

TSG-RAN Working Group 1 meeting #10
Beijing, China
January 18th – 21st 2000

TSGR1-00-0167

Agenda item:

Source: Nokia

Title: CR 25.211-030: Clarification of PICH channel

Document for: Decision

Introduction

In section 5.3.3.7 of 25.211 version 3.1.0 the mapping between the PI bits delivered to Layer 1 from higher layers and the physical bits on the PICH channel is described.

The existing text is unclear in that the term 'PI' is defined as a Page Indicator from higher layers, but then this term appears in the expression for calculation the parameter 'p'. It needs to be made clear that 'PI' is actually an index to the page indicator a UE should use, and not the page indicator itself. This is more in line with WG2 terminology.

CHANGE REQUEST

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

25.211 CR 030

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: **TSG-RAN #7** for approval
 list expected approval meeting # here ↑ for information

strategic
 non-strategic (for SMG use only)

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: **Nokia** **Date:** **1999-11-25**

Subject: **Clarification of paging indicator mapping**

Work item:

Category:	F Correction <input checked="" type="checkbox"/> A Corresponds to a correction in an earlier release <input 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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(only one category shall be marked with an X)

Reason for change: **The current text is misleading.**

Clauses affected: **5.3.3.7**

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

5.3.3.7 Page Indicator Channel (PICH)

The Page Indicator Channel (PICH) is a fixed rate (SF=256) physical channel used to carry the Page Indicators (PI). The PICH is always associated with an S-CCPCH to which a PCH transport channel is mapped. There are N page indicators per 10 ms frame, where N=18, 36, 72, or 144.

Higher layers calculate which page indicator is to be used by a particular UE and informs this to the physical layer using the parameter 'PI' where $PI = 0, 1, \dots, N-1$. If the PI^{th} paging indicator in a certain frame is set to "1" it is an indication that UEs associated with this Page Indicator should read the corresponding frame of the associated S-CCPCH.

Figure 21 illustrates the frame structure of the PICH. One PICH frame of length 10 ms consists of 300 bits (b_0, b_1, \dots, b_{299}). Of these, 288 bits (b_0, b_1, \dots, b_{287}) are used to carry Page Indicators. The remaining 12 bits ($b_{288}, b_{289}, \dots, b_{299}$) are undefined.

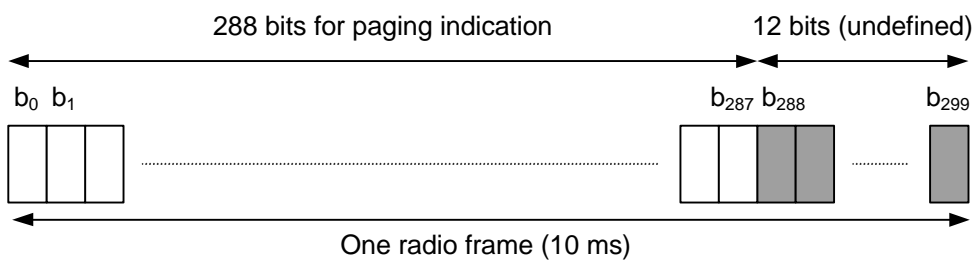


Figure 21: Structure of Page Indicator Channel (PICH)

N Page Indicators $\{PI_0, \dots, PI_{N-1}\}$ are transmitted in each PICH frame, where $N=18, 36, 72, \text{ or } 144$.

The PI calculated by higher layers for use for a certain UE, is mapped to the paging indicator PI_p , where p is computed as a function of the PI computed by higher layers, the SFN of the P-CCPCH radio frame during which the start of the PICH radio frame occurs, and the number of paging indicators per frame (N):

$$p = \left(PI + \left[\left((18 \times (SFN + \lfloor SFN / 8 \rfloor) + \lfloor SFN / 64 \rfloor + \lfloor SFN / 512 \rfloor) \right) \bmod 144 \right] \times \frac{N}{144} \right) \bmod N.$$

The page indicators from higher layers are mapped mapping from $\{PI_0, \dots, PI_{N-1}\}$ to the PICH bits $\{b_0, \dots, b_{287}\}$ are according to table 21.

Table 21: Mapping of Page Indicators (PI) to PICH bits

Number of PI per frame (N)	When the PI_p^{th} page indicator = 1	When the PI_p^{th} page indicator = 0
N=18	$\{b_{16p}, \dots, b_{16p+15}\} = \{1, 1, \dots, 1\}$	$\{b_{16p}, \dots, b_{16p+15}\} = \{0, 0, \dots, 0\}$
N=36	$\{b_{8p}, \dots, b_{8p+7}\} = \{1, 1, \dots, 1\}$	$\{b_{8p}, \dots, b_{8p+7}\} = \{0, 0, \dots, 0\}$
N=72	$\{b_{4p}, \dots, b_{4p+3}\} = \{1, 1, 1, 1\}$	$\{b_{4p}, \dots, b_{4p+3}\} = \{0, 0, 0, 0\}$
N=144	$\{b_{2p}, b_{2p+1}\} = \{1, 1\}$	$\{b_{2p}, b_{2p+1}\} = \{0, 0\}$

Where:

$$p = \left(PI + \left[\left((18 \times (SFN + \lfloor SFN / 8 \rfloor) + \lfloor SFN / 64 \rfloor + \lfloor SFN / 512 \rfloor) \right) \bmod 144 \right] \times \frac{N}{144} \right) \bmod N.$$

and SFN is the system frame number of the P-CCPCH radio frame during which the start of the PICH radio frame occurs.

If a Paging Indicator in a certain frame is set to "1" it is an indication that UEs associated with this Page Indicator should read the corresponding frame of the associated S-CCPCH.

When transmit diversity is employed for the PICH, STTD encoding is used on the PICH bits as described in section 5.3.1.1.1.