

□ 命令の27. 変換の仕方？

Oslo , March 7-10 , 1989

Title : Regulation at the Macro block level

Source : FRANCE

The new frame structure introduced in the RM7 involves problems in the regulation process. At the CIF format , overflow occurs in the SWING sequence and at the QCIF format , the number of GOB is 3 and changing the quantizer stepsize only 3 times per frame leads to a very bad buffer regulation (cf the stepsize plot at QCIF format hereafter).

We have performed simulations of regulation at the macro block level :

Related to the buffer occupancy , a stepsize is defined. If this stepsize is not the same as at the previous MB , it is send to the decoder differentially using the same VLC as for the DMV. In any case , 1 bit is used to indicate if the stepsize has changed or not.

Conclusion :

1) At the CIF format , the overflow problems on the SWING sequence are solved. The SNR on SWING and SALESMAN sequences is lower because the amount of bits used to transmit the MB attributes is increased. Nevertheless the buffer regulation is better.

2) At the QCIF format , this regulation technique performs much better.

Annexed to this document statistical results and SNR and Stepsize curves.

Statistics : RM7 ; CIF format : 10 Hz
 Bit rate : 59.4 Kbit/s
 Source : CNET/France
 Date : 23/01/89

Sequence	Swing GOB regul.	Swing MB regul.
R.M.S. Y	4.50	4.68
C	3.43	3.87
S.N.R. Y	35.07	34.72
C	37.44	36.37
Step size	24.20	14.81
Nbr of non zeroes	Y: 3.20 C: 3.52	1.89 2.28
Nbr of zeroes	Y: 24.35 C: 16.26	19.63 14.21
MACRO BLOCK TYPE		
Overflow	2	0
Fixed	314	254
Fixed MC	1	1
Inter	71	134
Inter MC	4	4
Intra	1	1
NUMBER OF BITS		
MB Attributes	374	978
Motion vectors	60	55
E O B	749	1145
Coefficients : Y	3847	3076
C	895	664
Total	5925	5918

step size 增加
 SNR 降低

Statistics : RM7 ; CIF format : 10 Hz
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Sequence	Salesman GOB regul.	Salesman MB regul.
R.M.S. Y	6.72	6.87
C	2.82	2.88
S.N.R. Y	31.58	31.40
C	39.13	38.93
Step size	26.37	26.00
Nbr of non zeroes	Y: 3.17 C: 1.34	2.97 1.41
Nbr of zeroes	Y: 11.01 C: 2.56	9.96 3.39
MACRO BLOCK TYPE		
Overflow	0	0
Fixed	273	268
Fixed MC	7	6
Inter	77	81
Inter MC	34	34
Intra	3	4
NUMBER OF BITS		
MB Attributes	570	801
Motion vectors	272	273
E O B	963	989
Coefficients : Y	3957	3686
C	170	181
Total	5932	5930

#480

Statistics : RM7 ; QCIF format ; 10 Hz
 Bit rate : 59.4 Kbit/s
 Source : CNET/France
 Date : 23/01/89

Sequence	Claire GOB regul.	Claire MB regul.
S.N.R.(QCIF) Y C	37.91 41.59	39.35 40.90
S.N.R.(CIF) Y C	33.38 ---	33.81 ---
Step size	21.63	9.61
Nbr of non zeroes	Y: 8.38 C: 5.41	6.97 3.10
Nbr of zeroes	Y: 10.63 C: 10.39	12.80 7.23
MACRO BLOCK TYPE		
Overflow	2	0
Fixed	57	46
Fixed MC	1	0
Inter	28	43
Inter MC	8	9
Intra	0	0
NUMBER OF BITS		
MB Attributes	172	350
Motion vectors	49	43
E O B	370	513
Coefficients : Y C	4405 595	4354 392
Total	5591	5652

