**TSG-RAN Meeting #13** ***TSGRP#13(01) 0600***
**Beijing, China, 18 - 21, September, 2001**

**Title:** **Agreed CRs to TS 25.435**

**Source:** **TSG-RAN WG3**

**Agenda item:** **8.3.3/8.3.4/9.4.3**

| RP Tdoc | R3 Tdoc | Spec | CR_Num | Rev | Release | CR_Subject | Cat | Cur_Ver | New_Ver | Workitem |
|---|---|---|---|---|---|---|---|---|---|---|
| RP-010600 | R3-012616 | 25.435 | 048 | 1 | Rel-4 | Uplink power control for LCR TDD | F | 4.1.0 | 4.2.0 | LCRTDD-IublIur |
| RP-010600 | R3-012259 | 25.435 | 049 | | Rel-4 | Correction on RACH data frame in Iub interface | F | 4.1.0 | 4.2.0 | LCRTDD-IublIur |
| RP-010600 | R3-012617 | 25.435 | 059 | 1 | Rel-4 | Uplink Power Control for TDD | F | 4.1.0 | 4.2.0 | LCRTDD-IublIur |

**3GPP TSG-RAN3 Meeting #23**
**Helsinki, Finland, 27th-31st August 2001**

***Tdoc R3-012616***

*CR-Form-v3*

# CHANGE REQUEST

⌘ **25.435** **CR** **048** ⌘ rev **1** ⌘ Current version: **4.1.0** ⌘

*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 **X** Core Network ☐

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Uplink Power Control for LCR TDD |
| ***Source:*** | ⌘ | R-WG3 |
| ***Work item code:*** | ⌘ | LCRTDD-IublUr |
| ***Date:*** | ⌘ | August 2001 |
| ***Category:*** | ⌘ | **F** |
| ***Release:*** | ⌘ | Rel-4 |

*Use one of the following categories:*
***F*** *(essential 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)*

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | Uplink inner loop power control for 1.28 Mcps TDD is closed loop as in FDD. So it is necessary to make the "Outer Loop Power Control" Frame Protocol procedure available for the respective uplink channels. Since these include not only DCHs but also USCHs, and for the USCH the Common Transport Channel Frame Protocol is applied, the "Outer Loop Power Control" shall be added to this protocol. |
| ***Summary of change:*** | ⌘ | This CR adds the "Outer Loop Power Control" control frame and control frame type to the Common Transport Channel Frame Protocol. The coding of the control frame type "Outer loop power control" has been aligned with the coding applied in the DCH Frame Protocol (TS 25.427).<br>Revision 1: Changes agreed at R3#23 (highlighted yellow): „SRNC" is replaced by „CRNC" in ch. 5.x; the additions follow the editorial rules applied in CR63/25.427 (R3-012366) and CR58/25.435 (R3-012368) |
| ***Consequences if not approved:*** | ⌘ | If this CR is not approved, power control for the USCH for LCR TDD would not work properly. Deviations between WG3 specs and WG1 specs would remain.<br>The CR is **backward compatible** to the current version of R99.<br>This CR has **no impact** to the current version of R99. |

| | | | | |
|---|---|---|---|---|
| ***Clauses affected:*** | ⌘ | 5.8 (new), 6.3.2.3, 6.3.3.9 (new) | | |
| ***Other specs*** | ⌘ | **X** Other core specifications | ⌘ | CR057 for 25.427v4.1.0,<br>CR063 for 25.427v4.1.0,<br>CR058 for 25.435v4.1.0, |

| | | |
|---|---|---|
| ***affected:*** | ☐ | CR059 for 25.435v4.1.0 |
| | ☐ Test specifications | |
| | ☐ O&M Specifications | |
| ***Other comments:*** | ⌘ | **If both this CR048 and the CR052 for 25.435 are approved, it is recommended to approve CR059 for 25.435 which is the merger of CR048 and CR052**. |

**How to create CRs using this form:**
Comprehensive information and tips about how to create CRs can be found at:
http://www.3gpp.org/3G_Specs/CRs.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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

## 5.7 Timing Advance [3.84Mcps TDD]

This procedure is used in order to signal to the Node B the adjustment to be performed by the UE in the uplink timing.

