

TECHNICAL INFORMATION OF EBU TEST SEQUENCES

UHD-1 test set

1. *Technical information 4k production*

<i>Date and location of production:</i>	June 2012, RAI Production Centre, Turin (Italy).
<i>Camera:</i>	Sony F65 system
<i>Resolution:</i>	4096 x 2160 pixels
<i>Frame rate:</i>	50 fps, progressive
<i>Data format:</i>	RAW, 4:4:4, 16bit
<i>Transfer function:</i>	S-Log2
<i>Lenses:</i>	LEICA SUMMILUX prime lens T1.4 Ø95 (18/35/50/75 mm)
<i>Post production system:</i>	Quantel Pablo 5.2 system

2. *Technical information UHD-1 output*

<i>Resolution:</i>	3840 x 2160 pixels
<i>Frame rate:</i>	50 fps, progressive
<i>Data format:</i>	DPX, RGB, 4:4:4, 10 bit
<i>Transfer function:</i>	ITU-R BT.709

3. List of “UHD-1 test set” sequences

The table below provides further details such as clip name, length, shutter, EI and used lens. Subjective tests compliant with ITU-R BT. 500 aim to use 500 frames (10 seconds). The table below contains a recommendation for specific 500 frames per clip. Laboratories conducting tests are encouraged to use these 500 frames in order to have exchangeable scientific data about the test results.

“Public Test set” sequences:

name	length [frames]	recommended 500 frames	shutter	EI	lens [mm]
rain_fruits	600	96 - 595	180	400	50
Lupo_candlelight	600	99 - 598	180	800	35

“UHD-1 Test set” sequences:

name	length [frames]	recommended 500 frames	shutter	EI	lens [mm]
wind_wool	750	47 - 546	180	400	75
veggie_fruits	750	149 - 648	180	400	50
pendulus_wide	750	130 - 629	180	800	18
Lupo_boa	750	118 - 617	90	400	35
Lupo_confetti	750	111 - 610	90	400	35
smoke_candle	750	249 - 748	180	800	35
waterfall_pan	750	219 - 718	180	200	35
park_dancer	750	183 - 682	180/90	200	35
fountain_lady	750	107 - 606	180	400	75
studio_dancer	750	249 - 748	90	800	50

3DTV test set

1. *Technical information 3D production*

<i>Date and location of production:</i>	June 2012, RAI Production Centre, Turin (Italy)
<i>Camera:</i>	ARRI Alexa M
<i>Resolution:</i>	2880 x 1620 pixels
<i>Frame rate:</i>	50 fps, progressive
<i>Data format:</i>	ARRIRAW, 4:4:4, 12bit
<i>Transfer function:</i>	Log-C
<i>Lenses:</i>	ARRI Prime lenses UP (24/32/50/135 mm)
<i>Post production system:</i>	Quantel Pablo 5.2 system

2. *Technical information 3D output*

<i>Resolution:</i>	1920 x 1080 pixels
<i>Frame rate:</i>	50 fps, progressive
<i>Data format:</i>	DPX, RGB, 4:4:4, 10 bit
<i>Transfer function:</i>	ITU-R BT.709

3. *List of “3DTV” sequences*

The table below provides further details such as clip name, length, shutter, HIT (horizontal image translation measured on a 1080p screen) and used lens. In the “3D Test set” some sequences, such as the “Error” sequences or different camera positions are for educational use and intended to show misalignments.

Subjective tests compliant with ITU-R BT. 2021 aim to use 500 frames (10 seconds). The table below contains a recommendation for specific 500 frames per clip. Laboratories conducting tests are encouraged to use these 500 frames in order to have exchangeable scientific data about the test results.

