3GPP TSG-RAN Meeting #15
Jeju, Korea, 5 – 8, March, 2002

RP-020057

Title: **Agreed CRs (Rel-5) for the WI of "UE positioning enhancements for 1.28 Mcps TDD"**

Source: **TSG-RAN WG1**

Agenda item: **9.5.2**

No.	Spec	CR	Rev	R1 T-doc	Subject	Release	Cat	Workitem	V_old	V_new
1	25.224	080	-	R1-02-0214	Introduction of “UE Positioning Enhancements for 1.28 Mcps TDD”	Rel-5	B	LCS-128Pos	4.3.0	5.0.0
2	25.225	043	-	R1-02-0214	Introduction of “UE Positioning Enhancements for 1.28 Mcps TDD”	Rel-5	B	LCS-128Pos	4.3.0	5.0.0

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R1-02-0214

CR-Form-v4

CHANGE REQUEST

⌘ **25.224** **CR** **080** ⌘ rev **-** ⌘ Current version: **4.3.0** ⌘

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

Title:	⌘	Introduction of "UE Positioning Enhancements for 1.28 Mcps TDD"
Source:	⌘	TSG RAN WG1
Work item code:	⌘	LCS-128Pos
Date:	⌘	03.01.2002
Category:	⌘	**B**
Release:	⌘	REL-5

Use one of the following categories:
F *(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:	⌘	Introduction / finalizing the WI to the specs
Summary of change:	⌘	Changes according to the Text in the TR 25.859 on UE-Pos. Enhancements for 1.28 Mcps TDD
Consequences if not approved:	⌘	

Clauses affected:	⌘	New section 5.7		
Other specs affected:	⌘	**X** Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	25.225
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://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 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.

5.7 Idle periods for IPDL location method

5.7.1 General

To support time difference measurements for location services, idle periods can be created in the downlink (hence the name IPDL) during which time transmission of the DwPCH from a Node B is temporarily ceased. During these idle periods the visibility of neighbour cells from the UE is improved.

The idle periods are arranged in a determined pattern according to higher layer parameters. An idle period has a duration of one DwPTS.

In general there are two modes for these idle periods:

- Continuous mode, and
- Burst mode

In continuous mode, the idle periods are active all the time. In burst mode the idle periods are arranged in bursts where each burst contains enough idle periods to allow a UE to make sufficient measurements for its location to be calculated. The bursts are separated by a period where no idle periods occur. The time difference measurements can be performed on any channel.

5.7.2 Parameters of IPDL

The following parameters are signalled to the UE via higher layers:

IP_Status: This is a logic value that indicates if the idle periods are arranged in continuous or burst mode.

IP_Spacing: The number of 10 ms radio frames between the start of a radio frame that contains an idle period and the next radio frame that contains the next idle period.

IP_Start: The number of the first frame with idle periods. In case of continuous mode IP_Start is the SFN of the first frame with idle periods and in case of burst mode IP_Start defines the number of frames after Burst_Start with the first frame with idle periods.

IP_Sub: Indicates whether the idle period is to occur in the odd, the even or both the odd and even 5 ms sub-frames of the 10 ms idle frame.

Additionally in the case of burst mode operation the following parameters are also communicated to the UE.

Burst_Start: Specifies the start of the first burst of idle periods. 256×Burst_Start is the SFN where the first burst of idle periods starts.

Burst_Length: The number of idle periods in a burst of idle periods.

Burst_Freq: Specifies the time between the start of a burst and the start of the next burst. 256×Burst_Freq is the number of radio frames between the start of a burst and the start of the next burst.

5.7.3 Calculation of idle period position

In burst mode, burst #0 starts in the radio frame with SFN = 256×Burst_Start. Burst #n starts in the radio frame with SFN = 256×Burst_Start + n×256×Burst_Freq (n = 0,1,2, …). The sequence of bursts according to this formula continues up to and including the radio frame with SFN = 4095. At the start of the radio frame with SFN = 0, the burst sequence is terminated (no idle periods are generated) and at SFN = 256×Burst_Start the burst sequence is restarted with burst #0 followed by burst #1 etc., as described above.

