TSG-RAN Meeting #22 **RP-030624**
Maui, USA, 09-12 December 2003

Title: **25.321 CRs to Rel-5**

Source: **TSG-RAN WG2**

Agenda item: **7.3.5**

Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Version-New	Doc-2nd-Level	Workitem
25.321	179	-	Rel-5	Corrections Relating to HSDPA TB Sizes for 1.28Mcps TDD	F	5.6.0	5.7.0	R2-032619	HSDPA-L23
25.321	180	-	Rel-5	HSDPA Transport block size table for 3.84Mcps TDD	F	5.6.0	5.7.0	R2-032620	HSDPA-L23
25.321	181	-	Rel-5	HSDPA TB size table	F	5.6.0	5.7.0	R2-032621	HSDPA-L23
25.321	182	-	Rel-5	Unwarranted HARQ re-transmissions	F	5.6.0	5.7.0	R2-032622	HSDPA-L23
25.321	183	-	Rel-5	MAC-hs Re-ordering Protocol Flushing correction	F	5.6.0	5.7.0	R2-032623	HSDPA-L23
25.321	184	-	Rel-5	Correction to window based stall avoidance mechanism	F	5.6.0	5.7.0	R2-032624	HSDPA-L23

3GPP TSG-RAN WG2 Meeting #39 ***R2-032619***
San-Diego, USA, 17th – 21st November 2003

CR-Form-v7

CHANGE REQUEST

⌘ **25.321** **CR** **179** ⌘**rev** ⌘ Current version: **5.6.0** ⌘

*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:	⌘	Corrections Relating to HSDPA TB Sizes for 1.28Mcps TDD
Source:	⌘	RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	17th November 2003
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:	⌘	1. HSDPA Transport Block sizes are currently expressed as a function of 'HSDPA UE class'. The parameter should be replaced by the parameter 'HS-DSCH physical layer capability' because it is this parameter that identifies UE capability and it is signalled on the Uu and Iub interfaces whereas 'HSDPA UE class' is not. 2. For consistency with FDD and for the same reasons that tabular listing of HSDPA transport block sizes were introduced for FDD, tabular representation of block sizes are added for 1.28 Mcps TDD.
Summary of change:	⌘	1. In section 9.2.3.3 the parameter UE HS-DSCH physical layer category replaces UE classes for HSDPA. 2. In section 9.2.3.3 tables of HSDPA transport block sizes are added.
Consequences if not approved:	⌘	1. The specification of HSDPA transport block sizes will remain a function of a parameter that is not made known to UTRAN by the UE. 2. Reference block sizes will not be available to enable confirmation of the correct operation of the HSDPA transport block formulae.

Clauses affected:	⌘	9.2.3.3

Other specs affected: ⌘	Y	N		⌘
		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.

9.2.3.3 Transport block size for 1.28 Mcps TDD

The mapping of transport block size, in bits, to TFRI value is dependent upon the UE's HS-DSCH capability class.

If k is the signalled TFRI value then the corresponding HS-DSCH transport block size L_k is given by:
If k = 1..62

$$L_k = \lfloor L_{\min} p^{k-1} \rfloor$$

where

$p = \frac{1340}{1269}$ ~~for the 1.4 Mbps user class~~if the HS-DSCH physical layer category is between 1 and 6 inclusively,

$p = \frac{1755}{1652}$ ~~for the 2.0 Mbps user class~~ if the HS-DSCH physical layer category is between 7 and 12 inclusively,

$p = \frac{2345}{2196}$ ~~for the 2.8 Mbps user class~~ if the HS-DSCH physical layer category is between 13 and 15 inclusively,

and

$$L_{\min} = 240$$

If k = 63 then,

L_k = 7016 ~~for the 1.4 Mbps user class~~ if the HS-DSCH physical layer category is between 1 and 6 inclusively,

10204 ~~for the 2.0 Mbps user class~~ if the HS-DSCH physical layer category is between 7 and 12 inclusively,

14056 ~~for the 2.8 Mbps user class~~ if the HS-DSCH physical layer category is between 13 and 15 inclusively.

If k=0, L_k indicates NULL and shall not be used to signal a transport block size in the TFRI.