“Public Test set” sequences:

name	length [frames]	recommended 500 frames	shutter	HIT [px]	lens [mm]
Veggie_left_pan	1000	79-578	180	53	32
Fountain_statue	1100	211-710	180	40	50

“3D Test set” sequences:

name	length [frames]	recommended 500 frames	shutter	HIT [px]	lens [mm]
Table_wide_low_light	1000	1-500	180	converged	50
Lupo_hands	1250	563-1062	180	converged	24
Lupo_bubbles	1250	512-1011	180	40	24
Lupo_confetti	1500	38-537	180	40	32
Dancer_low_cam	1250	1-500	180	40	24
Dancer_normal_cam	1250	746-1245	180	40	24
Dancer_high_cam	1250	672-1171	180	40	24
Error_tilt	1250	Full length for education	180	40	24
Error_roll	1250		180	40	24
Error_defocusing	1250		180	40	24
Fountain_dancer	1250	265-764	180	40	50

Eurovision Young Dancer Trailer

1. **Technical information 4k production (per left/right camera)**

<i>Date and location of production:</i>	June 2013, Gdansk, Poland, Baltic Opera
<i>Camera:</i>	Sony F65 cameras mounted on a mirror rig
<i>Resolution per camera:</i>	4096 x 2160 pixels
<i>Frame rate per camera:</i>	50 fps, progressive
<i>Data format:</i>	RAW, 16bit
<i>Lenses:</i>	LEICA SUMMILUX prime lenses (21/35/50 mm)
<i>Post production system:</i>	DaVinci, Final Cut, Piranha, After Effects, Sony development tool

2. **Technical information UHD-1 output (per left/right camera)**

<i>Resolution per camera:</i>	3840 x 2160 pixels
<i>Frame rate per camera:</i>	50 fps, progressive
<i>Data format:</i>	DPX, RGB, 4:4:4, 10 bit
<i>Transfer function:</i>	ITU-R BT.709
<i>Length:</i>	4 ½ minutes

Zurich Athletics 2014

1. Technical information - production

Date and location of production: August 2014, Letzigrund Stadium,
Zurich, Switzerland

Camera	Resolution in pixel	Frame rates	Data format	Transfer function
ARRI Amira	1920 x 1080	100 & 200 fps, progressive	ProRes 4444 RGB, 12 bit logarithmic	Log-C
Grass Valley LDX XtremeSpeed	1920 x 1080	150 fps, progressive	MXF, 10 bit, AVC-Intra	ITU-R Rec.709 (Live output)
Grass Valley LDX WorldCam (prototype)	1920 x 1080	50 fps, progressive	MXF, 10 bit, AVC-Intra	SMPTE ST2084 (Live output)
Phantom Flex	4096 x 2160	100, 120, 300 & 1000 fps, progressive	CineRAW, 4:4:4, 12bit logarithmic	S-Log

2. Technical information - output

Post production systems: 1) DaVinci Resolve 11 (ARRI Amira and Phantom Flex content grading and rendering)
2) DVS Clipster (Grass Valley content rendering)

HDR grading conditions: ARRI Amira and Phantom Flex content graded on a SIM2 HDR47ES4MB display in "max" brightness mode

Cameras	Resolution in pixel	Frame rates	Data format	Transfer function
ARRI Amira	1920x1080	100 & 200 fps, progressive	Open EXR, half float 16 bit	Display referenced linear light
Grass Valley LDX XtremeSpeed	1920x1080	150 fps, progressive	DPX, 4:2:2, 10 bit	ITU-R Rec.709
Grass Valley LDX WorldCam (prototype)	1920x1080	50 fps, progressive	DPX, 4:2:2, 10 bit	SMPTE ST2084
Phantom Flex	3840x2160	100, 120, 300 & 1000 fps, progressive	Open EXR, half float 16 bit	Display referenced linear light

3. List of “Zurich Athletics 2014” sequences

The table below provides further details such as clip name, resolution, shutter angle, frame rate and length¹. Subjective tests compliant with ITU-R BT. 500² aim to use 500 frames (10 seconds). The table below contains a recommended sequence of 10s (depending on the frame rate the number of frames vary for a 10s extract) per clip. Laboratories conducting tests are encouraged to use these 10s in order to have exchangeable scientific data about the test results.

