TSG RAN Meeting #27 **RP-050061**
Tokyo, Japan, 09 - 11 March 2005

Title **CR (Rel-6 categories C, D, F) to TS 25.460, TS 25.461, TS 25.462 and TS 25.463**
Source **TSG RAN WG3**
Agenda Item **9.9**

RAN3 Tdoc	Spec	CR	Rev	Cat	curr. Vers.	new Vers.	Rel	Work item	Title
R3-050153	25.460	3		D	6.1.0	6.2.0	Rel-6	RANimp-TiltAnt	Editorial Corrections to 25.460 after RAN3#45
R3-050265	25.461	8	1	F	6.1.0	6.2.0	Rel-6	RANimp-TiltAnt	Power consumption clarification of RET
R3-050278	25.461	7	1	F	6.1.0	6.2.0	Rel-6	RANimp-TiltAnt	Minor Corrections and editorial changes to 25.461
R3-050291	25.461	9		F	6.1.0	6.2.0	Rel-6	RANimp-TiltAnt	Modem Operating Bands
R3-050292	25.461	10		F	6.1.0	6.2.0	Rel-6	RANimp-TiltAnt	Modem Return loss
R3-050293	25.461	11		F	6.1.0	6.2.0	Rel-6	RANimp-TiltAnt	Modem Time Delay and Accuracy
R3-050294	25.461	12		F	6.1.0	6.2.0	Rel-6	RANimp-TiltAnt	Modem Insertion Loss
R3-050157	25.462	8		F	6.1.0	6.2.0	Rel-6	RANimp-TiltAnt	Clarification on HDLC Parameter Negotiation
R3-050266	25.462	6	1	D	6.1.0	6.2.0	Rel-6	RANimp-TiltAnt	Editorial Corrections to 25.462 after RAN3#45
R3-050267	25.462	7	1	F	6.1.0	6.2.0	Rel-6	RANimp-TiltAnt	Correction of definition of Secondary Payload Transmit/Receive Length
R3-050269	25.462	11	1	F	6.1.0	6.2.0	Rel-6	RANimp-TiltAnt	Correction of address assignment example
R3-050272	25.462	13		C	6.1.0	6.2.0	Rel-6	RANimp-TiltAnt	Reset in transport layer
R3-050342	25.462	14	1	C	6.1.0	6.2.0	Rel-6	RANimp-TiltAnt	Clarification on unique ID and device scan
R3-050055	25.463	20		D	6.1.0	6.2.0	Rel-6	RANimp-TiltAnt	Wrong numbering in table 6.7.6.2
R3-050158	25.463	24		F	6.1.0	6.2.0	Rel-6	RANimp-TiltAnt	Minor Corrections to 25.463 after RAN3#45
R3-050270	25.463	23	1	D	6.1.0	6.2.0	Rel-6	RANimp-TiltAnt	Editorial Corrections to 25.463 after RAN3#45

RAN3 Tdoc	Spec	CR	Rev	Cat	curr. Vers.	new Vers.	Rel	Work item	Title
R3-050271	25.463	26	1	C	6.1.0	6.2.0	Rel-6	RANimp-TiltAnt	Redefinition or the Software Reset procedure
R3-050287	25.463	25	2	F	6.1.0	6.2.0	Rel-6	RANimp-TiltAnt	Clarification on antenna movement during Set Tilt

3GPP TSG-RAN3 Meeting #46
Phoenix, USA, 14th-18th February 2005

Tdoc ⌘ R3-050153

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.460** **CR** **003** ⌘ **rev** **-** ⌘ Current version: **6.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [ ] ME [ ] Radio Access Network [X] Core Network [ ]

Title:	⌘	Editorial changes to 25.460 after RAN3#45
Source:	⌘	RAN3
Work item code:	⌘	RANimp-TiltAnt
Date:	⌘	08/02/2005
Category:	⌘	**D**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

Ph2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	Unclear specification and violation of the drafting rules
Summary of change:	⌘	Several editorial changes according to the drafting rules
Consequences if not approved:	⌘	Specification is unclear and not in line with the drafting rules

Clauses affected:	⌘	1, 4, 5, 6 and Annex A

	Y	N		
Other specs affected: ⌘		X	Other core specifications	⌘
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

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2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

1 Scope

The present document is an introduction to the 3GPP TS ~~TS~~ 25.46x series of UMTS Technical Specifications that define the Iuant Interface. The logical Iuant interface is a Node B internal interface between the implementation specific O&M function and the RET a~~A~~ntenna c~~C~~ontrol unit function of the Node B.

********** Unchanged Parts omitted **********

4 General aspects

4.1 Introduction

The Iuant interface for the c~~C~~ontrol of RET a~~A~~ntennas is a logical part of the Node B as shown in figure 9 of [1]. Therefore, no new UTRAN element for the RET a~~A~~ntenna and no new UTRAN element manager is needed. The existing Implementation Specific O&M transport is used for the connection between the RET a~~A~~ntenna c~~C~~ontrol unit and the Node B e~~E~~lement m~~M~~anager.

The Node B internal interface Iuant between the Implementation Specific O&M function and the RET a~~A~~ntenna c~~C~~ontrol unit function is specified in detail in the specifications for layer 1, signalling transport and RET application part [2,3,4].

4.2 Iuant interface general principles

For the control of RET antennas a standard data interface between the Node B Implementation Specific O&M function and the Node B RET a~~A~~ntenna c~~C~~ontrol function according to [1] is defined by means of which functional parameters of the device can be remotely controlled. The Iuant interface for the RET antenna control is based on a three-layer protocol model. The three-layer model is a compact form of the OSI seven-layer reference model and includes only layers 1, 2 and 7:

- The Physical Layer (Layer 1) defines the signalling levels and basic data characteristics including the data rates.
- The Data Link Layer (Layer 2) for the Signalling Transport uses a specific class of the HDLC standard as defined in [5].
- The Application Layer (Layer 7) defines the data payload format and the required command set. This layer is called the "RET ~~Control~~ Application Part" (RETAP).

This compact model for the control interface provides an efficient protocol stack suitable for implementation on a single embedded micro-controller.

4.3 Iuant interface specification objectives

The Iuant interface specifications shall facilitate the following:

- ~~controling~~Controlling the tilting of RET antennas remotely from the O&M Network and locally from the Node B;
- I~~i~~nterfacing a mix of RET antennas and Node Bs from different vendors;
- P~~p~~roviding RET functionality in the UTRAN accompanied by an appropriate set of signalling commands and control parameters
- S~~s~~upport of error and alarm handling.

4.4 Iuant interface characteristics

The Iuant interface has a protocol structure as shown below in figure 4.4.1.

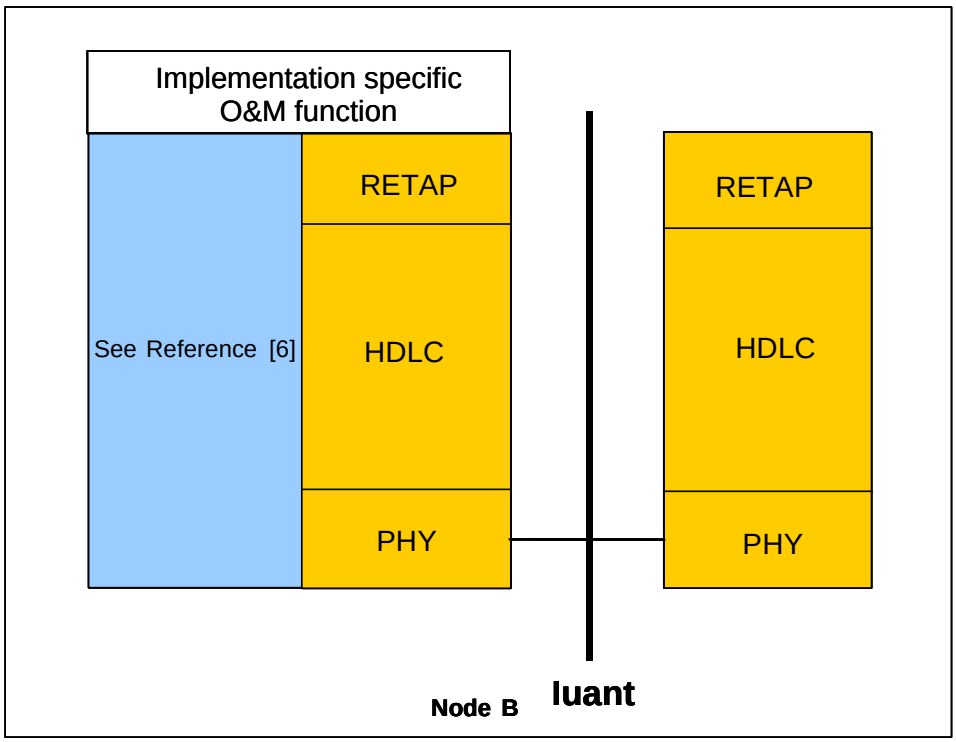

Figure 4.4.1: Protocol sStructure for Iuant interface

********** Unchanged Parts omitted **********

5.2 Data link layer functions

The dData lLink layer provides:

- A data packet communication format;
- An addressing scheme;
- A master/slave relationship whereby the primary device controls the half duplex timing;
- A message checksum scheme to protect from transmission errors;
- A message sequence numbering scheme which protects layer 7 from
  - Duplicated messages;
  - Deleted messages;
  - Receiving messages in the wrong order.
- A flow control mechanism protecting each ~~node~~ device from being overrun by messages.

