

TSG-RAN Working Group 1 meeting #11
San Diego, USA
February 29 – March 3, 2000

TSGR1#11(00)0071

Agenda item: AH 1
Source: Interdigital Communication, Siemens
Title: CR 25.221-16:
Document for: Decision

In order to support multi-user detection it is necessary for the UE to know or to be able to derive all the channelisation codes and midambles used by all UEs in the time slot and the associations between the channelisation codes and the midambles. The current specification defines associations between midambles and channelisation codes (25.221 - Annex A.3) but mandates these associations only in the case where the midambles are not assigned to the UE as part of channel configuration. In the case that the midambles are signaled by the higher layers no mapping is mandated. This does not pose any problem for the case that all UEs in the DL time slot share the same midamble (common midamble case) or when UE specific midambles are used for beamforming. However, for all other cases these mappings have to be mandatory. Otherwise it will be necessary to introduce higher layer signaling to provide the needed information. This is of course undesirable.

This contribution proposes to introduce mandatory mappings between channelisation codes and midambles for the case that a common midamble or UE specific midambles are not used, thus avoiding the need to introduce the additional signaling. In addition it specifies the conditions when a common midamble or a user specific midamble should be used.

The following changes are proposed for 25.221

Section 5.3.6 “Physical downlink shared channel (PDSCH)”. Text stating that when PDSCH physical layer signaling based on midambles is used no other physical channels may use the same time slot as the PDSCH and only one UE may share the PDSCH time slot at the same time was added.

Section 5.5.1 “Midamble allocation for DL physical channels” serves an introductory role. Text was changed to reflect the changes in the following sections.

Section 5.5.1.1 “Midamble Allocation by signaling” was rewritten to distinguish between two cases: Common midamble case, and UE-specific midamble case. Section 5.5.1.1.1 defines the conditions when a common midamble can be used. Section 5.5.1.1.2 defines the conditions when a UE specific midamble should be used.

Section 5.5.1.2 “Midamble allocation by default”. An editorial change was made.

Section 5.5.2 “Midamble Allocation for UL Physical Channels” is for uplink channels and remains unchanged.

<h1>CHANGE REQUEST</h1>			Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.
25.221	CR	16	Current Version: 3.1.0
GSM (AA.BB) or 3G (AA.BBB) specification number ↑		↑ CR number as allocated by MCC support team	
For submission to: RAN #7 <small>list expected approval meeting # here ↑</small>	for approval for information	<input checked="" type="checkbox"/> <input type="checkbox"/>	strategic <input type="checkbox"/> non-strategic <input type="checkbox"/> <small>(for SMG use only)</small>

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 Core Network
(at least one should be marked with an X)

Source: InterDigital Comm. Corp., Siemens **Date:** 1, March 2000

Subject: Association between Midambles and Channelisation Codes

Work item: TS 25.221

Category: <small>(only one category shall be marked with an X)</small>	F Correction <input type="checkbox"/> A Corresponds to a correction in an earlier release <input checked="" type="checkbox"/> B Addition of feature <input type="checkbox"/> C Functional modification of feature <input type="checkbox"/> D Editorial modification <input type="checkbox"/>	Release:	Phase 2 <input type="checkbox"/> Release 96 <input type="checkbox"/> Release 97 <input type="checkbox"/> Release 98 <input type="checkbox"/> Release 99 <input checked="" type="checkbox"/> Release 00 <input type="checkbox"/>
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Reason for change: A mandatory mapping between midambles and channelisation codes is required in some cases, e.g. Tx diversity is used and multiple UEs share the same time slot. The present specification does not mandate the mapping in these cases.

Clauses affected: 5.3.6, 5.5.1, 5.5.1.1, 5.5.1.1.1, 5.5.1.1.2, 5.5.1.2

Other specs affected:	Other 3G core specifications <input type="checkbox"/> → List of CRs: Other GSM core specifications <input type="checkbox"/> → List of CRs: MS test specifications <input type="checkbox"/> → List of CRs: BSS test specifications <input type="checkbox"/> → List of CRs: O&M specifications <input type="checkbox"/> → List of CRs:
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Other comments:



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5.3.6 Physical Downlink Shared Channel (PDSCH)

For Physical Downlink Shared Channel (PDSCH) the burst structure of DPCH as described in section 5.2 shall be used. User specific physical layer parameters like power control or directive antenna settings are derived from the associated channel (FACH or DCH). PDSCH provides the possibility for transmission of TFCI in downlink.