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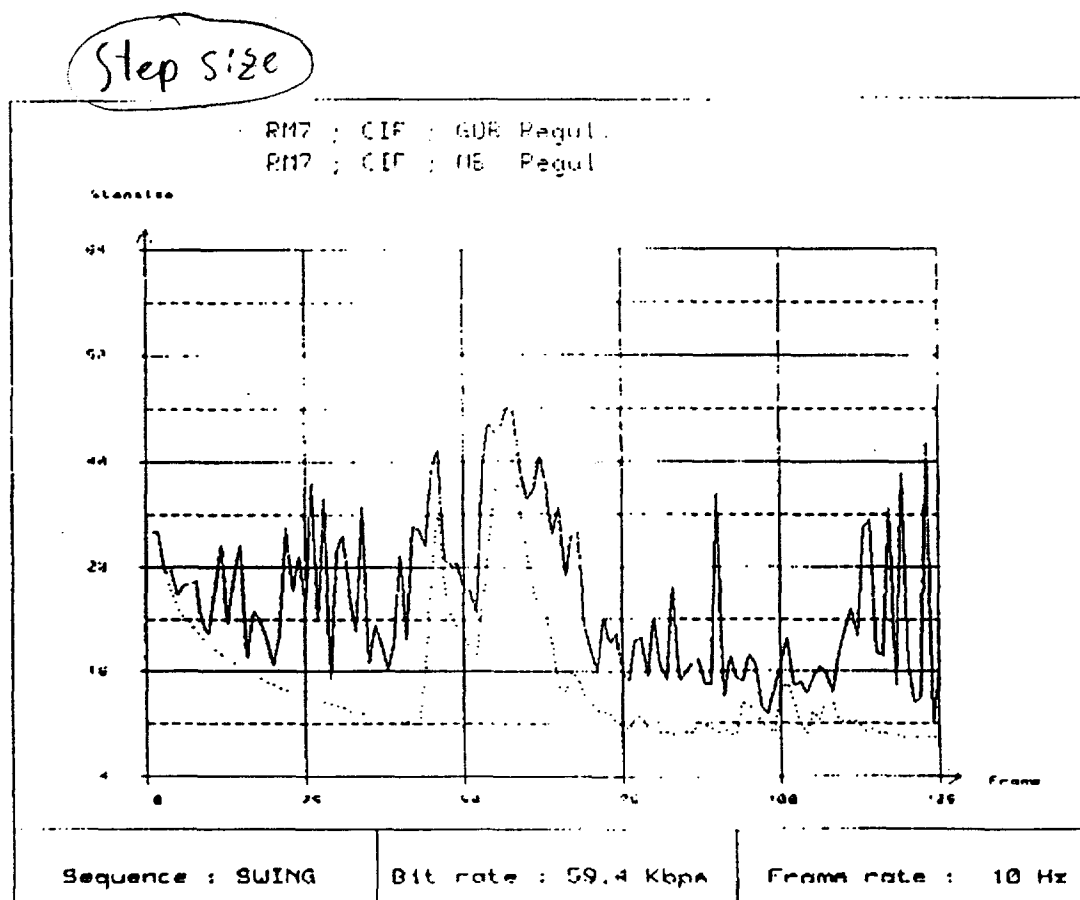
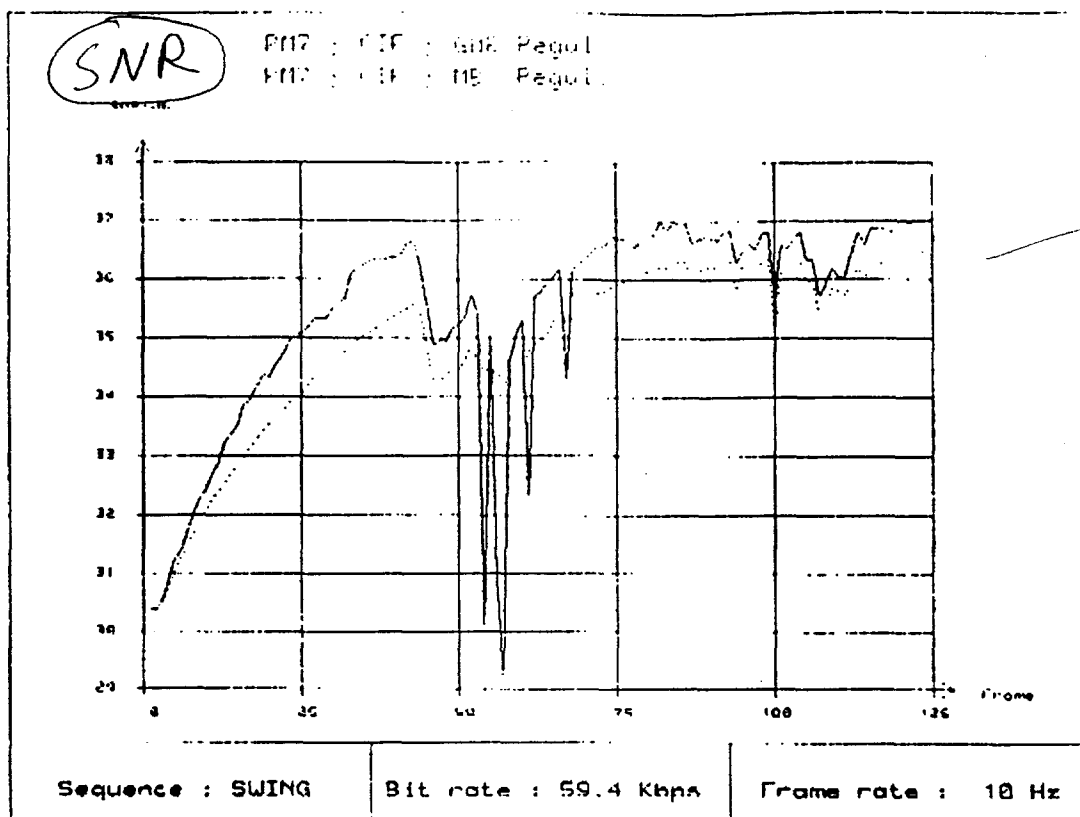
Sequence	Miss A GOB regul.	Miss A MB regul.
S.N.R.(QCIF) Y C	37.62 38.89	39.56 39.39
S.N.R.(CIF) Y C	34.55 ---	35.40 ---
Step size	25.56	9.72
Nbr of non zeroes	Y: 9.53 C: 4.40	6.36 2.21
Nbr of zeroes	Y: 11.34 C: 8.84	12.02 5.55
MACRO BLOCK TYPE		
Overflow	2	0
Fixed	50	36
Fixed MC	6	0
Inter	25	43
Inter MC	13	18
Intra	0	0
NUMBER OF BITS		
MB Attributes	179	371
Motion vectors	92	82
E O B	441	724
Coefficients : Y C	4030 1017	3852 824
Total	5759	5853