The Node B shall use the CFN and timing adjustment values to adjust its layer 1 to allow for accurate impulse averaging.

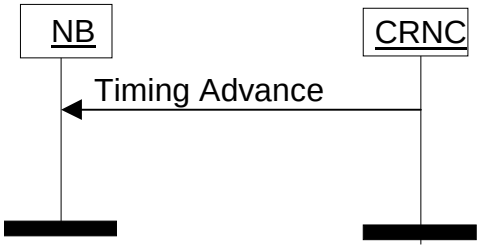



**Figure 12: Timing Advance Signalling**

## 5.x Outer Loop PC Information Transfer [1.28 Mcps TDD]

Based, for example, on the CRCI values and on the quality estimate in the USCH data frames, CRNC modifies the SIR target of the associated CCTrCH by including the absolute value of the new SIR target in the OUTER LOOP PC control frame sent to the Node B.

At the reception of the OUTER LOOP PC control frame from the CRNC via a Transport Bearer used for an USCH, the Node B shall immediately update the SIR target used for the inner loop power control for the respective CCTrCH with the specified value.

The OUTER LOOP PC control frame can be sent via any of the transport bearers carrying USCHs which belong to the CCTrCH for which the UL SIR Target shall be adjusted.

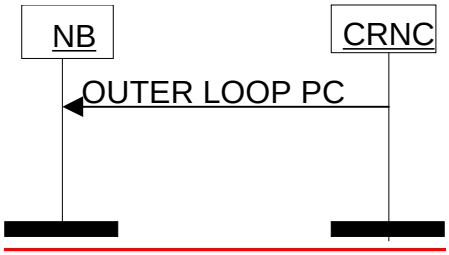



**Figure 5: Outer Loop Power Control Information Transfer procedure**

< Unchanged subclauses omitted here. >

### 6.3.2.2 Frame type (FT)

Refer to section 6.2.6.2.

### 6.3.2.3 Control Frame Type

**Description:** Indicates the type of the control information (information elements and length) contained in the payload.

**Value:** values of the Control Frame Type parameter are defined in the following table:

| Type of control frame | Value |
|---|---|
| OUTER LOOP POWER CONTROL | 0000 0001 |
| Timing adjustment | 0000 0010 |
| DL synchronisation | 0000 0011 |
| UL synchronisation | 0000 0100 |
| DL Node synchronisation | 0000 0110 |
| UL Node synchronisation | 0000 0111 |
| Dynamic PUSCH assignment | 0000 1000 |
| Timing Advance | 0000 1001 |

**Field Length:** 8 bits.

< Unchanged subclauses omitted here. >

#### 6.3.3.8.4 Spare Extension

**Description**: Indicates the location where new IEs can in the future be added in a backward compatible way.

**Field length**: 0-32 octets.

### 6.3.3.9 OUTER LOOP POWER CONTROL [1.28 Mcps TDD]

#### 6.3.3.9.1 Payload structure

Figure below shows the structure of the payload when control frame is used for the UL outer loop power control.

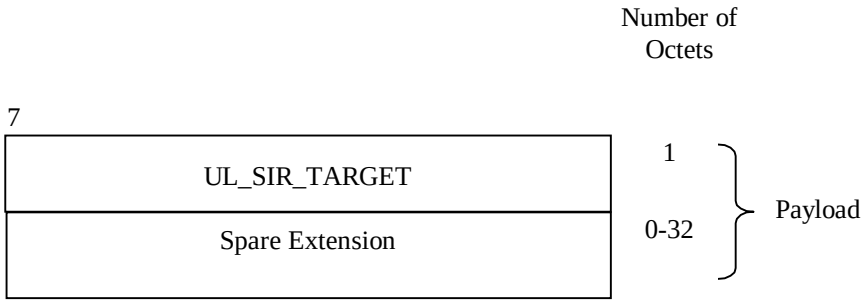



**Figure 31: Structure of the payload for OUTER LOOP PC control frame**

#### 6.3.3.9.2 SIR Target

**Description**: Value (in dB) of the SIR target to be used by the UL inner loop power control.

SIR Target is given in the unit UL_SIR_TARGET where:

UL_SIR_TARGET = 000 SIR Target = -8.2 dB
UL_SIR_TARGET = 001 SIR Target = -8.1 dB
UL_SIR_TARGET = 002 SIR Target = -8.0 dB
...
UL_SIR_TARGET = 254 SIR Target = 17.2 dB
UL_SIR_TARGET = 255 SIR Target = 17.3 dB

**Value range**: {-8.2…17.3 dB}.

**Granularity:** 0.1 dB.

**Field length**: 8 bits.

#### 6.3.3.9.3 Spare Extension

For the Spare Extension refer to subclause 6.3.3.8.4.

TSG-RAN WG 3 meeting #23 *TSGR3#23(01)2259*

**Helsinki, Finland, 27th – 31st August 2001**

*CR-Form-v3*

# CHANGE REQUEST

⌘ **25.435** **CR** **049** ⌘ rev **-** ⌘ Current version: **4.1.0** ⌘

*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 ☐

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Correction on RACH data frame in Iub interface |
| ***Source:*** | ⌘ | R-WG3 |
| ***Work item code:*** | ⌘ | LCR TDD-IublIur |
| ***Date:*** | ⌘ | Jul 2001 |
| ***Category:*** | ⌘ | **F** |
| ***Release:*** | ⌘ | Rel4 |

*Use one of the following categories:*
***F*** *(essential 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)*

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | It would simplify the implementation if the number of bits of 'Received SYNC UL Timing Deviation' ( in the RACH data frame) is changed from 11 to 8 ,so that the number of octets in the RACH data frame header would be independent of the UTRA mode (FDD; HCR TDD, LCR TDD) . |
| ***Summary of change:*** | ⌘ | 1. The figure of the RACH data frame is changed.<br>2. The number of bits of 'Received SYNC UL Timing Deviation' is changed from 11 to 8,and the resolution is changed from 1/8 chips to 1chip. |
| ***Consequences if not approved:*** | ⌘ | It would cause some difficulty in implementation.<br><br>Backward compatibility: This CR is backward compatible to the current R99 version.<br><br>This CR has isolated impact to the current R99 version, because none of the R99 functions is effected. |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 6.2.1, 6.2.7.6A |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications ⌘<br>☐ Test specifications<br>☐ 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/3G_Specs/CRs.htm. Below is a brief summary:

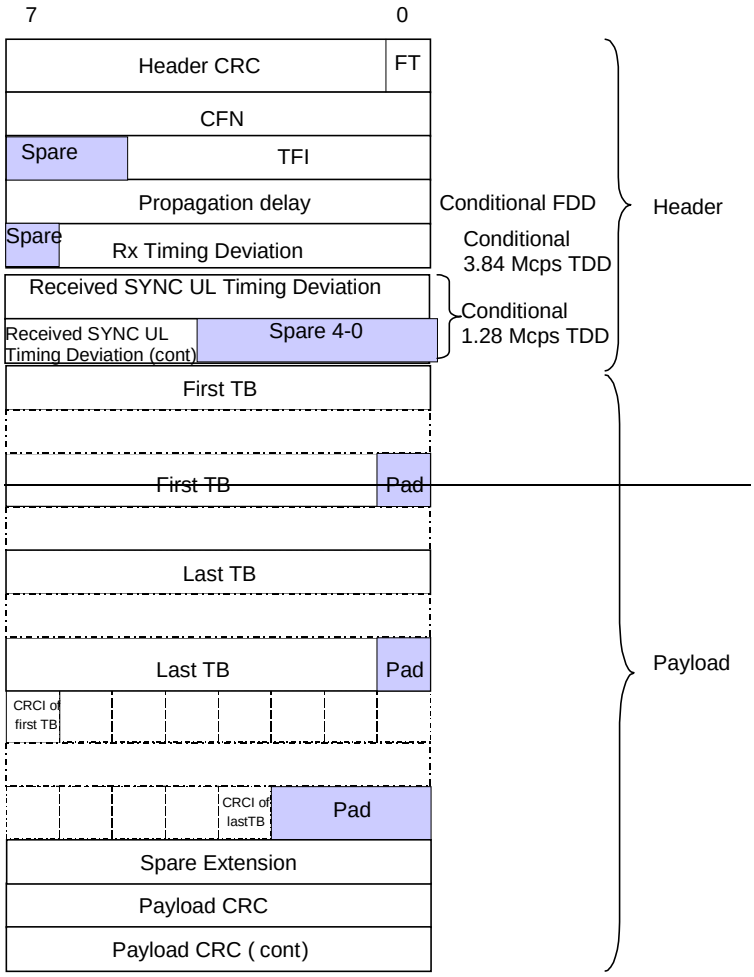
1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