“Public Test set” sequences:

Folder name	resolution	Shutter angle	Frame rate	length [frames]	recommended 10s [frames]
04_EBU_ZurichAthletics2014_HD_100p_HDR	1920x1080	356.0°	100fps	1036	4166-5165
13_EBU_ZurichAthletics2014_HD_200p_HDR	1920x1080	356.0°	200fps	2073	36025-38024
03_EBU_ZurichAthletics2014_HD_150p_SDR_live	1920x1080	-	150 fps	2604	-
08_EBU_ZurichAthletics2014_HD_50p_HDR_live	1920x1080	-	50 fps	1360	-
13_EBU_ZurichAthletics2014_UHD_100p_HDR	3840x2160	360°	100 fps	1024	13701-14700
01_EBU_ZurichAthletics2014_UHD_120p_HDR	3840x2160	360°	120 fps	2401	860-2059
10_EBU_ZurichAthletics2014_UHD_300p_HDR	3840x2160	360°	300 fps	1717	-
02_EBU_ZurichAthletics2014_UHD_1000p_HDR	3840x2160	360°	1000 fps	2928	-

¹ The below clips have been selected by the EBU to provide a range of images that can represent real television content.

² Please note that a new methodology for subjective evaluations of HDR content might be developed in the future.

“Zurich Athletics 2014” sequences:

Folder name	resolution	Shutter angle	Frame rate	length [frames]	recommended 10s [frames]
01_EBU_ZurichAthletics2014_HD_100p_HDR	1920x1080	180.0°	100fps	466	-
02_EBU_ZurichAthletics2014_HD_100p_HDR	1920x1080	356.0°	100fps	538	-
03_EBU_ZurichAthletics2014_HD_100p_HDR	1920x1080	356.0°	100fps	480	-
04_EBU_ZurichAthletics2014_HD_100p_HDR	1920x1080	356.0°	100fps	1036	4166-5165
05_EBU_ZurichAthletics2014_HD_100p_HDR	1920x1080	356.0°	100fps	1010	6224-7223
06_EBU_ZurichAthletics2014_HD_100p_HDR	1920x1080	356.0°	100fps	1124	7756-8755
07_EBU_ZurichAthletics2014_HD_100p_HDR	1920x1080	356.0°	100fps	1072	8898-9897
08_EBU_ZurichAthletics2014_HD_100p_HDR	1920x1080	356.0°	100fps	1021	12772-13771
09_EBU_ZurichAthletics2014_HD_100p_HDR	1920x1080	356.0°	100fps	1002	13772-14771
10_EBU_ZurichAthletics2014_HD_100p_HDR	1920x1080	356.0°	100fps	746	-
11_EBU_ZurichAthletics2014_HD_100p_HDR	1920x1080	356.0°	100fps	1035	16890-17889
12_EBU_ZurichAthletics2014_HD_100p_HDR	1920x1080	356.0°	100fps	1261	18058-19057
13_EBU_ZurichAthletics2014_HD_100p_HDR	1920x1080	356.0°	100fps	851	-
14_EBU_ZurichAthletics2014_HD_100p_HDR	1920x1080	356.0°	100fps	1584	20173-21172
15_EBU_ZurichAthletics2014_HD_100p_HDR	1920x1080	356.0°	100fps	1193	22651-23650
01_EBU_ZurichAthletics2014_HD_200p_HDR	1920x1080	356.0°	200fps	2009	0-1999
02_EBU_ZurichAthletics2014_HD_200p_HDR	1920x1080	356.0°	200fps	2629	2258-4257
03_EBU_ZurichAthletics2014_HD_200p_HDR	1920x1080	356.0°	200fps	2017	4655-6654
04_EBU_ZurichAthletics2014_HD_200p_HDR	1920x1080	356.0°	200fps	2044	6655-8654
05_EBU_ZurichAthletics2014_HD_200p_HDR	1920x1080	356.0°	200fps	2538	9237-11236
06_EBU_ZurichAthletics2014_HD_200p_HDR	1920x1080	356.0°	200fps	2092	13330-15329
07_EBU_ZurichAthletics2014_HD_200p_HDR	1920x1080	356.0°	200fps	2185	15446-17445
08_EBU_ZurichAthletics2014_HD_200p_HDR	1920x1080	180.0°	200fps	3141	17975-19974

