Agenda item:

Source: Siemens

Title: CR 25.225-018 : Corrections and Clarifications to 25.225

Document for: Decision

Proposed Changes to TS 25.225

The following changes are proposed to TS 25.225

1. The fact that the TDD SIR measurement is dependent on the receiver implementation is clarified by a note.

2. It is clarified that timing measurements made on received signals are defined by the first detected path (in time), using the definition given in [1].

3. It is clarified, that the Timeslot ISCP measurement in the UE only includes intercell interference

References

[1]. TSG R1-00-1049, "CR 25.211-075, CR 215-071: Clarification of first significant path".

CHANGE REQUEST

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

25.225	CR	**018r1**		Current Version:	**3.4.0**	

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

For submission to: **RAN #10**
list expected approval meeting # here
?

for approval   **X**
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 **X**   UTRAN / Radio **X**   Core Network ☐

Source:	Siemens AG	**Date:**	03/11/00

Subject: Corrections and Clarifications to 25.225

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:
The fact that the SIR measurement is receiver implementation dependent is clarified. The reference point for timing measurements on received signals is clarified to be the first detected path (in time).

Clauses affected: 3, 5.1, 5.1.3 – 5.1.6, 5.1.10 – 5.1.13, 5.2, 5.2.4, 5.2.8

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:

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Scope

The present document contains the description and definition of the measurements done at the UE and network in TDD mode in order to support operation in idle mode and connected mode.

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, the latest version applies.

[1]   3G TS 25.211: "Physical channels and mapping of transport channels onto physical channels (FDD)".

[2]   3G TS 25.212: "Multiplexing and channel coding (FDD)".

[3]   3G TS 25.213: "Spreading and modulation (FDD)".

[4]   3G TS 25.214: "Physical layer procedures (FDD)".

[5]   3G TS 25.215: "Physical layer measurements (FDD)".

[6]   3G TS 25.221: "Physical channels and mapping of transport channels onto physical channels (TDD)".

[7]   3G TS 25.222: "Multiplexing and channel coding (TDD)".

[8]   3G TS 25.223: "Spreading and modulation (TDD)".

[9]   3G TS 25.224: "Physical layer procedures (TDD)".

[10]   3G TS 25.301: "Radio Interface Protocol Architecture".

[11]   3G TS 25.302: "Services provided by the Physical layer".

[12]   3G TS 25.303: "UE functions and interlayer procedures in connected mode".

[13]   3G TS 25.304: "UE procedures in idle mode".

[14]   3G TS 25.331: "RRC Protocol Specification".

[15]   3G TR 25.922: "Radio Resource Management Strategies".

[16]   3G TR 25.923: "Report on Location Services (LCS)".

3 Abbreviations

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

BER   Bit Error Rate
BLER   Block Error Rate
CPICH   Common Pilot Channel (FDD)

DCH	Dedicated Channel
DPCH	Dedicated Physical Channel
Ec/No	Received energy per chip divided by the power density in the band
FACH	Forward Access Channel
ISCP	Interference Signal Code Power
P-CCPCH	Primary Common Control Physical Channel
PCH	Paging Channel
PLMN	Public Land Mobile Network
PRACH	Physical Random Access Channel
RACH	Random Access Channel
RSCP	Received Signal Code Power
RSSI	Received Signal Strength Indicator
S-CCPCH	Secondary Common Control Physical Channel
SCH	Synchronisation Channel
SIR	Signal-to-Interference Ratio
UE	User Equipment

4   Control of UE/UTRAN measurements

In this clause the general measurement control concept of the higher layers is briefly described to provide an understanding on how L1 measurements are initiated and controlled by higher layers.

4.1   General measurement concept

L1 provides with the measurement specifications a toolbox of measurement abilities for the UE and the UTRAN. These measurements can be differentiated in different measurement types: intra-frequency, inter-frequency, inter-system, traffic volume, quality and internal measurements (see [14]).
In the L1 measurement specifications the measurements are distinguished between measurements in the UE (the messages will be described in the RRC Protocol) and measurements in the UTRAN (the messages will be described in the NBAP and the Frame Protocol).

