3GPP TSG RAN Meeting #17 ***RP-020582***
Biarritz, France, 3 – 6, September 2002

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

Source: **TSG-RAN WG1**

Agenda item: **7.1.5**

No.	Spec	CR	Rev	R1 T-doc	Subject	Phase	Cat	Workitem	V_old	V_new
1	25.212	141	1	R1-02-0995	Bit scrambling for HS-DSCH	Rel-5	F	HSDPA-Phys	5.1.0	5.2.0
2	25.212	148	-	R1-02-0962	Physical channel mapping for HS-DPCCH	Rel-5	D	HSDPA-Phys	5.1.0	5.2.0
3	25.212	149	-	R1-02-0963	HARQ bit collection	Rel-5	F	HSDPA-Phys	5.1.0	5.2.0
4	25.212	150	1	R1-02-1121	Coding for HS-SCCH	Rel-5	F	HSDPA-Phys	5.1.0	5.2.0
5	25.212	151	-	R1-02-0941	Correction to UE specific masking for HS-SCCH part1	Rel-5	F	HSDPA-Phys	5.1.0	5.2.0
6	25.212	158	-	R1-02-1093	Specification of H-RNTI to UE identity mapping	Rel-5	F	HSDPA-Phys	5.1.0	5.2.0

3GPP TSG RAN Meeting #17 ***R1-02-0995***
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CHANGE REQUEST

⌘ **25.212** **CR** **141** ⌘ **rev** **1** ⌘ Current version: **5.1.0** ⌘

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

Title:	⌘	Bit scrambling for HS-DSCH
Source:	⌘	TSG RAN WG1
Work item code:	⌘	HSDPA-Phys
Date:	⌘	27/06/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one 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 one 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:	⌘	Performance degradation from power level estimation for 16QAM when specific data sequences are transmitted on the HS-DSCH, e.g all-zero or all-one sequences. Use of ciphering at higher layers seems unnecessarily complex.
Summary of change:	⌘	Bit scrambling step is introduced in the coding chain for HS-DSCH.
Consequences if not approved:	⌘	Performance degradation from power level estimation for 16QAM when specific data sequences are transmitted on the HS-DSCH, e.g all-zero or all-one sequences.

Clauses affected:	⌘	4.5			
Other specs affected:	⌘	**Y**	**N**		⌘
			X	Other core specifications	
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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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.

4.5 Coding for HS-DSCH

Data arrives to the coding unit in form of a maximum of one transport block once every transmission time interval. The transmission time interval is 2 ms which is mapped to a radio sub-frame of 3 slots.

The following coding steps can be identified:

- add CRC to each transport block (see subclause 4.5.1);
- bit scrambling (see subclause 4.5.1a);
- code block segmentation (see subclause 4.5.2);
- channel coding (see subclause 4.5.3);
- hybrid ARQ (see subclause 4.5.4);
- physical channel segmentation (see subclause 4.5.5);
- interleaving for HS-DSCH (see subclause 4.5.6);
- constellation re-arrangement for 16 QAM (see subclause 4.5.7);
- mapping to physical channels (see subclause 4.5.8).

The coding steps for HS-DSCH are shown in the figure below.