09_EBU_ZurichAthletics2014_HD_200p_HDR	1920x1080	356.0°	200fps	2130	20748-22747
10_EBU_ZurichAthletics2014_HD_200p_HDR	1920x1080	356.0°	200fps	2301	24882-26881
11_EBU_ZurichAthletics2014_HD_200p_HDR	1920x1080	356.0°	200fps	2009	27183-29182
12_EBU_ZurichAthletics2014_HD_200p_HDR	1920x1080	356.0°	200fps	2388	31479-33478
13_EBU_ZurichAthletics2014_HD_200p_HDR	1920x1080	356.0°	200fps	2073	36025-38024
14_EBU_ZurichAthletics2014_HD_200p_HDR	1920x1080	356.0°	200fps	3216	39290-41289
01_EBU_ZurichAthletics2014_HD_150p_SDR_live	1920x1080	-	150 fps	2479	-
02_EBU_ZurichAthletics2014_HD_150p_SDR_live	1920x1080	-	150 fps	1915	-
03_EBU_ZurichAthletics2014_HD_150p_SDR_live	1920x1080	-	150 fps	2604	-
04_EBU_ZurichAthletics2014_HD_150p_SDR_live	1920x1080	-	150 fps	1453	-
05_EBU_ZurichAthletics2014_HD_150p_SDR_live	1920x1080	-	150 fps	2780	-
06_EBU_ZurichAthletics2014_HD_150p_SDR_live	1920x1080	-	150 fps	1500	-
07_EBU_ZurichAthletics2014_HD_150p_SDR_live	1920x1080	-	150 fps	9278	-
08_EBU_ZurichAthletics2014_HD_150p_SDR_live	1920x1080	-	150 fps	1546	-
09_EBU_ZurichAthletics2014_HD_150p_SDR_live	1920x1080	-	150 fps	5421	-
10_EBU_ZurichAthletics2014_HD_150p_SDR_live	1920x1080	-	150 fps	2918	-
11_EBU_ZurichAthletics2014_HD_150p_SDR_live	1920x1080	-	150 fps	1553	-
12_EBU_ZurichAthletics2014_HD_150p_SDR_live	1920x1080	-	150 fps	6194	-
01_EBU_ZurichAthletics2014_HD_50p_HDR_live	1920x1080	-	50 fps	756	-
02_EBU_ZurichAthletics2014_HD_50p_HDR_live	1920x1080	-	50 fps	2657	-
03_EBU_ZurichAthletics2014_HD_50p_HDR_live	1920x1080	-	50 fps	784	-
04_EBU_ZurichAthletics2014_HD_50p_HDR_live	1920x1080	-	50 fps	637	-
05_EBU_ZurichAthletics2014_HD_50p_HDR_live	1920x1080	-	50 fps	830	-
06_EBU_ZurichAthletics2014_HD_50p_HDR_live	1920x1080	-	50 fps	833	-
07_EBU_ZurichAthletics2014_HD_50p_HDR_live	1920x1080	-	50 fps	1294	-
08_EBU_ZurichAthletics2014_HD_50p_HDR_live	1920x1080	-	50 fps	1360	-
09_EBU_ZurichAthletics2014_HD_50p_HDR_live	1920x1080	-	50 fps	400	-

