

Panasonic HD Writer AE File Formats

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Panasonic HD Writer AE File Formats

Filename extensions *.cont, *.iis, *.mtv, *.tmb and *.pmpd

This documentation is based on own research and the sources listed in the references section.

HD Writer AE is a program from Panasonic (see [1] - [4]) that comes with their Digital Video Cameras which use the AVCHD recording format.

AVCHD was developed by Sony and Panasonic (see [5] and [7]).

When you use HD Writer AE to copy scenes from your camera to your PC, the result is a separate directory for each day, containing all scenes shot on this day.

Each directory contains a single Video.cont file, plus the files for the individual scenes. Each scene consists of files named like <year><month><day>_<hour><minute><second>.*. The one with the extension *.m2ts is the actual video file (using MPEG2 Transport Stream as container format, see [6]). But then there are *.cont, *.iis, and *.tmb files.

HD Writer AE 2.0 generates an *.pmpd file instead of an *.iis file.

When converting a recording to MPEG2 video format, the result is the actual video file (*.mpg) plus a *.mtv file.

Content (*.cont) File Format

All values are in little-endian („Intel“) byte order.

In the following text, Offset means absolute offset within the file, +Offset means offset relative to the beginning of the section or structure.

General file structure

The file consists of the following parts:

Header, Section Table, Sections

Header

Offset	Type	Content
0x00	wchar / char	Signature = L"P_Cont_" + <LF> + "Cont" + <LF> + <LF> + \0 + \0 + \0 In hex: 50 00 5F 00 43 00 6F 00 6E 00 74 00 5F 00 0A 43 6F 6E 74 0A 0A 00 00 00
0x18	byte[7]	? =00 10 01 00 00 00 00
0x1F	byte	1 = Scene 2 = Directory (Video.cont) While the structure is the same, there are big differences in what optional parts and which values are contained, depending on this value.

Section Table

Offset	Type	Content
0x20	ushort	Number of sections
Number of sections times:		
+0x0	uint	Section type 1 = Creator 2 = Title 3 = ?? 4 = ?? 5 = Stream files 6 = Meta files 7 = Comment 10 = ?? (HD Writer AE 2.0) 11 = Software used to convert (HD Writer AE 2.0 when writing MPEG2)
+0x4	uint	Offset of section (from beginning of file)

Sections usually appear in ascending order of section type. Each section type may only appear once.

A *.cont file for a scene consists of sections of type ..

HD Writer AE 1.0: 1, 2, 3 (only present if not modified by HD Writer AE since copying from the camera), 5, 6, and 7 (optional).

HD Writer AE 2.0: 1, 2, 5, 6, 7 (optional), and 10 or 11

A Video.cont file for a directory consists of sections of type 1, 4, and 5.

Section type 1: Creator

+Offset	Type	Content
0x000	ContTime	Recording time (probably local time)
0x010	ContTime	Recording time - 1h (probably UTC)

The following shows the content for a scene. For a directory, all of these fields are 0.

0x020	ContTime	Last modify time
0x030	ContTime	Creation time
0x040	ulong	Size of the scene in byte (sum over the sizes of all stream files)
0x048	ulong	Duration in 100 ns units (just like FILETIME)
0x050	ulong	? =0
0x058	uint	? Value seen 9253726 (0x008D335E), 12784417 (0x00C31321), 18000000 (0x0112A880)
0x05C	ushort	? Values seen 0, 1
0x05E	ushort	? Values seen 0x0100, 0x0200
0x060	ulong	? Values seen 0, 1 (HD Writer AE 2.0: 32, 33)
0x068	uint	Resolution X (in pixel, e.g. 1920)
0x06C	uint	Resolution Y (in pixel, e.g. 1080)
0x070	uint	Aspect ratio X (e.g. 16)
0x074	uint	Aspect ratio Y (e.g. 9)
0x078	uint	Frame rate (in frames / s, e.g. 25)
0x07C	uint	? =1
0x080	ushort	? Values seen 0x0080, 0x0100
0x082	ushort	? Value seen 0x1100
0x084	uint	? Value seen 1
0x088	uint	Audio bit rate (in bit / s, e.g. 384000)

0x08C	ushort	Bits per sample (e.g. 16)
0x08E	ushort	Audio channels 2 = Stereo 3 = 5.1 Surround
0x090	uint	Sampling frequency (in Hz, e.g. 48000)
0x094	ushort	? Value seen 4
0x096	ushort	? Value seen 0x2100
0x098	wchar[128]	Manufacturer (wide char, terminated with 0, remaining space filled with 0, e.g. L"Panasonic")
0x198	wchar[128]	Model (several wide char strings, each terminated with 0, remaining space filled with 0) Values seen: As recorded = L"01", L"HDC-SD20", L"0", L"0"; after modification with HD Writer AE = L"04", L"HD Writer AE 1.0", L"01", L"00"

