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Technical Specification

3rd Generation Partnership Project (3GPP);
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Smart antenna
(Release 2000)

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Foreword

This Technical Report (TR) has been produced by the 3rd Generation Partnership Project (3GPP), Technical Specification Group RAN.
The contents of this TR are subject to continuing work within 3GPP and may change following formal TSG approval. Should the TSG modify the contents of this TR, it will be re-released with an identifying change of release date and an increase in version number as follows:
Version m.t.e

where:

m indicates [major version number]

x the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

y the third digit is incremented when editorial only changes have been incorporated into the specification.

1 Scope

The work item "Smart antenna" is a Building Block which has been agreed at TSG RAN#8. The purpose of the work item "Smart antenna" is to investigate the impact of Smart antennas on the present specifications and to identify needs to update the standard with respect to smart antenna. In the context of this document smart antennas refer to the usage in the UTRAN only – not in the UE.
The purpose of this document is to investigate the impact of Smart antennas on the present specifications for ~~both FDD and~~ TDD and to help the TSG RAN WG1-4 group to specify the changes to existing TDD ~~and FDD~~ specifications. It is intended to gather all information in order to trace the history and the status of the Work Task in RAN WG1. It is not intended to replace contributions and Change Requests, but only to list conclusions and make reference to agreed contributions and CRs. When solutions are sufficiently stable, the CRs can be issued.
The report describes agreed requirements related to the Work Task, and splits the Work Task into "Study Areas" in order to group contributions in a consistent way and identifies the affected specifications with related Change Requests.
This document is a 'living' document, i.e. it is permanently updated and presented to all TSG-RAN meetings.

2 References

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

?? References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

?? For a specific reference, subsequent revisions do not apply.

?? For a non-specific reference, 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.

[1.] TR 25.928, 1.28 Mcps functionality for UTRA TDD Physical Layer
[2.] TR 25.834, UTRA TDD Low Chip Rate Option Radio Protocol Aspects
[3.] TR 25.937, UTRA TDD Low Chip Rate Option Iub/Iur protocol Aspects
[4.] TR 25.945, RF requirements for 1.28Mcps UTRA TDD option

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

3.2 Symbols

3.3 Abbreviations

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

4 Simulation models for smart antennas

4.1 Introduction

4.2 Requirements

4.3 Study areas

4.3.1 Smart antenna models for WG1

~~? FDD~~
?? TDD
?? 3.84 Mcps TDD
?? 1.28 Mcps TDD

4.3.2 Smart antenna models for WG2

~~? FDD~~
?? TDD
?? 3.84 Mcps TDD
?? 1.28 Mcps TDD

4.3.3 Smart antenna models for WG4

~~? FDD~~
?? TDD
?? 3.84 Mcps TDD
?? 1.28 Mcps TDD

4.4 Agreements and associated contributions

4.5 Open issues

~~5Smart antennas for FDD~~

~~5.1Introduction~~

~~5.2Requirements~~

~~5.3Study areas~~

~~5.3.1Impact of smart antennas on soft(er) handover~~

~~5.3.2Impact of smart antennas on the physical layer procedures~~

~~? Synchronisation procedures~~
~~? Power control~~

~~? Random access procedure~~
~~? Closed loop mode transmit diversity~~
~~? Idle periods for IPDL location method~~

~~5.3.3Impact of smart antennas on radio requirements – radio requirements for smart antennas~~

~~5.3.4Impact of smart antennas on measurements~~

~~5.3.5Impact of smart antennas on Radio protocol aspects~~

~~5.3.6Impact of smart antennas on Iub, Iur aspects~~

~~5.3.7Benefits of smart antennas~~

~~5.3.7.1Impact of smart antennas on the cell range~~

~~5.4Agreements and associated contributions~~

~~5.5Specification impact and associated Change Requests~~

~~5.6Open issues~~

~~6~~5 Smart antennas for TDD

~~6.1~~5.1 Introduction

~~6.2~~5.2 Requirements for 1.28Mcps and 3.84 Mcps TDD

~~6.3~~5.3 Study areas for the 3.84 Mcps TDD

~~6.3.1~~5.3.1 Impact of smart antennas on the physical layer

?? Midamble code allocation
?? Transmitter Power Control
?? Timing Advance
?? Synchronisation and Cell Search Procedures
?? (DTX) of Radio Frames
?? Downlink Transmit Diversity
?? Random Access Procedure

~~6.3.2~~5.3.2 Impact of smart antennas on radio requirements – radio requirements for smart antennas

~~6.4~~5.4 Study areas for the 1.28 Mcps TDD

~~6.4.1~~5.4.1 Impact of smart antennas on the physical layer procedures

?? Midamble code allocation

Basic support for smart antennas is given by the possibility of assigning individual MA to the UEs also in DL. That is included already in TR25.928.

?? Baton handover

?? Transmitter Power Control

?? Timing Advance

?? Synchronisation and Cell Search Procedures

?? (DTX) of Radio Frames

?? Downlink Transmit Diversity

?? Random Access Procedure

~~6.4.2~~5.4.2 Impact of smart antennas on radio requirements – radio requirements for smart antennas

~~6.4.3~~5.4.3 Impact of smart antennas on measurements

~~6.4.4~~5.4.4 Impact of smart antennas on Radio protocol aspects

~~6.4.5~~5.4.5 Impact of smart antennas on Iub, Iur aspects

~~6.4.6~~5.4.6 Benefits of smart antennas

~~6.4.6.1~~5.4.6.1 Impact of smart antennas on the cell range

~~6.5~~5.5 Agreements and associated contributions

~~6.6~~5.6 Specification impact and associated Change Requests

~~6.7~~5.7 Open issues

~~7~~6 History

Document history		
V0.0.1	2000-08	First proposal
V0.0.2	2000-10	Structure modification according to RAN#9 dicision
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