These functions provide layer 7 with a safe full-duplex connection between the primary device and any secondary device. This full duplex ~~link~~ connection allows both the primary and secondary device to transmit layer 7 messages to the opposite device of the connection, whenever they need to. Actual delivery time on layer 2 will depend on the layer 2 polling frequency, which is chosen by the primary device.

5.3 Application layer functions

The list of functions on the Iuant interface is the following:

- Control of RET a~~A~~ntennas;
- Application software and configuration data download;
- Alarm Reporting;
- Operator specific data storage.

5.3.1 Control of RET a~~A~~ntennas

A RET device provides means to adjust the electrical tilt of one or multiple antennas. The set of procedures to control RET antennas provides means to control the electrical tilt of one or more RET antennas remotely.

5.3.2 Application software and configuration data download

The interface provides means for downloading new application software and configuration data to a secondary device.

The support of application software download to a secondary device is optional. If a secondary device supports application software download, it shall reset itself and start running the new application software automatically after the completed download. Further details on the software download procedure (e.g. the different states of the secondary device and the supported elementary procedures in these states) are described in ~~section~~ subclause 6.1 of [4].

5.3.3 Alarm reporting

The secondary device reports every change in error status after subscription for alarm reporting by transmitting alarm messages to the primary device. Alarm information can also be interrogated in the application layer.

5.3.4 Operator specific data storage

The secondary device provides means for storage of operator specific data, e.g. inventory information.

6 Other Iuant interface specifications

6.1 UTRAN Iuant interface: Layer 1 (TS 25.461)

TS 25.461 [2] specifies the standards allowed for implementation of Layer 1 (physical layer) on the Iuant interface.

6.2 UTRAN Iuant interface: Signalling Transport (TS 25.462)

TS 25.462 [3] specifies the signalling transport related to RETAP signalling to be used across the Iuant interface.

6.3 RETAP specification (TS 25.463)

TS 25.463 [4] specifies the standards for RETAP specification to be used over the Iuant interface.

6.4 Summary of UTRAN Iuant interface Technical Specifications

The relationship between the technical specifications that define the UTRAN Iuant interface is shown in figure 6.4.1.

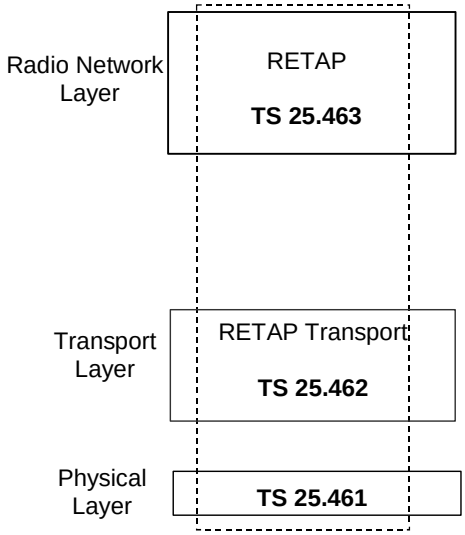

Figure 6.4.1: Iuant Interface Technical Specifications

Annex A (informative):
OSI model overview

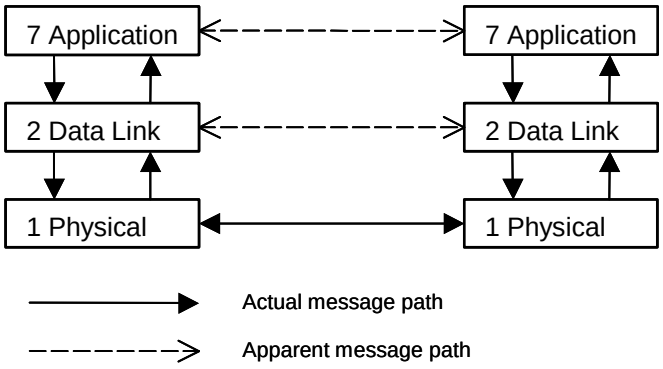

Figure A.1: Relevant OSI model layers

Figure A.1 shows the relevant OSI model layers and the communication paths between the primary and secondary device.

The two important aspects of the OSI model are:

- It defines a layered structure for the communication software
- It provides each layer with an apparent direct link to the same layer at the other device.

However, in real life, the only actual message path between the two devices is through the physical connection between the two layer 1 entities.

The layer 2 entities appear to communicate directly. In actual fact, a message passed from the first device to the second device takes the following path:

- Layer 2 at the first device passes the message down to Layer 1
- Layer 1 transmits ~~it~~ the message across the physical connection (for instance a wire) to layer 1 at the second device.
- Layer 1 at the second device passes the message up to Layer 2 at the second device.

Likewise, layer 7 entities appear to communicate directly. In actual fact, a message passed from the first device to the second device takes the following path:

- Layer 7 at the first device passes the message down to Layer 2
- Layer 2 at the first device passes the message down to Layer 1
- Layer 1 transmits ~~it~~ the message across the physical connection (for instance a wire) to layer 1 at the second device.
- Layer 1 at the second device passes the message up to Layer 2 at the second device.
- Layer 2 at the second device passes the message up to Layer 7 at the second device.

********** End of Changes **********

3GPP TSG-RAN WG3 Meeting #46 **Tdoc ⌘R3-050292**
Scottsdale, USA, 14th -18th February 2005

CR-Form-v7

CHANGE REQUEST

⌘ **25.461** **CR** **10** ⌘ **rev** **-** ⌘ Current version: **6.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Modem return loss
Source:	⌘	RAN3
Work item code:	⌘	RANimp-TiltAnt
Date:	⌘	17/2/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	Return loss for modem in external BS and RET modem operating bands is not specified.
Summary of change:	⌘	We assume that a maximum of 9% reflected power is acceptable. 9% is calculated to be achieved with return loss > 20 dB and still leave some margins for additional equipment between the modems. Return loss for modems in external BS and RET modem operating band is specified to be >20 dB.
Consequences if not approved:	⌘	Return loss for modem in external BS and RET modem operating band will remain unspecified.

Clauses affected:	⌘	4.3.3

		Y	N		
Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	This line in the TS 25.461 will be under the mandate of RAN 4

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Below is a brief summary:

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downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4.3.3 Impedance

The modem transceiver shall provide constant impedance in both transmitting and receiving modes:

- Nominal impedance Z_0: 50 Ω.
- Return loss at nominal modem carrier frequency > 6 dB.
- Return loss ~~in base station operating band [TBD]~~in external BS and RET modem operating bands > 20 dB.

4.3.4 Modulator characteristics

3GPP TSG-RAN WG3 Meeting #46 **Tdoc ⌘R3-050293**
Scottsdale, USA, 14th -18th February 2005

CR-Form-v7

CHANGE REQUEST

⌘ **25.461** **CR** **11** ⌘**rev** **-** ⌘ Current version: **6.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Modem Time Delay and Accuracy
Source:	⌘	RAN3
Work item code:	⌘	RANimp-TiltAnt
Date:	⌘	17/2/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The Modem Time Delay and Accuracy is not specified. The requirement is needed in order to fulfil the TX diversity requirements on time alignment.
Summary of change:	⌘	Inserting a new chapter introducing requirements on Time delay and accuracy. The requirement is needed to guarantee that the ¼ chip requirement for TX diversity can be met for the overall system performance. The ¼ chip requirement is part of core requirement in TS 25.104 as well as the conformance testing in TS 24.141.
Consequences if not approved:	⌘	Time Delay and Accuracy will remain unspecified.