To initiate a specific measurement the UTRAN transmits a 'measurement control message' to the UE including a measurement ID and type, a command (setup, modify, release), the measurement objects and quantity, the reporting quantities, criteria (periodical/event-triggered) and mode (acknowledged/unacknowledged), see [14].
When the reporting criteria is fulfilled the UE shall answer with a 'measurement report message' to the UTRAN including the measurement ID and the results.
In idle mode the measurement control message is broadcast in a System Information.

Intra-frequency reporting events, traffic volume reporting events and UE internal measurement reporting events described in [14] define events which trigger the UE to send a report to the UTRAN. This defines a toolbox from which the UTRAN can choose the needed reporting events.

4.2   Measurements for cell selection/reselection

Whenever a PLMN has been selected the UE shall start to find a suitable cell to camp on, this is 'cell selection'.
When camped on cell the UE regularly searches for a better cell depending on the cell reselection criteria, this is called 'cell reselection'. The procedures for cell selection and reselection are described in [13] and the measurements carried out by the UE are explained in this specification.

4.3   Measurements for Handover

For the handover preparation the UE receives from the UTRAN a list of cells (e.g. TDD, FDD or GSM).which the UE shall monitor (see 'monitored set' in [14]) in its idle timeslots.

At the beginning of the measurement process the UE shall find synchronization to the cell to measure using the synchronization channel. This is described under 'cell search' in [9] if the monitored cell is a TDD cell and in [4] if it is an FDD cell.

For a TDD cell to monitor after this procedure the exact timing of the midamble of the P-CCPCH is known and the measurements can be performed. Depending on the UE implementation and if timing information about the cell to

monitor is available, the UE may perform the measurements on the P-CCPCH directly without prior SCH synchronisation.

4.4 Measurements for DCA

DCA is used to optimise the resource allocation by means of a channel quality criteria or traffic parameters. The DCA measurements are configured by the UTRAN. The UE reports the measurements to the UTRAN.

For DCA no measurements are performed in idle mode in the serving TDD cell.

When connecting with the initial access the UE immediately starts measuring the ISCP of time slots which are communicated on the BCH. The measurements and the preprocessing are done while the UTRAN assigns an UL channel for the UE for signalling and measurement reporting.

In connected mode the UE performs measurements according to a measurement control message from the UTRAN.

4.5 Measurements for timing advance

To update timing advance of a moving UE the UTRAN measures 'Received Timing Deviation', i.e. the time difference of the received UL transmission (PRACH, DPCH, PUSCH) in relation to its timeslot structure that means in relation to the ideal case where an UL transmission would have zero propagation delay. The measurements are reported to higher layers, where timing advance values are calculated and signalled to the UE.

5 Measurement abilities for UTRA TDD

In this clause the physical layer measurements reported to higher layers. (this may also include UE internal measurements not reported over the air-interface) are defined.

5.1 UE measurement abilities

NOTE 1:   Measurements for TDD which are specified on the Primary CCPCH (P-CCPCH) are carried out on the P-CCPCH or on any other beacon channel, see [6].

NOTE 2:   For the beacon channels [6], the received power measurements shall be based on the sum of the received powers for midambles $m^{(1)}$ and $m^{(2)}$ if Block-STTD is applied to the P-CCPCH.

NOTE 3:   The UTRAN has to take into account the UE capabilities when specifying the timeslots to be measured in the measurement control message.

NOTE 4:   The RSCP can either be measured on the data part or the midamble of a burst, since there is no power offset between both. However, in order to have a common reference, the measurement on the midamble is assumed.

NOTE 5:   The line 'applicable for' indicates whether the measurement is applicable for inter-frequency and/or intra-frequency and furthermore for idle and/or connected mode.

