



T2V002 USA West User Manual

Video Clips for
Testing and Optimisation of
Video Compression



www.testvid.com

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T2V002_USA_West User manual v1.0c

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1. Overview of T2V002 USA West

2-D / 3-D	2D
Compressed/ Uncompressed	Uncompressed
Description of video	Scenes from San Francisco and Las Vegas
Purpose	Test an encoder to deal with HD video, with all aspects of global and local motion, slow/medium/fast motion, with panning, scrolling, zooming, smooth and erratic, high/low contrast, with limited colours/vivid colours and many common subject types
Number of clips	168 individual video clips (56 each at 1080p, 720p and 1080i resolutions)
Length of video	Total of over 2 hours 20 minutes (over 47 minutes each at 1080p, 720p and 1080i resolutions)
Total size on disk	540 GBytes
Video format(s)	YUV 4:2:0 planar 8 bits per sample: <ul style="list-style-type: none">□ 1920x1080 progressive [original filming size, at 25 fps]□ 1280x720 progressive□ 1920x1080 interlaced, bottom field first
Audio format(s)	MPEG-1 Layer II stereo 384kbps CBR 16-bit 48kHz and WAV linear PCM uncompressed stereo 1536kbps 48kHz

2. Introduction

T2Vid and **T3Vid** are high definition (HD) video clips designed for testing video encoders and decoders.

The **T3Vid** clips are stereoscopic 3-dimensional (matched left and right images); the **T2Vid** clips are 2-D.

Both the **T2Vid** and **T3Vid** clips come in two variants: those designed to test and stress video encoders (usually in uncompressed YUV format, some of which have associated sound); and compressed video designed to test the range of options available in a standards-compliant video decoder (in compressed format such as MPEG-4/AVC/H.264 or MPEG-2, both as elementary streams and in 'wrappers' such as MPEG-2 Transport Stream).

2.1 T2Vids and T3Vids for testing encoders

Each set of clips for testing encoders contains a diverse selection of clips designed to stress a video encoder in different ways. Typically this includes different movement types, different subjects, different lighting conditions, different camera movement - designed to encompass the majority of different types of difficult-to-encode items. In some cases the quality of filming is marginal - deliberately so, as this is often the hardest to encode. The majority of the filming was done hand-held, as is quite often the case with documentary and even film currently. However, in all cases there has been no video editing as such (unless otherwise stated for a specific clip) - all the separate video clips are direct decodes from the HD camera files, with no re-compression/re-encoding done. Where video editing has been done the re-encode is only at the transitions - the vast majority of these clips are also as per the original camera files.

These clips are provided as sets of video clips, typically 30 - 50 in a set, lasting from 15 - 20 minutes total. These include:

- ❑ 'standard' HD of real-world subjects (1920x1080, 1280x720; e.g. in New York, San Francisco, London, Munich)
- ❑ as above but D-cinema resolutions (2K and 4K)
- ❑ as above but 'low' resolutions such as NTSC, D1 PAL, CIF, mobile, web, etc.
- ❑ synthetically generated, which has features such as precisely defined motion - ideal for checking such items as encoder motion estimation

The formats/resolutions provided vary from by clip set; as an example all the HD sets are provided at 1920x1080 progressive, 1920x1080 interlaced and 1280x720 progressive formats, in uncompressed YUV format, 16:9 aspect ratio.

All filming was done native HD.

Most clip sets are provided in 8 bits per sample; some are available at 10-bit or 14-bits per sample.

The **T2Vid** clips are straightforward 2-D clips; the **T3Vid** clips comprise matched left and right video images. The **T3Vid** clips have the 'extra dimension' of varying 3-D depth: from shallow to deep 3-D effect, into or out of the picture, with additional artefacts and difficulties that can be encountered in 3-D.

2.1.1 Audio

Sound is provided for almost all clips: in some cases this is sound recorded which is directly associated with the clips, in other cases the sound comprises appropriate background or music.

In a few cases the associated audio is one of the main reasons for recording the clip so both should be viewed together (where this is the case the notes state this for the specific clip in the manual). However, note that in most cases the associated audio provided is just that which could easily be recorded at the same time as the video, typically comprising background sounds, and is often of low quality as the sound was not the primary consideration at the time of filming.

2.1.2 Software

In addition to the video and audio, utility software to process the YUV video is provided as listed in section 4 and information on YUV viewers.

2.2 T2Vids and T3Vids for testing decoders

These are designed to test standards-compliant video decoders, by providing a series of video clips where the same video source material is encoded at different bit-rates with different encoder options.

Normally each clip is provided more than one format: typically MPEG-2 and MPEG-4/AVC/H.264 elementary video formats, at both 1920x1080 and 1280x720, as well as the source video in YUV format. In addition, each clip is typically encoded into one or more 'wrapper' formats such as MPEG-2 Transport Stream, with the associated audio in an appropriate format.

The associated audio is also provided as separate elementary files.

Full information on the currently available sets of [T2Vid](#) and [T3Vid](#) clips series is at www.testvid.com.

2.3 TestVid logo

The [TestVid](#) logo (or a variant of it) is usually placed in the lower left corner of the video. It is a condition of the license agreement for [TVids](#) that this logo is not removed or obscured.

The logo has been carefully sized and placed to coincide with the borders of a 16x16 macroblock (where this is possible) and is static throughout each sequence, in order to have minimal effect on encoders and decoders.

2.4 Safety

The [TVids](#) are almost invariably supplied on a USB hard drive unit. This unit may be mains powered or powered directly from the USB port.

In all cases it is imperative that you carefully read and understand the safety information provided with the unit.

2.5 Backup

As the [TVids](#) are almost invariably supplied on a USB hard drive unit it is highly recommended that you make an immediate backup of the whole unit, as hard drives can of course fail. (This backup copy is in addition to the 25 copies allowed by the license agreement.)

The warranty on the hard drive is 180 days, but if it does fail it would of course take some days at least to provide a replacement unit.

3. T2V002 USA West Clip set description

3.1 Set content types

This set of video clips comprise a range of subjects, motion, colours, light levels designed to test and stress video encoders by providing a varied set of conditions:

- ❑ subject types such as people, traffic, buildings, sky, water, trees, text..
- ❑ movement types such as panning, zooming in/out, tracking, hand-held camera
- ❑ subject motion such as into, out of or across the picture, in front of and partially behind objects
- ❑ lighting conditions, from bright sunlight, dull daylight, shaded areas, indoors..
- ❑ varying camera properties such as depth of field, in/out-of-focus..
- ❑ hard to encode items such as reflections, fine lines, patterns, round objects..
- ❑ and with sound associated with some clips

In many cases the video is harder to encode than might normally be expected, as the lighting conditions are not ideal or there is significant camera movement, or the focus varies. These features are deliberately used as they often cause the most difficulty to video encoders and represent the worst case that the encoder should encounter in 'normal / real' use.

