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| *Title:* | **Description of HDR sequences proposed by Technicolor** | | |
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| *Source:* | Technicolor | | |

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# Abstract

Five High Dynamic Range (HDR) sequences are proposed for experiments in the context of MPEG and JCTVC HDR video coding exploration works. These sequences have been created in the framework of the French NEVEX collaborative project, by Binocle, Technicolor for four of them and Polymorph Software for one of them. The document provides a short description of these sequences.

# Introduction

In the context of the MPEG Adhoc group for High Dynamic Range and Full Color Gamut support, five HDR sequences are proposed for video coding experiments and evaluation. Four of them are natural sequences created from a rig of two Sony F3 or F65 cameras. The fifth one is a synthetic sequence. The document aims at describing these sequences.

The sequences are provided in openEXR format, half-float representation. They are display referred (corresponding to the nits rendered for each pixel by the SIM2 display used for the content grading).

The use of the sequences is restricted to MPEG and JCTVC, or for internal studies. They cannot be used or shown outside these organizations.

The sequences have been created in the framework of the French NEVEX collaborative project, Four natural video sequences have been created jointly by Binocle and Technicolor. One synthetic video sequence has been created by Polymorph Software.

# Reference display short description

The reference display is a SIM2 display (<http://www.sim2.com/HDR/hdrdisplay/hdr47e_s_4k>), whose main characteristics are provided in the table below.

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| --- | --- |
| Technology | HDR LCD Display with individually controlled LED backlight modulation |
| Resolution | 1920 x 1080 pixels |
| Display size | 47” |
| Panel aspect ratio | 16:9 |
| Number of real colours | 16 bits per channel |
| Number of LED | 2202 |
| Brightness | 4000 cd/m2 |
| ANSI Contrast | >20.000:1 |
| FULL ON/OFF Contrast | virtually infinite (>1.000.000:1) |
| White point | 6500K (totally adjustable 5000k–9000k) |

# Sequences description

## Natural sequences

The 4 first sequences have been created by Binocle and Technicolor. The capture is made using a simultaneous low exposure/high exposure capture with a rig of 2 Sony F3 or F65 cameras. In case the F65 camera is used, the content is captured in 4K resolution, then downsampled to 2K resolution. The raw content is exported to ACES RGB (openEXR format, half-float with lossless compression). A step of geometric alignment is applied using homographic transforms. The fusion is semi-automatically performed to get the HDR ACES content. Then a color grading is determined by improving the viewing quality on the HDR display and is applied; in this process a projection on the BT.709 gamut is also part of the color grading workflow. Finally the content, which is now BT.709, is sent back to the XYZ color space for storage.

*Note: contributors from Binocle are Cyril Lèbre, Thomas Bresard, Thomas Villepoux, Aymeric Manceau, Françoise Noyon, Christine Mignard, Adrien Latapie, Alexandre Sinn, Reine Gabriel, Thomas Durazzi and Yves Pupulin. Contributors from Technicolor are Yannick Olivier, David Touzé, Catherine Serré and Sébastien Lasserre.*

**Sequence ‘Seine’**

* F3 camera
* BT.709
* 1080p 25 fps
* 21 f-stops
* 200 frames (8s)



**Sequence ‘Balloon’**

* F65 camera
* BT.709
* 1080p 30 fps
* 16 f-stops
* 240 frames (8s)



**Sequence ‘Market3’**

* F65 camera
* BT.709
* 1080p 50 fps
* 15 f-stops
* 400 frames (8s)



**Sequence ‘FireEater2’**

* F65 camera
* BT.709
* 1080p 25 fps
* 18 f-stops
* 200 frames (8s)

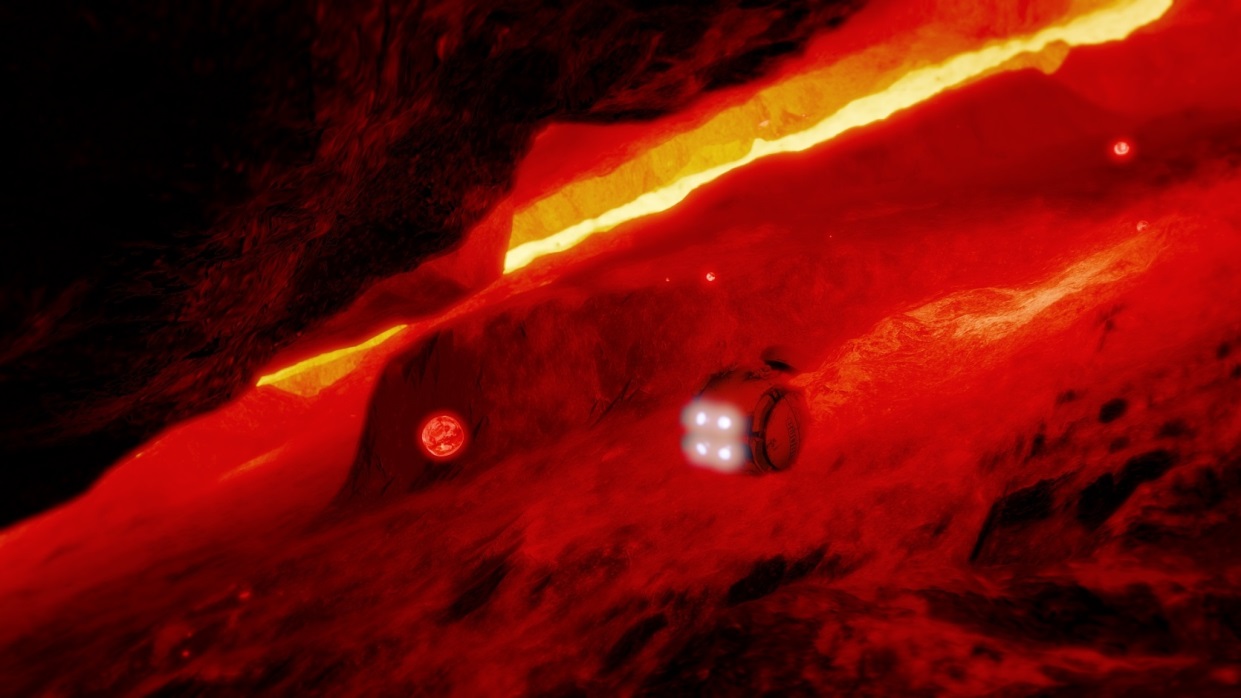


## Synthetic sequence

The fifth sequence has been made by Polymorph Software.

**Sequence ‘Tibul2’**

* BT.709
* 1080p 30 fps
* 19 f-stops
* 240 frames (8s)



# References

[1] E. Prado, [NEVex, a pioneer in HDR video](http://www.images-et-reseaux.com/fr/node/23397), Nov. 2012

# Patent rights declaration

**Technicolor does not have any current or pending patent rights relating to the technology described in this contribution.**