

Eastman Kodak Company JPEG File Implementation Guide

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Table of Contents

1. Introduction	4
1.1. Disclaimer.....	4
1.2. References	4
1.2.1. JFIF Specification	5
1.2.2. JEIDA Exif Specification	5
1.2.3. TIFF TM Revision 6.0	5
1.2.4. System Specifications for the Advanced Photo System	6
1.2.5. ISO/IEC 10918-1, JPEG Specification	6
1.3. Editorial Conventions	7
1.4. Revision History	7
2. Glossary	7
2.1. Metadata	7
2.2. DSC	7
3. The Composition of JPEG Image Files Written by Kodak Products	7
3.1. Optional JFIF APP0 Segment	10
3.2. Optional APP1 Exif Specific Application Segment	11
3.2.1. Optional Kodak Camera Info IFD Pointer	12
3.2.2. Thumbnail Images.....	12
3.2.2.1. Compressed Thumbnail Images	12
3.2.2.2. Uncompressed Thumbnail Images	13
3.3. Optional APP2 Segment	13
3.4. Optional APP3 Metadata Application Segment	14
3.4.1. APP3 0 th IFD Field Definitions	15
3.4.1.1. Metadata Version Number	16
3.4.1.2. Intended Print Area	16
3.4.1.3. Camera Owner ID	17
3.4.1.4. Camera Serial Num	18
3.4.1.5. Group Caption	18
3.4.1.6. Image Source	19
3.4.1.7. Scan Frame Sequence Number	20
3.4.1.8. Film Category	20
3.4.1.9. Film Size	21
3.4.1.10. Image Rotation Status	21
3.4.1.11. Reserved APP3 Tag Fields	22
3.4.1.12. Optional Kodak Special Effects IFD Pointer	22
3.4.1.13. Optional Kodak Borders IFD Pointer	23

List of Tables

Table 1	Structure of the Optional 18 Byte APP0.....	11
Table 2	Exif Performance and File Size Issues	11
Table 3	Print or Projected Image Area and Aspect Ratios for H, C and P Prints.....	16
Table 4	Character Codes and Designation.....	18
Table 5	Reserved APP3 Tag Fields.....	22

List of Figures

Figure 1	The Format of JPEG Image Files Written by Kodak Products	9
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1. Introduction

This Implementation Guide provides general guidelines for the format used by Kodak products to write JPEG image files. All of the JPEG image file names have the standard “.JPG” file extension. The format of data in the files uses the de-facto JFIF (JPEG File Interchange Format) and JEIDA Exif specifications. However, in addition, Kodak has expanded the Digital Still Camera centric characteristic of the Exif format for other imaging products by defining a new Application Segment that supports the storing of additional information, or metadata, associated with a digitized image.

Kodak encourages developers of JPEG readers and writers to make provisions for the following as you make use of this implementation guide:

- Maintain the metadata in the Application Segments, even if your application does not use the information.
- Do not reject an image file because it failed to strictly comply with an image file format specification. Every effort should be made to accept and process the image file.

The next release of this document may include detailed product specific information for new Digital Still Cameras and Kodak Picture CD. Comments and suggestion for the next release of this document can be made to the Kodak Developer Relations Group (DRG). The DRG can be contacted on the web at <http://www.kodak.com/go/drg> and selecting the “Contact Us” link on the left-hand side of the screen. Under the pull down menu that indicates the subject of your question please select "Comment on Kodak JPEG File Implementation Guide".

1.1. Disclaimer

Eastman Kodak Company reserves the right to change this information without notice, and makes no warranty, expressed or implied, with respect to this information. Kodak shall not be liable for any loss or damage, including consequential or special damages, resulting from the use of this information, even if loss or damage is caused by Kodak’s negligence or fault.

1.2. References

The specifications listed in this section are frequently referenced in this document. In order to make full use of the material in this document, we strongly recommend that you have access to the following specifications.

