
Source: Mitsubishi Electric
Title: Text proposal for section 4.4 in TS25.212 on compressed mode
Agenda item:
Document for: Discussion and decision

1. Introduction

We propose the following changes to the description of compressed mode in 25.212 (section 4.4):

- (1) Update of text, figures, formulas and descriptions to 15 slots per frame with slots numbered from 0...14
- (2) Change of the maximum allowed idle gap length per frame to 7 slots
- (3) Removal of references from specific TGL-values for specific purposes (e.g. power measurements, acquisition of control channels ...)
- (4) Add the possibility of double frame method for the case of TGL=7 in table 14
- (5) Add the Single frame method for the case of TGL=4 and TGL=7 with use of puncturing method A1
- (6) Update of the values of available idle lengths for measurements in table 14
- (7) Removal the last sentence below table 14: This sentence is used for explanation of notation in case of SF=1 and SF=2 case which is not needed any more
- (8) Changing the title of column from Mode to Type in Table 14: Section 4.4.1 uses type A and type B, does not use mode A or mode B.
- (9) Add a note that the use of the SF-reduction method with SF=4 needs further clarification
- (10) Table11 and Table 12 are changed according to 16slots/frame to 15slots/frame and Table 10 in TS25.211
- (11) Table 14 is revised to clarify the case of fixed gap position or adjustable gap position.
- (12) Table 14 is revised to show the combination of idle slot per frame in double frame method
- (13) Table 14 is revised according to the change of SF range for each Type; A:4-512, B:4-256
- (14) Method A2 is proposed to remove from R'99 and to move technical document for future release
- (15) Add decision criteria whether method A1 (puncturing) can be used or not

2. Text proposal for 25.212(Section 4.4)

4.4 Coding of compressed mode

In compressed mode, slots N_{first} to N_{last} are not used for transmission of data. As illustrated in Figure 16, which shows the example of fixed ~~idle length transmission gap~~ position with single frame method (see section 4.4.2), the instantaneous transmit power is increased in the compressed frame in order to keep the quality (BER, FER, etc.) unaffected by the reduced processing gain. The amount of power increase depends on the transmission time reduction method (see section 4.4.2). What frames are compressed, are decided by the network. When in compressed mode, compressed

frames can occur periodically, as illustrated in Figure 16, or requested on demand. The rate and type of compressed frames is variable and depends on the environment and the measurement requirements.

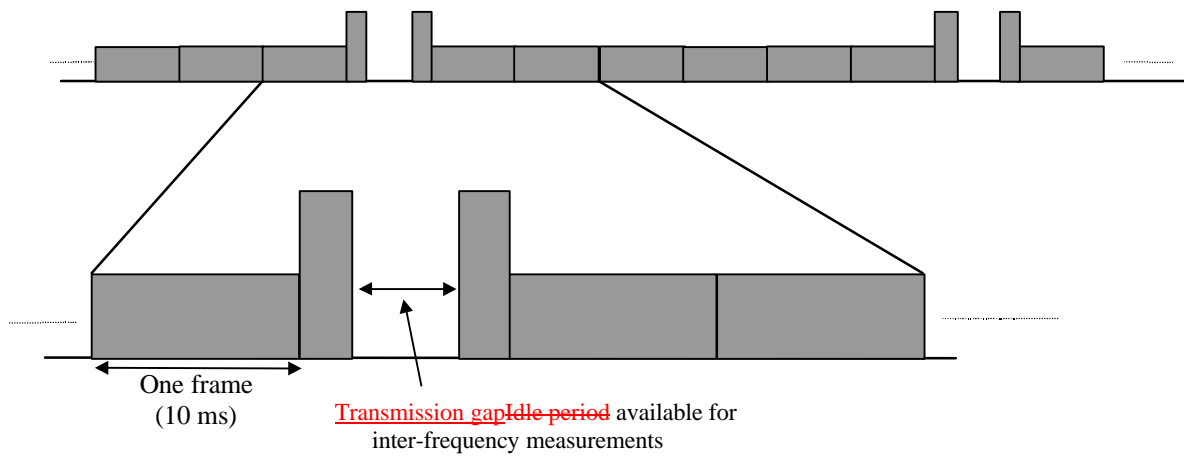
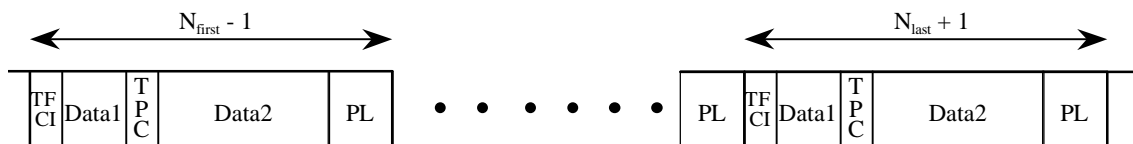