The total time of the individual clips is over 2 hours 20 minutes (over 47 minutes in each of the formats).

3.2 Individual clips provided

168 YUV clips are provided, comprising 56 individual clips each at the following resolutions:

- ❑ 1920x1080 progressive [original filming size]
- ❑ 1280x720 progressive: this has been generated by downsizing from 1920x1080 using a proprietary scaling algorithm (superior to bicubic interpolation)
- ❑ 1920x1080 interlaced (see sections 3.2.1 and 3.3.3), comprising alternate fields with each field at 1920x540 resolution, bottom field first

Each of these clips are:

- ❑ planar YUV 4:2:0 (i.e. a frame of Y followed by a frame of U followed by a frame of V, where the U and V are both half the resolution of the Y plane, both horizontally and vertically)
- ❑ 8-bits (one byte) per sample
- ❑ square pixels
- ❑ 16:9 picture aspect ratio
- ❑ no headers
- ❑ top picture row first
- ❑ Y planes are unsigned nominally 16-235 but may go 0-255
- ❑ U and V planes are centred at 128 and are nominally 16-240 but may go from 0-255

All of the clips were filmed at 25 frames per second, although the YUV may be re-played / encoded at any speed (such as 24 or 29.97 fps).

3.2.1 Generation of interlaced video

All the clips were originally filmed progressive. In order to generate the correct fields representing the video data at the time between the progressive fields, in-house software has been used. Normally this has been done by calculating pixel-by-pixel motion vectors from one frame to the next in order to generate the intermediate time frame. For the majority of the clips this process works well: sometimes it does not due to excessive movement or other factors.

Where there are minor artefacts in the generated frames of the video these are noted in box GN.12 of the clip description (in order to ensure that these are not interpreted as encoder errors).

For video clips where the motion vector calculations produce a large number of artefacts, the intermediate fields have been generated by blending the preceding and following frames together. Where this is the case the 1920x1080i clip has been denoted below with 'Frame blend' in box GN.12.

All the generated interlaced clips are one frame shorter than the progressive clips upon which they are based (this is a by-product of the generation process).

3.3 Format of video on disk

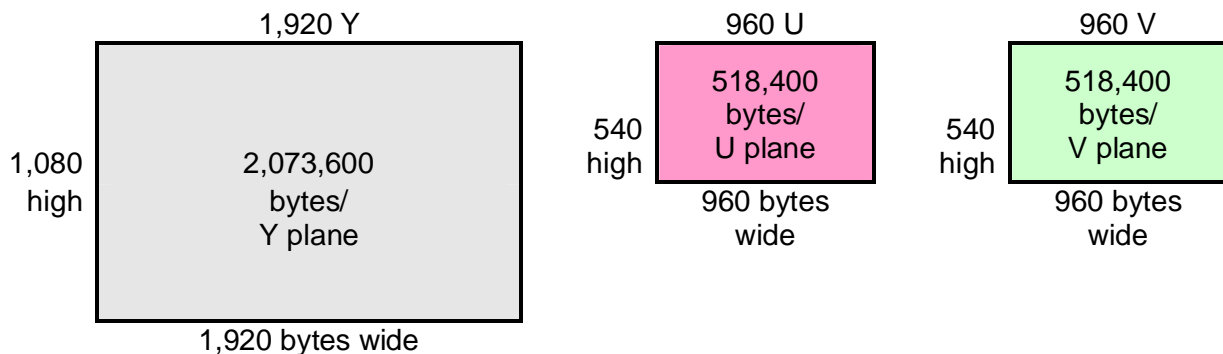
All the YUV video is stored in planar form, i.e. a plane of Y followed by a plane of U followed by a plane of V.

3.3.1 1080p

Byte 0 in the file is the Y data of the pixel at top left of the first frame.

One frame of Y, U and V:

Plane of Y followed by plane of U followed by plane of V



Valid video data ranges:

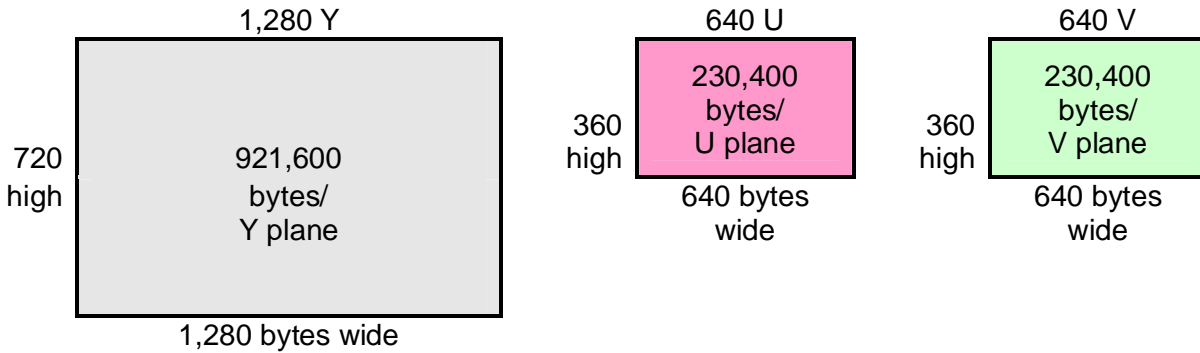
- Y: 16 - 235
- U and V: 16 - 240

3.3.2 720p

Byte 0 in the file is the Y data of the pixel at top left of the first frame.

One frame of Y, U and V:

Plane of Y followed by plane of U followed by plane of V



Valid video data ranges:

- Y: 16 - 235
- U and V: 16 - 240

3.3.3 1080i

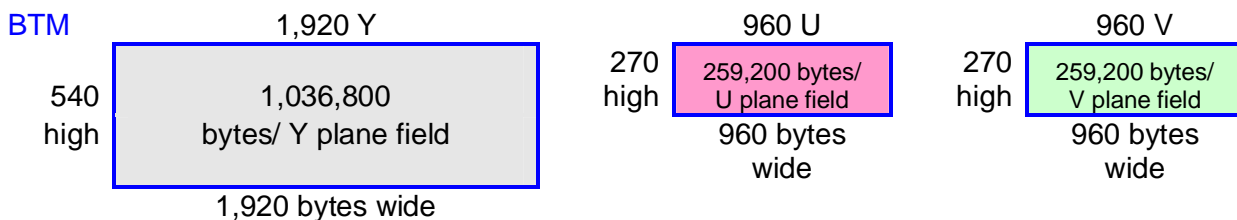
Byte 0 in the file is the Y data of the pixel at top left of the first frame.