Clauses affected:	⌘	New 4.3.8

Other specs affected: ⌘	Y	N	
		X	Other core specifications
		X	Test specifications
		X	O&M Specifications

⌘

Other comments:	⌘	Chapter 4.3.8 shall be marked as under RAN4 mandate.

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

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2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4.3.8 Time delay and accuracy

The time delay shall be declared by the manufacturer with ± 1 ns accuracy. The time delay shall not exceed [30] ns. This requirement is only applicable to external BS and RET modems.

3GPP TSG-RAN WG3 Meeting #46 **Tdoc ⌘R3-050294**
Scottsdale, USA, 14th -18th February 2005

CR-Form-v7

CHANGE REQUEST

⌘ **25.461** **CR** **12** ⌘ **rev** **-** ⌘ Current version: **6.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [ ] ME [ ] Radio Access Network [X] Core Network [ ]

Title:	⌘	Modem Insertion Loss
Source:	⌘	RAN3
Work item code:	⌘	RANimp-TiltAnt
Date:	⌘	17/2/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The Modem Insertion Loss is not specified.
Summary of change:	⌘	Inserting a new chapter introducing requirements on Modem Insertion Loss.
Consequences if not approved:	⌘	Insertion loss will remain unspecified. Too high insertion loss will degrade system performance. Unspecified Insertion loss can not be compensated for in the reporting values and would result in wrong measurement reporting to RNC.

Clauses affected:	⌘	New 4.3.9

		Y	N		
Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	Chapter 4.3.9 shall be marked as under RAN4 mandate.

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4.3.9 Insertion Loss

The insertion loss in the external BS or RET modem operating band shall be ≤ [0.3] dB.

The actual insertion loss shall be declared by the manufacturer.

3GPP TSG-RAN3 Meeting #46
Scottsdale, USA, 14th – 18th February 2005

Tdoc ⌘ R3-050278

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.461** **CR** **7** ⌘ **rev** **1** ⌘ Current version: **6.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Minor Corrections and editorial changes to 25.461
Source:	⌘	RAN3
Work item code:	⌘	RANimp-TiltAnt
Date:	⌘	14/02/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F (correction)
A (corresponds to a correction in an earlier release)
B (addition of feature),
C (functional modification of feature)
D (editorial modification)

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
Ph2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)
Rel-7 (Release 7)

Reason for change:	⌘	Minor corrections and editorial changes for cleaner and more precise specification. Furthermore the numbering of tables and figures are not inline with the drafting rules.
Summary of change:	⌘	Tables and Figures are renumbered according to the drafting rules. Section 2: A dot is missing at the end. Some Abbreviations are corrected (also in the text). Section 4: "needs to" is corrected to "shall" according to the drafting rules. Format is changed to "Standard" in some paragraphs. Grammar corrections in many subclauses and figures. Figures 4.2 and 4.3 (now 4.3.1 and 4.3.2): "Base Station" -> "BS" Section 4.1: Spelling error of "indepent" is corrtected to "independent". Section 4.4.1: "section" is corrected to "subclause". Revision 1: Subclause 4.4.1: referes → refers, table heading corrected.
Consequences if	⌘	***[H17]*** Incomplete, unclear or wrong specification.

not approved:	

Clauses affected:	⌘	1, 2, 3.1, 3.2, 4, 4.1, 4.2, 4.3, 4.4		
		Y	**N**	
Other specs affected:	⌘		**X**	Other core specifications ⌘
			X	Test specifications
			X	O&M Specifications
Other comments:	⌘			

How to create CRs using this form:
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1) Fill out the above form. The symbols above marked ⌘[H22] contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

1 Scope

~~The present document specifies the standards allowed to implement Layer 1 on the Iuant interface.~~

The present document specifies the standards allowed to implement layer 1 on the Iuant interface.

The specification of transmission delay requirements and O&M requirements are not in the scope of the present document.

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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TS 25.462: "UTRAN Iuant interface: Signalling transport".

[2] ISO/IEC 8482 (1993): "Information technology - Telecommunications and information exchange between systems - Twisted pair multipoint interconnections".

[3] TIA/EIA TSB89: “Application guidelines for TIA/EIA-485-A”.

3 Definitions and abbreviations

3.1 Definitions

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

On-Off ~~k~~ Keying: A modulation system in which a carrier is switched between two states, ON and OFF.

Common ~~F~~feeder ~~C~~cable: Feeder cable where some antenna line devices (e.g. RET, TMA) are connected via the same feeder cable.

3.2 Abbreviations

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

BS	Base Station
DC	Direct Current
ISB	Idle ~~s~~State ~~b~~Biasing
OOK	On-Off-Keying
RET	Remote Electrical Tilting ~~Unit~~
RF	Radio Frequency
TMA	Tower -Mounted Amplifier

4 Iuant ~~L~~layer 1

4.1 General

There are two layer 1 options:

- RS485 option: A screened multicore cable, which supports a conventional RS485 serial multi-drop bus.
- Modem option: A connection to a RET control unit by way of a coaxial cable which is shared with DC supply and RF signals.

Both layer 1 options support the connection of two-way serial data and DC power to the RET antenna device.

At least one of these two layer 1 options ~~needs to~~shall be supported.

~~The default data rate for both layer 1 options shall be 9.6 kbps. Higher data rates of 38.4 kbps for both layer 1 options and 115.2 kbps only for the RS485 layer 1 option may optionally be supported. Each unit communicates on one of the three data rates, but different units on the same interface may use different data rates.~~The default data rate for both layer 1 options shall be 9.6 kbps. Higher data rates of 38.4 kbps for both layer 1 options and 115.2 kbps only for the RS485 layer 1 option may optionally be supported. Each unit communicates on one of the three data rates, but different units on the same interface may use different data rates.

After a~~ny~~ reset, a secondary station shall alternate between supported data rates. When alternating between data rates, the data rate shall be held constant for 300 ms. After every correctly received device scan command (see [1]) independent of whether it matches or not, at one of the supported data rates, that data rate shall be held constant for 1.5 seconds. After successful reception of an address assignment frame, the secondary station shall use that data rate until it is reset.

~~Data rates:~~Data rates:

- 9.6 kbps ± 3 %
- 38.4 kbps ± 3 %
- 115.2 kbps ± 3 %

The format of the data octet shall be as shown in figure 4.1.1:

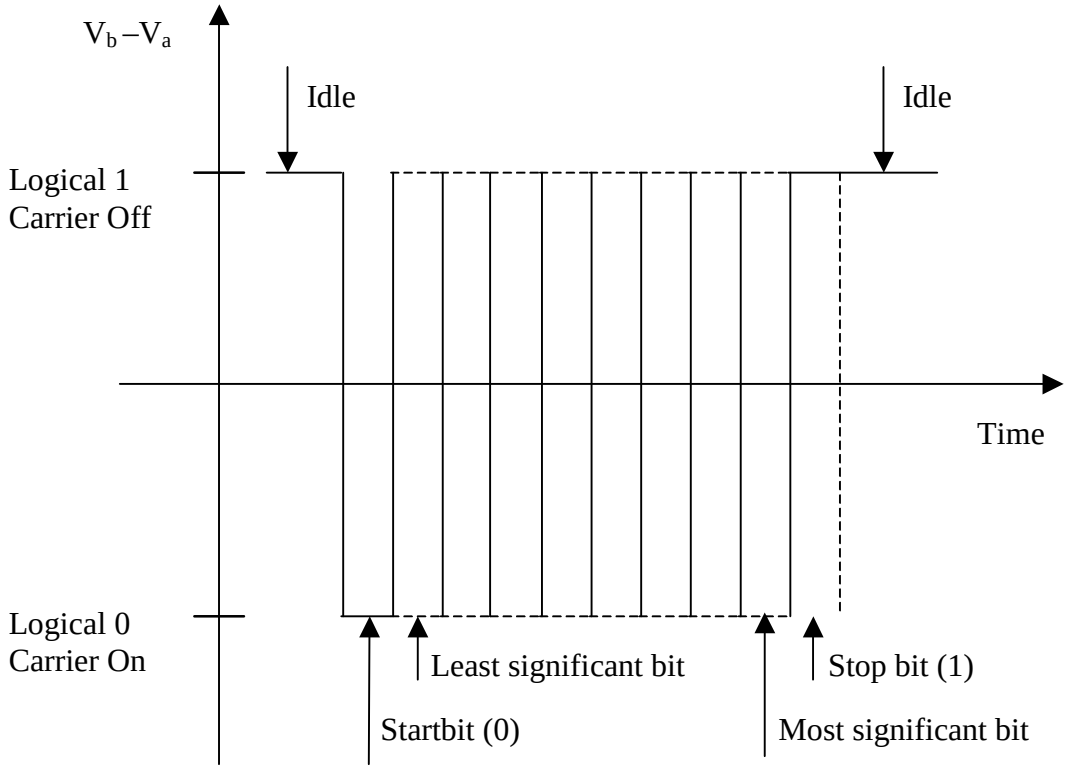


Figure 4.1.1: Format and order of transmitted data

4.2 RS485 option

This option ~~are~~is constituted by a two wire bi-directional multi-drop configuration conforming to [2]. The mapping of mark/space to logical one and zero as referred to in [2] shall be according to figure 4.1.1.