1.2.1. JFIF Specification

Title: JPEG File Interchange Format (JFIF)

Version: 1.02

Date: September 1, 1992

Author: Eric Hamilton, C-Cube Microsystems

Web Access: Document is available at

<http://icib.igd.fhg.de/icib/it/defacto/research/jfif/read.html#Titlepage>

1.2.2. JEIDA Exif Specification

Title: Japan Electronic Industry Development Association
Standard for Digital Still Camera Image File
Format Standard (Exchangeable image file format for
Digital Still Cameras: Exif)

Version: 2.1

Date: June 1998, last revision

Author: Japan Electronic Industry Development Association
(JEIDA)

Web Access: The document is only available as a paper copy
from JEIDA. Information on purchasing a copy
is available at

<http://www.jeida.or.jp/guide/book/index-e.html>

Note, early in 1999, PIMA (<http://www.pima.net/it10a.htm>) and JEIDA agree that PIMA will begin distributing the Exif specification in the US. Details not available as of 2/99.

1.2.3. TIFFTM Revision 6.0

Title: TIFF (Tagged Image File Format) Revision 6.0

Version: 6.0

Date: June 3, 1992

Author: Microsoft and Aldus, currently maintained by Adobe

Web Access: A PDF document is available at

<http://www.adobe.com/supportservice/devrelations/PDFS/TN/TIFF6.pdf>

1.2.4. System Specifications for the Advanced Photo System

Title: System Specifications for the Advanced Photo System

Version: Release 4.20

Date: 5/27/97

Authors: Canon Incorporated, Eastman Kodak Company,
Fuji Photo Film Company, Minolta Company,
and Nikon Corporation

Web Access: The System Specifications for the Advanced
Photo System (APS) is available on the web at

<http://www.kodak.com/global/en/consumer/APS/redBook/specsIndex.shtml>

The System Specifications for the Advanced Photo System is a technical definition of the System including, but not limited to, dimensional, operational, interface, and interoperability standards and requirements for products usable in the System.

These specifications are not confidential. However, compliance with them may require the use of inventions covered by patent rights.

The System Developing Companies (Canon, Inc., Eastman Kodak Company, Fuji Photo Film Co., Ltd., Minolta Camera Co., Ltd., and Nikon Corporation) offer royalty-bearing licenses for the manufacture, use, and sale of Licensed Products, including Cameras, Film/Cartridges, and Image Making Devices to the extent necessary to enable Licensed Products to interface and interact with one another. Image Making Devices include Photofinishing Equipment, Peripheral Devices, and devices that assist Photofinishing Equipment, Peripheral Devices, or both. The initial fee required to enter into these Licenses varies, depending on License type, between \$20,000 and \$100,000.

1.2.5. ISO/IEC 10918-1, JPEG Specification

Title: Information technology - Digital compression and coding
of continuous-tone still images: Requirements and
guidelines, Reference number ISO/IEC 10918-1:1994(E)

Version: 1

Date: 2/15/94

Author: CCIT Study Group VIII and the Joint Photographic Experts
Group (JPEG) of ISO/IEC JTC 1/SC 29/WG 10

Web Access: Document is available from Global Engineering
Documents. Global Engineering Documents web site is
<http://global.ihs.com/>

1.3. Editorial Conventions

Certain words and terms used in this document have a specific meaning beyond the common English meaning. These words and terms are defined in the glossary or in the text where they first appear. Names of variable types, conditions and statuses appear in upper case. Lower case is used for words having the normal English meaning.

1.4. Revision History

Version	Date	Comments
.9	02/05/99	Initial review copy
.95	02/10/99	Review release 2.0
1.0	03/17/99	Release 1.0

2. Glossary

2.1. Metadata

Related attribute information that describes characteristics of both compressed and uncompressed image files. The format of this data is typically stored as tag information. The tag format matches that of Revision 6.0 of TIFF.

2.2. DSC

Digital Still Camera.

3. The Composition of JPEG Image Files Written by Kodak Products

The organization of the data in a JPEG image file is defined in Figure 1, The Format of JPEG Image Files Written by Kodak Products. The file format utilizes the concepts that are presented in the public JPEG, JFIF, Exif and TIFF specifications. Additionally, Kodak has expanded the Digital Still Camera centric characteristics of Exif specification by defining an APP3 Application Segment that provides additional information, or metadata, about the digitized image.