Note: as supplied, the 1080i video is stored on disk with alternating fields of YUV, bottom field first. If the 1080i video is required in frame format, with the alternating fields on alternating lines, the supplied utility program `yuvfieldcombine` can be used to combine the fields. See sections 3.2.1 and 4.3.3 for more information.

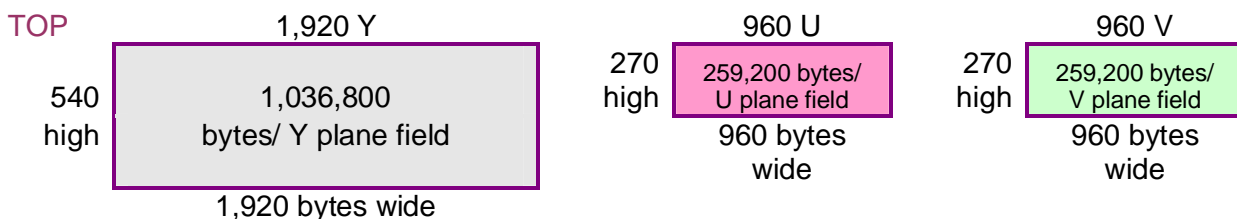
Each frame of Y, U and V is divided into alternating fields, bottom field first, with the YUV data as follows (each field being half the height of the frame):

BTM field			TOP field		
Y data BTM field	U data BTM field	V data BTM field	Y data BTM field	U data BTM field	V data BTM field

For each field: plane of Y followed by plane of U followed by plane of V



followed by top field:



Valid video data ranges:

- Y: 16 - 235
- U and V: 16 - 240

3.4 Audio

Audio clips are provided for every video clip, matching the video length. In the vast majority of cases this was the actual audio recorded with the video.

Where the audio provided was not recorded with the video, similar/appropriate audio is provided, matched in time-length. This is denoted by `'_sim_'` in the audio filename (instead of `'_act_'`, denoting actual audio recorded at the time).

Clearly the main point of the *Tvids* is video testing, so the audio supplied is intended to be used to check timing/correlation during the encode process rather than to be particularly useful as standalone audio. Consequently, this audio has not been cleaned up or normalised and nor was much time spent in ensuring good audio recording during filming.

All the audio clips are provided in two formats:

- MPEG-1 Layer II stereo 384kbps CBR 16-bit 48kHz and
- WAV linear PCM uncompressed stereo 1536kbps 16-bit 48kHz

4. Software to view & process YUV video

4.1 Viewing/playing the YUV video

This section explains some of the technical requirements for playing the YUV video (computer and software requirements).

4.1.1 Computer requirements of viewing the YUV video

The **Tvids** YUV files are uncompressed and some of the clips within this set require a high performance computer in order to play the video in real-time at full frame rates. The sustained continuous data rates required from disk are:

- ❑ **1080p/i:** 78 MBytes/sec
- ❑ **720p:** 35 MBytes/sec

This means that the above rates must be achieved using disk arrays, solid state disks or with the video loaded into RAM disk.

Useful references as starting points for system recommendations are given on the websites for Aja (www.aja.com) and BlackMagic Design (www.blackmagic-design.com) although various companies provide information about how this can be achieved / the configuration of system required to achieve this. A list is given on the **TestVid** website under Support at:

<http://www.testvid.com/highperfpc.html>

TestVid accepts no responsibility or liability for use of any of the information on the pages listed.

4.1.2 YUV viewers/players

There are a number of software programs for viewing YUV files: a list is given on the **TestVid** website under Support at:

<http://www.testvid.com/yuvviewers.html>

Links are provided to the pages where the YUV viewers can be downloaded.

Note that these programs only show one YUV stream at a time.

TestVid accepts no responsibility or liability for download or use of any of the programs listed; the user should carefully examine the license agreement that applies to the software concerned.

4.1.3 Programs that do not display/import YUV files directly

A number of common programs - such as Final Cut Pro, Adobe Premiere Pro, Sony Vegas and others may not import YUV uncompressed files directly: the YUV files may need to be wrapped e.g. in an AVI or converted to another format

- ❑ wrap the YUV within an AVI file
- ❑ convert the YUV into a different format acceptable to the chosen program
- ❑ play the YUV video out in real-time on SDI and use an adaptor to display the two SDI inputs

Each of the above options is discussed below.

4.1.4 Wrap the YUV within an AVI file

There are a number of programs to do this; probably the easiest is to use a program called **FFMPEG**. This is used as a command line program: it can easily be found using a search engine.

Usage:

```
ffmpeg -r 25 -s 1920x1080 -i <infile.yuv> -vcodec copy <outfile.avi>
```

where

- ❑ `-r 25` sets the frame rate to 25 fps (FFMPEG default is 25 fps)
- ❑ `-s 1920x1080` sets the resolution of the input file
- ❑ `<infile.yuv>` is the input YUV filename
- ❑ `<outfile.avi>` is the output AVI filename

Note that the 1920x1080 interlaced files are separate fields, with each field 1920 horizontal and 540 vertical. Most likely, it will be better to combine these separate fields into frames 1920 horizontal and 1080 vertical, before putting into an AVI: use the provided [TestVid](#) program `yuvfieldcombine` to do this (see section 4.3 below). The batch file provided does this.

Note that in order to use these batch files:

- ❑ firstly, the [Tvids](#) sequences will need to be copied to a different disk as there is insufficient space on the supplied disk unit
- ❑ secondly, the correct paths will need to be set up in the batch files, to FFMPEG and by doing a 'Search and Replace' (Ctrl-H in Windows Notepad)
- ❑ FFMPEG will need to be downloaded

4.1.5 Convert YUV to another format

As the purpose of this set of [Tvids](#) sequences is to test encoders (and presumably purchased for this purpose), the user will have a means to encode the YUV sequences into a compressed format such as MPEG-2, H.264/MPEG-4/AVC, MVC or other, so can then view the compressed sequences.

4.2 Real-time play-out of the YUV video

The YUV files provided are suitable for direct use with video encoders, but in some circumstances it may be desirable to play-out the YUV in real-time on an SDI / ASI / DVI / HDMI link.

Essentially, the issue is to get the uncompressed [Tvids](#) YUV files from disk onto an SDI / ASI / DVI / HDMI interface via a specialised I/O board.

