

Summary



Vclips VC106B Video Clips for Testing and Optimization of Video Compression

Decoder Series – VC106B, D-Traffic MP4 ASP Hdr

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General Safety Summary

Use this product only as specified.

While using this product, you may need to access other parts of a larger system. Read the safety sections of the other product manuals for warnings and cautions related to their operation.

Summary: VC-106-A D-Traffic-MP4-ASP-Hdr

Decoder Test Set	VC-106-A D-Traffic-MP4-ASP-Hdr
Purpose	Test MPEG-4 Advanced Simple Profile decoders (at Levels 3, 3b, 4 and 5) with all variants of bit fields within the MPEG-4 Visual Object and Video Object Layer headers.
Content	Single scene – traffic moving into, out of and across picture 501 frames
Standard	ISO/IEC 14496-2:2001(E) ISO title: Information technology – Coding of audio-visual objects: Part 2: Visual 2 nd Edition 2001-12-01
Number of clips	47 sequences, numbered V10601 to V10647: <ul style="list-style-type: none"> • 352x288 (43 streams) • 352x576 (2 streams) • 720x576 (2 streams) <p>i.e. total 47 clips plus five YUV source videos</p>
Total disk size	108 Mbytes (compressed video) plus 555 Mbytes (trace files)
Video format	Compressed ".m4v" video files as per MPEG-4 Part 2 Visual standard
How supplied	1 computer DVD
Software supplied	YUV sequence viewer ".m4v" to YUV decoder in folder: \Software on disk 1
Documentation	PDF of this manual in folder: \Documentation on disk 1

1. Introduction

This set of video sequences is designed to test the parts of an MPEG-4 Advanced Simple Profile decoder which decode the headers of the video bitstream, primarily the VisualObjectSequence, VisualObject and VideoObjectLayer structures.

This is done by individually enabling all the different permissible bit-field options within the header structures in the clips specified. Some clips are also provided with multiple combinations and with all permissible bit-fields enabled.

A single video scene is provided: all the variations are done on this single video scene.

2. Information supplied

The following pages list:

- ❑ the basic details of the video sequence (source data, contents of the scene);
- ❑ the settings used for each sequence.

In addition, on the DVD there is provided:

- ❑ 'Trace' information, showing the location and value of each syntax element in the sequence headers and first five VOPs.
- ❑ a spreadsheet listing all the clips and showing which header parameters are enabled and the values used (Microsoft Excel[®] format).
- ❑ the original YUV source video used to encode the video sequences.

2.1. 'Trace' information provided

The 'Trace' files provide a parsing/decoding of the header and the first few VOPs of each clip, into the bitstream fields as listed in the standard.

Two Trace files are provided for each clip:

- ❑ Parse bitstream
- ❑ Interpret

Both of these file types have the file extension '.vpt', although they only contain standard ASCII text data and can be viewed with any text viewer.

(These Trace files were generated using the [MTS4EA](#) video compression analysis tool, available from [Tektronix](#).)

