TSG-RAN Meeting #23 **RP-040087**
Phoenix, Arizona, USA, 10 - 13 March 2004

Title: **Independent Release 6 CR to TS 25.211 on Re-Introduction of S-CPICH in combination with Closed Loop TxDiversity**

Source: **TSG-RAN WG1**

Agenda item: **8.9**

1. Independent Release 6 CR to **TS 25.211** on Re-Introduction of S-CPICH in combination with Closed Loop TxDiversity **(RP-040087)**

RP tdoc#	WG tdoc#	Spec	CR	R	Subject	Ph	C	Curr	New	WI	Remarks
RP-040087	R1-040179	25.211	189	-	Re-Introduction of S-CPICH in combination with Closed Loop TxDiversity	Rel-6	B	6.0.0	6.1.0	TEI6	

3GPP TSG RAN WG1 Meeting #36
Malaga, Spain, 16-20 February, 2004

Tdoc ⌘R1-040179

CR-Form-v7

CHANGE REQUEST

⌘ **25.211** **CR** **189** ⌘ **rev** **-** ⌘ Current version: **6.0.0** ⌘

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

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [X] Core Network [ ]

Title:	⌘	Re-Introduction of S-CPICH in combination with Closed Loop TxDiversity
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI6
Date:	⌘	09/02/2004
Category:	⌘	**B**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The current specification does not allow Closed Loop TxDiversity in combination with using the S-CPICH as phase reference for DPCH and associated shared channels. This combination is seen benefitial to increase the cell capacity.
Summary of change:	⌘	The restriction that the P-CPICH shall always be a phase reference for DPCH and associated shared channels with Closed Loop TxDiversity is removed. Instead the S-CPICH may be used as phase reference.
Consequences if not approved:	⌘	Possible capacity increase due to the combination of Closed Loop TxDiversity with S-CPICH is lost.

Clauses affected:	⌘	5.3.3.1.1

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

Other comments:	⌘	Corresponding background Tdoc (R1-030025) and first version of the CR (R1-030043 REL-6 cat.B CR176 to 25.211 v5.3.0) were already discussed at RAN1 #30 (San Diego) in January 2003. The CR was revised in R1-030234 and R1-030320 at RAN1 #31 (Tokyo, Feb. 2003) to take comments into account and a final version (R1-030423) was already provided at RAN1 #32 (Paris) in May 2003. However, as there were no REL-6 specifications available the CR was put on hold and it is resubmitted here based on the new REL-6 specification.

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

5.3.3 Common downlink physical channels

5.3.3.1 Common Pilot Channel (CPICH)

The CPICH is a fixed rate (30 kbps, SF=256) downlink physical channel that carries a pre-defined bit sequence. Figure 13 shows the frame structure of the CPICH.

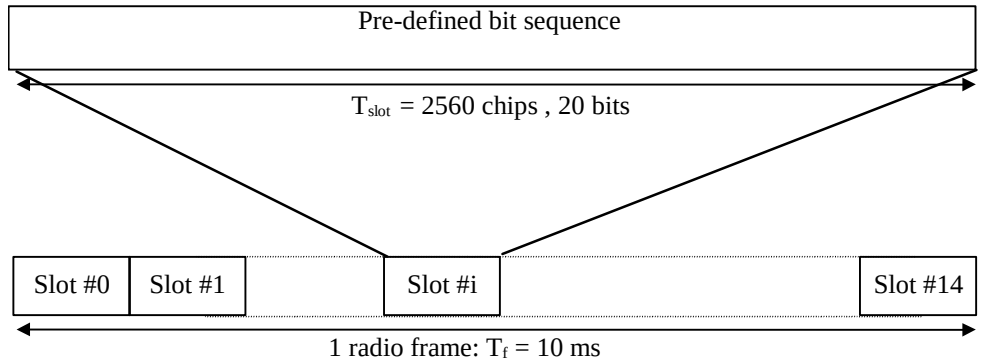

Figure 13: Frame structure for Common Pilot Channel

In case transmit diversity (open or closed loop) is used on any downlink channel in the cell, the CPICH shall be transmitted from both antennas using the same channelization and scrambling code. In this case, the pre-defined bit sequence of the CPICH is different for Antenna 1 and Antenna 2, see figure 14. In case of no transmit diversity, the bit sequence of Antenna 1 in figure 14 is used.