The use of ~~Idle State Biasing (~~ISB~~)~~, also called idle-line failsafe in [3], is mandatory. The bias voltages shall be applied only by the primary station to any separate RS485 bus. The polarity of the idle-state bias is defined as a transmitted 1.

The RS485 transmitter shall be set to drive the bus before the first start bit is sent and held active until the last stop bit is sent. The RS485 transmitter shall stop driving the bus within 20 bit-times after the last stop bit is sent.

If a RET modem is used ISB shall be implemented by the RET modem.

4.3 Modem option

The connection to a RET control unit by way of a coaxial cable which is shared with DC supply and RF signals is provided by two modems, a BS modem and a RET modem. The BS modem shall be either connected to the antenna connector of the BS or integrated in the BS. It provides signal transmission to the RET modem and signal reception from the RET modem over the antenna feeder cable. The RET modem is located between the antenna feeder cable and the antenna. Modem configurations and reference points for modem characteristics are specified in figure 4.~~2~~3.1 and figure 4.3.2. Unless otherwise stated, requirements in this section apply to both BS modem and RET modem.

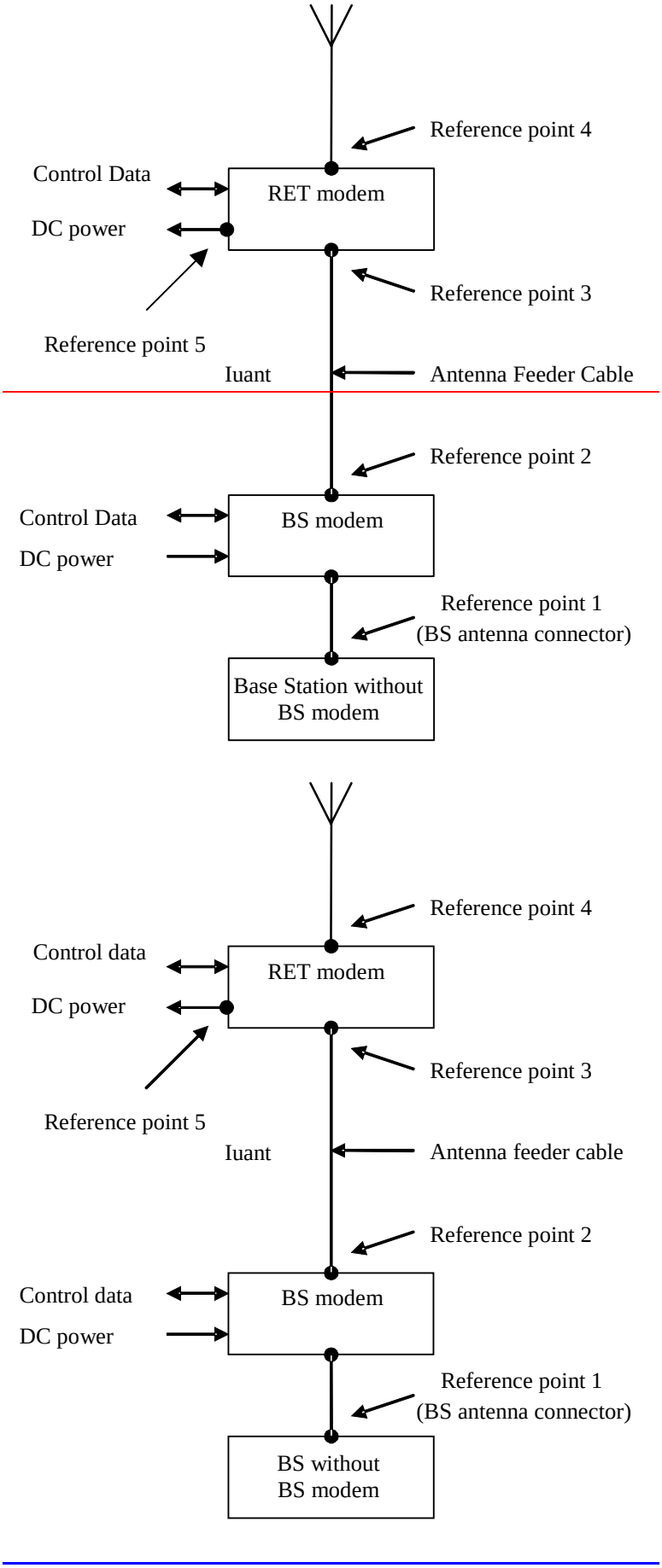
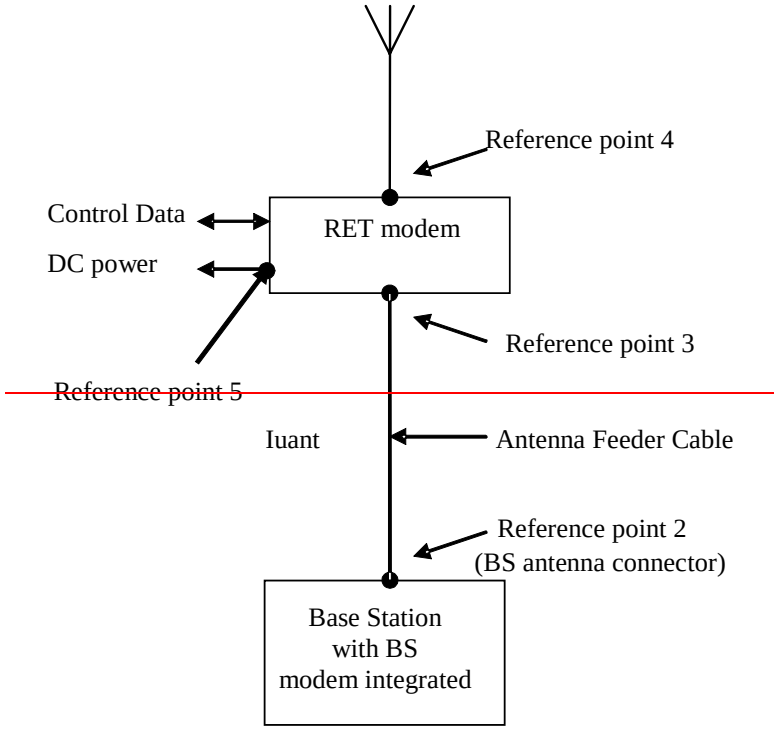

Reference point 4
Control Data
RET modem
DC power
Reference point 3
Reference point 5
Iuant
Antenna Feeder Cable
Reference point 2
Control Data
BS modem
DC power
Reference point 1
(BS antenna connector)
Base Station without
BS modem
Reference point 4
Control data
RET modem
DC power
Reference point 3
Reference point 5
Iuant
Antenna feeder cable
Reference point 2
Control data
BS modem
DC power
Reference point 1
(BS antenna connector)
BS without
BS modem

Figure 4.~~2~~3.1: Modem configuration and modem reference points for ~~base station~~ a BS without BS modem



