TSG-RAN Meeting #8 *RP-000206*
Düsseldorf, Germany, 21 – 23 June 2000

Title: **Agreed CRs to TS 25.104**

Source: **TSG-RAN WG4**

Agenda item: **5.4.3**

Doc-1st-	Spec	CR	Re	Phas	Subject	Cat	Version	Version
RP-000206	25.104	040		R99	Correction of frequency numbering scheme	F	3.2.0	3.3.0
RP-000206	25.104	041		R99	Add requirements on SSDT from 5.1.1.8.	D	3.2.0	3.3.0
RP-000206	25.104	042		R99	Correction to Emission mask	F	3.2.0	3.3.0
RP-000206	25.104	043		R99	Clarification of the specification on Peak Code Domain Error	F	3.2.0	3.3.0
RP-000206	25.104	044		R99	Editorial changes, including definitions and abbreviations	D	3.2.0	3.3.0
RP-000206	25.104	045		R99	Reference Measurement Channels	F	3.2.0	3.3.0
RP-000206	25.104	046		R99	Editorial corrections on moving propagation conditions	F	3.2.0	3.3.0
RP-000206	25.104	047		R99	Conformance values for dynamic propagation conditions	F	3.2.0	3.3.0
RP-000206	25.104	048		R99	Alignment of measurement descriptions between 25.141 and	F	3.2.0	3.3.0

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.104	CR	040	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	RAN #8	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 [ ] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: RAN WG4 **Date:** 2000-05-15

Subject: Correction of frequency numbering scheme

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: Corrects an editorial error in the frequency numbering scheme.

Clauses affected: 5.4.3

Other specs affected:

Other 3G core specifications		→ List of CRs:
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:

5.4 Channel arrangement

5.4.1 Channel spacing

The nominal channel spacing is 5 MHz, but this can be adjusted to optimize performance in a particular deployment scenario.

5.4.2 Channel raster

The channel raster is 200 kHz, which means that the center frequency must be an integer multiple of 200 kHz.

5.4.3 Channel number

The carrier frequency is designated by the UTRA Absolute Radio Frequency Channel Number (UARFCN). The value of the UARFCN in the IMT2000 band is defined as follows;

Table 5.1: UTRA Absolute Radio Frequency Channel Number

Uplink	$N_u = 5 * (F_{uplink}$ MHz)	0.0 MHz ≤ F_{uplink} ≤ 3276.6 MHz where F_{uplink} is the uplink frequency in MHz
Downlink	$N_d = 5 * (F_{downlink}$ MHz)	0.0 MHz ≤ ~~F_{uplink}~~ $F_{downlink}$ ≤ 3276.6 MHz where $F_{downlink}$ is the downlink frequency in MHz

3G CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.104 **CR** **041** Current Version: 3.2.0

3G specification number ↑ *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #8 *list TSG meeting no. here ↑*

For approval [X] For information [ ] *(only one box should be marked with an X)*

Form: 3G CR cover sheet, version 1.0 *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf*

Proposed change affects: *(at least one should be marked with an X)* USIM [ ] ME [ ] UTRAN [X] Core Network [ ]

Source: RAN WG4 **Date:** 2000-05-15

Subject: Editorial corrections -SSDT

3G Work item:

Category: *(only one category Shall be marked With an X)*

F	Correction	
A	Corresponds to a correction in a 2G specification	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	X

Release:

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

Reason for change: To Incorporate outcome from RAN4-AH in Malmoe

Clauses affected:

Other specs Affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other 2G core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[X]	→ List of CRs: CR 25.141-xxx attached
O&M specifications	[ ]	→ List of CRs:

Other comments: Section numbers to be rearranged.

8.6 BS Functionality in Site Selection Diversity Transmission (SSDT) Mode

Site Selection Diversity Transmission (SSDT) is an optional feature of BS. This requirement for SSDT mode ensures that BS correctly reacts to Layer 1 feedback signaling messages from UE.

8.6.1 Minimum requirements

For the conditions specified, the BS shall transmit or not transmit the downlink DPDCH channel.

Table 8.8: Parameters for SSDT mode test

Parameter	Unit	Test 1	Test 2	Test 3	Test 4
Cell ID of BS under test	-	A	A	A	A
SSDT Quality threshold, Q_{th}, set in BS	dB	-5			
Uplink: $\frac{DPCH\_E_c}{I_o}$	dB	Q_{th} + 10	Q_{th} + 10	Q_{th} - 3	Q_{th} – 3
Cell ID transmitted by UE	-	A	B	A	B
Transmission Of downlink DPCCH	-	Yes	Yes	Yes	Yes
Transmission Of downlink DPDCH	-	Yes	No	Yes	Yes

The above test should be for repeated for each of the three code sets “long”, “medium” and “short” Cell ID code sets. The UE emulator can check the power ratio of downlink DPDCH/DPCCH in order to confirm whether BS transmitted the DPDCH.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.104	CR	042	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	RAN#8	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: *(at least one should be marked with an X)*	(U)SIM		ME		UTRAN / Radio	X	Core Network	

Source: RAN WG4 **Date:**

Subject: Correction for emission mask measurement

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: Correction for emission mask measurement

