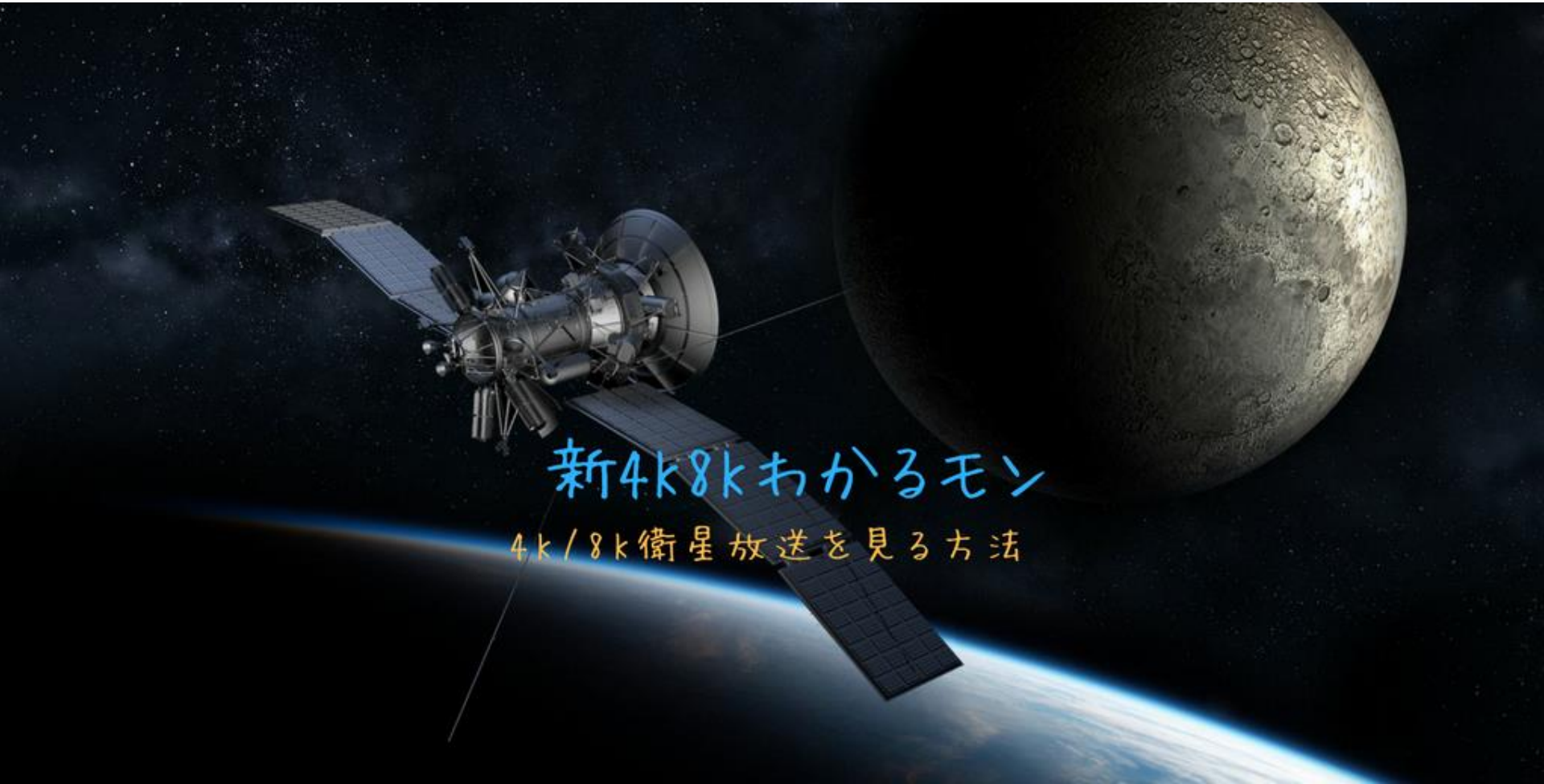
From The Lap Top to 4K, and BEYOND



David King
MHE 5.07.19

8K Broadcasting



2018年12月1日　BS 4K・BS 8Kいよいよ放送開始！　新たな二つのチャンネルのロゴが決定しました

2018年12月1日！

視聴者の皆さんに次世代の放送サービスをお届けするため、
ＮＨＫは、二つの新たなチャンネルを立ち上げます。

NHK BS4K　NHK BS8K

これまでない高画質な映像と迫力の音響で、
“未知の映像体験”をご家庭で楽しんでいただける時代の到来です！


NHK
Japan Broadcasting Corporation


TM
TOKYO 2020

Broadcasting

Japanese public broadcaster NHK began research and development on 8K in 1995, having spent over $1 billion on R & D since then.[29] Codenamed Super Hi-Vision (named after its old Hi-Vision analog HDTV system), NHK also was simultaneously working on the development of 22.2 channel surround sound audio. The world's first 8K television was unveiled by Sharp at the Consumer Electronics Show (CES) in 2012.[30] Experimental transmissions of the resolution were tested with the 2012 Summer Olympics, and at the Cannes Film Festival showcasing Beauties À La Carte, a 27-minute short showcased publicly on a 220" screen, with a three-year roadmap that entails the launch of 8K test broadcasting in 2016, with plans to roll out full 8K services by 2018, and in time for the 2020 Summer Olympics.[31] On December 1, 2018, NHK launched BS8K, a broadcast channel with 8K capability.[32][33]

NHK's Roadmap of 8K

World Cup
Brazil



Rio
Olympics



World Cup
Russia



Tokyo
Olympics



2014 Public viewing

2015 Experiments
(by using a broadcast satellite)

2016 Test broadcasting

2018 Broadcasting

2020

NHK

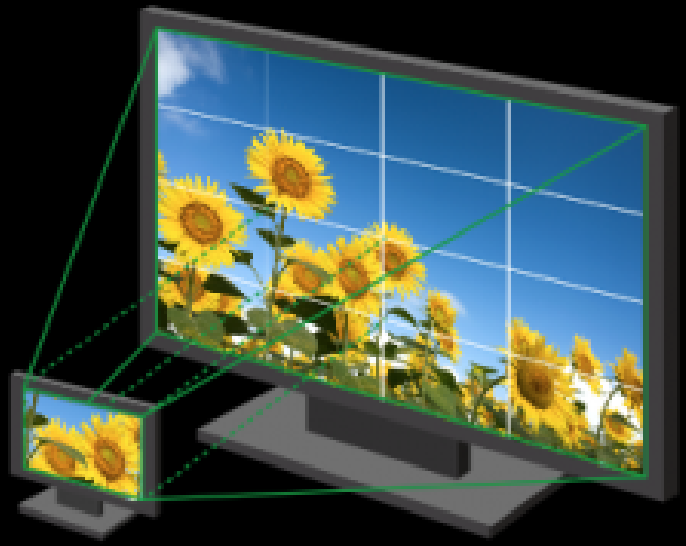


4K/8K Super Hi-Vision Master Control Room just before the launch of regular 8K service on December 1, 2018.