Statistics : RM7 ; QCIF format ; 10 Hz
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Sequence	Salesman GOB regul.	Salesman MB regul.
S.N.R.(QCIF) Y C	34.41 41.28	34.49 40.22
S.N.R.(CIF) Y C	28.41 ---	28.43 ---
Step size	22.84	11.22
Mbr of non zeroes	Y: 9.01 C: 2.41	6.08 1.70
Mbr of zeroes	Y: 17.08 C: 6.42	16.68 4.80
MACRO BLOCK TYPE		
Overflow	3	0
Fixed	58	39
Fixed MC	0	0
Inter	31	54
Inter MC	4	4
Intra	0	0
NUMBER OF BITS		
MB Attributes	169	385
Motion vectors	29	26
E O B	363	565
Coefficients : Y C	4807 212	4667 140
Total	5580	5783

Statistics : RM7 ; QCIF format ; 10 Hz
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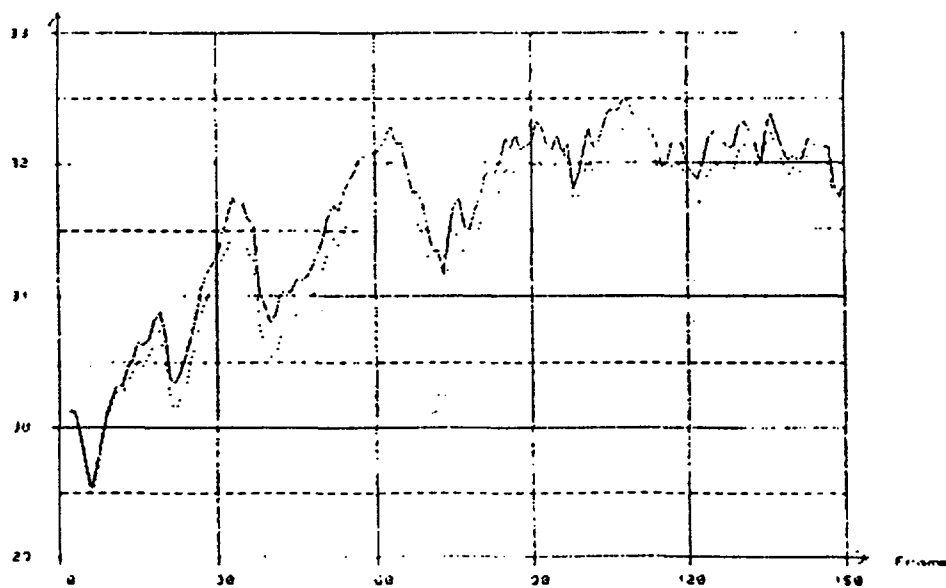
Sequence	Trevor GOB regul.	Trevor MB regul.
S.N.R.(QCIF) Y C	34.17 40.57	35.03 40.48
S.N.R.(CIF) Y C	31.72 ---	32.18 ---
Step size	26.31	16.15
Mbr of non zeroes	Y: 5.67 C: 1.86	5.47 1.61
Mbr of zeroes	Y: 9.79 C: 3.06	10.23 1.94
MACRO BLOCK TYPE		
Overflow	0	0
Fixed	49	45
Fixed MC	3	0
Inter	18	23
Inter MC	24	28
Intra	2	2
NUMBER OF BITS		
MB Attributes	176	308
Motion vectors	197	187
E O B	468	531
Coefficients : Y C	5052 167	4756 112
Total	6060	5894



