TSG-RAN Working Group 1 meeting #9 *TSGR1#9(99)i42*
Dresden, Germany
November 30 – December 3, 1999

Agenda item: 8
Source: Motorola
Title: CRs related to introduction of Block STTD encoding for P-CCPCH for the TDD mode
Document for: Decision

During last TSG RAN WG1 #9, AH06 recommended to accept the possible use of Block STTD encoding for TDD P-CCPCH. The three attached documents are the CRs required for the inclusion of this feature in WG1 specifications (25.221 CR004, 25.224 CR004 and 25.225 CR002).

TSG-RAN Working Group 1 meeting #9
Dresden, Germany,

November 30 – December 3, 1999

Document ***TSGR1#9(99)i42***

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.

25.221	CR	004	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] 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 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: Motorola **Date:** November 9th 99

Subject: Block STTD capability for P-CCPCH, TDD component.

Work item:

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	[X]
C	Functional modification of feature	[ ]
D	Editorial modification	[ ]

Release:

Phase 2	[ ]
Release 96	[ ]
Release 97	[ ]
Release 98	[ ]
Release 99	[X]
Release 00	[ ]

Reason for change:

Clauses affected: 5.3

Other specs affected:

Other 3G core specifications	[X]	→ List of CRs:	25.224, 25.225, 25.331
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: Text and sections have been made consistent with CR001r1 prepared by Siemens.

help.doc

<--------- double-click here for help and instructions on how to create a CR.

5.3.1.5 Block STTD antenna diversity for P-CCPCH

Block STTD antenna diversity can be optionally applied for the P-CCPCH. Its implementation is mandatory for the UE. For those timeslots in which the P-CCPCH is mapped, the midambles $m^{(1)}$,. $m^{(2)}$, $m^{(9)}$and $m^{(10)}$ are reserved for P-CCPCH Block STTD implementation. Two possibilities exist :

- If no antenna diversity is applied to P-CCPCH, $m^{(1)}$, is used and $m^{(2)}$ is left unused. If 16 midambles are being used, $m^{(9)}$and $m^{(10)}$ are also left unused.
- If Block STTD antenna diversity is applied to P-CCPCH, $m^{(1)}$ is used for the first antenna and $m^{(2)}$ is used by the diversity antenna. If 16 midambles are being used, $m^{(9)}$and $m^{(10)}$ are also left unused.

The reference power level for beacon function purposes corresponds to the sum of the power allocated to both midambles. Two possibilities exist :

- If no antenna diversity is applied to P-CCPCH, all the reference power is allocated to $m^{(1)}$,.
- If Block STTD antenna diversity is applied to P-CCPCH, midambles $m^{(1)}$ and $m^{(2)}$ are each allocated half of the reference power. If other physical channels are allocated to the same channelisation code and same timeslot as a P-CCPCH, i.e. the same physical resource is used in the multiframe pattern, then these channels shall also provide this beacon function. Providing beacon function these other physical channels requires
  - allocating half the reference power to midambles $m^{(1)}$ and $m^{(2)}$.
  - transmitting identical data sequences on both antennas (i.e. without block STTD encoding). Each antenna is allocated half the reference power.

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

Document ***TSGR1#9(99)i42***

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** **004** 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: (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: Motorola **Date:** November 9th 99

Subject: STTD capability for P-CCPCH, TDD component.

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	[X]		Release 97	[ ]
C	Functional modification of feature	[ ]		Release 98	[ ]
D	Editorial modification	[ ]		Release 99	[X]
				Release 00	[ ]

Reason for change:

Clauses affected: 4.7.3

Other specs affected:

Other 3G core specifications	[X]	→ List of CRs:	25.221, 25.225, 25.331
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.

4.7.3 Transmit Diversity for P-CCPCH

Block Space Time Transmit Diversity (Block STTD) can be employed as transmit diversity scheme for the Primary Common Control Physical Channels (P-CCPCH).

4.7.3.1 P-CCPCH Transmission Scheme

The open loop downlink transmit diversity employs a Block Space Time Transmit Diversity scheme (Block STTD). The Block STTD encoding can be optionally used at the base station. Its support at the UE is mandatory.

A block diagram of the Block STTD transmitter is shown in Figure 6. Before Block STTD encoding, channel coding, rate matching, interleaving and bit-to-symbol mapping are performed as in the non-diversity mode.

Block STTD encoding is separately performed for each of the two data fields present in a burst (each data field contains N data symbols). For each data field at its input, 2 data fields are generated at its output, corresponding to each of the diversity antennas. The Block STTD encoding operation is illustrated in Figure 7, where the superscript * stands for complex conjugate. If N is an odd number, the first symbol of the block shall not be STTD encoded and the same symbol will be transmitted with equal power from both antennas.

After Block STTD encoding both branches are separately spread and scrambled as in the non-diversity mode..

The base station transmits a L3 message on the broadcast channel (BCH) indicating the presence/absence of the diversity antenna. During power on and handover between cells the UE determines the presence of diversity antenna by receiving a L3 message.