A JPEG image file is a collection of parameters, Segments and compressed image data segments defined in Annex B of the JPEG ISO Standard. The JFIF and Exif standards work within the base line constraints defined in the JPEG ISO standard to produce image files that have exceptional interoperability for the compressed image bitstream. The imaging industry's next step requires the expansion of this interoperability to include the metadata associated with the compressed image bitstreams. To that end, Exif-capable readers and writers have developed means for applications to gain access to the metadata or tag data associated with a compressed image bitstream.

The remainder of this section is divided into four subsections that address the four types of application segments: APP0, APP1, APP2 and APP3. Application segments are important components of a Kodak JPEG image file. The titles of each of these four sections use the word Optional. This is because Kodak has a wide variety of imaging products that create JPEG image files. Therefore one cannot expect to find every item defined in this document in every JPEG image file.

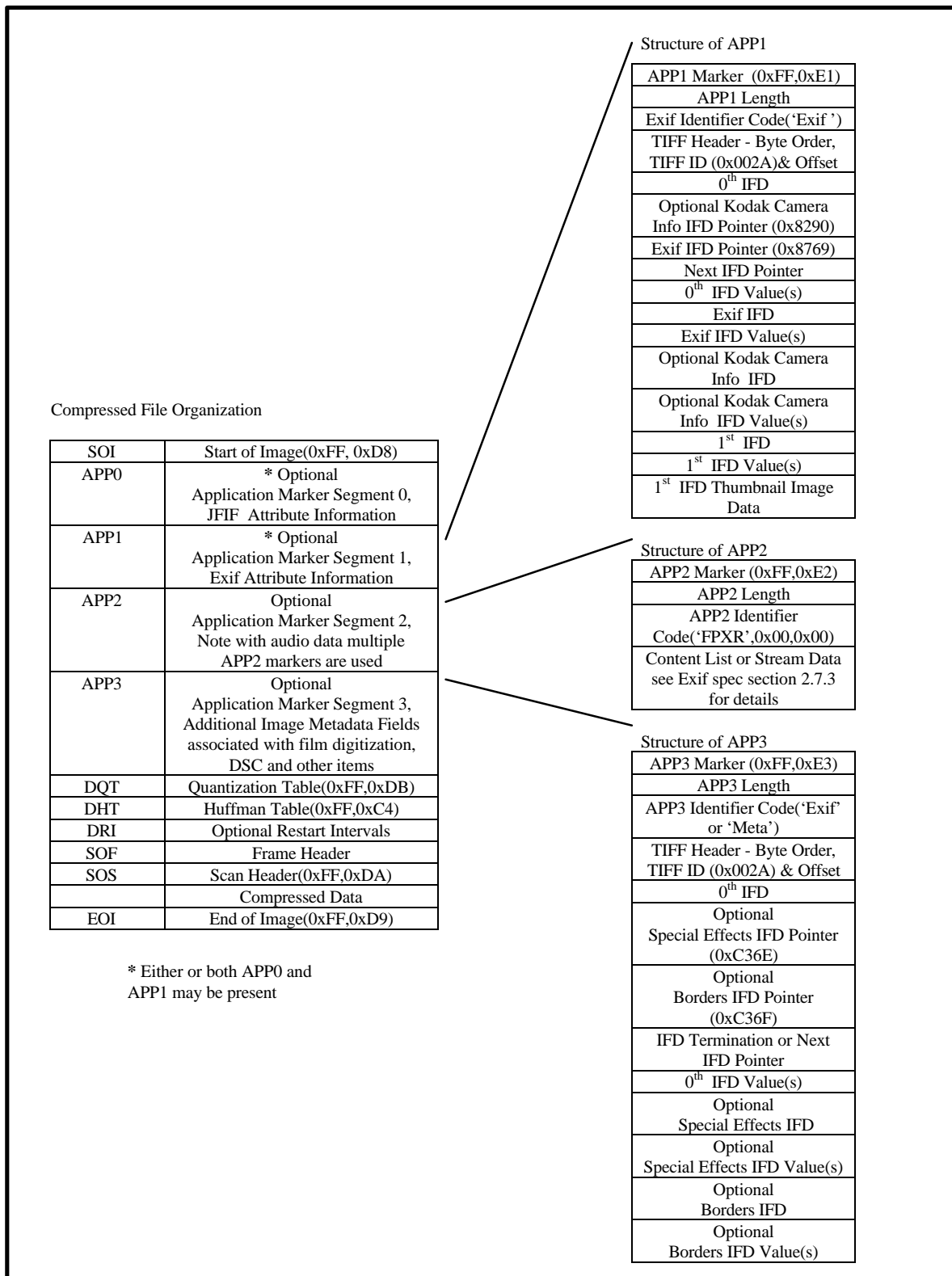


Figure 1 The Format of JPEG Image Files Written by Kodak Products

3.1. Optional JFIF APP0 Segment

The APP0 segment is defined in the JPEG File Interchange Format (JFIF) specification. See section 1.2.1 of this document.

Kodak products create two types of JPEG image files that contain the APP0 segment:

- First type** The first type of image file uses a mandatory APP0 segment conforming to the JFIF specification to define the format of the data in the file.
- Second type** The second type of image file contains an optional APP0 JFIF segment followed by additional Application Segments (APP1, APP3). In this type of JPEG file, the APP0 Segment provides a minimal amount of functionality to the compressed image bitstreams. The optional 18 byte APP0 segment, see Table 1, was placed in a JPEG Exif image file to remove a performance and file size problem. This problem occurred when a very popular software application inserted an Exif image into a document.

