xa004	40964	Photo	Exif.Photo.RelatedSoundFile	Ascii	This tag is used to record the name of an audio file related to the image data. The only relational information recorded here is the Exif audio file name and extension (an ASCII string consisting of 8 characters + '.' + 3 characters). The path is not recorded.
0xa005	40965	Photo	Exif.Photo.InteroperabilityTag	Long	Interoperability IFD is composed of tags which stores the information to ensure the Interoperability and pointed by the following tag located in Exif IFD. The Interoperability structure of Interoperability IFD is the same as TIFF defined IFD structure but does not contain the image data characteristically compared with normal TIFF IFD.

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0xa20b	41483	Photo	Exif.Photo.FlashEnergy	Rational	Indicates the strobe energy at the time the image is captured, as measured in Beam Candle Power Seconds (BCPS).
0xa20c	41484	Photo	Exif.Photo.SpatialFrequencyResponse	Undefined	This tag records the camera or input device spatial frequency table and SFR values in the direction of image width, image height, and diagonal direction, as specified in ISO 12233.
0xa20e	41486	Photo	Exif.Photo.FocalPlaneXResolution	Rational	Indicates the number of pixels in the image width (X) direction per <FocalPlaneResolutionUnit> on the camera focal plane.
0xa20f	41487	Photo	Exif.Photo.FocalPlaneYResolution	Rational	Indicates the number of pixels in the image height (V) direction per <FocalPlaneResolutionUnit> on the camera focal plane.
0xa210	41488	Photo	Exif.Photo.FocalPlaneResolutionUnit	Short	Indicates the unit for measuring <FocalPlaneXResolution> and <FocalPlaneYResolution>. This value is the same as the <ResolutionUnit>.

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0xa214	41492	Photo	Exif.Photo.SubjectLocation	Short	Indicates the location of the main subject in the scene. The value of this tag represents the pixel at the center of the main subject relative to the left edge, prior to rotation processing as per the <Rotation> tag. The first value indicates the X column number and second indicates the Y row number.
0xa215	41493	Photo	Exif.Photo.ExposureIndex	Rational	Indicates the exposure index selected on the camera or input device at the time the image is captured.
0xa217	41495	Photo	Exif.Photo.SensingMethod	Short	Indicates the image sensor type on the camera or input device.
0xa300	41728	Photo	Exif.Photo.FileSource	Undefined	Indicates the image source. If a DSC recorded the image, this tag value of this tag always be set to 3, indicating that the image was recorded on a DSC.
0xa301	41729	Photo	Exif.Photo.SceneType	Undefined	Indicates the type of scene. If a DSC recorded the image, this tag value must always be set to 1, indicating that the image was directly photographed.

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0xa302	41730	Photo	Exif.Photo.CFAPattern	Undefined	Indicates the color filter array (CFA) geometric pattern of the image sensor when a one-chip color area sensor is used. It does not apply to all sensing methods.
0xa401	41985	Photo	Exif.Photo.CustomRendered	Short	This tag indicates the use of special processing on image data, such as rendering geared to output. When special processing is performed, the reader is expected to disable or minimize any further processing.
0xa402	41986	Photo	Exif.Photo.ExposureMode	Short	This tag indicates the exposure mode set when the image was shot. In auto-bracketing mode, the camera shoots a series of frames of the same scene at different exposure settings.
0xa403	41987	Photo	Exif.Photo.WhiteBalance	Short	This tag indicates the white balance mode set when the image was shot.
0xa404	41988	Photo	Exif.Photo.DigitalZoomRatio	Rational	This tag indicates the digital zoom ratio when the image was shot. If the numerator of the

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					recorded value is 0, this indicates that digital zoom was not used.
0xa405	41989	Photo	Exif.Photo.FocalLengthIn35mmFilm	Short	This tag indicates the equivalent focal length assuming a 35mm film camera, in mm. A value of 0 means the focal length is unknown. Note that this tag differs from the <FocalLength> tag.
0xa406	41990	Photo	Exif.Photo.SceneCaptureType	Short	This tag indicates the type of scene that was shot. It can also be used to record the mode in which the image was shot. Note that this differs from the <SceneType> tag.
0xa407	41991	Photo	Exif.Photo.GainControl	Short	This tag indicates the degree of overall image gain adjustment.
0xa408	41992	Photo	Exif.Photo.Contrast	Short	This tag indicates the direction of contrast processing applied by the camera when the image was shot.
0xa409	41993	Photo	Exif.Photo.Saturation	Short	This tag indicates the direction of saturation processing applied by the camera when the