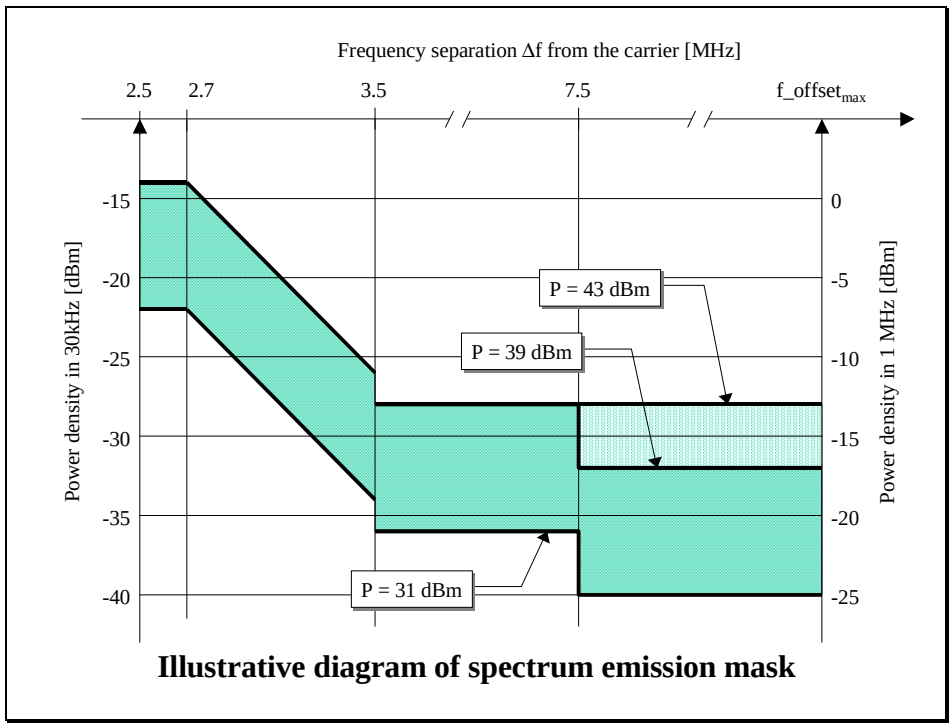
Clauses affected: 6.5.2.1 Emission mask measurement

Other specs Affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	TS 25.141
O&M specifications		→ List of CRs:	

Other comments:

- f_offset_{max} is either 12.5 MHz or the offset to the UMTS Tx band edge as defined in section 5.2, whichever is the greater.



Illustrative diagram of spectrum emission mask

Table 6.3: Spectrum emission mask values, BS maximum output power P ≥ 43 dBm

Frequency offset of measurement filter –3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-14 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	- 14 – 15·(f_offset- 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	30 kHz
3.5 ≤ Δf MHz	4.0MHz ≤ f_offset < f_offset_{max}	-13 dBm	1 MHz

Table 6.4: Spectrum emission mask values, BS maximum output power 39 ≤ P < 43 dBm

Frequency offset of measurement filter –3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-14 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	-14 – 15·(f_offset - 2.715) dBm	30 kHz
(see note)	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0MHz ≤ f_offset < 8.0MHz	-13 dBm	1 MHz
7.5 ≤ Δf MHz	8.0MHz ≤ f_offset < f_offset_{max}	P - 56 dBm	1 MHz

Table 6.5: Spectrum emission mask values, BS maximum output power 31 ≤ P < 39 dBm

Frequency offset of measurement filter –3dB point,Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	P - 53 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	P - 53 - 15·(f_offset - 2.715) dBm	30 kHz
(see note)	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	P - 52 dBm	1 MHz
7.5≤ Δf MHz	8.0MHz ≤ f_offset < f_offset_{max}	P - 56 dBm	1 MHz

Table 6.6: Spectrum emission mask values, BS maximum output power P < 31 dBm

Frequency offset of measurement filter –3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	2.515MHz ≤ f_offset < 2.715MHz	-22 dBm	30 kHz
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	-22 – 15·(f_offset - 2.715) dBm	30 kHz
(see note)	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0MHz ≤ f_offset < 8.0MHz	-21 dBm	1 MHz
7.5 ≤ Δf MHz	8.0MHz ≤ f_offset < f_offset_{max}	-25 dBm	1 MHz

NOTE: This frequency range ensures that the range of values of f_offset is continuous .

6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the transmitted power to the power measured in an adjacent channel. Both the transmitted power and the adjacent channel power are measured through a matched filter (Root Raised Cosine and roll-off 0.22) with a noise power bandwidth equal to the chip rate. The requirements shall apply for all configurations of BS (single carrier or multiple carrier), and for all operating modes foreseen by the manufacturer's specification.

6.6.2.2.1 Minimum requirement

The ACLR shall be higher than the value specified in Table 6.7.

Table 6.7: BS ACLR

BS adjacent channel offset below the first or above the last carrier frequency used	ACLR limit
5 MHz	45 dB

10 MHz	50 dB

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.104	CR	043	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: RAN#12 *list expected approval meeting # here ↑*

for approval [ ] 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 [ ] UTRAN / Radio [ ] Core Network [ ]

Source: RAN WG4 **Date:** 23.05.2000

Subject: Clarification of the specification on Peak Code Domain Error (PCDE)

Work item: TS 25.104

Category: *(only one category shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
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: The PCDE is strongly dependent on the spreading factor (SF); therefore, it is needed to clearly specify at which SF the PCDE is evaluated.

Clauses affected:

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
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:

6.8.3 Peak code Domain error

The code domain error is computed by projecting the error vector onto the code domain at a specific~~the maximum~~ spreading factor. The code domain error for every code in the domain is defined as the ratio of the mean power of the projection onto that code, to the mean power of the composite reference waveform expressed in dB. The peak code domain error is defined as the maximum value for the code domain error. The measurement interval is one power control group (timeslot).

6.8.3.1 Minimum requirement

The peak code domain error shall not exceed -33 dB at spreading factor 256

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.104	CR	044	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: RAN #8	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 [ ] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: RAN WG4 **Date:** 2000-05-25

Subject: Editorial changes, including definitions and abbreviations

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

Reason for change: Review mainly of definitions and abbreviations. Some unused definitions and abbreviations are removed, a few others added.

Clauses affected: 2, 3, 7.2, 8.2, 8.3, 8.4, 8.5

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
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:

2 References

The following documents contain provisions, which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, subsequent revisions do apply.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] ITU-R Recommendation SM.329-7, “Spurious emissions”.

