3GPP TSG RAN Meeting #18   **RP-020846**
New Orleans, Louisiana, USA, 3 - 6 December, 2002

Title: **CRs (Rel-5) to TS 25.212**

Source: **TSG-RAN WG1**

Agenda item: **7.1.5**

Release 5 CRs

CRs with no links to other specifications

TS 25.212   **(RP-020846)**

No.	Spec	CR	Rev	R1 T-doc	Subject	Phase	Cat	Workitem	V_old	V_new
1	25.212	163	-	R1-02-1337	Correction of CQI index to bit mapping	REL-5	F	HSDPA-Phys	5.2.0	5.3.0
2	25.212	164	-	R1-02-1431	Correction of mapping of HARQ-ACK	REL-5	F	HSDPA-Phys	5.2.0	5.3.0

CR-Form-v7

CHANGE REQUEST

⌘   **25.212 CR 163**   ⌘ **rev**   -   ⌘   Current version: **5.2.0**   ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐   ME **X** Radio Access Network **X** Core Network ☐

Title: ⌘	Correction of CQI index to bit mapping
Source: ⌘	TSG RAN WG1
Work item code:⌘	HSDPA-Phys **Date:** ⌘ 31/10/2002

Category: ⌘ **F**	**Release:** ⌘ Rel-5

Use <u>one</u> of the following categories:
F *(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 <u>one</u> 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)*
Rel-6   *(Release 6)*

Reason for change: ⌘	The mapping between the 31 decimal CQI values and the 32 binary CQI codewords is not defined. Different interpretations could give rise to CQI errors as a result of mapping to codewords 0 to 30 or 1 to 31.
Summary of change:⌘	The mapping from decimal CQI values to binary codewords is defined.
Consequences if ⌘ **not approved:**	Without this correction, the coding of the CQI values is ambiguous.

Clauses affected: ⌘	4.7

	Y	N		
Other specs ⌘		X	Other core specifications ⌘	
affected:		X	Test specifications	
		X	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/specs/CR.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.

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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.

4.7 Coding for HS-DPCCH

Data arrives to the coding unit in form of indicators for measurement indication and HARQ acknowledgement.

The following coding/multiplexing steps can be identified:

- channel coding (see subclause 4.7.1);

- mapping to physical channels (see subclause 4.7.2).

The general coding flow is shown in the figure below. This is done in parallel for the HARQ-ACK and CQI as the flows are not directly multiplexed but are transmitted at different times.
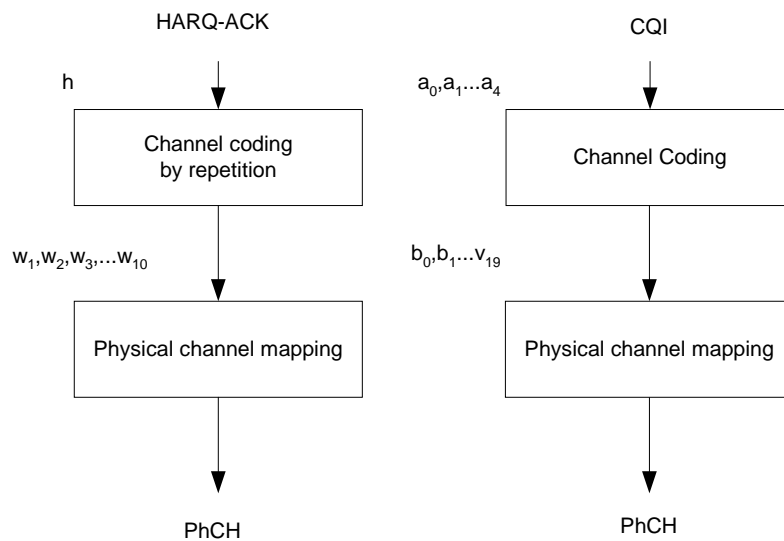

Figure 20: Coding for HS-DPCCH

4.7.1 Channel coding for HS-DPCCH

Two forms of channel coding are used, one for the channel quality information (CQI) and another for HARQ-ACK (acknowledgement).

