

## DVB UHD-1 Phase 1

*"Bits are Bucks, but Megapixels will be Megabucks."*

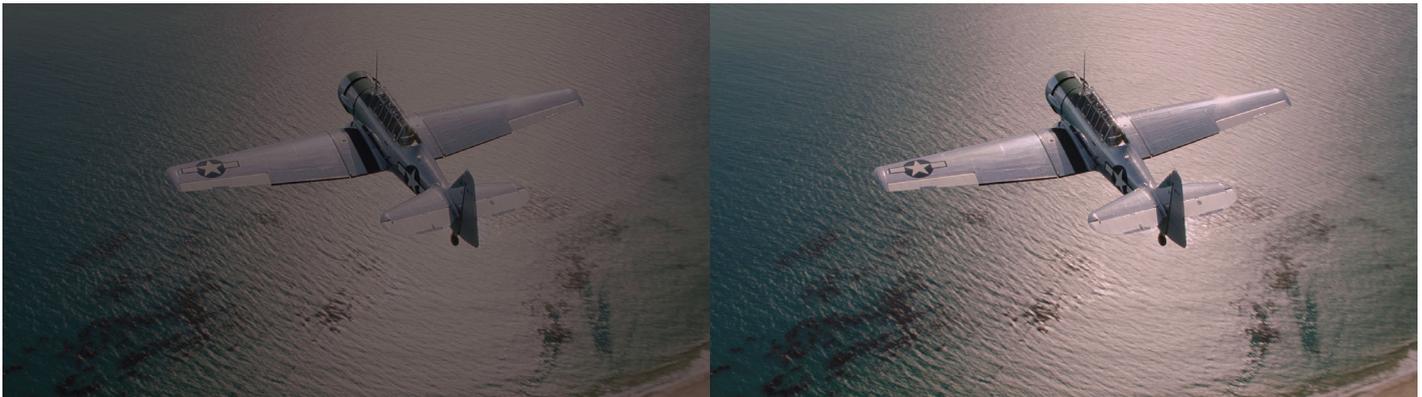
UHDTV is the proportionately scaled-up extension of HDTV for which DVB is developing consumer delivery formats. It may eventually become the normal form of television. UHDTV was first specified in the ITU-R in 2012 with Recommendation BT.2020. Its options included two levels of spatial **resolution**: 8 Megapixels (aka 4K) and 33 Megapixels (aka 8K).

DVB responds to its members' demands, which initially were for a 4K system without other potential features such as High Dynamic Range, High Frame Rate, or Next Generation Audio. In 2014 DVB agreed the specification for **DVB UHD-1 Phase 1**, which was first used by DirecTV later in the year. DVB Members have expressed the wish for additional features to be included in the next consumer delivery formats: DVB-UHD-1 Phase 2.

The joint MPEG/ITU-T group develops image **compression** technology used by the DVB system, and MPEG develops audio compression technology. DVB UHD-1 consumer delivery systems for broadcast are taken to use HEVC/H.265 compression technology.

## High Dynamic Range

High Dynamic Range (HDR) will allow an increase in the quality of the image for the new generations of TV sets that have higher peak screen brightness. The image quality benefit is somewhat different to that from increased resolution. It is sometimes said to be adding 'sparkle' to the image.



Without HDR

With HDR

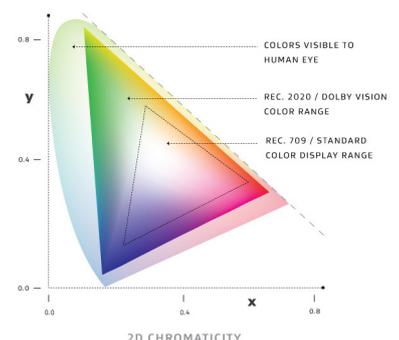
images: Dolby

There is no DVB/ETSI standard for HDR yet, and work on agreeing a standard is progressing slower than anticipated in standards bodies such as the ITU-R. Several different approaches have been put forward, each with their own advantages. To understand these, IBC attendees should follow the IBC conference and visit proponents' booths, including Dolby, Philips, Technicolor, BBC, and NHK. DVB aims to have an HDR specification for consumer delivery by 2016. If this is achieved, services of UHD-1 + HDR would be possible from 2017.

## Wider Color Gamut

TV displays form images using combinations of three primary colours embedded in the TV set. DVB UHD-1 systems allow for future UHDTV displays that will use a new set of color primaries, termed BT. 2020.

This much **wider range of colors** will have the capability to reproduce deeper colors and thereby increase the realism of the viewing experience further.



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## High Frame Rate

High Frame Rate or HFR-TV is another new feature that would enhance the quality of the UHDTV image in certain cases. This is not the same as the High Frame Rate used for some movie productions, which involves 48 FPS, whereas HFR-TV involves frame rates of up to 120 FPS. HFR-TV will sharpen objects in motion in an image, adding to the sense of reality of the image.



*Without HFR*



*With HFR*

*images: BBC*

Developing receiver decoder ICs that will cope with HFR-TV will take time and the current perspective is that services that allow HFR-TV may be possible from 2019 onwards.

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## Next Generation Audio

Next Generation Audio (NGA) was first specified in ITU-R in 2014 with Recommendation BT.2051. This new concept for sound delivery is based on providing a number of audio or sound elements together with instructions (metadata) to the receiver about what to do with them.

There is no doubt that NGA would enhance the UHD-1 experience. This may come from giving the viewer more clues to the 'point of origin' of a sound in his 'sound stage'. This may become more valuable with larger screen sizes. The NGA systems would also allow the viewer to personalize the sound experience, and it may also allow more additional sound services to be provided. The current target is for the NGA specification to be available at the same time as the specification for HDR (2017).

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## Next Steps

DVB Members have also requested tools needed to provide DVB UHD-1 over IP. The structure to do so is currently being set in place and may provide for OTT or hybrid delivery of UHD-1.

The DVB process involves first agreeing 'commercial requirements' for any new system – what it needs to do to be commercially successful. This is followed by the actual development of the specification. This is followed by a check that the commercial requirements have been met. This process is being followed for UHDTV.

If the number of UHD demos at IBC 2015 is any indication, UHD TV is set to be a big commercial success and bring in the "Megabucks".