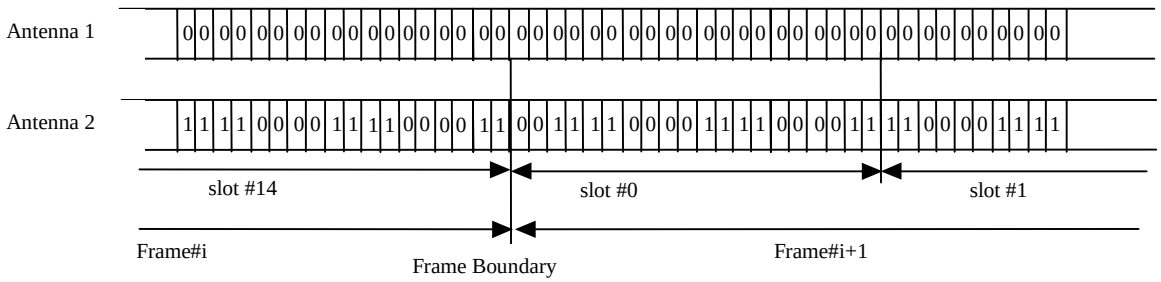

Figure 14: Modulation pattern for Common Pilot Channel

There are two types of Common pilot channels, the Primary and Secondary CPICH. They differ in their use and the limitations placed on their physical features.

5.3.3.1.1 Primary Common Pilot Channel (P-CPICH)

The Primary Common Pilot Channel (P-CPICH) has the following characteristics:

- The same channelization code is always used for the P-CPICH, see [4];
- The P-CPICH is scrambled by the primary scrambling code, see [4];
- There is one and only one P-CPICH per cell;
- The P-CPICH is broadcast over the entire cell.

The Primary CPICH is a phase reference for the following downlink channels: SCH, Primary CCPCH, AICH, PICH AP-AICH, CD/CA-ICH, CSICH, DL-DPCCH for CPCH and the S-CCPCH. By default, the Primary CPICH is also a phase reference for downlink DPCH and any associated PDSCH, HS-PDSCH and HS-SCCH. The UE is informed by higher layer signalling if the P-CPICH is not a phase reference for a downlink DPCH and any associated PDSCH, HS-PDSCH and HS-SCCH.

~~The Primary CPICH is always a phase reference for a downlink physical channel using closed loop TX diversity.~~

5.3.3.1.2 Secondary Common Pilot Channel (S-CPICH)

A Secondary Common Pilot Channel (S-CPICH) has the following characteristics:

- An arbitrary channelization code of SF=256 is used for the S-CPICH, see [4];
- A S-CPICH is scrambled by either the primary or a secondary scrambling code, see [4];
- There may be zero, one, or several S-CPICH per cell;
- A S-CPICH may be transmitted over the entire cell or only over a part of the cell;

A Secondary CPICH may be a phase reference for a downlink DPCH. If this is the case, the UE is informed about this by higher-layer signalling.

~~The Secondary CPICH can be a phase reference for a downlink physical channel using open loop TX diversity, instead of the Primary CPICH being a phase reference.~~

Note that it is possible that neither the P-CPICH nor any S-CPICH is a phase reference for a downlink DPCH. In this case the UE shall assume that no Tx diversity is used for the downlink DPCH and any associated PDSCH, HS-PDSCH and HS-SCCH in that cell.

5.3.3.2 Downlink phase reference

Table 17 summarizes the possible phase references usable on different downlink physical channel types.