4.7.1.1 Channel coding for HS-DPCCH HARQ-ACK

The 1 bit HARQ acknowledgement shall be repetition coded to 10 bits. The output is denoted $w_1, w_2, \ldots w_{10}$.

4.7.1.2 Channel coding for HS-DPCCH channel quality information

The channel quality information is coded using a (20,5) code. The code words of the (20,5) code are a linear combination of the 5 basis sequences denoted $M_{i,n}$ defined in the table below.

Table 14: Basis sequences for (20,5) code

i	$M_{i,0}$	$M_{i,1}$	$M_{i,2}$	$M_{i,3}$	$M_{i,4}$
0	1	0	0	0	1
1	0	1	0	0	1
2	1	1	0	0	1
3	0	0	1	0	1
4	1	0	1	0	1
5	0	1	1	0	1
6	1	1	1	0	1
7	0	0	0	1	1
8	1	0	0	1	1
9	0	1	0	1	1
10	1	1	0	1	1
11	0	0	1	1	1
12	1	0	1	1	1
13	0	1	1	1	1
14	1	1	1	1	1
15	0	0	0	0	1
16	0	0	0	0	1
17	0	0	0	0	1
18	0	0	0	0	1
19	0	0	0	0	1

The CQI values 0 .. 30 as defined in [4] are converted from decimal to binary to map them to the channel quality information bits (0 0 0 0 0) to (0 1 1 1 1) respectively. The channel quality information bits are a_0 , a_1 , a_2 , a_3 , a_4 (where a_0 is LSB and a_4 is MSB). The output code word bits b_i are given by:

$$b_i = \sum_{n=0}^{4} (a_n \times M_{i,n}) \bmod 2$$

where $i = 0, \ldots, 19$.

4.7.2   Physical channel mapping for HS-DPCCH

The HS-DPCCH physical channel mapping function shall map the input bits w_k directly to physical channel so that bits are transmitted over the air in ascending order with respect to k.

The HS-DPCCH physical channel mapping function shall map the input bits b_k directly to physical channel so that bits are transmitted over the air in ascending order with respect to k.

CR-Form-v7

CHANGE REQUEST

⌘ **25.212 CR 164** ⌘ **rev** **-** ⌘ Current version: **5.2.0** ⌘

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Proposed change affects: UICC apps⌘ ☐ ME **X** Radio Access Network **X** Core Network ☐

Title: ⌘	Correction of mapping of HARQ-ACK	
Source: ⌘	TSG RAN WG1	
Work item code: ⌘	HSDPA-Phys	***Date:*** ⌘ 07/11/2002
Category: ⌘ **F**		***Release:*** ⌘ Rel-5

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Reason for change: ⌘	The mapping between higher-layer HARQ acknowledgements and physical layer signals is not defined.
Summary of change: ⌘	A table is inserted describing the mapping of HARQ-ACK messages to physcial layer coding. The relevant figure is also revised.
Consequences if not approved: ⌘	The mapping between higher-layer HARQ acknowledgements and physical layer signals is undefined

Clauses affected: ⌘	4.7

	Y	N		
Other specs affected: ⌘	X		Other core specifications ⌘	
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘	CR 25.212-161r1 also incorporates the same changes, so if that CR is adopted, then this one (CR 25.212-164) is not needed.