Figure 16: Compressed mode transmission

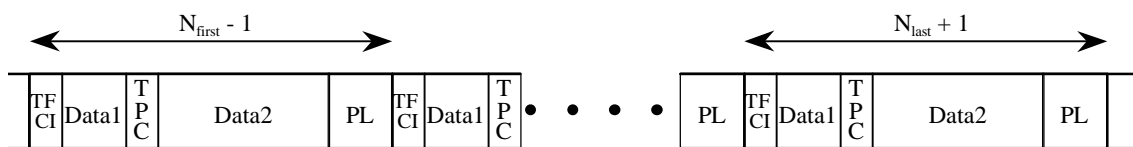
4.4.1 Frame structure types in the downlink

There are two different types of frame structures defined for downlink compressed transmission. Type A is the basic case, which maximises the transmission gap length. Type B, which is more optimised for power control, can be used if the requirement of the transmission gap length allows that. Slot structure for uplink compressed mode is for further study.

- With frame structure of type A, BTS transmission is off from the beginning of TFCI field in slot N_{first} , until the end of Data2 field in slot N_{last} (Figure 17(a)).
- With frame structure of type B, BTS transmission is off from the beginning of Data2 field in slot N_{first} , until the end of Data2 field in slot N_{last} (Figure 17(b)) Dummy bits are transmitted in the TFCI and Data1 fields of slot N_{first} , and BTS and MS do not use the dummy bits. Thus BTS and MS utilize only the TPC field of N_{first} .



(a) Frame structure type A



(b) Frame structure type B

Figure 17: Frame structure types in downlink compressed transmission

4.4.2 Transmission time reduction method

When in compressed mode, the information normally transmitted during a 10 ms frame is compressed in time. The mechanism provided for achieving this is either changing the code rate (method A), which means puncturing in practice, or the reduction of the spreading factor by a factor of two (method B). The maximum idle length is defined to be 7 slots 5 ms per one 10 ms frame.

In case of flexible positions of Transport Channels, Method B shall be used, when

$$N_{SF}^{cm,o} \geq PL \cdot \max_{j \in TFCs} \left(\sum_{i=1}^{i=L} \left(\frac{RM_i}{\max_{1 \leq i' \leq L} RM_{i'}} \right) \cdot \frac{N_{i,TFC_i(j)}^{TTI}}{F_i} \right)$$

is not fulfilled.

For fixed fixed positions of Transport Channels, the above criteria is still correct if there exists a TFC in which all the Transport Channels transmit simultaneously at maximum bit rate. Otherwise it shall be replaced by the following criteria:

$$N_{SF}^{cm,o} \geq PL \cdot \left(\sum_{i=1}^{i=L} \left(\frac{RM_i}{\max_{1 \leq i' \leq L} RM_{i'}} \right) \cdot \frac{\max_{l \in TFS(i)} N_{i,l}^{TTI}}{F_i} \right)$$

The following notation is used:

- PL it is a puncturing limit signalled from upper layers for the Downlink
- $N_{SF}^{cm,o}$ this is the number of available bits for the CCTrCH in a DL radio frame compressed mode format *o*. Compressed mode format is notably defined by the number of idle slots per frame TGPF, and by whether special slot format are used for the compressed mode. The compressed mode format is defined for for some spreading factor *SF*.
The value of *SF* is the same as the one used in normal mode, and the compressed mode format is selected for that SF in order to get the desired TGPF.

4.4.2.1 Method A4: By puncturing, ~~basic case~~

During compressed mode, rate matching (puncturing) is applied for ~~making creating short-transmission gap length~~ in one frame. ~~The Algorithm for rate matching (puncturing) as described in Section 4.2.7 is used. The maximum transmission gap length allowed to be achieved with this method is the case where the code rate is increased from 1/3 to 1/2 by puncturing, depending on the rate matching conditions that would be used in the non-compressed frame case. The explanation of the rate matching conditions are given below:~~

~~Example 1: If rate matching conditions in the non-compressed frame case would be such that maximum puncturing =0.2 would be used, then during compressed mode further puncturing of $1 - (2/(3*(1-0.2))) = 0.17$ is allowed which corresponds to $0.17*15=2.55 \Rightarrow 2$ time slots.~~

~~Example 2: If rate matching conditions in the non-compressed frame case would be such that no puncturing would be used, then during compressed mode puncturing of $1 - (2/3) = 0.33$ is allowed which corresponds to $0.33*15=4.95 \Rightarrow 4$ time slots.~~

DPDCH and DPCCH fields for compressed mode when puncturing 4 slots and 3 slots, respectively, are shown in Table 11 and Table 12. Because of higher encoding rate, some DPDCH symbols remain unused and shall be indicated as DTX.