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					image was shot.
0xa40a	41994	Photo	Exif.Photo.Sharpness	Short	This tag indicates the direction of sharpness processing applied by the camera when the image was shot.
0xa40b	41995	Photo	Exif.Photo.DeviceSettingDescription	Undefined	This tag indicates information on the picture-taking conditions of a particular camera model. The tag is used only to indicate the picture-taking conditions in the reader.
0xa40c	41996	Photo	Exif.Photo.SubjectDistanceRange	Short	This tag indicates the distance to the subject.
0xa420	42016	Photo	Exif.Photo.ImageUniqueID	Ascii	This tag indicates an identifier assigned uniquely to each image. It is recorded as an ASCII string equivalent to hexadecimal notation and 128-bit fixed length.
0xa430	42032	Photo	Exif.Photo.CameraOwnerName	Ascii	This tag records the owner of a camera used in photography as an ASCII string.
0xa431	42033	Photo	Exif.Photo.BodySerialNumber	Ascii	This tag records the serial number of the body of the

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					camera that was used in photography as an ASCII string.
0xa432	42034	Photo	Exif.Photo.LensSpecification	Rational	This tag notes minimum focal length, maximum focal length, minimum F number in the minimum focal length, and minimum F number in the maximum focal length, which are specification information for the lens that was used in photography. When the minimum F number is unknown, the notation is 0/0
0xa433	42035	Photo	Exif.Photo.LensMake	Ascii	This tag records the lens manufactor as an ASCII string.
0xa434	42036	Photo	Exif.Photo.LensModel	Ascii	This tag records the lens's model name and model number as an ASCII string.
0xa435	42037	Photo	Exif.Photo.LensSerialNumber	Ascii	This tag records the serial number of the interchangeable lens that was used in photography as an ASCII string.
0x0001	1	Iop	Exif.Iop.InteroperabilityIndex	Ascii	Indicates the identification of the Interoperability rule. Use "R98" for stating ExifR98 Rules.

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					Four bytes used including the termination code (NULL). see the separate volume of Recommended Exif Interoperability Rules (ExifR98) for other tags used for ExifR98.
0x0002	2	Iop	Exif.Iop.InteroperabilityVersion	Undefined	Interoperability version
0x1000	4096	Iop	Exif.Iop.RelatedImageFileFormat	Ascii	File format of image file
0x1001	4097	Iop	Exif.Iop.RelatedImageWidth	Long	Image width
0x1002	4098	Iop	Exif.Iop.RelatedImageLength	Long	Image height
0x0000	0	GPSInfo	Exif.GPSInfo.GPSVersionID	Byte	Indicates the version of <GPSInfoIFD>. The version is given as 2.0.0.0. This tag is mandatory when <GPSInfo> tag is present. (Note: The <GPSVersionID> tag is given in bytes, unlike the <ExifVersion> tag. When the version is 2.0.0.0, the tag value is 02000000.H).
0x0001	1	GPSInfo	Exif.GPSInfo.GPSLatitudeRef	Ascii	Indicates whether the latitude is north or south latitude. The ASCII value 'N' indicates north latitude, and 'S' is south

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					latitude.
0x0002	2	GPSInfo	Exif.GPSInfo.GPSLatitude	Rational	Indicates the latitude. The latitude is expressed as three RATIONAL values giving the degrees, minutes, and seconds, respectively. When degrees, minutes and seconds are expressed, the format is dd/1,mm/1,ss/1. When degrees and minutes are used and, for example, fractions of minutes are given up to two decimal places, the format is dd/1,mmmm/100,0/1.
0x0003	3	GPSInfo	Exif.GPSInfo.GPSLongitudeRef	Ascii	Indicates whether the longitude is east or west longitude. ASCII 'E' indicates east longitude, and 'W' is west longitude.
0x0004	4	GPSInfo	Exif.GPSInfo.GPSLongitude	Rational	Indicates the longitude. The longitude is expressed as three RATIONAL values giving the degrees, minutes, and seconds, respectively. When degrees, minutes and seconds are expressed, the format is ddd/1,mm/1,ss/1. When degrees and minutes are used

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					and, for example, fractions of minutes are given up to two decimal places, the format is ddd/1,mmmm/100,0/1.
0x0005	5	GPSInfo	Exif.GPSInfo.GPSAltitudeRef	Byte	Indicates the altitude used as the reference altitude. If the reference is sea level and the altitude is above sea level, 0 is given. If the altitude is below sea level, a value of 1 is given and the altitude is indicated as an absolute value in the GSPAltitude tag. The reference unit is meters. Note that this tag is BYTE type, unlike other reference tags.
0x0006	6	GPSInfo	Exif.GPSInfo.GPSAltitude	Rational	Indicates the altitude based on the reference in GPSAltitudeRef. Altitude is expressed as one RATIONAL value. The reference unit is meters.
0x0007	7	GPSInfo	Exif.GPSInfo.GPSTimeStamp	Rational	Indicates the time as UTC (Coordinated Universal Time). <TimeStamp> is expressed as three RATIONAL values giving the hour, minute, and second

