3GPP TSG RAN WG1 (Radio) Meeting #9
Dresden, Germany, 30 NOV 1999 - 03 DEC 1999

Document R1-99h78
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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

25.221	**CR**	**002r1**	Current Version:	V3.0.0

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

For submission to:	RAN #6	for approval	X	strategic		*(for SMG use only)*
list expected approval meeting # here ↑		for information		non-strategic		

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 [X] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: Siemens AG **Date:** 19 Oct 1999

Subject: Removal of Superframe for TDD

Work item: TS25.221

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: There is no need to keep the superframe structure in TDD.

Clauses affected: 2, 5, 5.7, 6.2.2

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:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

2 References

References may be made to:

a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply;

b) publications without mention of a specific version, in which case the latest version applies.

A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

[1] TS 25.201: "Physical layer - general description"

[2] TS 25.211: "Physical channels and mapping of transport channels onto physical channels (FDD)"

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

[4] TS 25.213: "Spreading and modulation (FDD)"

[5] TS 25.214: "Physical layer procedures (FDD)"

[6] TS 25.215: "Physical layer – Measurements (FDD)"

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

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

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

[10] TS 25.225: "Physical layer – Measurements (TDD)"

[11] TS 25.301: "Radio Interface Protocol Architecture"

[12] TS 25.302: "Services Provided by the Physical Layer"

[13] TS 25.401: "UTRAN Overall Description"

[14] TS 25.402: "UTRAN Synchronisation in UTRAN, Stage 2"

5 Physical channels

All physical channels take three-layer structure~~ of superframes~~ with respect to timeslots, radio frames and system frame numbering (SFN), see [14]~~radio frames, and timeslots~~. Depending on the resource allocation, the configuration of radio frames or timeslots becomes different. All physical channels need guard symbols in every timeslot. The time slots are used in the sense of a TDMA component to separate different user signals in the time and the code domain. The physical channel signal format is presented in Figure 1.

A physical channel in TDD is a burst, which is transmitted in a particular timeslot within allocated Radio Frames. The allocation can be continuous, i.e. the time slot in every frame is allocated to the physical channel or discontinuous, i.e. the time slot in a subset of all frames is allocated only. A burst is the combination of a data part, a midamble and a guard period. The duration of a burst is one time slot. Several bursts can be transmitted at the same time from one transmitter. In this case, the data part must use different OVSF channelisation codes, but the same scrambling code. The midamble part has to use the same basic midamble code, but can use different midambles.

