3GPP TSG-RAN Working Group 1 Meeting No. 11
San Diego, USA, 28 FEB 2000 - 03 MAR 2000

Agenda Item:	Plenary
Source:	Nokia, Vodafone AirTouch
Title:	Removal of ODMA in the TDD specifications (TS25.221)
Document for:	Approval

Currently, the functionality to support ODMA in release 99 is incomplete. The aim of this CR is to remove the sections on ODMA contained in TS25.221. These sections should then be incorporated into TR25.833.

3GPP TSG RAN WG1 Meeting #11
San Diego, USA, 28 FEB 2000 - 03 MAR 2000

Document R1-00-0439
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	017	Current Version:	V3.1.0

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	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 :* ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

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

Source: Nokia **Date:** 23.02.2000

Subject: Removal of ODMA from the TDD specifications

Work item: TS25.221

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

F	Correction		**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	X		Release 99	X
				Release 00	

Reason for change: Removal of ODMA from the TDD specifications since it is not supported for R99

Clauses affected:

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.

3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

BCH	Broadcast Channel
CCPCH	Common Control Physical Channel
CCTrCH	Coded Composite Transport Channel
CDMA	Code Division Multiple Access
DPCH	Dedicated Physical Channel
DSCH	Downlink Shared Channel
FACH	Forward Access Channel
FDD	Frequency Division Duplex
FEC	Forward Error Correction
GP	Guard Period
GSM	Global System for Mobile Communication
NRT	Non-Real Time
~~ODCH~~	~~ODMA Dedicated Transport Channel~~
~~ODMA~~	~~Opportunity Driven Multiple Access~~
~~ORACH~~	~~ODMA Random Access Channel~~
OVSF	Orthogonal Variable Spreading Factor
P-CCPCH	Primary CCPCH
PCH	Paging Channel
PDSCH	Physical Downlink Shared Channel
PDU	Protocol Data Unit
PICH	Page Indicator Channel
PRACH	Physical Random Access Channel
PSCH	Physical Synchronisation Channel
PUSCH	Physical Uplink Shared Channel
RACH	Random Access Channel
RLC	Radio Link Control
RF	Radio Frame
RT	Real Time
S-CCPCH	Secondary CCPCH
SCH	Synchronisation Channel
SFN	Cell System Frame Number
TCH	Traffic Channel
TDD	Time Division Duplex
TDMA	Time Division Multiple Access
USCH	Uplink Shared Channel

4 Transport channels

4.1 Transport channels

Transport channels are the services offered by layer 1 to the higher layers. A transport channel is defined by how and with what characteristics data is transferred over the air interface. A general classification of transport channels is into two groups:

- common channels (where there is a need for in-band identification of the UEs when particular UEs are addressed) and
- dedicated channels (where the UEs are identified by the physical channel)

General concepts about transport channels are described in 3GPP RAN TS25.302 (L2 specification).

4.1.1 Dedicated transport channels

The Dedicated Channel (DCH) is an up- or downlink transport channel that is used to carry user or control information between the UTRAN and a UE.

~~Two types of dedicated transport channels have been identified:~~

~~1) Dedicated Channel (DCH)~~

~~2) ODMA Dedicated Transport Channel (ODCH)~~

4.1.2 Common transport channels

Common transport channels are:

1) Broadcast Channel (BCH)

   The Broadcast Channel (BCH) is a downlink transport channel that is used to broadcast system- and cell-specific information.

2) Paging Channel (PCH)

   The Paging Channel (PCH) is a downlink transport channel that is used to carry control information to a mobile station when the system does not know the location cell of the mobile station.

3) Forward Access Channel(s) (FACH)

   The Forward Access Channel (FACH) is a downlink transport channel that is used to carry control information to a mobile station when the system knows the location cell of the mobile station. The FACH may also carry short user packets.

4) Random Access Channel(s) (RACH)

   The Random Access Channel (RACH) is an up link transport channel that is used to carry control information from mobile station. The RACH may also carry short user packets.

~~5) ODMA Random Access Channel (ORACH)~~

5~~6~~) Synchronisation Channel (SCH)

6~~7~~) Uplink Shared Channel (USCH)

   The uplink shared channel (USCH) is a uplink transport channel shared by several UEs carrying dedicated control or traffic data.

7~~8~~) Downlink Shared Channel (DSCH)

   The downlink shared channel (DSCH) is a downlink transport channel shared by several UEs carrying dedicated control or traffic data.

5 Physical channels

All physical channels take three-layer structure with respect to timeslots, radio frames and system frame numbering (SFN), see [14]. 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.

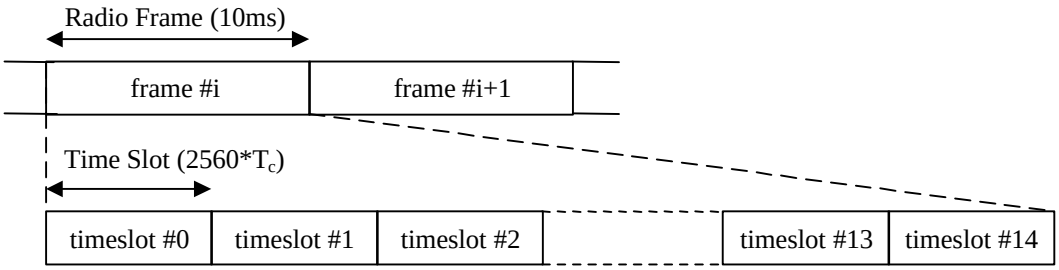


Figure 1: Physical channel signal format

The data part of the burst is spread with a combination of channelisation code and scrambling code. The 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 The scrambling code and the basic midamble code are broadcast 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.

