CCITT SGXV
Specialists Group on Coding
for Visual Telephony

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Title: Updates to Draft Recommendation H.12x

Source: France, FRG, Italy, Netherlands, Norway, Sweden, UK

This document contains updates to draft Recommendation H.12x proposed by the European countries. Only changed parts are given here.

Text enclosed within square brackets is for explanatory purposes within this document only and is not intended to form part of the Recommendation.

2.2 Digital output and input

Digital access at the primary rate of 1544 or 2048 kbit/s is with vacated timeslots in accordance with Recommendation I.431. Interfaces using ISDN basic accesses are under study. (Recommendation I.420)

[This revised version is clearer that interfaces other than at the primary rate are possible]

3.1 Source format

[Added paragraph]

The use at some bit rates of horizontal and vertical spatial sampling densities of half the values given above and a maximum instantaneous picture rate of 14.985 Hz is under study.

3.2.2 Motion compensation

Motion compensation is optional in the encoder. The decoder will accept one vector for each block of 8 pels by 8 lines. The horizontal and vertical components of these vectors are within the range -16 to +16.

[Restriction to luminance blocks is removed. Range of components is specified.]

3.2.3 Loop filter

The prediction process may be modified by a two-dimensional spatial filter which operates on pels within a predicted block.

The filter is separable into one dimensional horizontal and vertical functions. Both are non-recursive with coefficients of 1/4, 1/2, 1/4. At block edges, where one of the taps would fall outside the block, the peripheral pel is used for two taps. Full arithmetic precision is retained with rounding to 8 bit integer values at the 2-D filter output. Values whose fractional part is one half are rounded up.

[The filter is specified.]

3.2.6 is deleted.

[Classification is moved to the video multiplex.]

4.1 Data Structure

Note 1: Unless specified otherwise the most significant bit is transmitted first.
Note 2: Unless specified otherwise Bit 1 is transmitted first.
Note 3: Unless specified otherwise all unused or spare bits are set to zero.

[Another note added - no.2 above]

4.2 Video Multiplex arrangement

4.2.1 Picture Header

The structure of the Picture Header is shown in Figure 4. Picture Headers for dropped pictures are not transmitted.

[Picture Headers of dropped pictures are not transmitted.]

Buffer state is removed

Temporal Reference (TR)

A five bit number derived using modulo-32 counting of pictures at 29.97 Hz.

[Size of TR increased. TR is incremented at 29.97Hz rate of input, not by transmitted Picture Header.]

Type Information (TYPE1)

Information about the complete picture;

Bit 1 Split screen indicator. '0' off, '1' on
Bit 2 Document camera. '0' off, '1' on
Bit 3 Freeze Picture Release. Under study
Bit 4 Filter signalling. '0' from motion vector
'1' by side information
Bit 5 number of classes. '0' one, '1' four
Bits 6 to 12 Under study

[Bits 3 to 5 allocated. Number of bits is defined.]

Extra Insertion Information (PEI)

Two bits which signal the presence of the following two optional data fields.

[Specification is refined.]

Parity Information (PARITY)

For optional use and present only if the first GEI bit is set to '1'. Eight parity bits each representing odd parity of the aggregate of the corresponding bit planes of the locally decoded PCM values of Y, CR and CB in the previous picture period.

[First sentence expanded.]

Spare Information (PSPARE)

Sixteen bits are present when the second PEI bit is set to '1'. The use of these bits is under study.

[Number of bits is defined.]

4.2.2 Group of Blocks Header

A group of blocks consists of 2k lines of 44 luminance blocks each, k lines of 22 CR blocks and k lines of 22 CB blocks. The value of k is under study.

[Size of GOB is left for further study.]

The structure of the Group of Blocks Header is shown in Figure 5. All GOB Headers are transmitted except those in dropped pictures.

[Transmission of GOB Headers is defined.]

Group Number (GN)

A m bit number indicating the vertical position of the group of blocks. The value of m is the smallest integer greater than or equal to log2(18/k). GN is 1 at the top of the picture.

[Modification to GN in consequence of size of GOB]

Type Information (TYPE2)

Bit 1 When set to '1' indicates all 132k blocks are transmitted in INTRA mode.

[Number of blocks will depend on size of GOB.]

Quantiser Information (QUANT1)

A j bit codeword which indicates the blocks in the group of blocks where QUANT2 codewords are present. These blocks, their codewords and the value of j are under study.

[Concept of QUANT1 is changed to give more flexibility but can include cases very similar to flexible hardware specification. For example QUANT1 might be 3 bits giving 8 possibilities. One of these could be one quantiser indicator for the whole GOB in the first transmitted block. Another could be one quantiser indicator per BA. The other six bit patterns could signal

predefined points in the GOB at which the quantiser can be changed.]

4.2.3 Block data alignment

The structure of the data for n transmitted blocks is shown in Figure 6. The values of n and the order are under study. Elements are omitted when not required.

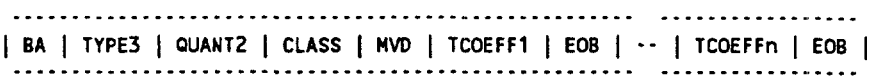

Figure 6/H.12x Data structure of transmitted block

[Possibility of macro-block arrangement is introduced.]

Block Address (BA)

A Variable Length Code-word indicating the position of n blocks within a group of blocks. VLC codewords are under study.

[BA refers to n blocks]

Both example paragraphs are deleted.

Block Type Information (TYPE3)

A variable length codeword indicating the type of blocks and which data elements are present. Block types and VLC codewords are under study.

[TYPE3 may be applicable to more than one block.]

Quantiser (QUANT2)

A codeword of up to q bits signifying the table(s) used to quantise transform coefficients. The value of q and the codewords are under study. QUANT2 ispresent in the first transmitted block after the position indicated by QUANT1.

[QUANT2 not restricted to fixed length. QUANT2 always present at least once in the GOB.]

Classification Index (CLASS)

CLASS is present if bit 5 of TYPE1 is set to '1' and indicates which of the four available transmission sequence orders is used for luminance block coefficients. If bit 5 of TYPE1 is set to '0' then luminance block coefficients are transmitted in the default sequence order.

Chrominance block coefficients are transmitted in one sequence order.

The CLASS codewords and sequence orders are under study.

[Possibility of only one class is introduced.]

End of Block Marker (EOB)

Use of and codeword for EOB are under study. An EOB without any transform coefficients for a block is allowed.

[EOB for empty block is allowed]

6. Transmission coder

6.1 Bit rate

The net bit rate including audio and optional data channels is an integer multiple of 384 kbit/s up to and including 1920 kbit/s. The use of lower bit rates is under study.

[Addition of bit rates below 384 kbit/s under study.]

6.9 Network interface

Access at the primary rate is with vacated timeslots as per RecommendationI.431.

[Only primary rate access is no longer implied.]
END