3GPP TSG RAN WG1 Meeting #17
Stockholm, Sweden, 21-24 Nov. 2000

Document R1-001342
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CHANGE REQUEST

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25.221	CR	036	Current Version:	3.4.0

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

For submission to:	RAN#10	for approval	X	strategic		(for SMG use only)
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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-Formv2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]

Source: Siemens AG **Date:** 10-11-2000

Subject: Clarification on PICH power setting

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: In WG3 specification, PICH power is set by NBAP signalling. In WG1 specifications PICH power is fixed to the P-CCPCH reference power. In order to make specifications consistent this CR changes the definitions on L1, because this aligns FDD and TDD settings and allows reduced interference for the case of good PICH coding.

Clauses affected: 5.3.7

Other specs affected:

Other 3G core specifications	X	? List of CRs:	CR25.224-040
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:

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5.3.7 The Paging Indicator Channel (PICH)

The Paging Indicator Channel (PICH) is a physical channel used to carry the paging indicators. ~~The PICH is always transmitted at the same reference power level as the P-CCPCH.~~

Figure 15 depicts the structure of a PICH burst and the numbering of the bits within the burst. The same burst type is used for the PICH in every cell. N_{PIB} bits in a normal burst of type 1 or 2 are used to carry the paging indicators, where N_{PIB} depends on the burst type: N_{PIB}=240 for burst type 1 and N_{PIB}=272 for burst type 2. The bits b_{NPIB},..., b_{NPIB+3} adjacent to the midamble are reserved for possible future use. They shall be set to 0 and transmitted with the same power as the paging indicator carrying bits.

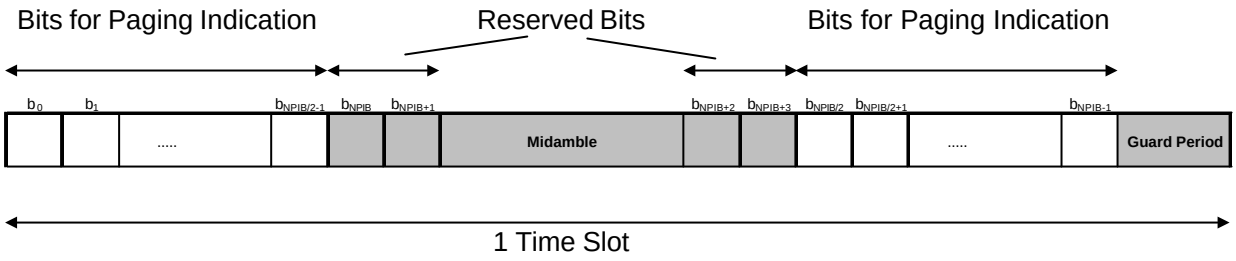

Figure 15: Transmission and numbering of paging indicator carrying bits in a PICH burst

In each time slot, N_{PI} paging indicators are transmitted, using L_{PI}=2, L_{PI}=4 or L_{PI}=8 symbols. L_{PI} is called the paging indicator length. The number of paging indicators N_{PI} per time slot is given by the paging indicator length and the burst type, which are both known by higher layer signalling. In table 8 this number is shown for the different possibilities of burst types and paging indicator lengths.

Table 8: Number N_{PI} of paging indicators per time slot for the different burst types and paging indicator lengths L_{PI}

	L_{PI}=2	L_{PI}=4	L_{PI}=8
Burst Type 1	N_{PI}=60	N_{PI}=30	N_{PI}=15
Burst Type 2	N_{PI}=68	N_{PI}=34	N_{PI}=17

As shown in figure 16, the paging indicators of N_{PICH} consecutive frames form a PICH block, N_{PICH} is configured by higher layers. Thus, N_P=N_{PICH}*N_{PI} paging indicators are transmitted in each PICH block.

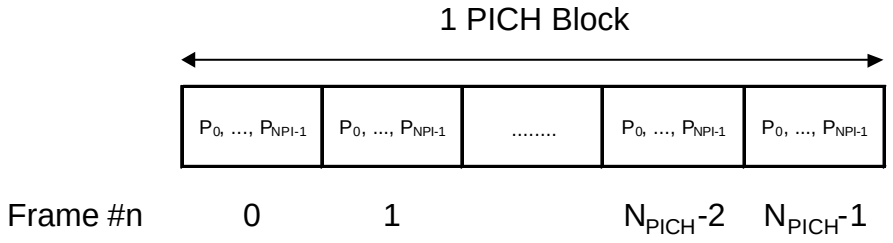

Figure 16: Structure of a PICH block

The value PI (PI = 0, ..., N_P-1) calculated by higher layers for use for a certain UE, see [15], is associated to the paging indicator P_q in the nth frame of one PICH block, where q is given by

$q = PI \bmod N_{PI}$

and n is given by

$n = PI \operatorname{div} N_{PI}$.

The PI bitmap in the PCH data frames over Iub contains indication values for all possible higher layer PI values, see [16]. Each bit in the bitmap indicates if the paging indicator P_q associated with that particular PI shall be set to 0 or 1. Hence, the calculation in the formulas above is to be performed in Node B to make the association between PI and P_q.

The paging indicator P_q in one time slot is mapped to the bits $\{b_{Lpi*q},...,b_{Lpi*q+Lpi-1},b_{NPIB/2+Lpi*q},...,b_{NPIB/2+Lpi*q+Lpi-1}\}$ within this time slot, as exemplary shown in figure 17. Thus, half of the L_{PI} symbols used for each paging indicator are transmitted in the first data part, and the other half of the L_{PI} symbols are transmitted in the second data part.

The coding of the paging indicator P_q is given in [7].

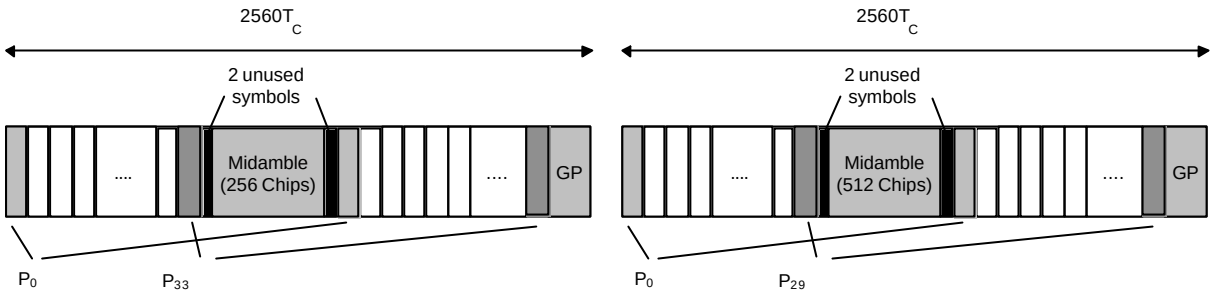

Figure 17: Example of mapping of paging indicators on PICH bits for L_{PI}=4

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BSS test specifications	[ ]	? List of CRs:	
O&M specifications	[ ]	? List of CRs:	

Other comments:


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4.2.3.1 P-CCPCH, PICH

The Primary CCPCH transmit power is set by higher layer signalling and can be changed based on network determination on a slow basis. The reference transmit power of the P-CCPCH is signalled on the BCH. The PICH is transmitted with the same power as the P-CCPCH.

4.2.3.2 S-CCPCH, PICH

The relative transmit power of the Secondary CCPCH and the PICH compared to the P-CCPCH transmit power are is set by higher layer signalling. The PICH power offset relative to the P-CCPCH reference power is signalled on the BCH.