TSG RAN Meeting #20   **RP-030341**
Hämeenlinna, Finland, 3 - 6 June, 2003

Title   **CRs (Rel-6 only) to TS 25.453 for WI 'Open interface between SMLC and the SRNC within the UTRAN to support Rel-4 positioning methods'**
Source   **TSG RAN WG3**
Agenda Item   **8.4.2**

RAN3 Tdoc	Spec	curr. Vers.	new Vers.	REL	CR	Rev	Cat	Title	Work item
R3-030639	25.453	6.0.0	6.1.0	REL-6	028	-	C	Improvement of position calculation with pathloss	LCS-Rel4Pos
R3-030653	25.453	6.0.0	6.1.0	REL-6	035	-	C	Position Calculation Extension for TDD	LCS-Rel4Pos

Note: R3-030639 was considered as 'technically correct' in RAN3, since Nortel thought RAN2 needs to be involved for this CR.

CR-Form-v7

CHANGE REQUEST

| ⌘ | **25.453 CR 028** | ⌘**rev** | **-** | ⌘ | Current version: | **6.0.0** | ⌘ |

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [ ] ME [ ] Radio Access Network [X] Core Network [ ]

Title: ⌘	Improvement of position calculation with pathloss	
Source: ⌘	RAN WG3	
Work item code:⌘	LCS-Rel4Pos	**Date:** ⌘ 19/05/03
Category: ⌘ **C**		**Release:** ⌘ Rel-6

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)
Rel-6 (Release 6)

Reason for change: ⌘	Improvement of position calculation in case of cell-id based methods by taking the downlink pathloss into accont if available
Summary of change:⌘	Inclusion of downlink pathloss in Cell-ID Measured Results Info List IE
Consequences if not approved: ⌘	Less accurate position calculation
Clauses affected: ⌘	9.2.2.31, 9.3.4

		Y	N		
Other specs	⌘		X	Other core specifications	⌘
affected:			X	Test specifications	
			X	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/specs/CR.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.

9.2.2.31 Cell-ID Measured Results Info List

This IE contains the Cell-ID measurements of signals associated with one or more cells.

Table 69

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Cell-ID Measured Results Info		1..< maxNoOfMeasNCell >		
>UC-ID	M		9.2.2.37	The identifier of the measured cell.
>UTRAN Access Point Position with Altitude	M		9.2.2.36	Exact geographical position of the base station antenna.
>Geographical Area	O		9.2.2.6	
>**Round Trip Time Info**		0..1		
>>UE Rx-Tx Time Difference Type 2	M		INTEGER (0..8191)	According to mapping in [13].
>>UE Positioning Measurement Quality	M		9.2.2.35	Quality of the UE Rx-Tx time difference measurement.
>>Round Trip Time	M		INTEGER (0..32767)	According to mapping in [13].
>Pathloss	O		INTEGER (46..158)	Unit: dB as defined in [4] subclause 10.3.7.3