Transport block sizes calculated by this formulae shall equal the values indicated in the following tables: –

Table 9.2.3.3.1: HSDPA Transport Block Sizes for 1.28 Mcps TDD, for HS-DSCH physical layer category [1,6]

TB index (k)	TB size [bits]	TB index (k)	TB size [bits]	TB index (k)	TB size [bits]	TB index (k)	TB size [bits]
0	NULL	16	543	32	1297	48	3100
1	240	17	573	33	1370	49	3274
2	253	18	605	34	1446	50	3457
3	267	19	639	35	1527	51	3650
4	282	20	675	36	1613	52	3854
5	298	21	712	37	1703	53	4070
6	315	22	752	38	1798	54	4298
7	332	23	794	39	1899	55	4538
8	351	24	839	40	2005	56	4792
9	370	25	886	41	2118	57	5060
10	391	26	936	42	2236	58	5344
11	413	27	988	43	2361	59	5643
12	436	28	1043	44	2493	60	5958

13	461	29	1102	45	2633	61	6292
14	487	30	1163	46	2780	62	6644
15	514	31	1228	47	2936	63	7016

Table 9.2.3.3.2: HSDPA Transport Block Sizes for 1.28 Mcps TDD, for HS-DSCH physical layer category [7,12]

TB index (k)	TB size [bits]	TB index (k)	TB size [bits]	TB index (k)	TB size [bits]	TB index (k)	TB size [bits]
0	NULL	16	594	32	1564	48	4118
1	240	17	631	33	1662	49	4375
2	254	18	671	34	1766	50	4648
3	270	19	712	35	1876	51	4938
4	287	20	757	36	1993	52	5246
5	305	21	804	37	2117	53	5573
6	324	22	854	38	2249	54	5920
7	344	23	908	39	2389	55	6289
8	366	24	964	40	2538	56	6681
9	389	25	1024	41	2697	57	7098
10	413	26	1088	42	2865	58	7541
11	439	27	1156	43	3043	59	8011
12	466	28	1228	44	3233	60	8510
13	495	29	1305	45	3435	61	9041
14	526	30	1386	46	3649	62	9605
15	559	31	1473	47	3877	63	10204

Table 9.2.3.3.3 : HSDPA Transport Block Sizes for 1.28 Mcps TDD, for HS-DSCH physical layer category [13,15]

TB index (k)	TB size [bits]	TB index (k)	TB size [bits]	TB index (k)	TB size [bits]	TB index (k)	TB size [bits]
0	NULL	16	642	32	1836	48	5250
1	240	17	686	33	1961	49	5606
2	256	18	732	34	2094	50	5987
3	273	19	782	35	2236	51	6393
4	292	20	835	36	2388	52	6827
5	312	21	892	37	2550	53	7290
6	333	22	952	38	2723	54	7785
7	355	23	1017	39	2908	55	8313
8	380	24	1086	40	3105	56	8877
9	405	25	1160	41	3316	57	9479
10	433	26	1238	42	3541	58	10123
11	462	27	1322	43	3781	59	10809
12	494	28	1412	44	4037	60	11543
13	527	29	1508	45	4311	61	12326
14	563	30	1610	46	4604	62	13162
15	601	31	1719	47	4916	63	14056

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San Diego, USA, 17-21 November 2003

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CHANGE REQUEST

⌘ **25.321** **CR** **180** ⌘ **rev** **-** ⌘ Current version: **5.6.0** ⌘

*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:	⌘	HSDPA Transport block size table for 3.84Mcps TDD
Source:	⌘	RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	13/11/2003
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
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C *(functional modification of feature)*
D *(editorial modification)*
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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:	⌘	For consistency with FDD and for the same reasons that tabular listing of HSDPA transport block sizes were introduced for FDD, tabular representation of block sizes are added for 3.84 Mcps TDD.
Summary of change:	⌘	In section 9.2.3.2 tables of HSDPA transport block sizes are added.
Consequences if not approved:	⌘	Reference block sizes will not be available to enable confirmation of the correct operation of the HSDPA transport block formulae.

Clauses affected:	⌘	9.2.3.2			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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9.2.3.2 Transport block size for 3.84 Mcps TDD

Let k be the signalled TFRI value, then the corresponding HS-DSCH transport block size L_k is given by :

If k=1..510

$$L_k = \lfloor L_{\min} p^k \rfloor$$

$$p = \frac{8313}{8192}$$

$$L_{\min} = 57$$

If k = 511

L_k = 102000

If k=0, L_k indicates NULL and shall not be used to signal a transport block size in the TFRI.

