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CR-Form-v3

CHANGE REQUEST

3G TS 25.215	CR	80	rev	1	Current version:	3.4.0

*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 ☒ Radio Access Network ☒ Core Network ☐

Title: ✍	Clarifications to compressed mode usage	
Source: ✍	Motorola	
Work item code: ✍		***Date:*** ✍ 22/11/2000
Category: ✍	F	***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: ✍	Section 6.1.1.1 uses a number of undefined terms that relate to different UE implementations (for example 'dual receiver', 'monitoring receiver', etc). The propose of this CR is to clarify the text in this section
Summary of change: ✍	A paragraph is inserted to state that the need to use compressed mode in order monitor inter-frequency and inter-system cells is indicated by UE capabilities. It also states that a UE shall support compressed mode for those cases that are indicated in UE capabilities. For other the UE shall have an alternative means of making the measurements. Other paragraphs that include references to UE implementations and undefined terms such as 'dual receiver', 'monitoring receiver', etc are deleted. The paragraph referring to measurement purposes is changed to be consistent with the subsequent section.
Consequences if not approved: ✍	The specification will contain inappropriate and potentially ambiguous text.

Clauses affected: ✍	6.1.1.1		
Other specs affected: ✍	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	✍	
Other comments: ✍			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ✍ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

6 Measurements for UTRA FDD

6.1 UE measurements

6.1.1 Compressed mode

6.1.1.1 Use of compressed mode~~/dual receiver~~ for monitoring

On command from the UTRAN, ~~A~~a UE shall~~, on higher layers commands,~~ monitor cells on other FDD frequencies and on other modes and radio access technologies that are supported by the UE (~~FDD, e.g.~~i.e. TDD, GSM). To allow the UE to perform measurements, ~~higher layers~~UTRAN shall command that the UE enters in compressed mode, depending on the UE capabilities.

The UE capabilities define whether a UE requires compressed mode in order to monitor cells on other FDD frequencies and on other modes and radio access technologies. UE capabilities indicate~~s~~ the need for compressed mode separately for the uplink and downlink and for each mode, radio access technology and frequency band.

A UE shall support compressed mode for all cases for which the UE indicates that compressed mode is required.

A UE does not need to support compressed mode for cases for which the UE indicates that compressed mode is not required. For these cases, the UE shall support an alternative means of making the measurements.

~~In case of compressed mode decision, UTRAN shall communicate to the UE the parameters of the compressed mode.~~

~~A UE with a single receiver shall support downlink compressed mode.~~

~~Every UE shall support uplink compressed mode, when monitoring frequencies which are close to the uplink transmission frequency (i.e. frequencies in the TDD or GSM 1800/1900 bands).~~

~~All fixed duplex UE shall support both downlink and uplink compressed mode to allow inter-frequency handover within FDD and inter-mode handover from FDD to TDD.~~

~~Monitoring frequencies outside TDD and GSM 1800/1900 bands without uplink compressed mode is a UE capability.~~

~~UE with dual receivers can perform independent measurements, with the use of a "monitoring branch" receiver, that can operate independently from the UTRA FDD receiver branch. Such UE do not need to support downlink compressed mode.~~

The UE shall support one single measurement purpose ~~within~~ for one ~~compressed mode~~ transmission gap pattern sequence. The measurement purpose of the transmission gap pattern sequence is signalled by higher layers.

The following subclause provides rules to parametrise the compressed mode.

6.1.1.2 Parameterisation of the compressed mode

In response to a request from higher layers, the UTRAN shall signal to the UE the compressed mode parameters.

A transmission gap pattern sequence consists of alternating transmission gap patterns 1 and 2, each of these patterns in turn consists of one or two transmission gaps. See figure 1.