/* partly omitted */

9.3.4 Information Element Definitions

/* partly omitted */

```
-- **************************************************************
--
-- Cell Id Measured Results Sets
--
-- **************************************************************

CellId-MeasuredResultsSets ::=        SEQUENCE (SIZE (1..maxNrOfSets)) OF
    CellId-MeasuredResultsInfoList

CellId-MeasuredResultsInfoList ::=    SEQUENCE (SIZE (1..maxNrOfMeasNCell)) OF
    CellId-MeasuredResultsInfo

CellId-MeasuredResultsInfo ::=        SEQUENCE {
    uC-ID                             UC-ID,
    uTRANAccessPointPositionAltitude  UTRANAccessPointPositionAltitude,
    ue-PositionEstimate               UE-PositionEstimate            OPTIONAL,
    roundTripTimeInfo                 RoundTripTimeInfo              OPTIONAL,
    pathloss                          Pathloss                      OPTIONAL,
    iE-Extensions                     ProtocolExtensionContainer { { CellId-MeasuredResultsInfo-
ExtIEs } }        OPTIONAL,
    ...
}

CellId-MeasuredResultsInfo-ExtIEs PCAP-PROTOCOL-EXTENSION ::= {
    ...
}

Pathloss ::=                          INTEGER (46..158)
-- Unit: dB; as defined in [4] subclause 10.3.7.3

RoundTripTimeInfo ::=                 SEQUENCE {
    ue-RxTxTimeDifferenceType2        UE-RxTxTimeDifferenceType2,
    ue-PositioningMeasQuality         UE-PositioningMeasQuality,
    roundTripTime                     RoundTripTime,
    iE-Extensions                     ProtocolExtensionContainer { { RoundTripTimeInfo-ExtIEs } }
        OPTIONAL,
    ...
}

RoundTripTimeInfo-ExtIEs PCAP-PROTOCOL-EXTENSION ::= {
    ...
}

UE-RxTxTimeDifferenceType2 ::=        INTEGER (0..8191)

UE-PositioningMeasQuality ::=         SEQUENCE {
    stdResolution                     BIT STRING (SIZE (2)),
    numberOfMeasurements              BIT STRING (SIZE (3)),
    stdOfMeasurements                 BIT STRING (SIZE (5)),
    iE-Extensions                     ProtocolExtensionContainer { { UE-PositioningMeasQuality-
ExtIEs } }        OPTIONAL,
    ...
}

UE-PositioningMeasQuality-ExtIEs PCAP-PROTOCOL-EXTENSION ::= {
    ...
}

RoundTripTime ::=                     INTEGER (0..32767)
-- Actual value RoundTripTime = IE value * 0.0625 + 876

UTRANAccessPointPositionAltitude ::=  SEQUENCE {
    geographicalCoordinates           GeographicalCoordinates,
    ga-AltitudeAndDirection           GA-AltitudeAndDirection        OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { { UTRANAccessPointPositionAltitude-
ExtIEs } }        OPTIONAL,
    ...
}

UTRANAccessPointPositionAltitude-ExtIEs PCAP-PROTOCOL-EXTENSION ::= {
    ...
}
```

CR-Form-v7

CHANGE REQUEST

⌘   **25.453 CR**   **035**   ⌘**rev**   **-**   ⌘   Current version: **6.0.0**   ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐   ME ☐   Radio Access Network **X**   Core Network ☐

Title: ⌘	Position Calculation Extension for TDD	
Source: ⌘	RAN WG3	
Work item code:⌘	LCS-Rel4Pos	***Date:*** ⌘ 19/05/2003

Category: ⌘ **C**	***Release:*** ⌘ REL-6

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)*
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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)*
   Rel-6 *(Release 6)*

Reason for change: ⌘	The currently defined Round Trip Time in the Cell-ID Measured Results Info List IE is valid only for FDD. For TDD Rx Timing Deviation shall be used.
Summary of change:⌘	Inclusion of Rx Timing Deviation Info IE for 3.84Mcps TDD and Rx Timing Deviation Info LCR IE for 1.28Mcps TDD in the Cell-ID Measured Results Info List IE. Abbreviations for FDD and TDD are included.
Consequences if not approved: ⌘	If this CR is not approved the use of Cell-ID Measured Results for Position Calculation for TDD is not possible.

Clauses affected: ⌘	2, 3.2, 9.2.2.31, 9.3.4

	Y	**N**	
Other specs ⌘		**X**	Other core specifications ⌘
affected:		**X**	Test specifications
		X	O&M Specifications

Other comments: ⌘	[x1]=[14]

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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.

