TSG-RAN Working Group 1 meeting #18
Boston, USA
Jan 15 - 18, 2001

TSGR1#18(01)0077

Agenda item: AH 99

Source: Nokia

Title: CR 25.212-104: Addition of TGL=8

Document for: Decision

TSG RAN WG4 has decided to include a compressed mode transmission gap length of 8 slots into their specifications, as it provides good performance for GSM measurements and is better suited for DL compressed mode by puncturing than 7 slots, as in the symmetrical (4,4) case, the necessary SIR is always the same for both frames. It also reduces the high amount of puncturing needed with a 10 slot gap in the case of slot formats with less data bits per slot in compressed mode than in normal mode.

Therefore, to support these improvements and to be in line with RAN WG4, TS 25.212 needs to be updated accordingly.

The complexity increase is quite small compared to the case with a gap length of 7 or 10 slots using a double-frame gap, and thus we propose to include the transmission gap length of 8 slots in TS 25.212.

In case this CR is rejected, it is suggested to send a LS to RAN WG4 and indicate that RAN WG1 does not see it feasible to include this gap length in R99.

3GPP TSG-RAN Meeting #18
Boston, USA, 15 – 18 Jan 2001

Tdoc R1-01-0077

CR-Form-v3

CHANGE REQUEST

✍ **25.212** **CR** **104** ✍ rev **-** ✍ Current version: **3.5.0** ✍

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ✍ symbols.*

Proposed change affects: ✍ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title: ✍	Addition of compressed mode gap length “8 slots”	
Source: ✍	Nokia	
Work item code: ✍		***Date:*** ✍ 9-jan-2001
Category: ✍	**C**	***Release:*** ✍ R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change: ✍	TGL=8 used by RAN WG4 is missing in 25.215
Summary of change: ✍	TGL=8 added to list of supported gap lengths.
Consequences if not approved: ✍	Compressed mode performance is worse, RAN WG4 patterns with TGL=8 cannot be used.

Clauses affected: ✍	4.4.4, B.1		
Other specs affected: ✍	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	✍	
Other comments: ✍			

4.4.4 Transmission gap position

Transmission gaps can be placed at different positions as shown in figures 14 and 15 for each purpose such as interfrequency power measurement, acquisition of control channel of other system/carrier, and actual handover operation.

When using single frame method, the transmission gap is located within the compressed frame depending on the transmission gap length (TGL) as shown in figure 14 (1). When using double frame method, the transmission gap is located on the center of two connected frames as shown in figure 14 (2).

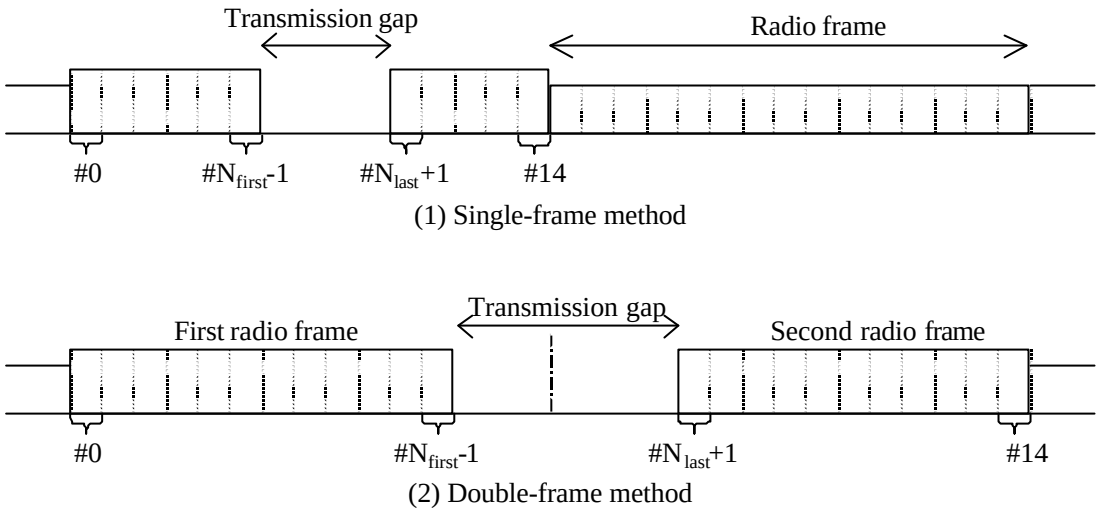


Figure 14: Transmission gap position

Parameters of the transmission gap positions are calculated as follows.