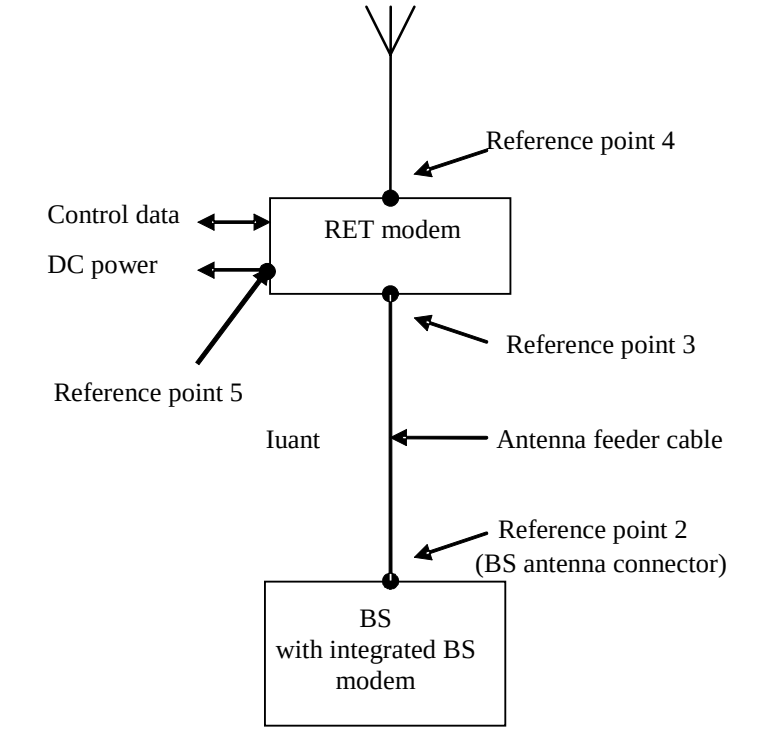


Figure 4.3.2: Modem configuration and modem reference points for ~~base station~~ a BS with integrated BS modem

4.3.1 Interference with existing systems

The modem circuit shall be capable of managing its transmitting characteristic according to subclause 4.3.5.

4.3.1.1 Carrier frequency and frequency stability

The following carrier frequency shall be used for this application:

2.176 MHz ± 100 ppm

4.3.1.2 Modem isolation and modem emissions

The BS modem shall provide at least 41 dB attenuation for frequencies below 400 MHz between reference point 2 and reference point 1 to protect the BS~~base station~~ from emissions of the RET modem.

BS modem emissions at reference point 1 for frequencies below 400 MHz shall be at least 41 dB below the levels specified for the modem spectrum emission mask in subclause 4.3.4.2 to protect the BS~~base station~~ from emissions of the BS modem.

The RET modem shall provide at least 41 dB attenuation for frequencies below 400 MHz between reference point 3 and reference point 4 to protect other radio systems from emission of the BS modem.

RET modem emissions at reference point 4 for frequencies below 400 MHz shall be at least 41 dB below the levels specified for the modem spectrum emission mask in subclause 4.3.4.2 to protect other radio systems from emission of the RET modem.

4.3.1.3 Modem intermodulation attenuation

BS modem and RET modem shall provide intermodulation attenuation of [TBD] at a interferer level of [TBD].

4.3.2 Recovery time

A minimum recovery time shall be allowed between receiving and transmitting messages on the bus. For this reason a minimum permitted response time is specified in subclause 4.5 in [1].

4.3.3 Impedance

The modem transceiver shall provide constant impedance in both transmitting and receiving modes:

- Nominal impedance Z_0: 50 Ω;~~.~~
- Return loss at nominal modem carrier frequency > 6 dB;~~.~~
- Return loss in base station operating band [TBD].

4.3.4 Modulator characteristics

4.3.4.1 Levels

ON-Level: +3 dBm ± 2 dB

OFF-Level: ≤ -40 dBm

4.3.4.2 Spectrum emission mask

The modem spectrum emission mask is specified in figure 4.3.4.2.1. Intermediate values may be obtained by linear interpolation between the points shown. The corresponding measurement bandwidths are specified in table 4.3.4.2.1. For modem configurations according to figure 4.3.1~~2~~ the BS modem shall meet the spectrum emission mask at reference point 2. For modem configurations according to figure 4.3.2 the ~~base station~~BS with integrated BS modem

~~integrated~~ shall meet the spectrum emission mask at reference point 2 only for frequencies below 400 MHz. RET modems shall meet the spectrum emission mask at reference point 3.

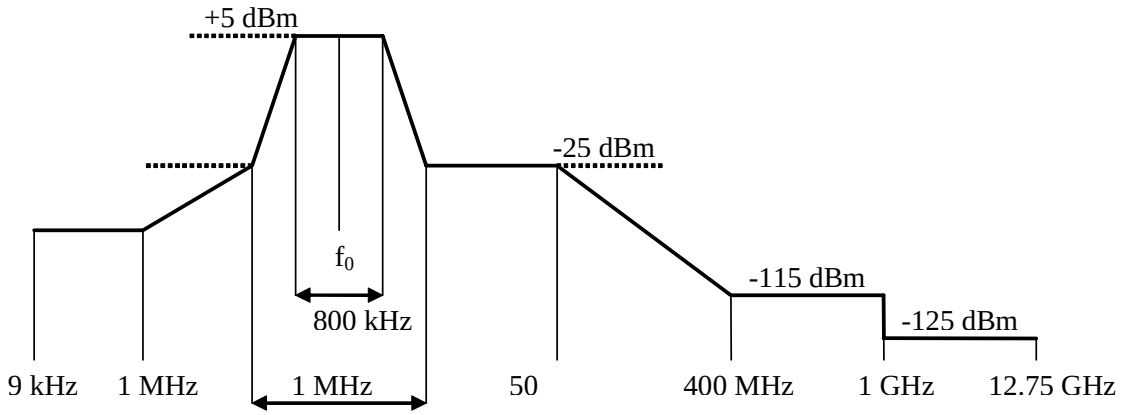


Figure 4.3.4.2.1: Modem spectrum emission mask.

Table 4.3.4.2.1: Modem spectrum emission mask measurement bandwidth

Band	Measurement Bandwidth
9 kHz - 150 kHz	1 kHz
150 kHz - 30 MHz	10 kHz
30 MHz - 1 GHz	100 kHz
1 GHz - 12.75 GHz	1 MHz

4.3.5 Demodulator characteristics

The demodulator shall fulfil the requirement in ~~section~~subclause 4.3.6 for a carrier ON-L~~n l~~evel within +5 dBm to -12 dBm and a carrier OFF-L~~ff l~~evel less than -18 dBm. The levels within –12 dBm to –18 dBm are undefined.

4.3.6 Duty cycle variation

In order to guarantee proper transmission of data bits through the processes of modulation and demodulation, the following limit shall be met for the duty cycle variation:

$\Delta DC_{SYSTEM} = |DC_{RX} - DC_{TX}| \leq 10\ \%$

Where: ΔDC_{SYSTEM} is the difference between the duty cycles of the transmitted and received bit streams,

DC_{TX} = Duty cycle for the input bit stream, and

DC_{RX} = Duty cycle for the output bit stream.

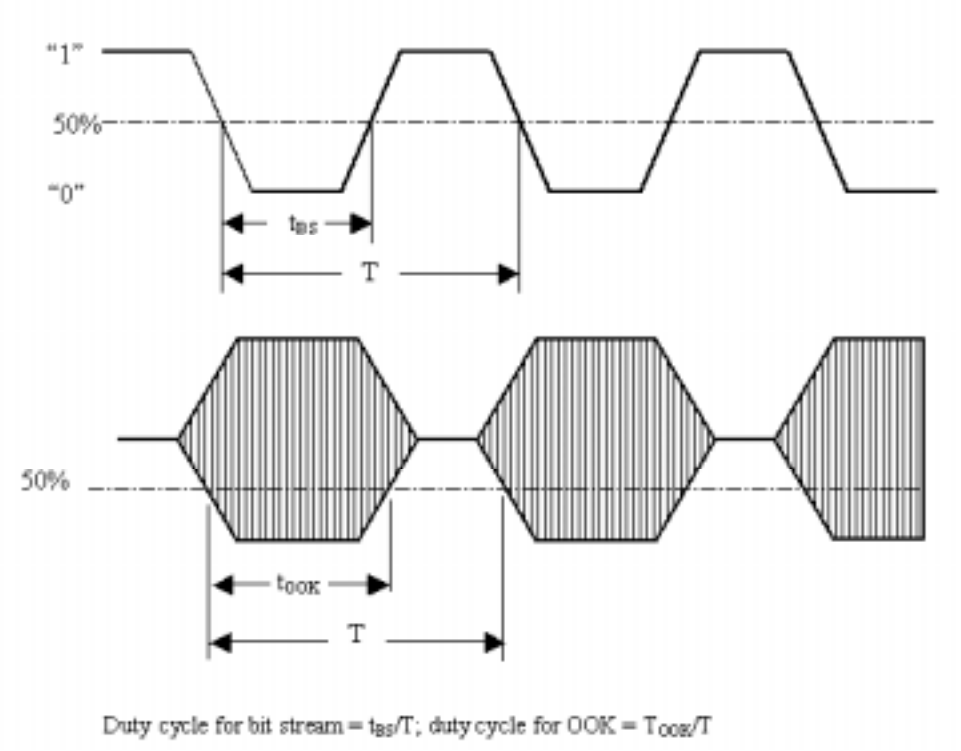


Figure 4.~~5~~3.6.1: Duty cycles of the bit stream and OOK modulated subcarrier

For transmission through a coaxial cable, two converters are required, one from a bit stream to OOK (modulator) and one from OOK back to a bit stream (demodulator). Therefore~~, so for each converter~~ half of the total duty cycle tolerance is available for each converter.