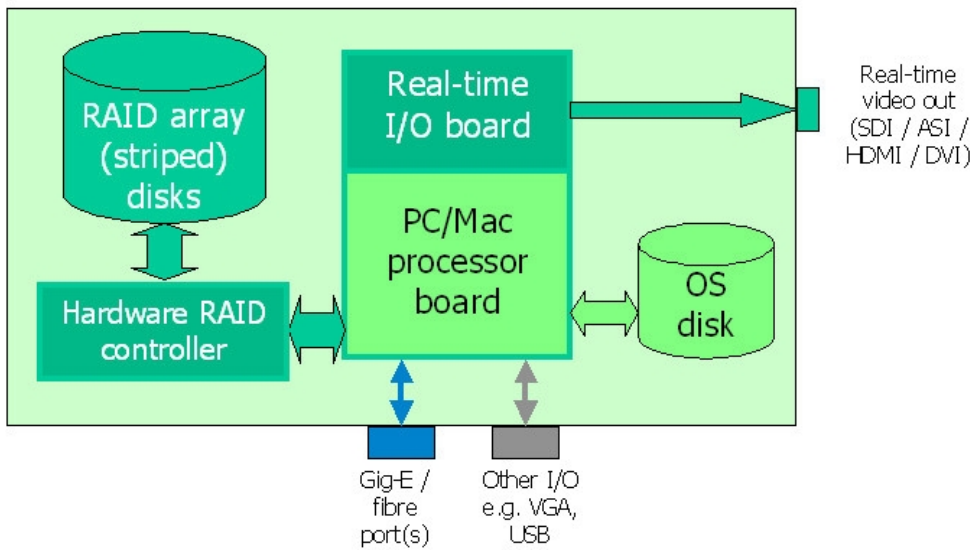
All video servers, many hardware encoders and a large proportion of other professional broadcast equipment have internal hard disks and Gig-E Ethernet interfaces. This allows the [Tvids](#) to be directly copied over the Ethernet network onto the hard disk, and play-out from there.

Where it is required to produce an SDI / ASI / DVI / HDMI stream as input to other equipment, this can be done relatively straightforwardly, using:

- ❑ a high performance PC / Mac
- ❑ with high speed RAID hard disks
- ❑ with an appropriate SDI etc. I/O board, e.g. from Aja, BlackMagic Design or Bluefish444
- ❑ and software to control moving the video from disk onto the I/O interface

A schematic of the required set-up is:

Real-time Play-out Using a PC/Mac



See the [TestVid](http://www.testvid.com) website:

<http://www.testvid.com/support.html>

More detailed information is provided, including a page on "broadcast applications" and the steps required are covered in some detail in the white paper, "Real-Time Play-out of YUV Video in a Broadcast Environment"

4.3 Software tools provided

The following software is provided:

Software tool	Purpose
yuvmake1088	Add extra lines at the top/bottom of a 1920x1080 YUV file to make it 1920x1088
yuvfieldcombine	Combine interlaced fields which are stored in alternating format (bottom field followed by top field, each half-height) into frames where alternate lines contain alternate fields
yuvletterbox	Alter provided video by making it appear 'letterboxed' (i.e. with black bands top and bottom of each frame) or 'pillarboxed' (with black bands left and right)

Note

1. The software tools are provided solely for the use of the purchaser of the license to use this set of video clips and may not be used with other video or provided to other persons/organisations.
2. The use of these software tools is only on the basis of complete acceptance of the license agreement as given in section below. The fact of using these software tools gives your explicit consent to abide by the terms of the license agreement.

4.3.1 License agreement relating to the software tools provided

This license agreement below applies to all software listed in this section 4.3.

The software program(s) is/are provided to the user without any license fee or royalty on an "as is" basis, solely as an incidental part of the clip set and do not form part of the contract.

TestVid disclaims any and all warranties, whether express, implied, or statutory, including any implied warranties or merchantability or of fitness for a particular purpose.

The user makes use of this/these program(s) at their own risk. In no event shall **TestVid** be liable for any incidental, punitive, or consequential damages of any kind whatsoever arising from the use of this/these program(s).

This disclaimer of warranty extends to the user of this/these program(s) and user's customers, employees, agents, transferees, successors and assigns.

The software program(s) is/are provided solely to the purchaser of the relevant set of **TVids** and may not be sent to or copied to any other person or organisation or used with any other video

4.3.2 yuvmake1088

This is a command line program for adding 8 additional lines to 1080 vertical resolution video, to make it 1088 vertically i.e. an integer multiple of 16.

All the lines added are greyscale, set to one grey colour.

Usage:

```
yuvmake1088 <inputfile.yuv> <p> <n> <c>
```

where

- <inputfile.yuv> is the input filename which is 1080 lines vertically (must have extension .yuv)
- <p> = progressive or interlaced input file, set to 'p' or 'i'
- <n> = the number of the 8 lines to add at the top of each frame (0, 2, 3, 6 or 8). '0' means add zero lines at the top i.e. at 8 lines at the bottom; '8' means add 8 lines at the top and zero at the bottom; '4' means add 4 at top and bottom, etc.
- <c> = greyscale colour to add, number 16-235. 16=black; 235=white. Numbers less than 16 will be set to 16; greater than 235 will be set to 235.

The filename for the output file, with the extra 8 lines added, will be

```
inputfile_1088.yuv (the '_1088' is added by yuvmake1088)
```

The output file is put in the same folder as the input file.

4.3.3 yuvfieldcombine

This is a command line program for combining interlaced fields which are stored in alternating format (bottom field followed by top field, each half-height) into frames where alternate lines contain alternate fields.

It is assumed that the video data is stored bottom field first.

Usage:

```
yuvfieldcombine <inputfile.yuv> <xsize> <ysize> <nnn>
```

where

- ❑ `<inputfile.yuv>` is the input filename (must have extension `.yuv`)
- ❑ `<xsize>` = horizontal resolution of the input file (must be multiple of 2)
- ❑ `<yssize>` = vertical resolution of **frame** of the input file, e.g. set to 1080 for 1920x1080i; set to 480 to 720x480i (must be multiple of 4)
- ❑ `<nnn>` = number of video frames to process. Set to 0 to process all frames. If `<nnn>` is greater than the number of frames then all frames will be processed

The filename for the output file, with the fields combined will be

`inputfile_FLDCMB.yuv` (the `'_FLDCMB'` is added by `yuvfieldcombine`)

The output file is put in the same folder as the input file.

4.3.4 yuvletterbox

This is a command line program for creating a black band at the top & bottom of each frame (or left & right), by over-writing the video data in these bands. The luminance of the 'black' band may be set; the size of the bands top and bottom (left/right) may be set. The *TVids* logo is moved to remain visible in the bottom left corner of the video data.

For interlaced video it is assumed that the video data is stored bottom field first.

1080p/i (1920x1080) and 720p (1280x720) videos are 16:9 picture aspect ratio (1.777:1).