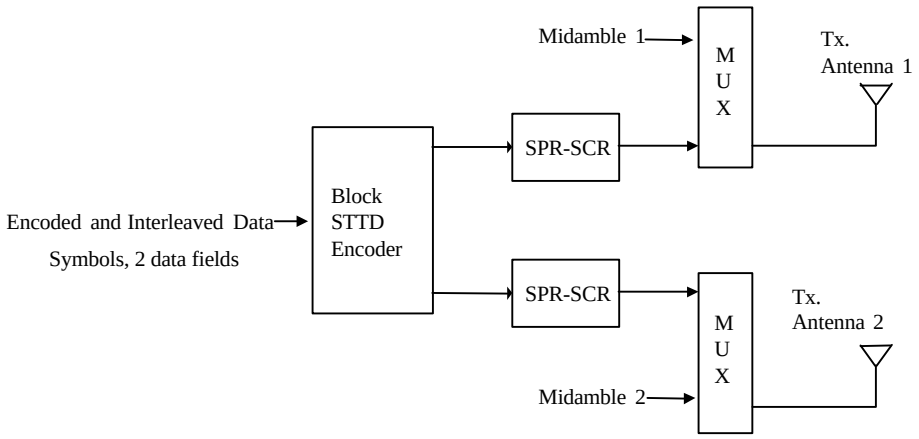

Figure 6: Block Diagram of the transmitter (STTD)

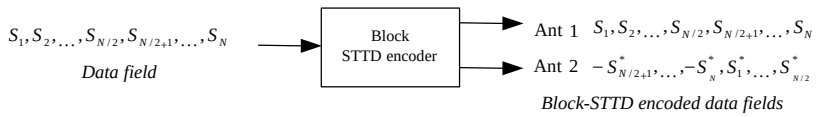

Figure 7: Block Diagram of Block STTD encoder. The symbols S_i are QPSK. N is the length of the block to be encoded

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

Document ***TSGR1#9(99)i42***

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.

25.225 **CR** **002** 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: (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: Motorola **Date:** November 9th 99

Subject: Block STTD capability for P-CCPCH, TDD component.

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	[X]		Release 97	[ ]
C	Functional modification of feature	[ ]		Release 98	[ ]
D	Editorial modification	[ ]		Release 99	[X]
				Release 00	[ ]

Reason for change:

Clauses affected: 5.3

Other specs affected:

Other 3G core specifications	[X]	→ List of CRs:	25.221, 25.224, 25.331
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.

monitor is available, the UE may perform the measurements on the PCCPCH directly without prior SCH synchronisation.

4.4 Measurements for DCA

DCA is used to optimise the resource allocation by means of a channel quality criteria or traffic parameters. The DCA measurements are configured by the UTRAN. The UE reports the measurements to the UTRAN.

For DCA no measurements are performed in idle mode in the serving TDD cell.

When connecting with the initial access the UE immediately starts measuring the ISCP of time slots which are communicated on the BCH. The measurements and the preprocessing are done while the UTRAN assigns an UL channel for the UE for signalling and measurement reporting.

In connected mode the UE performs measurements according to a measurement control message from the UTRAN.

4.5 Measurements for timing advance

To update timing advance of a moving UE the UTRAN measures 'Received Timing Deviation', i.e. the time difference of the received UL transmission (PRACH, DPCH, PUSCH) in relation to its timeslot structure that means in relation to the ideal case where an UL transmission would have zero propagation delay. The measurements are reported to higher layers, where timing advance values are calculated and signalled to the UE.

5 Measurement abilities for UTRA TDD

In this chapter the physical layer measurements reported to higher layers. (this may also include UE internal measurements not reported over the air-interface) are defined.

5.1 UE measurement abilities

NOTE 1: Measurements for TDD which are carried out on Primary CCPCH (P-CCPCH) can also be carried out on another CCPCH if it has the same constant power level as the P-CCPCH and no beamforming is used.

NOTE 2: For those channels providing beacon function (i.e. those mapped in the same code/timeslot in a frame as the P-CCPCH), the received power measurements are based on the sum of the received powers for midambles $m^{(1)}$ and $m^{(2)}$.

NOTE 3~~2~~: The UTRAN has to take into account the UE capabilities when specifying the timeslots to be measured in the measurement control message.

NOTE 4~~3~~: The RSCP can either be measured on the data part or the midamble of a burst, since there is no power offset between both. However, in order to have a common reference, the measurement on the midamble is assumed.

NOTE 5~~4~~: The line 'applicable for' indicates whether the measurement is applicable for inter-frequency and/or intra-frequency and furthermore for idle and/or connected mode.

5.1.1 P-CCPCH RSCP

Definition	Received Signal Code Power, the received power on P-CCPCH of own or neighbour cell after despreading. The reference point for the RSCP is the antenna connector at the UE.
Applicable for	idle mode, connected mode (intra-frequency & inter-frequency)
Range/mapping	