CCITT SGXV
Working Party XV/1
Experts Group for ATM Video Coding

Document AVC-84
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SOURCE: JAPAN
TITLE: Additional submission materials for 'Kurihama Test'
PURPOSE: Proposal

1. Introduction

One of the important objectives for the joint development of high quality video coding among CCITT, MPEG, and CMTT is to recommend a generic coding algorithm with transmission rates up to 10 Mb/s, including communication services as an essential application. Such transmission bit rates are provided by B-ISDN, which adopts the ATM system.

As is well known with ATM, user information is divided into cells, and some cells are inevitably lost. This causes picture quality degradation which depends on the coding algorithm used. Therefore, it is important what decoded pictures the proposed coding algorithm provides in case of cell loss.

2. Additional materials to be submitted

The following materials need to be submitted to the Kurihama test, a) and b) are mandatory, and c) is preferable.

a) Protection algorithm (**mandatory**)
Description of the algorithm's protection against cell loss, if any, is necessary.

b) Delay time (**mandatory**)
Increase of processing delay time due to the cell loss protection algorithm must be described.

c) Decoded picture (**preferable**)
Presentation of the decoded picture is preferable with the following cell-loss characteristics.

cell length: 48 bytes (user data only)
cell-loss ratio: 10^{-3} (for example)

Annex shows an example of cell loss concealment scheme which gives only small picture quality degradation at cell loss ratio of 10^{-2} and 10^{-3}.

3. Conclusion

Cell loss and its effect on the B-ISDN ATM environment is an important issue, and so additional materials that describe the characteristics of the coding algorithm when cell loss occurs should be included in the draft proposal package description. They are protection algorithm, delay time, and decoded picture.

END

ANNEX to AVC-84

Cell-loss concealment method

1. Algorithm (ref. Figs. 1 and 2)

   Source coding

   - DCT + coefficient domain adaptive intra/inter-frame prediction

   Cell-loss compensation

   - Leaky prediction
   - Adaptive concealment
   - Replacement of lost block by motion compensation in receiver

2. Simulation condition

   Picture format: CIF
   Block size: 8 pels x 8 lines
   Quantization: step size 16, linear (open-loop control)
   VLC: 2-dimensional variable length coding
   Leakage factor: 0.9
   Cell size: 48 bytes
   Cell loss: single cell within fixed interval

3. Contents of VCR

Sequence	Bit rate	Cell loss
1) Salesman	2 Mb/s	0
2) Salesman	2 Mb/s	10^{-3}
3) Salesman	2 Mb/s	10^{-2}
4) Flower garden	8 Mb/s	0
5) Flower garden	8 Mb/s	10^{-3}
6) Flower garden	8 Mb/s	10^{-2}

