

## CHANGE REQUEST

⌘ 25.214 CR 174 ⌘ ev - ⌘ Current version: 3.6.0 ⌘

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

**Proposed change affects:** ⌘ (U)SIM  ME/UE  Radio Access Network  Core Network

<b>Title:</b>	⌘ Clarification of DPCCH/DPDCH synchronisation		
<b>Source:</b>	⌘ Panasonic		
<b>Work item code:</b>	⌘	<b>Date:</b>	⌘ 18, May, 2001
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ R99
	Use <u>one</u> 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 <a href="#">TR 21.900</a> .		Use <u>one</u> 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)

<b>Reason for change:</b>	⌘ - From TS25.212, CRC length has 0 bit. The synchronisation procedure by the CRC criterion does not work well in 0bit length CRC. - In the case of power control preamble length is non-zero and activation time is signalled, the transmission starting timing has ambiguous. - The procedure of the addition to the existing radio link have first phase of radio link establishment or not is unclear. The higher layer specification does not require the synchronization of each radio link when soft handover.
<b>Summary of change:</b>	⌘ - CRC criterion is the case of non-zero length CRC is clarified. - The trasmission starting time is including power control preamble is clarified. - One or sereral radio link case behavior is clarified. The addition to the existing radio link does not have first phase of radio link establishment in subclause 4.3.1.2. UE's behavior is always same when new radio link is added.
<b>Consequences if not approved:</b>	⌘ - The synchronisation process does not work properly. - Activation time has ambiguous.

<b>Clauses affected:</b>	⌘ 4.3.1.2, 4.3.2.2, 4.3.2.3		
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	
<b>Other comments:</b>	⌘		

### How to create CRs using this form:

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## 4.3 DPCCH/DPDCH synchronisation

### 4.3.1 Synchronisation primitives

#### 4.3.1.1 General

For the dedicated channels, synchronisation primitives are used to indicate the synchronisation status of radio links, both in uplink and downlink. The definition of the primitives is given in the following subclauses.

#### 4.3.1.2 Downlink synchronisation primitives

Layer 1 in the UE shall every radio frame check synchronisation status of the downlink dedicated channels. Synchronisation status is indicated to higher layers using the CPHY-Sync-IND and CPHY-Out-of-Sync-IND primitives.

The criteria for reporting synchronisation status are defined in two different phases.

The first phase starts when higher layers initiate physical dedicated channel establishment (as described in [5]) and lasts until 160 ms after the downlink dedicated channel is considered established by higher layers (physical channel establishment is defined in [5]). During this time out-of-sync shall not be reported and in-sync shall be reported using the CPHY-Sync-IND primitive if the following criterion is fulfilled:

- The UE estimates the DPCCH quality over the previous 40 ms period to be better than a threshold  $Q_{in}$ . This criterion shall be assumed not to be fulfilled before 40 ms of DPCCH quality measurements have been collected.  $Q_{in}$  is defined implicitly by the relevant tests in [7].

The second phase starts 160 ms after the downlink dedicated channel is considered established by higher layers. During this phase both out-of-sync and in-sync are reported as follows.

Out-of-sync shall be reported using the CPHY-Out-of-Sync-IND primitive if either of the following criteria are fulfilled:

- The UE estimates the DPCCH quality over the previous 160 ms period to be worse than a threshold  $Q_{out}$ .  $Q_{out}$  is defined implicitly by the relevant tests in [7].
- The 20 most recently received transport blocks with a [non-zero length](#) CRC attached, as observed on all TrCHs using [non-zero length](#) CRC, have been received with incorrect CRC. In addition, over the previous 160 ms, all transport blocks with a [non-zero length](#) CRC attached have been received with incorrect CRC. In case of no TFCI ~~is used~~, this criterion shall be considered only for TrCHs using [non-zero length](#) CRC in all transport formats.

In-sync shall be reported using the CPHY-Sync-IND primitive if both of the following criteria are fulfilled:

- The UE estimates the DPCCH quality over the previous 160 ms period to be better than a threshold  $Q_{in}$ .  $Q_{in}$  is defined implicitly by the relevant tests in [7].
- At least one transport block with a [non-zero length](#) CRC attached, as observed on all TrCHs using [non-zero length](#) CRC, is received in a TTI ending in the current frame with correct CRC. If no transport blocks are received, or no transport block has a [non-zero length](#) CRC attached, this criterion shall be assumed to be fulfilled. In case of no TFCI ~~is used~~ this criterion shall be considered only for TrCHs using [non-zero length](#) CRC in all transport formats.

How the primitives are used by higher layers is described in [5]. The above definitions may lead to radio frames where neither the in-sync nor the out-of-sync primitives are reported.

#### 4.3.2.2 No existing radio link

When one or several radio links are to be established and there is no existing radio link for the UE already, a dedicated physical channel is to be set up in uplink and at least one dedicated physical channel is to be set up in downlink. This corresponds to the case when a dedicated physical channel is initially set up on a frequency.