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					(atomic clock).
0x0008	8	GPSInfo	Exif.GPSInfo.GPSSatellites	Ascii	Indicates the GPS satellites used for measurements. This tag can be used to describe the number of satellites, their ID number, angle of elevation, azimuth, SNR and other information in ASCII notation. The format is not specified. If the GPS receiver is incapable of taking measurements, value of the tag is set to NULL.
0x0009	9	GPSInfo	Exif.GPSInfo.GPSStatus	Ascii	Indicates the status of the GPS receiver when the image is recorded. "A" means measurement is in progress, and "V" means the measurement is Interoperability.
0x000a	10	GPSInfo	Exif.GPSInfo.GPSMeasureMode	Ascii	Indicates the GPS measurement mode. "2" means two-dimensional measurement and "3" means three-dimensional measurement is in progress.
0x000b	11	GPSInfo	Exif.GPSInfo.GPSDOP	Rational	Indicates the GPS DOP (data degree of precision). An HDOP

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					value is written during two-dimensional measurement, and PDOP during three-dimensional measurement.
0x000c	12	GPSInfo	Exif.GPSInfo.GPSSpeedRef	Ascii	Indicates the unit used to express the GPS receiver speed of movement. "K" "M" and "N" represents kilometers per hour, miles per hour, and knots.
0x000d	13	GPSInfo	Exif.GPSInfo.GPSSpeed	Rational	Indicates the speed of GPS receiver movement.
0x000e	14	GPSInfo	Exif.GPSInfo.GPSTrackRef	Ascii	Indicates the reference for giving the direction of GPS receiver movement. "T" denotes true direction and "M" is magnetic direction.
0x000f	15	GPSInfo	Exif.GPSInfo.GPSTrack	Rational	Indicates the direction of GPS receiver movement. The range of values is from 0.00 to 359.99.
0x0010	16	GPSInfo	Exif.GPSInfo.GPSImgDirectionRef	Ascii	Indicates the reference for giving the direction of the image when it is captured. "T" denotes true direction and "M" is

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					magnetic direction.
0x0011	17	GPSInfo	Exif.GPSInfo.GPSImgDirection	Rational	Indicates the direction of the image when it was captured. The range of values is from 0.00 to 359.99.
0x0012	18	GPSInfo	Exif.GPSInfo.GPSMapDatum	Ascii	Indicates the geodetic survey data used by the GPS receiver. If the survey data is restricted to Japan, the value of this tag is "TOKYO" or "WGS-84".
0x0013	19	GPSInfo	Exif.GPSInfo.GPSDestLatitudeRef	Ascii	Indicates whether the latitude of the destination point is north or south latitude. The ASCII value "N" indicates north latitude, and "S" is south latitude.
0x0014	20	GPSInfo	Exif.GPSInfo.GPSDestLatitude	Rational	Indicates the latitude of the destination point. The latitude is expressed as three RATIONAL values giving the degrees, minutes, and seconds, respectively. If latitude is expressed as degrees, minutes and seconds, a typical format would be dd/1,mm/1,ss/1. When degrees and minutes are used and, for example, fractions of

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					minutes are given up to two decimal places, the format would be dd/1,mmmm/100,0/1.
0x0015	21	GPSInfo	Exif.GPSInfo.GPSDestLongitudeRef	Ascii	Indicates whether the longitude of the destination point is east or west longitude. ASCII "E" indicates east longitude, and "W" is west longitude.
0x0016	22	GPSInfo	Exif.GPSInfo.GPSDestLongitude	Rational	Indicates the longitude of the destination point. The longitude is expressed as three RATIONAL values giving the degrees, minutes, and seconds, respectively. If longitude is expressed as degrees, minutes and seconds, a typical format would be ddd/1,mm/1,ss/1. When degrees and minutes are used and, for example, fractions of minutes are given up to two decimal places, the format would be ddd/1,mmmm/100,0/1.
0x0017	23	GPSInfo	Exif.GPSInfo.GPSDestBearingRef	Ascii	Indicates the reference used for giving the bearing to the destination point. "T" denotes true direction and "M" is

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					magnetic direction.
0x0018	24	GPSInfo	Exif.GPSInfo.GPSDestBearing	Rational	Indicates the bearing to the destination point. The range of values is from 0.00 to 359.99.
0x0019	25	GPSInfo	Exif.GPSInfo.GPSDestDistanceRef	Ascii	Indicates the unit used to express the distance to the destination point. "K", "M" and "N" represent kilometers, miles and knots.
0x001a	26	GPSInfo	Exif.GPSInfo.GPSDestDistance	Rational	Indicates the distance to the destination point.
0x001b	27	GPSInfo	Exif.GPSInfo.GPSProcessingMethod	Undefined	A character string recording the name of the method used for location finding. The first byte indicates the character code used, and this is followed by the name of the method.
0x001c	28	GPSInfo	Exif.GPSInfo.GPSAreaInformation	Undefined	A character string recording the name of the GPS area. The first byte indicates the character code used, and this is followed by the name of the GPS area.
0x001d	29	GPSInfo	Exif.GPSInfo.GPSDateStamp	Ascii	A character string recording date and time information

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					relative to UTC (Coordinated Universal Time). The format is "YYYY:MM:DD.".
0x001e	30	GPSInfo	Exif.GPSInfo.GPSDifferential	Short	Indicates whether differential correction is applied to the GPS receiver.

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