Table 11: DPDCH and DPCCH fields in compressed mode when puncturing 4 slots

| Channel Bit Rate (kbps) | Channel Symbol Rate (ksps) | SF | Bits/Frame | | | Bits/Slot | DPDCH Bits/Slot | | DPCCH Bits/Slot | | | Extra DPDCH symbols for DTX |
|-------------------------|----------------------------|-----|------------|-------|-------|-----------|--------------------|--------------------|-------------------|------------------|--------------------|-----------------------------|
| | | | DPDCH | DPCCH | TOT | | N _{Data1} | N _{Data2} | N _{TFCI} | N _{TPC} | N _{Pilot} | |
| 16 | 8 | 512 | 40 | 66 | 110 | 10 | 2 | 2 | 0 | 2 | 4 | 4 |
| 32 | 16 | 256 | 100 | 110 | 220 | 20 | 2 | 8 | 0 | 2 | 8 | 10 |
| 32 | 16 | 256 | 80 | 140 | 220 | 20 | 0 | 8 ⁺ | 2 ⁺ | 2 | 8 | 0 |
| 64 | 32 | 128 | 300 | 110 | 440 | 40 | 6 ⁺ | 24 | 0 | 2 | 8 | 30 |
| 64 | 32 | 128 | 280 | 140 | 440 | 40 | 4 ⁺ | 24 | 2 ⁺ | 2 | 8 | 20 |
| 128 | 64 | 64 | 600 | 252 | 880 | 80 | 4 ⁺ | 56 | 8 ^{1,2} | 4 | 8 | 28 |
| 256 | 128 | 32 | 1400 | 252 | 1760 | 160 | 20 ⁺ | 120 | 8 ^{1,2} | 4 | 8 | 108 |
| 512 | 256 | 16 | 2880 | 384 | 3520 | 320 | 48 ⁺ | 240 | 8 ^{1,2} | 8 | 16 | 256 |
| 1024 | 512 | 8 | 6080 | 384 | 7040 | 640 | 112 ⁺ | 496 | 8 ^{1,2} | 8 | 16 | 576 |
| 2048 | 1024 | 4 | 12480 | 384 | 14080 | 1280 | 240 ⁺ | 1008 | 8 ^{1,2} | 8 | 16 | 1216 |

| Channel Bit Rate (kbps) | Channel Symbol Rate (ksps) | SF | Bits/Frame | | | Bits/Slot | DPDCH Bits/Slot | | DPCCH Bits/Slot | | | Extra DPDCH symbols for DTX |
|-------------------------|----------------------------|-----|------------|-------|-------|-----------|--------------------|--------------------|-------------------|------------------|--------------------|-----------------------------|
| | | | DPDCH | DPCCH | TOT | | N _{Data1} | N _{Data2} | N _{TFCI} | N _{TPC} | N _{Pilot} | |
| 15 | 7.5 | 512 | 40 | 66 | 110 | 10 | 2 | 2 | 0 | 2 | 4 | 4 |
| 30 | 15 | 256 | 160 | 44 | 220 | 20 | 2 | 14 | 0 | 2 | 2 | 16 |
| 30 | 15 | 256 | 140 | 74 | 220 | 20 | 0 | 14 ¹ | 2 ¹ | 2 | 2 | 6 |
| 30 | 15 | 256 | 140 | 66 | 220 | 20 | 2 | 12 | 0 | 2 | 4 | 14 |
| 30 | 15 | 256 | 120 | 96 | 220 | 20 | 0 | 12 ¹ | 2 ¹ | 2 | 4 | 4 |
| 30 | 15 | 256 | 100 | 110 | 220 | 20 | 2 | 8 | 0 | 2 | 8 | 10 |
| 30 | 15 | 256 | 80 | 140 | 220 | 20 | 0 | 8 ¹ | 2 ¹ | 2 | 8 | 0 |
| 60 | 30 | 128 | 340 | 66 | 440 | 40 | 6 | 28 | 0 | 2 | 4 | 34 |
| 60 | 30 | 128 | 320 | 96 | 440 | 40 | 4 ¹ | 28 | 2 ¹ | 2 | 4 | 24 |
| 60 | 30 | 128 | 300 | 110 | 440 | 40 | 6 | 24 | 0 | 2 | 8 | 30 |
| 60 | 30 | 128 | 280 | 140 | 440 | 40 | 4 ¹ | 24 | 2 ¹ | 2 | 8 | 20 |
| 120 | 60 | 64 | 600 | 252 | 880 | 80 | 4 ¹ | 56 | 8 ^{1,2} | 4 | 8 | 28 |
| 240 | 120 | 32 | 1400 | 252 | 1760 | 160 | 20 ¹ | 120 | 8 ^{1,2} | 4 | 8 | 108 |
| 480 | 240 | 16 | 2880 | 384 | 3520 | 320 | 48 ¹ | 240 | 8 ^{1,2} | 8 | 16 | 256 |
| 960 | 480 | 8 | 6080 | 384 | 7040 | 640 | 112 ¹ | 496 | 8 ^{1,2} | 8 | 16 | 576 |
| 1920 | 960 | 4 | 12480 | 384 | 14080 | 1280 | 240 ¹ | 1008 | 8 ^{1,2} | 8 | 16 | 1216 |

1) This figure does not take into account the extra TFCI bits from deleted slots

2) ~~If no TFCI then the TFCI field is blank~~ If TFCI bits are not used, then DTX shall be used in TFCI field

