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# **General Purpose Stereoscopic Data Descriptor**

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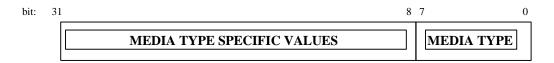
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### **Overview**

This document defines a set of values which represent the stereoscopic attributes of a data file. Together, these values comprise a descriptor which is embedded in a stereoscopic file. By incorporating a common descriptor, an application can write a stereo data file in a manner that is most efficient for displaying on the targeted viewing device (i.e. interleaved for interlaced displays, side-by-side for page flipped). Other applications simply read the descriptor and load the file in the appropriate manner. For existing files, the descriptor can be inserted without disturbing the original contents of the file.

# **Stereoscopic Descriptor**

A stereoscopic descriptor, (regardless of the file format) will always include the following 32-bit value which will sufficiently describe the stereoscopic attributes of the data file. The first 16 bits of the descriptor will describe the media type of the file. The next 16 bits are specific to the media type and will be defined the in section that describes the media type.



Depending on the media type, a descriptor may require additional data. Any additional data will immediately follow this 32-bit value. Currently there is no additional data defined.

## **Media Types**

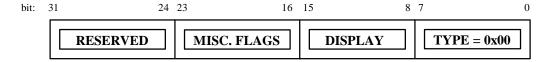
Currently there are 2 media types defined:

SD\_MTYPE\_MONOSCOPIC\_IMAGE 0x00 SD\_MTYPE\_STEREOSCOPIC\_IMAGE 0x01

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# ${\bf Media\ Type-SD\_MTYPE\_MONOSCOPIC\_IMAGE}$

A file with this media type is a monoscopic image. The stereoscopic descriptor is defined as follows:



### DISPLAY (bits 8-15)

SD_EYE_BOTH	0x00	display the same image in both eyes.
SD_EYE_LEFT	0x01	display the image in the left eye only.
SD_EYE_RIGHT	0x02	display the image in the right eye only

### MISC. FLAGS (bits 16-23)

HEIGHT BIT	bit 16	0: image data is full height
		1: image data is half height
WIDTH BIT	bit 17	0: image data is full width
		1: image data is half width

**RESERVED** (bits 24-31)

Reserved. Should be 0x00

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# ${\bf Media\ Type-SD\_MTYPE\_STEREOSCOPIC\_IMAGE}$

A file with this media type is a stereoscopic image whose stereoscopic descriptor is defined as follows:

### LAYOUT (bits 8-15)

SD_LAYOUT_INTERLEAVED	0x01	image data is in an alternating line format
SD_LAYOUT_SIDEBYSIDE	0x02	image data is in a side by side format
SD_LAYOUT_OVERUNDER	0x03	image data is in an over under format
SD_LAYOUT_ANAGLYPH	0x04	image data is in an anaglyph format

### MISC FLAGS (bits 16-23, these individual bits should be set accordingly)

HEIGHT BIT	bit 16	0: image data is full height
		1: image data is half height
WIDTH BIT	bit 17	0: image data is full height
		1: image data is half height
FIELD ORDER BIT	bit 18	0: right field first (topmost or leftmost)
		1: left field first (topmost or leftmost)
		if layout is SD_LAYOUT_ANAGLYPH:
		0: red field, right eye
		1: red field, left eye

### SEPARATION (bits 24-32)

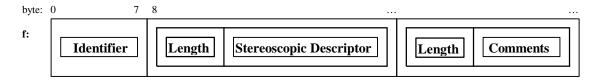
An unsigned 8-bit value that specifies the separation (in pixels) between the left and right fields in the image file. Typically this will be 0x00, although some systems may write images that contain a non-zero separation. Interpretation of this value is dependent on the media type:

SD_LAYOUT_INTERLEAVED	Value is undefined: readers, ignore; writers write 0x00
SD_LAYOUT_SIDEBYSIDE	Value defines horizontal separation between the two fields
SD_LAYOUT_OVERUNDER	Value defines vertical separation between the two fields
SD_LAYOUT_ANAGLYPH	Value is undefined: readers, ignore; writers write 0x00

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### **Stereoscopic Descriptor for JPEG**

A stereoscopic descriptor for a JPEG file is implemented as a JPEG marker. The APP3 marker is used for this descriptor. The descriptor for a JPEG consists of 3 blocks: Identifier, Descriptor, and Comments. The Identifier is always a fixed length (8 bytes). The Descriptor and Comments blocks can be a variable length and are preceded by a 16-bit value that indicates the length of the block.



**Identifier**: A unique identifier used to distinguish this APP3 marker as a stereoscopic

descriptor. These 8 bytes should always be "\_JPSJPS\_"

(0x5F,0x4A,0x50,0x53,0x4A,0x50,0x53,0x5F).

**Length:** 16 bit value that determines the length of a block. This value should be written Most

Significant Byte first.

**Stereo Descriptor**: At least 4 bytes which contain the 32-bit stereoscopic descriptor previously defined.

This 32-bit value should be written Most Significant Byte first. In some cases,

additional data may follow. Currently no additional data is defined.

**Comments:** Optional, application specific, comments. Should be an ASCII string.

### **Notes**

• A JPEG file that contains this descriptor should have an extension ".jps"

• A JPEG marker is limited to 65533 bytes. An application should limit the size of the Comments block accordingly.

# **Assumptions**

If a JPEG file is thought to contain a stereo image, but a stereoscopic descriptor is not present, an application should assume the layout of the stereo image to be: Side-by-Side, Full Height, Right Field First.

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```
#ifndef __SDFLAGS_H__
#define __SDFLAGS_H__
* sdflags.h -- general purpose stereoscopic descriptor
* MEDIA TYPE
#define SD_MTYPE_MONOSCOPIC_IMAGE 0x00
#define SD_MTYPE_STEREOSCOPIC_IMAGE 0x01
 * LAYOUT options
#define SD_LAYOUT_INTERLEAVED 0x0100
#define SD_LAYOUT_SIDEBYSIDE 0x0200
#define SD_LAYOUT_OVERUNDER 0x0300
#define SD_LAYOUT_ANAGLYPH 0x0400
 * MISC FLAGS bits
                           0x000000
0x010000
0x000000
#define SD FULL HEIGHT
#define SD_HALF_HEIGHT
#define SD_FULL_WIDTH
#define SD_HALF_WIDTH
                                    0x000000
                                    0x020000
#define SD_HALF_WIDTH 0x020000

#define SD_RIGHT_FIELD_FIRST 0x000000

#define SD_LEFT_FIELD_FIRST 0x040000
 * handy macros
#define FIELD_SEPARATION(f) f & 0xFF000000
 * defaults
 #define SD JPS DEFAULT SD MTYPE STEREOSCOPIC IMAGE
                                       SD LAYOUT SIDEBYSIDE
                                             SD_FULL_HEIGHT
                                       SD RIGHT FIELD FIRST
 * defines for SD_MTYPE_MONOSCOPIC_IMAGE
 #define SD_EYE_BOTH 0x0000
#define SD_EYE_LEFT 0x0100
#define SD_EYE_RIGHT 0x0200
#endif /* __SDFLAGS_H__ */
```

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