### 6.2.1 RACH Channels

The RACH Data Frame includes the CFN corresponding to the SFN of the frame in which the payload was received. If the payload was received in several frames, the CFN corresponding to the first Uu frame in which the information was received shall be indicated.


7
0
Header CRC
FT
CFN
Spare
TFI
Propagation delay
Spare
Rx Timing Deviation
Received SYNC UL Timing Deviation
Received SYNC UL Timing Deviation (cont)
Spare 4-0
First TB
First TB
Pad
Last TB
Last TB
Pad
CRCI of first TB
CRCI of lastTB
Pad
Spare Extension
Payload CRC
Payload CRC ( cont)
Conditional FDD
Conditional 3.84 Mcps TDD
Conditional 1.28 Mcps TDD
Header
Payload

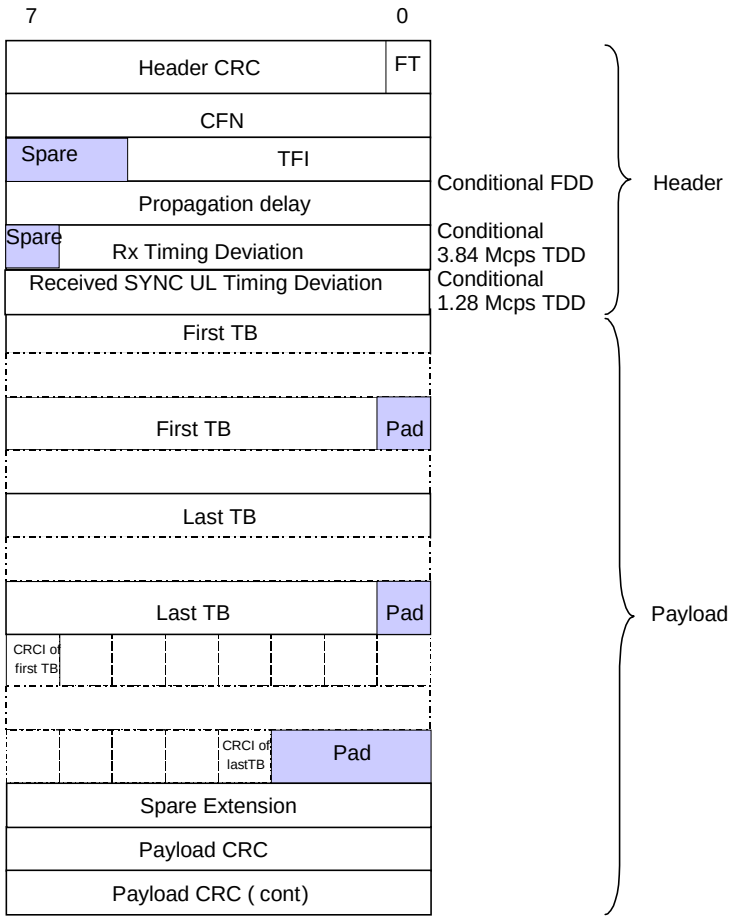



**Figure 15: RACH Data Frame structure**

Propagation delay is a conditional Information Element which is only present when the Cell supporting the RACH Transport Channel is a FDD Cell.