Note: Compressed mode with puncturing cannot be used for SF=512 with TFCI

Table 12: DPDCH and DPCCH fields in compressed mode frame when puncturing 3 slots

| Channel Bit Rate (kbps) | Channel Symbol Rate (ksps) | SF | Bits/Frame | | | Bits/Slot | DPDCH Bits/Slot | | DPCCH Bits/Slot | | | Extra DPDCH symbols for DTX |
|-------------------------|----------------------------|-----|------------|-------|-------|-----------|--------------------|--------------------|-------------------|------------------|--------------------|-----------------------------|
| | | | DPDCH | DPCCH | TOT | | N _{Data1} | N _{Data2} | N _{TFCI} | N _{TFC} | N _{Pilot} | |
| 16 | 8 | 512 | 40 | 72 | 120 | 10 | 2 | 2 | 0 | 2 | 4 | 8 |
| 32 | 16 | 256 | 100 | 120 | 240 | 20 | 2 | 8 | 0 | 2 | 8 | 20 |
| 32 | 16 | 256 | 80 | 150 | 240 | 20 | 0 | 8 ⁺ | 2 ⁺ | 2 | 8 | 10 |
| 64 | 32 | 128 | 300 | 120 | 480 | 40 | 6 | 24 | 0 | 2 | 8 | 60 |
| 64 | 32 | 128 | 280 | 150 | 480 | 40 | 4 ⁺ | 24 | 2 ⁺ | 2 | 8 | 50 |
| 128 | 64 | 64 | 600 | 264 | 960 | 80 | 4 ⁺ | 56 | 8 ⁺² | 4 | 8 | 96 |
| 256 | 128 | 32 | 1400 | 264 | 1920 | 160 | 20 ⁺ | 120 | 8 ⁺² | 4 | 8 | 256 |
| 512 | 256 | 16 | 2880 | 408 | 3840 | 320 | 48 ⁺ | 240 | 8 ⁺² | 8 | 16 | 552 |
| 1024 | 512 | 8 | 6080 | 408 | 7680 | 640 | 112 ⁺ | 496 | 8 ⁺² | 8 | 16 | 1192 |
| 2048 | 1024 | 4 | 12480 | 408 | 15360 | 1280 | 240 ⁺ | 1008 | 8 ⁺² | 8 | 16 | 2472 |

| Channel Bit Rate (kbps) | Channel Symbol Rate (ksps) | SF | Bits/Frame | | | Bits/Slot | DPDCH Bits/Slot | | DPCCH Bits/Slot | | | Extra DPDCH symbols for DTX |
|-------------------------|----------------------------|-----|------------|-------|-------|-----------|--------------------|--------------------|-------------------|------------------|--------------------|-----------------------------|
| | | | DPDCH | DPCCH | TOT | | N _{Data1} | N _{Data2} | N _{TFCI} | N _{TPC} | N _{Pilot} | |
| 15 | 7.5 | 512 | 40 | 72 | 120 | 10 | 2 | 2 | 0 | 2 | 4 | 8 |
| 30 | 15 | 256 | 160 | 48 | 240 | 20 | 2 | 14 | 0 | 2 | 2 | 32 |
| 30 | 15 | 256 | 140 | 78 | 240 | 20 | 0 | 14 ¹ | 2 ¹ | 2 | 2 | 22 |
| 30 | 15 | 256 | 140 | 72 | 240 | 20 | 2 | 12 | 0 | 2 | 4 | 28 |
| 30 | 15 | 256 | 120 | 102 | 240 | 20 | 0 | 12 ¹ | 2 ¹ | 2 | 4 | 18 |
| 30 | 15 | 256 | 100 | 120 | 240 | 20 | 2 | 8 | 0 | 2 | 8 | 20 |
| 30 | 15 | 256 | 80 | 150 | 240 | 20 | 0 | 8 ¹ | 2 ¹ | 2 | 8 | 10 |
| 60 | 30 | 128 | 340 | 72 | 480 | 40 | 6 | 28 | 0 | 2 | 4 | 68 |
| 60 | 30 | 128 | 320 | 102 | 480 | 40 | 4 ¹ | 28 | 2 ¹ | 2 | 4 | 58 |
| 60 | 30 | 128 | 300 | 120 | 480 | 40 | 6 | 24 | 0 | 2 | 8 | 60 |
| 60 | 30 | 128 | 280 | 150 | 480 | 40 | 4 ¹ | 24 | 2 ¹ | 2 | 8 | 50 |
| 120 | 60 | 64 | 600 | 264 | 960 | 80 | 4 ¹ | 56 | 8 ^{1,2} | 4 | 8 | 96 |
| 240 | 120 | 32 | 1400 | 264 | 1920 | 160 | 20 ¹ | 120 | 8 ^{1,2} | 4 | 8 | 256 |
| 480 | 240 | 16 | 2880 | 408 | 3840 | 320 | 48 ¹ | 240 | 8 ^{1,2} | 8 | 16 | 552 |
| 960 | 480 | 8 | 6080 | 408 | 7680 | 640 | 112 ¹ | 496 | 8 ^{1,2} | 8 | 16 | 1192 |
| 1920 | 960 | 4 | 12480 | 408 | 15360 | 1280 | 240 ¹ | 1008 | 8 ^{1,2} | 8 | 16 | 2472 |

