

Source : FRANCE, THE NETHERLANDS, THE FEDERAL REPUBLIC OF
GERMANY

Title : EXAMPLE STATISTICS ON THE IMPROVED REFERENCE MODEL

1. INTRODUCTION

This contribution gives the statistics measured using improvements on the reference model. The improvements of France and The Netherlands are shown. For France the improvements on the reference model are:

1. - no motion compensation for chrominance blocks
- quantizer step transmitted as a group of block attribute
- triangular VLC for block attributes as depicted in table 1.

Y		U,V	
Fixed	1	Fixed	1
Inter M.C.	01	Inter	01
Fixed M.C.	001	Intra	001
Inter	0001		
Intra	00001		

Table 1 Triangular VLC

2. improvements of (1) + intra frame only for the start and the scene cut (no more block attributes).

For The Netherlands the improvement is a combination of :

3. Non-linear quantizer +
Filter in the loop (see doc #)

The quantizer is defined as:

$$q_n = T + (n-1) g + \sum_{m=3}^n (m-2) g$$

with g = stepsize which is a GOB attribute.

2. USED MATERIAL

Picture format :

- * Y : 352 x 288
- * U,V : 176 x 144

Sequences used:

- * Split- Trevor : 10 Hz --> Improvement 1,2,3
- * Checked Jacket: 15 Hz --> Improvement 3
- * Miss America : 15 Hz --> Improvement 3

Standard conversion:

- * Frame repeat 10 Hz to 30 Hz
- * Frame repeat 15 Hz to 50 Hz

Only results from France

- * Linear interpolation 1/2 (1 1) between
360 and 720 pels.
- * Linear interpolation from 30 Hz to 50 Hz
according to BT-NTT document

3.RESULTS

	SPLIT-TREVOR	SPLIT-TREVOR	SPLIT-TREVOR	CHECKED JACKET	MISS AMERICA
	Improvement 1	Improvement 2	Improvement 3		
LUMINANCE					
1 Intra	: 16	15	79	5	10
2 Fixed	: 849	859	841	1098	1124
3 Inter	: 100	93	114	223	100
4 Fixed MC	: 173	168	156	117	181
5 Inter MC	: 445	446	392	138	166
CHROMINANCE					
1a Intra U	:		69	0	3
1b Intra V	:		93	25	19
1c Intra U+V	: 24	25	162	25	22
2a Fixed U	:		254	347	236
2b Fixed V	:		247	319	273
2c Fixed U+V	: 660	659	501	666	509
3a Inter U	:		71	48	156
3b Inter V	:		55	50	102
3c Inter U+V	: 106	107	126	98	258
NUMBER OF BITS					
Y_ attributes	:		3168	3168	3168
U_ attributes	:		554	554	554
V_ attributes	:		554	554	554
YUV_ attributes	: 3689	3662	4276	4276	4276
EOB_word	: 2750	2777	2476	1257	1273
motion vectors	: 4949	4920	4393	2047	2785
quantizer step	: 54	54	3305	3285	3212
Y_ coefficients	:		12861	8218	5679
U_ coefficients	:		643	278	1473
V_ coefficients	:		516	348	1054
YUV_ coefficients	: 18320	18456	14020	8844	8206
TOTAL	: 29763	29871	28470	19709	19752