TSG-RAN Meeting #11 *RP-010041*
Palm Springs, CA, USA, 13 - 16 March 2001

Title: **Agreed CRs (Release 4) for WI "NodeB Synchronisation for TDD"**

Source: **TSG-RAN WG2**

Agenda item: **6.6.7**

Doc-1st-	Status-	Spec	CR	Rev	Phase	Subject	Cat	Version	Versio	Workitem
R2-010737	agreed	25.302	093	1	Rel-4	Measurements for Node B synchronisation	B	3.7.0	4.0.0	RANimp-NBsynch
R2-010495	agreed	25.331	692	1	Rel-4	Idle allocation for Node B synchronisation	B	3.5.0	4.0.0	RANimp-NBsynch

3GPP TSG-RAN WG2 Meeting #19
Sophia Antipolis, France, 19 - 23 February 2001

Tdoc R2-010737

CR-Form-v3

CHANGE REQUEST

⌘ **25.302** **CR** **093** ⌘ rev **r1** ⌘ Current version: **3.7.0** ⌘

*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 **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Measurements for Node B synchronisation
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	RANimp-NBsynch
Date:	⌘	21.01.01
Category:	⌘	**B**
Release:	⌘	REL-4

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:	⌘	The Node B synchronisation feature for TDD requires new UTRAN measurements to support the mechanism. These measurements are introduced. The measured physical channel is also introduced to implement the operation.
Summary of change:	⌘	Two new measurements are introduced for the UTRAN side. The physical channel between Node Bs is introduced.
Consequences if not approved:	⌘	These changes are essential for the Node B synchronisation mechanism.

Clauses affected:	⌘	9.3.18 (new), 9.3.19 (new), 10.3.5.18 (new)
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.

9.3 UTRAN Measurements

9.3.18 Cell Sync Burst Timing

Measurement	Cell Sync Burst Timing
Source	L1(Node B)
Destination	RRC (RNC)
Reporting Trigger	Periodic, event triggered
Definition	Cell sync burst timing is the time of start (defined by the first detected path in time) of the cell sync burst of a neighbouring cell. Type 1 is used for the initial phase of Node B synchronization. Type 2 is used for the steady-state phase of Node B synchronization.

9.3.19 Cell Sync Burst SIR

Measurement	Cell Sync Burst SIR
Source	L1(Node B)
Destination	RRC (RNC)
Reporting Trigger	Periodic, event triggered
Definition	Signal to Interference Ratio for the cell sync burst, defined as: RSCP/Interference, where:

10.3.5 Physical channel description

10.3.5.18 PNBSCH (Physical Node B Synchronisation channel)

- Node B - Node B over the air communication
- only for TDD cells
- Repetition period
- **C**oncatenated periodically **E**xtended **C**omplementary sequences

3GPP TSG-RAN WG2 Meeting #19
Sophia Antipolis, France, 19.02.01 - 23.02.01

Tdoc R2-010495

CR-Form-v3

CHANGE REQUEST

⌘ **25.331 CR 692** ⌘ rev **r1** ⌘ Current version: **3.5.0** ⌘

*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 **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Idle allocation for Node B synchronisation
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	RANimp-NBsynch
Date:	⌘	10.02.2001
Category:	⌘	**B**
Release:	⌘	REL-4

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: ⌘ The Node B synchronisation feature uses some of the PRACH resources. UEs should be aware that usage of these resources will fail.

Summary of change: ⌘ One new information element group (PNBSCH allocation) is introduced in the PRACH info to inform UEs about PRACH resources that are not available due to the synchronisation process.
This information element is comprised of:

- Number of repetitions per SFN period: WG3 defines two parameters: Number of cycle per SFN period (range: 1,2,4,8) and Number of repetitions per cycle (range: 1..10). The range for Number of repetitions per SFN period is chosen such that all possible allocations described by WG3s two parameters can be signalled with Number of repetitions per SFN period

The UE needs to have this parameter available to determine all resources that are used for Node B synchronisation purposes.

The used formula is included in the procedure description part for the new information elements.

The actual blocking of resources is described in 25.224 in the physical RACH procedure. A reference to this specification is added.

Consequences if not approved: ⌘ UE's random access performance is unnecessarily degraded.

Clauses affected: ⌘ 2, 8.6.6.2a (new), 10.3.6.52, 10.3.8.x (new), 11.3

Other specs affected: ⌘ **X** Other core specifications ⌘ 25.221, 25.224, 25.225, 25.302, 25.402, 25.433
☐ Test specifications

	☐ O&M Specifications	
Other comments:	⌘	

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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.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 25.301: "Radio Interface Protocol Architecture".

[3] 3GPP TS 25.303: "Interlayer Procedures in Connected Mode".

[4] 3GPP TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode".

[5] 3GPP TS 24.008: "Mobile radio interface layer 3 specification, Core Network Protocols - Stage 3".

[6] 3GPP TS 25.103: "RF Parameters in Support of RRM".

[7] 3GPP TS 25.215: "Physical layer – Measurements (FDD)".

[8] 3GPP TS 25.225: "Physical layer – Measurements (TDD)".

[9] 3GPP TS 25.401: "UTRAN overall description".

[10] 3GPP TS 25.402: "Synchronization in UTRAN, stage 2".

[11] 3GPP TS 23.003: "Numbering, addressing and identification".