2.1.1 Parse bitstream Trace file

The Parse bitstream Trace file lists all the bits of the bitstream, divided into the individual bitstream fields:

```

0000 0000 0000 0000 0000 0001 1011 0000 (0x00000000,7) : VISUAL_OBJECT_SEQUENCE_START_CODE
1111 0011 ---- ---- ---- ---- ---- (0x00000004,7) : PROFILE_AND_LEVEL_INDICATION
0000 0000 0000 0000 0000 0001 1011 0101 (0x00000005,7) : VISUAL_OBJECT_START_CODE
0--- ---- ---- ---- ---- ---- ---- (0x00000009,7) : IS_VISUAL_OBJECT_IDENTIFIER
0001 ---- ---- ---- ---- ---- ---- (0x00000009,6) : VISUAL_OBJECT_TYPE
0--- ---- ---- ---- ---- ---- ---- (0x00000009,2) : VIDEO_SIGNAL_TYPE
01-- ---- ---- ---- ---- ---- ---- (0x00000009,1) : STUFFING_BITS
0000 0000 0000 0000 0000 0001 0000 0000 (0x0000000A,7) : VIDEO_OBJECT_START_CODE
0000 0000 0000 0000 0000 0001 0010 0000 (0x0000000E,7) : VIDEO_OBJECT_LAYER_START_CODE
0--- ---- ---- ---- ---- ---- ---- (0x00000012,7) : RANDOM_ACCESSIBLE_VOL
0001 0001 ---- ---- ---- ---- ---- (0x00000012,6) : VIDEO_OBJECT_TYPE_INDICATION
1--- ---- ---- ---- ---- ---- ---- (0x00000013,6) : IS_OBJECT_LAYER_IDENTIFIER
0101 ---- ---- ---- ---- ---- ---- (0x00000013,5) : VIDEO_OBJECT_LAYER_VERID
001- ---- ---- ---- ---- ---- ---- (0x00000013,1) : VIDEO_OBJECT_LAYER_PRIORITY
0001 ---- ---- ---- ---- ---- ---- (0x00000014,6) : ASPECT_RATIO_INFO
0--- ---- ---- ---- ---- ---- ---- (0x00000014,2) : VOL_CONTROL_PARAMETERS
00-- ---- ---- ---- ---- ---- ---- (0x00000014,1) : VIDEO_OBJECT_LAYER_SHAPE
1--- ---- ---- ---- ---- ---- ---- (0x00000015,7) : MARKER_BIT

```

The above information is split into 3 sections:

- ❑ the section of '0's and '1's on the left gives the bits in the bitstream, in the order they occur;
- ❑ the data in brackets (0x00000004,7) is the hex address byte address in the bitstream and the starting bit position in the bitstream, where 7 is the most-significant bit (occurring first in the byte) and 0 is the least-significant bit (occurring last in the byte);
- ❑ the name given is the standard name for the bitstream field.

Each of the Parse bitstream Trace files has a name of the form:

V106nn_A_D-Traffic_MP4_ASP_Hdr_xxx_parse_bitstream.vpt

(where 'nn' is the last 2 digits of the clip number)

2.1.2 Interpret Trace file

The Interpret Trace file reads the values in the bitstream fields and interprets them i.e. explains what the value given means:

```

(0x00000000,7) [VOS] {MP4} visual_object_sequence_start_code = 0x1b0 (should be 0x1b0)
MPEG-4 Advanced Simple/Level 3
(0x00000005,7) [VO ] {MP4} visual_object_start_code = 0x1b5 (should be 0x1b5)
(0x00000009,7) [VO ] {MP4} is_visual_object_identifier = 0 : no visual object version ID or
priority are set
(0x00000009,6) [VO ] {MP4} visual_object_type = '0001' : video ID
(0x00000009,2) [VO ] {MP4} video_signal_type = 0 : video_signal_type information not present
(0x00000009,1) [VOP] {MP4} Stuffing bits = 0x1 (number of bits is 2)
(0x0000000A,7) [VO ] {MP4} video_object_start_code = 0x100 (range: 0x100-0x11f)
(0x0000000E,7) [VO ] {MP4} video_object_layer_start_code = 0x120 (range: 0x120-0x12f)
(0x00000012,7) [VOL] {MP4} random_accessible_vol = 0
(0x00000012,6) [VOL] {MP4} video_object_type_indication = Advanced Simple Object Type
(0x00000013,6) [VOL] {MP4} is_object_layer_identifier = 1
(0x00000013,5) [VOL] {MP4} video_object_layer_verid = 0x5
(0x00000013,1) [VOL] {MP4} video_object_layer_priority = 0x1
(0x00000014,6) [VOL] {MP4} aspect_ratio_info = '0001' = 1:1 (Square)
[VOL] {MP4} vol_control_parameters are off
(0x00000014,1) [VOL] {MP4} video_object_layer_shape = 0 (Rectangular)
(0x00000015,6) [VOL] {MP4} vop_time_increment_resolution = 0x19 (dec. 25)
[inf] {MP4} number of bits for vop_time_increment = 5
(0x00000017,5) [VOL] {MP4} fixed_vop_rate = 0 : VOP rate can be variable
[VOL] {MP4} video_object_layer_width = 352; video_object_layer_height = 288

```

The above information is split into 3 sections:

- ❑ section on the left in brackets (0x00000004,7) is the hex address byte address in the bitstream and the starting bit position in the bitstream, where 7 is the most-significant bit (occurring first in the byte) and 0 is the least-significant bit (occurring last in the byte);
- ❑ the title (such as [VOL] is the general syntax level of the bitstream element (e.g. VOL = VideoObjectLayer) and {MP4} denotes this applies to MPEG-4 only (as opposed to other standards such as H.263);
- ❑ section on the right gives the interpreted value of the bitstream data, i.e. what the bitstream data means.