Transport block sizes calculated by this formula shall equal the values indicated in Table 9.2.3.2.1

Table 9.2.3.2.1: HSDPA Transport Block Sizes for 3.84 Mcps TDD

TB index (k)	TB size [bits]	TB index (k)	TB size [bits]	TB index (k)	TB size [bits]	TB index (k)	TB size [bits]
0	NULL	128	372	256	2432	384	15890
1	57	129	377	257	2468	385	16124
2	58	130	383	258	2504	386	16362
3	59	131	389	259	2541	387	16604
4	60	132	394	260	2579	388	16849
5	61	133	400	261	2617	389	17098
6	62	134	406	262	2656	390	17351
7	63	135	412	263	2695	391	17607
8	64	136	418	264	2735	392	17867
9	65	137	424	265	2775	393	18131
10	66	138	431	266	2816	394	18399
11	66	139	437	267	2858	395	18671
12	67	140	443	268	2900	396	18946
13	68	141	450	269	2943	397	19226
14	69	142	457	270	2986	398	19510
15	71	143	463	271	3030	399	19798
16	72	144	470	272	3075	400	20091
17	73	145	477	273	3121	401	20388
18	74	146	484	274	3167	402	20689
19	75	147	491	275	3213	403	20994
20	76	148	499	276	3261	404	21304
21	77	149	506	277	3309	405	21619
22	78	150	514	278	3358	406	21938
23	79	151	521	279	3408	407	22263
24	81	152	529	280	3458	408	22591
25	82	153	537	281	3509	409	22925
26	83	154	545	282	3561	410	23264
27	84	155	553	283	3613	411	23607

28	85	156	561	284	3667	412	23956
29	87	157	569	285	3721	413	24310
30	88	158	578	286	3776	414	24669
31	89	159	586	287	3832	415	25033
32	91	160	595	288	3888	416	25403
33	92	161	604	289	3946	417	25778
34	93	162	613	290	4004	418	26159
35	95	163	622	291	4063	419	26545
36	96	164	631	292	4123	420	26938
37	98	165	640	293	4184	421	27335
38	99	166	650	294	4246	422	27739
39	100	167	659	295	4309	423	28149
40	102	168	669	296	4372	424	28565
41	103	169	679	297	4437	425	28987
42	105	170	689	298	4502	426	29415
43	107	171	699	299	4569	427	29849
44	108	172	709	300	4636	428	30290
45	110	173	720	301	4705	429	30738
46	111	174	730	302	4774	430	31192
47	113	175	741	303	4845	431	31652
48	115	176	752	304	4916	432	32120
49	116	177	763	305	4989	433	32594
50	118	178	775	306	5063	434	33076
51	120	179	786	307	5138	435	33564
52	122	180	798	308	5213	436	34060
53	123	181	809	309	5290	437	34563
54	125	182	821	310	5369	438	35074
55	127	183	834	311	5448	439	35592
56	129	184	846	312	5528	440	36117
57	131	185	858	313	5610	441	36651
58	133	186	871	314	5693	442	37192
59	135	187	884	315	5777	443	37742
60	137	188	897	316	5862	444	38299
61	139	189	910	317	5949	445	38865
62	141	190	924	318	6037	446	39439
63	143	191	937	319	6126	447	40021
64	145	192	951	320	6217	448	40613
65	147	193	965	321	6308	449	41212
66	150	194	980	322	6402	450	41821
67	152	195	994	323	6496	451	42439
68	154	196	1009	324	6592	452	43066
69	156	197	1024	325	6689	453	43702
70	159	198	1039	326	6788	454	44347
71	161	199	1054	327	6889	455	45002
72	163	200	1070	328	6990	456	45667
73	166	201	1085	329	7094	457	46342
74	168	202	1101	330	7198	458	47026
75	171	203	1118	331	7305	459	47721
76	173	204	1134	332	7413	460	48426
77	176	205	1151	333	7522	461	49141