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2   References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document.*

[1]	3GPP TS 25.450: "UTRAN Iupc interface general aspects and principles".
[2]	3GPP TS 25.451: "UTRAN Iupc interface layer 1".
[3]	3GPP TS 25.452: "UTRAN Iupc interface signalling transport".
[4]	3GPP TS 25.331: "Radio Resource Control (RRC) Protocol Specification".
[5]	3GPP TS 25.401: "UTRAN Overall Description".
[6]	3GPP TS 25.305: "Stage 2 functional specification of UE positioning in UTRAN".
[7]	ITU-T Recommendation X.680 (1997): "Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".
[8]	ITU-T Recommendation X.681 (1997): "Information technology - Abstract Syntax Notation One (ASN.1): Information object specification".
[9]	ITU-T Recommendation X.691 (1997): "Information technology - ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)".
[10]	ICD-GPS-200: "Navstar GPS Space Segment/Navigation User Interface".
[11]	3GPP TS 23.032: "Universal Geographical Area Description (GAD)".
[12]	3GPP TR 25.921: "Guidelines and principles for protocol description and error handling".
[13]	3GPP TS 25.133: "Requirements for support of Radio Resource management (FDD)".
[x1]	3GPP TS 25.123: "Requirements for support of Radio Resource management (TDD)".

/* partly omitted */

3.2   Abbreviations

For the purposes of the present document, the following abbreviations apply:

A-GPS	Assisted GPS
ASN.1	Abstract Syntax Notation One
CN	Core Network
CRNC	Controlling RNC
DGPS	Differential GPS
EP	Elementary Procedure
FDD	Frequency Division Duplex
GPS	Global Positioning System
MSC	Mobile services Switching Center
OTDOA	Observed Time Difference Of Arrival

PCAP	Positioning Calculation Application Part
PRC	Pseudorange Correction
RNC	Radio Network Controller
RNS	Radio Network Subsystem
RRC	Radio Resource Control
SAS	Stand-Alone SMLC
SCCP	Signalling Connection Control Part
SIB	System Information Block
SMLC	Serving Mobile Location Center
SRNC	Serving RNC
SRNS	Serving RNS
TDD	Time Division Duplex
TOW	Time of Week
UE	User Equipment
UTRAN	Universal Terrestrial Radio Access Network

/* partly omitted */

9.2.2.31   Cell-ID Measured Results Info List

This IE contains the Cell-ID measurements of signals associated with one or more cells.

Table 69

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Cell-ID Measured Results Info		*1..< maxNoOfMeasNCell >*		
>UC-ID	M		9.2.2.37	The identifier of the measured cell.
>UTRAN Access Point Position with Altitude	M		9.2.2.36	Exact geographical position of the base station antenna.
>Geographical Area	O		9.2.2.6	
>**Round Trip Time Info**		*0..1*		FDD only
>>UE Rx-Tx Time Difference Type 2	M		INTEGER (0..8191)	According to mapping in [13].
>>UE Positioning Measurement Quality	M		9.2.2.35	Quality of the UE Rx-Tx time difference measurement.
>>Round Trip Time	M		INTEGER (0..32767)	According to mapping in [13].
>**Rx Timing Deviation Info**		*0..1*		3.84Mcps TDD only
>>Rx Timing Deviation	M		INTEGER (0..8191)	According to mapping in [x1].
>>Timing Advance	M		INTEGER (0..63)	According to [4].
>**Rx Timing Deviation LCR Info**		*0..1*		1.28Mcps TDD only
>>Rx Timing Deviation LCR	M		INTEGER (0..511)	According to mapping in [x1].
>>Timing Advance LCR	M		INTEGER (0..2047)	According to mapping in [x1].

Table 70

Range bound	Explanation
MaxNoOfMeasNCell	Maximum number of neighbour cells on which information can be reported. The value of MaxNoOfMeasNCell is 32.