Each of the Interpret Trace files has a name of the form:

V106nn_A_D-Traffic_MP4_ASP_Hdr_xxx_interpret.vpt

(where 'nn' is the last 2 digits of the clip number)

3. Software supplied

The following software is supplied:

- ❑ ".m4v" to YUV decoder;
- ❑ YUV sequence viewer.

3.1. YUV sequence viewer

This program is called: YUVSequenceViewer.exe

and is located on disk 1 in the folder: \Software

To run it, double-click on it – it does not need to be installed.

Once it has been run once, it associates files with an extension of .yuv so that after this double-clicking on a file with this extension will automatically open the YUV file in the sequence viewer.

YUVSequenceViewer tries to work out the size of the video frames from the filename (if it is given in the filename): if there are no clues from the filename then the user must enter the size of the frames.

On the 'Tool' menu there is an option to subtract two YUV sequences, to look for differences between two files. A zero difference results in a constant grey image. To make these differences more visible, select the menu 'View' then 'Options' then enter a number into the 'Subtraction scale' box: the larger the number, the more the differences are multiplied.

3.2. ".m4v" to YUV decoder

This program is called: decoder.exe

and is located on disk 1 in the folder: \Software

It is a command-line only tool (to be called from within a DOS / Command Prompt box).

The syntax for use is:


```
decoder <input file> <output file> <width> <height>
```

Where the file names include spaces, the filenames must be included within quotes, e.g.

```
decoder "input 1" "C:\Temp\output 1" 352 288
```

4. Basic Clip Set Details

4.1. General clip set details

BASIC CLIP DETAILS		Begin End	Title
			Traffic
1.	Number(s)	V10601 to V10647	
2.	Filename(s)	V10601_A_D-Traffic_MP4_ASP_Hdr_<name>.m4v to V10647_A_D-Traffic_MP4_ASP_Hdr_<name>.m4v	
3.	Title	Traffic	
4.	Description	Vehicles into picture, out of picture, across picture	
5.	Main purposes / tests	Check different options in Header are correctly decoded	
6.	Size(s), horizontal x vertical	43 CIF sequences (352x288); 2 2CIF sequences (352x576); 2 D1 sequences (720x576)	
7.	Video format	.m4v MPEG-4 Part 2 Visual (source material YUV 4:2:0 Planar, 8 bits per pixel)	
8.	Number of frames	501 (typically: sometimes varies, with bit-rate limitations)	
9.	Source frame rate	25 fps	
10.	Clip duration (seconds : frames)	20 : 00	
11.	File size on disc (MB)	Total for all files: 67MB	
12.	Original video format	720x576 DV, interlaced	

13.	Keywords	KW-vehicles, KW-movement_in, KW-movement_out, KW-cross_movement, KW-high_contrast, KW-bright_colours, KW-leaves, KW-monochromatic_area
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	FEATURES	Qty / amount	Notes
14.	GLOBAL MOTION		
15.	Fast pan	-	
16.	Pan	-	
17.	Tracking pan	-	
18.	Zoom in	-	
19.	Zoom out	-	
20.	Scroll	-	
21.	Rotate	-	
22.	Hand-held camera	-	

23.	OBJECT MOTION		
24.	Movement out of picture	Lots, some fast	
25.	Movement into picture	Lots, some fast	
26.	Movement across picture	Lots, some fast	
27.	Diagonal movement	-	