TGL is the number of consecutive idle slots during the compressed mode transmission gap:

TGL = 3, 4, 5, 7, 8, 10, 14

N_{first} specifies the starting slot of the consecutive idle slots,

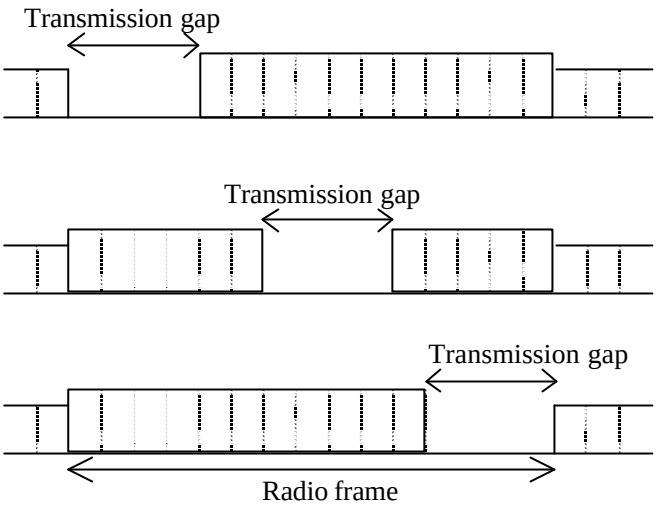
N_{first} = 0,1,2,3,…,14.

N_{last} shows the number of the final idle slot and is calculated as follows;

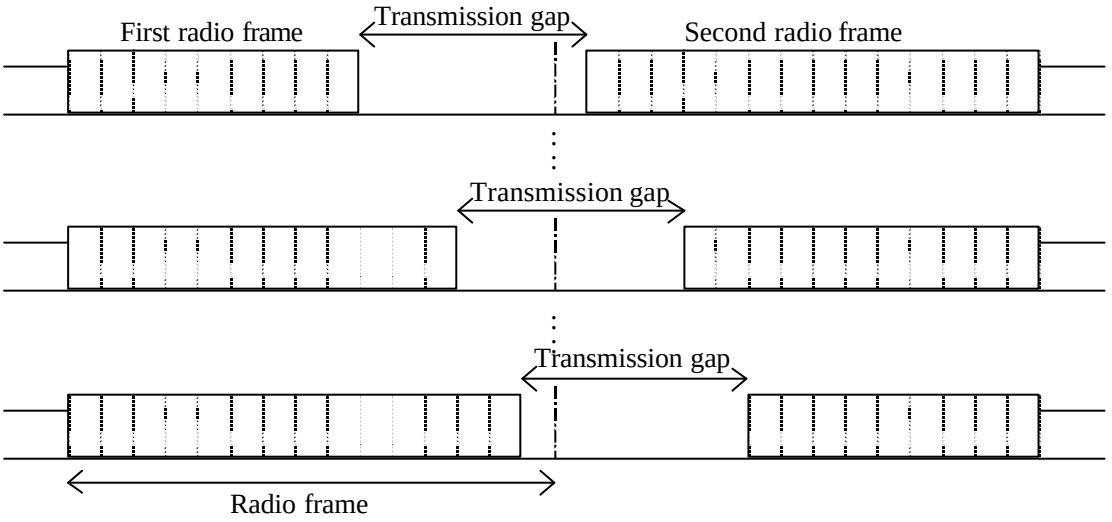
If N_{first} + TGL ? 15, then $N_{last} = N_{first}$ + TGL – 1 (in the same frame),

If N_{first} + TGL > 15, then $N_{last} = (N_{first} + TGL - 1) \bmod 15$ (in the next frame).

