TSG-RAN Working Group 1 meeting #9
Dresden, Germany
November 30 – December 3, 1999

**TSGR1#9(99)i69**

**Agenda item:** AH 16

**Source:** Ericsson

**Title:** CR 25.215-003: Definition of observed time difference to GSM cell

**Document for:** Decision

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The aim of this CR is to incorporate the measurement "Observed time difference to GSM cell" for the UE in the layer 1 specification 25.215.

This measurement shall be supported by multimode FDD/GSM and FDD/TDD/GSM terminals. The measurement of "Observed time difference to GSM cell" is defined by WG2 in TS 25.302 as: Time difference between the Primary CCPCH of the current cell and the timing of the GSM cell.

The measurement of "Observed time difference to GSM cell" is shown in figure 1, where:

$\mathbf{T_{GSM\text{-}SFN}} = T_{RxGSMj} - T_{RxSFNi}$

$\mathbf{T_{RxSFNi}}$ is the time at the beginning of the P-CCPCH frame with SFN=0 from cell i.

$\mathbf{T_{RxGSMj}}$ is the time at the beginning the GSM BCCH 51-multiframe from GSM frequency j received closest in time after the time $T_{RxSFNi}$.

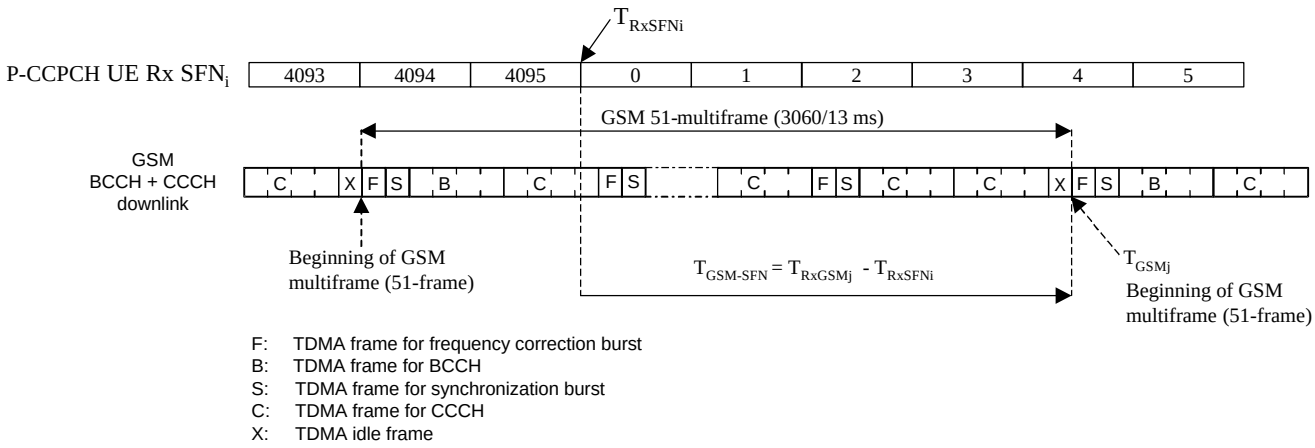


**Figure 1 Measuring the Observed time difference to GSM cell**

The UE can be requested to perform this measurement at any SFN and it is not necessary for the UE to wait until SFN=0 to perform the measurement. As the frame structures between UMTS and GSM is sliding in time it is however important to define if it is the previous or the next occurrence of SFN=0 that the measurement shall refer to if the UE measures the timing at any other SFN. It is proposed that the timing measurement shall reflect the timing situation when the most recent (in time) P-CCPCH with SFN=0 was received in the UE.

The information signalled to perform measurements on a GSM cell is specified by WG2 in TS 25.331. Regarding the handling of BSIC in combination with measurements on a GSM frequency, WG2 is currently proposing that UTRAN should be able to control whether or not the UE shall read the BSIC on a GSM frequency that it is requested to measure. More information can be found in the draft WG2 liaison R2-99f71 "Proposed liaison – Response to liaison

**3GPP TSG RAN WG1 Meeting #9**
**Dresden, Germany, Nov 30 – Dec 3, 1999**

***Document ????99???***
*e.g. for 3GPP use the format TP-99xxx*
*or for SMG, use the format P-99-xxx*

# 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 | 003 | Current Version: | 3.0.0 |
|---|---|---|---|---|

*GSM (AA.BB) or 3G (AA.BBB) specification number ↑* *↑ CR number as allocated by MCC support team*

| For submission to: | TSG-RAN #6 | for approval | X | strategic | | (for SMG use only) |
|---|---|---|---|---|---|---|
| *list expected approval meeting # here ↑* | | for information | | non-strategic | | |

*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:** *(at least one should be marked with an X)* | (U)SIM | | ME | X | UTRAN / Radio | X | Core Network | |
|---|---|---|---|---|---|---|---|---|

**Source:** Ericsson **Date:** 1999-11-10

**Subject:** Definition of observed time difference to GSM cell

**Work item:**

| **Category:** *(only one category shall be marked with an X)* | | | **Release:** | |
|---|---|---|---|---|
| F | Correction | | Phase 2 | |
| A | Corresponds to a correction in an earlier release | | Release 96 | |
| B | Addition of feature | X | Release 97 | |
| C | Functional modification of feature | | Release 98 | |
| D | Editorial modification | | Release 99 | X |
| | | | Release 00 | |

**Reason for change:** The aim of this CR is to incorporate the measurement "Observed time difference to GSM cell" for the UE in the layer 1 specification 25.215. This measurement shall be supported by multimode FDD/GSM and FDD/TDD/GSM terminals. The requirement to measure "Observed time difference to GSM cell" by layer 1 is defined by WG2 in TS 25.302 .