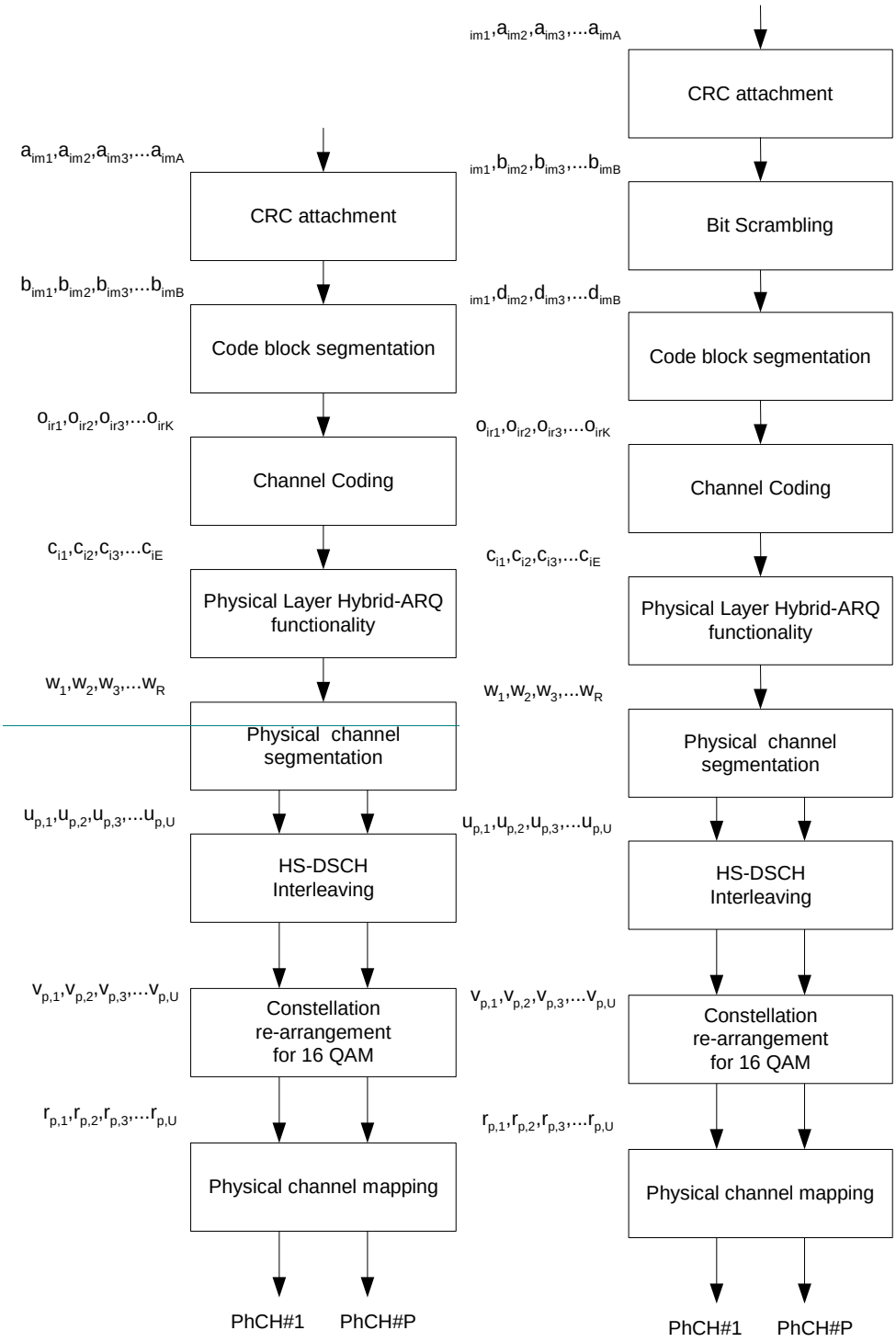

Figure 16: Coding chain for HS-DSCH

In the following the number of transport blocks and the number of transport channels is always one. When referencing non HS-DSCH formulae which are used in correspondence with HS-DSCH formulae the convention is used that transport block subscripts may be omitted (e.g. X_1 may be written X).

4.5.1 CRC attachment for HS-DSCH

CRC attachment for the HS-DSCH transport channel shall be done using the general method described in 4.2.1 above with the following specific parameters.

There will be a maximum of one transport block, i=1. The CRC length shall always be $L_1 = 24$ bits.

4.5.1a Bit scrambling for HS-DSCH

The bits output from the HS-DSCH CRC attachment are scrambled in the bit scrambler. The bits input to the bit scrambler are denoted by $b_{im,1}, b_{im,2}, b_{im,3}, ..., b_{im,B}$, where B is the number of bits input to the HS-DSCH bit scrambler

The bits after bit scrambling are denoted $d_{im,1}, d_{im,2}, d_{im,3}, ..., d_{im,B}$.

Bit scrambling is defined by the following relation:

$d_{im,k} = (b_{im,k} + y_k) \bmod 2$ $k = 1,2,\ldots,B$

and y_k results from the following operation:

$y'_m = 0$ $-15 < m < 1$

$y'_m = 1$ $m = 1$

$y'_m = \left(\sum_{i=1}^{16} g_i \cdot y'_{m-i} \right) \bmod 2$ $1 < m < B,$

where $g = \{0,0,0,0,0,0,0,0,0,0,1,0,1,1,0,1\}$,

$y_k = y'_k$ $k = 1,2,\ldots,B.$

4.5.2 Code block segmentation for HS-DSCH

Code block segmentation for the HS-DSCH transport channel shall be done with the general method described in 4.2.2.2 above with the following specific parameters.