When the transmission gap spans two consecutive radio frames, N_{first} and TGL must be chosen so that at least 8 slots in each radio frame are transmitted.



(1) Single-frame method



(2) Double-frame method

Figure 15: Transmission gap positions with different N_{first}

Annex B (informative): Compressed mode idle lengths

The tables 9-11 show the resulting idle lengths for different transmission gap lengths, UL/DL modes and DL frame types. The idle lengths given are calculated purely from the slot and frame structures and the UL/DL offset. They do not contain margins for e.g. synthesizer switching.

B.1 Idle lengths for DL, UL and DL+UL compressed mode

Table 9: Parameters for DL compressed mode

TGL	DL Frame Type	Spreading Factor	Idle length [ms]	Transmission time Reduction method	Idle frame Combining
3	A	512 – 4	1.73 – 1.99	Puncturing, Spreading factor division by 2 or Higher layer scheduling	(S) (D) =(1,2) or (2,1)
	B		1.60 – 1.86		
4	A		2.40 – 2.66		(S) (D) =(1,3), (2,2) or (3,1)
	B		2.27 – 2.53		
5	A		3.07 – 3.33		(S) (D) = (1,4), (2,3), (3, 2) or (4,1)
	B		2.93 – 3.19		
7	A		4.40 – 4.66		(S) (D)=(1,6), (2,5), (3,4), (4,3), (5,2) or (6,1)
	B		4.27 – 4.53		
8	A		5.07 – 5.33		(D)=(1,7), (2,6), (3,5), (4,4), (5,3), (6,2), (7,1)
	B		4.93 – 5.19		
10	A		6.40 – 6.66		(D)=(3,7), (4,6), (5,5), (6,4) or (7,3)
	B		6.27 – 6.53		
14	A		9.07 – 9.33		(D) =(7,7)
	B		8.93 – 9.19		

Table 10: Parameters for UL compressed mode

TGL	Spreading Factor	Idle length [ms]	Transmission time Reduction method	Idle frame Combining
3	256 – 4	2.00	Spreading factor division by 2 or Higher layer scheduling	(S) (D) =(1,2) or (2,1)
4		2.67		(S) (D) =(1,3), (2,2) or (3,1)
5		3.33		(S) (D) = (1,4), (2,3), (3, 2) or (4,1)
7		4.67		(S) (D)=(1,6), (2,5), (3,4), (4,3), (5,2) or (6,1)
8		5.33		(D)=(1,7), (2,6), (3,5), (4,4), (5,3), (6,2), (7,1)
10		6.67		(D)=(3,7), (4,6), (5,5), (6,4) or (7,3)
14		9.33		(D) =(7,7)

Table 11: Parameters for combined UL/DL compressed mode

TGL	DL Frame Type	Spreading Factor	Idle length [ms]	Transmission time Reduction method	Idle frame Combining
3	A or B	DL: 512 – 4 UL: 256 – 4	1.47 – 1.73	DL: Puncturing, Spreading factor division by 2 or Higher layer scheduling UL: Spreading factor division by 2 or Higher layer scheduling	(S) (D) =(1,2) or (2,1)
4			2.13 – 2.39		(S) (D) =(1,3), (2,2) or (3,1)
5			2.80 – 3.06		(S) (D) = (1,4), (2,3), (3, 2) or (4,1)
7			4.13 – 4.39		(S) (D)=(1,6), (2,5), (3,4), (4,3), (5,2) or (6,1)
8			4.80 – 5.06		(D)=(1,7), (2,6), (3,5), (4,4), (5,3), (6,2), (7,1)
10			6.13 – 6.39		(D)=(3,7), (4,6), (5,5), (6,4) or (7,3)
14			8.80 – 9.06		(D) =(7,7)

(S): Single-frame method as shown in figure 14 (1).

(D): Double-frame method as shown in figure 14 (2). (x,y) indicates x: the number of idle slots in the first frame, y: the number of idle slots in the second frame.

NOTE: Compressed mode by spreading factor reduction is not supported when SF=4 is used in normal mode