[2] ETSI Technical Report ETR 028, “Radio Equipment and s (RES); Uncertainties in the measurement of mobile radio equipment characteristics”

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following definitions apply:

~~Power Setting~~	~~The value of the control signal, which determines the desired transmitter, output Power. Typically, the power setting would be altered in response to power control commands~~
~~Maximum Power Setting~~	~~The highest value of the Power control setting which can be used.~~
Output power	The mean power of one carrier odf the base station, delivered to a load with resistance equal to the nominal load impedance of the transmitter.
Rated output power	Rated output power of the base station is the mean power level per carrier that the manufacturer has declared to be available at the antenna connector.
Maximum output Power	~~This refers to the measure of power when averaged over the transmit timeslot at the maximum power setting.~~ The mean power level per carrier of the base station measured at the antenna connector in a specified reference condition.
Power control dynamic range	The difference between the maximum and the minimum transmit output power of a code channel for a specified reference condition.
Total power dynamic range	The difference between the maximum and the minimum total transmit output power for a specified reference condition.
~~Peak Power~~	~~The instantaneous power of the RF envelope which is not expected to be exceeded for [99.9%] of the time~~
~~Maximum peak power~~	~~The peak power observed when operating at a given maximum output power.~~
~~Average transmit power~~	~~The average transmitter output power obtained over any specified time interval, including periods with no transmission.~~
~~Maximum average power~~	~~The average transmitter output power obtained over any specified time interval, including periods with no transmission, when the transmit time slots are at the~~

	~~maximum power setting.~~

3.2 Symbols

For the purposes of the present document, the following symbols apply:

<symbol> <Explanation>

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ACIR	Adjacent Channel Interference Ratio
ACLR	Adjacent Channel Leakage power Ratio
ACS	Adjacent Channel Selectivity
BS	Base Station
BER	Bit Error ~~Rate~~Ratio
BLER	Block Error Ratio
CW	Continuous Wave (unmodulated signal)
DL	Down Link (forward link)
~~**EIRP**~~	~~Effective Isotropic Radiated Power~~
FDD	Frequency Division Duplexing
GSM	Global System for Mobile Communications
~~**FER**~~	~~Frame Error Rate~~
~~**MER**~~	~~Message Error Rate~~
P_{out}	Output Power
P_{RAT}	Rated Output Power
PHS	Personal Handyphone System
PPM	Parts Per Million
RSSI	Received Signal Strength Indicator
SIR	Signal to Interference ratio
TDD	Time Division Duplexing
TPC	Transmit Power Control
UARFCN	UTRA Absolute Radio Frequency Channel Number
UE	User Equipment
UL	Up Link (reverse link)
WCDMA	Wideband Code Division Multiple Access

7.2 Reference sensitivity level

The reference sensitivity is the minimum receiver input power measured at the antenna connector at which the Bit Error Ratio ~~Rate~~ (BER) does not exceed the specific value indicated in section 7.2.1.

7.2.1 Minimum requirement

For the measurement channel specified in Annex A, the reference sensitivity level and performance of the BS shall be as specified in Table 7.1.

Table 7.1: BS reference sensitivity levels

Measurement channel	BS reference sensitivity level (dBm)	BER
12.2 kbps	-121 dBm	BER shall not exceed 0.001

7.2.2 Maximum Frequency Deviation for Receiver Performance

The need for such a requirement is for further study.

8.2 Demodulation in static propagation conditions

8.2.1 Demodulation of DCH

The performance requirement of DCH in static propagation conditions is determined by the maximum Block Error Ratio ~~Rate~~ (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.2.1.1 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.2.

Table 8.2: Performance requirements in AWGN channel.

Measurement channel	Received E_b/N_0	Required BLER
12.2 kbps	n.a.	$< 10^{-1}$
	5.1 dB	$< 10^{-2}$
64 kbps	1.5 dB	$< 10^{-1}$
	1.7 dB	$< 10^{-2}$
144 kbps	0.8 dB	$< 10^{-1}$
	0.9 dB	$< 10^{-2}$
384 kbps	0.9 dB	$< 10^{-1}$
	1.0 dB	$< 10^{-2}$

8.3 Demodulation of DCH in multipath fading conditions

8.3.1 Multipath fading Case 1

The performance requirement of DCH in multipath fading Case 1 is determined by the maximum Block Error Ratio ~~Rate~~ (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.1.1 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.3.

Table 8.3: Performance requirements in multipath Case 1 channel.

Measurement channel	Received E_b/N_0	Required BLER
12.2 kbps	n.a.	$< 10^{-1}$

	11.9 dB	$< 10^{-2}$
64 kbps	6.2 dB	$< 10^{-1}$
	9.2 dB	$< 10^{-2}$
144 kbps	5.4 dB	$< 10^{-1}$
	8.4 dB	$< 10^{-2}$
384 kbps	5.8 dB	$< 10^{-1}$
	8.8 dB	$< 10^{-2}$

8.3.2 Multipath fading Case 2

The performance requirement of DCH in multipath fading Case 2 is determined by the maximum Block Error Ratio ~~Rate~~ (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.2.1 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.4.

Table 8.4: Performance requirements in multipath Case 2 channel.

Measurement channel	Received E_b/N_0	Required BLER
12.2 kbps	n.a.	$< 10^{-1}$
	9.0 dB	$< 10^{-2}$
64 kbps	4.3 dB	$< 10^{-1}$
	6.4 dB	$< 10^{-2}$
144 kbps	3.7 dB	$< 10^{-1}$
	5.6 dB	$< 10^{-2}$
384 kbps	4.1 dB	$< 10^{-1}$
	6.1 dB	$< 10^{-2}$

8.3.3 Multipath fading Case 3

The performance requirement of DCH in multipath fading Case 3 is determined by the maximum Block Error Ratio ~~Rate~~ (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.3.1 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.5.

Table 8.5: Performance requirements in multipath Case 3 channel.

Measurement channel	Received E_b/N_0	Required BLER
12.2 kbps	n.a.	$< 10^{-1}$

	6.7 dB	$< 10^{-2}$
	7.5 dB	$< 10^{-3}$
64 kbps	2.9 dB	$< 10^{-1}$
	3.3 dB	$< 10^{-2}$
	3.6 dB	$< 10^{-3}$
144 kbps	2.3 dB	$< 10^{-1}$
	2.7 dB	$< 10^{-2}$
	3.1 dB	$< 10^{-3}$
384 kbps	2.7 dB	$< 10^{-1}$
	3.1 dB	$< 10^{-2}$
	3.7 dB	$< 10^{-3}$

8.4 Demodulation of DCH in moving propagation conditions

The performance requirement of DCH in moving propagation conditions is determined by the maximum Block Error Ratio ~~Rate~~ (BLER) allowed when the receiver input signal is at a specified Eb/N0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.4.1 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.6.