There will be a maximum of one transport block, i=1. The bits ~~$b_{im1}, b_{im2}, b_{im3}, \ldots b_{imB}$~~ $d_{im1}, d_{im2}, d_{im3}, \ldots d_{imB}$ input to the block are mapped to the bits $x_{i1}, x_{i2}, x_{i3}, \ldots x_{iXi}$ directly. It follows that $X_1 = B$. Note that the bits x referenced here refer only to the internals of the code block segmentation function. The output bits from the code block segmentation function are $o_{ir1}, o_{ir2}, o_{ir3}, \ldots o_{irK}$.

The value of Z = 5114 for turbo coding shall be used.

3GPP TSG RAN Meeting #17 ***R1-02-0962***
Biarritz, France, 3 – 6, September 2002

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CHANGE REQUEST

⌘ **25.212** **CR** **148** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

*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 ☒ Radio Access Network ☒ Core Network ☐

Title:	⌘	Physical channel mapping for HS-DPCCH
Source:	⌘	TSG RAN WG1
Work item code:	⌘	HSDPA-Phys
Date:	⌘	dd/07/2002
Category:	⌘	**D**
Release:	⌘	Rel-5

Use one 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 one 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 description of Physical channel mapping for HS-DPCCH in 4.7.2 does not follow the common description of Physical channel mapping for other channels and thus may cause confussion.
Summary of change:	⌘	The description of Physical channel mapping for HS-DPCCH in 4.7.2 is modified to state clearly that channels bits are transmitted over the air in ascending order with respect to *k.*
Consequences if not approved:	⌘	Physical channel mapping for HS-DPCCH may cause confussion

Clauses affected:	⌘	4.7.2

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

⌘

Other comments: ⌘

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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.

4.7.2 Physical channel mapping for HS-DPCCH

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

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

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Biarritz, France, 3 – 6, September 2002

R1-02-0963

CR-Form-v7

CHANGE REQUEST

⌘ **25.212** **CR** **149** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

*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:	⌘	HARQ bit collection
Source:	⌘	TSG RAN WG1
Work item code:	⌘	HSDPA-Phys
Date:	⌘	dd/07/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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C *(functional modification of feature)*
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Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one 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 case when $N_{t,sys}$ =0 (i.e. N_c=0 and N_r =0) is not correctly handle by the description of HARQ bit collection in 4.5.4.4.
Summary of change:	⌘	• The text is modified so that the case when $N_{t,sys}$ =0 is correctly handle. • It is also clarified that writing in and reading out column by column are started from the first column.
Consequences if not approved:	⌘	The case when $N_{t,sys}$ =0 is not correctly handle.

Clauses affected:	⌘	4.5.4.4

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

Other comments: ⌘

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4.5.4.4 HARQ bit collection

The HARQ bit collection is achieved using a rectangular interleaver of size $N_{row} \times N_{col}$.

The number of rows and columns are determined from:

$$N_{row} = 4 \text{ for 16QAM and } N_{row} = 2 \text{ for QPSK}$$

$$N_{col} = N_{data} / N_{row}$$

where N_{data} is used as defined in 4.5.4.3.

Data is written into the interleaver column by column, and read out of the interleaver column by column starting from the first column.

$N_{t,sys}$ is the number of transmitted systematic bits. Intermediate values N_r and N_c are calculated using:

$$N_r = \left\lfloor \frac{N_{t,sys}}{N_{col}} \right\rfloor \text{ and } N_c = N_{t,sys} - N_r \cdot N_{col}.$$

If N_c=0 and $N_r > 0$, the systematic bits are written into rows 1…N_r.

Otherwise systematic bits are written into rows 1…N_r*+1* in the first N_c columns and, if $N_r > 0$, also into rows 1…N_r in the remaining N_{col}-N_c columns.

The remaining space is filled with parity bits. The parity bits are written column wise into the remaining rows of the respective columns. Parity 1 and 2 bits are written in alternating order, starting with a parity 2 bit in the first available column with the lowest index number.

In the case of 16QAM for each column the bits are read out of the interleaver in the order row 1, row 2, row 3, row 4. In the case of QPSK for each column the bits are read out of the interleaver in the order row1, row2.