NOTE 6:   The Interference part of the SIR measurement will be dependent on the receiver implementation, and will normally be different from the Timeslot ISCP measurement.

NOTE 7:   The measurement 'Timeslot ISCP' is only a measure of the intercell interference.

5.1.1 P-CCPCH RSCP

Definition	Received Signal Code Power, the received power on P-CCPCH of own or neighbour cell. The reference point for the RSCP is the antenna connector at the UE.
Applicable for	idle mode, connected mode (intra-frequency & inter-frequency)

5.1.2 CPICH RSCP

Definition	Received Signal Code Power, the received power on one code measured on the Primary CPICH. The reference point for the RSCP is the antenna connector at the UE. (This measurement is used in TDD for monitoring FDD cells while camping on a TDD cell). If Tx diversity is applied on the Primary CPICH the received code power from each antenna shall be separately measured and summed together in [W] to a total received code power on the Primary CPICH.
Applicable for	idle mode, connected mode (inter-frequency)

5.1.3 Timeslot ISCP

Definition	Interference Signal Code Power, the interference on the received signal in a specified timeslot measured on the midamble. The reference point for the ISCP ~~is~~ shall be the antenna connector at the UE.
Applicable for	connected mode (intra-frequency).

5.1.4 UTRA carrier RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth in a specified timeslot. Measurement shall be performed on a UTRAN DL carrier. The reference point for the RSSI ~~is~~ shall be the antenna connector at the UE.
Applicable for	idle mode, connected mode (intra- & inter-frequency)

5.1.5 GSM carrier RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth in a specified timeslot. Measurement shall be performed on a GSM BCCH carrier. The reference point for the RSSI ~~is~~ shall be the antenna connector at the UE.
Applicable for	idle mode, connected mode (inter-frequency)

5.1.6 SIR

Definition	Signal to Interference Ratio, defined as: (RSCP/~~ISCP~~Interference)xSF. Where: RSCP = ~~─~~Received Signal Code Power, the received power on the code of a specified DPCH or ~~────~~PDSCH. ~~ISCP~~ Interference = ~~Interference Signal Code Power, t~~The interference on the received signal in the ~~────────────~~same timeslot which can't be eliminated by the receiver.~~-~~ SF = ~~────~~ The used spreading factor. The reference point for the SIR ~~is~~ shall be the antenna connector of the UE.
Applicable for	connected mode (intra-frequency)

5.1.7 CPICH Ec/No

Definition	The received energy per chip divided by the power density in the band. The Ec/No is identical to RSCP/RSSI. Measurement shall be performed on the Primary CPICH. The reference point for Ec/No is the antenna connector at the UE. (This measurement is used in TDD for monitoring FDD cells while camping on a TDD cell) If Tx diversity is applied on the Primary CPICH the received energy per chip (Ec) from each antenna shall be separately measured and summed together in [Ws] to a total received chip energy per chip on the Primary CPICH, before calculating the Ec/No.
Applicable for	idle mode, connected mode (inter-frequency)

5.1.8 Transport channel BLER

Definition	Estimation of the transport channel block error rate (BLER). The BLER estimation shall be based on evaluating the CRC on each transport block.
Applicable for	connected mode (intra-frequency)

5.1.9 UE transmitted power

Definition	The total UE transmitted power on one carrier measured in a timeslot. The reference point for the UE transmitted power shall be the UE antenna connector.
Applicable for	connected mode (intra-frequency).