Table 2, Exif Performance and File Size Issues, highlights the performance issues and the effect of inserting an APP0 Segment into an Exif JPEG image file. The software vendor made a fix available for the problem. The future need for the APP0 segment is therefore questionable. However, the APP0 segment will initially be present to solve the performance and file size problem for users that do not have the most current version of the word processing software.

Table 1 Structure of the Optional 18 Byte APP0

Field Definition	Default Contents
APP0 Application Marker	0xFF,0xE0
Length - Total APP0 field byte count, including the byte count value (2 bytes), but excluding the APP0 marker itself	0x0010
Identifier - This zero terminated string ("JFIF") uniquely identifies this APP0 marker. This string shall have zero parity (bit 7=0).	0x4A, 0x46, 0x49, 0x46, 0x00
Version - The most significant byte is used for major revisions, the least significant byte for minor revisions. Version 1.02 is the current released revision.	0x0102
Units - Units for the X and Y densities.	0x00
Xdensity - Horizontal pixel density	0x0001
Ydensity - Vertical pixel density	0x0001
Xthumbnail - Thumbnail horizontal pixel count	0x00
Ythumbnail - Thumbnail vertical pixel count	0x00

Table 2 Exif Performance and File Size Issues

Image Resolution	Image File Type	Approximate Time in Seconds, to Insert an Image into a Document (166MHz Pentium PC)	Image File Size (Bytes)	Document File Size After Image is Inserted (Bytes)
640x480	Exif	15	132,011	550,400
640x480	Exif with APP0 inserted	3	132,029	153,088
1280x1024	Exif	52	657,964	2,262,528
1280x1024	JFIF	5	920,402	947,712

3.2. Optional APP1 Exif Specific Application Segment

The general structure of the APP1 data elements are defined in Figure 1, The Format of JPEG Image Files Written by Kodak Products. The format and definitions of the APP1 metadata are well defined in the Exif specification. This metadata about the digital image is important to the end users of the compressed image streams.

An example of the importance of metadata is found in the expectations new users of digital imaging technology have that the scanned reflective print will look the same as the original when displayed on a monitor, or when output to a printer. They are disappointed when it does not. The metadata defined in APP1 begins to provide the information necessary for an application to better manage and display digital images on the desktop. The data also provides opportunity for using new aspects of digital imaging, such as audio sound.