/* partly omitted */

9.3.4   Information Element Definitions

/* partly omitted */

```
-- ***************************************************************
--
-- Cell Id Measured Results Sets
--
-- ***************************************************************

CellId-MeasuredResultsSets ::=          SEQUENCE (SIZE (1..maxNrOfSets)) OF
    CellId-MeasuredResultsInfoList

CellId-MeasuredResultsInfoList ::=      SEQUENCE (SIZE (1..maxNrOfMeasNCell)) OF
    CellId-MeasuredResultsInfo

CellId-MeasuredResultsInfo ::=          SEQUENCE {
    uC-ID                               UC-ID,
    uTRANAccessPointPositionAltitude    UTRANAccessPointPositionAltitude,
    ue-PositionEstimate                 UE-PositionEstimate          OPTIONAL,
    roundTripTimeInfo                   RoundTripTimeInfo            OPTIONAL, -- FDD only
    rxTimingDeviationInfo               RxTimingDeviationInfo        OPTIONAL, -- 3.84Mcps TDD only
    rxTimingDeviationLCRInfo            RxTimingDeviationLCRInfo     OPTIONAL, -- 1.28Mcps TDD only
    iE-Extensions                       ProtocolExtensionContainer { { CellId-MeasuredResultsInfo-
ExtIEs } }        OPTIONAL,
    ...
}

CellId-MeasuredResultsInfo-ExtIEs PCAP-PROTOCOL-EXTENSION ::= {
    ...
}

RoundTripTimeInfo ::=                   SEQUENCE {
    ue-RxTxTimeDifferenceType2          UE-RxTxTimeDifferenceType2,
    ue-PositioningMeasQuality           UE-PositioningMeasQuality,
    roundTripTime                       RoundTripTime,
    iE-Extensions                       ProtocolExtensionContainer { { RoundTripTimeInfo-ExtIEs } }
        OPTIONAL,
    ...
}

RoundTripTimeInfo-ExtIEs PCAP-PROTOCOL-EXTENSION ::= {
    ...
}

UE-RxTxTimeDifferenceType2 ::=          INTEGER (0..8191)

UE-PositioningMeasQuality ::=           SEQUENCE {
    stdResolution                       BIT STRING (SIZE (2)),
    numberOfMeasurements                BIT STRING (SIZE (3)),
    stdOfMeasurements                   BIT STRING (SIZE (5)),
    iE-Extensions                       ProtocolExtensionContainer { { UE-PositioningMeasQuality-
ExtIEs } }        OPTIONAL,
    ...
}

UE-PositioningMeasQuality-ExtIEs PCAP-PROTOCOL-EXTENSION ::= {
    ...
}

RoundTripTime ::=                       INTEGER (0..32767)
-- Actual value RoundTripTime = IE value * 0.0625 + 876

UTRANAccessPointPositionAltitude ::=    SEQUENCE {
    geographicalCoordinates             GeographicalCoordinates,
    ga-AltitudeAndDirection             GA-AltitudeAndDirection       OPTIONAL,
    iE-Extensions                       ProtocolExtensionContainer { { UTRANAccessPointPositionAltitude-
ExtIEs } }        OPTIONAL,
    ...
}

UTRANAccessPointPositionAltitude-ExtIEs PCAP-PROTOCOL-EXTENSION ::= {
    ...
}

RxTimingDeviationInfo ::=               SEQUENCE {
    rxTimingDeviation                   RxTimingDeviation,
```

```
    timingAdvance                          TimingAdvance,
    iE-Extensions                          ProtocolExtensionContainer { { RxTimingDeviationInfo-ExtIEs
} }    OPTIONAL,
    ...
}

RxTimingDeviationInfo-ExtIEs PCAP-PROTOCOL-EXTENSION ::= {
    ...
}

RxTimingDeviationLCRInfo ::=           SEQUENCE {
    rxTimingDeviationLCR               RxTimingDeviationLCR,
    timingAdvanceLCR                   TimingAdvanceLCR,
    iE-Extensions                      ProtocolExtensionContainer { { RxTimingDeviationLCRInfo-
ExtIEs } }       OPTIONAL,
    ...
}

RxTimingDeviationLCRInfo-ExtIEs PCAP-PROTOCOL-EXTENSION ::= {
    ...
}

RxTimingDeviation ::=                  INTEGER (0..8191)

RxTimingDeviationLCR ::=               INTEGER (0..511)

TimingAdvance ::=                      INTEGER (0..63)

TimingAdvanceLCR ::=                   INTEGER (0..2047)
```

/* partly omitted */