To indicate to the UE that there is data to decode on the DSCH, three signalling methods are available:

- 1) using the TFCI field of the associated channel or PDSCH
- 2) using on the DSCH user specific midamble derived from the set of midambles used for that cell
- 3) using higher layer signalling.

When the midamble based method is used, the UE shall decode the PDSCH if the PDSCH was transmitted with the midamble assigned ~~indicated to~~for the UE by UTRAN, see 5.5.1.1.2. For this method no other physical channels may use the same time slot as the PDSCH and only one UE may share the PDSCH time slot at the same time.

5.5 Midamble Allocation for Physical Channels

In general, midambles are part of the physical channel configuration which is performed by higher layers.

Optionally, if no midamble is allocated by higher layers, a default midamble allocation shall be used. This default midamble allocation is given by a fixed association between midambles and channelisation codes, see annex A.3, and shall be applied individually to all channelisation codes within one time slot. Different associations apply for different burst types and cell configurations with respect to the maximum number of midambles.

5.5.1 Midamble Allocation for DL Physical Channels

~~For DL physical channels the midamble allocation depends on whether the midambles are signalled by higher layers or by default and whether TxDiversity/Beamforming is used. Physical channels providing the beacon function shall always use the reserved midambles, see 5.4. For all other DL physical channels the midamble allocation is signalled or given by default.~~

5.5.1.1 Midamble Allocation by signalling

~~Either a common or a UE specific midamble shall be signalled to the UE as a part of the physical channel configuration. Common or UE specific midambles may be applied only if the conditions in Sections 5.5.1.1.1 and Section 5.5.1.1.2 hold respectively. If the midamble is not signalled as a part of the physical channel configuration, midamble allocation by default shall be used.~~

~~5.5.1.1.1 Common Midamble~~

~~A common midamble may be assigned to all physical channels in one time slot, if~~

- ~~• a single UE uses all physical channels in one time slot (as in the case of high rate service)~~

~~or~~

- ~~• multiple UEs use the physical channels in one time slot and~~
 - ~~- no beamforming/TxDiversity is applied to any of these DL physical channels and~~
 - ~~- midambles are not used for PDSCH physical layer signalling.~~

~~5.5.1.1.2 UE specific Midamble~~

~~An individual midamble may be assigned to each of the UEs in one time slot, if~~

- ~~• multiple UEs use the physical channels in one time slot and~~
 - ~~- beamforming is applied to all of these DL physical channels and~~
 - ~~- no TxDiversity is applied to any of these DL physical channels~~

~~or~~

- ~~• PDSCH physical layer signalling based on the midamble is used.~~

~~5.5.1.1.1 DL Physical Channels without TxDiversity/Beamforming~~

~~If the midamble is part of the physical channel configuration, a common midamble shall be assigned to all physical channels in one time slot, except for physical channels~~

~~providing the beacon function, see 5.4. When PDSCH physical layer signalling based on the midamble is used, each UE that may share the PDSCH shall get an individual midamble, see 5.3.6.~~

~~5.5.1.1.2 DL Physical Channels with Tx Diversity/Beamforming~~

~~When DL beamforming or TX Diversity is used, each user to which Tx Diversity/Beamforming is applied and which has a dedicated channel shall get one individual midamble, see 5.2.4.~~

5.5.1.2 Midamble Allocation by default

If no midamble is allocated by signalling, the UE shall derive the midamble from the associated channelisation code and shall use an individual midamble for each channelisation code, ~~except for physical channels providing the beacon function, see 5.4.~~

For each association between midambles and channelisation codes in annex A.3, there is one primary channelisation code associated to each midamble. A set of secondary channelisation codes is associated to each primary channelisation code. All the secondary channelisation codes within a set use the same midamble as the primary channelisation code to which they are associated.

Higher layers shall allocate the channelisation codes in a particular order. Primary channelisation codes shall be allocated prior to associated secondary channelisation codes. If midambles are reserved for the beacon function, all primary and secondary channelisation codes that are associated with the reserved midambles shall not be used. Primary and its associated secondary channelisation codes shall not be allocated to different UE's.

In the case that secondary channelisation codes are used, secondary channelisation codes of one set shall be allocated in ascending order, with respect to their numbering.

5.5.2 Midamble Allocation for UL Physical Channels

If the midamble is part of the physical channel configuration, an individual midamble shall be assigned to all UE's in one time slot.

If no midamble is allocated by higher layers, the UE shall derive the midamble from the assigned channelisation code as for DL physical channels. If the UE changes the SF according to the data rate, it shall always vary the channelisation code along the lower branch of the OVSF tree.