10_EBU_ZurichAthletics2014_HD_50p_HDR_live	1920x1080	-	50 fps	1000	-
11_EBU_ZurichAthletics2014_HD_50p_HDR_live	1920x1080	-	50 fps	3598	-
12_EBU_ZurichAthletics2014_HD_50p_HDR_live	1920x1080	-	50 fps	759	-
13_EBU_ZurichAthletics2014_HD_50p_HDR_live	1920x1080	-	50 fps	1443	-
14_EBU_ZurichAthletics2014_HD_50p_HDR_live	1920x1080	-	50 fps	3603	-
01_EBU_ZurichAthletics2014_UHD_100p_HDR	3840x2160	180°	100 fps	762	-
02_EBU_ZurichAthletics2014_UHD_100p_HDR	3840x2160	360°	100 fps	1010	1250-2249
03_EBU_ZurichAthletics2014_UHD_100p_HDR	3840x2160	360°	100 fps	853	-
04_EBU_ZurichAthletics2014_UHD_100p_HDR	3840x2160	180°	100 fps	1294	3714-4913
05_EBU_ZurichAthletics2014_UHD_100p_HDR	3840x2160	180°	100 fps	424	-
06_EBU_ZurichAthletics2014_UHD_100p_HDR	3840x2160	360°	100 fps	1057	5655-6654
07_EBU_ZurichAthletics2014_UHD_100p_HDR	3840x2160	360°	100 fps	1070	6725-7724
08_EBU_ZurichAthletics2014_UHD_100p_HDR	3840x2160	360°	100 fps	812	-
09_EBU_ZurichAthletics2014_UHD_100p_HDR	3840x2160	180°	100 fps	1234	8612-9611
10_EBU_ZurichAthletics2014_UHD_100p_HDR	3840x2160	360°	100 fps	1652	10117-11116
11_EBU_ZurichAthletics2014_UHD_100p_HDR	3840x2160	360°	100 fps	1230	11474-12473
12_EBU_ZurichAthletics2014_UHD_100p_HDR	3840x2160	360°	100 fps	1024	12677-13676
13_EBU_ZurichAthletics2014_UHD_100p_HDR	3840x2160	360°	100 fps	1024	13701-14700
01_EBU_ZurichAthletics2014_UHD_120p_HDR	3840x2160	360°	120 fps	2401	860-2059
02_EBU_ZurichAthletics2014_UHD_120p_HDR	3840x2160	360°	120 fps	1439	2401-3600
01_EBU_ZurichAthletics2014_UHD_300p_HDR	3840x2160	360°	300 fps	1628	-
02_EBU_ZurichAthletics2014_UHD_300p_HDR	3840x2160	360°	300 fps	3361	1628-4627
03_EBU_ZurichAthletics2014_UHD_300p_HDR	3840x2160	360°	300 fps	3912	5705-8704
04_EBU_ZurichAthletics2014_UHD_300p_HDR	3840x2160	360°	300 fps	2462	-
05_EBU_ZurichAthletics2014_UHD_300p_HDR	3840x2160	360°	300 fps	3039	16744-19743
06_EBU_ZurichAthletics2014_UHD_300p_HDR	3840x2160	360°	300 fps	4924	20302-23301
07_EBU_ZurichAthletics2014_UHD_300p_HDR	3840x2160	360°	300 fps	3607	27492-30491

08_EBU_ZurichAthletics2014_UHD_300p_HDR	3840x2160	360°	300 fps	3428	35691-38690
09_EBU_ZurichAthletics2014_UHD_300p_HDR	3840x2160	360°	300 fps	2823	-
10_EBU_ZurichAthletics2014_UHD_300p_HDR	3840x2160	360°	300 fps	1717	-
11_EBU_ZurichAthletics2014_UHD_300p_HDR	3840x2160	360°	300 fps	2455	-
12_EBU_ZurichAthletics2014_UHD_300p_HDR	3840x2160	360°	300 fps	3026	52636-55635
13_EBU_ZurichAthletics2014_UHD_300p_HDR	3840x2160	360°	300 fps	2612	-
01_EBU_ZurichAthletics2014_UHD_1000p_HDR	3840x2160	360°	1000 fps	2290	-
02_EBU_ZurichAthletics2014_UHD_1000p_HDR	3840x2160	360°	1000 fps	2928	-
03_EBU_ZurichAthletics2014_UHD_1000p_HDR	3840x2160	360°	1000 fps	3135	-
04_EBU_ZurichAthletics2014_UHD_1000p_HDR	3840x2160	360°	1000 fps	4207	-
05_EBU_ZurichAthletics2014_UHD_1000p_HDR	3840x2160	360°	1000 fps	2304	-

In order to show a longer sequence instead of individual clips, e.g. during exhibitions, we recommend that the clips be dropped into the timeline in contiguous numerical order within one sequence.

Example:

01_EBU_ZurichAthletics2014_HD_100p_HDR

02_EBU_ZurichAthletics2014_HD_100p_HDR

....

15_EBU_ZurichAthletics2014_HD_100p_HDR