5.1.10 SFN-SFN observed time difference

Definition	SFN-SFN observed time difference is the time difference of the reception times of frames from two cells (serving and target) measured in the UE and expressed in chips. It is distinguished ~~in~~ by two types. Type 2 applies if the serving and the target cell have the same frame timing.
	Type 1:
	SFN-SFN observed time difference = OFF ?38400 ~~+~~ T_m in chips, where:
	T_m = $-T_{RxSFNi} - T_{RxSFNk}$, given in chip units with the range [0, 1, …, 38399] chips
	T_{RxSFNi} ~~:~~= time of start _(defined by the first detected path in time)_ of the received frame SFN_i of the serving TDD cell i.
	T_{RxSFNk} ~~:~~= time of start _(defined by the first detected path in time)_ of the received frame SFN_k of the target UTRA cell k received most
	recent~~ly~~ in time before the time instant T_{RxSFNi} in the UE. If this frame SFN_k of the target UTRA cell is received exactly at T_{RxSFNi} then $T_{RxSFNk} = T_{RxSFNi}$ (which leads to $T_m=0$).
	OFF = $(SFN_i - SFN_k)$ mod 256, given in number of frames with the range [0, 1, …, 255] frames.
	SFN_i ~~:~~= system frame number for downlink frame from serving TDD cell i in the UE at the time T_{RxSFNi}.
	SFN_k ~~:~~= system frame number for downlink frame from target UTRA cell k received in the UE at the time T_{RxSFNk} (for FDD: the P-CCPCH frame)
	Type 2:
	SFN-SFN observed time difference = T_{RxTSk} ~~-~~ T_{RxTSi}, in chips, where
	T_{RxTSi} : time of start _(defined by the first detected path in time)_ of a timeslot received ~~of~~ from the serving TDD cell i.
	T_{RxTSk} : time of start _(defined by the first detected path in time)_ of a timeslot received from the target UTRA cell k that is closest in time to the start of the timeslot of the serving TDD cell i.
Applicable for	idle m ode, connected mode (intra-frequency), connected mode (inter-frequency)

5.1.11   SFN-CFN observed time difference

Definition	The SFN-CFN observed time difference is defined as: T_m for an FDD neighbour cell (i.e. the value is reported in chips), OFF for a TDD neighbour cell (i.e. the value is reported in frames), where: T_m = $-T_{UETx} - T_{RxSFN}$, given in chip units with the range $[0, 1, …, 38399]$ chips. T_{UETx} = is the time at the beginning of the frame with the connection frame number CFN_{TX} considering the transmission from the UE in the serving TDD cell. T_{RxSFN} = is the time (defined by the first detected path in time) at the beginning of the frame with the system frame number SFN (for FDD neighbour cells: P-CCPCH frame is considered) received at the UE from a neighbour cell. T_{RxSFN} is the time instant most recent in time before the time instant T_{UETx} OFF = $(SFN-CFN_{TX})$ mod 256, given in number of frames with the range $[0, 1, …, 255]$ frames. CFN_{Tx} = is the connection frame number for the UE transmission. SFN = is the system frame number for the neighbouring cell frame (for FDD neighbour cells: P- CCPCH frame) received in the UE at the time instant T_{RxSFN}.
Applicable for	connected mode (inter-frequency), connected mode (intra-frequency)

5.1.12   Observed time difference to GSM cell

Definition	Observed time difference to GSM cell is the time difference T_m in ms, where $T_m = T_{RxGSMk} - T_{RxSFN0i}$ $T_{RxSFN0i}$: time of start (defined by the first detected path in time) of the received frame SFN=0 of the serving TDD cell i T_{RxGSMk} : time of start (defined by the first detected path in time) of the GSM BCCH 51-multiframe of the considered target GSM frequency k received closest in time after the time $T_{RxSFN0i}$. If the next GSM BCCH 51-multiframe is received exactly at $T_{RxSFN0i}$ then $T_{RxGSMk} = T_{RxSFN0i}$ (which leads to T_m=0). The beginning of the GSM BCCH 51-multiframe is defined as the beginning of the first tail bit of the frequency correction burst in the first TDMA-frame of the GSM BCCH 51-multiframe, i.e. the TDMA-frame following the IDLE-frame.
Applicable for	Idle mode, connected mode (inter-frequency)

5.1.13   UE GPS Timing of Cell Frames for LCS

Definition	The timing between cell j and GPS Time Of Week. $T_{UE-GPSj}$ is defined as the time of occurrence of a specified UTRAN event according to GPS time. The specified UTRAN event is the beginning of a particular frame (identified through its SFN) in the first significant detected multipath (in time) of the cell j P-CCPCH measured in the UE.
Applicable for	connected mode (intra-frequency, inter-frequency)

5.2 UTRAN measurement abilities

NOTE 1: If the UTRAN supports multiple frequency bands then the measurements apply for each frequency band individually.