For an input bit stream with a duty ratio of 50 %, the cascaded modulator and demodulator shall provide an output bit stream with a duty ratio within the limits 40 % - 60 %, measured in each case at 0.5 times peak amplitude (see figure 4.~~5~~3.6.1).

4.4 DC power supply

4.4.1 Power consumption

The DC supply requirements refer~~e~~s to reference points 3 and 5 in ~~section~~subclause 4.3.

The RET control unit and a RET modem shall be able to operate with a DC supply voltage range of 10 V – 30 V.

The RET has two power consumption modes:

Table 4.4.1.1~~a~~: Power consumption modes for RET

Power mode	Maximum power consumption
High	< 15 W
Low	< 2 W

A RET modem maximum power consumption shall be < 2 W.

A RET modem shall impose a voltage drop less than 2 V~~olt~~ between reference point 3 and 5.

4.4.2 Conducted emission

The levels of generated conducted noise and ripple on DC Power supply shall be within the limits given in table 4.4.2.1.

Table 4.4.2.1: Noise and ripple

Item	Limit	Frequency	Remarks
RET power mode High	70 mV_{pp}	0.15 - 30 MHz	Only one operating unit a time
RET power mode Low	20 mV_{pp}	0.15 - 30 MHz	

All RET units connected to a DC supply bus shall exhibit full performance up to the limit of 112 mV_{pp} total noise and ripple within 0.15 - 30 MHz.

3GPP TSG-RAN3 Meeting #46
Scottsdale, USA, 14th – 18th February 2005

Tdoc ⌘ R3-050265

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.461** **CR** **8** ⌘ **rev** **1** ⌘ Current version: **6.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Power consumption clarification of RET
Source:	⌘	RAN3
Work item code:	⌘	RANimp-TiltAnt
Date:	⌘	15/02/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
Ph2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)
Rel-7 (Release 7)

Reason for change:	⌘	Current value does not reflect the principle agreed for maximum power consumption, stipulating that maximum power consumption for a RET antenna and modem shall be 15 W
Summary of change:	⌘	Maximum power consumption for the RET control unit is reduced to 13 W. Table heading and text is clarified.
Consequences if not approved:	⌘	Maximum power consumption is higher than agreed, leading to higher costs for implementing primary devices.

Clauses affected:	⌘	4.4.1

		Y	N		
Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4.4 DC power supply

4.4.1 Power consumption

The DC supply requirements referes to reference points 3 and 5 in section 4.3.

The RET control unit and a RET modem shall be able to operate with a DC supply voltage range of 10 V – 30 V.

The RET control unit has two power consumption modes:

Table 4.1.a: Power consumption modes for RET control unit

Power mode	Maximum power consumption
High	< ~~15~~ 13 W
Low	< 2 W

A RET modem maximum power consumption shall be < 2 W.

A RET modem shall impose a voltage drop less than 2 Volt between reference point 3 and 5.

3GPP TSG-RAN WG3 Meeting #46
Scottsdale, USA, 14th -18th February 2005

Tdoc ⌘R3-050291

CR-Form-v7

CHANGE REQUEST

⌘ **25.461** **CR** **9** ⌘ **rev** **-** ⌘ Current version: **6.1.0** ⌘

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Proposed change affects: UICC apps⌘ [ ] ME [ ] Radio Access Network [X] Core Network [ ]

Title:	⌘	Modem Operating Bands
Source:	⌘	RAN3
Work item code:	⌘	RANimp-TiltAnt
Date:	⌘	17/2/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The Modem operating bands are not specified.
Summary of change:	⌘	Inserting a new chapter introducing the operating bands. An external BS modem or RET modem could be designed for some or all of the operating bands.
Consequences if not approved:	⌘	Operating bands will remain unspecified.

Clauses affected:	⌘	New 4.3.7

		Y	N		
Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	Chapter 4.3.7 shall be marked as under RAN4 mandate.

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

3.2 Abbreviations

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

BS	Base Station
DC	Direct Current
DL	Downlink
FDD	Frequency Division Duplex
ISB	Idle-state biasing
OOK	On-Off-Keying
RET	Remote Electrical Tilt Unit
RF	Radio Frequency
TMA	Tower-Mounted Amplifier
UE	User Equipment
UL	Uplink
UMTS	Universal Mobile Telecommunications System
UTRA	UMTS Terrestrial Radio Access

/* partly omitted */

4.3.7 Operating bands

A UTRA/FDD BS or RET modem is designed to operate in one or several of the following paired frequency bands:

Table 4.3.7.1: Frequency bands

Operating Band	UL Frequencies UE transmit, Node B receive	DL frequencies UE receive, Node B transmit
I	1920 – 1980 MHz	2110 – 2170 MHz
II	1850 –1910 MHz	1930 – 1990 MHz
III	1710 – 1785 MHz	1805 – 1880 MHz
IV	1710 – 1755 MHz	2110 – 2155 MHz
V	824 – 849 MHz	869 – 894 MHz
VI	830 – 840 MHz	875 – 885 MHz

The operating bands of the BS or RET modem shall be declared by the manufacturer.

3GPP TSG-RAN3 Meeting #46
Scottsdale, USA, 14th – 18th February 2005

Tdoc ⌘ R3-050269

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.462** **CR** **11** ⌘ **rev** **1** ⌘ Current version: **6.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Correction of address assignment example
Source:	⌘	RAN3
Work item code:	⌘	RANimp-TiltAnt
Date:	⌘	15/02/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

Ph2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	Current example does not follow the outlined rules in the specification
Summary of change:	⌘	Omitting parameter 3 and 5 from the address assignment example. Replacing given values with hex values, corrections
Consequences if not approved:	⌘	Incorrect example remains. Implementations following the example may not accept address assignments and render useless.

Clauses affected:	⌘	Annex D.

Other specs affected: ⌘	Y	N	
		X	Other core specifications
		X	Test specifications
		X	O&M Specifications

⌘

Other comments: ⌘

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP

specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

Annex D (informative):
Address assignment example

D.1 Address ~~Assignment~~ assignment command

Table D.1: Format of the XID frame originated by the primary station

Field	Content	Description
ADDR	0xFF	All-station address (Broadcast)
CTRL	0xBF~~XID~~	XID command
FI	0x81	Format identifier
GI	0xF0	User defined parameter set
GL	0x10~~Length in octets for the rest of the message~~	Length of the parameter field (rest of the message) in octets ~~Length of parameter field~~
PI	0x01~~1~~	~~Parameter id 1 =~~ Unique ID
PL	0x07~~N~~	Length of PV field in octets
PV	0x58 0x59 0x7B 0x20 0x41 0x42 0x43~~Unique ID~~	Unique ID of the secondary station~~Concatenation of vendor code and serial number (N octets)~~
PI	0x02	~~Parameter id 2 =~~ HDLC address
PL	0x01	Length of PV field in octets
PV	~~1 – 254~~0x17	Assigned HDLC address
~~PI~~	~~3~~	~~Parameter id 3 = Bit Mask (for Unique ID), indicates a device scan~~
~~PL~~	~~M~~	~~Length of PV field in octets~~
~~PV~~	~~Bit Mask~~	~~Bit Mask for Unique ID used for device scan~~
~~PI~~	~~4~~	~~Parameter id 4 = Device Type~~
~~PL~~	~~1~~	~~Length of PV field in octets~~
~~PV~~	~~Device Type~~	~~Device Type as defined in table 4.1~~
PI	0x06	~~Parameter id 5 =~~ Vendor ~~Code~~ code as given in [4]
PL	0x02	Length of PV field in octets
PV	0x58 0x59~~Vendor Code~~	Unique assigned vendor code as given in [4] (virtual vendor code "XY" used in this example)

NOTE: The parameters may occur in any order in the XID command. Also other parameters (except PI=3) may be included in the address assignment.