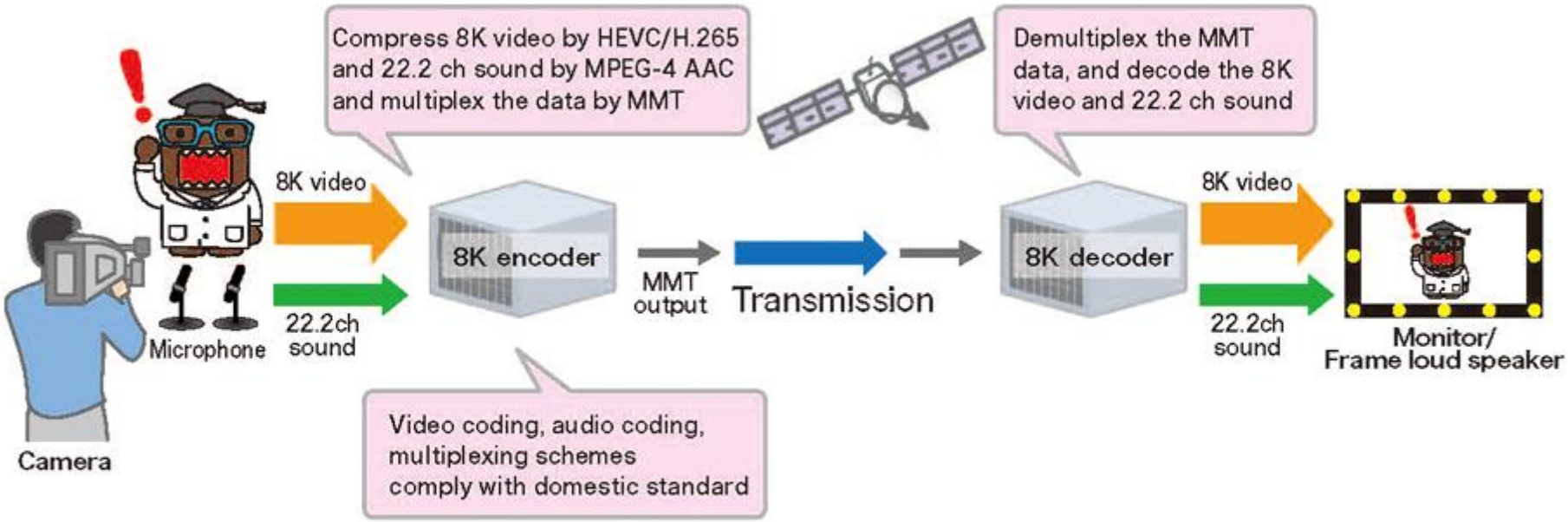
The 8K channel, “NHK BS8K,” is broadcast for about 12 hours daily. A wide range of programs, such as entertainment, art, nature, and sports is presented. The programs are exclusively produced for the 8K channel in the world’s highest quality, providing faithful representations and highly immersive experiences.

Super Hi-Vision offers 33,000,000 pixels, 16 times that of Hi-Vision (HDTV).



◀Hi-Vision ◀Super Hi-Vision

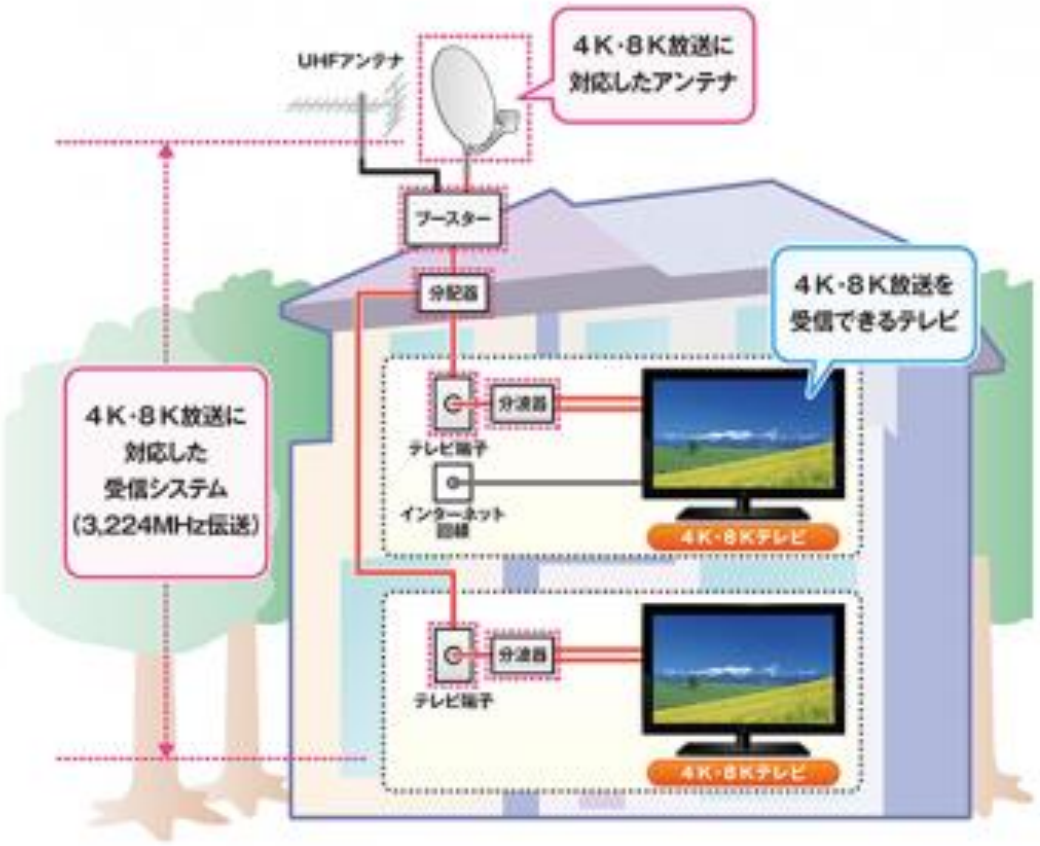
Aspect ratio (Width: Height)	16 : 9
Pixel count	Number of pixels: 7,680×4,320
Frame rate	120、60、59.94
Scanning	Progressive scanning
Bit depth	10、12 bit
Color gamut	Wide gamut system colorimetry