Table 8.6: Performance requirements in moving channel.

Measurement channel	Received E_b/N_0	Required BLER
12.2 kbps	n.a.	$< 10^{-1}$
		$< 10^{-2}$
64 kbps		$< 10^{-1}$
		$< 10^{-2}$

8.5 Demodulation of DCH in birth/death propagation conditions

The performance requirement of DCH in birth/death propagation conditions is determined by the maximum Block Error Ratio ~~Rate~~ (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.5.1 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.7.

Table 8.7: Performance requirements in birth/death channel.

Measurement channel	Received E_b/N_0	Required BLER
12.2 kbps	n.a.	$< 10^{-1}$
		$< 10^{-2}$
64 kbps		$< 10^{-1}$
		$< 10^{-2}$

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.104	CR	045	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	RAN #8	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 [ ] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: RAN WG4 **Date:** 2000-05-23

Subject: Reference Measurement Channels

Work item:

Category: *(only one category shall be marked with an X)*

			Release:	
F	Correction	X	Phase 2	
A	Corresponds to a correction in an earlier release		Release 96	
B	Addition of feature		Release 97	
C	Functional modification of feature		Release 98	
D	Editorial modification		Release 99	X
			Release 00	

Reason for change: Correction of the size of some DCCH fields in the measurement channels and of the indicated TTI for the 2048 kbps channel.

Clauses affected: Appendix A.2, A.3, A.4, A.5, A.6

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications	X	→ List of CRs:	CR 25.141-xxx attached
O&M specifications		→ List of CRs:	

Other comments: Note: The changes are in figures inserted as embedded documents, so change bars are not visible. The changes are only visible in the figures.

A.2 UL reference measurement channel for 12.2 kbps

The parameters for the UL reference measurement channel for 12.2 kbps are specified in Table A.2 and the channel coding is detailed in Figure A.2.

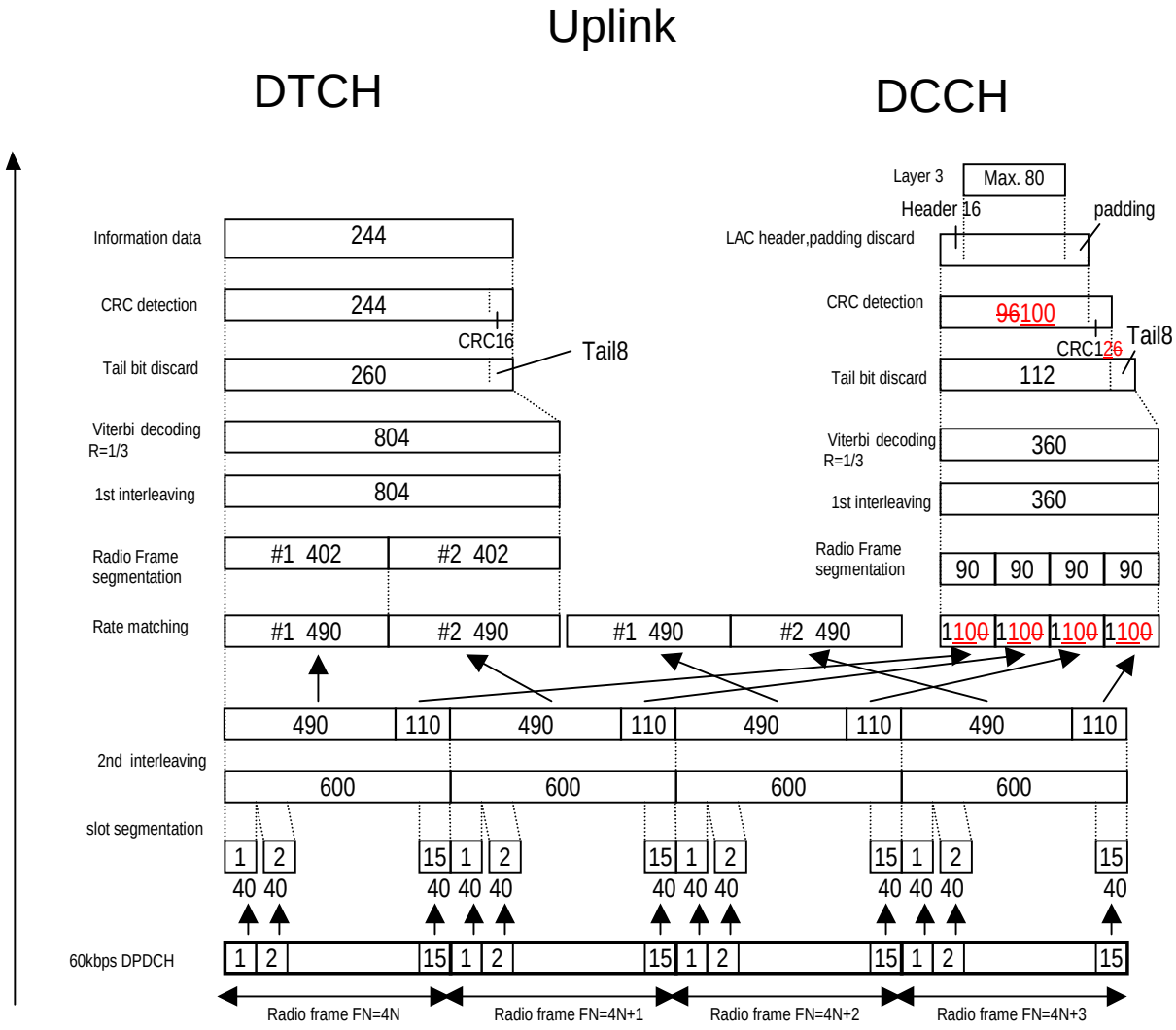


Table A.2: UL reference measurement channel (12.2 kbps)

Parameter	Level	Unit
Information bit rate	12.2	kbps
DPCH	60	kbps
Power control	Off	
TFCI	On	
Repetition	22	%

A.3 UL reference measurement channel for 64 kbps

The parameters for the UL reference measurement channel for 64 kbps are specified in Table A.3 and the channel coding is detailed in Figure A.3.