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Biarritz, France, 3 – 6, September 2002

R1-02-1121

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CHANGE REQUEST

⌘ **25.212** **CR** **150** ⌘ **rev** **1** ⌘ Current version: **5.1.0** ⌘

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

Title:	⌘	Coding for HS-SCCH
Source:	⌘	TSG RAN WG1
Work item code:	⌘	HSDPA-Phys
Date:	⌘	20/08/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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F *(correction)*
A *(corresponds to a correction in an earlier release)*
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C *(functional modification of feature)*
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Use one of the following releases:

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R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The indexes of Y and C used in section 4.6.4 are not matched with those in Figure 19 causing confusion.
Summary of change:	⌘	• Notation of C, Index of Y, and MUX block forming Y in Figure 19 are removed to fit the description in section 4.6.4. • Section 4.6.4 is corrected since Y contains both 16 CRC mask bits and bits $x_{2,1}$ $x_{2,2}$,..., $x_{2,13}$ • The "msb" notation in 4.6.2.1 is also corrected to "MSB"
Consequences if not approved:	⌘	The indexes of Y and C used in section 4.6.4 are not matched with those in Figure 19 causing confusion.

Clauses affected:	⌘	4.6.1, 4.6.2.1 & 4.6.4

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

Other comments:	⌘	

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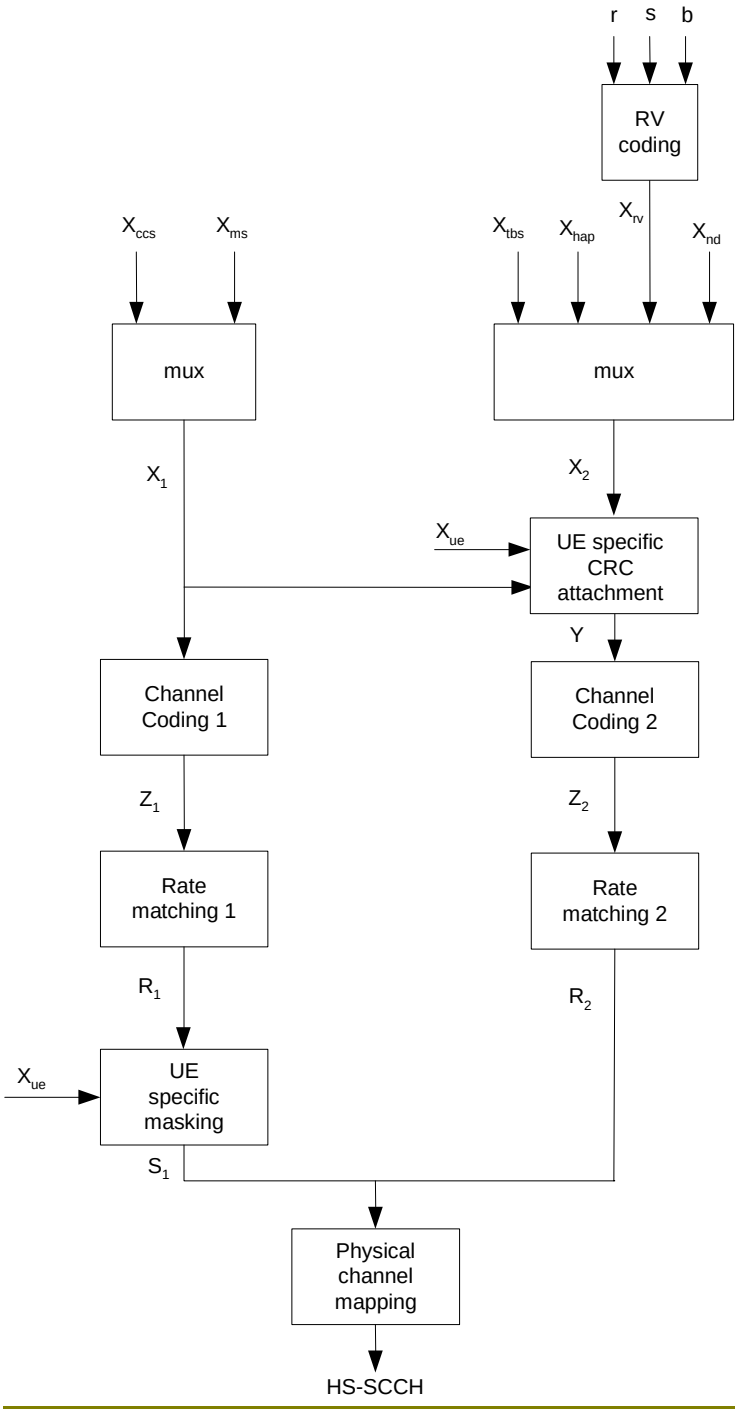
4.6 Coding for HS-SCCH

The following information is transmitted by means of the HS-SCCH physical channel.