3.2.1. Optional Kodak Camera Info IFD Pointer

Within the APP1 0th IFD, Kodak has defined the Camera Info IFD Pointer. The Kodak Camera Info IFD Pointer has a value of 33424 or 0x8290 and provides access to various hardware specific ancillary data depending on the camera model. At this time further detailed definition of the ancillary data will not be provided.

3.2.2. Thumbnail Images

The thumbnail data for a compressed JPEG image stream may be recorded in an image file as uncompressed or compressed data. It is important to note that if the thumbnail data is extracted from an image file it can be decoded and displayed using a standard JPEG reader if it is compressed or a standard TIFF reader if it is uncompressed.

3.2.2.1. Compressed Thumbnail Images

The compressed thumbnail stored in a JPEG image file uses the Exif-specific recording method. The Exif specification uses the following tags in the 1st IFD to record the compressed thumbnail image:

- The Compression tag (259 or 0x0103) is recorded with a value set to “6”.
- The JPEGInterchangeFormat tag (513 or 0x0201) designates the location of the thumbnail image data in the application segment
- The JPEGInterchangeFormatLength tag (514 or 0x0202) designates the size of the thumbnail image.

The compressed thumbnail image data is recorded at the designated location as a JPEG stream, from the Start of Image (SOI) to the End of Image (EOI) conforming to the JPEG Baseline DCT format. The JPEG thumbnail image stream does not contain Application Markers, COM Markers or Restart Markers.

3.2.2.2.Uncompressed Thumbnail Images

An uncompressed thumbnail image data is recorded in the 1st IFD in conformance with Baseline TIFF Rev. 6.0 RGB Full Color Image or TIFF Rev. 6.0 Extensions YCbCr Image.

3.3. Optional APP2 Segment

In Kodak JPEG files optional APP2 segments may be used to store a JPEG image stream that is a LCD (Liquid Crystal Display) display sized screenail (enlarged thumbnail) and audio data. The Exif specification Section 2.7.3, Interoperability Structure of APP2 in Compressed Data, contains a detailed description of the data structures used to store information in the APP2 segment.

The APP2 segments are arranged as follows. The first APP2 segments defines a contents list. The contents list data structure defines the total number of entries for the list. For each entry in the list there is specific information. The specific information for each entry includes the size, default value, storage or stream name and an optional Class ID.

The contents list also creates an implied index value for each entry; the first entry has an index of zero and increments to the total number of entries minus one. The subsequent APP2 segments use the index value to define stream data for the entries defined in the contents list.

For example, if an application wants to extract audio data from the APP2 segment fields it identifies the APP2 segment with a contents list. The contents list is then interrogated to find a storage or stream name that contains 'Audio Stream'(0x41,0x00,0x75,0x00,0x64,0x00,0x69,0x00,0x6F,0x00,0x20,0x00,0x53,0x00,0x74,0x00,0x72,0x00,0x65,0x00,0x61,0x00,0x6D,0x00).

It is important to note that the storage or stream names contain other characters and all of the characters are 16 bit Unicode. The index value of the entry that

contains the name 'Audio Stream' is used to find the APP2 segment that contains the Stream Data for the audio content. The audio content is a finished wav file. The first eight bytes of the wav file contain the following information; 'RIFF' (0x52,0x49,0x46,0x46) followed by a 4-byte field that defines the size of the wav file. An Application segment has a size limited of 64K bytes. If the sound data exceeds 64K then the audio data is continued in the next APP2 segment with the same index value. For more details concerning the format of the audio data in APP2 segment see section 3.5, Basic Structure of Audio Data, in the Exif Specification.

3.4. Optional APP3 Metadata Application Segment

The APP3 segment may include additional information that is relevant to the conversion of film to a digital image file.

