

3GPP TSG-RAN Working Group 1 Meeting No. 10
Beijing, China, 18 JAN 2000 - 21 JAN 2000

Agenda Item: Ad Hoc 1

Source: Siemens

Title: Reduction of the Timing Advance range for TDD

Document for: Approval

The current range for Timing Advance ($0 \dots 255 * 4$ chips) allows a cell size of ~ 40 km and is therefore overdimensioned.

It is proposed to reduce the range to $0 \dots 63 * 4$ chips and this will be coded with 6 bits and a stepsize of 4 chips. The new range goes up to ~ 9.2 km.

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Document **R1-00-0079**

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.

25.224 CR 006

Current Version: **V3.1.0**

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **TSG RAN #7**
list expected approval meeting # here
↑

for approval
for information

strategic
non-strategic (for SMG use only)

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

Proposed change affects:

(at least one should be marked with an X)

(U)SIM ME UTRAN / Radio Core Network

Source:

Siemens

Date:

13.01.00

Subject:

Reduction of Timing Advance Range

Work item:

TS25.224

Category:

(only one category shall be marked with an X)

F Correction
A Corresponds to a correction in an earlier release
B Addition of feature
C Functional modification of feature
D Editorial modification

Release:

Phase 2
Release 96
Release 97
Release 98
Release 99
Release 00

Reason for change:

The current range for Timing Advance allows a cell size of 40 km and is therefore too high. The new range goes up to 10 km.

Clauses affected:

4.3

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.

4.3 Timing Advance

4.3.1 Without UL Synchronization

The timing of transmissions from the UE is adjusted according to timing advance values received from the UTRAN. The initial value for timing advance will be determined in the UTRAN by measurement of the timing of the PRACH. The required timing advance will be represented as a 68 bit number (0-63255) being the multiple of 4 chips which is nearest to the required timing advance. The maximum allowed value may be limited by the operator to a value lower than 63255, if required or the function may be disabled. A UE cannot operate beyond the range set by the maximum value of timing advance.

The UTRAN will continuously measure the timing of a transmission from the UE and send the necessary timing advance value. On receipt of this value the UE will adjust the timing of its transmissions accordingly in steps of ± 4 chips. The transmission of TA values is done by means of higher layer messages.

When TDD to TDD handover takes place the UE shall transmit in the new cell with timing advance TA adjusted by the relative timing difference Δt between the new and the old cell:

$$TA_{\text{new}} = TA_{\text{old}} + 2\Delta t$$

4.3.2 With UL Synchronization

UL Synchronization, the timing advance is sub-chip granular and with high accuracy in order to enable synchronous CDMA in the UL. The required timing advance will be represented as a multiple of 1/8 chips.

The UTRAN will continuously measure the timing of a transmission from the UE and send the necessary timing advance value. On receipt of this value the UE will adjust the timing of its transmissions accordingly in steps of $\pm 1/8$ chips. The transmission of TA values is ffs.