EBU UHD & HDR activities

EBU & ASBU week of Technology
07-08 October 2019
There are 4* ways to go beyond HDTV:

- More pixels per image
- Better pixels
- More frames per second
- Better audio

The strategic question for European broadcasters is which improvements to plan for when.

* 5 actually: interlaced -> progressive!
Moving to UHD-1 definition (3840 x 2160 pixels) is a logical step when broadcasters replace their equipment. But typically they will not receive more money for doing so, only higher bills.

Several EBU Members are looking at 1080p/50 HDR distribution as a stepping stone towards UHD.

Most marketed
Least relevant
“4K” becoming standard
8K not for tomorrow
8K ahead of its time

- EBU Members pioneered 8K R&D
- The technology is very impressive
- The display part is ‘easy’
- The production side is a big challenge
- The road to services is long

First 8K content may be:
- Special events (single transponder)
- VoD (special drama/movies)
- Games (e.g. Sony playstation)

For EBU 8K is NOT a priority

Professional equipment is missing

Satellite the only option?

Questions about benefits/drawbacks

8K displays are good for HD/4K
**HDR & WCG**

HDR is the ‘best bang for the buck’.

Many EBU Members are experimenting with it.

Theoretical education and practical experience are key to avoid problems, especially regarding:

- What productions benefit most
- Reference monitors
- HDR workflows

**Biggest ‘WOW’ factor**

**Lowest cost**

**Dim “HDR” CE displays are an issue**

**Education & experience are key**
In 2017 the EBU ‘redefined’ grade 1\* reference monitors to include HDR and WCG.

Grade 1A monitors do not (yet) exist.

Grade 1B monitors may exist now?!

Last year they did not.

The green primary remains a major challenge. Nevertheless, monitor quality progress is impressive.

* See EBU Tech 3320

See EBU Tech Report 047 for a summary of the 2018 monitor tests.
We should not forget most broadcasters are still at 25 fps.

Moving to High Frame Rates (100/120 fps) offers serious quality improvements, for fast moving content.

Live HFR sports coverage is not straightforward and has a serious cost.

There are almost no CE displays that support 100/120 Hz and we probably will need higher refresh rates.
Figure 11  Both overall results (with and without motion interpolation) and the 95% confidence intervals.

See EBU Tech Report 050
Recent publications

EBU Tech 3372
UHD/HDR Service Parameters (incl. NGA!)
UHD, HDR & NGA Fact Sheet

EBU Tech 3320 v4.1
Requirements for Monitors
EBU Tech 3325s1
Additional Grade 1 HDR test colours

EBU Tech Report 050
100 Hz HFR Subjective evaluation

Also take a look at the video library:
tech.ebu.ch/publications
Current work

The main UHD & HDR activities are:

- HDR converter tests
- HDR Live Workshop
- HDR guidelines
- New HDR Colour bars
- Helping Members test HDR monitors
- Production codecs testing
- Distribution codecs group
- UHDTV Survey

More details:

[tech.ebu.ch/video](http://tech.ebu.ch/video)
Live HDR Workshop

Fundamentals
SDR & HDR Video basics
Format and colour space conversions

Workflows
Parallel HDR & SDR production
Practical experiences
Best practices

Recording & Playback
Recording formats
Replay servers

tech.ebu.ch/hdrworkshop2019

Hosted by the NRK in Oslo, Norway
18 – 20 Nov 2019
EBU Members ONLY
IBC 2019: New Colour Bars

SMPTE ST 435-1 Test

EBU HDR COLOUR BARS
Helping test monitors

We are working on three things:

1. **Written guidance**
   EBU Tech 3320 & 3325s1 are published
   EBU Tech 3325 update is next

2. **Product support**
   Measurement equipment vendors
   ‘EBU test profile’

3. **Sharing Members’ test results**
   EBU database to crosscheck results
   Understand monitor applicability & trends
Production codecs

Planning
Testing: Q4 2019
Report: Q1 2020

Scope
Standardized codecs in current products
Real-time implementations
Asked Members to vote what to test

Report
7 generations performance (Members-only)
Overall trends (public)

HD & UHD
SDR & HDR
Some 1080p/60*
*59.94 Hz
Distribution codecs

1. Overview
   Understand what codecs are available

2. Test material
   Create a shared database

3. Testing
   Perform tests and/or share test results

4. Neural network based codecs
   Improve understanding

New activity

Led by Roberto Iacoviello (RAI)

Next step: dedicated call
UHDTV Survey

We need your input!
From now on...

All Audio, Video and Metadata/AI work is part of the new SP on Production.

This SP is open to all EBU Members for sharing advice, experiences, raising issues, defining new work items, priorities, etc.

Board Members:
BBC (chair), ZDF, SRG SSR, ORF, RAI, IRT, CyBC and FranceTV.

tech.ebu.ch/production

First meeting 02 Sep 2019
Sync on how we will work and what to focus on first.
List of wishes from Members + current work items.

Existing work continues
The former SPs (e.g. Audio, Video) are now groups.

More steering opportunity
More emphasis on a multidisciplinary vision, supported by representatives from different domains.

Getting more Members involved
Especially those who face problems in daily operation and who may not have access to R&D facilities directly.
Other topics

Quality Control
- EBU QC Group
- EBU.IO/QC will be moved to Python 3

Subtitling
- EBU Timed Text group

NLE User Group
- https://tech.ebu.ch/nle
- Looking for a better forum tool

Media Archives Group?
- Preparing to address Members’ needs

Work is triggered by EBU Members

 Enough resources must be available

 Most work is online

 Testing/trial work is typically on-site
Summary

Public Service Media face difficult choices on where to invest, when.

The EBU Video & Audio groups (Production) bring together Members to share:

- Requirements
- Questions
- Experiences
- Test material
- Trials

4K
Evolution, mainly about costs.
EBU UHD/HDR service parameters provides guidance

HDR
Focus on optimum workflows
HDR equipment tests, education

NGA
Broadcasters must get to grips with it more, evaluate its potential and create their own long-term vision

HFR, 8K
Interest in experiments, no planned use (8K is CE industry push)

tech.ebu.ch/video tech.ebu.ch/audio
In the end it is all about teamwork...