Common picture aspect ratios with areas of letterbox / pillarbox are:

Picture aspect ratio	1080p/i (1920x1080)	720p (1280x720)
Default	Number of black lines top & bottom	
1.777:1 (16:9)	0, 0	0, 0
Letterbox	Number of black lines top & bottom	
1.85:1	21, 21	14, 14
2.35:1	131, 132	87, 88
Pillarbox	Number of black lines left & right	
1.33:1 (4:3)	240, 240	160, 160
14:9 (1.56:1)	117, 118	78, 79

Usage:

```
yuvletterbox <inputfile.yuv> <xsize> <yssize> <nnn> (cont'd)
               <f> <blk> <l> <tl> <br>
```

where

- ❑ `<inputfile.yuv>` is the input filename (must have extension `.yuv`)
- ❑ `<xsize>` = horizontal resolution of the input file (must be multiple of 2)
- ❑ `<yssize>` = vertical resolution of **frame** of the input file, e.g. set to 1080 for 1920x1080i (must be multiple of 4)

- `<nnn>` = number of video frames to process. Set to 0 to process all frames. If `<nnn>` is greater than the number of frames then all frames will be processed
- `<f>` = format, i.e. progressive or interlaced input file, set to 'p' or 'i'
- `<blk>` = 'black' colour to add, number 16-235. 16=black; 235=white. Numbers less than 16 will be set to 16; greater than 235 will be set to 235.
- `<l>` = letterbox or pillarbox, set to 'l' or 'p'. If set to 'l' (for letterbox) then the values for `<t1>` and `
` are used respectively for the top and bottom of the video; if set to 'p' (for pillarbox) then the values for `<t1>` and `
` are used respectively for the left and right of the video
- `<t1>` = the number of the lines (columns) to over-write at the top (left) of each frame with the `<blk>` value. Valid values are 0 to 400
- `
` = the number of the lines (columns) to over-write at the bottom (right) of each frame with the `<blk>` value. Valid values are 0 to 400

As an example:

```
yuvletterbox inputfile.yuv 1920 1080 0 p 16 l 21 21
```

will produce a letterboxed version of the `inputfile.yuv` file, 1920x1080, all frames, progressive, black colour 16, with 21 black lines top and bottom (making a visible picture aspect ratio of 1:85:1)

The filename for the output file, with the letterboxed/pillarboxed content will be

























```
inputfile_LBOX.yuv    if <l> = 'l', or (the '_LBOX' is added by yuvletterbox)
inputfile_PBOX.yuv    if <l> = 'p', or (the '_PBOX' is added by yuvletterbox)
```

The output file is put in the same folder as the input file.

5. List of clips

5.1 Clips summary

□ Total time of clips at each resolution (at 25 fps): **47 mins 15 secs 11 frames**

Clip number(s)	Title	Main purposes	Duration (mins:secs:frames)	Begin	End
T2V002001, T2V002101, T2V002201	Bars_countdown	HD colour bars with countdown and introduction slate	00:50:00		
T2V002002, T2V002102, T2V002202	Enjoy the adventure	Slow global motion & slow zoom	00:47:19		
T2V002003, T2V002103, T2V002203	Pier 39 shops	Medium speed macroblock motion vectors	01:08:16		
T2V002004, T2V002104, T2V002204	Close up carousel	Fast macroblock motion vectors with obscured objects	00:15:11		
T2V002005, T2V002105, T2V002205	Golden evening	Slow global zoom in high contrast with fine lines and out-of-focus	02:27:15		
T2V002006, T2V002106, T2V002206	Stars n Stripes	Rapid macroblock motion vectors with bright colours & monochromatic back-ground with MPEG artefacts	00:40:01		
T2V002007, T2V002107, T2V002207	Red white fleet	Slow global motion with larger area macroblock motion vectors	00:32:17		
T2V002008, T2V002108, T2V002208	Alcatraz	Rapid global motion and rotation, with panning movement and low & high contrast	02:51:02		
T2V002009, T2V002109, T2V002209	Brigantine	Tracking large area of macroblocks with foreground and background	00:59:20		
T2V002010, T2V002110, T2V002210	Boat masts	Fast panning with detailed lines	00:32:05		
T2V002011, T2V002111, T2V002211	Sea lions	Compression of fur and water during global zoom	00:34:13		
T2V002012, T2V002112, T2V002212	Waiting in line	Global motion around focus point	00:52:08		

T2V002013, T2V002113, T2V002213	Seagull	Slow global motion and macroblock tracking with highly reflective background	00:21:07		
T2V002014, T2V002114, T2V002214	Moss by Golden Gate	Natural patterns with dull colours mixed with bright lines & colours	00:51:18		
T2V002015, T2V002115, T2V002215	Ride a cowboy	Medium speed global motion with multiple large macroblock areas moving in different directions	00:42:22		
T2V002016, T2V002116, T2V002216	Lombard street	Slow global motion and zoom in with obscured subject	00:50:23		
T2V002017, T2V002117, T2V002217	Fuzzy traffic	Macroblock motion vector tracking with global static view but in/out of focus	01:04:00		
T2V002018, T2V002118, T2V002218	Boat reflection	High reflectivity high contrast	00:21:08		
T2V002019, T2V002119, T2V002219	Bridge focus	Rapid diagonal motion with fine lines/detail, also going in/out of focus	01:19:05		
T2V002020, T2V002120, T2V002220	Cable car turn	High contrast with tracking of large macroblock areas	00:50:01		
T2V002021, T2V002121, T2V002221	Enjoy the ride	Rapid erratic global motion and zoom out with line details and high contrast	01:57:04		
T2V002022, T2V002122, T2V002222	Streets of San Francisco	Highly erratic random global motion and zoom out with line detail and obscured subjects	01:59:17		
T2V002023, T2V002123, T2V002223	End of the line	High contrast with tracking of large macroblock areas	00:58:14		
T2V002024, T2V002124, T2V002224	Blue boarding	Very rapid pan left with high contrast areas	00:07:01		
T2V002025, T2V002125, T2V002225	Spanish guitarist	Low global motion with detail movement and transitions (audio is recommended)	00:35:22		
T2V002026, T2V002126, T2V002226	Chinatown	Pan left with detail scene	00:15:18		
T2V002027, T2V002127, T2V002227	Street bikers	Limited global motion with multiple high-speed subjects, with 2 transitions	01:13:08		