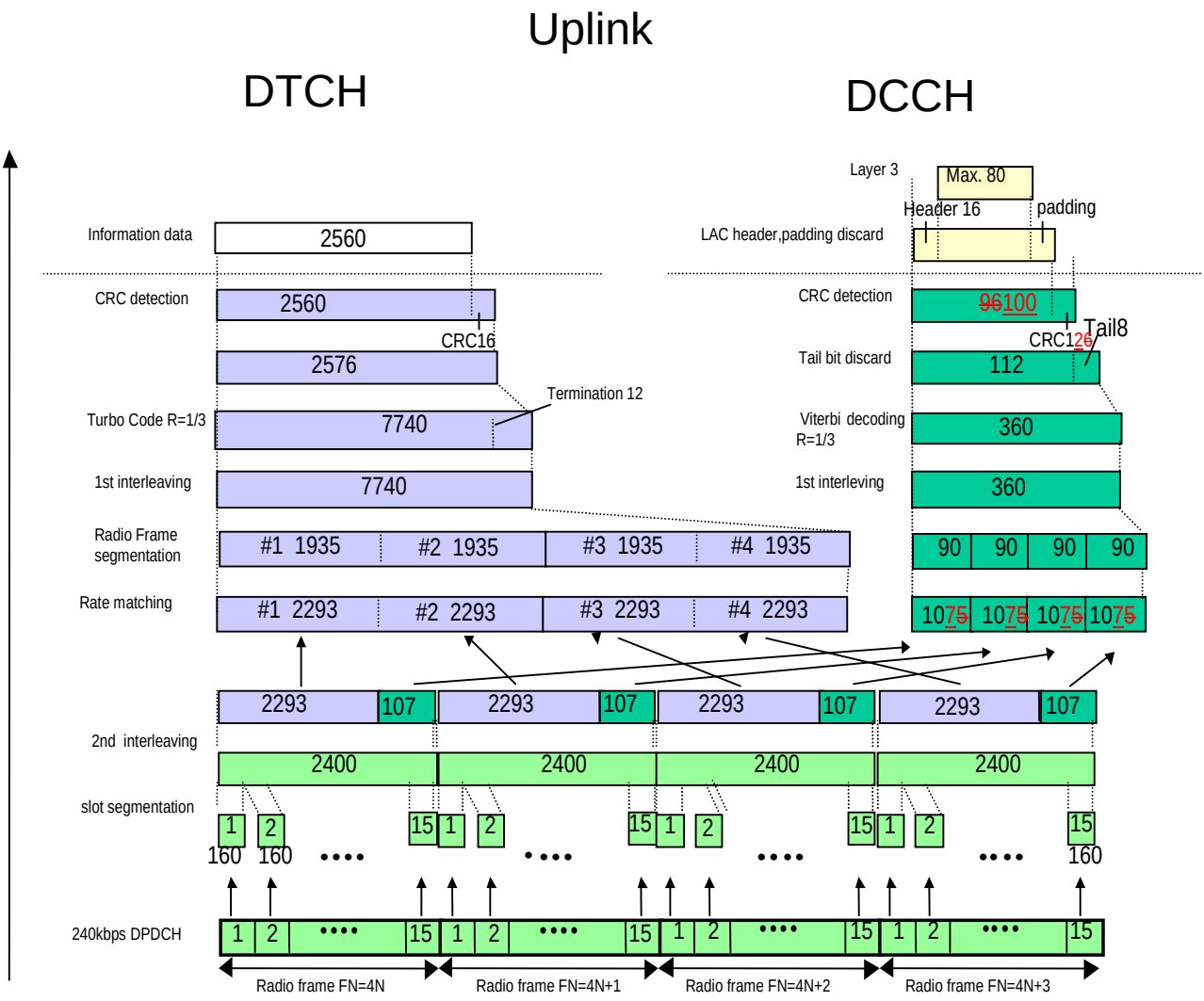


Table A.3: UL reference measurement channel (64kbps)

Parameter	Level	Unit
Information bit rate	64	kbps
DPCH	240	kbps
Power control	Off	
TFCI	On	
Repetition	19	%

A.4 UL reference measurement channel for 144 kbps

The parameters for the UL reference measurement channel for 144 kbps are specified in Table A.4 and the channel coding is detailed in Figure A.4.