78	178	206	1168	334	7633	462	49867
79	181	207	1185	335	7746	463	50603
80	184	208	1203	336	7860	464	51351
81	186	209	1221	337	7976	465	52109
82	189	210	1239	338	8094	466	52879
83	192	211	1257	339	8214	467	53660
84	195	212	1276	340	8335	468	54453
85	198	213	1294	341	8458	469	55257
86	201	214	1313	342	8583	470	56073
87	204	215	1333	343	8710	471	56901
88	207	216	1353	344	8839	472	57742
89	210	217	1373	345	8969	473	58595
90	213	218	1393	346	9102	474	59460
91	216	219	1413	347	9236	475	60338
92	219	220	1434	348	9373	476	61230
93	222	221	1456	349	9511	477	62134
94	226	222	1477	350	9652	478	63052
95	229	223	1499	351	9794	479	63983
96	232	224	1521	352	9939	480	64928
97	236	225	1543	353	10086	481	65887
98	239	226	1566	354	10235	482	66860
99	243	227	1589	355	10386	483	67848
100	246	228	1613	356	10539	484	68850
101	250	229	1637	357	10695	485	69867
102	254	230	1661	358	10853	486	70899
103	258	231	1685	359	11013	487	71946
104	261	232	1710	360	11176	488	73009
105	265	233	1736	361	11341	489	74087
106	269	234	1761	362	11508	490	75182
107	273	235	1787	363	11678	491	76292
108	277	236	1814	364	11851	492	77419
109	281	237	1840	365	12026	493	78563
110	285	238	1868	366	12204	494	79723
111	290	239	1895	367	12384	495	80901
112	294	240	1923	368	12567	496	82095
113	298	241	1952	369	12752	497	83308
114	303	242	1981	370	12941	498	84539
115	307	243	2010	371	13132	499	85787
116	312	244	2039	372	13326	500	87054
117	316	245	2070	373	13523	501	88340
118	321	246	2100	374	13722	502	89645
119	326	247	2131	375	13925	503	90969
120	331	248	2163	376	14131	504	92313
121	336	249	2195	377	14340	505	93676
122	340	250	2227	378	14551	506	95060
123	346	251	2260	379	14766	507	96464
124	351	252	2293	380	14984	508	97889
125	356	253	2327	381	15206	509	99335
126	361	254	2362	382	15430	510	100802
127	366	255	2397	383	15658	511	102000

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San Diego, USA, 9/17/2003

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CHANGE REQUEST

⌘ **25.321** **CR** **181** ⌘ **rev** **-** ⌘ Current version: **5.6.0** ⌘

*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:	⌘	HSDPA TB size table
Source:	⌘	RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	9/17/2003
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
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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 formula based scheme is open to finite accuracy and rounding errors. Note also that part
Summary of change:	⌘	Made the formula informative and introduced the normative table in an Annex.
Consequences if not approved:	⌘	Errors in the computation may result in costly hardware changes for manufacturers.

Clauses affected:	⌘	9.2.3.1, Annex A

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

Other specs affected: ⌘

Other comments: ⌘

The formula after the first "else" in 9.2.3.1:

$L(i,k_i) = \lfloor L_{\min} p^{k_{0,i}+k_i} \rfloor$
$p = 2085/2048$
$L_{\min} = 296$
$k_{0,i} = \text{from Table } 9.2.3.1$
$k_i = 0,...,63$

Was erroneously deleted in the version 5.6.0.
It is now proposed to change it into:

$L(k_t) = \lfloor L_{\min} p^{k_t} \rfloor$
$p = 2085/2048$
$L_{\min} = 296$

	(the previous formula has been “added and deleted” with change bars, so that people can see what happened).

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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.

9.2.3.1 Transport block size for FDD

For all transmissions of a transport block, the transport block size is derived from the TFRI value as specified below, except only in those cases of retransmissions where the Node-B selects a combination for which no mapping exists between the original transport block size and the selected combination of channelisation Code set and modulation type. In such cases, the transport block size index value signalled to the UE shall be set to 111111, i.e., k_i=63.

Let k_i be the TFRI signalled on the HS-SCCH value and let $k_{0,i}$ be the value in the table 9.2.3.1 corresponding to the modulation and the number of codes signalled on the HS-SCCH. Let k_t be the sum of the two values: $k_t = k_i + k_{0,i}$. The transport block size $L(k_t)$ can be obtained by accessing the position k_t in the table in Annex A (normative) or by using the formula below (informative):

~~For each combination of channelization code set and modulation scheme i = 0..31, a set of k_i = 0..62 transport block sizes $L(i, k_i)$ is given by:~~

If k_t ~~i = 0 and k_i~~ < 4039

$$\frac{L(i,k_i) = 137 + 12k_i}{k_i = 0,...,38} \qquad L(k_t) = 125 + 12 \cdot k_t$$

else

$$L(i,k_i) = \lfloor L_{\min} p^{k_{0,i}+k_i} \rfloor$$
$$p = 2085/2048$$
$$\frac{L_{\min} = 296}{k_{0,i} = \text{from Table } 9.2.3.1} \qquad p = 2085/2048$$
$$\frac{k_i = 0,...,63}{} \qquad L_{\min} = 296$$

$$L(k_t) = \lfloor L_{\min} p^{k_t} \rfloor$$

end

~~The 'if' statement above is true only for a single channelization code using QPSK modulation. The index k_i of the transport block size $L(i, k_i)$ corresponds to the 6 bit transport block size index signalled on the HS-SCCH. The index i corresponds to the combination of channelization code set and modulation scheme as defined in Table 9.2.3.1.~~

Table 9.2.3.1: Values of $k_{0,i}$ for different numbers of channelization codes and modulation schemes

