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Title: IMPROVEMENTS ON THE REFERENCE MODEL

The picture quality obtained with the reference model simulation can be improved. Two simulations with the sequence Split/Trevor have been done, one with only improvement no 1 below, the other with all four improvements (1-4) below. Comparisons will be demonstrated during the meeting.

1) For all blocks with a non-zero motion vector, the motion compensated predictor uses five (5) pels from previously coded picture. A significant improvement was achieved. The following predictor coefficients were used (where the middle one correspond to the motion vector).

$$\begin{array}{ccc} & 0.125 & \\ 0.125 & 0.5 & 0.125 \\ & 0.125 & \end{array}$$

For zero motion vectors, a one-pel predictor was used.

2) The motion vectors estimated from the luminance were used also for prediction of chrominance. No extra side information is needed. Vectors were applied on 4x4 chrominance blocks after beeing scaled to cope with the different spatial resolution. Only integer vectors were used. A small improvement was achieved.

3) Adaptive scanning of quantized components was used. Three classes were used: a) zig-zag (as in ref. model) b) horizontal c) vertical. For each coded block, the used class was indicated with side information (1-2-2 bits). A small improvement was achieved.

4) Quantizer stepsize was changed only after each Group of Blocks, instead of each block.The saving is three bits per coded block.

Below are given some statistical results for the reference model and the improvements. Only those that differ from the refence model are mentioned. Only mean values for the whole sequence are given.

	Reference	Improvement 1	Improvements 1-
RMS coding error	5.849	5.012	4.749
RMS prediction error	7.446	6.827	6.741
No of bits for chrominance attributes and data	2 645	3 040	2 264
No of coded blocks	680	721	734
No of non-zeroes per coded block	3.696	3.507	4.020
No of transmitted components per coded block	13.964	12.184	10.898
Probability for quantizer level 0 in coded blocks	0.734	0.704	0.622