T2V002028, T2V002128, T2V002228	Broadway	Slow global pan/scroll with large detail and patterns	01:15:10		
T2V002029, T2V002129, T2V002229	Transamerica Pyramid	Generally low contrast with high contrast fine lines, going in / out of focus	00:45:19		
T2V002030, T2V002130, T2V002230	Oakland Bay bridge	Rapid global zoom in with erratic global motion, with large change in colour/brightness from dark - light red - dark	00:47:06		
T2V002031, T2V002131, T2V002231	SF silhouette	Slow global zoom with high contrast and over-bright highlights	00:36:02		
T2V002032, T2V002132, T2V002232	Golden sunset	Erratic global motion with zoom out and high contrast	00:18:01		
T2V002033, T2V002133, T2V002233	Desert wing	Mainly fixed subject with contrast/colours varying from bright to dull	01:01:13		
T2V002034, T2V002134, T2V002234	Ted landing	Tracking small object in field of view with grain and subject increasing in size/ obscured	00:27:08		
T2V002035, T2V002135, T2V002235	Moneyrail	High contrast bright colours and reflections with text, with slow global motion and large area macroblock motion	00:50:03		
T2V002036, T2V002136, T2V002236	New York	Slow pan with fine detail and monochromatic background with MPEG artefacts	00:17:09		
T2V002037, T2V002137, T2V002237	Travelator	Round objects in high-contrast, with global zoom in and with moiré patterns (from MPEG artefacts)	03:03:23		
T2V002038, T2V002138, T2V002238	Chandelier reflections	Macroblock motion vector nightmare (very hard to correlate correct macroblocks)	00:17:11		
T2V002039, T2V002139, T2V002239	Couple on steps	Slow tracking/global motion with obscured subjects	00:33:10		
T2V002040, T2V002140, T2V002240	Tropicana junction	Macroblock motion vector tracking of multiple smaller objects	00:24:02		
T2V002041, T2V002141, T2V002241	The Real Thing	Slow pan up/down/right with high contrast/high detail and text	00:44:00		
T2V002042, T2V002142, T2V002242	Going up	Slow global zoom out with some erratic motion	00:27:04		

T2V002043, T2V002143, T2V002243	Going down	Slow global zoom in	00:32:07		
T2V002044, T2V002144, T2V002244	Mock Eiffel	Water and fine detail moving to monochromatic background	00:21:03		
T2V002045, T2V002145, T2V002245	Red 7	Multiple subjects filling field of view, where focus shifts from one to another	00:53:12		
T2V002046, T2V002146, T2V002246	MGM fountains	Bright background with some text and water with low contrast but textured background	00:24:01		
T2V002047, T2V002147, T2V002247	Vegas from above	Night-time high contrast with slow diagonal global motion and grain	01:48:10		
T2V002048, T2V002148, T2V002248	Rio neon	Slow global zoom in of high contrast/bright colours	00:30:07		
T2V002049, T2V002149, T2V002249	The bar at	Slow pan left/down of indoors (dark) scene with text	00:31:24		
T2V002050, T2V002150, T2V002250	Vegas night drive	Rapid global movement with high contrast, generally dark area	01:14:00		
T2V002051, T2V002151, T2V002251	Las Vegas blvd	Minor global 'twitching) with multiple subjects moving away	00:15:10		
T2V002052, T2V002152, T2V002252	Walking close	Multiple subjects filling field of view, where focus shifts from one to another	00:28:15		
T2V002053, T2V002153, T2V002253	Water ripples	Macroblock motion vector nightmare (very hard to correlate correct macroblocks)	00:13:12		
T2V002054, T2V002154, T2V002254	Two women walking	Tracking and right-left global motion	00:25:05		
T2V002055, T2V002155, T2V002255	Hog waiting	Tracking and left-right global motion with partially-obscured subject	00:23:17		
T2V002056, T2V002156, T2V002256	Taxy service	Tracking multiple object where whole scene is shimmering (due to heat haze)	01:23:23		

5.2 Clip features

5.2.1 PDF file searching for specific clip features

The PDF of the user manual may be searched to find clips that match the given CF-words ('CF'= Clip Feature).

5.2.2 Excel file sorting for specific clip features

In addition to the PDF of this manual, an Excel file is provided which lists all the clips and the clip features in columns. This spreadsheet is in Excel .xls format (compatible with Excel versions from 97-2000 and later).

There are two tabs in the spreadsheet:

- the first tab has the clip set title: this has all the items listed in the manual for the clip
- the second tab "Clip features" just lists the individual clips, with the list of their clip features and individual columns for each individual clip feature.

Probably the "Clip features" tab is easiest to use to find specific clips with specific features, although every column may be sorted for specific features, by clicking on the drop-down arrow adjacent to each column heading (the examples below are from the T2V001 USA East clip set)

1	A	B	C	D	E	F	G	
2	Number(s)	True	GN.01 Filename(s)	GN.02 Horizontal x vertical si	GN.03 Progressive / Interlaced	GN.04 Video format	GN.05 Bits per sam	GN.06 Video c
3	T2V001001, T2V001101, T2V001201	Bars_countdown	T2V001001_Bars_countdown_1920x1080p.yuv	1920x1080; 1280x720	'p' file suffix = progressive; 'i' YUYV planar 4:8 (for each of 'HD colo			
4	T2V001002, T2V001102, T2V001202	Stars_n_Stripes	T2V001002_Stars_n_Stripes_1920x1080p.yuv	1920x1080; 1280x720	'p' file suffix = progressive; 'i' YUYV planar 4:8 (for each of 'US flag			
5	T2V001003, T2V001103, T2V001203	Times_Square	T2V001003_Times_Square_1920x1080p.yuv	1920x1080; 1280x720	'p' file suffix = progressive; 'i' YUYV planar 4:8 (for each of 'Somew			
6	T2V001004, T2V001104, T2V001204	Chrysler_building	T2V001004_Chrysler_building_1920x1080p.yuv	1920x1080; 1280x720	'p' file suffix = progressive; 'i' YUYV planar 4:8 (for each of 'Slow zo			
7	T2V001005, T2V001105, T2V001205	Display	T2V001005_Display_1920x1080p.yuv	1920x1080; 1280x720	'p' file suffix = progressive; 'i' YUYV planar 4:8 (for each of 'Large ot			

Click arrow to get drop-down list of items in this column (example below for 'SS.01 People')

AC	AD	AE	AF	AG
C.10	LC.11	SS.01	SS.02	SS.
-	Some	(All) (Top 10,..) (Custom...)	One	-
-	-	-	-	-
-	-	-	-	-
-	-	Few	-	-
-	-	Many	-	-
-	-	One	-	-
-	-	People	-	-

Select 'One' to show only clips with 'One' under 'SS.01 People'

Note that this first tab on the spreadsheet is roughly 100 columns wide (from column A to column CZ), so it may be helpful to use the 'Freeze Panes' feature (on the 'Window' menu in Excel 2000 and 2003) or split windows to keep the clip number visible.