- 1) This figure does not take into account the extra TFCI bits from deleted slots
- 2) If no TFCI then the TFCI field is blank. If TFCI bits are not used, then DTX shall be used in TFCI field

Note: Compressed mode with puncturing cannot be used for SF=512 with TFCI

<Mitsubishi NOTE: In all cases where the number of idle slots per frame = 1 to 7, the same description as given in table 11, 12 is necessary.>

Mitsubishi NOTE: The old section 4.4.2.2 (Method A2) is proposed not to be included for R'99. The figure and text is changed to a more realistic example with interleaving depth 40ms. This section could be moved to the study items document.

4.4.2.2 Method A2: By puncturing, optional case for services that allow larger delay

Other methods of supporting compressed mode may be considered as options. For example, with services that allow for a larger delay, e.g. data services with interleaving over several frames, multiple frames might be compressed together in order to create a short measurement slot. As an example, for a 2 Mbps service, with interleaving of 45 frames (4050 ms), an 5 ms idle gap of 7 slots can be created by puncturing only 1011.66% of 45 frames, as illustrated in Figure 18.

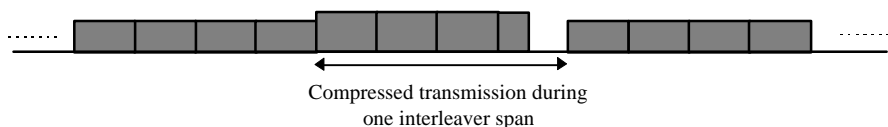


Figure 18: Multi-frame compressed mode for long delay services

4.4.2.34.4.2.2 Method B: By reducing the spreading factor by 2

During compressed mode, the spreading factor (SF) can be reduced by 2 to enable the transmission of the information bits in the remaining time slots of a compressed frame. This can accommodate up to 50% idle slots per frame which is the maximum compression factor required. Additional rate matching is required if there are less than 50% idle slots. Reducing the spreading factor will normally be used if rate matching alone is not sufficient to transmit all information bits in compressed mode. Use of this method for uplink compressed mode is for further study.

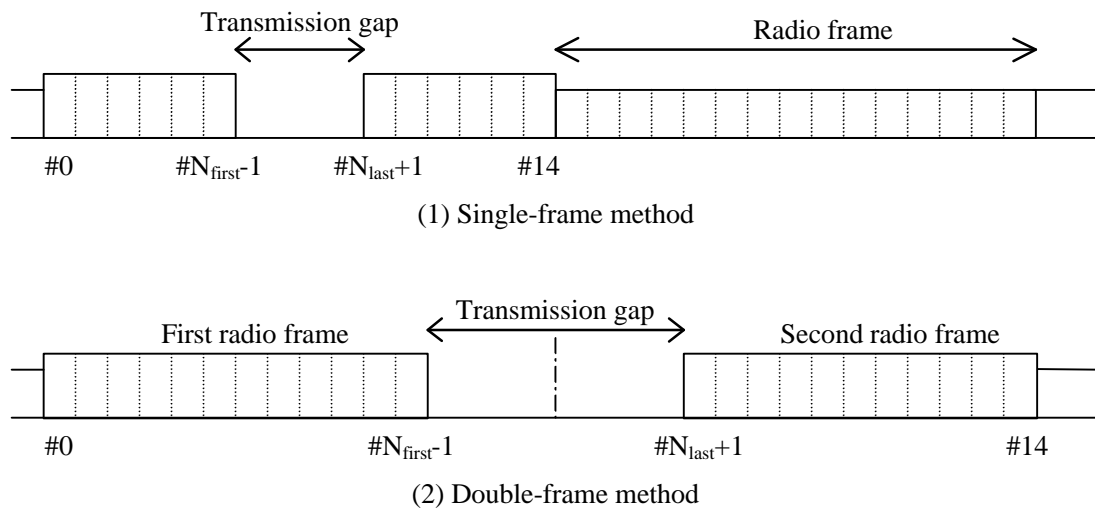
On the downlink, UTRAN can also order the UE to use a different scrambling code in compressed mode than in normal mode. If the UE is ordered to use a different scrambling code in compressed mode, then there is a one-to-one mapping between the scrambling code used in normal mode and the one used in compressed mode, as described in TS 25.213 section 5.2.1.

4.4.3 Transmission gap position

Transmission gaps can be placed at both fixed position and adjustable position for each purpose such as interfrequency power measurement, acquisition of control channel of other system/carrier, and actual handover operation.