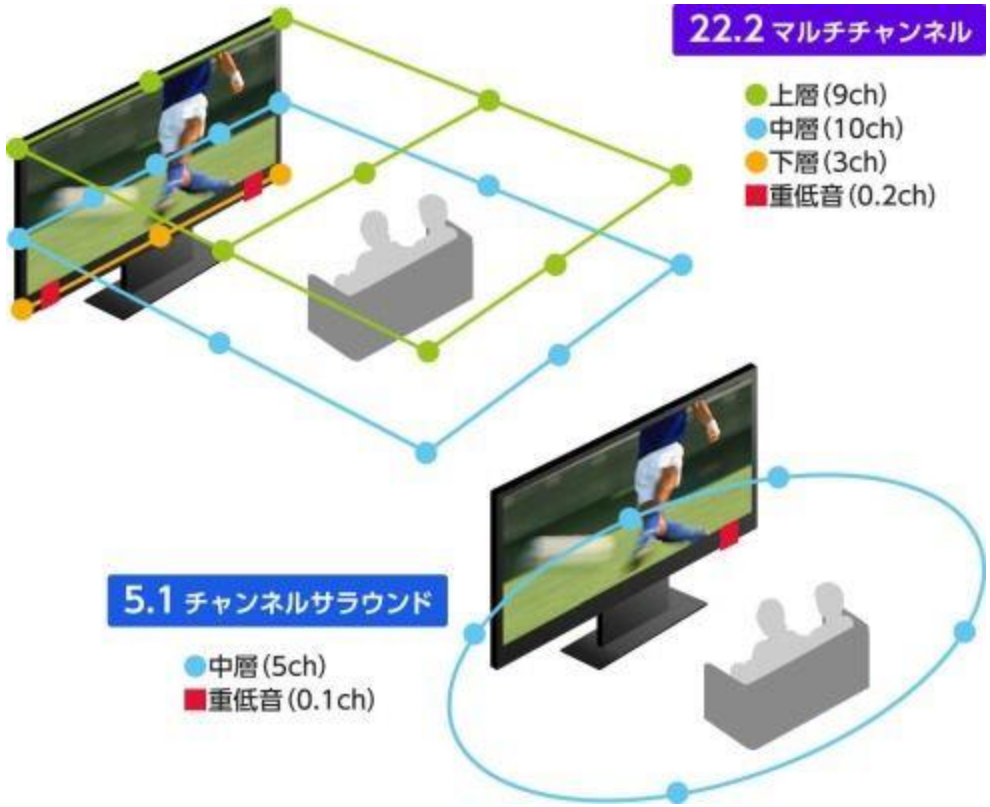


8K encoder/decoder diagram

The 4K and 8K satellite broadcasting is achieved by the ISDB-S3 transmission format, where a transponder bandwidth of 34.5 MHz typically has a transmission rate of approximately 100 Mbps, enabling home delivery of one 8K channel or three 4K channels per transponder. The video encoding scheme used is H.265 | HEVC. The image format is compliant with Recommendation ITU-R BT.2020 and BT.2100, meaning the wider color gamut and the high dynamic range (HLG) supported.

Home Sweet Home




22.2 マルチチャンネル
上層(9ch)
中層(10ch)
下層(3ch)
重低音(0.2ch)
5.1 チャンネルサラウンド
中層(5ch)
重低音(0.1ch)



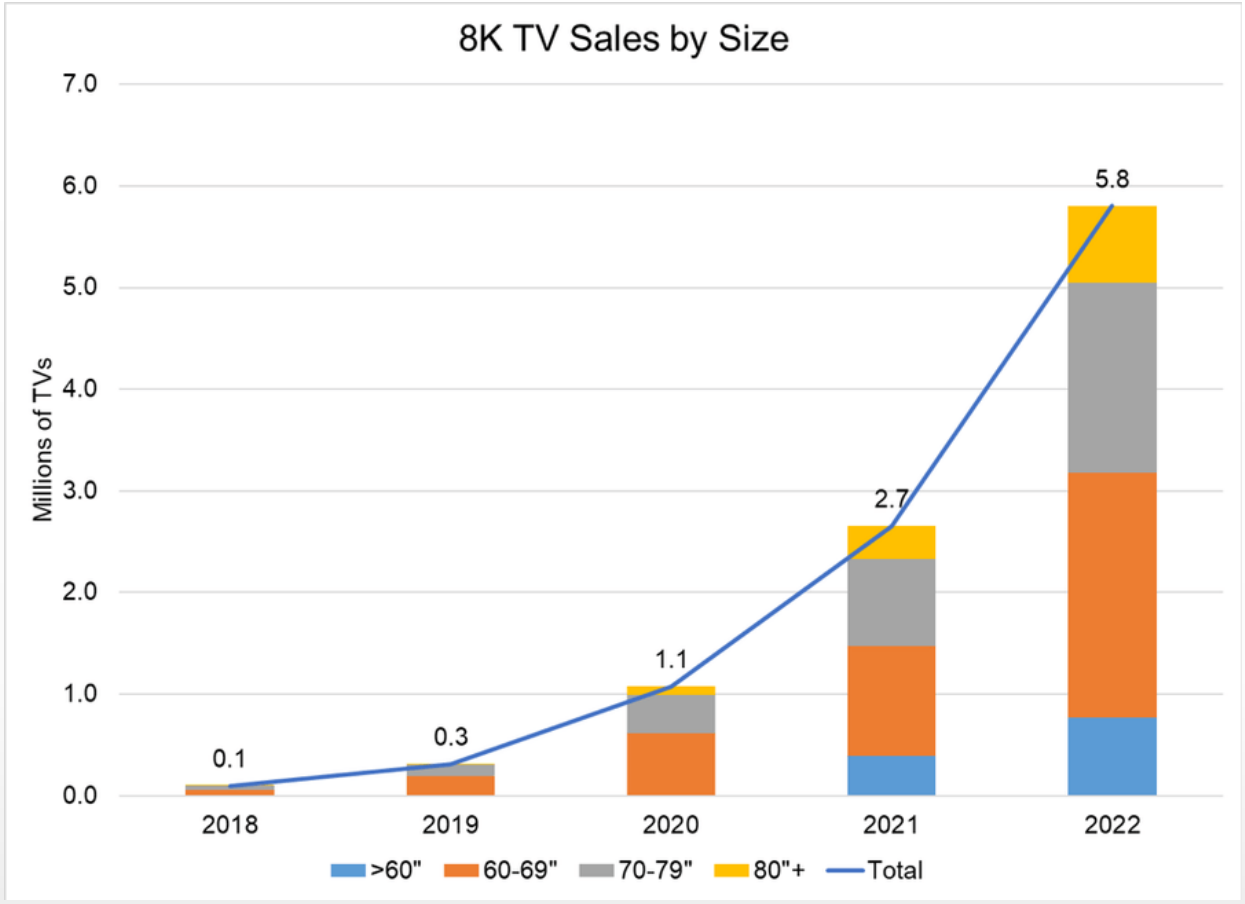
8K OLED TVs officially become on June 3rd. 2019 starts taking orders in South Korea for arguably the most advanced consumer TV set ever created. The 88Z9 has an 88-inch OLED panel with 8K Ultra HD resolution (7680 x 4320)

LG is addressing this by leaning on its second-generation Alpha 9 8K processor that uses deep learning algorithms to help upscale images to a higher resolution.

retail price is 50 million won (~$42,000), but preorders taken in June will have a reduced price of 40 million won (~$34,000) and come with a free air purifier.

Optimal Viewing Distances

Screen Size	8K TV	4K TV	1080p HD
55"	0.5m (1.7')	1.0m (3.4')	2.1m (7.0')
65"	0.6m (2.0')	1.2m (4.0')	2.5m (8.2')
75"	0.7m (2.3')	1.4m (4.6')	2.9m (9.5')
85"	0.8m (2.6')	1.6m (5.1')	3.2m (10.6')
120"	1.1m (3.7')	2.2m (7.4')	4.6m (15.2')
150"	1.4m (4.6')	2.8m (9.2')	5.8m (19.0')



Sales of 8K Flat Panel TVs are expected to increase from 0.1 million in 2018 to 5.8 million in 2022, with China leading the way representing more than 60% of the total market during this period.

total manufacturing costs for 8K 65" LCD panels are estimated at $1000 per panel currently and are expected to be reduced to $595 by 2021.