The APP3 segment has the following organization:

Bytes 0-1	APP3 Marker (0xFF,0xE3)
Bytes 2-3	Length – Total APP3 field byte count, including the byte count value (2 bytes), but excluding the APP3 marker itself.
Bytes 4-9	Identifier – This zero terminated and padded string ("Meta",0x00,0x00 or "Exif,"0x00,0x00) that identifies the APP3 segment.
Bytes 10-11	Byte Order - Byte Order written as either "II" (0x49, 0x49) (little endian) or "MM" (0x4D, 0x4D) (big endian)
Bytes 12-13	TIFF Identifier (42 or 0x2A)
Bytes 14-17	Offset to APP3 0 th IFD. The offset is from the start of the TIFF header(Byte Order, TIFF Identifier(42)) to the position where the APP3 0 th IFD is recorded.

3.4.1. APP3 0th IFD Field Definitions

This section of the document defines the fields that may be present in APP3's 0th IFD.

The 12 byte IFD entry has the following format, which follows the TIFF 6.0 specification:

Before the first 12 byte IFD record there is a 2 byte count field that records the number of 12 byte IFD fields that are present.

Bytes 0-1	Tag Field.
Bytes 2-3	Type Field, has the following enumeration: 1 = BYTE 8-bit unsigned integer. 2 = ASCII 8-bit byte that contains a 7-bit ASCII code; the last byte must be NUL (binary zero). 3 = SHORT 16-bit (2-byte) unsigned integer. 4 = LONG 32-bit (4-byte) unsigned integer. 5 = RATIONAL Two LONGs: the first represents the numerator of a fraction; the second, the denominator. 6 = SBYTE An 8-bit signed (twos-complement) integer. 7 = UNDEFINED An 8-bit byte that can take any value depending on the field definition, 8 = SSHORT A 16-bit (2-byte) signed (twos-complement) integer. 9 = SLONG A 32-bit (4-byte) signed integer (2's complement notation), 10 = SRATIONAL Two SLONGs. The first SLONG is the numerator and the second SLONG is the denominator. 11 = FLOAT Single precision (4-byte) IEEE format. 12 = DOUBLE Double precision (8-byte) IEEE format.
Bytes 4-7	Count Field identifies the number of values of the indicated Type.
Bytes 8-11	Value / Offset Field identifies the Value if it fits into 4 bytes or the Offset to the data. The offset is from the start of the TIFF header (Byte Order, TIFF Identifier(42)) to the position where the value itself is recorded. In cases where the value fits in 4 bytes, the value itself is recorded. If the value is smaller than 4 bytes, the value is stored in the 4-byte area starting from the left, i.e., from the lower end of

the byte offset area. For example, in big endian format, if the type is SHORT and the value is 1, it is recorded as 00010000.H.

The last four bytes of the group of IFD fields will contain an offset to the next IFD or it will terminate with a 0x00000000.

3.4.1.1.Metadata Version Number

The first version of APP3 metadata is designated by “0100” as 4-byte ASCII. Since the type is UNDEFINED, there is no NULL for termination.

Tag Field	=	50021
Type Field	=	UNDEFINED
Count Field	=	4
Default	=	“0100”

3.4.1.2.Intended Print Area

This field is used to record a flag which indicates information about the intended print or projected image area. The flag values 0-3 are defined below and values 1-3 correspond to the Print Aspect Ratio (PAR) field defined in the System Specifications for the Advanced Photo System (APS), referenced in Section 1.2.4. of this document. In an APS camera, every exposed frame of film is the same size, 30.2 x 16.7 mm. For each exposed frame, an APS camera allows the user to select one of the three defined print or projected image areas. Table 3 summarizes the aspect ratio and the dimensions of the negative area used to print or display an image.

