

Source: Lucent Technologies, Nokia
Title: CR 25.215-044R1: Correction to UE/UTRAN GPS timing of cell frames for LCS
Document for: Approval

1. Introduction

During RAN WG1#10, CR 25.215-030R1 was approved [1].

During RAN WG1#11, the joint session between RAN WG1 and WG4 discussed the chip resolution for UE/UTRAN-GPS intersystem measurements [2].

Following discussion, CR 25.215 - 044Rev1 is presented here for approval.

2. References

- [1] Tdoc R1-00-0110: "CR 25.215-030R1"; RAN WG1 #10; 18 Jan – 21 Jan 2000.
- [2] Tdoc R1-00-0324: "CR 25.215-044"; RAN WG1 #11; 29 Feb – 3 Mar 2000.

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|---|--|--|---------------------------------|
| CHANGE REQUEST | | Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly. | |
| 25.215 | CR | 044R1 | Current Version: V 3.1.1 |
| GSM (AA.BB) or 3G (AA.BBB) specification number ↑ | | ↑ CR number as allocated by MCC support team | |
| For submission to: RAN #7 | for approval <input checked="" type="checkbox"/> | strategic <input type="checkbox"/> | (for SMG use only) |
| <i>list expected approval meeting # here ↑</i> | for information <input type="checkbox"/> | non-strategic <input type="checkbox"/> | |

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: <ftp://ftp.3gpp.org/Information/CR-Form-v2.doc>

Proposed change affects: (U)SIM ME UTRAN / Radio Core Network
(at least one should be marked with an X)

Source: Lucent Technologies **Date:** 29 Feb 2000

Subject: Correction to sections: 5.1.15 UE GPS Timing of Cell Frames for LCS; 5.2.8 UTRAN GPS Timing of Cell Frames for LCS

Work item: TS 25.215

| | | | |
|---|--|-----------------|--|
| Category: | F Correction <input checked="" type="checkbox"/> | Release: | Phase 2 <input type="checkbox"/> |
| (only one category shall be marked with an X) | A Corresponds to a correction in an earlier release <input type="checkbox"/> | | Release 96 <input type="checkbox"/> |
| | B Addition of feature <input type="checkbox"/> | | Release 97 <input type="checkbox"/> |
| | C Functional modification of feature <input type="checkbox"/> | | Release 98 <input type="checkbox"/> |
| | D Editorial modification <input type="checkbox"/> | | Release 99 <input checked="" type="checkbox"/> |
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Reason for change: Correction of UE/UTRAN measurement parameters to support assisted GPS LCS method to required accuracy. The requirement to measure these parameters has been defined by RAN WG2 in LS R299J47.

Clauses affected: 5.1.15; 5.2.8

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|------------------------------|--|----------------|--|
| Other specs affected: | Other 3G core specifications <input type="checkbox"/> | → List of CRs: | |
| | Other GSM core specifications <input type="checkbox"/> | → List of CRs: | |
| | MS test specifications <input type="checkbox"/> | → List of CRs: | |
| | BSS test specifications <input type="checkbox"/> | → List of CRs: | |
| | O&M specifications <input type="checkbox"/> | → List of CRs: | |

Other comments:

<----- double-click here for help and instructions on how to create a CR.

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| Definition | <p>Type 1: The SFN-SFN observed time difference to cell is defined as: $OFF \times 38400 + T_m$, where: $T_m = T_{RxSFNi} - T_{RxSFNj}$, given in chip units with the range [0, 1, ..., 38399] chips T_{RxSFNj} is the time at the beginning of a received neighbouring P-CCPCH frame from cell j. T_{RxSFNi} is time at the beginning of the next received neighbouring P-CCPCH frame from cell i after the time instant T_{RxSFNj} in the UE. If the next neighbouring P-CCPCH frame is received exactly at T_{RxSFNj} then $T_{RxSFNj} = T_{RxSFNi}$ (which leads to $T_m = 0$). and $OFF = (SFN_j - SFN_i) \bmod 256$, given in number of frames with the range [0, 1, ..., 255] frames SFN_j = the system frame number for downlink P-CCPCH frame from cell j in the UE at the time T_{RxSFNj}. SFN_i = the system frame number for the P-CCPCH frame from cell i received in the UE at the time T_{RxSFNi}.</p> <p>Type 2: The relative timing difference between cell j and cell i, defined as $T_{CPICHRxj} - T_{CPICHRxi}$, where: $T_{CPICHRxj}$ is the time when the UE receives one Primary CPICH slot from cell j $T_{CPICHRxi}$ is the time when the UE receives the Primary CPICH slot from cell i that is closest in time to the Primary CPICH slot received from cell j</p> |
| Applicable for | <p>Type 1: Idle, Connected Intra Type 2: Idle, Connected Intra, Connected Inter</p> |
| Range/mapping | <p>Type 1: Time difference is given with a resolution of one chip with the range [0, ..., 9830399] chips. Type 2: Time difference is given with a resolution of 0.25 chip with the range [-1279.75, ..., 1280] chips.</p> |