The following parameters characterize a transmission gap pattern:

- TGSN (Transmission Gap Starting Slot Number): A transmission gap pattern begins in a radio frame, henceforward called first radio frame of the transmission gap pattern, containing at least one transmission gap slot. TGSN is the slot number of the first transmission gap slot within the first radio frame of the transmission gap pattern;

- TGL1 (Transmission Gap Length 1): This is the duration of the first transmission gap within the transmission gap pattern, expressed in number of slots;
- TGL2 (Transmission Gap Length 2): This is the duration of the second transmission gap within the transmission gap pattern, expressed in number of slots. If this parameter is not explicitly set by higher layers, then TGL2 = TGL1;
- TGD (Transmission Gap start Distance): This is the duration between the starting slots of two consecutive transmission gaps within a transmission gap pattern, expressed in number of slots. The resulting position of the second transmission gap within its radio frame(s) shall comply with the limitations of [2]. If this parameter is not set by higher layers, then there is only one transmission gap in the transmission gap pattern;
- TGPL1 (Transmission Gap Pattern Length): This is the duration of transmission gap pattern 1, expressed in number of frames;
- TGPL2 (Transmission Gap Pattern Length): This is the duration of transmission gap pattern 2, expressed in number of frames. If this parameter is not explicitly set by higher layers, then TGPL2 = TGPL1.

The following parameters control the transmission gap pattern sequence start and repetition:

- TGPRC (Transmission Gap Pattern Repetition Count): This is the number of transmission gap patterns within the transmission gap pattern sequence;
- TGCFN (Transmission Gap Connection Frame Number): This is the CFN of the first radio frame of the first pattern 1 within the transmission gap pattern sequence.

In addition to the parameters defining the positions of transmission gaps, each transmission gap pattern sequence is characterized by:

- UL/DL compressed mode selection: This parameter specifies whether compressed mode is used in UL only, DL only or both UL and DL;
- UL compressed mode method: The methods for generating the uplink compressed mode gap are spreading factor division by two or higher layer scheduling and are described in [2];
- DL compressed mode method: The methods for generating the downlink compressed mode gap are puncturing, spreading factor division by two or higher layer scheduling and are described in [2];
- downlink frame type: This parameter defines if frame structure type 'A' or 'B' shall be used in downlink compressed mode. The frame structures are defined in [2];
- scrambling code change: This parameter indicates whether the alternative scrambling code is used for compressed mode method 'SF/2'. Alternative scrambling codes are described in [3];
- RPP: Recovery Period Power control mode specifies the uplink power control algorithm applied during recovery period after each transmission gap in compressed mode. RPP can take 2 values (0 or 1). The different power control modes are described in [4];
- ITP: Initial Transmit Power mode selects the uplink power control method to calculate the initial transmit power after the gap. ITP can take two values (0 or 1) and is described in [4].

The UE shall support simultaneous compressed mode pattern sequences which can be used for different measurements. The maximum number of simultaneous compressed mode pattern sequences depends on the supported modes and systems and is defined in the table below.

Supported modes/systems	Maximum number of parallel CM pattern sequences supported by the UE
FDD	2
FDD+TDD	3
FDD+GSM	5
FDD+TDD+GSM	6

Higher layers will ensure that the compressed mode gaps do not overlap and are not scheduled to overlap the same frame. The behaviour when an overlap occurs is described in TS 25.302.

In all cases, higher layers have control of individual UE parameters. Any pattern sequence can be stopped on higher layers' command.

The parameters TGSN, TGL1, TGL2, TGD, TGPL1, TGPL2, TGPRC and TGCFN shall all be integers.