4.4.3.1 Fixed transmission gap position

The transmission gaps can be placed onto fixed positions. When using single frame method, the fixed transmission gap is located within the compressed frame depending on the transmission gap length (TGL) as shown in Figure 19 (1). When using double frame method, the fixed transmission gap is located on the center of two connected frames as shown in Figure 19 (2). Table 13 shows the parameters for the fixed transmission gap position case.



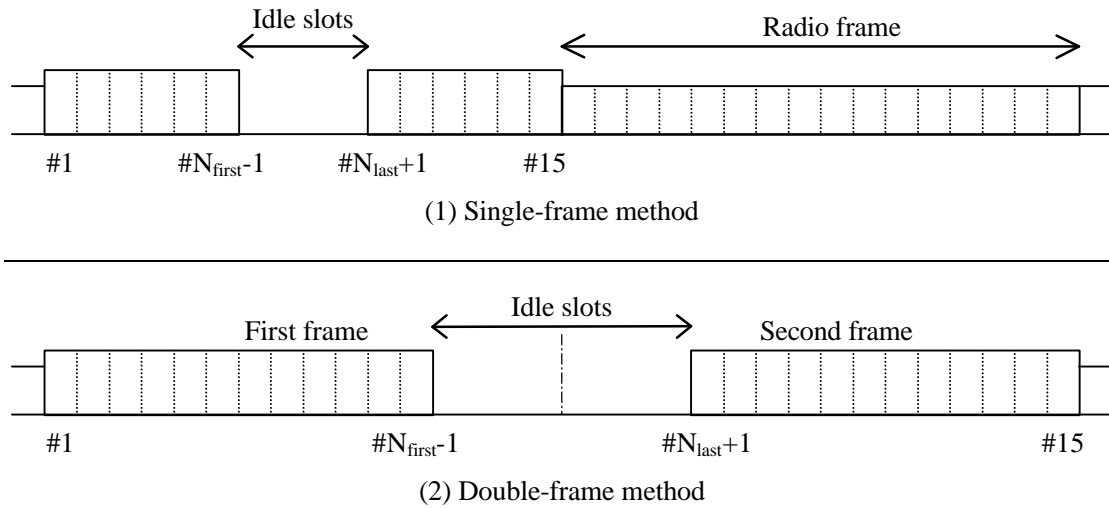


Figure 19: Fixed transmission gap-lengths position

Table 13: Parameters for fixed transmission gap position

| TGL Transmission gap length | Single-frame method | | Double-frame method | |
|-----------------------------|---------------------|-------------------|---------------------|--------------------|
| | N _{first} | N _{last} | N _{first} | N _{last} |
| 3 | 78 | 940 | 1445 in first frame | 12 in second frame |
| 4 | 67 | 940 | 1344 in first frame | 12 in second frame |
| 7 | 67 | 1243 | 1243 in first frame | 34 in second frame |
| 10 | N.A. | N.A. | 1044 in first frame | 45 in second frame |
| 14 | N.A. | N.A. | 89 in first frame | 67 in second frame |

4.4.3.2 Adjustable transmission gap position

Position of transmission gaps can be adjustable/relocatable for some purpose e.g. data acquisition on certain position as shown in Figure 20. 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. Parameters of the adjustable transmission gap lengths positions are calculated as follows:

N_{idle-TGL} is the number of consecutive idle slots during compressed mode, as shown in Table 13,

$$N_{idle-TGL} = 3, 4, 5, 6, 7, 10, 16, 14$$

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

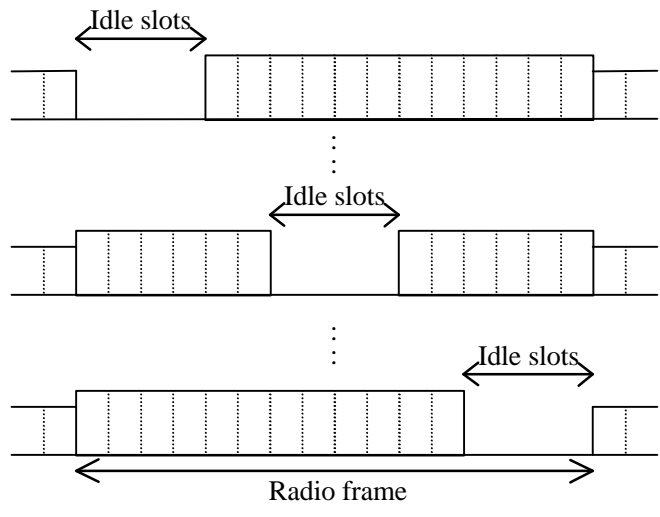
$$N_{first} = 1, 2, 3, \dots, 160, 1, 2, 3, \dots, 14$$