Combination i	Modulation scheme	Number of channelization codes	$k_{0,i}$
0	QPSK	1	1
1		2	40
2		3	63
3		4	79
4		5	92
5		6	102
6		7	111
7		8	118
8		9	125
9		10	131
10		11	136
11		12	141
12		13	145
13		14	150
14		15	153
15	16QAM	1	40
16		2	79
17		3	102

18		4	118
19		5	131
20		6	141
21		7	150
22		8	157
23		9	164
24		10	169
25		11	175
26		12	180
27		13	184
28		14	188
29		15	192

Annex A (normative): HS-DSCH Transport Block Size Table for FDD

The following table provides the mapping between k_t (as per the definition in section 9.2.3.1) and the HS-DSCH Transport Block Size ($L(k_t)$):

Index	TB Size	Index	TB Size	Index	TB Size
1	137	86	1380	171	6324
2	149	87	1405	172	6438
3	161	88	1430	173	6554
4	173	89	1456	174	6673
5	185	90	1483	175	6793
6	197	91	1509	176	6916
7	209	92	1537	177	7041
8	221	93	1564	178	7168
9	233	94	1593	179	7298
10	245	95	1621	180	7430
11	257	96	1651	181	7564
12	269	97	1681	182	7700
13	281	98	1711	183	7840
14	293	99	1742	184	7981
15	305	100	1773	185	8125
16	317	101	1805	186	8272
17	329	102	1838	187	8422
18	341	103	1871	188	8574
19	353	104	1905	189	8729
20	365	105	1939	190	8886
21	377	106	1974	191	9047
22	389	107	2010	192	9210
23	401	108	2046	193	9377
24	413	109	2083	194	9546
25	425	110	2121	195	9719
26	437	111	2159	196	9894
27	449	112	2198	197	10073
28	461	113	2238	198	10255
29	473	114	2279	199	10440
30	485	115	2320	200	10629

31	497	116	2362	201	10821
32	509	117	2404	202	11017
33	521	118	2448	203	11216
34	533	119	2492	204	11418
35	545	120	2537	205	11625
36	557	121	2583	206	11835
37	569	122	2630	207	12048
38	581	123	2677	208	12266
39	593	124	2726	209	12488
40	605	125	2775	210	12713
41	616	126	2825	211	12943
42	627	127	2876	212	13177
43	639	128	2928	213	13415
44	650	129	2981	214	13657
45	662	130	3035	215	13904
46	674	131	3090	216	14155
47	686	132	3145	217	14411
48	699	133	3202	218	14671
49	711	134	3260	219	14936
50	724	135	3319	220	15206
51	737	136	3379	221	15481
52	751	137	3440	222	15761
53	764	138	3502	223	16045
54	778	139	3565	224	16335
55	792	140	3630	225	16630
56	806	141	3695	226	16931
57	821	142	3762	227	17237
58	836	143	3830	228	17548
59	851	144	3899	229	17865
60	866	145	3970	230	18188
61	882	146	4042	231	18517
62	898	147	4115	232	18851
63	914	148	4189	233	19192
64	931	149	4265	234	19538
65	947	150	4342	235	19891
66	964	151	4420	236	20251
67	982	152	4500	237	20617
68	1000	153	4581	238	20989
69	1018	154	4664	239	21368
70	1036	155	4748	240	21754
71	1055	156	4834	241	22147
72	1074	157	4921	242	22548
73	1093	158	5010	243	22955
74	1113	159	5101	244	23370
75	1133	160	5193	245	23792
76	1154	161	5287	246	24222
77	1175	162	5382	247	24659
78	1196	163	5480	248	25105
79	1217	164	5579	249	25558
80	1239	165	5680	250	26020
81	1262	166	5782	251	26490
82	1285	167	5887	252	26969
83	1308	168	5993	253	27456
84	1331	169	6101	254	27952
85	1356	170	6211		

3GPP TSG-RAN2 Meeting #39
San Diego, USA, 17th November 2003

Tdoc ⌘R2-032622

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CHANGE REQUEST

⌘ **25.321** **CR** **182** ⌘ **rev** **-** ⌘ Current version: **5.6.0** ⌘

*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:	⌘	Unwarranted HARQ re-transmissions
Source:	⌘	RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	17/11/2003
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:	⌘	It is not stated what will happen if a new transmission is scheduled before the UE de-coding is completed. It is not stated what the HARQ process will do if a MAC-hs PDU is intended for a HARQ process which does not exist
Summary of change:	⌘	We specify that the UE will discard data meant for a MAC-hs process that does not exist. We specify that if a transmission is received within 5TTI of the previous one, then the UE should discard it.
Consequences if not approved:	⌘	UE implementations will have to handle cases which are not useful and will therefore be made more complex without reason.

