3GPP TSG RAN WG1 ***TSGR1#8(99)i12***

November 30 – December 3, 1999, Dresden, Germany

Agenda item: **WG1 Plenary**

Source: **Philips**

Title: **Revised Text proposal and Change Request for rapid DCH initialisation**

Document for: **Decision**

Introduction

This paper is a resubmission of R1-99h04 which was agreed in the adhoc 14 meeting at WG1#8. The CR form and base-version of the specification have been updated.

The current description of the procedure for rapid initialisation of the DCH in TS25.214 leaves the inner loop power control step size during the power control preamble unspecified.

Simulation results in [1] (presented in Ad Hoc 9 at WG1#8) have confirmed that a larger initial step size in the power control preamble is beneficial in reducing the required Eb/No and assisting the UE transmit power to converge to the required level as quickly as possible.

The attached Text Proposal and Change Request 25.214-CR005rev2 specifies the initial power control step size for the power control preamble based on the optimal values from the simulation results in [1]. This reduces the large number of negotiable parameters in this procedure.

Reference:

[1] TSGR1#(99)g23 Philips, October 1999

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

Document R1-99i12
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.

3G25.214	CR	005rev2	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: Philips **Date:** 1999-11-05

Subject: Rapid DCH initialisation

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature	X		Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: Feature not fully defined at present.

Clauses affected: 7.1 Rapid Initialization of DCH for Packet Data Transfer

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.

7 Procedures in Packet Data Transfer

7.1 Rapid Initialization of DCH for Packet Data Transfer

A rapid initialization procedure for establishing a DCH is defined to support bursting packet data transfer. The rapid initialization may be invoked for downlink packet data transfer on the DSCH or uplink packet data transfer on the DCH. The procedure may also be invoked to resume a recently discontinued DCH connection.

7.1.1 Rapid Initialization of DCH for Packet Data Transfer using DSCH

The synchronization of the DSCH/DCH pair may be expedited so that data transmission using DSCH can commence in slightly over 10 ms following the FACH burst assigning the TFCI using DCH. Figure 3shows the timing diagram of RACH/FACH to DCH/DCH+DSCH state transition. The parameter T_A specifies the RACH/FACH response time. The parameters T_B, T_C and T_D are referenced relative to the FACH frame. T_B specifies the time period when the downlink DPCCH is started. The parameter T_C specifies the period at which the UE will start the uplink DPCCH. Finally, T_D specifies the period that the DCH will be stable and the first frame of data may arrive. The parameters T_B, T_C, and T_D have the following relationship:

$$T_B < T_C << T_D$$

$$T_D = T_B + N_{slots}*0.666$$

where N_{slots} is a positive integer.

In order to initialise fast uplink link power control loop, searcher and channel estimator at the Node B, the UE will adhere to the following:

- The transmission of uplink link DPCCH will start at N_{slots} slots (1 to 15 slots) prior to the scheduled downlink packet data transmission using DSCH.
- The DPCCH will be transmitted with an additional negative power offset P_{offset} from the computed open loop estimate.
- ~~The initial power control step size for transmitting the DPCCH will be set at P_{step} (typically: 2dB).~~ The initial power control step size for transmitting the DPCCH differs from that used after T_D: if inner loop power control algorithm 1 is to be used after T_D, then the initial step size for the DPCCH is $\Delta_{TPC\text{-}init}$, where $\Delta_{TPC\text{-}init}$ is equal to the minimum value out of 3 dB and $2\Delta_{TPC}$, where Δ_{TPC} is the power control step size used for the main part of the transmission (see section 5.1.2.2.1). If inner loop power control algorithm 2 is to be used after T_D, then inner loop power control algorithm 1 is used initially on the DPCCH, with a step size of 2dB.
- The UE will revert back to the normal power control (PC) step size and algorithm upon the receipt of the first down power control command during the uplink DPCCH transmission phase,
- The step size and algorithm always go~~es~~ back to ~~its~~ their nominal settings ~~in~~ at the beginning of DSCH transmission

The parameters T_B, T_C, T_D , N_{slots}~~,~~ *and* P_{offset} ~~and P_{step}~~ may be negotiated with each individual UE or broadcast by the system so that the transition from RACH/FACH to DCH/DCH+DSCH sub-state is optimised.

7.1.2 Rapid Initialization of DCH for Uplink Packet Data Transfer

The synchronization of the DCH may also be expedited for the transfer of uplink packet data.. Figure 4 shows the same parameters T_B, T_C, and T_D applied to an uplink packet data transfer. The UE, upon detecting data in its queue, transmits a RACH with measurement report. After the UTRAN assigns the DCH via the FACH message, the downlink DPCCH is started after a time period T_B. The UE then begins transmission of the uplink DPCCH for reasons as outlined in section 7.3.4 at time period T_C. T_C is measured relative to the FACH transmit timing. Finally, the UE begins transmitting the data on the DPDCH after the period T_D. The initial power control procedure on the

DPCCH is as described in section 7.2.1. The procedure for starting the uplink DPCCH transmission will be similar to Section 7.3.4.1

7.1.3 Resumption of DCH for Downlink or Uplink Packet Data Transfer

The synchronization of the DCH technique may be used to resume a DCH/DCH+DSCH connection that has been dropped for a short period.. This is applicable for packet data transfer using DSCH or uplink DPDCH or bi-directional data transfer using DSCH/Uplink DPDCH. Figure 5 shows the case where the DCH has been discontinued based on an inactivity timer T_E. The UTRAN, upon detecting data in the queue, may resume the DCH operation provided the period T_E has not elapsed. Typically T_E is set to 1000msec.