Table 3 Print or Projected Image Area and Aspect Ratios for H, C and P Prints

APS Print or Display Setting	Aspect Ratio Width : Height	Width about the center of the exposed image area(mm)	Height about the center of the exposed image area(mm)
Exposed Image Area		30.2	16.7
H	~16: 9	27.4	15.6
P	~3:1	27.4	9.6
C	~3:2	22.3	15.6

The aspect ratio is a proportional measurement of an image based on the vertical height and horizontal width. For example, an image with an aspect ratio of 16:9 (Width : Height) has a horizontal width that is equal to 16/9 of the vertical height. To display the intended print or projected area you may use the aspect ratio and the following tags from 0th IFD of APP1:

- Xresolution, tag 282(0x11A), image resolution in the width direction
- Yresolution, tag 283(0x11B), image resolution in the height direction and
- ResolutionUnit, tag 296(0x128), units of X and Y resolution

Tag Field	=	50002
Type Field	=	SHORT
Count Field	=	1
Value / Offset Field	=	Intended Print Area Flag

The value of the Intended Print Area Flag has the following enumeration:

- 0 = the complete image area is displayed
- 1 = APS printed or projected image area, H print(HDTV aspect ratio of ~16:9)
- 2 = APS printed or projected image area, P print(Panoramic aspect ratio of ~3:1)
- 3 = APS printed or projected image area, C print(Classic aspect ratio of ~3:2)
- 4 - 65535 = Reserved for future definition

Note, if the value of this field cannot be interpreted, assume that the complete image area will be displayed.

3.4.1.3.Camera Owner ID

This field contains a string which records the camera owner ID. The Camera Owner ID definition is based on the Camera Owner ID definition in section 10.4.7.3 of the System Specifications for the Advanced Photo System (APS), referenced in Section 1.2.4. of this document. The first 8-bytes of the data stream contain the character code designation as defined in Table 4. Unused portions of the 8 byte area are padded with NULL ("00.H"). For Kodak implementations, the character code for this string shall be Unicode.

The string containing the Camera Owner ID shall immediately follow the first 8 bytes of the data stream. The string is not NULL terminated. The value of count is determined based on the fixed 8 byte character code area and the number of bytes in the camera owner ID string.

Tag Field = 50003
 Type Field = UNDEFINED
 Count Field = Any

Table 4 Character Codes and Designation

Character Code	Code Designation (8 Bytes)	References
ASCII	41H, 53H, 43H, 49H, 49H, 00H, 00H, 00H	ITU-T T.50 IA5 ^{ix}
JIS	4AH, 49H, 53H, 00H, 00H, 00H, 00H, 00H	JIS X0208-1990 ^x
Unicode	55H, 4EH, 49H, 43H, 4FH, 44H, 45H, 00H	Unicode Standard ^{xi}
Undefined	00H, 00H, 00H, 00H, 00H, 00H, 00H, 00H	Undefined

3.4.1.4.Camera Serial Num

This field contains a string which records the camera serial number. The Camera Serial Num definition is based on the Camera Serial Number definition in section 10.4.7.4 of the System Specifications for the Advanced Photo System (APS), referenced in Section 1.2.4. of this document. The first 8-bytes of the data stream contain the character code designation as defined in Table 4 . Unused portions of the 8 byte area are padded with NULL (“00.H”). For Kodak implementations, the character code for this string shall be Unicode. The string containing the Camera Serial Number shall immediately follow the first 8 bytes of the data stream. The string is not NULL terminated. The value of count is determined based on the fixed 8 byte character code area and the number of bytes in the camera serial number string. The Camera

Tag Field = 50004
 Type Field = UNDEFINED
 Count Field = Any

3.4.1.5.Group Caption

This field contains a string that records comments that relate to a group of pictures (i.e. the title of the roll of film). The Group

Caption definition is based on the User Select Filmstrip Title definition in section 10.4.7.2 of the System Specifications for the Advanced Photo System (APS), referenced in Section 1.2.4. of this document. The first 8-bytes of the data stream contain the character code designation as defined in Table 4. Unused portions of the 8 byte area are padded with NULL ("00.H"). For Kodak implementations, the character code for this string shall be Unicode. The string containing the group caption shall immediately follow the first 8 bytes of the data stream. The string is not NULL terminated. The value of count is determined based on the fixed 8 byte character code area and the number of bytes in the group caption string.

Tag Field	=	50005
Type Field	=	UNDEFINED
Count Field	=	Any

Note, Kodak products will use two-byte character codes to store keywords or comments. For example, the User Comment field (Tag ID 37510, 0x9286) in the Exif IFD of APP1 shall store individual frame keywords or comments.