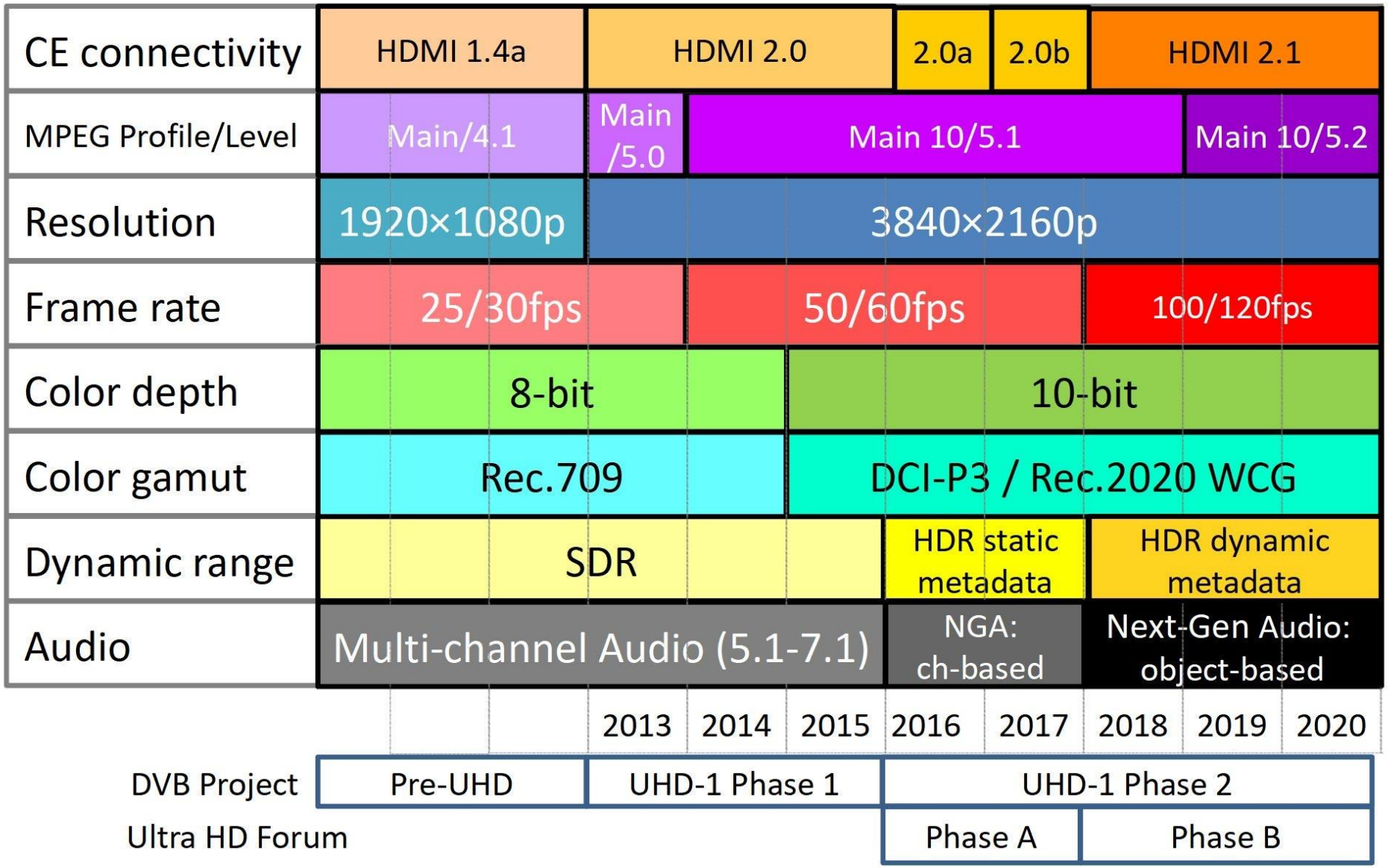
Cameras from Hitachi, Astrodesign, Ikegami, Sharp and Sony address the many challenges in capturing 8K video.

8K EXPERIMENT AT ROLAND GARROS 2019



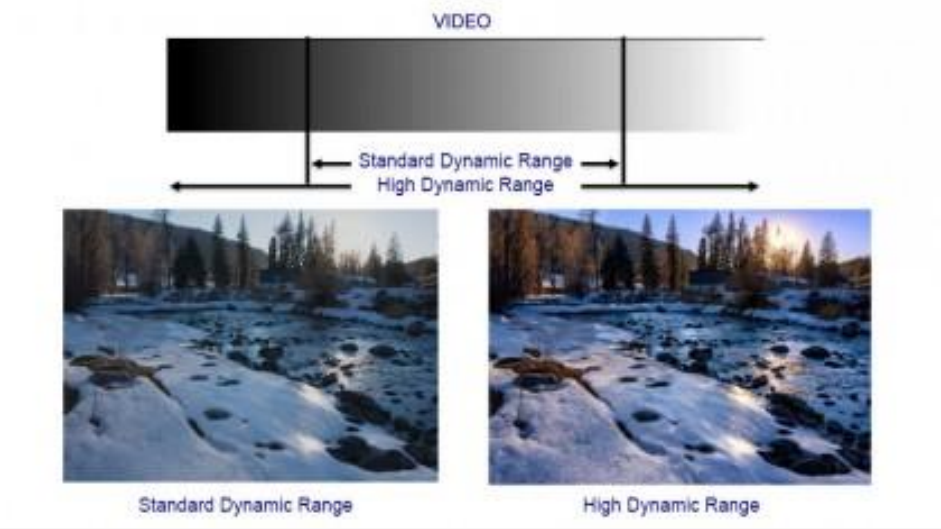
During the Roland Garros 2019 tournament, France TV demonstrates live streaming of 8K video to connected TVs and mobile devices using a trial 5G local network deployed by Orange.