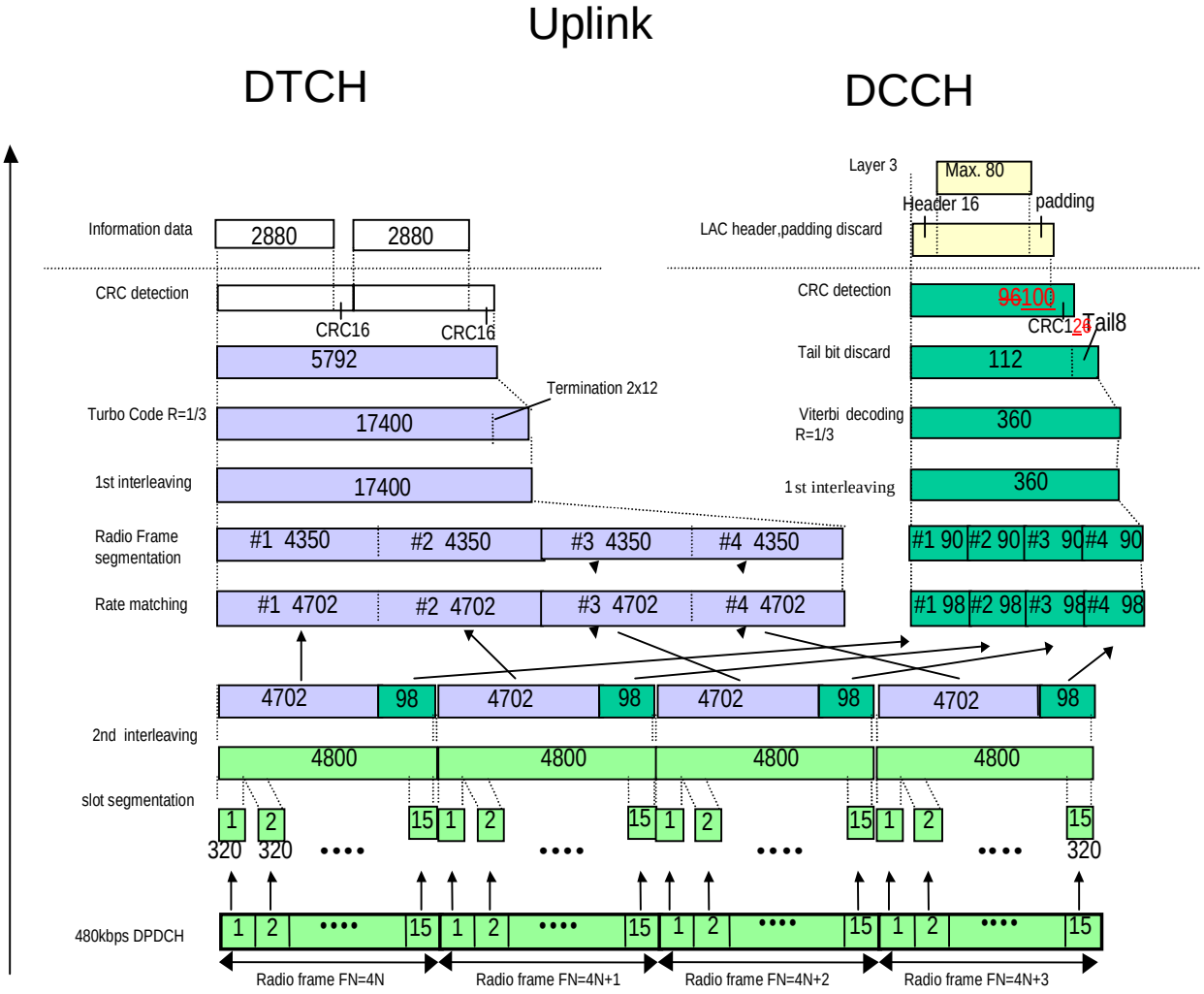


Table A.4: UL reference measurement channel (144kbps)

Parameter	Level	Unit
Information bit rate	144	kbps
DPCH	480	kbps
Power control	Off	
TFCI	On	
Repetition	8	%

A.5 UL reference measurement channel for 384 kbps

The parameters for the UL reference measurement channel for 384 kbps are specified in Table A.5 and the channel coding is detailed in Figure A.5.

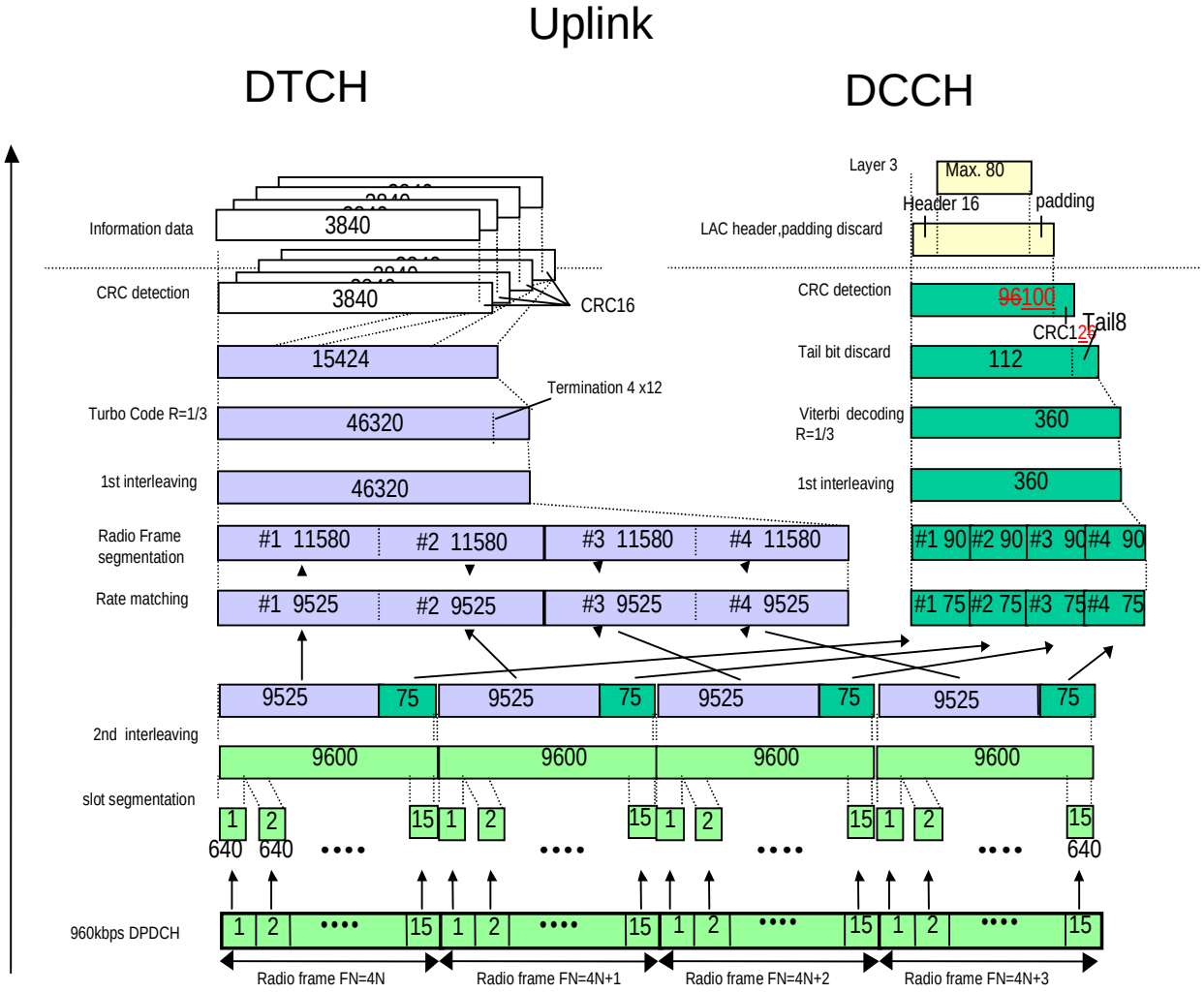


Table A.5: UL reference measurement channel (384kbps)