5.1.13 UE Rx-Tx time difference

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| Definition | <p>The difference in time between the UE uplink DPCCCH/DPDCH frame transmission and the first significant path, of the downlink DPCH frame from the measured radio link. Measurement shall be made for each cell included in the active set. Note: The definition of "first significant path" needs further elaboration.</p> |
| Applicable for | Connected Intra |
| Range/mapping | The UE Rx-Tx time difference is given with the resolution of 0.25 chip with the range [876, ..., 1172] chips. |

5.1.14 Observed time difference to GSM cell

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| Definition | <p>The Observed time difference to GSM cell is defined as: $T_{RxGSMj} - T_{RxSFNi}$, where: T_{RxSFNi} is the time at the beginning of the P-CCPCH frame with SFN=0 from cell i. T_{RxGSMj} is the time at the beginning of the GSM BCCH 51-multiframe from GSM frequency j received closest in time after the time T_{RxSFNi}. If the next GSM multiframe is received exactly at T_{RxSFNi} then $T_{RxGSMj} = T_{RxSFNi}$ (which leads to $T_{RxGSMj} - T_{RxSFNi} = 0$). The timing measurement shall reflect the timing situation when the most recent (in time) P-CCPCH with SFN=0 was received in the UE.</p> |
| Applicable for | Idle, Connected Inter |
| Range/mapping | The Observed time difference to GSM cell is given with the resolution of $3060/(4096 \times 13)$ ms with the range [0, ..., $3060/13 - 3060/(4096 \times 13)$] ms. |

5.1.15 UE GPS Timing of Cell Frames for LCS

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| Definition | <p>The timing between cell j and GPS Time Of Week. $T_{UE-GPSj}$ is defined as the time of occurrence of a specified UTRAN event according to GPS time. The specified UTRAN event is the beginning of a particular frame (identified through its SFN) in the first significant multipath of the cell j CPICH, where cell j is a cell within the active set.</p> |
| Applicable for | Connected Intra, Connected Inter |
| Range/mapping | The resolution of $T_{UE-GPSj}$ is $4 \mu\text{s} \pm 0.125$ chips. The range is from 0 to $6.04 \times 10^{11} \mu\text{s}$. |

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| Definition | <p>Type 1: Measured on the DPDCH: The physical channel BER is an estimation of the average bit error rate (BER) before channel decoding of the DPDCH data after RL combination in Node B.</p> <p>Type 2: Measured on the DPCCH: The Physical channel BER is an estimation of the average bit error rate (BER) on the DPCCH after RL combination in Node B.</p> <p>It shall be possible to report a physical channel BER estimate of type 1 or of type 2 or of both types at the end of each TTI for the transferred TrCh's, e.g. for TrCh's with a TTI of x ms a x ms averaged physical channel BER shall be possible to report every x ms.</p> |
| Range/mapping | <p>The Physical channel BER shall be reported for $0 \leq \text{Physical channel BER} \leq 1$ in the unit BER_dB where:</p> <p>BER_dB_00: Physical channel BER = 0 BER_dB_01: $-\infty < \text{Log}_{10}(\text{Physical channel BER}) < -4.03$ BER_dB_02: $-4.03 \leq \text{Log}_{10}(\text{Physical channel BER}) < -3.965$ BER_dB_03: $-3.965 \leq \text{Log}_{10}(\text{Physical channel BER}) < -3.9$... BER_dB_61: $-0.195 \leq \text{Log}_{10}(\text{Physical channel BER}) < -0.13$ BER_dB_62: $-0.13 \leq \text{Log}_{10}(\text{Physical channel BER}) < -0.065$ BER_dB_63: $-0.065 \leq \text{Log}_{10}(\text{Physical channel BER}) \leq 0$</p> |

5.2.7 Round trip time

NOTE: The relation between this measurement and the TOA measurement defined by WG2 needs clarification.

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| Definition | <p>Round trip time (RTT), is defined as $RTT = T_{RX} - T_{TX}$, where T_{TX} = The time of transmission of the beginning of a downlink DPCH frame to a UE. T_{RX} = The time of reception of the beginning (the first significant path) of the corresponding uplink DPCCH/DPDCH frame from the UE. Note: The definition of "first significant path" needs further elaboration. Measurement shall be possible on DPCH for each RL transmitted from an UTRAN access point and DPDCH/DPCCH for each RL received in the same UTRAN access point.</p> |
| Range/mapping | <p>The Round trip time is given with the resolution of 0.25 chip with the range [876, ..., 2923.75] chips.</p> |

5.2.8 UTRAN GPS Timing of Cell Frames for LCS

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| Definition | <p>The timing between cell j and GPS Time Of Week. $T_{\text{UTRAN-GPS}_j}$ is defined as the time of occurrence of a specified UTRAN event according to GPS time. The specified UTRAN event is the beginning of a particular frame (identified through its SFN) in the first significant multipath of the cell j CPICH, where cell j is a cell within the active set.</p> |
| Applicable for | <p>Connected Intra, Connected Inter</p> |
| Range/mapping | <p>The resolution of $T_{\text{UTRAN-GPS}_j}$ is $4\mu\text{s} \pm 0.125$ chips. The range is from 0 to 6.04×10^{11} μs.</p> |