- Channelization-code-set information (7 bits): $x_{ccs,1}, x_{ccs,2}, \ldots, x_{ccs,7}$
- Modulation scheme information (1 bit): $x_{ms,1}$
- Transport-block size information (6 bits): $x_{tbs,1}, x_{tbs,2}, \ldots, x_{tbs,6}$
- Hybrid-ARQ process information (3 bits): $x_{hap,1}, x_{hap,2}, x_{hap,3}$
- Redundancy and constellation version (3 bits): $x_{rv,1}, x_{rv,2}, x_{rv,3}$
- New data indicator (1 bit): $x_{nd,1}$
- UE identity (16 bits): $x_{ue,1}, x_{ue,2}, \ldots, x_{ue,16}$

4.6.1 Overview

Figure 19 below illustrates the overall coding chain for HS-SCCH.


r
s
b
RV coding
X_{rv}
X_{ccs}
X_{ms}
X_{tbs}
X_{hap}
X_{nd}
mux
mux
X_1
X_2
X_{ue}
UE specific CRC attachment
Y
Channel Coding 1
Channel Coding 2
Z_1
Z_2
Rate matching 1
Rate matching 2
R_1
R_2
X_{ue}
UE specific masking
S_1
Physical channel mapping
HS-SCCH

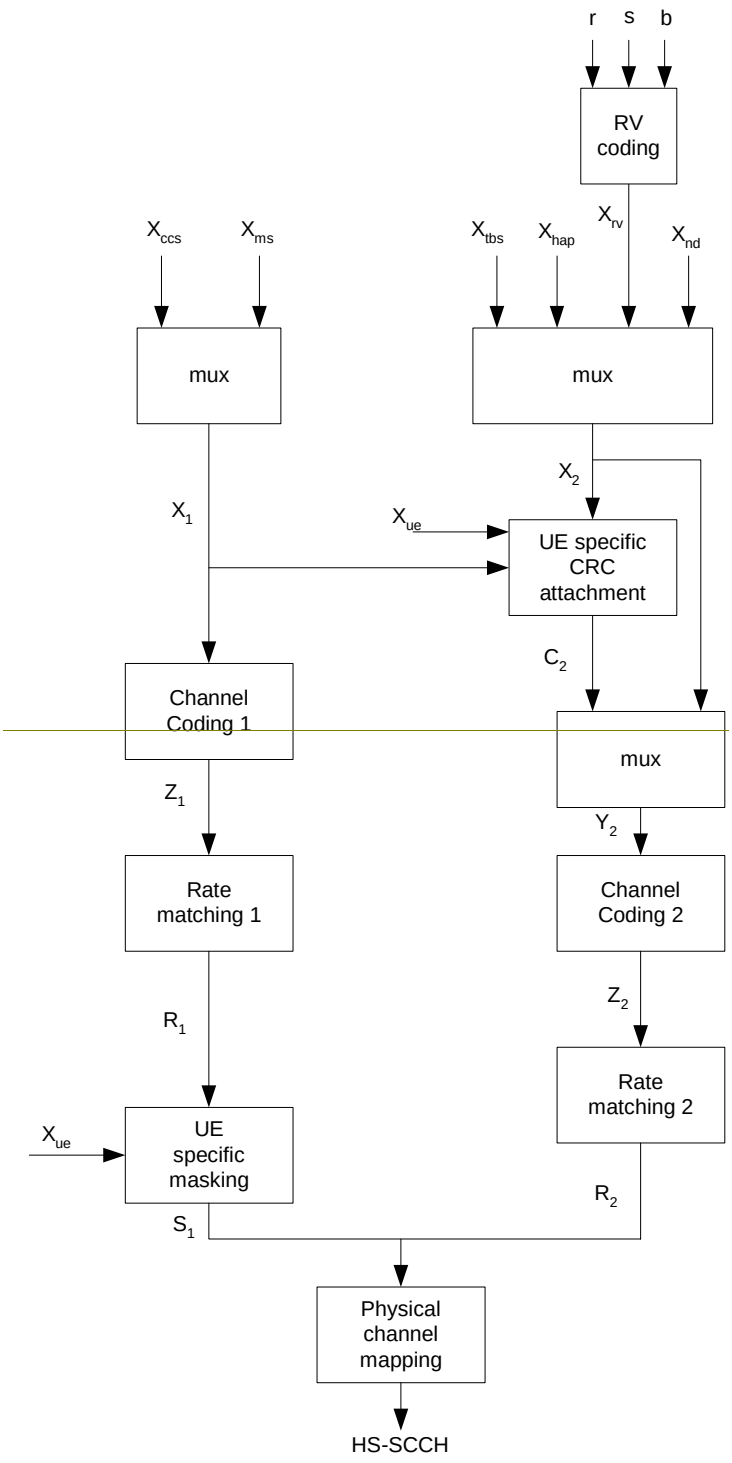


Figure 19: Coding chain for HS-SCCH

4.6.2 HS-SCCH information field mapping

4.6.2.1 Redundancy and constellation version coding

The redundancy version (RV) parameters *r*, *s* and constellation version parameter *b* are coded jointly to produce the value X_{rv}. X_{rv} is alternatively represented as the sequence $x_{rv,1}$, $x_{rv,2}$, $x_{rv,3}$ where $x_{rv,1}$ is the ~~msb~~MSB. This is done according to the following tables according to the modulation mode used:

Table 12: RV coding for 16 QAM

X_{rv} (value)	s	r	b
0	1	0	0
1	0	0	0
2	1	1	1
3	0	1	1
4	1	0	1
5	1	0	2
6	1	0	3
7	1	1	0

Table 13: RV coding for QPSK

X_{rv} (value)	s	r
0	1	0
1	0	0
2	1	1
3	0	1
4	1	2
5	0	2
6	1	3
7	0	3

4.6.2.2 Modulation scheme mapping

The value of $x_{ms,1}$ is derived from the modulation and given by the following:

$$x_{ms,1} = \begin{cases} 0 & if \quad QPSK \\ 1 & if \quad 16QAM \end{cases}$$

4.6.2.3 Channelization code-set mapping

The channelization code-set bits $x_{ccs,1}$, $x_{ccs,2}$, …, $x_{ccs,7}$ are coded according to the following:

Given P (multi-)codes starting at code O calculate the information-field using the unsigned binary representation of integers calculated by the expressions,

for the first three bits (code group indicator):

$x_{ccs,1}$, $x_{ccs,2}$, $x_{ccs,3}$ = min(P-1,15-P)

for the last four bits (code offset indicator):

$x_{ccs,4}$, $x_{ccs,5}$, $x_{ccs,6}$, $x_{ccs,7}$ = |O-1-⌊P/8⌋ *15|

The definitions of P and O are given in [3].

4.6.3 Multiplexing of HS-SCCH information

The channelization-code-set information $x_{ccs,1}$, $x_{ccs,2}$, …, $x_{ccs,7}$ and modulation-scheme information $x_{m,1}$ are multiplexed together. This gives a sequence of bits $x_{1,1}$, $x_{1,2}$, …, $x_{1,8}$ where

$x_{1,i} = x_{ccs,i}$ $\quad i=1,2,\ldots,7$

$x_{1,i} = x_{ms,i-7}$ $\quad i=8$

The transport-block-size information $x_{tbs,1}$, $x_{tbs,2}$, …, $x_{tbs,6}$, Hybrid-ARQ-process information $x_{hap,1}$,$x_{hap,2}$, $x_{hap,3}$, redundancy-version information $x_{rv,1}$, $x_{rv,2}$, $x_{rv,3}$ and new-data indicator $x_{nd,1}$ are multiplexed together. This gives a sequence of bits $x_{2,1}$, $x_{2,2}$, …, $x_{2,13}$ where

$x_{2,i} = x_{tbs,i}$ $i=1,2,\ldots,6$

$x_{2,i} = x_{hap,i-6}$ $i=7,8,9$

$x_{2,i} = x_{rv,i-9}$ $i=10,11,12$

$x_{2,i} = x_{nd,i-12}$ $i=13$

4.6.4 CRC attachment for HS-SCCH

From the sequence of bits $x_{1,1}, x_{1,2}, \ldots, x_{1,8}, x_{2,1}, x_{2,2}, \ldots, x_{2,13}$ a 16 bits CRC is calculated according to Section 4.2.1.1. This gives a sequence of bits $c_1, c_2, \ldots, c_{16}$. This sequence of bits is then masked with the UE ID $x_{ue,1}, x_{ue,2}, \ldots, x_{ue,16}$, where $x_{ue,1}$ *is the* MSB *and* $x_{ue,16}$ is the LSB of the UE ID, and then appended to the sequence of bits $x_{2,1}, x_{2,2}, \ldots, x_{2,13}$ to form the sequence of bits $y_1, y_2, \ldots, y_{29}$, where