The radio link establishment is as follows:

- a) Node B considers the radio link sets which are to be set up to be in the initial state. UTRAN shall start the transmission of the downlink DPCCH and may start the transmission of DPDCH if any data is to be transmitted. The initial downlink DPCCH transmit power is set by higher layers [6]. Downlink TPC commands are generated as described in 5.1.2.2.1.2.
- b) The UE establishes downlink chip and frame synchronisation of DPCCH, using the P-CCPCH timing and timing offset information notified from UTRAN. Frame synchronisation can be confirmed using the frame synchronisation word. Downlink synchronisation status is reported to higher layers every radio frame according to subclause 4.3.1.2.
- c) If no activation time for uplink DPCCH has been signalled to the UE, uplink DPCCH transmission shall start when higher layers consider the downlink physical channel established. If an activation time has been given, uplink DPCCH transmission shall not start before the downlink physical channel has been established and the activation time has been reached. Physical channel establishment and activation time are defined in [5]. The initial uplink DPCCH transmit power is set by higher layers [5]. The total signalling response delay for the establishment of a new DPCH shall not exceed the requirements given in [8] sub-clause 7.3. The transmission of the uplink DPCCH power control preamble shall start  $N_{pcp}$  radio frames prior to the start of uplink DPDCH transmission, where  $N_{pcp}$  is a higher layer parameter set by UTRAN [5]. If an activation time has been given and power control preamble length is not 0 length, power control preamble shall not start before the downlink physical channel has been established and the activation time has been reached. Note that the transmission start delay between DPCCH and DPDCH may be cancelled using a power control preamble of 0 length. The starting time for transmission of DPDCHs shall also satisfy the constraints on adding transport channels to a CCTrCH, as defined in [2] sub-clause 4.2.14, independently of whether there are any bits mapped to the DPDCHs. During the uplink DPCCH power control preamble, independently of the selected TFC, no transmission is done on the DPDCH.
- d) UTRAN establishes uplink chip and frame synchronisation. Frame synchronisation can be confirmed using the frame synchronisation word. Radio link sets remain in the initial state until  $N\_INSYNC\_IND$  successive in-sync indications are received from layer 1, when Node B shall trigger the RL Restore procedure indicating which radio link set has obtained synchronisation. When RL Restore has been triggered the radio link set shall be considered to be in the in-sync state. The parameter value of  $N\_INSYNC\_IND$  is configurable, see [6]. The RL Restore procedure may be triggered several times, indicating when synchronisation is obtained for different radio link sets.

#### 4.3.2.3 One or several existing radio links

When one or several radio links are to be established and one or several radio links already exist, there is an existing DPCCH/DPDCH in the uplink, and at least one corresponding dedicated physical channel shall be set up in the downlink. This corresponds to the case when new radio links are added to the active set and downlink transmission starts for those radio links.

The radio link establishment is as follows:

- a) Node B considers new radio link sets to be set up to be in initial state. If a radio link is to be added to an existing radio link set this radio link set shall be considered to be in the state the radio link set was prior to the addition of the radio link, i.e. if the radio link set was in the in-sync state before the addition of the radio link it shall remain in that state.
- b) UTRAN starts the transmission of the downlink DPCCH/DPDCH at a frame timing such that the frame timing received at the UE will be within  $T_0 \pm 148$  chips prior to the frame timing of the uplink DPCCH/DPDCH at the UE. Simultaneously, UTRAN establishes uplink chip and frame synchronisation of the new radio link. Frame synchronisation can be confirmed using the frame synchronization word. Radio link sets considered to be in the initial state shall remain in the initial state until  $N\_INSYNC\_IND$  successive in-sync indications are received from layer 1, when Node B shall trigger the RL Restore procedure indicating which radio link set has obtained synchronisation. When RL Restore is triggered the radio link set shall be considered to be in the in-sync state. The parameter value of  $N\_INSYNC\_IND$  is configurable, see [6]. The RL Restore procedure may be triggered several times, indicating when synchronisation is obtained for different radio link sets.

- c) ~~The UE establishes chip and frame synchronisation of the new radio link. Layer 1 in the UE keeps reporting downlink synchronization status to higher layers every radio frame according to the second phase of subclause 4.3.1.2. Frame synchronisation can be confirmed using the frame synchronization word. Downlink synchronisation status shall be reported to higher layers every radio frame according to subclause 4.3.1.2.~~

3GPP TSG-RAN-WG1 Meeting #20  
 Busan, Korea, 21-25 May 2001

R1-01-0498

CR-Form-v4
<b>CHANGE REQUEST</b>
⌘ <b>25.214 CR 175</b> ⌘ ev <b>-</b> ⌘ Current version: <b>4.0.0</b> ⌘

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