Clauses affected:	⌘	11.6.2.1, 11.6.2.2

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

Other comments:	⌘	

How to create CRs using this form:
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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.

11.6.2.1 HARQ Entity

~~—~~There is one HARQ entity at the UE which processes the HARQ process identifiers ~~in~~ received on the HS-SCCH transmissions associated with MAC-hs PDUs received on the HS-DSCH. [NOTE TO EDITOR: CHANGE IN FORMAT]

A number of parallel HARQ processes are used in the UE to support the HARQ entity. The number of HARQ processes is configured by upper layers:

- Each received MAC-hs PDU shall be allocated to the HARQ process indicated by the HARQ process identifier of the MAC-hs PDU.

~~— If there is no HARQ process corresponding to the indicated HARQ process identifier of the MAC-hs PDU, the PDU shall be discarded.~~

11.6.2.2 HARQ process

~~A number of parallel HARQ processes are used in the UE to support the HARQ protocol. The number of HARQ processes is configured by upper layers.~~

The HARQ process processes the New Data Indicator indicated by lower layers for each received MAC-hs PDU.

The UE may:

- for FDD, if the MAC-hs PDU is received within 5 sub-frames from the reception of the previous MAC-hs PDU intended for this HARQ process; or
- for TDD, if the MAC-hs PDU is received before generation of feedback resulting from reception of a previous MAC-hs PDU for the same H-ARQ process:
  - discard the MAC-hs PDU.

The UE shall:

- if the New Data Indicator has been incremented compared to the value in the previous received transmission in this HARQ process or this is the first received transmission in the HARQ process:
  - replace the data currently in the soft buffer for this HARQ process with the received data.
  - if the Transport Block Size index value is equal to 111111 (FDD only):
    - generate a positive acknowledgement (ACK) of the data in this HARQ process;
    - discard the received data;
    - assume that the data has been successfully decoded.
- if the New Data Indicator is identical to the value used in the previous received transmission in the HARQ process:
  - if the Transport Block Size index value is equal to 111111 (FDD only):
    - assume that the transport block size is identical to the last valid transport block size signalled for this HARQ process.
  - if the data has not yet been successfully decoded:
    - combine the received data with the data currently in the soft buffer for this HARQ process.
- if the data in the soft buffer has been successfully decoded and no error was detected:
  - deliver the decoded MAC-hs PDU to the reordering entity;
  - generate a positive acknowledgement (ACK) of the data in this HARQ process.
- else:

  - generate a negative acknowledgement (NAK) of the data in this HARQ process;

- schedule the generated positive or negative acknowledgement for transmission and the time of transmission relative to the reception of data in a HARQ process is configured by upper layer.

The HARQ process processes the Queue ID in the received MAC-hs PDUs. The UE shall:

- arrange the received MAC-hs PDUs in queues based on the Queue ID.

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San-Diego, US, 17th – 21th November 2003

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CR-Form-v7

CHANGE REQUEST

⌘ **25.321** **CR** **183** ⌘ **rev** ⌘ Current version: **5.6.0** ⌘

*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:	⌘	MAC-hs Re-ordering Protocol Flushing correction
Source:	⌘	RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	September 2003
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:	⌘	During RAN2#37, CR174R1 (R2-032038) was approved. This CR introduced the possibility for the UE to flush part of its re-ordering buffer in case of memory shortage. The introduced description was however incomplete.
Summary of change:	⌘	The description of the flushing is completed.
Consequences if not approved:	⌘	The description of the flushing remains incomplete.

Clauses affected:	⌘	11.6.2.3.2

	Y	N		
Other specs affected: ⌘		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.

11.6.2.3.2 Reordering functionality

If no timer T1 is active:

- the timer T1 shall be started when a MAC-hs PDU with TSN > next_expected_TSN is correctly received.
- T1_TSN shall be set to the TSN of this MAC-hs PDU.

If a timer T1 is already active:

- no additional timer shall be started, i.e. only one timer T1 may be active at a given time.

The timer T1 shall be stopped if:

- the MAC-hs PDU with TSN = T1_TSN can be delivered to the disassembly entity before the timer expires.

When the timer T1expires and T1_TSN > next_expected_TSN:

- all correctly received MAC-hs PDUs with TSN > next_expected_TSN up to and including T1_TSN-1 shall be delivered to the disassembly entity;
- all correctly received MAC-hs PDUs up to the next not received MAC-hs PDU shall be delivered to the disassembly entity.
- next_expected_TSN shall be set to the TSN of the next not received MAC-hs PDU.