The "Clip features" tab appears and can be sorted as indicated below:

A	B	C	D	E	F	G	
1	Clip number / nam	Clip features	CF-animal	CF-angl	CF-bandin	CF-black_bac kgroun	CF-bright_da ylight
2	T2V001001_Bars_countdown	CF-text, CF-dark_areas, CF-patterns, CF-black_background, CF-round_objects, CF-transitions, CF-large_monochromatic				y	
3	T2V001002_Stars_n_Stripes	CF-bright_colours, CF-large_monochromatic, CF-movement_across					
4	T2V001003_Times_Square	CF-panning, CF-complex_scene					
5	T2V001004_Chrysler_building	CF-zoom_in, CF-fine_details, CF-low_contrast, CF-dull_daylight					
6	T2V001005_Display	CF-high_contrast, CF-rapid_changes					
7	T2V001006_Smiling	CF-faces, CF-people					
8	T2V001007_Traffic_duty	CF-faces, CF-text, CF-people					
9	T2V001008_Empire_State	CF-patterns, CF-scroll, CF-faces, CF-hand_held					
10	T2V001009_FDNY	CF-out_of_focus, CF-vehicles					
11	T2V001010_Checked_caps	CF-people, CF-movement_out, CF-patterns					
12	T2V001011_Gold_statue	CF-water, CF-patterns, CF-large_monochromatic					
13	T2V001012_Eyewitness_news	CF-moving text					

Selecting a drop-down menu and clicking on 'y' reduces the list to those that have that CF value:

I	J	K	L	M
CF- bright_da yight	CF- bright_su nlight	CF- brightnes s_chan	CF- complex_ scene	CF- coordina ed_mov ment
			(All) (Top 10...) (Custom...) (Blanks) (NonBlanks)	

col	CF- bright_da yight	CF- bright_su nlight	CF- brightnes s_chan	CF- complex_ scene
				y
				y
				y
				y

Clip number / name	Clip features
4 T2V001003_Times_Square	CF-panning, CF-complex_scene
34 T2V001033_People_crossing	CF-complex_scene, CF-vehicles, CF-people
36 T2V001035_Pan_left	CF-panning, CF-complex_scene, CF-tracking
45 T2V001044_Times_Sq_night	CF-night, CF-complex_scene, CF-dark_areas, CF-transitions, CF-scene_change, CF-graininess
48 T2V001047_Broadway	CF-night, CF-text, CF-complex_scene

5.2.3 List of 'CF' ('clip features') words used

The PDF of the user manual may be searched to find clips that match the given CF-words ('CF'= Clip Feature).

- | | | |
|-----------------------------------|------------------------|-----------------------|
| CF-people | CF-trees | CF-clouds |
| CF-buildings | CF-scene_vehicles | CF-sound_vehicles |
| CF-text | CF-reflections | CF-water |
| CF-sky | CF-large_monochromatic | CF-black_background |
| CF-patterns | CF-round | CF-fine_details |
| CF-hand_held | CF-transitions | |
| CF-panning | CF-scroll | CF-fast_track_pan |
| CF-tracking | CF-tracking_in_out | CF-tracking_following |
| CF-sunset_sunrise | CF-bright_daylight | CF-bright_sunlight |
| CF-dull_daylight | CF- brightness_change | CF-shaded |
| CF-indoors_bright | CF-indoors_dark | CF-night |
| CF-out_of_focus | CF-zoom_in | CF-zoom_out |
| CF-depth_of_field | CF- dark_picture | |
| CF-bright_colours | CF-dull_colours | CF-high_contrast |
| CF-
subjects_behind_foreground | | |
| CF-diagonal_movement | CF-movement_across | CF-movement_out |
| CF-movement_up_down | CF-low_movement | CF-movement |
| CF-talking | CF-wind | CF-music |
| CF-clear_distorted | CF-level_changes | |

6. Detailed information on individual clips

The following pages provide detailed information on the clips in this set.

6.1 Detailed description of each clip

This section contains detailed descriptions of each video clip, and the associated audio.

70 features are listed for each clip: the purpose of providing these descriptions is to make it easier to select specific clips for specific features.

Therefore even if a characteristic does occur in a particular clip, this is not necessarily listed where it is not a prominent feature and/or where it is believed that the clip would not be selected for this particular feature. (As an example, clip T2V002002_Enjoy_the_adventure does include a reasonable size monochromatic area for some of the clip – the sky – but it is not a principal feature so is not listed.)

Clearly to some extent these descriptions and selections are subjective, and the user is likely to come to their own conclusions as to which are most relevant to their particular codec / situation: the descriptions provided are intended to be an appropriate starting point.

Bars countdown

GN.01	Filenames	T2V002001_Bars_countdown_1920x1080p.yuv T2V002101_Bars_countdown_1280x720p.yuv T2V002201_Bars_countdown_1920x1080i.yuv
GN.02	Horizontal x vertical size(s)	1920x1080; 1280x720
GN.03	Progressive / Interlaced	'p' file suffix = progressive; 'i' file suffix = interlaced
GN.04	Video format	YUV planar 4:2:0
GN.05	Bits per sample	8 (for each of Y, U, V)
GN.06	Video description	HD colour bars and countdown with title slate, black segment and audio tone & pips
GN.07	Principal purposes	Monitor set up; text
GN.08	Duration (mins:secs:frames) at 25 fps *	00:50:00
GN.09	No. of frames (1080i 2 less *)	1250 (1080i: 1248 frames)
GN.10	1080i generation / artefacts	Motion tracking
GN.11	Original video format	1080p25; 720p25
GN.12	File size(s) on disk (MB)	3,888 : 1,729: 3,882
GN.13	CF words	CF-text, CF-dark_picture, CF-patterns, CF-black_background, CF-round_objects, CF-transitions, CF-large_monochromatic
GN.14	Associated audio types	MPEG1 Layer II 48kHz 16bit stereo 384kbps Constant Bit Rate 16bit uncompressed 48kHz stereo WAV
GN.15	Associated audio filenames	T2a002x01_Bars_countdown_act_MP1LII.mpa T2a002y01_Bars_countdown_act_unc.wav
GN.16	Associated audio description	1kHz audio tone and pips on countdown
GN.17	Audio duration	Same as video (video played at 25fps)

Clip features		Details	SCENE SUBJECTS		
LIGHT CONDITIONS			SS.01	People	-
LC.01	Bright sunlight	-	SS.02	Faces	-
LC.02	Bright daylight	-	SS.03	Vehicles	-
LC.03	Dull daylight	-	SS.04	Buildings	-
LC.04	Shaded areas	-	SS.05	Trees	-
LC.05	Indoors bright	-	SS.06	Text	Some
LC.06	Indoors dark	-	SS.07	Talking head	-
LC.07	Twilight	-	SS.08	Water	-
LC.08	Sunrise/sunset	-	SS.09	Leaves	-
LC.09	Night	-	SS.10	Sky	-
LC.10	Backlighting	-	SS.11	Clouds	-
LC.11	Large brightness change	Some	SS.12	Patterns	Some