D.2 Address assignment response

~~The secondary station verifies the validity of the XID command. Thereafter the secondary station matches PV1, PV3 and PV4.~~

~~To fulfil the match with the Unique ID given as the first parameter value PV1, the following two rules shall be valid:~~

~~1.Length of given Unique ID shall be less or equal to the length of its own Unique ID.~~

~~2.When compared character by character, from right to left, they shall match.~~

- To fulfil the match with the vendor code given as the third parameter value PV3, one of the following two rules shall be valid:

  1.The given vendor code is a wild card coded as 0xFF 0xFF.

  2.The given vendor code matches exactly

- To fulfil the match with the device type given as the fourth parameter value PV4, one of the following two rules shall be valid:

  1.The given device type is a wild card coded as 0xFF.

  2.The given device type matches exactly.

Table D.2: Format of Address Assignment Response by the secondary station

Field	Content	Description
ADDR	#0x17	Station HDLC address of the station
CTRL	0xBFXID	XID Commandcommand
FI	0x81	Format identifier
GI	0xF0	User defined parameter set
GL	0x0Cn+14	Length of parameter field (rest of the message) in octets.
PI	0x01	Parameter id 1 = Unique ID
PL	N0x07	Length of PV field in octets
PV	0x58 0x59 0x7B 0x20 0x41 0x42 0x43Unique ID	Unique ID of the secondary stationConcatenation of vendor code and serial number (n octets)
PI	2	Parameter id 2 = HDLC address
PL	1	Length of PV field in octets
PV	1 – 254	Assigned HDLC address
PI	3	Parameter id 3 = Bit Mask (for Unique ID), indicates a device scan
PL	M	Length of PV field in octets
PV	Bit Mask	Bit Mask for Unique ID used for device scan
PI	0x04	Parameter id 4 = Device Typetype
PL	0x01	Length of PV field in octets
PV	Device Type0x01	Device Type type as defined in table 4.1
PI	5	Parameter id 5 = 3GPP Release ID
PL	1	Length of PV field in octets
PV	Release ID	Latest supported 3GPP Release version

In case of a match it changes its address to the one supplied in the second PV. It then responds with an XID frame transmitted from its new address.

If the match fails, the secondary station does nothing.

After the assignment of its address a secondary station enters the state *Connected*.

NOTE: In this address assignment example messages the virtual vendor code "XY", the unique ID 0x58 0x59 0x7B 0x20 0x41 0x42 0x43, the HDLC address 0x17 and the device type 0x01 for a single-antenna device are used.

NOTE: Some further work on this example might be needed.

3GPP TSG-RAN3 Meeting #46
Scottsdale, USA, 14th – 18th February 2005

Tdoc ⌘ R3-050272

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.462** **CR** **13** ⌘ **rev** **-** ⌘ Current version: **6.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Reset in the transport layer
Source:	⌘	RAN3
Work item code:	⌘	RANimp-TiltAnt
Date:	⌘	15/02/2005
Category:	⌘	**C**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
Ph2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)
Rel-7 (Release 7)

Reason for change:	⌘	Explicit reset functionality for the transport layer is missing. A disfunctional transport layer may block the higher layer SoftwareReset elementary procedures from reaching the secondary device. SoftwareReset does not carry out a complete reset of the secondary station. No complete reset is described or required.
Summary of change:	⌘	An explicit reset functionality through the transport layer is introduced. Reset function refers to power up behaviour.
Consequences if not approved:	⌘	Explicit reset functionality will remain missing. The primary station may not be able to order reset to the secondary station. Unclear reset behaviour by RET devices may create interoperability problems.

Clauses affected:	⌘	3.1, 4.6, 4.8, 4.10

Other specs affected: ⌘

Y	N	
	X	Other core specifications
	X	Test specifications
	X	O&M Specifications

⌘

Other comments: ⌘

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

3.1 Definitions

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

ASCII character: A character forming part of the International Reference Version of the 7-bit character set defined in ISO/IEC 646:1991

Octet: 8 bits as used in [2]

Device type: One octet identifying the type of a device

Vendor code: A unique ASCII 2-character code assigned to each vendor in [4]

Reset: A process by which the device is put in the state it reaches after a completed power-up

Secondary Payload Transmit Length: The maximum length of the Info field of an HDLC I-frame in the direction secondary station to primary station. The value is by default 74 octets or decided by XID negotiation. It is always 74 octets or larger.

Secondary Payload Receive Length: The maximum length of the Info field of an HDLC I-frame in the direction primary station to secondary station. The value is by default 74 octets or decided by XID negotiation. It is always 74 octets or larger.

----------Unchanged section omitted----------

4.6 State model

The connection state model for the layer 2 of the secondary station is shown in figure 4.1. The events written in *italic* are procedures from higher levels e.g. link establishment. The HDLC frames that correspond to the events are written in bold as **command / response** messages.

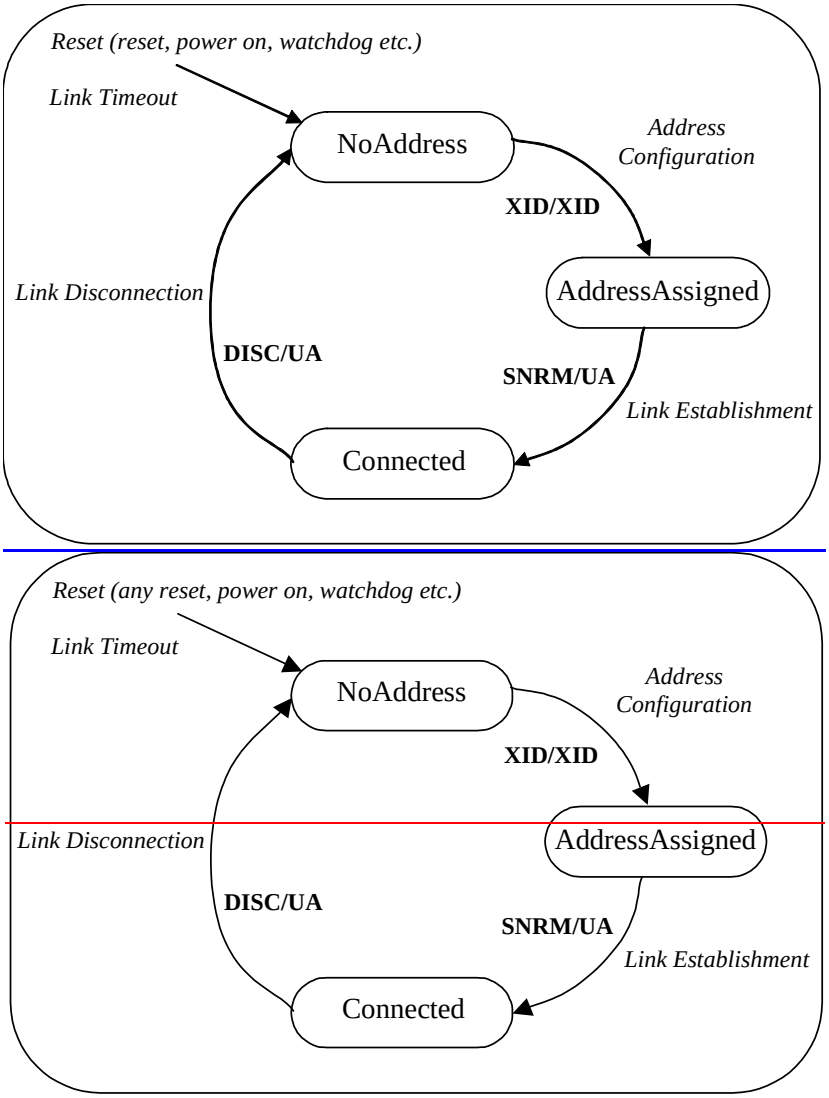

Figure 4.1: Connection State Model

----------Unchanged section omitted----------

4.8.x Reset device

Format identifier (FI) shall be 0x81 and group identifier (GI) shall be 0xF0. All secondary stations shall support the following parameter:

Table 4.x: HDLC parameters for reset of secondary stations

PI	PL	Description of PV
7	0	Reset device

If the XID command reset device is received as a broadcast (0xFF) by the secondary device, the secondary device shall reset without responding, otherwise the addressed secondary device shall reset after responding.