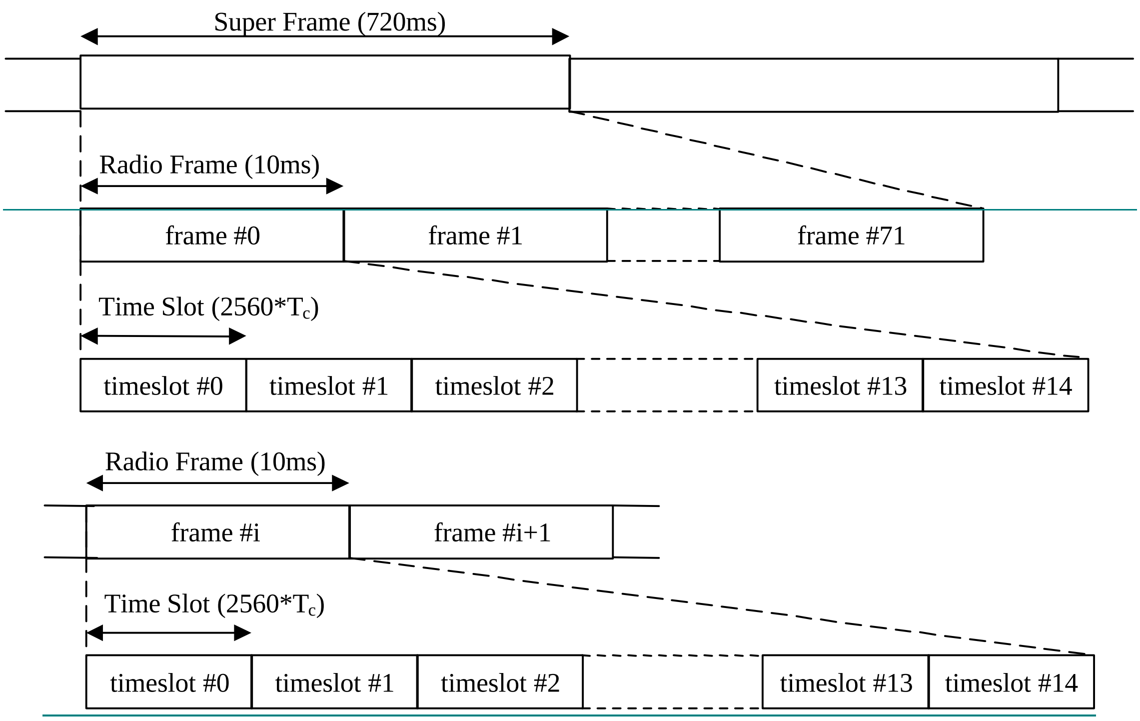

Figure 1 Physical channel signal format

~~A physical channel in TDD is a burst, which is repeated in the same timeslot with a certain repetition length of consecutive RF in and after each RF defined by a repetition period, starting at a certain frame number defined by the superframe offset in the multiframe, where the repetition period is a submultiple of 72, i.e. 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, or 72, and the superframe offset is in the interval 0...(repetition period-1). The repetition length of each repeated allocation can have the values 1, 2, 4 or 8 frames. It should be equal to the longest interleaving depth of all transport channels on this physical channel.~~

The data part of the burst is spread with a channelisation code. This channelisation code is a OVSF code, that can have a spreading factor of 1, 2, 4, 8, or 16. The data rate of the physical channel is depending on the used spreading factor of the used OVSF code.

The midamble part of the burst can contain two different types of midambles: a short one of length 256 chips, or a long one of 512 chips. The data rate of the physical channel is depending on the used midamble length.

So a physical channel is defined by frequency, timeslot, channelisation code, burst type and Radio Frame allocation.~~, repetition period, superframe offset and repetition length.~~ The scrambling code and the basic midamble code are broadcast~~ed~~ and may be constant within a cell. When a physical channel is established, a start frame is given. The physical channels can either be of infinite duration, or a duration for the allocation can be defined.

5.7 The Page Indicator Channel (PICH)

The Page Indicator Channel (PICH) is a physical channel used to carry the Page Indicators (PI). The PICH substitutes one or more paging sub-channels that are mapped on a CCPCH, see 6.2.2. The page indicator indicates a paging message for one or more UEs that are associated with it.

The page indicators of length L_{PI}=2, L_{PI}=4 or L_{PI}=8 symbols are transmitted in a normal burst (type 1 or 2) as seen in Figure 2. ~~The PI may be repeated within one superframe. The number of repetitions within one superframe is given by the repetition factor RF_{PI}.~~ The number of page indicators N_{PI} per ~~superframe~~ time slot is given by ~~the number of time slots per superframe N_{PICH}, used for the PICH,~~ the number L_{PI} of symbols for the page indicators and~~,~~ the burst type ~~BT and the repetition factor of the paging indicators, RF_{PI}~~. In Table 5 this number is shown for the different possibilities of burst types and PI lengths.

Table 5 Number N_{PI} of PI per Time Slot for the different burst types and PI lengths L_{PI}

	L_{PI}=2	L_{PI}=4	L_{PI}=8
Burst Type 1	61	30	15
Burst Type 2	69	34	17

The same burst type is used for the PICH in every cell. In case of L_{PI}=4 or L_{PI}=8, one symbol in each data part adjacent to the midamble is left over. These symbols are filled by dummy bits that are transmitted with the same power as the PI. Figure 2 shows ~~an~~ examples for the transmission of page indicators in the different burst types for L_{PI}=4~~, BT 1, N_{PICH}=4, RF_{PI}=2~~.