When the timer T1 is stopped or expires, and there still exist some received MAC-hs PDUs that can not be delivered to higher layer:

- timer T1 is started
- set T1_TSN to the highest TSN among those of the MAC-hs PDUs that can not be delivered.

Transmitter operation:

After the transmitter has transmitted a MAC-hs PDU with TSN=SN, any MAC-hs PDU with TSN ≤ SN – TRANSMIT_WINDOW_SIZE should not be retransmitted to avoid sequence number ambiguity in the receiver.

Receiver operation:

When a MAC-hs PDU with TSN = SN is received:

- If SN is within the receiver window:
  - if SN < next_expected_TSN, or this MAC-hs PDU has previously been received:
    - the MAC-hs PDU shall be discarded.
    - else:
  - the MAC-hs PDU is placed in the reordering buffer at the place indicated by the TSN.

- If SN is outside the receiver window:
  - the received MAC-hs PDU shall be placed above the highest received TSN in the reordering buffer, at the position indicated by SN;
  - RcvWindow_UpperEdge shall be set to SN thus advancing the receiver window;
  - any MAC-hs PDUs with TSN ≤ RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE, i.e. outside the receiver window after its position is updated, shall be removed from the reordering buffer and be delivered to the disassembly entity;

- next_expected_TSN shall be set to RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE + 1;

- All received MAC-hs PDUs with consecutive TSNs from next_expected_TSN (included) up to the first not received MAC-hs PDU are delivered to the disassembly entity.

- next_expected_TSN shall be advanced to the TSN of this first not received MAC-hs PDU.

In case a UE has insufficient memory to process a received MAC-hs PDU, it shall perform the following set of operations:

- select TSN_flush such that: next_expected_TSN < TSN_flush ≤ RcvWindow_UpperEdge + 1;

- deliver all correctly received MAC-hs PDUs with TSN < ~~next_expected_~~TSN_flush to the disassembly entity;

- if the MAC-hs PDU with TSN=TSN_flush has previously been received:

  - deliver all received MAC-hs PDUs with consecutive TSNs from TSN_flush (included) up to the first not received MAC-hs PDU to the disassembly entity;

  - advance next_expected_TSN to the TSN of this first not received MAC-hs PDU.

- else

  - set next_expected_TSN to TSN_flush. [comment: changed indentation]

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San Diego, USA, 17th-21st November, 2003

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CHANGE REQUEST

⌘ **25.321** **CR** **184** ⌘ **rev** **-** ⌘ Current version: **5.6.0** ⌘

*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:	⌘	Correction to window based stall avoidance mechanism
Source:	⌘	RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	Nov 2003
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)*
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Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
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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:	⌘	Current receiver operation with window based stall avoidance mechanism is incomplete. Protocol errors may occur if next_expected_TSN is unconditionally set to the lower edge of the receiver window after the receiver window is updated.
Summary of change:	⌘	1. A new condition is added so that the next_expected_TSN is set to the lower edge of the receiver window only when the next_expected_TSN goes below the receiver window. 2. A clarifying condition is added so that the delivery of the MAC-hs PDUs whose TSNs are larger than or equal to the next_expected_TSN is activated when the MAC-hs PDU with TSN = next_expecte_TSN is already stored in the reordering buffer. **Isolated Impact Analysis** The change has an isolated impact since only the UE behavior of the window based stall avoidance mechanism is affected. The change can be seen as a correction where the specification was incomplete.
Consequences if not approved:	⌘	1. Correctly and sequentially received MAC-hs PDU may be stored in the reordering buffer not being delivered to disassembly entity. It can increase transmission delay. 2. UE can't figure out whether the received MAC-hs PDU has valid TSN. It can cause protocol errors.

Clauses affected:	⌘	11.6.2.3

Y N

Other specs affected:	⌘		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.

11.6.2.3 Reordering entity

11.6.2.3.1 Definitions

In the functions described in this section the following definitions apply:

Parameters

- Transmitter window size (TRANSMIT_WINDOW_SIZE)
  TRANSMIT_WINDOW_SIZE is the size of the transmitter window according to the definition below. This is a parameter in the Node B and the value of the parameter is configured by higher layers.

- Receiver window size (RECEIVE_WINDOW_SIZE)
  RECEIVE_WINDOW_SIZE is the size of the receiver window according to the definition below. This is a parameter in the UE and the value of the parameter is configured by higher layers.