**Clauses affected:** 5.1 UE measurement abilities

| **Other specs affected:** | | | |
|---|---|---|---|
| Other 3G core specifications | | → List of CRs: | |
| Other GSM core specifications | | → List of CRs: | |
| MS test specifications | | → List of CRs: | |
| BSS test specifications | | → List of CRs: | |
| O&M specifications | | → List of CRs: | |

**Other comments:**

help.doc

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

## 5.1.11 CFN-SFN observed time difference

| | |
|---|---|
| Definition | The CFN-SFN observed time difference to cell is defined as: OFF×38400+ $T_m$, where:<br>$T_m$= $T_{RxSFN}$ - ($T_{UETx}$-$T_0$), given in chip units with the range [0, 1, …, 38399] chips<br>$T_{UETx}$ is the time when the UE transmits an uplink DPCCH/DPDCH frame.<br>$T_0$ is defined in TS 25.211 section 7.1.3.<br>$T_{RxSFN}$ is time at the beginning of the next received neighbouring P-CCPCH frame after the time instant $T_{UETx}$-$T_0$in the UE. If the next neighbouring P-CCPCH frame is received exactly at $T_{UETx}$-$T_0$ then $T_{RxSFN}$=$T_{UETx}$-$T_0$ (which leads to $T_m$=0).<br>and<br>OFF=($CFN_{Tx}$-SFN) mod 256, given in number of frames with the range [0, 1, …, 255] frames<br>$CFN_{Tx}$ is the connection frame number for the UE transmission of an uplink DPCCH/DPDCH frame at the time $T_{UETx}$.<br>SFN = the system frame number for the neighbouring P-CCPCH frame received in the UE at the time $T_{RxSFN}$. |
| **Applicable for** | Connected Inter, Connected Intra |
| **Range/mapping** | Time difference is given with the resolution of one chip with the range [0, …, 9830399] chips. |

## 5.1.12 SFN-SFN observed time difference

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|---|---|
| Definition | **Type 1:**<br>The SFN-SFN observed time difference to cell is defined as: OFF×38400+ $T_m$, where:<br>$T_m$= $T_{RxSFNj}$ - $T_{RxSFNi}$, given in chip units with the range [0, 1, …, 38399] chips<br>$T_{RxSFNj}$ is the time at the beginning of a received neighbouring P-CCPCH frame from cell j.<br>$T_{RxSFNi}$ 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).<br>and<br>OFF=($SFN_j$- $SFN_i$) mod 256, given in number of frames with the range [0, 1, …, 255] frames<br>$SFN_j$ = the system frame number for downlink P-CCPCH frame from cell j in the UE at the time $T_{RxSFNj}$.<br>$SFN_i$ = the system frame number for the P-CCPCH frame from cell i received in the UE at the time $T_{RxSFNi}$.<br>**Type 2:**<br>The relative timing difference between cell j and cell i, defined as $T_{CPICHRxj}$ - $T_{CPICHRxi}$, where:<br>$T_{CPICHRxj}$ is the time when the UE receives one CPICH slot from cell j<br>$T_{CPICHRxi}$ is the time when the UE receives the CPICH slot from cell i that is closest in time to the CPICH slot received from cell j |
| **Applicable for** | **Type 1:** Idle, Connected Intra<br>**Type 2:** Idle, Connected Intra, Connected Inter |
| **Range/mapping** | **Type 1:** Time difference is given with a resolution of one chip with the range [0, …, 9830399] chips.<br>**Type 2:** Time difference is given with a resolution of 0.5 chip with the range [-1279, …, 1280] chips. |

## 5.1.13 UE Rx-Tx time difference

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|---|---|
| Definition | The difference in time between the UE uplink DPCCH/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.<br>Note: The definition of "first significant path" needs further elaboration. |
| **Applicable for** | Connected Intra |
| **Range/mapping** | Always positive. |

## 5.1.15 Observed time difference to GSM cell

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|---|---|
| Definition | The Observed time difference to GSM cell is defined as: $T_{RxGSMj}$ - $T_{RxSFNi}$, where:<br>$T_{RxSFNi}$ is the time at the beginning of the P-CCPCH frame with SFN=0 from cell i.<br>$T_{RxGSMj}$ 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. |
| **Applicable for** | Idle, Connected Inter |
| **Range/mapping** | |