NOTE 2: The RSCP can either be measured on the data part or the midamble of a burst, since there is no power offset between both. However, in order to have a common reference, the measurement on the midamble is assumed.

NOTE 3: The Interference part of the SIR measurement will be dependent on the receiver implementation, and will normally be different from the Timeslot ISCP measurement

5.2.1 RSCP

Definition	Received Signal Code Power, the received power on one DPCH, PRACH or PUSCH code. The reference point for the RSCP shall be the antenna connector.

5.2.2 Timeslot ISCP

Definition	Interference Signal Code Power, the interference on the received signal in a specified timeslot measured on the midamble. The reference point for the ISCP shall be the antenna connector.

5.2.3 RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the UTRAN UL carrier channel bandwidth in a specified timeslot. The reference point for the RSSI shall be the antenna connector.

5.2.4 SIR

Definition	Signal to Interference Ratio, defined as: (RSCP/~~ISCP~~Interference)xSF.
	Where:
	RSCP = Received Signal Code Power, the received power on the code of a specified DPCH,
	                        PRACH or PUSCH.
	~~ISCP~~ Interference = ~~Interference Signal Code Power, t~~The interference on the received signal in the
	                        same timeslot which can't be eliminated by the receiver.
	SF = The used spreading factor.
	
	The reference point for the SIR shall be the antenna connector.

5.2.5 Transport channel BER

Definition	The transport channel BER is an estimation of the average bit error rate (BER) of DCH or USCH data. The transport channel (TrCH) BER is measured from the data considering only non-punctured bits at the input of the channel decoder in Node B. It shall be possible to report an estimate of the transport channel BER for a TrCH after the end of each TTI of the TrCH. The reported TrCH BER shall be an estimate of the BER during the latest TTI for that TrCH. Transport channel BER is only required to be reported for TrCHs that are channel coded.

5.2.6 Transmitted carrier power

Definition	Transmitted carrier power, is the ratio between the total transmitted power and the maximum transmission power. Total transmission power is the power [W] transmitted on one DL carrier in a specific timeslot from one UTRAN access point. Maximum transmission power is the power [W] on the same carrier when transmitting at the configured maximum transmission power for the cell. The measurement shall be possible on any carrier transmitted from the UTRAN access point. The reference point for the transmitted carrier power measurement shall be the antenna connector. In case of Tx diversity the transmitted carrier power for each branch shall be measured and the maximum of the two values shall be reported to higher layers, i.e. only one value will be reported to higher layers.

5.2.7 Transmitted code power

Definition	Transmitted Code Power, is the transmitted power on one carrier and one channelisation code in one timeslot. The reference point for the transmitted code power measurement shall be the antenna connector at the UTRAN access point cabinet.

5.2.8 RX Timing Deviation

Definition	'RX Timing Deviation' is the time difference TRXdev = TTS – TRXpath in chips, with TRXpath: time of the reception in the Node B of the first ~~significant~~ detected uplink path (in time) to be used in the detection process TTS: time of the beginning of the respective slot according to the Node B internal timing

NOTE: This measurement can be used for timing advance calculation or location services.

5.2.9 UTRAN GPS Timing of Cell Frames for LCS

Definition	The time difference between the timing of the cell and GPS Time Of Week. $T_{UTRAN-GPS}$ is defined as the time of occurrence of a specified UTRAN event according to GPS time. The specified UTRAN event is the beginning of a particular frame (identified through its SFN) transmitted in the cell.