END

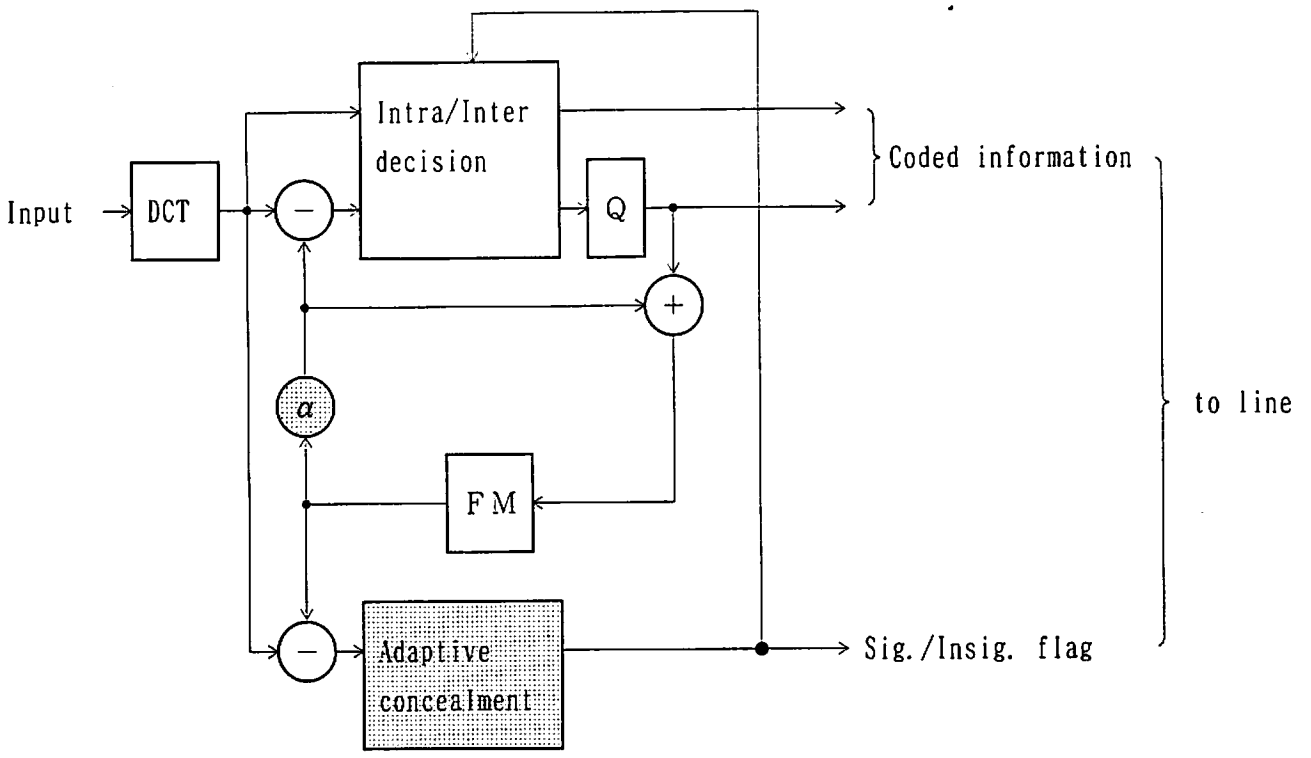

Fig. 1 Encoder

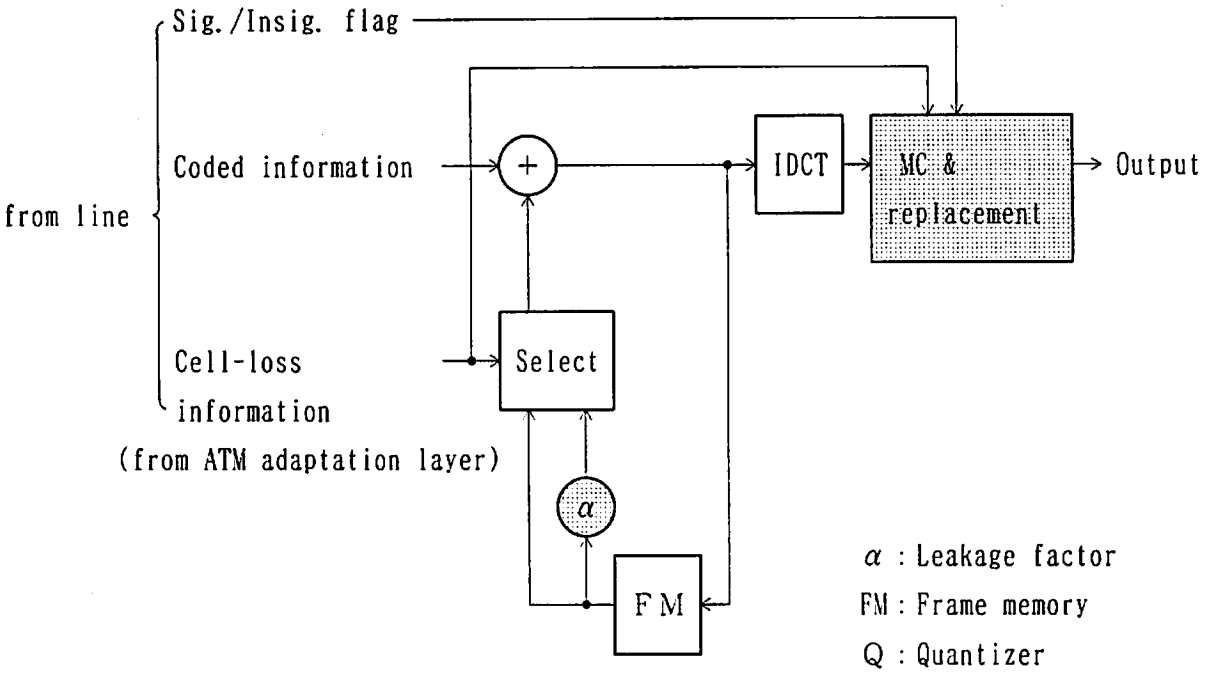

Fig. 2 Decoder