Continuous mode is equivalent to burst mode, with only one burst spanning the whole SFN cycle of 4096 radio frames, this burst starts in the radio frame with SFN = 0. In case of continuous mode the parameter IP_Start defines the first frame with idle periods.

The DwPCH, that has to be idle, is defined by two values: IP_Frame(x) and IP_Sub. IP_Frame(x) defines the x^{th} frame within a burst in which subframe with the number IP_Sub has to be switched off.

The actual frame with idle periods within a burst is calculated as follows:

$$IP\_Frame(x) = IP\_Start + (x\text{-}1) \times IP\_Spacing \text{ with } x = 1, 2, 3, ...$$

Figure 14 below illustrates the idle periods for the burst mode which shows the case that both subframes within each frame have DwPTS as an idle period.

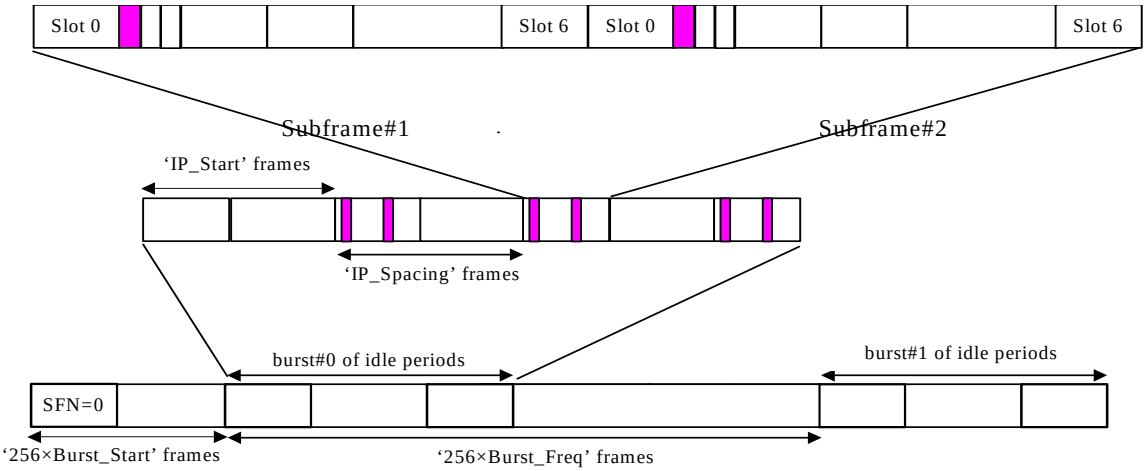

Figure 14: Idle periods of burst mode for 1.28Mcps TDD

3GPP TSG RAN Meeting #15
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5.2.13 Received SYNC-UL Timing Deviation for 1.28 Mcps TDD

Definition	'Received SYNC-UL Timing Deviation' is the time difference $UpPCH_{POS} = UpPTS_{Rxpath} – UpPTS_{TS}$ Where $UpPTS_{Rxpath}$: time of the reception in the Node B of the SYNC-UL to be used in the uplink synchronization process $UpPTS_{TS}$: time instance two symbols prior to the end of the DwPCH according to the Node B internal timing UE can calculate Round Trip Time (RTT) towards the UTRAN after the reception of the FPACH containing $UpPCH_{POS}$ transmitted from the UTRAN. Round Trip Time RTT is defined by $RTT = UpPCH_{AVD} + UpPCH_{POS} – 8*16\ T_C$ Where $UpPCH_{ADV}$: the amount of time by which the transmission of UpPCH is advanced in time relative to the end of the guard period according to the UE Rx timing.

5.2.14 Angle of Arrival (AOA) for 1.28 Mcps TDD

Definition	AOA defines the estimated angle of a user with respect to a reference direction. The reference direction for this measurement shall be the North, positive in a counter-clockwise direction. The AOA is determined at the BS antenna for an UL channel corresponding to this UE.