$y_i = x_{2,i}$ $i=1,2,\ldots,13$

$y_i = (c_{i-13} + x_{ue,i-13}) \bmod 2$ $i=14,15,\ldots,29$

The UE ID corresponds to the HS-DSCH Radio Network Identifier (H-RNTI) as defined in [13], expressed in unsigned binary form. ~~The mask CRC bits correspond to the sequence of bits $y_1, y_2, \ldots, y_{29}$, where~~

~~$y_i = x_{2,i}$ $i=1,2,\ldots,13$~~

~~$y_i = c_{i-13} + x_{ue,i-13} \bmod 2$ $i=14,15,\ldots,29$~~

3GPP TSG RAN Meeting #17 ***R1-02-0941***
Biarritz, France, 3 – 6, September 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.212** **CR** **151** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

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

Title:	⌘	Correction to UE specific masking for HS-SCCH part1
Source:	⌘	TSG RAN WG1
Work item code:	⌘	HSDPA-Phys
Date:	⌘	02/07/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
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R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	To be consistent with the current rate matching rule which has recently been modified
Summary of change:	⌘	The puncutring function now refers now to the rate matching rules described in section 4.6.6
Consequences if not approved:	⌘	Suboptimal performance and implementation.

Clauses affected:	⌘	4.6.7

		Y	N		
Other specs affected:	⌘		X	Other core specifications	⌘
			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.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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.

4.6.6 Rate matching for HS-SCCH

From the input sequence $z_{1,1}, z_{1,2}, \ldots, z_{1,48}$ the bits $z_{1,1}, z_{1,2}, z_{1,4}, z_{1,8}, z_{1,42}, z_{1,45}, z_{1,47}, z_{1,48}$ are punctured to obtain the output sequence $r_{1,1}, r_{1,2} \ldots r_{1,40}$.

From the input sequence $z_{2,1}, z_{2,2}, \ldots, z_{2,111}$ the bits $z_{2,1}, z_{2,2}, z_{2,3}, z_{2,4}, z_{2,5}, z_{2,6}, z_{2,7}, z_{2,8}, z_{2,12}, z_{2,14}, z_{2,15}, z_{2,24}, z_{2,42}, z_{2,48}, z_{2,54}, z_{2,57}, z_{2,60}, z_{2,66}, z_{2,69}, z_{2,96}, z_{2,99}, z_{2,101}, z_{2,102}, z_{2,104}, z_{2,105}, z_{2,106}, z_{2,107}, z_{2,108}, z_{2,109}, z_{2,110}, z_{2,111}$ are punctured to obtain the output sequence $r_{2,1}, r_{2,2} \ldots r_{2,80}$.

4.6.7 UE specific masking for HS-SCCH

The rate matched bits $r_{1,1}, r_{1,2} \ldots r_{1,40}$ shall be masked in an UE specific way using the UE ID $x_{ue,1}, x_{ue,2}, \ldots, x_{ue,16}$, *where* $x_{ue,1}$ *is the MSB and* $x_{ue,16}$ is the LSB of the UE ID, to produce the bits $s_{1,1}, s_{1,2} \ldots s_{1,40}$. The UE ID corresponds to the HS-DSCH Radio Network Identifier (H-RNTI) as defined in [13], expressed in unsigned binary form.

Intermediate code word bits b_i, i=1,2…,48, are defined by endcoding the UE ID bits using the rate ½ convolutional coding described in Section 4.2.3.1. Eight bits out of the resulting 48 convolutionally encoded bits are punctured using the rate matching rule of ~~with the general method described in~~ Section ~~4.2.7.5~~ 4.6.6 for the HS-SCCH part 1 sequence, that is, the intermidiate code word bits $b_1, b_2, b_4, b_8, b_{42}, b_{45}, b_{47}, b_{48}$, are punctured to obtain the 40 bit UE specific scrambling sequence $c_1, c_2, \ldots c_{40}$. ~~where X_i = 48, e_{ini}=1, e_{plus}=96 and e_{minus}=16. That is, from the input sequence $b_1, b_2, \ldots, b_{48}$, the bits $b_1, b_7, b_{13}, b_{19}, b_{25}, b_{31}, b_{37}, b_{43}$ are punctured to obtain the 40 bit UE specific scrambling sequence $c_1, c_2 \ldots c_{40}$.~~