Technology roadmap for Ultra HD content distribution



Source: Y. Geutskens, @UHD4k

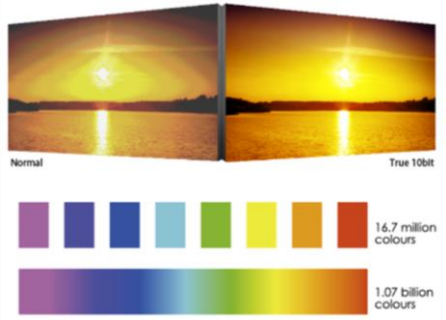
HDR (High Dynamic Range) Contrast

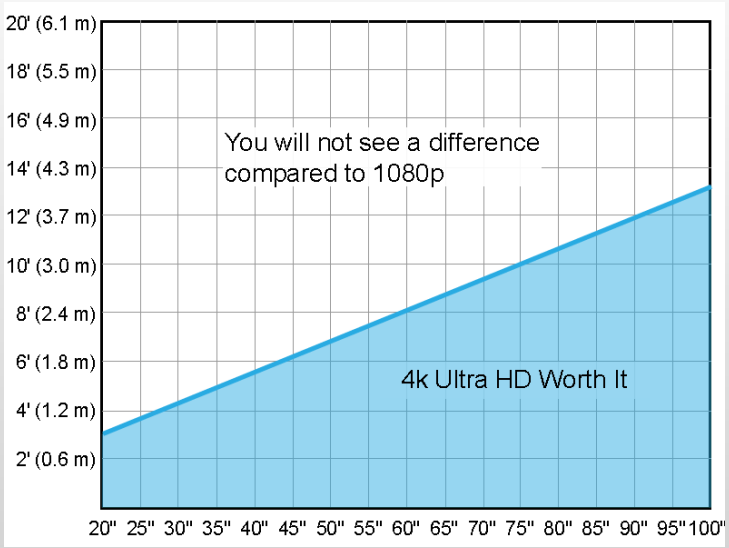


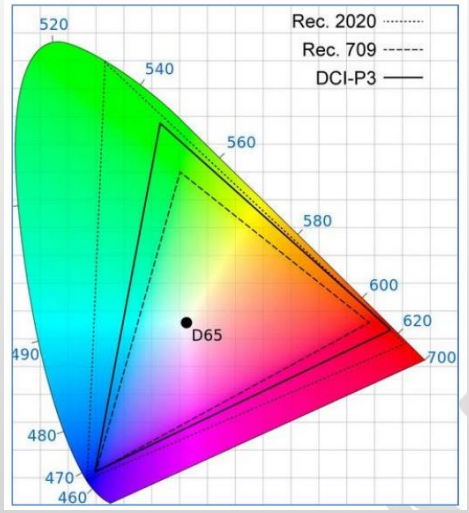
Colour Depth

HD is 8-bit, which means that a standard HD TV is able to display 256 shades each of red, green and blue, or 16,777,216 colors total combined

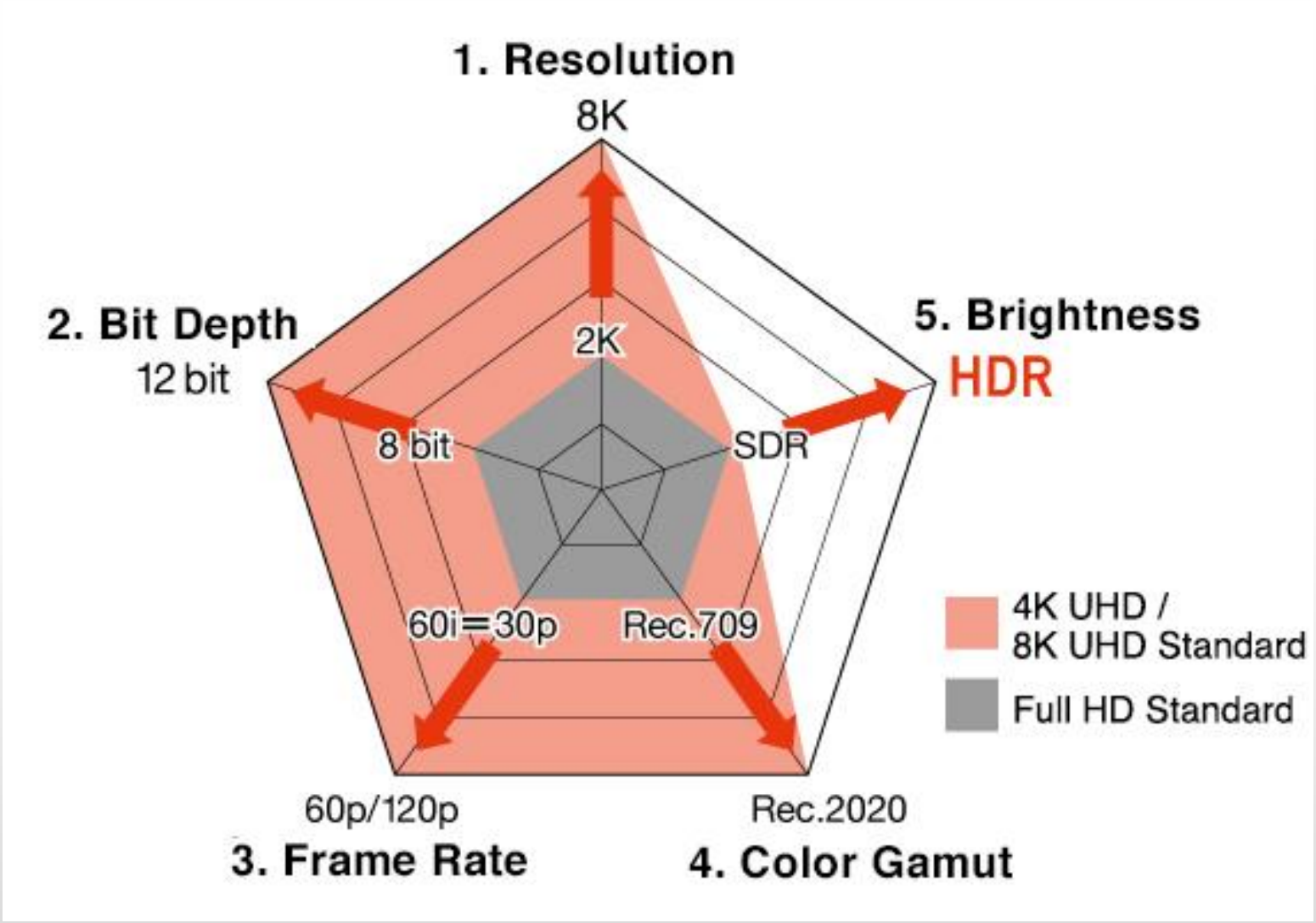
UHD Premium increases this to 10-bits. Due to the way binary works, increasing this to 10-bit results in an exponential increase to 1,024 shades of the three primary colors. In total this means that 10-bit color offers a total of 1,073,741,824 colors.

