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

TSGR1#9(99)i63

Agenda item:

Source: Ericsson

Title: CR 25.214-007: Removal of open loop power control

Document for: Decision

At WG1#8 it was decided to move the responsibility to define open loop power control to WG2. This decision is reflected in CR 25.214-009 for the RACH procedure. However, the open loop power control is currently described in more parts of the specification. Those sections are addressed by this CR.

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.

25.214 CR 007 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
list expected approval meeting # here ↑

for approval	X	strategic		*(for SMG use only)*	
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: (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: Ericsson **Date:** 1999-11-18

Subject: Removal of open loop power control

Work item:

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

F	Correction		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	

Release: Release 99

Reason for change: Open loop power control is specified in RAN WG2, and should hence not be specified in RAN WG1.

Clauses affected: 5.1.1.1, 5.1.2.2.1

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.

a) Based on the handover destination CPICH reception timing, the UE establishes chip synchronisation of downlink channels from handover destination cell. Frame synchronization can be confirmed using the Frame Synchronization Word. Successful frame synchronization is confirmed and reported to the higher layers when S_R successive frames have been confirmed to be frame synchronized. Otherwise, frame synchronization failure is reported to the higher layers.

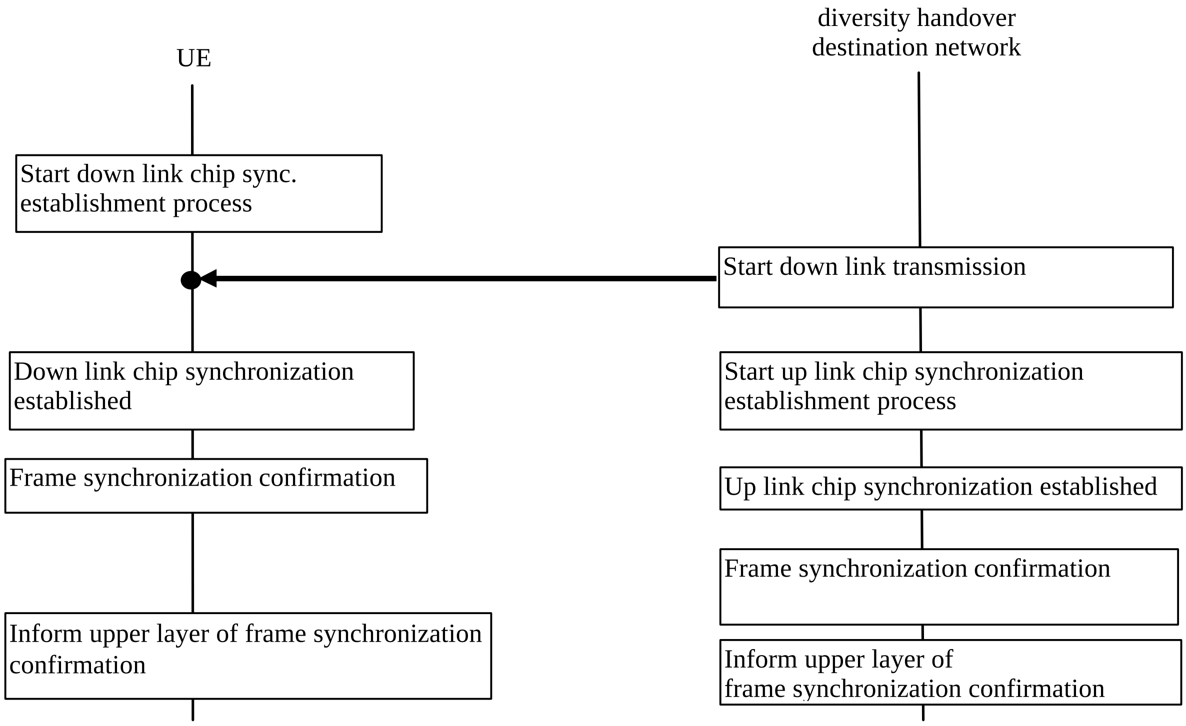

Figure 1 : Synchronization establishment flow upon intra/inter-cell soft handover

During a connection, in some cases the UE is allowed to change its transmission timing. When the UE is not in soft handover or in soft handover with cells that all are known to have the same timing reference, the UE may adjust its DPDCH/DPCCH transmission time instant. <Note: maximum rate of the adjustment should be specified in R4> Otherwise, the UE may not adjust its DPDCH/DPCCH transmission time instant.

