TSG RAN Meeting #27 **RP-050045**
Tokyo, Japan, 9 - 11 March 2005

Title **CR (Rel-6 Category C) to TS25.212 for HARQ bit collection for E-DCH**
Source **TSG RAN WG1**
Agenda Item **9.6**

RAN1 Tdoc	Spec	CR	Rev	Rel	Cat	Current Version	Subject	Work item	Remarks
R1-050108	25.212	199	-	Rel-6	C	6.3.0	HARQ bit collection for E-DCH	EDCH-Phys	

3GPP TSG-RAN WG1 Meeting #40
Scottsdale, AZ, USA, February 14th- 18th, 2005

Tdoc R1-050108 ⌘

CR-Form-v7

CHANGE REQUEST

⌘ **25.212** **CR** **199** ⌘ **rev** **-** ⌘ Current version: **6.3.0** ⌘

*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 for E-DCH
Source:	⌘	RAN WG1
Work item code:	⌘	EDCH-Phys
Date:	⌘	07/02/2005
Category:	⌘	**C**
Release:	⌘	Rel-6

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:	⌘	This CR introduces a simplification for HARQ bit collection for E-DCH.
Summary of change:	⌘	HARQ bit collection for E-DCH made the same as for Rel 99.
Consequences if not approved:	⌘	E-DCH bit collection is unnecessarily complex, which can lead to higher cost in terms of implementation and testing.

Clauses affected:	⌘	4.8.4.4

Other specs affected: ⌘	Y	N		⌘
		X	Other core specifications	
			Test specifications	
			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 reques

4.8.4 Physical layer HARQ functionality and rate matching for E-DCH

The hybrid ARQ functionality matches the number of bits at the output of the channel coder to the total number of bits of the E-DPDCH set to which the E-DCH transport channel is mapped. The hybrid ARQ functionality is controlled by the redundancy version (RV) parameters.

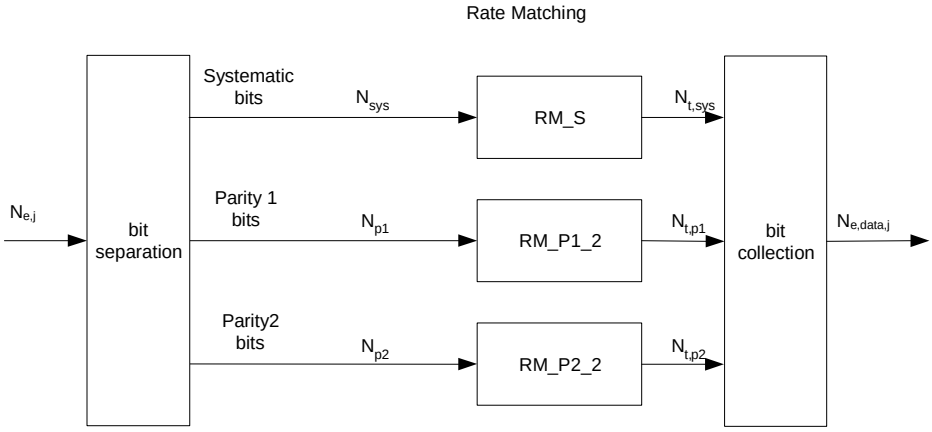

Figure 22: E-DCH hybrid ARQ functionality

4.8.4.1 Determination of SF and number of PhCHs needed

The maximum amount of puncturing that can be applied is

- 1-$PL_{non\text{-}max}$ if the number of code channels is less than the maximum allowed by the UE capability and restrictions imposed by UTRAN.
- 1-PL_{max} if the number of code channels equals to the maximum allowed by the UE capability and restrictions imposed by UTRAN.

The number of available bits per TTI of one E-DPDCH for all possible spreading factors is denoted by N_{64}, N_{32}, N_{16}, N_8, N_4 and N_2, where the index refers to the spreading factor.

The possible number of bits available to the CCTrCH of E-DCH type on all PhCHs, $N_{e,data}$, then are $\{N_{64}, N_{32}, N_{16}, N_8, N_4, 2\times N_4, 2\times N_2, 2\times N_2+2\times N_4\}$.

SET0 denotes the set of $N_{e,data}$ values allowed by the UTRAN and supported by the UE, as part of the UE's capability. SET0 can be a subset of $\{N_{64}, N_{32}, N_{16}, N_8, N_4, 2\times N_4, 2\times N_2, 2\times N_2+2\times N_4\}$.

The total number of bits in a TTI before rate matching with transport format j is $N_{e,j}$. The total number of bits available for the E-DCH transmission per TTI with transport format j, $N_{e,data,j}$, is determined by executing the following algorithm:

SET1 = { $N_{e,data}$ in SET0 such that $N_{e,data} - N_{e,j}$ is non negative }

If SET1 is not empty and the smallest element of SET1 requires just one E-DPDCH then

$N_{e,data,j}$ = min SET1

Else

SET2 = { $N_{e,data}$ in SET0 such that $N_{e,data} - PL_{non\text{-}max} \times N_{e,j}$ is non negative }

If SET2 is not empty then

Sort SET2 in ascending order

$N_{e,data}$ = min SET2

While $N_{e,data}$ is not the max of SET2 and the follower of $N_{e,data}$ requires no additional E-DPDCH do

$N_{e,data}$ = follower of $N_{e,data}$ in SET2

End while

$N_{e,data,j} = N_{,e,data}$

Else

$N_{e,data,j}$ = max SET0 provided that $N_{e,data,j}$ - $PL_{max} \times N_{e,j}$ is non negative

End if

End if

4.8.4.2 HARQ bit separation

The HARQ bit separation function shall be performed in the same way as bit separation for turbo encoded TrCHs in 4.2.7.4.1 above.

4.8.4.3 HARQ Rate Matching Stage

The hybrid ARQ rate matching for the E-DCH transport channel shall be done with the general method described in 4.2.7.5 with the following specific parameters. Bits selected for puncturing which appear as δ in the algorithm in 4.2.7.5 shall be discarded and are not counted in the streams towards the bit collection.

The parameters of the rate matching stage depend on the value of the RV parameters *s* and *r*. The *s* and *r* combinations corresponding to each RV allowed for the E-DCH are listed in the table below.

Table 15: RV for E-DCH

E-DCH RV Index	*s*	*r*
0	1	0
1	0	0
2	1	1
3	0	1

The parameter e_{plus}, e_{minus} and e_{ini} are calculated with the general method for QPSK as described in 4.5.4.3 above. The following parameters are used as input:

- $N_{sys} = N_{p1} = N_{p2} = N_{e,j}/3$
- $N_{data} = N_{e,data,j}$
- $r_{max} = 2$

4.8.4.4 HARQ bit collection

The HARQ bit collection shall be performed according to the general method for bit collection as specified in 4.2.7.4.2~~specified in 4.5.4.4 above using the specific parameter N_{row}=2 as input~~.