3.4.1.6. Image Source

The Image Source Flag specifies the device source of the digitized image.

Tag Field	=	50001
Type Field	=	SHORT
Count Field	=	1
Value / Offset Field	=	Image Source Flag

The Image Source Flag has the following enumeration:

- 0 = unidentified
- 1 = film scanner
- 2 = reflection print scanner
- 3 = digital camera
- 4 = still from video
- 5 = computer graphics
- 6 - 65535 = Reserved for future definition

Note, if the source of the image is a Digital Still Camera and the Camera sets the Exif File Source field in 0th IFD of APP1, then this field shall be omitted.

3.4.1.7. Scan Frame Sequence Number

This field contains the sequence number of the frame as it was scanned (i.e. 1,2,3, etc.). For scans of APS film, this field will contain the frame number that is decoded from the film's latent image barcode.

Tag Field	=	50009
Type Field	=	SHORT
Count Field	=	1
Value / Offset Field	=	Scan Frame Sequence Number

3.4.1.8. Film Category

This field is used to record the Film Category Flag that records the category of the film used.

Tag Field	=	50010
Type Field	=	SHORT
Count Field	=	1
Value / Offset Field	=	Film Category Flag

The Film Category Flag has the following enumeration:

0 =	unidentified
1 =	Negative B&W
2 =	Negative color
3 =	Reversal B&W
4 =	Reversal Color

Note, if the field is omitted it should be assumed that the Film Category is unidentified.

3.4.1.9.Film Size

This field is used to record the Film Size Flag that records the size of the film.

Tag Field	=	50013
Type Field	=	SHORT
Count Field	=	1
Value / Offset Field	=	Film Size Flag

The Film Size Flag has the following enumeration:

0	=	135 (35 mm)
1	=	124 (APS)
2 - 65535	=	Unidentified and reserved for future definition

3.4.1.10.Image Rotation Status

This field is used to record the Image Rotation Status Flag that indicates what triggered the system to rotate the image from the orientation of the original scan.

Tag Field	=	50019
Type Field	=	SHORT
Count Field	=	1
Value / Offset Field	=	Image Rotation Flag

The Image Rotation Flag has the following enumeration:

0	=	image not rotated
1	=	rotated based on user input (i. e. Scan operator)
2	=	rotated based on customer direction
3	=	rotated based on an algorithm input
4-254	=	reserved for future definition
255	=	unknown reason
256 - 65535	=	reserved for future definition

3.4.1.11.Reserved APP3 Tag Fields

The reserved APP3 tag fields are defined in Table 5. These fields may be present in an image file but their definition and continued use is currently in question. Therefore the fields are considered to be reserved for future definition and may contain non zero data.

Table 5 Reserved APP3 Tag Fields

Tag Field	Status
50000	Reserved for Future Definition
50006	Reserved for Future Definition
50007	Reserved for Future Definition
50008	Reserved for Future Definition
50011	Reserved for Future Definition
50012	Reserved for Future Definition
50014	Reserved for future definition or removal
50015	Reserved for future definition or removal
50016	Reserved for future definition or removal
50017	Reserved for future definition or removal
50018	Reserved for future definition or removal
50020	Reserved for Future Definition

3.4.1.12.Optional Kodak Special Effects IFD Pointer

This field contains a pointer to the Digital Special Effects IFD tags.

Tag Field	=	50030
Type Field	=	LONG
Count Field	=	1
Offset/Value	=	Offset pointer to the Effects IFD Tag(s)

Note, as of the release date of this document the detailed tag descriptions were not available. A future version of this document may provide definitions for the tags.

3.4.1.13.Optional Kodak Borders IFD Pointer

This field contains a pointer to the Border/Template/Watermark IFD tags.

Tag Field	=	50031
Type Field	=	LONG
Count Field	=	1
Offset / Value Field	=	Offset pointer to Kodak Borders IFD Tag(s)

As of the release date of this document the detailed tag descriptions were not available. A future version of this document may provide definitions for the tags.