Rx Timing Deviation is a conditional Information Element which is only present when the Cell supporting the RACH Transport Channel is a 3.84Mcps TDD Cell.

Received SYNC UL Timing Deviation is a conditional Information Element which is only present when the Cell supporting the RACH Transport Channel is a 1.28Mcps TDD Cell.

/* partly omitted */

## 6.2.7.6A [1.28Mcps TDD – Received SYNC UL Timing Deviation]

**Description:** Measured Received SYNC UL Timing Deviation as a basis for propagation delay.

**Value range:** {0, ..., +256} chips

**Granularity:** ~~1/8~~1 chip~~s~~.

**Field length:** ~~11~~ 8 bits.

**3GPP TSG-RAN3 Meeting #23**
**Helsinki, Finland, 27th-31st August 2001**

***Tdoc R3-012617***

*CR-Form-v3*

# CHANGE REQUEST

⌘ **25.435** **CR** **059** ⌘ rev **1** ⌘ Current version: **4.1.0** ⌘

*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 **X** Core Network ☐

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Uplink Power Control for LCR TDD; Applicability of control frames on transport bearers (merged) |
| ***Source:*** | ⌘ | R-WG3 |
| ***Work item code:*** | ⌘ | LCRTDD-Iublur, TEI |
| ***Date:*** | ⌘ | August 2001 |
| ***Category:*** | ⌘ | **F** |
| ***Release:*** | ⌘ | Rel-4 |

*Use one of the following categories:*
***F*** *(essential 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)* |

***Reason for change:*** ⌘
1) The association of the control frames and the transport bearers lacks clarification.
2) Uplink power control for 1.28 Mcps TDD requires corrections in the Common Transport Channel Frame Protocol
3) The combination of these two groups of corrections results in additional changes which are only visible in this merged CR.

***Summary of change:*** ⌘ This CR059 includes the corrections proposed in CR048 and in CR052 as well as the result of logically combining these two CRs: An additional column "Outer Loop PC Info Xfer" is added to the Association Table of CR052.

***Consequences if not approved:*** ⌘ If this CR is not approved, while the two reference CRs, CR048 and CR052, are approved, these reference CRs will be hard to implement since the implications of combining these CRs will not be specified.

The CR is backward compatible to R99.

This CR has no impact to the current version of R99.

***Clauses affected:*** ⌘ 5.3, 5.4, 5.8, 5.8.1, 5.x (new), 5.y (new), 6.3.2.3, 6.3.3.9 (new)

***Other specs affected:*** ⌘

| | | |
|---|---|---|
| **X** | Other core specifications | CR048 for 25.435v4.1.0, CR052 for 25.435v4.1.0. |
| ☐ | Test specifications | |
| ☐ | O&M Specifications | |

| | | |
|---|---|---|
| ***Other comments:*** | ⌘ | **This merged CR059 can only be approved if the two reference CRs (CR048 and CR052 for 25.435) are also approved. However once CR059 is approved, the two reference CRs become obsolete and can be excluded from implementation, since CR059 includes the changes proposed in CR048 and CR052 and hence CR059 supersedes the two reference CRs.** |

**How to create CRs using this form:**

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

## 5.3 DL Transport Channels Synchronisation

CRNC sends a DL SYNCHRONISATION Control Frame to Node B. This message indicates the target CFN.

Upon reception of the DL SYNCHRONISATION Control Frame Node B shall immediately respond with UL SYNCHRONISATION Control Frame indicating the ToA for the DL Synchronisation frame and the CFN indicated in the received message.

The procedure shall not be applied on transport bearers transporting UL traffic channels RACH or USCH.