State variables

- next_expected_TSN:
  The next_expected_TSN is the Transmission sequence number (TSN) following the TSN of the last in-sequence MAC-hs PDU received. It shall be updated upon the delivery~~receipt~~ to the disassembly entity of the MAC-hs PDU with TSN equal to next_expected_TSN. The initial value of next_expected_TSN =0.

- RcvWindow_UpperEdge:
  The RcvWindow_UpperEdge represents the TSN, which is at the upper edge of the receiver window. After the first MAC-hs PDU has been received successfully, it also corresponds to the MAC-hs PDU with the highest TSN of all received MAC-hs PDUs. The initial RcvWindow_UpperEdge equals 63. RcvWindow_UpperEdge is updated based on the reception of new ~~payloads~~MAC-hs PDU according to the procedure given below.

- T1_TSN:
  The TSN of the latest MAC-hs PDU that cannot be delivered to the disassembly entity, when the timer T1 is started.

Timers

- Re-ordering release timer (T1):
  The Re-ordering release timer T1 controls the stall avoidance in the UE reordering buffer as described below. The value of T1 is configured by upper layers.

Other definitions

- Receiver window:
  The receiver window defines TSNs of those MAC-hs PDUs that can be received in the receiver without causing an advancement of the receiver window according to the procedure below. The size of the receiver window equals RECEIVE_WINDOW_SIZE and spans TSNs going from RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE + 1 to RcvWindow_UpperEdge included.

11.6.2.3.2 Reordering functionality

If no timer T1 is active:

- the timer T1 shall be started when a MAC-hs PDU with TSN > next_expected_TSN is correctly received.

- T1_TSN shall be set to the TSN of this MAC-hs PDU.

If a timer T1 is already active:

- no additional timer shall be started, i.e. only one timer T1 may be active at a given time.

The timer T1 shall be stopped if:

- the MAC-hs PDU with TSN = T1_TSN can be delivered to the disassembly entity before the timer expires.

When the timer T1expires and T1_TSN > next_expected_TSN:

- all correctly received MAC-hs PDUs with TSN > next_expected_TSN up to and including T1_TSN-1 shall be delivered to the disassembly entity;
- all correctly received MAC-hs PDUs up to the next not received MAC-hs PDU shall be delivered to the disassembly entity.
- next_expected_TSN shall be set to the TSN of the next not received MAC-hs PDU.

When the timer T1 is stopped or expires, and there still exist some received MAC-hs PDUs that can not be delivered to higher layer:

- timer T1 is started
- set T1_TSN to the highest TSN among those of the MAC-hs PDUs that can not be delivered.

Transmitter operation:

After the transmitter has transmitted a MAC-hs PDU with TSN=SN, any MAC-hs PDU with TSN ≤ SN – TRANSMIT_WINDOW_SIZE should not be retransmitted to avoid sequence number ambiguity in the receiver.

Receiver operation:

When a MAC-hs PDU with TSN = SN is received:

- ~~I~~if SN is within the receiver window:
  - if SN < next_expected_TSN, ~~-~~or this MAC-hs PDU has previously been received:
    - the MAC-hs PDU shall be discarded;~~-~~
  - else: [Indentation changed to B2]
    - the MAC-hs PDU ~~is~~shall be placed in the reordering buffer at the place indicated by the TSN;~~-~~ [Indentation changed to B3]

- ~~I~~if SN is outside the receiver window:
  - the received MAC-hs PDU shall be placed above the highest received TSN in the reordering buffer, at the position indicated by SN;
  - RcvWindow_UpperEdge shall be set to SN thus advancing the receiver window;
  - any MAC-hs PDUs with TSN ≤ RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE, i.e. outside the receiver window after its position is updated, shall be removed from the reordering buffer and be delivered to the disassembly entity;
  - if next_expected_TSN is below the updated receiver window:
    - next_expected_TSN shall be set to RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE + 1; [Indentation changed to B3]

- if the MAC-hs PDU with TSN = next_expected_TSN is stored in the reordering buffer:
  - ~~A~~all received MAC-hs PDUs with consecutive TSNs from next_expected_TSN (included) up to the first not received MAC-hs PDU ~~are~~shall be delivered to the disassembly entity;~~-~~ [Indentation changed to B2]
  - next_expected_TSN shall be advanced ~~-~~to the TSN of this first not received MAC-hs PDU. [Indentation changed to B2]

In case a UE has insufficient memory to process a received MAC-hs PDU, it shall perform the following set of operations:

- select TSN_flush such that: next_expected_TSN < TSN_flush ≤ RcvWindow_UpperEdge + 1;
- deliver all correctly received MAC-hs PDUs with TSN < next_expected_TSN to the disassembly entity;
- set next_expected_TSN to TSN_flush.