ContTime structure

+Offset	Type	Content
0x0	ushort	Year
0x2	ushort	Month (1-12)
0x4	ushort	Day of week (0=Sun, 1=Mon, ..., 6=Sat)
0x6	ushort	Day (1-31)
0x8	ushort	Hour (0-24)
0xA	ushort	Minute (0-59)
0xC	ushort	Second (0-59)
0xE	ushort	? Millisecond? Values seen: 0..999

Section type 2: Title

General structure: WString

WString

A wide char string, 0 terminated, with length

+Offset	Type	Content
0x0	uint	String length in byte, including the terminator
0x2	wchar[]	Length/2-1 characters (Attention: May be empty!)
	wchar	=0 terminator

Section type 3: Camera settings?

+Offset	Type	Content
0x00	uint	? =0
0x04	uint	Length of remaining section in byte, usually 1024
0x08	uint	? =0x03082864 – maybe a camera model / serial number?
0x0C	uint	? =0x0C010201
0x10	uint	? =0x00000102
0x14	uint	Number of entries. Values seen 7.
Number of entries times:		
	uint	? =0x00000401, 0x7FF1FF7F, 0x00B37180, 0x01005900, 0x02000101, 0x00CD1400, 0x00080101
0x34	byte	? =0x08

0x35	byte[979]	? =0
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Section type 4: ??

General structure: WString, = L""

Section type 5: Stream files

Lists the stream files which together form one scene.

General structure: Subsection table, Subsections

Subsection Table

ROffset	Type	Content
0x0	uint	Number of sections, at least 1
Number of sections times:		
	uint	Offset of section (from beginning of file)

Section type 5, each subsection: File data

+Offset	Type	Content
0x00	ulong	? =0 (Type of stream file?)
0x08	ulong	File size in byte (0 if *.cont file is for a directory)
0x10	FILETIME	Modification time, see [8].
0x18	WString	File name including extension (Length is 0 if *.cont file is for a directory)

Section type 6: Meta files

Lists the meta files which which are associated with this scene.

General structure: Subsection table, Subsections

Section type 6, each subsection: Meta file data

+Offset	Type	Content
0x00	uint	Type of metafile 0 = Thumbnail (*.tmb) file 1 = Intelligent Index System (*.iis) file 3 = ?? (*.mtv) file 4 = Maker Private Data (*.pmpd) file (only HD Writer AE 2.0)
0x04	FILETIME	Modification time
0x0C	WString	File name including extension

The Subsections usually appear in ascending type of metafile. There are 1 or 2 subsections.

Section type 7: Comment

General structure: WString

Section type 10: Camera settings?

+Offset	Type	Content
0x00	uint	? =17
0x04	uint	? =0
0x08	byte	StringLength
0x09	char[2]	RecordingMode 'HA' = (17Mbps/VBR) (1920 x 1080) 'HG' = (13Mbps/VBR) (1920 x 1080) 'HN' = (9Mbps/VBR) 1920 x 1080) ('HX'?) 'HE' = (6Mbps/VBR) (1440 x 1080)
0x0B	byte	Terminator =0
0x0C	uint	? =0

Section type 11: Software used to convert

General structure: WString

E.g. L"HD Writer AE 2.0"

Intelligent Index System (*.iis) File Format

"The Highlight Playback function is designed for users who want to view recorded images as quickly as possible. It detects zooming, panning, scene changes, increases and decreases in sound level, faces, etc., in recorded images as "highlights" by using the I.I.S. (Intelligent Index System). Then, it automatically plays back the detected highlight scenes according to a set time interval. It even allows the user to select music stored in the camcorder and plays it together with the video as background music. Because this function plays only highlight scenes, it makes not only playback but also recording more fun."

All values are in big-endian („Motorola“) byte order.