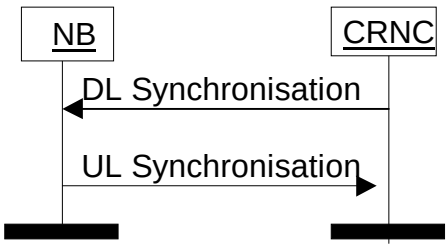



**Figure 8: ~~FACH, PCH and DSCH~~ Transport Channels Synchronisation procedure**

## 5.4 DL Timing Adjustment

Timing Adjustment procedure is used to indicate for the CRNC the incorrect arrival time of downlink data to Node B.

Timing adjustment procedure is initiated by the Node B if a DL frame arrives outside of the defined arrival window.

If the DL frame has arrived before the ToAWS or after the ToAWE nodeB includes the ToA and the target CFN as message parameters for TIMING ADJUSTMENT Control Frame.

The arrival window and the time of arrival are defined as follows:

- **Time of Arrival Window Endpoint (ToAWE):** ToAWE represents the time point by which the DL data shall arrive to the node B from Iub. The ToAWE is defined as the amount of milliseconds before the last time point from which a timely DL transmission for the identified CFN would still be possible taking into account the node B internal delays. ToAWE is set via control plane. If data does not arrive before ToAWE a Timing Adjustment Control Frame shall be sent by node B.
- **Time of Arrival Window Startpoint (ToAWS):** ToAWS represents the time after which the DL data shall arrive to the node B from Iub. The ToAWS is defined as the amount of milliseconds from the ToAWE. ToAWS is set via control plane. If data arrives before ToAWS a Timing Adjustment Control Frame shall be sent by node B.
- **Time of Arrival (ToA):** ToA is the time difference between the end point of the DL arrival window (ToAWE) and the actual arrival time of DL frame for a specific CFN. A positive ToA means that the frame is received before the ToAWE, a negative ToA means that the frame is received after the ToAWE.

The general overview on the timing adjustment procedure is reported in [2].


**Figure 9: ~~FACH, PCH, DSCH and [FDD - DSCH TFCI signalling]~~ Timing Adjustment procedure**

## 5.7 Timing Advance [3.84Mcps TDD]

This procedure is used in order to signal to the Node B the adjustment to be performed by the UE in the uplink timing.

The Node B shall use the CFN and timing adjustment values to adjust its layer 1 to allow for accurate impulse averaging.

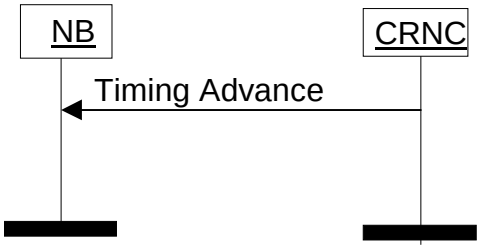



**Figure 12: Timing Advance Signalling**

## 5.x Outer Loop PC Information Transfer [1.28 Mcps TDD]

Based, for example, on the CRCI values and on the quality estimate in the USCH data frames, CRNC modifies the SIR target of the associated CCTrCH by including the absolute value of the new SIR target in the OUTER LOOP PC control frame sent to the Node B.

At the reception of the OUTER LOOP PC control frame from the CRNC via a Transport Bearer used for an USCH, the Node B shall immediately update the SIR target used for the inner loop power control for the respective CCTrCH with the specified value.

The OUTER LOOP PC control frame can be sent via any of the transport bearers carrying USCHs which belong to the CCTrCH for which the UL SIR Target shall be adjusted.