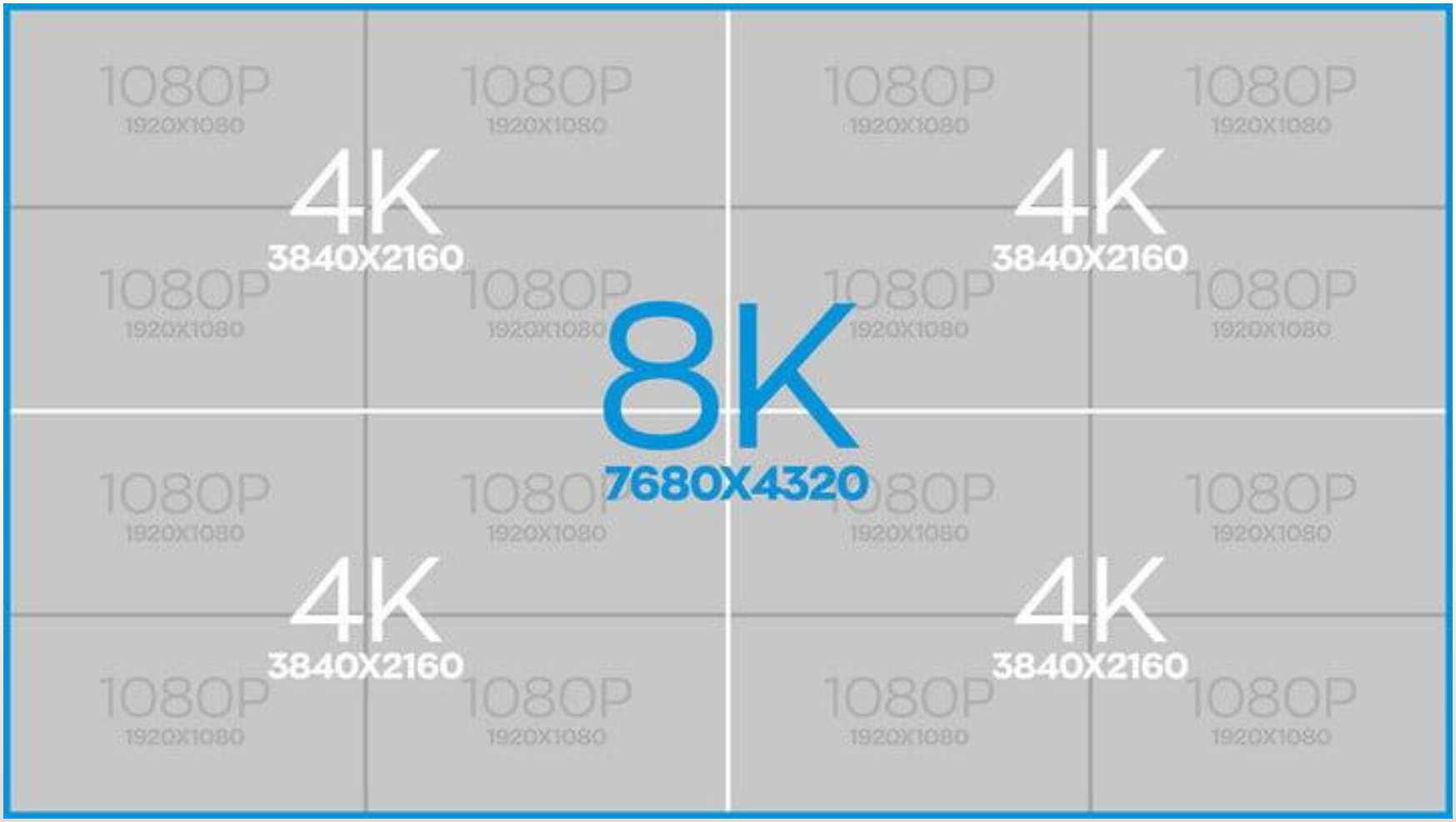




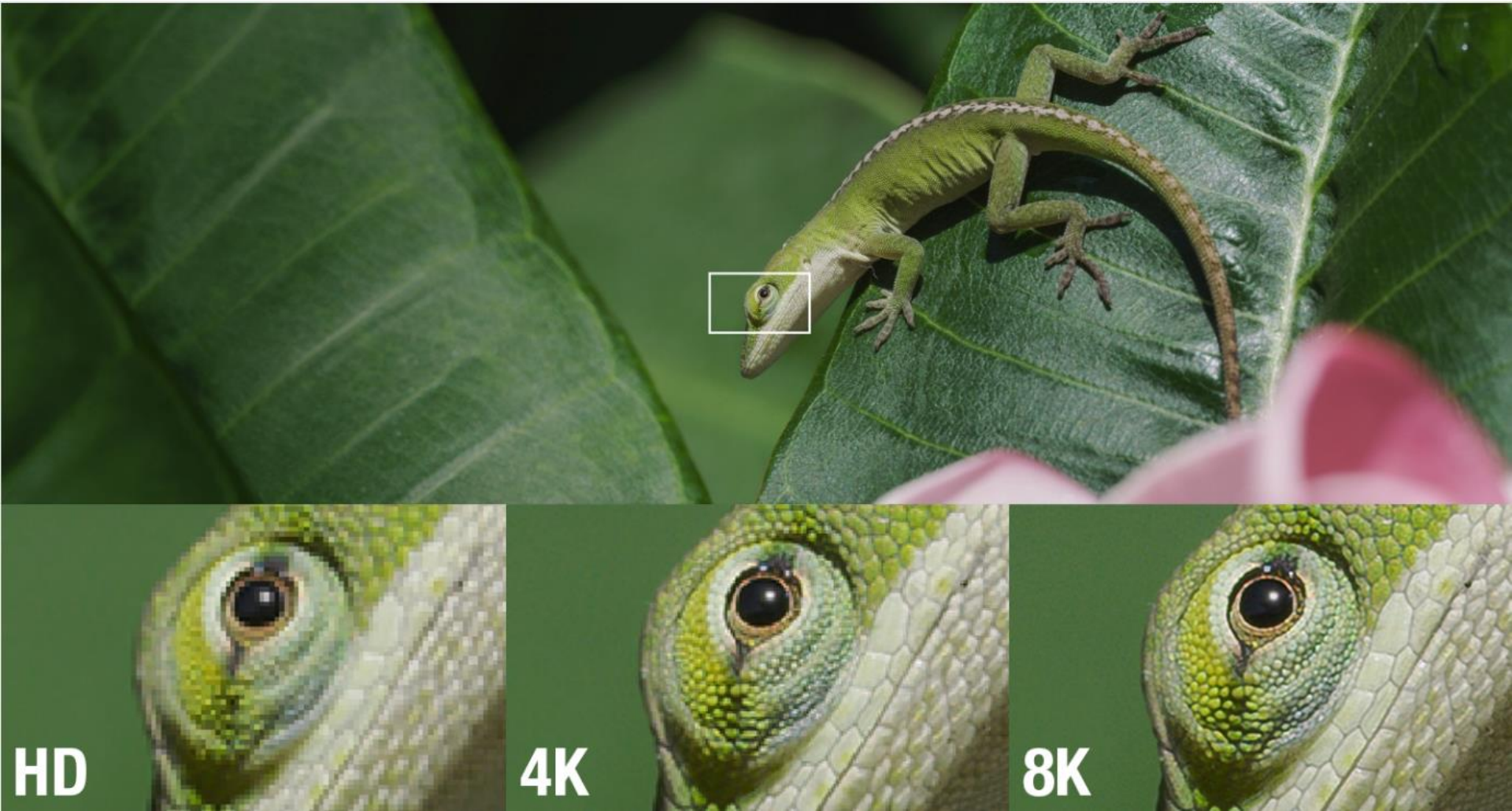


Wide Colour Gamut (WCG)


1. Resolution
8K
2K
2. Bit Depth
12 bit
8 bit
5. Brightness
HDR
SDR
60i=30p
Rec.709
4K UHD /
8K UHD Standard
Full HD Standard
60p/120p
Rec.2020
3. Frame Rate
4. Color Gamut