The mask output bits $s_{1,1}, s_{1,2} \ldots s_{1,40}$ are calculated as follows:

$s_{1k} = (r_{1,k} + c_k) \ mod \ 2$ for k = 1,2…40

3GPP TSG RAN Meeting #17 ***R1-02-1093***
Biarritz, France, 3 – 6, September 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.212** **CR** **158** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

*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:	⌘	Specification of H-RNTI to UE identity mapping
Source:	⌘	TSG RAN WG1
Work item code:	⌘	HSDPA-Phys
Date:	⌘	15/08/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one 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 one 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 H-RNTI to UE identity mapping is currently specified twice in 25.212.
Summary of change:	⌘	The mapping is specified in a separate section. Unncessary specification of “unsigned binary” form removed.
Consequences if not approved:	⌘	Maintenance of 25.212 will be more difficult and error prone in the event that the mapping is ever changed.

Clauses affected:	⌘	4.6.2.4, 4.6.4, 4.6.7

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

Other comments: ⌘

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4.6.2.4 UE identity mapping

The UE identity is the HS-DSCH Radio Network Identifier (H-RNTI) defined in [13]. This is mapped such that $x_{ue,1}$ corresponds to the MSB and $x_{ue,16}$ to the LSB.

4.6.4 CRC attachment for HS-SCCH

From the sequence of bits $x_{1,1}, x_{1,2}, \ldots, x_{1,8}, x_{2,1}, x_{2,2}, \ldots, x_{2,13}$ a 16 bits CRC is calculated according to Section 4.2.1.1. This gives a sequence of bits $c_1, c_2, \ldots, c_{16}$. This sequence of bits is then masked with the UE ~~ID~~ identity $x_{ue,1}, x_{ue,2}, \ldots, x_{ue,16}$~~, where $x_{ue,1}$ *is the* MSB *and* $x_{ue,16}$ is the LSB of the UE ID,~~ and then appended to the sequence of bits $x_{2,1}, x_{2,2}, \ldots, x_{2,13}$~~ The UE ID corresponds to the HS-DSCH Radio Network Identifier (H-RNTI) as defined in [13], expressed in unsigned binary form~~. The mask CRC bits correspond to the sequence of bits $y_1, y_2, \ldots, y_{29}$, where

$y_i = x_{2,i}$ $\quad i=1,2,\ldots,13$

$y_i = c_{i-13} + x_{ue,i-13} \bmod 2$ $\quad i=14,15,\ldots,29$

4.6.7 UE specific masking for HS-SCCH

The rate matched bits $r_{1,1}, r_{1,2} \ldots r_{1,40}$ shall be masked in an UE specific way using the UE ~~ID~~ identity $x_{ue,1}, x_{ue,2}, \ldots, x_{ue,16}$, ~~*where $x_{ue,1}$ is the MSB and $x_{ue,16}$* is the LSB of the UE ID,~~ to produce the bits $s_{1,1}, s_{1,2} \ldots s_{1,40}$. ~~The UE ID corresponds to the HS-DSCH Radio Network Identifier (H-RNTI) as defined in [13], expressed in unsigned binary form.~~

Intermediate code word bits b_i, i=1,2…,48, are defined by endcoding the UE ~~ID~~ identity bits using the rate ½ convolutional coding described in Section 4.2.3.1. Eight bits out of the resulting 48 convolutionally encoded bits are punctured using rate matching with the general method described in Section 4.2.7.5 where $X_i = 48$, $e_{ini}=1$, $e_{plus}=96$ and $e_{minus}=16$. That is, from the input sequence $b_1, b_2, \ldots, b_{48}$, the bits $b_1, b_7, b_{13}, b_{19}, b_{25}, b_{31}, b_{37}, b_{43}$ are punctured to obtain the 40 bit UE specific scrambling sequence $c_1, c_2 \ldots c_{40}$.

The mask output bits $s_{1,1}, s_{1,2} \ldots s_{1,40}$ are calculated as follows:

$s_{1,k} = (r_{1,k} + c_k) \; mod \; 2$ for k = 1,2…40