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

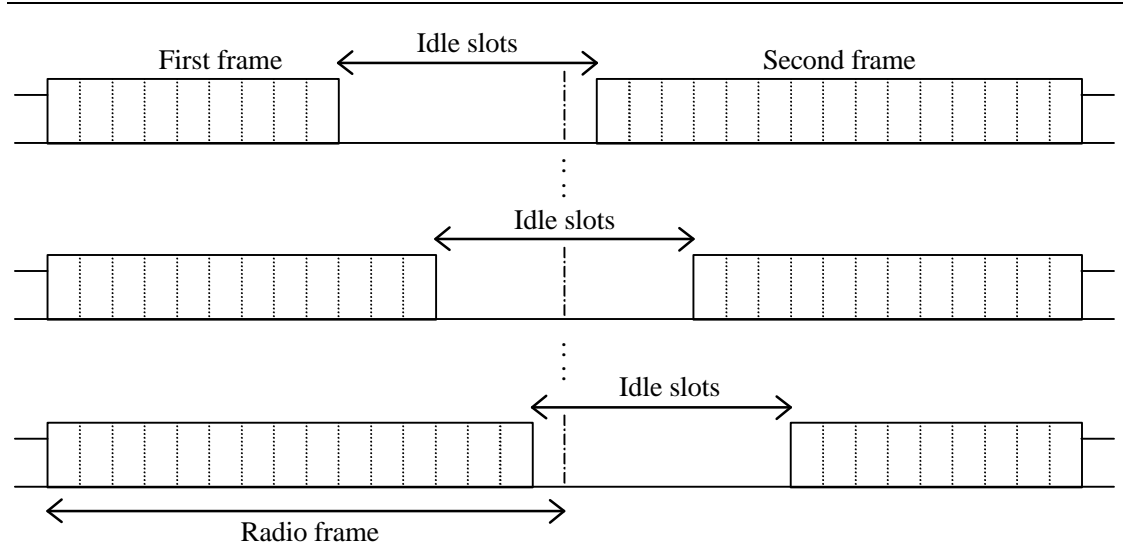
$$\text{If } N_{first} + N_{idle-TGL} \leq 1715, \text{ then } N_{last} = N_{first} + N_{idle-TGL} - 1 \text{ (in the same frame),}$$

$$\text{If } N_{first} + N_{idle-TGL} > 1715, \text{ then } N_{last} = (N_{first} + N_{idle-TGL} - 1) \bmod 1547 \text{ (in the next frame).}$$

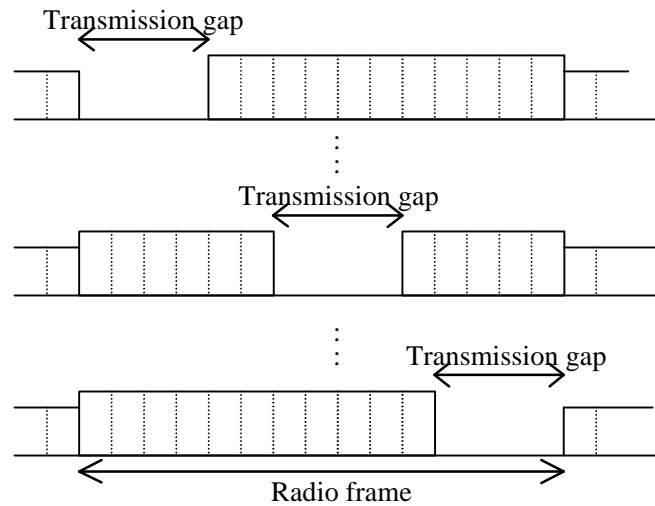
When the transmission gap spans two consecutive radio frames, N_{first} and TGL must be chosen so that at least 8 slots in each radio frame are transmitted