[12] ICD-GPS-200: "Navstar GPS Space Segment/Navigation User Interface".

[13] RTCM-SC104: "RTCM Recommended Standards for Differential GNSS Service (v.2.2)".

[14] 3GPP TR 25.921: "Guidelines and Principles for protocol description and error handling".

[15] 3GPP TS 25.321: "MAC protocol specification".

[16] 3GPP TS 25.322: "RLC Protocol Specification".

[17] 3GPP TS 24.007: "Mobile radio interface signalling layer 3" General Aspects.

[18] 3GPP TS 25.305: "Stage 2 Functional Specification of Location Services in UTRAN".

[19] 3GPP TS 25.133: "Requirements for Support of Radio Resource Management (FDD)".

[20] 3GPP TS 25.123: "Requirements for Support of Radio Resource Management (TDD)".

[21] 3GPP TS 25.101: "UE Radio Transmission and Reception (FDD)".

[22] 3GPP TS 25.102: "UE Radio Transmission and Reception (TDD)".

[23] 3GPP TS 23.060: "General Packet Radio Service (GPRS), Service description, Stage 2".

[24] 3GPP TS 25.224: "Physical Layer Procedures (TDD)"

8.6.6.2a PNBSCH allocation

The UE shall consider the frame numbers fulfilling the following equation as "PRACH blocked frames" as specified in [24].

- SFN = ⌊k * Repetition period ⌋

  for an integer k with k {0, 1, 2, 3, 4, ... , value of IE "Number of repetitions per SFN period" - 1}, where:

Repetition period is: 4096 / value of IE "Number of repetitions per SFN period".

The UE shall configure the physical layer for the physical random access procedure accordingly.

10.3.6.52 PRACH info (for RACH)

Information Element/Group name	Need	Multi	Type and reference	Semantics description	Version
CHOICE *mode*	MP				
>FDD					
>> Available Signature	MP		Bitstring(16)	(Note1) 0000000000000001:Signature 0 0000000000000010:Signature 1 0000000000000011:Signature 0&1 .....: 1111111111111111:Signature 0to15	
>>Available SF	MP		Integer (32,64,128,256)	In chips per symbol Defines the smallest permitted SF (i.e. the maximum rate)	
>>Preamble scrambling code number	MP		Integer (0 .. 15)	Identification of scrambling code see TS 25.213	
>>Puncturing Limit	MP		Real(0.40..1.00 by step of 0.04)		
>> Available Sub Channel Number	MP		Bitstring(12)	(Note2) 000000000001:SubChNumber 0 000000000010:SubChNumber 1 000000000011:SubChNumber 0&1 ...: 111111111111:SubChNumber 0to11	
>TDD					
>>Timeslot number	MP		Timeslot number 10.3.6.84		
>>PRACH Channelisation Code	MP		PRACH Channelisation Code 10.3.6.51		
>>PRACH Midamble	OP		Enumerated (Direct, Direct/Inverted)	Direct or direct and inverted midamble are used for PRACH	
>> PNBSCH allocation	OP		PNBSCH allocation 10.3.8.x	Identifies frames used for cell synchronisation purposes	REL 4

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10.3.8.x PNBSCH allocation

UTRAN may use this IE to provide silent periods in the cell that may be used for cell synchronisation purposes.

Information element	Need	Multi	Type and reference	Semantics description	Version
Number of repetitions per SFN period	MP		Integer(2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20, 24, 28, 32, 36, 40, 48, 56, 64, 72, 80)		REL-4

11.3 Information element definitions

```
PNBSCH_Allocation ::=               SEQUENCE {
        numberOfRepetitionsPerSFNPeriod ENUMERATED {
                                            c2, c3, c4, c5, c6, c7, c8, c9, c10,
                                            c12, c14, c16, c18, c20, c24, c28, c32,
                                            c36, c40, c48, c56, c64, c72, c80  }
}

SysInfoType5 ::=                    SEQUENCE {
        sib6indicator                   BOOLEAN,
    -- Physical channel IEs
        pich-PowerOffset                PICH-PowerOffset,
        modeSpecificInfo                CHOICE {
            fdd                             SEQUENCE {
                aich-PowerOffset                AICH-PowerOffset
            },
            tdd                             SEQUENCE {
                pusch-SysInfoList-SFN           PUSCH-SysInfoList-SFN       OPTIONAL,
                pdsch-SysInfoList-SFN           PDSCH-SysInfoList-SFN       OPTIONAL,
                midambleConfiguration           MidambleConfiguration       OPTIONAL,
                openLoopPowerControl-TDD        OpenLoopPowerControl-TDD
    }
        },
        primaryCCPCH-Info               PrimaryCCPCH-Info                   OPTIONAL,
        prach-SystemInformationList     PRACH-SystemInformationList,
        sCCPCH-SystemInformationList    SCCPCH-SystemInformationList,
        cbs-DRX-Level1Information       CBS-DRX-Level1Information           OPTIONAL,
        -- Conditional on any of the CTCH indicator IEs in
        -- sCCPCH-SystemInformationList
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {
            pNBSCH_Allocation-r4            PNBSCH_Allocation-r4            OPTIONAL,
            -- Extension mechanism for non-r4 information
            nonCriticalExtensions           SEQUENCE {}                     OPTIONAL
    }                                                                       OPTIONAL
}
```