General file structure

The file consists of the following parts:

Header, Highlights

Header

Offset	Type	Content
0x00	char[]	Signature = "PIIS" + \1 + \1, in hex: 50 49 49 53 01 01
0x06	uint	? Values seen 0, 2, 3, 4, 5, 7, 8, 9, 10, 11, 13
0x0A	uint	? =0
0x0E	lisTime	
0x16	ushort	? =0
0x18	uint	Length / Duration in 100 ns units?
0x1C	ushort	Number of highlights (may be 0)
0x1E	ushort	? =0

lisTime structure

+Offset	Type	Content
0x0	ushort	Year
0x2	byte	Month (1-12)
0x3	byte	Day (1-31)
0x4	byte	Hour (0-24)
0x5	byte	Minute (0-59)
0x6	byte	Second (0-59)
0x7	byte	? =0

Highlight

+Offset	Type	Content
0x00	ushort	Flags? Values seen 0x2100, 0x2140
0x02	ushort	? Values seen 0x1222, 0x1622, 0x2001, 0x2201, 0x2730, 0x2830, 0x2A30, 0x2D00, 0x3000, 0x3100, 0x3230, 0x3400, 0x3500, 0x3530, 0x3700, 0x3800, 0x3900, 0x3A00, 0x3B00, 0x3C00, 0x4000, 0x4100, 0x4200, 0x4300, 0x4400, 0x4700, 0x4800, 0x4B00, 0xCE13, 0xEC11, 0xF111
0x04	uint	Start position
0x08	uint	End position? Duration?
0x0C	uint	? Values seen 0, 0x18000000, 0x1C000000, 0x21000000, 0x25000000, 0x26000000, 0x2A000000, 0x2B000000, 0x30000000, 0x34000000
0x10	uint	Unknown position or duration
0x14	uint[3]	Padding, =0

? (*.mtv) File Format

Accompanying information file for MPEG2 video.

MT could be MediaType, but what is V?

All values are in little-endian („Intel“) byte order.

Offset	Type	Content
0x000	byte[12]	Signature = hex: F0 F0 F0 F0 F8 01 00 00 00 00 01 00
0x00C	uint	Total length of file
0x010	string	Creator = "Panasonic_Type2 MovieClipper2 P", terminated with 0
0x030	string	Filename with extension *.mpg, terminated with 0, filled with 0 to maximum size
0x130	ulong	Size of MPG file in byte
0x138	FILETIME	Modification time
0x140	uint	00 00 07 00
0x144	byte[188]	00
0x200		List of records Records appear in ascending order of record type.

Record

ROffset	Type	Content
0x0	ushort	? =0
0x2	ushort	Record type 1 = ? 2 = Audio 4 = ?
0x4	uint	Length of value
0x8	byte[Value- Length]	Value (record type specific)

Value for record type 1 (??)

Length is 12.

ROffset	Type	Content
0x0	byte[8]	01 01 01 00 00 00 00 01
0x8	uint	Some length/duration? Values seen: 5E 57 87 00 or 6B 48 8B 00 or 2A 0E 8C 00 or 3E 72 87 00 or 55 2F 88 00 or 00 69 5F 00

Value for record type 2 (Audio)

Length is 12.

ROffset	Type	Content
0x0	byte[8]	00 00 00 05 0B 00 00 00 = 5.1 surround 00 00 00 01 09 00 00 00 = 2Ch
0x8	uint	? =0

Value for record type 4 (??)

Length is 8.

ROffset	Type	Content
0x0	byte[8]	00 00 00 00 00 00 00 00

Thumbnail (*.tmb) File Format

This is a thumbnail for a scene in JFIF (JPEG Interchange File Format).

HD Writer AE 1.0:

It has a JFIF 1.02 segment, a Comment segment containing the string "LEAD Technologies Inc. V1.01", and has a resolution of 416 x 240 pixel. There is no EXIF segment.

HD Writer AE 2.0:

It has an EXIF segment which contains an Exif IFD and a thumbnail IFD. The Exif IFD contains a MakerNote (Manufacturer Specific Data) Field. There is no JFIF segment and no comment segment.

The resolution is 426 x 240 pixel. The resolution of the IFD 1 thumbnail is 160 x 120 pixel.

Maker Private Data (*.pmpd) File Format

UTF-8 with BOM (Byte Order Mark), containing XML content.
Can be viewed with text editor.

References

Used sources of information

- [1] <http://av.jpn.support.panasonic.com/support/global/cs/soft/download/index.html>
- [2] <http://avchdsupport.de/download.htm>
- [3] http://rus.panasonic.ru/download/driver/index.php?AGREE=YES&USECTION_ID=45457
- [4] <https://forum.videohelp.com/threads/349814-Panasonic-HD-Writer-software-no-download-Any-other-options>
- [5] <https://en.wikipedia.org/wiki/AVCHD>
- [6] <https://en.wikipedia.org/wiki/.m2ts>

Standards and specifications

- [7] <http://www.avchd-info.org/>
- [8] FILETIME structure [https://msdn.microsoft.com/de-de/library/windows/desktop/ms724284\(v=vs.85\).aspx](https://msdn.microsoft.com/de-de/library/windows/desktop/ms724284(v=vs.85).aspx)

Sources of sample files

- [9] <http://samples.mplayerhq.hu/mtv/>