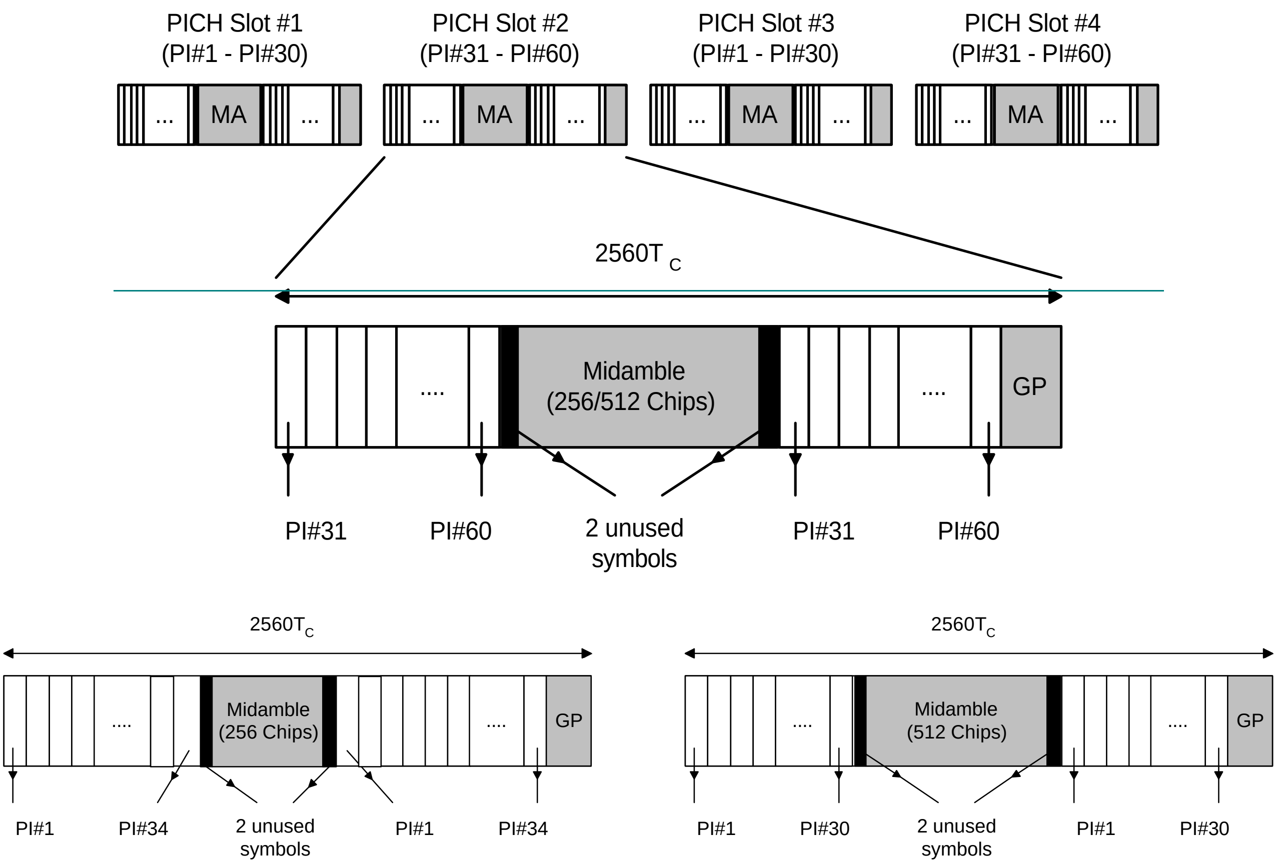

Figure 2 Example of PI Transmission in ~~the~~ PICH bursts of different types for L_{PI}=4

6.2.2 The Paging Channel (PCH)

The PCH is mapped onto one or several CCPCHs so that capacity can be matched to requirements. The location of the PCH is indicated on the BCH. It is always transmitted at a reference power level.

To allow an efficient DRX, the PCH is divided into several paging sub-channels within the allocated multiframe structure~~ of one superframe~~. Examples of multiframe structures are given in the Annex B of this document. Each paging sub-channel is mapped onto 2 consecutive frames that are allocated to the PCH on the same CCPCH. ~~Thus, the number of paging sub-channels per CCPCH is half of the number of frames used for the PCH in one superframe.~~ Layer 3 information to a particular paging group is transmitted only in the associated paging sub-channel. The assignment of UEs to paging groups is independent of the assignment of UEs to page indicators.