5 Power control

5.1 Uplink power control

5.1.1 PRACH

5.1.1.1 General

The power control during the physical random access procedure is described in clause 6. The setting of power of the message control and data parts is described in the next sub-clause.

~~The transmitter power of UE shall be calculated by following equation:~~

~~$P_{RACH} = L_{Perch} + I_{BTS} +$ Constant value~~
~~where,~~
~~P_{RACH}: transmitter power level in dBm,~~
~~L_{Pearch}: measured path loss in dB,~~
~~I_{BTS}: interference signal power level at BTS in dBm, which is broadcasted on BCH,~~
~~Constant value: This value shall be designated via Layer 3 message (operator matter).~~

5.1.1.2 Setting of PRACH control and data part power difference

The message part of the uplink PRACH channel shall employ gain factors to control the control/data part relative power similar to the uplink dedicated physical channels. Hence, section 5.1.2.4 applies also for the RACH message part, with the differences that:

- b_c is the gain factor for the control part (similar to DPCCH),
- b_d is the gain factor for the data part (similar to DPDCH),
- no inner loop power control is performed.

5.1.2 DPCCH/DPDCH

5.1.2.1 General

'The uplink transmit power control procedure controls simultaneously the power of a DPCCH and its corresponding DPDCHs. The power control loop adjusts the power of the DPCCH and DPDCHs with the same amount. The relative transmit power offset between DPCCH and DPDCHs is determined by the network and signalled to the UE using higher layer signalling.

5.1.2.2 Ordinary transmit power control

5.1.2.2.1 General

The initial uplink transmit power ~~to use is decided using an open-loop power estimate, similar to the random access procedure. < *Editor's note: This needs to be elaborated, how is the estimate derived?* >~~is set by higher layers.

The maximum transmission power at the maximum rate of DPDCH is designated for uplink and control must be performed within this range. < *Editor's note: The necessity of this range needs to be confirmed.* > The maximum transmit power value of the inner-loop TPC is set by the network using higher layer signalling.

The uplink inner-loop power control adjusts the UE transmit power in order to keep the received uplink signal-to-interference ratio (SIR) at a given SIR target, SIR_{target}.

The serving cells (cells in the active set) should estimate signal-to-interference ratio SIR_{est} of the received uplink DPCH . The serving cells then generates TPC commands and transmits the commands once per slot according to the following rule: if $SIR_{est} > SIR_{target}$ then the TPC command to transmit is "0", while if $SIR_{est} < SIR_{target}$ then the TPC command to transmit is "1".

Upon reception of one or more TPC commands in a slot, the UE derives a single TPC command, TPC_cmd, for each slot, combining multiple TPC commands if more than one is received in a slot. Two algorithms shall be supported by the UE for deriving a TPC_cmd, as described in subclauses 5.1.2.2.2 and 5.1.2.2.3. Which of these two algorithms is used is an UE-specific parameter and is under the control of the UTRAN.

The step size Δ_{TPC} is a UE specific parameter, under the control of the UTRAN that can have the values 1 dB or 2 dB.

After deriving of the combined TPC command TPC_cmd using one of the two supported algorithms, the UE shall adjust the transmit power of the uplink dedicated physical channels with a step of Δ_{TPC} dB according to the TPC command. If TPC_cmd equals 1 then the transmit power of the uplink DPCCH and uplink DPDCHs shall be increased by Δ_{TPC} dB. If TPC_cmd equals -1 then the transmit power of the uplink DPCCH and uplink DPDCHs shall be decreased by Δ_{TPC} dB. If TPC_cmd equals 0 then the transmit power of the uplink DPCCH and uplink DPDCHs shall be unchanged.