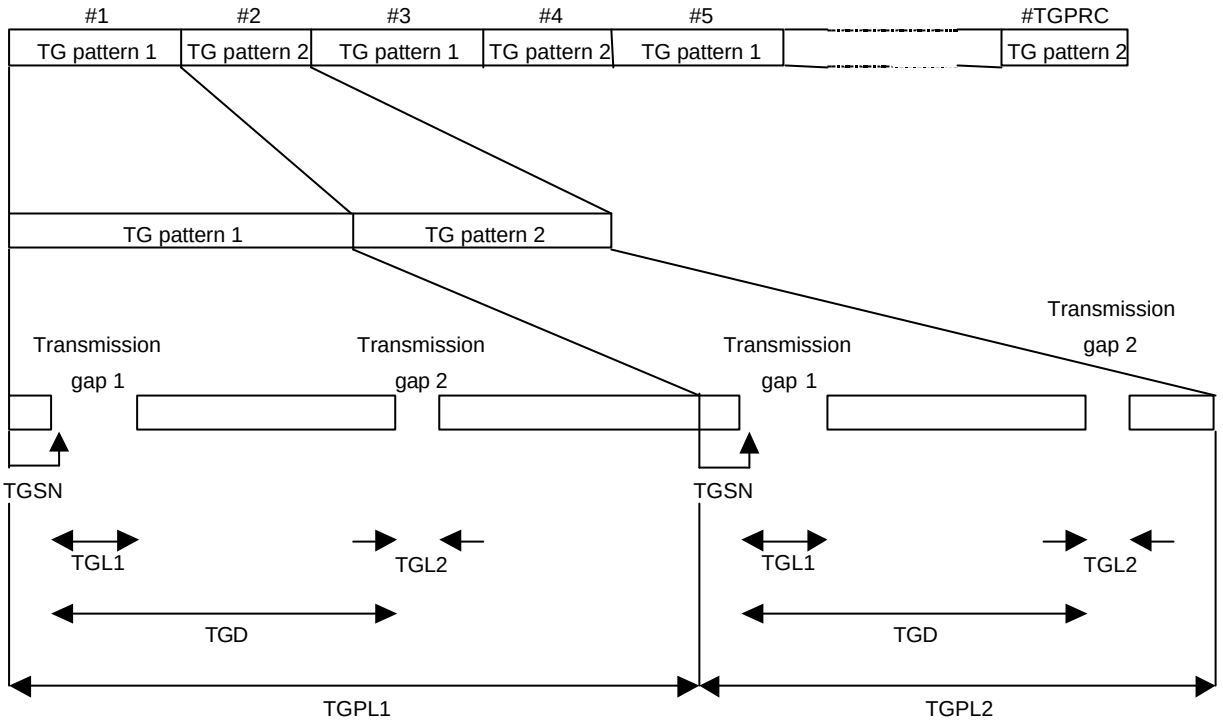

Figure 1: Illustration of compressed mode pattern parameters

6.1.1.3 Parameterisation limitations

In the table below the supported values for the TGL1 and TGL2 parameters are shown.

Measurements performed on	Supported TGL1 values, when TGL2 is not set	Supported TGL1 and TGL2 values when both are set (TGL1, TGL2)
FDD inter-frequency cell	7, 14	(10, 5)
TDD cell	4	-
GSM cell	3, 4, 7, 10, 14	-

Multi-mode terminals shall support all TGL1 and TGL2 values for the supported modes.

Depending on the starting slot and length of the gap, it can be placed within one single frame (single-frame method) or it can overlap two frames (double-frame method). The following table shows the combinations that are supported:

TGL	Idle frame combining
3	(S) (D) = (1,2) or (2,1)
4	(S) (D) = (1,3), (2,2) or (3,1)
5	(S) (D) = (1,4), (2,3), (3, 2) or (4,1)
7	(S) (D) = (1,6), (2,5), (3,4), (4,3), (5,2) or (6,1)
10	(D) = (3,7), (4,6), (5,5), (6,4) or (7,3)
14	(D) = (7,7)

The notation used within the table is:

(S): Single-frame method as specified in TS 25.212

(D): Double-frame method as specified in TS 25.212: (x,y) indicates x: the number of idle slots in the first frame, y: the number of idle slots in the second frame.

Further limitations on the transmission gap position within its frame(s) are given in TS 25.212.