28.	Subjects behind foreground objects	Some	
29.	Low movement	-	
30.	COLOURS & CONTRAST		
31.	Light picture	Areas	
32.	Dark picture	Areas	
33.	Bright colours	Areas	
34.	Dull colours	Areas	
35.	Fine detail pattern	Some	
36.	High contrast areas	Several	
37.	Large monochromatic area	Some	
38.	SCENE CONTENT		
39.	Out-of-focus	-	
40.	Fine lines / moiré patterns	Some	
41.	Reflections	Some	
42.	Scene change	-	
43.	SCENE SUBJECTS		
44.	People	-	
45.	Faces	-	
46.	Vehicles	Lots	
47.	Buildings	-	
48.	Trees	Some	Background
49.	Text	-	
50.	Talking head	-	
51.	Water	-	
52.	Leaves	Some	Background
53.	Sky	-	
54.	Clouds	-	
55.	Round objects	-	
56.	LIGHT CONDITIONS		
57.	Bright sunlight	Some	
58.	Shaded areas	Some	
59.	Bright daylight	Some	
60.	Dull daylight	-	
61.	Twilight	-	
62.	Night	-	
63.	Backlighting	-	
64.	Substantial brightness change	-	

4.2. Summary of clips

V10601	Advanced Simple Profile/Level 3 stream
V10602	Bitstream with is_visual_object_identifier set to 1, high priority
V10603	Bitstream with is_visual_object_identifier set to 7, low priority
V10604	Bitstream with video_signal_type information.
V10605	Bitstream with video_signal_type and colour description information, low values.
V10606	Bitstream with video_signal_type and colour description information, high values.
V10607	Bitstream with video_object_start_code set to 0x1f.
V10608	Bitstream with video_object_layer_start_code set to 0x2f.
V10609	Bitstream of I-VOPs, random_accessible_vol set to 1.
V10610	Bitstream with is_object_layer_identifier set to 0
V10611	Bitstream with is_object_layer_identifier set to 1, low priority
V10612	Bitstream with 40:33 pixel aspect ratio.
V10613	Bitstream using extended pixel aspect ratio of 1:2.
V10614	Bitstream using extended pixel aspect ratio of 254:255.
V10615	Bitstream with low_delay set to 1.
V10616	Bitstream using vbv_parameters syntax elements, lower settings.
V10617	Bitstream using vbv_parameters syntax elements, default settings.
V10618	Bitstream using vop_time_increment_resolution equal to 1.
V10619	Bitstream using fixed VOP rate of 25fps.
V10620	Bitstream using fixed VOP rate, testing high value of fixed_vop_time_increment.
V10621	Bitstream with GMC enabled, 0 warping points and 1/2 pel accuracy.
V10622	Bitstream with GMC enabled, 1 warping point and 1/2 pel accuracy.
V10623	Bitstream with GMC enabled, 2 warping points and 1/4 pel accuracy.
V10624	Bitstream with GMC enabled, 3 warping points and 1/8 pel accuracy.
V10625	Bitstream with GMC enabled, 4 warping points and 1/16 pel accuracy.
V10626	Bitstream using the MPEG quantisation method, default matrix
V10627	Bitstream using the MPEG quantisation method and short matrices.
V10628	Bitstream using the MPEG quantisation method and full matrices.
V10629	Bitstream quarter-sample precision for motion compensation.
V10630	Bitstream using complexity estimation header elements, but all estimation flags set to 0.
V10631	Bitstream using complexity estimation header elements, all method 0 estimates enabled
V10632	Bitstream using complexity estimation header elements, all method 1 estimates enabled
V10633	Bitstream with resync markers enabled.
V10634	Bitstream using data partitioning and resync markers.
V10635	Bitstream using data partitioning, RVLC and resync markers.

V10636	Stream with Group_of_VOP headers every 20 VOPs. Time code elements at 0.
V10637	Stream with a Group_of_VOP header before each VOP. Time code elements at max values.
V10638	Stream with user data in VisualObjectSequence()
V10639	Stream with user data in VisualObject()
V10640	Stream with user data in Group_of_VideoObjectPlane()
V10641	Bitstream with many parameter variations (see table in section 5 for full details).
V10642	ASP @ L3b stream using interlace, GMC and quarter-sample.
V10643	ASP @ L3b stream using low_delay, data partitioning and resync markers.
V10644	ASP @ L4 stream using interlace, GMC and quarter-sample.
V10645	ASP @ L4 stream using low_delay, data partitioning and resync markers.
V10646	ASP @ L5 stream using interlace, GMC and quarter-sample.
V10647	ASP @ L5 stream using low_delay, data partitioning and resync markers.