Parameter	Level	Unit
Information bit rate	384	kbps
DPCH	960	kbps
Power control	Off	
TFCI	On	
Puncturing	18	%

A.6 UL reference measurement channel for 2048 kbps

The parameters for the UL reference measurement channel for 2048 kbps are specified in Table A.6 and the channel coding is detailed in Figure A.6.

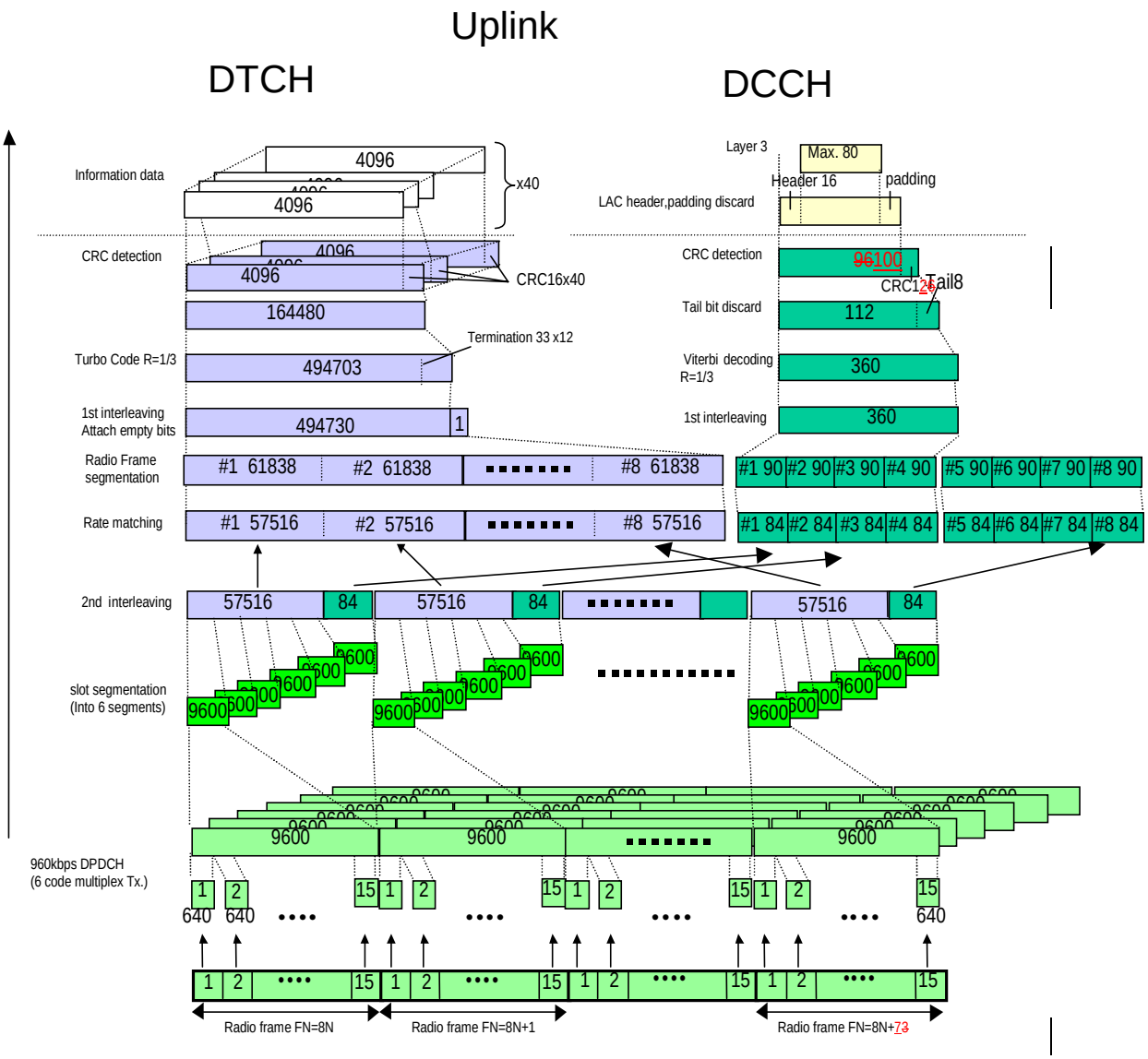


Table A.6: UL reference measurement channel (2048kbps)

Parameter	Level	Unit
Information bit rate	2048	Kbps
DPCH	960	Kbps
Power control	Off	
TFCI	On	
Puncturing	1	%

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.104	CR	046	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	RAN#8	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: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 2000-05-23

Subject: Editorial corrections on moving propagation conditions

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: Remove ambiguity on unit

Clauses affected: B.3

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications	X	→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

B.3 Moving propagation conditions

The dynamic propagation conditions for the test of the baseband performance are non-fading channel models with two taps. The moving propagation condition has two tap, one static, Path0, and one moving, Path1. The time difference between the two paths is according Equation (B.1). The parameters for the equation are shown in Table B.2. The taps have equal strengths and equal phases.

