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| **Joint Collaborative Team on Video Coding (JCT-VC)**  **of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC 29/WG 11**  32nd Meeting: Ljubljana, SI, 12–18 July 2018 | Document: JCTVC-AF0006-v1 |

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| *Title:* | **JCT-VC AHG report: Report development for usage of video signal type code points** | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Ad-hoc group report (AHG6) | | |
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| *Source:* | AHG chairs | | |

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# Abstract

This report summarizes the activities of the AhG on Report development for usage of video signal type code points that have taken place between the 31st and 32nd JCT-VC meetings. Activities focused on work on text and diagrams of the draft output document JCTVC-AE1003.

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# Introduction

The mandates of this AHG were:

* Produce the output draft text JCTVC-AE1003 and develop proposed improvements of its content
* Study the industry usage of video signal type code points and identify the most common and important combinations of such code points (including study of the draft text JCTVC-AE1003).

# Activities

## Reflector

The e-mail reflector is [jct-vc@lists.rwth-aachen.de]. To receive email, please subscribe to the e-mail reflector: <http://mailman.rwth-aachen.de/mailman/listinfo/jct-vc>. For e-mail exchange, it is recommended to put [AHG6] in the subject line for easy grouping.

The reflector had several emails on comments to improve the output document content and format. Also there was some discussion on similar topic areas on ultra low latency, IMF , and JPEG 2000. A discussion resulted in adding in text to the WD to add area to describe synonyms and common terms and use CICP, HEVC/HEVC, and SMPTE MXF for the tables listing common combinations of video properties.

## Teleconferences

A teleconference occurred from 1:00-2:30 pm PT June 13th, 2018. In attendance were the following individuals: Chad Fogg (Co-Chair) /Movielabs, Alexandros Tourapis/ Apple, Sean McCarthy/Dolby, Gary Sullivan/Microsoft-JCT CoChair, Lars Borg/Adobe, Walt Husak/Dolby, Andrew Krupiczka/ESPN, Yasser Syed (Co-Chair)/ Comcast-NBCU.

A second occurred from 11:00-12:30 pm PT June 29th, 2018. In attendance were the following individuals: Chad Fogg (Co-Chair) /Movielabs, Alexandros Tourapis/ Apple, Sean McCarthy/Dolby, Gary Sullivan/Microsoft-JCT CoChair, Lars Borg/Adobe, Walt Husak/Dolby, Chris Seeger/NBCU-Comcast, Andrew Krupiczka/ESPN, Yasser Syed (Co-Chair)/ Comcast-NBCU.

Group was discussing the working draft for a planned technical report envisioned as 23091-4.

Main Output is we have iterated the working draft and uploaded working draft output. We have converged to agreement on systems tags for SDR/NCG streams, SDR/WCG Streams, and HDR/WCG streams. We have editorially changed the layout of these tables to make it more readable to the reader. Beyond editorial changes We have identified a couple of places where common workflows goes beyond the definitions stated for 709 and 2020 for handling of full range scalability and can mark these situations through systems tags. Many other groups have just labeled exceptions to what is in the Spec (IMF, HDMI, others) IN JCT-VC, we need to understand if this needs to be pointed out to ITU,but need to have evidence for this need. Additionally, there has been discussions to add a baseband to the tables to handle wireline inputs (e.g. SDI) which will need to be discussed during the upcoming meeting.

Discussion Points-

1. System Identifier Tags
   * Agreed to put tag names as for SDR/NCG- BT.709 YCC, BT.709 RGB, FR709 RGB, BT.601 525, BT.601 625: for SDR/WCG- BT.2020 YCC NCL, FR2020 RGB; HDR/WCG- BT.2100 PQ YCC, BT.2100 HLG YCC, BT.2100 PQ RGB, BT.2100 HLG RGB
   * Discussed and worked out final versions of system tags for Dynamic Range/ Color gamut options.   Indicated defaults for narrow, but decided against using YCC as a default.
   * Made MXF more readable and accurate by indicating registration descriptor is the same across a workflow group.
2. Systems identifier Tags for MDCV
   * + Tag Name are – 709-100 (0.05), P3+-4000 (0.05), P3-1000 (0.0005), 2100-107 (0.0005)
       - The tags should reflect the Mastering Displays that are currently used. As of now there are no mastering Displays using the FULL 2020 gamut unless it is a laser projector. Other displays maybe OLED or LED. Revised Tags to reflect P3 or P3+ being used.
       - Use D65 white point is always used don’t have to include in the Sys tag name
       - Indicate what are values in the AVC/HEVC or MXF table and indicated what are the coded Hex Bytes. This will prevent any scaling confusion that might happen.
3. Adding in Tables for baseband? (2082-10, 2081-10, Look at Chart)
   * We need to understand this more. There were some discussion here if some of the bytes in the frame were defined while other bytes weren’t, then would we be defining something incompletely?
   * 2110 is also emerging with its own specific latency and buffering requirements
   * This is a technical issue that needs to be discussed at the JCT meeting.
   * Should we be adding a baseband table to indicate SDR/HDR NCG/WCG etc?
4. GBR instead of RGB for SEI and CICP messages
   * Don’t need to indicate this, but add a note: The Color Representation does not indicate the media component order in the file (Done)
5. Full Range/ Narrow Range Topic- in the709/2020 specs the color gamut, Narrow Range scalability is used. Industry workflows, there are commonly used streams make use of Full Range scalability more commonly with difference in film and video ( and sometimes floating). This can be pointed to the use of 709 FULL by IMF. It is also an Option covered in CTA 861.G Data Structures. Questions is whether we just tag these workflows or bring it up to ITU? Another request was adding a tag for BT.2020 RGB (narrow Range) which needs to be discussed at the meeting.
6. Should we be considering other tags for more Dynamic Metadata that may be stored in SEI or HANC/VANC areas?
7. Work on Aligning terms. Is Color Volume used correctly in all cases or can this be video properties in some cases and Colourimetry in others.

Requests from discussions and emails:

* + 1. In Production Cover 4:4:4 12 bit (DPX, TIFF Master files used in Production)
    2. Add BT.2020 RGB Tag for workflows that use Narrow Range (added). Is 4:4:4 used off of Cameras for things like Chroma Key.
    3. Add in Baseband Inputs payload Identifiers (SDI, 3G, ST.2110 in addition to HEVC/AVC or MXF because signals do Come in via Wireline Frame Digital Interface (and may also go out uncompressed at the HDMI interface).
    4. Indicate that Interlace only is used in SDR and not HDR.
    5. Recheck Bit Depth on file wrappers section in Table 4. Should there be 4:4:4- 16 bit out there. (What about RAW over 40+Gbps tethers)
    6. Also in file wrapper section compression should also be in production because recording devices are also compressed (e.g. 4:1) on taped medium

## Activities and output

Work was done to produce, review, add comments to, and refine the output document JCTVC-AE1003 and capture email and teleconference activity in this report.