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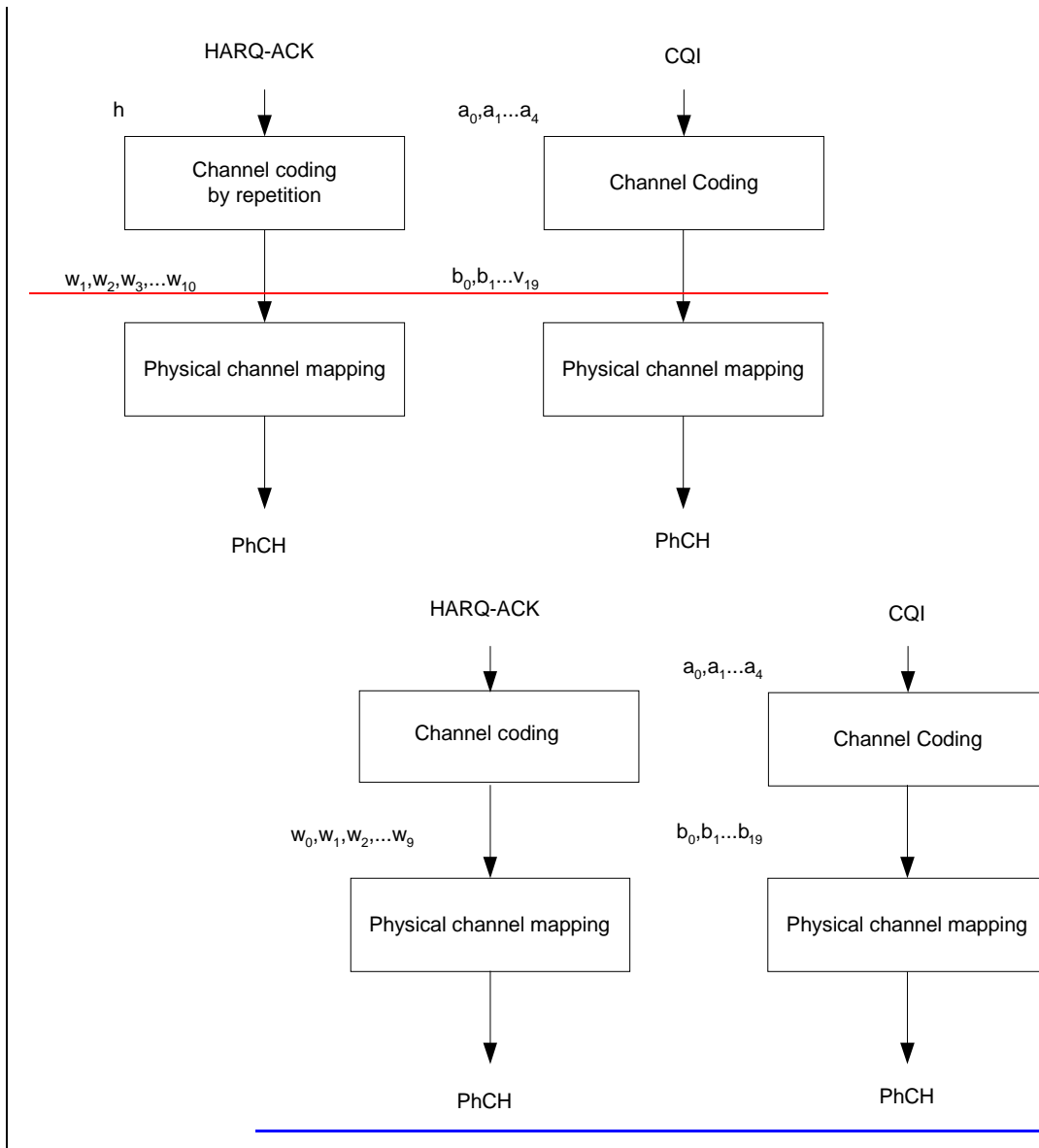
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Two forms of channel coding are used, one for the channel quality information (CQI) and another for HARQ-ACK (acknowledgement).

4.7.1.1 Channel coding for HS-DPCCH HARQ-ACK

The 1 bit HARQ acknowledgement message to be transmitted, as defined in [4], shall be repetition coded to 10 bits as shown in Table 13A. The output is denoted w_0, w_1,…w_9.

Table 13A: Channel coding of HARQ-ACK

HARQ-ACK message to be transmitted	w_0	w_1	w_2	w_3	w_4	w_5	w_6	w_7	w_8	w_9
ACK	1	1	1	1	1	1	1	1	1	1
NACK	0	0	0	0	0	0	0	0	0	0