SS.13	Round objects	One	SM.04	Movement up/down	-
SCENE PROPERTIES			SM.05	Diagonal movement	-
SP.01	Depth of field	-	SM.06	Subjects behind foreground - objects	-
SP.02	Out-of-focus	-	SM.07	Low movement	Yes
SP.03	Fine lines / moiré patterns	-	SOUND CONTENT		
SP.04	Reflections	-	SC.01	Talking	-
SP.05	Scene change	4	SC.02	Movement	-
SP.06	Fades	-	SC.03	Vehicles	-
SP.07	Transitions	4	SC.04	Wind	-
SP.08	Slow motion	-	SC.05	Music	-
COLOURS & CONTRAST			SC.06	Background	-
CC.01	Light picture	Most	SC.07	Other	1kHz tone
CC.02	Dark picture	Black	SOUND CHARACTERISTICS		
CC.03	Bright colours	Some	SH.01	Mono/ stereo	Stereo
CC.04	Dull colours	-	SH.02	Average volume	Mid
CC.05	Fine detail/ moiré patterns	-	SH.03	Level changes	-
CC.06	High contrast areas	Some	SH.04	Clear/ distorted	-
CC.07	Large monochromatic areas	Some			
CC.08	Graininess				
CC.09	Black background	10 seconds			
CC.10	White background	-			
GLOBAL MOTION					
GM.01	Fast track/pan	-			
GM.02	Tracking in/out	-			
GM.03	Tracking	-			
GM.04	Panning	-			
GM.05	Tracking (following)	-			
GM.06	Fast scroll	-			
GM.07	Scroll	-			
GM.08	Angled	-			
GM.09	Zoom in	-			
GM.10	Zoom out	-			
GM.11	Hand-held camera	-			
SUBJECT MOTION					
SM.01	Movement out of picture	-			
SM.02	Movement into picture	-			
SM.03	Movement across picture	-			

Enjoy the adventure



GN.01	Filenames	T2V002002_Enjoy_the_adventure_1920x1080p.yuv T2V002102_Enjoy_the_adventure_1280x720p.yuv T2V002202_Enjoy_the_adventure_1920x1080i.yuv
GN.02	Horizontal x vertical size(s)	1920x1080; 1280x720
GN.03	Progressive / Interlaced	'p' file suffix = progressive; 'i' file suffix = interlaced
GN.04	Video format	YUV planar 4:2:0
GN.05	Bits per sample	8 (for each of Y, U, V)
GN.06	Video description	View from boat leaving harbour with sea lions
GN.07	Principal purposes	Slow global motion & slow zoom
GN.08	Duration (mins:secs:frames) at 25 fps *	00:47:19
GN.09	No. of frames (1080i 1 less *)	1194
GN.10	1080i generation / artefacts	Motion tracking
GN.11	Original video format	1080p25
GN.12	File size(s) on disk (MB)	3,714 : 1,651 : 3,711
GN.13	CF words	CF-bright_sunlight, CF- brightness_change, CF-buildings, CF-water, CF-text, CF-fine_details, CF-reflections, CF-tracking, CF-panning, CF-wind, CF-talking, CF-level_changes, CF-people
GN.14	Associated audio types	MPEG1 Layer II 48kHz 16bit stereo 384kbps Constant Bit Rate 16bit uncompressed 48kHz stereo WAV
GN.15	Associated audio filenames	T2a002x02_Enjoy_the_adventure_act_MP1LII.mpa T2a002y02_Enjoy_the_adventure_act_unc.wav
GN.16	Associated audio description	Loud commentary with sea lions and wind noise (actual audio recorded with video)
GN.17	Audio duration	Same as video (video played at 25fps)

Clip features	Details	LC.10	Backlighting	-
LIGHT CONDITIONS				
LC.01	Bright sunlight	All	LC.11	Large brightness change Some
LC.02	Bright daylight	-	SCENE SUBJECTS	
LC.03	Dull daylight	-	SS.01	People Many
LC.04	Shaded areas	-	SS.02	Faces -
LC.05	Indoors bright	-	SS.03	Vehicles -
LC.06	Indoors dark	-	SS.04	Buildings Many
LC.07	Twilight	-	SS.05	Trees -
LC.08	Sunrise/sunset	-	SS.06	Text Some
LC.09	Night	-	SS.07	Talking head -
			SS.08	Water Lots

SS.09	Leaves	-	GM.04	Panning	Slow right
SS.10	Sky	Some blue	GM.05	Tracking (following)	-
SS.11	Clouds	-	GM.06	Fast scroll	-
SS.12	Patterns	-	GM.07	Scroll	-
SS.13	Round objects	-	GM.08	Angled	-
SCENE PROPERTIES			GM.09	Zoom in	-
SP.01	Depth of field	Deep	GM.10	Zoom out	-
SP.02	Out-of-focus	-	GM.11	Hand-held camera	-
SP.03	Fine lines / moiré patterns	-	SUBJECT MOTION		
SP.04	Reflections	Water - some	SM.01	Movement out of picture	-
SP.05	Scene change	One	SM.02	Movement into picture	-
SP.06	Fades	-	SM.03	Movement across picture	-
SP.07	Transitions	One: cross-fade at 00:14:00	SM.04	Movement up/down	-
SP.08	Slow motion	-	SM.05	Diagonal movement	-
COLOURS & CONTRAST			SM.06	Subjects behind foreground objects	-
CC.01	Light picture	Most	SM.07	Low movement	Yes
CC.02	Dark picture	-	SOUND CONTENT		
CC.03	Bright colours	Some	SC.01	Talking	Lots
CC.04	Dull colours	Some	SC.02	Movement	-
CC.05	Fine detail/ moiré patterns	Some	SC.03	Vehicles	-
CC.06	High contrast areas	-	SC.04	Wind	Some
CC.07	Large monochromatic areas	-	SC.05	Music	-
CC.08	Black background	-	SC.06	Background	People
CC.09	White background	-	SC.07	Other	Animal - other
GLOBAL MOTION			SOUND CHARACTERISTICS		
GM.01	Fast track/pan	-	SH.01	Mono/ stereo	Stereo
GM.02	Tracking in/out	In	SH.02	Average volume	Mid
GM.03	Tracking	Slow left	SH.03	Level changes	Some
			SH.04	Clear/ distorted	-