International Telegraph and Telephone
Consultative Committee
(CCITT)

#37

Question 4/XV
Specialist group on coding
for visual telephony

English only
Date: September 19, 1985

STUDY GROUP XV - CONTRIBUTION NO 37

Source: SWEDEN,

Title: EXAMPLE OF SIMULATION WITH HYBRID CODING

The Swedish simulation result demonstrated during the meeting in Torino is achieved with the coding sceme proposed in document no 36 "HYBRID CODING". In the specific simulation the following parameters are used.

Picture Format

Luminance:	304 pels/line 288 lines/picture 12.5 pictures/second	Chrominance:	152 pels/line 144 lines/picture 12.5 pictures/second

Bit Rate

256 kbit/s

P Predictor

The predictor uses pels in the previously reconstructed frame taking into account motion vectors for each 8•8 block. Properly scaled motion vectors are used on chrominance. Intra-frame mode is used at scene changes only.

ME Motion Estimation

Motion estimation is done by full search block matching on luminance. Maximum movement is 8 pels and movement resolution is 1 pel.

T Transform

8•8 DCT on prediction error.

Q Quantizer

The quantizer in Figure 1 is used, with no limitation in number of levels. Stepsize g is adjusted for each row of transform blocks, using buffer fill-ness and average frame difference as regulation parameters. 3 bits of side information indicate stepsize g.
Conditional replennishment or frequency weighting is not used.

VLC Variable Length Coding

The smallest rectangle in the transform block holding all non-zero components is adressed with 6 bits. Inside the rectangle the tree code in Figure 2 is used.

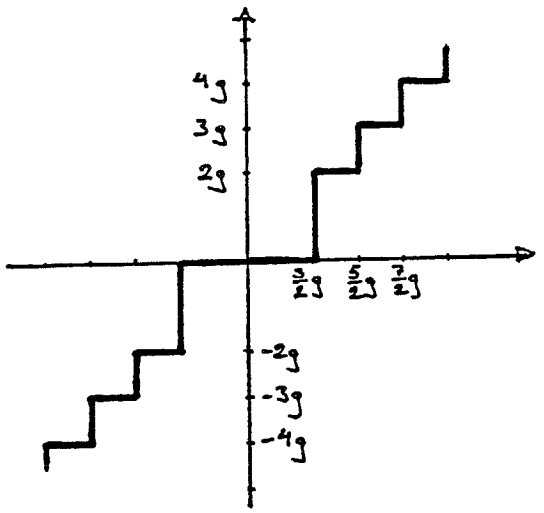

Figure 1

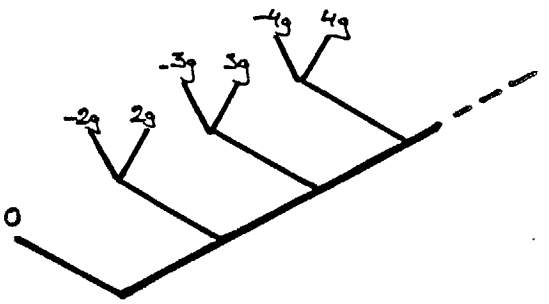

Figure 2

TB Transmission Buffer

Buffer size corresponds to 80 ms delay. (20 480 bits)

NR, IH Noise Reduction and Image Enhancement

Not used.

Scene Change

At scene changes a special code is used.
The threshold in the quantizer is eliminated (uniform quantizer). The rectangle in the transform block is maximized to 6 components. The DC component is fix length coded with 7 bits.

This coding gives about the double number of bits (40 000) for the first frame after a scene change. Therefore the next frame is omitted from coding, and the last frame before the scene change is repeated in the decoder.