1080P
1920X1080
4K
3840X2160
8K
7680X4320

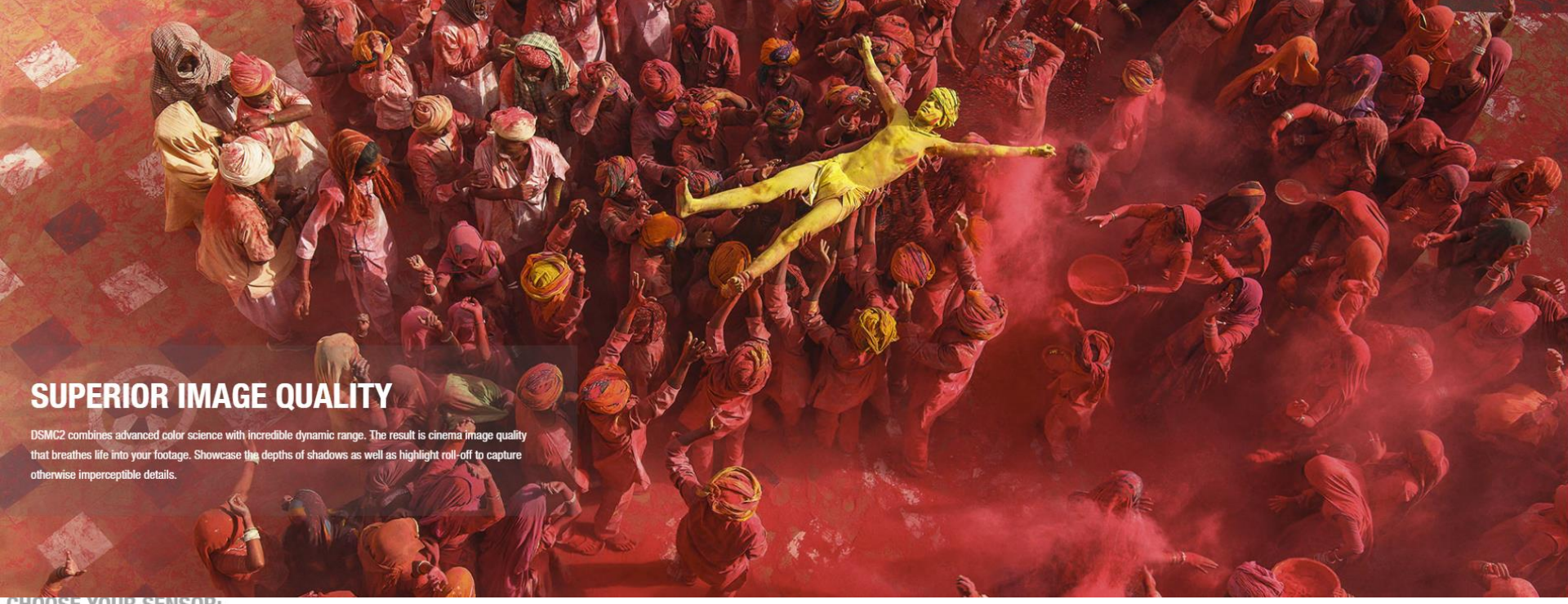
RESOLUTION MATTERS By RED



Thoughts on 8K and RED Weapon

PHFX PHIL HOLLAND





SUPERIOR IMAGE QUALITY

DSMC2 combines advanced color science with incredible dynamic range. The result is cinema image quality that breathes life into your footage. Showcase the depths of shadows as well as highlight roll-off to capture otherwise imperceptible details.

CHOOSE YOUR SENSOR:



MONSTRO 8K VV

35.4 Megapixel CMOS Sensor
40.96 mm x 21.60 mm (Diag: 46.31 mm)
60 fps at 8K Full Format (8192 × 4320)
75 fps at 8K 2.4:1 (8192 × 3456)

$54,500 (AUD 76 K)



HELIUM 8K S35

35.4 Megapixel CMOS Sensor
29.90 mm x 15.77 mm (Diag: 33.80 mm)
60 fps at 8K Full Format (8192 × 4320)
75 fps at 8K 2.4:1 (8192 × 3456)

$24,500



GEMINI 5K S35

15.4 Megapixel Dual Sensitivity CMOS Sensor
30.72 mm x 18 mm (Diagonal: 35.61 mm)
96 fps at 5K Full Format (5120 × 2700)
75 fps at 5K Full Height 1.7:1 (5120 × 3000)

$19,500



DRAGON-X 5K S35

13.8 Megapixel CMOS Sensor
25.6 mm x 13.5 mm (Diagonal: 28.9 mm)
96 fps at 5K Full Format (5120 x 2700)
120 fps at 5K 2.4:1 (5120 x 2160).

