

Summary



Vclips VC104C Video Clips for Testing and Optimization of Video Compression

Decoder Series – VC104C, D-Traffic MP4 SP V

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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-104-B D-Traffic-MP4-SP-V

Decoder Test Set	VC-104-B D-Traffic-MP4-SP-V
Purpose	Test MPEG-4 Simple Profile decoders with all variants of bit fields within the MPEG-4 visual stream VOP Mainly Level 3 and above
Content	Single scene – traffic moving into, out of and across picture 500 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	45 sequences, numbered V10401 to V1045: <ul style="list-style-type: none"> • CIF 352x288 42 • QCIF 176x144 3 i.e. total 45 clips plus CIF-size YUV source video (number V10400) and QCIF-size YUV source video (number V10450)
Total disk size	114 Mbytes (compressed video files only)
Video format	Compressed ".m4v" video files as per MPEG-4 Part 2 Visual standard
How supplied	1 computer CD
Software supplied	YUV sequence viewer ".m4v" to YUV decoder in folder: \Software
Documentation	PDF of this manual in folder: \Documentation

1. Introduction

This set of video sequences is designed to test the parts of an MPEG-4 Simple Profile decoder which decode the VOP part of the video bitstream, i.e. the VideoObjectPlane.

For the purposes of these tests the VOP is defined as comprising those sections of the standard which are referred to by the pseudo-functions:

- VideoObjectPlane(); and
- video_plane_with_short_header()

in section 6.2.5 of the MPEG-4 standard.

The sequences are split as follows:

- MPEG-4: sequences V10401 – V10436 inclusive
- short header: sequences V10437 – V10445 inclusive

This is done by individually enabling all the different permissible bit-field options within the VOP 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 CD there is provided:

- 'Trace' information for some of the VOPs of each clip (the 'Trace' information is ~1Mbyte per VOP, so not all VOPs are detailed, but a relevant number are chosen - see below);
- where relevant, the 'Trace' information for the 'Header' of the sequence (the Header comprises all syntactic elements higher than the VOP);
- a spreadsheet which lists all the clips and shows which VOP fields (and Header fields) 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 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
0000 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
0000 0001 ----- (0x00000012,6) : VIDEO_OBJECT_TYPE_INDICATION
0--- ----- (0x00000013,6) : IS_OBJECT_LAYER_IDENTIFIER
0001 ----- (0x00000013,5) : ASPECT_RATIO_INFO
0--- ----- (0x00000013,1) : VOL_CONTROL_PARAMETERS
00-- ----- (0x00000013,0) : VIDEO_OBJECT_LAYER_SHAPE
1--- ----- (0x00000014,6) : 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:

V104nn_D-Traffic_MP4_SP_VOP_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 = 0xb0 (0xB0)
MPEG-4 Simple/Level 3
(0x00000005,7) [VO ] {MP4} visual_object_start_code = 0x1b5 (0x1B5)
(0x00000009,7) [VO ] {MP4} is_visual_object_identifier = 0
(0x00000009,6) [VO ] {MP4} visual_object_type = 0x1
(0x00000009,2) [VO ] {MP4} video_signal_type = 0
(0x00000009,1) [VOP] {MP4} Stuffing bits = 0x1 (number of bits is 2)
(0x0000000A,7) [VOS] {MP4} video_object_start_code = 0x100 (range: 0x100 - 0x11F)
(0x0000000E,7) [VOL] {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 = Simple Object Type
(0x00000013,6) [VO ] {MP4} is_object_layer_identifier = 0: video_object_layer_verid='0001'
(Version 1) assumed
(0x00000013,5) [VOL] {MP4} aspect_ratio_info = '0001' = 1:1 (Square)
[VOL] {MP4} vol_control_parameters are off
(0x00000013,0) [VOL] {MP4} video_object_layer_shape = 0 (Rectangular)
(0x00000014,5) [VOL] {MP4} vop_time_increment_resolution = 0x19 (dec. 25)
[inf] {MP4} number of bits for vop_time_increment = 5
(0x00000016,4) [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:

V104nn_D-Traffic_MP4_SP_VOP_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" 176 144
```

4. Basic Clip Details

4.1. General clip set details

BASIC CLIP DETAILS		Begin End	Title
			Traffic
1.	Number(s)	V10401 to V10445	
2.	Filename(s)	V10401_D-Traffic_MP4_SP_VOP_<name>.m4v to V10436_D-Traffic_MP4_SP_VOP_<name>.m4v and V10437_D-Traffic_MP4_SP_VOP_sh_<name>.263 to V10445_D-Traffic_MP4_SP_VOP_sh_<name>.263	
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	42 CIF sequences (352x288); 3 QCIF sequences (176x144)	
7.	Video format	.m4v MPEG-4 Part 2 Visual (source material YUV 4:2:0 Planar, 8 bits per pixel) and .263 short_header	
8.	Number of frames	500 (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

Clip Name	Description
V10401	Simple Profile/Level 3 stream
V10402	Bitstream with <code>intra_dc_vlc_thr</code> set to 1.
V10403	Bitstream with <code>intra_dc_vlc_thr</code> set to 4.
V10404	Bitstream with <code>intra_dc_vlc_thr</code> set to 7.
V10405	Bitstream with explicit <code>vop_quant</code> settings: 4, 8 for I-, and P-VOPs respectively.
V10406	Bitstream with explicit <code>vop_quant</code> settings: 8, 24 for I-, and P-VOPs respectively.
V10407	Bitstream with explicit <code>vop_quant</code> settings: 24, 8 for I-, and P-VOPs respectively.
V10408	Bitstream using the resynchronisation error resilience tool.
V10409	Bitstream using the resynchronisation error resilience tool, but with <code>resync_marker_disable = 1</code> .
V10410	Bitstream using the data partitioning error resilience tool.
V10411	Bitstream using a combination of the data partitioning and RVLC error resilience tools.
V10412	Bitstream using the resynchronisation error resilience tool with video packet length of 2048 bits.
V10413	Bitstream using the resynchronisation error resilience tool with video packet length of 4096 bits.
V10414	Bitstream with no 4MV mode macroblocks.
V10415	Bitstream encoded with I-VOPs only.
V10416	Bitstream encoded with group-of-pictures (GOP) pattern containing an I-VOP followed by 14 P-VOPs.
V10417	Bitstream encoded with group-of-pictures (GOP) pattern containing an I-VOP followed by 4 P-VOPs.
V10418	Bitstream with no skipped macroblocks.
V10419	Bitstream with <code>vop_time_increment_resolution</code> set to 1.
V10420	Bitstream with <code>vop_time_increment_resolution</code> set to 65535.
V10421	Bitstream with fixed VOP rate specified.
V10422	Bitstream with fixed VOP rate specified.
V10423	Bitstream with fixed VOP rate specified and using maximum <code>vop_time_increment_resolution</code> .
V10424	Simple Profile/Level 1 stream
V10425	Simple Profile/Level 2 stream
V10426	Simple Profile/Level 2 stream
V10427	Bitstream using <code>Group_of_VideoObjectPlane</code> syntax with zero <code>time_code</code> .
V10428	Bitstream using <code>Group_of_VideoObjectPlane</code> syntax with maximum <code>time_code</code> .
V10429	Bitstream using <code>Group_of_VideoObjectPlane</code> syntax with mid-range <code>time_code</code> .
V10430	Bitstream using <code>Group_of_VideoObjectPlane</code> syntax with user data in.
V10431	Bitstream with <code>vol_control_parameters</code> enabled in the VideoObjectLayer.

Clip Name	Description
V10432	Bitstream with mid-range VBV parameters specified in the VideoObjectLayer.
V10433	Bitstream with high VBV parameters specified in the VideoObjectLayer.
V10434	Bitstream with many parameter variations (see table in section 6 for full details).
V10435	Bitstream without VideoObjectSequence entry point syntax.
V10436	Bitstream with many parameter variations (see table in section 6 for full details).
V10437	MPEG-4 Short header stream
V10438	Short header bitstream with split_screen_indicator, document_camera_indicator and full_picture_freeze_release bits set.
V10439	Short header bitstream with extra insertion information.
V10440	Short header bitstream with extra insertion information.
V10441	Short header bitstream with mid-range quant parameter.
V10442	Short header bitstream at QCIF size.
V10443	Short header bitstream with regular intra frames.
V10444	Short header bitstream encoded with I-frames only.
V10445	Short header bitstream with many parameter variations (see table in section 7 for full details).