Annex A (informative):
Monitoring GSM from TDD: Calculation Results

A.1 Low data rate traffic using 1 uplink and 1 downlink slot

NOTE: The section evaluates the time to acquire the FCCH if all idle slots are devoted to the tracking of a FCCH burst, meaning that no power measurements is done concurrently. The derived figures are better than those for GSM. The section does not derive though any conclusion. A conclusion may be that the use of the idle slots is a valid option. An alternative conclusion may be that this is the only mode to be used, removing hence the use of the slotted frames for low data traffic or the need for a dual receiver, if we were to considering the monitoring of GSM cells only, rather than GSM, TDD and FDD.

If a single synthesiser UE uses only one uplink and one downlink slot, e.g. for speech communication, the UE is not in transmit or receive state during 13 slots in each frame. According to the timeslot numbers allocated to the traffic, this period can be split into two continuous idle intervals A and B as shown in the figure below.
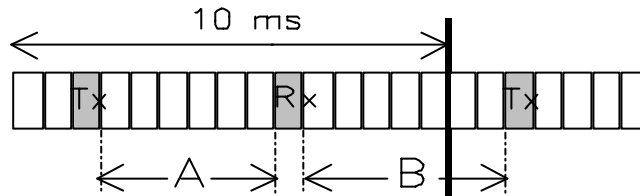
Figure A.1: Possible idle periods in a frame with two occupied timeslots

A is defined as the number of idle slots between the Tx and Rx slots and B the number of idle slots between the Rx and Tx slots. It is clear that A+B=13 time slots.

In the scope of low cost terminals, a [0.8] ms period is supposed to be required to perform a frequency jump from UMTS to GSM. This lets possibly two free periods of $A*Ts-1.6$ ms and $B*Ts-1.6$ ms during which the mobile station can monitor GSM, Ts being the slot period.

Following table evaluates the average synchronisation time and maximum synchronisation time, where the announced synchronisation time corresponds to the time needed to find the FCCH. The FCCH is supposed to be perfectly detected meaning that the FCCH is found if it is entirely present in the monitoring window. The FCCH being found the SCH location is unambiguously known from that point. All the 13 idle slots are assumed to be devoted to FCCH tracking and the UL traffic is supposed to occupy the time slot 0.

Table A.1: example- of average and maximum synchronisation time with two busy timeslots per frame and with 0.8 ms switching time (*)

Downlink time slot number	Number of free TS in A	Number of free TS in B	Average synchronisation time (ms)	Maximum synchronisation time (ms)
1	0	13	44	140
2	1	12	50	187
3	2	11	58	188
4	3	10	66	189
5	4	9	70	233
6	5	8	77	234
7	6	7	75	189
8	7	6	75	189
9	8	5	75	235
10	9	4	67	235
11	10	3	63	186
12	11	2	56	186
13	12	1	49	186
14	13	0	43	132

(*) All simulations have been performed with a random initial delay between GSM frames and UMTS frames.

Each configuration of TS allocation described above allows a monitoring period sufficient to acquire synchronisation.

A.1.1 Higher data rate traffic using more than 1 uplink and/or 1 downlink TDD timeslot

The minimum idle time to detect a complete FCCH burst for all possible alignments between the GSM and the TDD frame structure (called 'guaranteed FCCH detection'), assuming that monitoring happens every TDD frame, can be calculated as follows (t_{FCCH} = one GSM slot):

$$t_{min, guaranteed} \; ? \; 2 \, ? \; t_{synth} \; ? \; t_{FCCH} \; ? \; \frac{10\text{ms}}{13} \; ? \; 2 \, ? \; t_{synth} \; ? \; \frac{35\text{ms}}{26}$$

-   (e.g for t_{synth} =0ms: 3 TDD **consecutive** idle timeslots needed, for t_{synth} =0,3ms: 3 slots, for t_{synth} =0,5ms: 4 slots, for t_{synth} =0,8ms: 5 slots). Under this conditions the FCCH detection time can never exceed the time of 660ms.

-   (For a more general consideration t_{synth} may be considered as a sum of all delays before starting monitoring is possible).