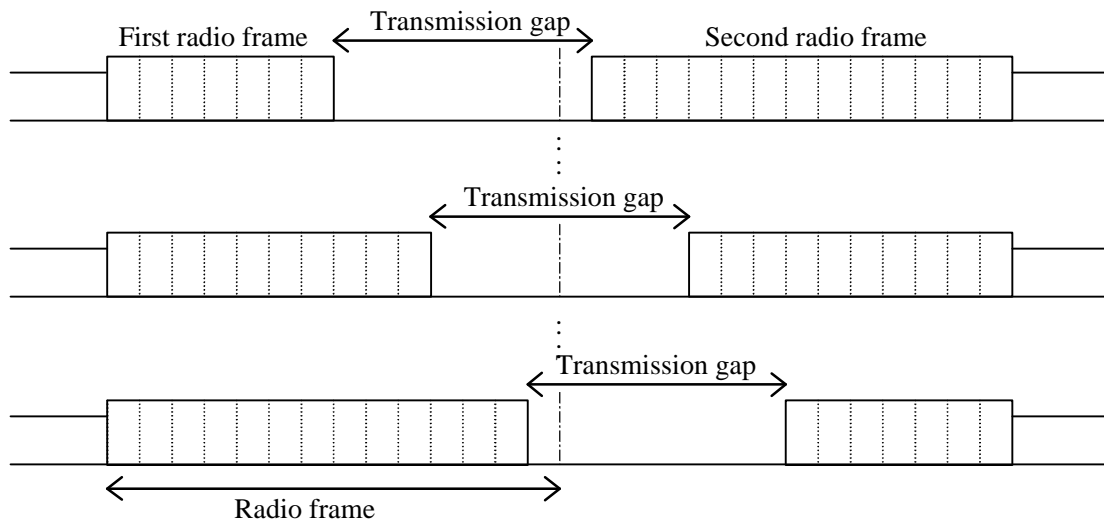
(1) Single-frame method



(2) Double-frame method



(1) Single-frame method



(2) Double-frame method

Figure 20: Concept of Adjustable transmission gap lengths position

<Editors note: Adjustment needed>

4.4.3.3 Parameters for compressed mode

< Editor's note: WG1 suggestion is that there is need for further clarifications in Table 14 (e.g. rationales between change of coding rate/puncturing/change of spreading factor and idle time size, spreading factor range for different modes, etc.).>

Table 14 shows the detailed parameters for each number of idle slots when transmission time reduction methods A or B are used. This is an example for the 10ms interleaving depth. Application of compressed mode for interleaving depths other than 10ms are for further study. Each number of idle slots are classified for three cases:

Case 1 – Power measurement : Number of idle slots = 3, 4, 5, 6.

Case 2 – Acquisition of control channels : Number of idle slots = 3, 4, 5, 6, 8, 10.

Case 3 – Actual handover operation : Number of idle slots = 10, 16.

Table 14: Parameters for compressed mode

| Number of idle slots | Mode | Spreading Factor | Idle length [ms] | Transmission time reduction method | Idle frame combining |
|----------------------|------|------------------|------------------|---|----------------------|
| 3 | A | 512 - 256 | 1.63 - 1.63 | Puncturing Spreading factor reduction by 2 | (S)/(D) |
| | B | 128 - 4 | 1.63 - 1.75 | | |
| 4 | A | 512 - 256 | 2.25 - 2.25 | Puncturing (D) Spreading factor reduction by 2 (D)/(S) | |
| | B | 128 - 4 | 2.25 - 2.37 | | |
| 5 | A | 512 - 256 | 2.87 - 2.87 | | |
| | B | 128 - 4 | 2.87 - 2.99 | | |
| 6 | A | 512 - 256 | 3.50 - 3.50 | Puncturing (D)/(S) Spreading factor reduction by 2 (S)/(D) | |
| | B | 128 - 4 | 3.50 - 3.62 | | |
| 7 | A | 512 - 256 | 4.75 - 4.75 | Spreading factor reduction by 2 (S) | |
| | B | 128 - 4 | 4.75 - 4.87 | | |
| 10 | A | 512 - 256 | 6.00 - 6.00 | Puncturing Spreading factor reduction by 2 | (D) |
| | B | 128 - 4 | 6.00 - 6.12 | | |
| 14 | A | 512 - 256 | 9.75 - 9.75 | Puncturing Spreading factor reduction by 2 | |
| | B | 128 - 4 | 9.75 - 9.87 | | |

| TGL | Type | Adjustable /fixed gap position | Spreading Factor | Idle length[ms] | Transmission time Reduction method | Idle frame Combining |
|-----|------|--------------------------------|------------------|-----------------|--|--|
| 3 | A | Adjustable | 512 - 4 | 1.73-1.99 | Puncturing Spreading factor reduction by 2 | (S) (D) = (1,2),(2,1) |
| | B | | 256- 4 | 1.60-1.86 | | |
| 4 | A | Fixed | 512 - 4 | 2.40-2.66 | | (S) (D) = (1,3),(2,2),(3,1) |
| | B | | 256- 4 | 2.27-2.53 | | |
| 5 | A | | 512 - 4 | 3.07-3.33 | | (S) (D) = (1,4),(2,3),(3,2),(4,1) |
| | B | | 256- 4 | 2.93-3.19 | | |
| 6 | A | | 512 - 4 | 3.73-3.99 | | (S) (D) = (1,5),(2,4),(3,3),(4,2),(5,1) |
| | B | | 256- 4 | 3.60-3.86 | | |
| 7 | A | | 512 - 4 | 4.40-4.66 | | (S) (D) = (1,6),(2,5),(3,4),(4,3),(5,2),(6,1) |
| | B | | 256- 4 | 4.27-4.53 | | |
| 10 | A | | 512 - 4 | 6.40-6.66 | (D) = (3,7),(4,6),(5,5),(6,4),(7,3) | |
| | B | | 256- 4 | 6.27-6.53 | | |
| 14 | A | Fixed | 512 - 4 | 9.07-9.33 | (D) = (7,7) | |
| | B | | 256- 4 | 8.93-9.19 | | |

(S): Single-frame method as shown in Figure 19 (1).

(D): Double-frame method as shown in Figure 19 (2). (x,y) indicates x: the number of idle slots in the first frame, y: the number of idle slots in the second frame.

SF="2/1": "2" is for (S) and "1" is for (D).

Note: Details for the use of the spreading factor reduction method with SF=4 are FFS

References

[1] 3GPP TSG RAN 25.212 V2.2.0, Source: Editor