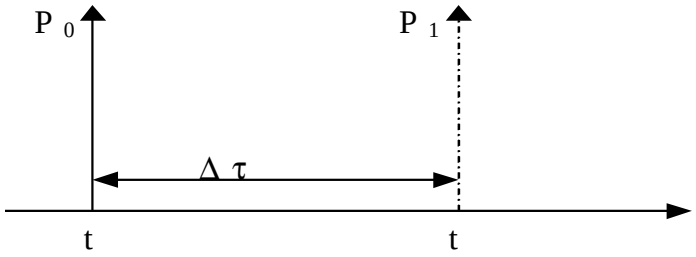


Figure B.1 The moving propagation conditions

$$\Delta\tau = B + \frac{A}{2}\left(1+\sin(\Delta\omega \cdot t)\right) \quad \text{~~}\Delta\tau = \left(1+\frac{A}{2}\left(1+\sin(\Delta\omega \cdot t)\right)\right)\text{~~}$$

(B.1)

Table B.2: Parameters for moving propagation

A	5 μs
B	1 μs
Δω	$40 \cdot 10^{-3}$ s^{-1}

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.104	CR	047	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	RAN #8	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 [ ] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: RAN WG4 **Date:** 2000-05-25

Subject: Conformance values for dynamic propagation conditions

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
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: Conformance values for moving and birth/death propagation conditions have now been achieved and concluded.

Clauses affected: 8.4, 8.5

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications	X	→ List of CRs:	25.141-xxx attached
O&M specifications		→ List of CRs:	

Other comments:

8.4 Demodulation of DCH in moving propagation conditions

The performance requirement of DCH in moving propagation conditions is determined by the maximum Block Error Rate (BLER) allowed when the receiver input signal is at a specified Eb/N0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.4.1 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.6.

Table 8.6: Performance requirements in moving channel.

Measurement channel	Received E_b/N_0	Required BLER
12.2 kbps	n.a.	$< 10^{-1}$
	5.7 dB	$< 10^{-2}$
64 kbps	2.1 dB	$< 10^{-1}$
	2.2 dB	$< 10^{-2}$

8.5 Demodulation of DCH in birth/death propagation conditions

The performance requirement of DCH in birth/death propagation conditions is determined by the maximum Block Error Rate (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.5.1 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.7.

Table 8.7: Performance requirements in birth/death channel.

Measurement channel	Received E_b/N_0	Required BLER
12.2 kbps	n.a.	$< 10^{-1}$
	7.7 dB	$< 10^{-2}$
64 kbps	4.1 dB	$< 10^{-1}$
	4.2 dB	$< 10^{-2}$

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.104	CR	048	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG RAN #8	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	X	

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 [ ] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: RAN WG4 **Date:** 2000-05-24

Subject: Alignment of measurement descriptions between 25.141 and 25.104

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	
C	Functional modification of feature	
D	Editorial modification	X

Release:

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

Reason for change: This CR aligns the new wording for measurement definitions in 25.141 introduced in R4-000469

Clauses affected: 6.3, 6.8

Other specs affected:

Other 3G core specifications		→ List of CRs:
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:

6.3 Frequency ~~stability~~Error

~~Frequency stability is ability of the BS to transmit at the assigned carrier frequency.~~ . The same source shall be used for RF frequency and data clock generation.

6.3.1 Minimum requirement

The modulated carrier frequency of the BS shall be accurate to within ± 0.05 ppm ~~for RF frequency generation~~ observed over a period of one power control group (timeslot).

6.8 Transmit modulation

Transmit modulation is specified in three parts, Frequency Error, Error Vector Magnitude and Peak Code Domain Error. These specifications are made with reference to a theoretical modulated waveform.

The theoretical modulated waveform is created by modulating a carrier at the assigned carrier frequency using the same data as was used to generate the measured waveform. The chip modulation rate for the theoretical waveform shall be exactly 3.84 Mcps. The code powers of the theoretical waveform shall be the same as the measured waveform, rather than the nominal code powers used to generate the test signal.

6.8.1 Transmit pulse shape filter

The transmit pulse-shaping filter is a root-raised cosine (RRC) with roll-off α =0.22 in the frequency domain. The impulse response of the chip impulse filter $RC_0(t)$ is

$$RC_0(t) = \frac{\sin\left(\pi \frac{t}{T_C}(1-\alpha)\right) + 4\alpha \frac{t}{T_C}\cos\left(\pi \frac{t}{T_C}(1+\alpha)\right)}{\pi \frac{t}{T_C}\left(1-\left(4\alpha \frac{t}{T_C}\right)^2\right)}$$

Where the roll-off factor α = 0.22 and the chip duration: $T_C = \frac{1}{chiprate} \approx 0.26042\mu s$

6.8.2 Error Vector Magnitude

The Error Vector Magnitude is a measure of the difference between the ~~measured waveform and the theoretical modulated waveform (the error vector). It is the square~~ theoretical waveform and a modified version of the measured waveform. This difference is called the error vector. The measured waveform is modified by first passing it through a matched Root Raised Cosine filter with bandwidth 3.84 MHz and roll-off α =0.22. The waveform is then further modified by selecting the frequency, absolute phase, absolute amplitude and chip clock timing so as to minimise the error vector. The EVM result is defined as root of the ratio of the mean error vector power to the mean reference signal power expressed as a %. The measurement interval is one power control group (timeslot). The requirement is valid over the total power dynamic range as ~~specifed~~specified in 6.4.3.

6.8.2.1 Minimum requirement

The Error Vector Magnitude shall not be worse than 17.5 %.

6.8.3 Peak code Domain error

The ~~code domain error~~ Peak Code Domain Error is computed by projecting the power of the error vector (as defined in 6.8.2) onto the code domain at the maximum spreading factor. The ~~c~~Code ~~d~~Domain ~~e~~Error for every code in the domain is defined as the ratio of the mean power of the projection onto that code, to the mean power of the composite reference waveform. This ratio is expressed in dB. The ~~p~~Peak ~~c~~Code ~~d~~Domain ~~e~~Error is defined as the maximum value for the ~~c~~Code ~~d~~Domain ~~e~~Error for all codes. The measurement interval is one power control group (timeslot).

6.8.3.1 Minimum requirement

The peak code domain error shall not exceed -33 dB