-   For detecting SCH instead of FCCH (for a parallel search) the same equation applies.

-   In the equation before the dual synthesiser UE is included if the synthesiser switching time is 0ms.

Table A.2: FCCH detection time for a dual synthe sizer UE monitoring GSM from TDD every TDD frame

occupied slots= 15-idle slots	cases	FCCH detection time in ms	
		Average	maximum
2	105	37	189
3	455	46	327
4	1365	58	419
5	3003	72	501
6	5005	90	646
7	6435	114	660
8	6435	144	660
9	5005	175	660
10	3003	203	660
11	1365	228	660
12	455	254	660
13	105	-	-
14	15	-	-

In the table above for a given number of occupied slots in the TDD mode all possible cases of distributions of these occupied TDD slots are considered (see 'cases'). For every case arbitrary alignments of the TDD and the GSM frame structure are taken into account for calculating the average FCCH detection time (only these cases are used which guarantee FCCH detection for all alignments; only the non-parallel FCCH search is reflected by the detection times in the table 2).

The term 'occupied slots' means that the UE is not able to monitor in these TDD slots.

For a synthesiser switching time of one or one half TDD timeslot the number of needed consecutive idle TDD timeslots is summarized in the table below:

Table A.3: Link between the synthesiser performance and the number of free consecutive TSs for guaranteed FCCH detection, needed for GSM monitoring

One-way switching time for the synthesiser	Number of free consecutive TDD timeslots needed in the frame for a guaranteed FCCH detection
1 TS (=2560 chips)	5
0.5 TS (=1280 chips)	4
0 (dual synthesiser)	3

Annex B (informative):
Change history

Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
**Change history**
14/01/00	RAN_05	RP-99595	-		Approved at TSG RAN #5 and placed under Change Control	-	3.0.0
14/01/00	RAN_06	RP-99700	001	1	Primary and Secondary CCPCH in TDD	3.0.0	3.1.0
14/01/00	RAN_06	RP-99701	002	1	Block STTD capability for P-CCPCH, TDD component	3.0.0	3.1.0
14/01/00	RAN_06	RP-99700	003	1	Update concerning measurement definitions, ranges and mappings	3.0.0	3.1.0
14/01/00	-	-	-		Change history was added by the editor	3.1.0	3.1.1
31/03/00	RAN_07	RP-000071	004	1	Correction of CPICH measurements and 'RX Timing Deviation' range	3.1.1	3.2.0
31/03/00	RAN_07	RP-000071	005	2	Editorial modifications to 25.225	3.1.1	3.2.0
31/03/00	RAN_07	RP-000071	006	1	Corrections to 25.225 Measurements for TDD	3.1.1	3.2.0
26/06/00	RAN_08	RP-000275	009	-	Clarifications on TxDiversity for UTRA TDD	3.2.0	3.3.0
26/06/00	RAN_08	RP-000275	010	-	Removal of Range/mapping	3.2.0	3.3.0
26/06/00	RAN_08	RP-000275	011	-	Removal of transport channel BLER	3.2.0	3.3.0
23/09/00	RAN_09	RP-000348	012	1	Alignment of TDD measurements with FDD : GPS related measurements	3.3.0	3.4.0
23/09/00	RAN_09	RP-000348	013	1	Alignment of TDD measurements with FDD :SFN-CFN observed time difference	3.3.0	3.4.0
23/09/00	RAN_09	RP-000348	014	-	Clarification of the Timeslot ISCP measurements	3.3.0	3.4.0
23/09/00	RAN_09	RP-000348	015	-	Terminology regarding the beacon function	3.3.0	3.4.0
23/09/00	RAN_09	RP-000348	016	-	Removal of Physical Channel BER	3.3.0	3.4.0
23/09/00	RAN_09	RP-000348	017	-	Update of TS25.225 due to recent change for FDD: Reporting of UTRAN TX carrier power	3.3.0	3.4.0