SNR

PM7 : CIF : G08 Regul.
PM7 : CIF : H2 Regul.

SNR - dB

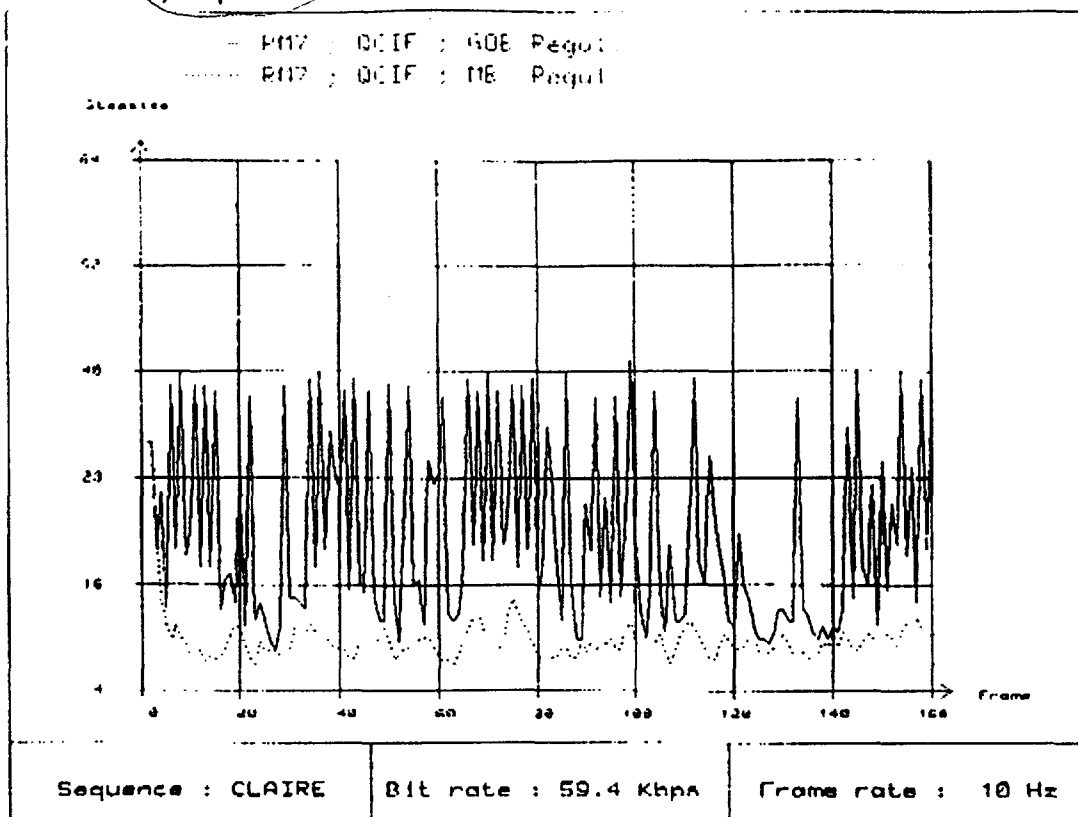


Sequence : SALESMAN

Bit rate : 59.4 Kbps

Frame rate : 10 Hz

Step size



SNR

