TITLE : **Examples of simulation with variable blocksize hybrid coding scheme (DCT) at 64 kbit/s.**

Source : France

The french simulation results, presented during the meeting in TOKYO, have been achieved according to a simplify version of the coding scheme depicted in document n°   "Variable Blocksize hybrid coding scheme", and the following parameters have been used.

Picture format

Miss America

Luminance : 360 x 288   Chrominance : 90 x 72
7,5 pictures/second (intermediate format subsampled 4 to 1)

Bit-rate

64 kbit/s = 56 kbit/s (Y) + 4 kbit/s (U) + 4 kbit/s (V)

Transform

DCT : 16 x 16, 16 x 8, 8 x 16 and 8 x 8 for luminance
16 x 16 for chrominance.

Motion estimation

Motion estimation is done by full search block matching on luminance. The block size is 16 x 16. The maximum displacement is limited to - 7 and + 8. The displacement resolution is 1 pel.

Predictor

Intra frame, inter frame with no motion compensation or inter frame wih motion compensation. Inter and intra frame modes can be used at the same time (see fig. 1).

Quantisation strategy

$$Q^n = T + (n-1)G + \sum_{m=3}^{n-1} (m-2)D \quad n \geq 0$$

and symetrically for $n < 0$.

T and G are related to the buffer state (line of blocks)
D is related to the power of the prediction error. (every block)
16 possible combina tions of T, G and .
One quantizer per block.
One bit allocation table.

Classification

There is a set of 16 predefinded scannings. The selected one minimizes the address of the last non zero-coefficient.

Variable length coding

4 variable length codes according to the bit allocation table.

Transmission buffer

Buffer size : 8 kbit/s (see enclosed paper).

Regulation

8 modes (T, G and motion detection).

Standard conversion

* Simple filter $\frac{1}{4}$ (1 2 1) and subsampling to convert 720 pel/1 into 360 pel/1ne.

* Linear interpolation from 50 Hz to 30 Hz according to BT-NTT document SIM/85/71.

* Frame repeat from 7,5 Hz to 30 Hz.

* Linear interpolation from 30 Hz to 50 Hz according to BT-NTT document SIM/85/71.

* Simple filter $\frac{1}{2}$ (1 1) to interpolate pel to come back to 720 pel/1.

Preprocessing
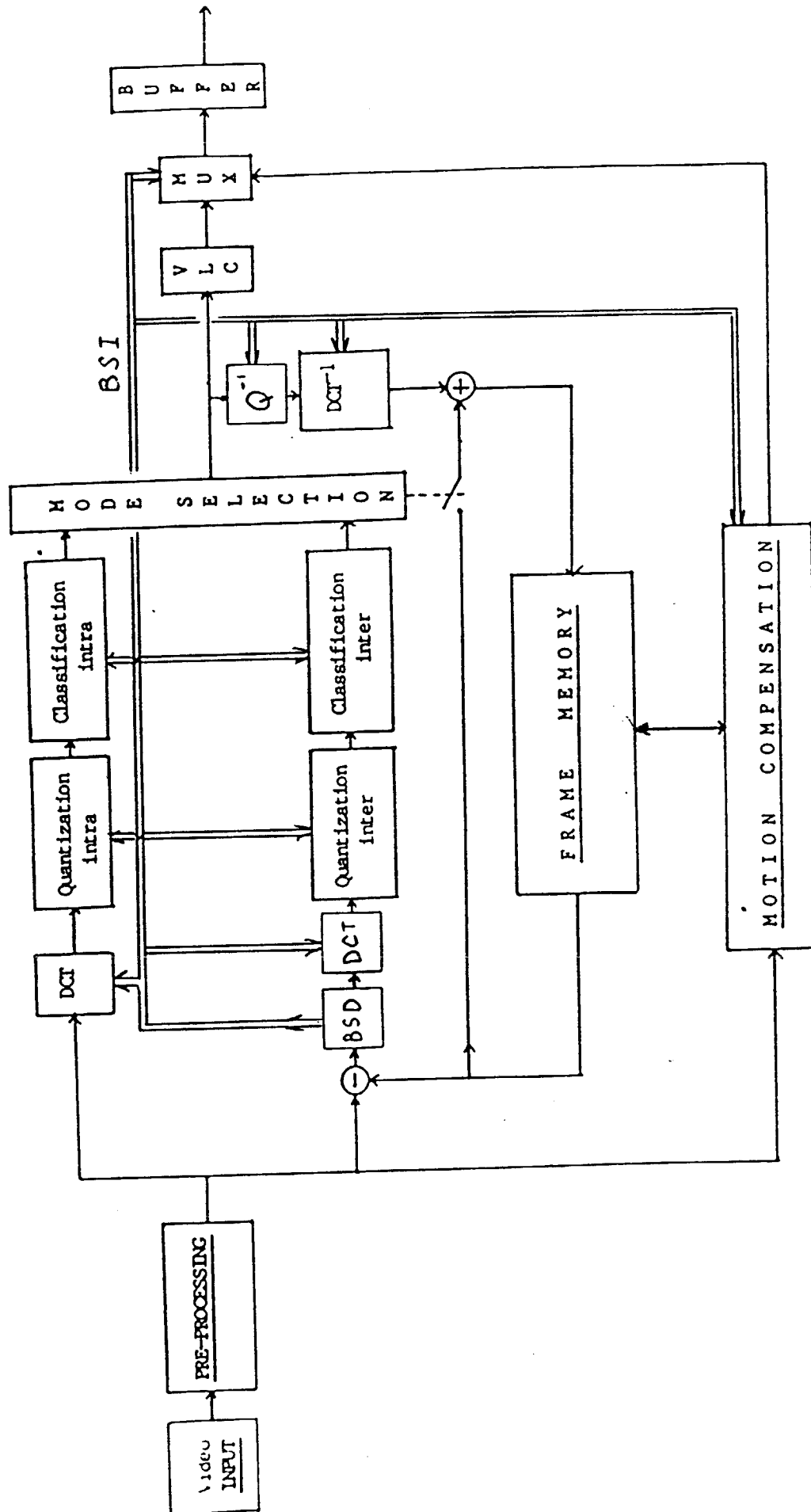
Temporal noise reduction (thresholding).

Postprocessing

Spatial noice reduction and edge enhancement.

Side information

No variable length code to reduce the bit rate devoted to the motion vector and the overhead.

Fig. 1 : Hybrid codec structure with variable blocksize

BSD : Block size decision
BSI : Block size information

Ruffa

7,5 Hz   USA CODEE 56KB/S   18 b/b