5.1 Frame structure

The TDMA frame has a duration of 10 ms and is subdivided into 15 time slots (TS) of 2560*T_c duration each. A time slot corresponds to 2560 chips. The physical content of the time slots are the bursts of corresponding length as described in section 5.2.2.

Each 10 ms frame consists of 15 time slots, each allocated to either the uplink or the downlink (figure 2). With such a flexibility , the TDD mode can be adapted to different environments and deployment scenarios. In any configuration at least one time slot has to be allocated for the downlink and at least one time slot has to be allocated for the uplink.

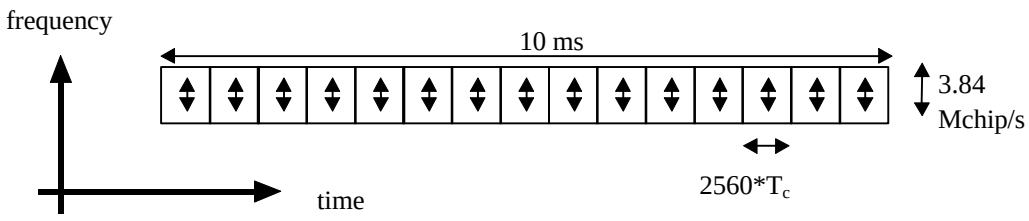
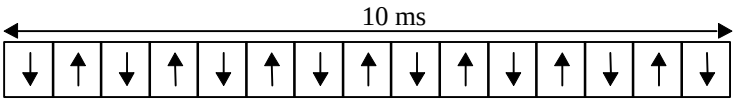
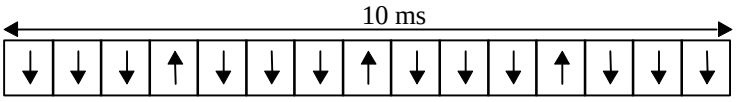


Figure 2: The TDD frame structure

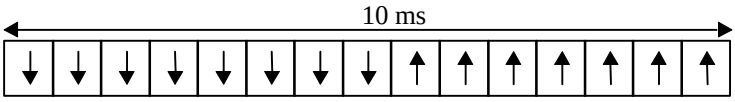
Examples for multiple and single switching point configurations as well as for symmetric and asymmetric UL/DL allocations are given in figure 3.



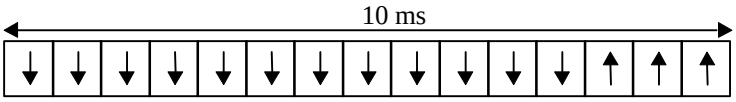
Multiple-switching-point configuration (symmetric DL/UL allocation)



Multiple-switching-point configuration (asymmetric DL/UL allocation)



Single-switching-point configuration (symmetric DL/UL allocation)

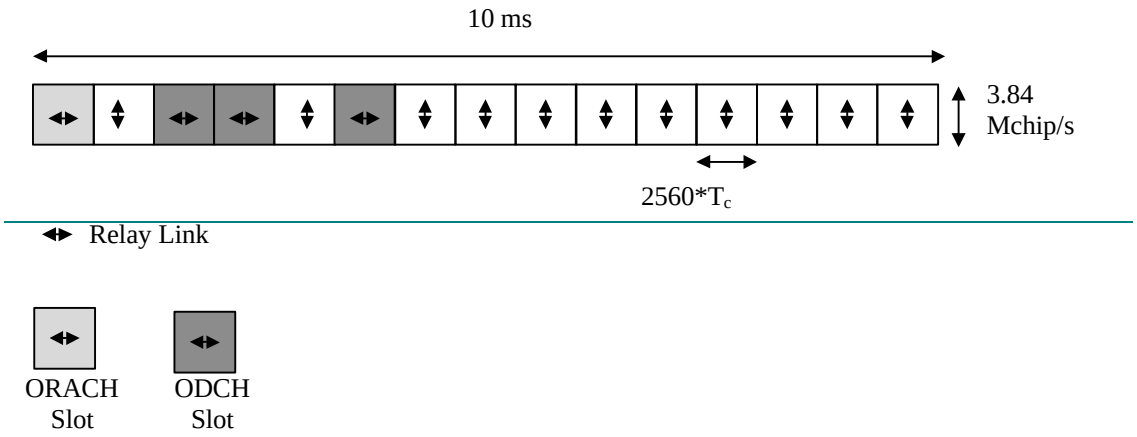


Single-switching-point configuration (asymmetric DL/UL allocation)

Figure 3: TDD frame structure examples

~~When operating ODMA at least one common timeslot has to be allocated for the ORACH. If large quantities of information have to be transferred between ODMA nodes then it is normal to use at least one timeslot for the ODCH (figure 4). As figure 4 shows, any timeslot in the TDD frame may potentially be used by the ODCH.~~

~~A common timeslot indicates a carrier-timeslot combination which can be used for transmission and reception by a group of mobiles operating ODMA.~~



~~**Figure 4: TDD frame structure example for ODMA operation**~~