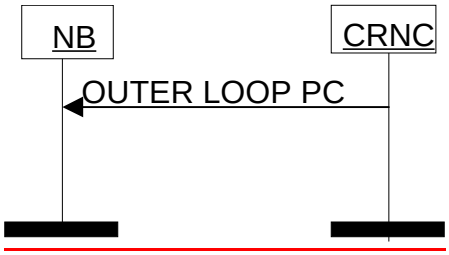



**Figure 5: Outer Loop Power Control Information Transfer procedure**

## 5.y General

### 5.y.1 Association between transport bearer and data/control frames

The following table shows how the data and control frames are associated to the transport bearers. 'Yes' indicates that the control frame is applicable to the transport bearer, 'no' indicates that the control frame is not applicable to the transport bearer.

| Transport bearer used for | Associated data frame | Associated control frames | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Timing adjust-ment | DL transport channels synchroni-sation | Node Synchroni sation | Dynamic PUSCH Assign-ment | Timing advance | DSCH TFCI signal-ling | Outer Loop PC Info Xfer |
| RACH | RACH data frame | no | no | no | no | no | no | no |
| FACH | FACH data frame | yes | yes | yes | no | no | no | no |
| CPCH | CPCH data frame | no | no | no | no | no | no | no |
| PCH | PCH data frame | yes | yes | yes | no | no | no | no |
| DSCH | DSCH data frame | yes | yes | yes | no | no | no | no |
| USCH | USCH data frame | no | no | no | yes | yes | no | yes |
| TFCI2 | - | yes | yes | yes | no | no | yes | no |

< Unchanged subclauses omitted here. >

### 6.3.2.3 Control Frame Type

**Description:** Indicates the type of the control information (information elements and length) contained in the payload.

**Value:** values of the Control Frame Type parameter are defined in the following table:

| Type of control frame | Value |
|---|---|
| OUTER LOOP POWER CONTROL | 0000 0001 |
| Timing adjustment | 0000 0010 |
| DL synchronisation | 0000 0011 |
| UL synchronisation | 0000 0100 |
| DL Node synchronisation | 0000 0110 |
| UL Node synchronisation | 0000 0111 |
| Dynamic PUSCH assignment | 0000 1000 |
| Timing Advance | 0000 1001 |

**Field Length:** 8 bits.

< Unchanged subclauses omitted here. >

#### 6.3.3.8.4 Spare Extension

**Description**: Indicates the location where new IEs can in the future be added in a backward compatible way.

**Field length**: 0-32 octets.

### 6.3.3.9 OUTER LOOP POWER CONTROL [1.28 Mcps TDD]

#### 6.3.3.9.1 Payload structure

Figure below shows the structure of the payload when control frame is used for the UL outer loop power control.

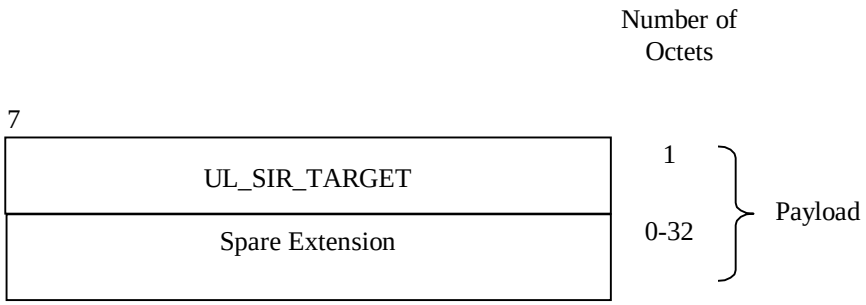



**Figure 31: Structure of the payload for OUTER LOOP PC control frame**

#### 6.3.3.9.2 SIR Target

**Description**: Value (in dB) of the SIR target to be used by the UL inner loop power control.

SIR Target is given in the unit UL_SIR_TARGET where:

UL_SIR_TARGET = 000 SIR Target = -8.2 dB
UL_SIR_TARGET = 001 SIR Target = -8.1 dB
UL_SIR_TARGET = 002 SIR Target = -8.0 dB
...
UL_SIR_TARGET = 254 SIR Target = 17.2 dB
UL_SIR_TARGET = 255 SIR Target = 17.3 dB

**Value range**: {-8.2…17.3 dB}, step 0.1 dB.

**Field length**: 8 bits.

#### 6.3.3.9.3 Spare Extension

For the Spare Extension refer to subclause 6.3.3.8.4.