$14,950

TECHNICAL SPECIFICATIONS

MONSTRO | HELIUM | GEMINI | DRAGON-X

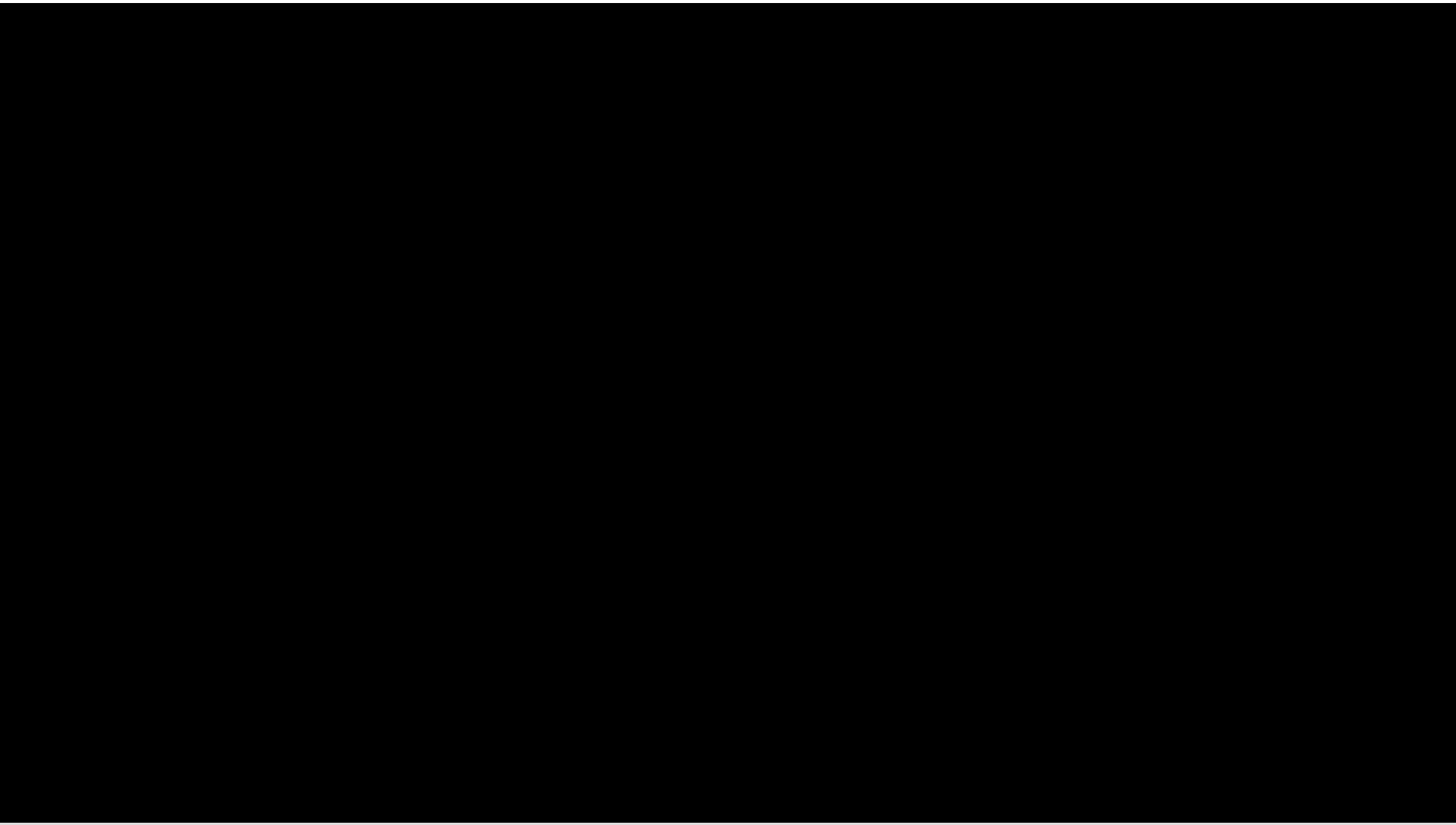


SENSOR TYPE	MONSTRO 35.4 Megapixel CMOS
EFFECTIVE PIXELS	8192 × 4320
SENSOR SIZE	40.96 mm × 21.60 mm (Diagonal: 46.31 mm)
DYNAMIC RANGE	17+ stops
MAX DATA RATES	Up to 300 MB/s using RED MINI-MAG (480GB & 960GB) Up to 225 MB/s using RED MINI-MAG (120GB & 240GB)
MAX FRAME RATES	60 fps at 8K Full Format (8192 × 4320), 75 fps at 8K 2.4:1 (8192 × 3456) 60 fps at 7K Full Format (7168 × 3780), 75 fps at 7K 2.4:1 (7168 × 3024) 75 fps at 6K Full Format (6144 × 3240), 100 fps at 6K 2.4:1 (6144 × 2592) 96 fps at 5K Full Format (5120 × 2700), 120 fps at 5K 2.4:1 (5120 × 2160) 120 fps at 4K Full Format (4096 × 2160), 150 fps at 4K 2.4:1 (4096 × 1728) 150 fps at 3K Full Format (3072 × 1620), 200 fps at 3K 2.4:1 (3072 × 1296) 240 fps at 2K Full Format (2048 × 1080), 300 fps at 2K 2.4:1 (2048 × 864)
PLAYBACK FRAME RATES (PROJECT TIMEBASE)	23.98, 24, 25, 29.97, 47.95, 48, 50, 59.94, 60 fps, all resolutions
REDCODE SETTINGS RANGE FROM 2:1 UP TO 22:1	5:1 REDCODE for 8K Full Format (8192 × 4320) at 24 fps 12:1 REDCODE for 8K Full Format (8192 × 4320) at 60 fps 2:1 REDCODE for 4K Full Format (4096 × 2160) at 24 fps 3:1 REDCODE for 4K Full Format (4096 × 2160) at 60 fps
REDCODE RAW ACQUISITION FORMATS	8K Full Format (8192 × 4320), 2:1, 2.4:1, 16:9, 14:9, 8:9, 3:2, 6:5, 4:1, 8:1, and Ana 2x, 1.3x, 1.25x 7K Full Format (7168 × 3780), 2:1, 2.4:1, 16:9, 8:9, 6:5, 4:1, 8:1, and Ana 2x, 1.3x 6K Full Format (6144 × 3240), 2:1, 2.4:1, 16:9, 8:9, 3:2, 4:3, 6:5, 4:1, 8:1, and Ana 2x, 1.3x, 1.25x 5K Full Format (5120 × 2700), 2:1, 2.4:1, 16:9, 8:9, 6:5, 4:1, 8:1, and Ana 2x, 1.3x 4K Full Format (4096 × 2160), 2:1, 2.4:1, 16:9, 8:9, 3:2, 4:3, 5:4, 6:5, 4:1, 8:1, 1:1, and Ana 2x, 1.3x 3K Full Format (3072 × 1620), 2:1, 2.4:1, 16:9, 3:2, 4:3, 5:4, 6:5, 4:1, 8:1, and Ana 2x, 1.3x 2K Full Format (2048 × 1080), 2:1, 2.4:1, 16:9, 3:2, 4:3, 5:4, 6:5, 4:1, 8:1, and Ana 2x, 1.3x



CAMERA BUILDS THE HANDHELD SETUP

The World’s First 31.5” 8K Monitor





The World's First 31.5" 8K Monitor

Dell UltraSharp 32 8K Monitor UP3218K

Display Type
LED-backlit LCD monitor / TFT active matrix
Diagonal Size 32"
Viewable Size 31.5"
Built-in Devices USB 3.0 hub
Panel Type IPS
Aspect Ratio 16:9
Native Resolution
8K 7680 x 4320 at 60 Hz
Brightness 400 cd/m²
Contrast Ratio 1300:1
Color Support 1.07 billion colors

Backlight Technology LED backlight
Features
100% Adobe RGB color gamut, 100% sRGB color gamut, 98% DCI-P3, 100% Rec 709 color gamut
Color Black
Dimensions (WxDxH)
28.4 in x 8.5 in x 24.3 in - with stand
Response Time 6 ms (gray-to-gray)
Horizontal Viewing Angle 178
Vertical Viewing Angle178
Screen Coating
Anti-reflective, 2H Hard Coating

Interfaces
2 x DisplayPort
3 x USB 3.0 downstream (Type A)
USB 3.0 downstream (Type A
USB 3.0 upstream (Type B)
Audio line-out

Price: USD 3899
(ca. AUD 5482)

Devindra Hardawar: 8K Explained

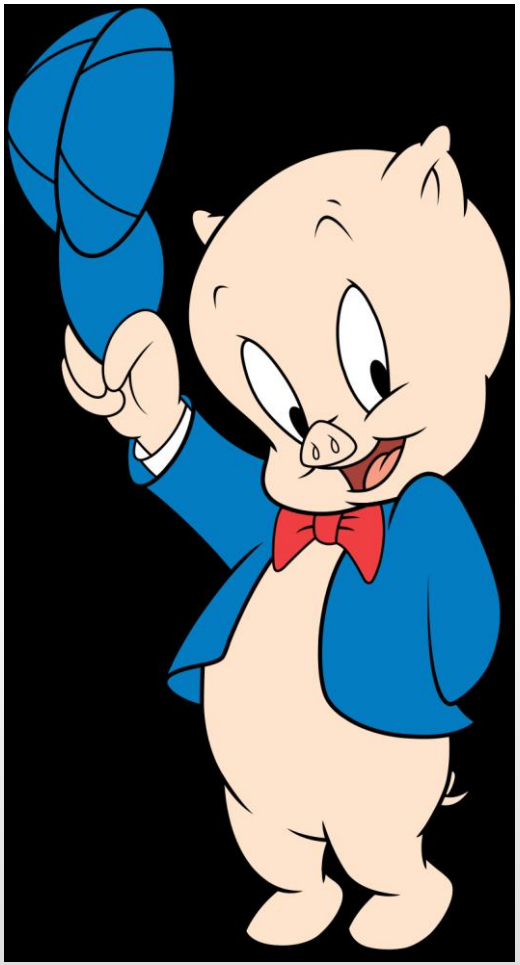


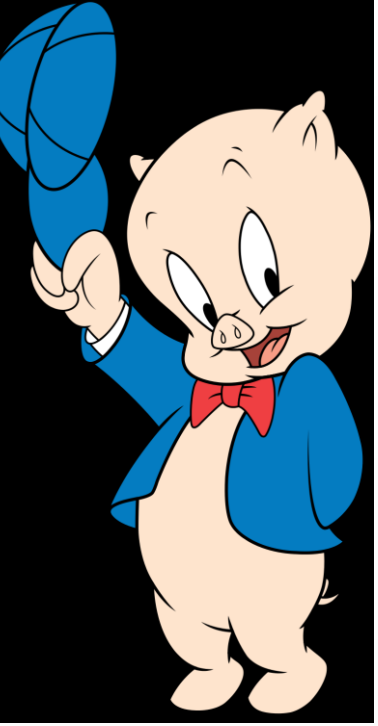
https://www.engadget.com/



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Now,
Let’s hear it for
Kelvin!



Continuation 4K and 8k Videos

Kelvin Cording
July 2019