

Title: **Coding of Parameter Sets**
 Annex A – Slice Layer Changes Relative to JVT WD2r7

Status: Input Document to JVT

Purpose: Proposal

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8.2 Slice Layer

[Ed. Note: The slice layer needs a significant amount of work together with the NAL concept. The Picture sync and picture type codewords are present to ease the VCL development.]

The header information sent at the slice layer is coded depending on the NAL type. The coding, the order and even the presence of some header fields may differ between the different NALs. [Ed. Note: Revisit these two statements as the NAL specification matures.]

8.2.1 Slice Parameter Set ID (SPSID)

SPSID is a collection of two codewords coded according to section QQ. The first codeword signals the length of the identifier codeword, and the second codeword carries the actual identifier.

8.2.2 Picture type (Ptype)

[Ed. Note: Clarify relation to NAL, parameter sets, etc.]

Code_number=0: Inter picture
Code_number=1: Intra picture.
Code_number=2: B picture
Code_number=3: SP picture
Code_number=4: SI picture

8.2.3 Temporal reference (TRType/TR)

See contribution JVT-C070 for a proposal of TR signaling.

8.2.4 Picture structure (PSTRUCT)

[Ed. Note: Clarify relation to NAL, parameter sets, etc.]

Code_number=0: Progressive frame picture.
Code_number=1: Top field picture.
Code_number=2: Bottom field picture.
Code_number=3: Interlaced frame picture, whose top field precedes its bottom field in time.
Code_number=4: Interlaced frame picture, whose bottom field precedes its top field in time.

Note that when top field and bottom field pictures are coded for a frame, the one that is decoded first is the one that occurs first in time.

8.2.5 First MB in slice

The number of the first macroblock contained in this slice.

8.2.6 Slice QP (SQP)

Information about the quantiser QUANT to be used for luminance for the picture. (See under Quantisation concerning QUANT for chrominance). The 6-bit representation is the natural binary representation of the value of QP+12, which range from 0 to 47 (QP ranges from -12 to +39). QP+12 is a pointer to the actual quantisation parameter QUANT to be used. (See below under quantisation). The range of quantisation value is still about the same as for H.263, 1-31. An approximate relation between the QUANT in H.263 and QP is: $QUANT_{H.263}(QP) \cong QP0(QP) = 2QP/6$. QP0() will be used later for scaling purposes when selecting prediction modes. Negative values of QP correspond to even smaller step sizes, as described below under quantisation.

8.2.7 SP Slice QP

For SP frames the SP slice QP is transmitted, using the same scale described above.

8.2.8 Number of macroblocks in slice

For CABAC entropy coding the number of macroblocks contained in the slice is transmitted.

8.2.9 Picture Number (PN)

[Ed. Note: Clarify relation to NAL, parameter sets, etc.]

PN shall be incremented by 1 for each coded picture in coding order, in modulo MAX_PN operation, relative to the PN of the previous stored picture in coding order. For non-stored pictures, PN shall be incremented from the value in the most temporally recent stored picture which precedes the non-stored picture in coding order.

The PN serves as a unique ID for each picture stored in the multi-picture buffer within MAX_PN coded and stored pictures. Therefore, a picture cannot be kept in the buffer after more than MAX_PN-1 subsequent coded and stored pictures unless it has been assigned a long-term picture index as specified below. The encoder shall ensure that the bitstream shall not specify retaining any short-term picture after more than MAX_PN-1 subsequent stored pictures. A decoder which encounters a picture number on a current picture having a value equal to the picture number of some other short-term stored picture in the multi-picture buffer should treat this condition as an error.