The reset device parameter shall not be combined with other parameters in an XID command.

NOTE: There is no PV in the XID command Reset device.

----------Unchanged section omitted----------

4.10 Link timeout

Whenever a secondary station receives an HDLC frame addressed to itself, i.e. not an all-station address (0xFF), it shall restart a 3 minute timer. If this 3 minute timer expires, the secondary station shall be reset.~~enter the state *No Address.*~~

3GPP TSG-RAN3 Meeting #46
Scottsdale, USA, 14th – 18th February 2005

Tdoc ⌘ R3-050342

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.462** **CR** **14** ⌘ **rev** **1** ⌘ Current version: **6.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Clarification on uniqueID and device scan
Source:	⌘	RAN3
Work item code:	⌘	RANimp-TiltAnt
Date:	⌘	18/02/2005
Category:	⌘	**C**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

Ph2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	Definition of unique ID is missing. Defintion of device scan is unclear and can be improved for scannig speed.
Summary of change:	⌘	Definition of unique ID is introduced. Device scan response is clarified, padding character is changed to non-printable character, vendor code included in the device scan response. Only secondary stations in NoAddress state shall respond to device scan commands. Update of device scan example.
Consequences if not approved:	⌘	Defintion of unique ID remains missing (uniqueness mechanism unclear), device scan implementation in secondary devices may vary, leading to more complicated device scan implementations in primary devices and longer device scan times.

Clauses affected:	⌘	3.1, 4.8.3, 4.8.4, and annex E

Other specs affected: ⌘

Y	N	
	X	Other core specifications
	X	Test specifications
	X	O&M Specifications

⌘

Other comments: ⌘

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

3.1 Definitions

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

ASCII character: A character forming part of the International Reference Version of the 7-bit character set defined in ISO/IEC 646:1991 represented as one octet

Octet: 8 bits as used in [2]

Device type: One octet identifying the type of a device

Unique ID: A concatenation of the vendor code (2 octets) and a 1 to 17 octets long unit specific code (e.g. serial number) exclusive for each secondary station from the vendor to whom the vendor code is assigned. The vendor code is placed in the left-most (most significant) position of the unique ID. The vendor to whom the vendor code is assigned is responsible for ensuring the uniqueness of the unique ID for each station.

Vendor code: A unique ASCII 2-character code assigned to each vendor in [4]

Secondary Payload Transmit Length: The maximum length of the Info field of an HDLC I-frame in the direction secondary station to primary station. The value is by default 74 octets or decided by XID negotiation. It is always 74 octets or larger.

Secondary Payload Receive Length: The maximum length of the Info field of an HDLC I-frame in the direction primary station to secondary station. The value is by default 74 octets or decided by XID negotiation. It is always 74 octets or larger.

----------Unchanged section omitted----------

4.8.3 Address assignment

The primary station broadcasts the XID commands. The secondary station(s) which match shall respond. The primary shall ensure that only one secondary matches the supplied parameter(s). See below for details.

Format Identifier (FI) shall be 0x81 and Group Identifier (GI) shall be 0xF0. All secondary stations shall support the following parameters:

Table 4.4: HDLC parameters for addressing and device scan

PI	PL	Description of PV
1	~~1~~ 0 to 19	Unique ID
2	1	HDLC Address
3	~~1~~ 0 to 19	Bit Mask (for Unique ID), indicates a device scan
4	1	Device Type (see table 4.1)
6	2	Vendor Code as given in [4]

The XID message can be used to assign HDLC addresses or to scan for devices.

An address assignment XID command shall contain at least PI=2 (HDLC Address) and shall not contain PI=3 (Bit Mask). During an address assignment all secondary stations first assume a match and then carry out the following steps:

- If PI=1 (Unique ID) is supplied, the right-most PL octets of the secondary station's Unique ID are compared to the Unique ID in the XID command. If they are different, the secondary station does not match, and the message is ignored. If the Unique ID in the XID command is longer than the secondary station's Unique ID, the secondary station does not match, and the message is ignored.

- If PI=4 (Device Type) is supplied, the device type of the secondary station is compared to the device type in the XID command. If they are different, the secondary station does not match, and the message is ignored.

- If PI=6 (Vendor Code) is supplied, the vendor code of the secondary station is compared to the vendor code in the XID command. If they are different, the secondary station does not match, and the message is ignored.

If the secondary station still matches after these steps, the secondary station sets its HDLC address to the address specified in PI=2 and responds with an XID response which contains PI=1 and PI=4.

NOTE: Unlike the normal XID negotiation, in this XID negotiation, the XID response message returns a different set of parameters than the XID command message.

4.8.4 Device Scan

A device scan XID command shall only contain PI=1 (Unique ID) and PI=3 (Bit Mask), see table 4.4. PI=1 and PI=3 shall be of equal length PL octets.

~~The~~ If in the NoAddress state, the secondary station masks the min(PL,2) left~~-~~most ~~PL~~ octets of its own ~~Unique~~ unique ID with the min(PL,2) left-most octets of the bit mask in the XID command~~,~~ and compares the result with the min(PL,2) left-most octets the unique ID supplied in the XID command. If they match, the secondary device masks the max(0,PL-2) right-most octets of its own unique ID with the max(0,PL-2) right-most octets of the ~~-~~bit mask in the XID command and compares the result with the max(0,PL-2) right-most octets of the ~~Unique~~ unique ID supplied in the XID command. If they also match, the secondary station transmits an XID response message with its own identification data in the fields PI=1 (complete ~~Unique~~ unique ID)~~), PI=2 (HDLC Address) ,and~~ PI=4 (~~Device~~ device ~~Type~~type) and PI=6 (vendor code).

For the device scan comparison, the ~~Unique~~ unique ID of the secondary station shall be padded with ~~trailing spaces~~ NUL characters (character code ~~0x20~~0x00) between the second and third left-most positions to a length of 19 octets.

The device scan messages may be utilised by the primary to identify all secondary stations on an interface.

Bit mask PL=0 shall match all secondary stations in the NoAddress state.

Only matching secondary stations in the NoAddress state shall respond to the device scan messages.

----------Unchanged section omitted----------

Annex E (informative): Device scan example

In some situations it may be found that the Unique ID of a bus device is unknown or has been inaccurately recorded. This HDLC command exchange is used by the primary station to perform a binary tree scan of the bus, in order to identify all connected and disconnected devices.

Table E.1: Primary device scan command (XID Frame)

Field	Content	Description
ADDR	0xFF	All-station address (Broadcast)
CTRL	0xBF~~XID~~	XID command
FI	0x81	Format identifier
GI	0xF0	User defined parameter set
GL	~~Length in octets for the rest of the message~~ 0x0A	Length in octets for the rest of the message~~Length of parameter field~~
PI	0x01	~~Parameter id 1 =~~ Unique ID
PL	~~N~~0x03	Length of PV field in octets
PV	0x58 0x11 0x15~~Unique ID~~	~~Concatenation of vendor code and serial number (N octets)~~Unique ID supplied by the primary station for masked comparison with the unique ID of the secondary station
PI	0x03	~~Parameter id 3 =~~ Bit ~~Mask~~mask
PL	~~n~~0x03	Length of PV field in octets (same as for PI=1)
PV	~~Bit Mask~~0xFF 0x17 0xFF	Bit ~~Mask~~ mask to be applied ~~(n octets)~~

NOTE: The parameters may occur in any order in the XID command.

- **Device Scan Response**

When each secondary station in the NoAddress state receives the command it masks its Unique ID with the bit mask and compares the result with the Unique ID supplied as described in clause 4.8.4. If they match, the secondary station responds using XID format frame according to table 8 of section 5.5 of [2].

Table E.x: Secondary device scan response (XID Frame) in case of a match

Field	Content	Description
ADDR	0x00	No station address
CTRL	0xBF	XID command
FI	0x81	Format identifier
GI	0xF0	User defined parameter set
GL	0x0F	Length in octets for the rest of the message
PI	0x01	Unique ID
PL	0x06	Length of PV field in octets
PV	0x58 0x59 0x07 0x5B 0xCD 0x15	Unique ID of the secondary station
PI	0x06	Vendor code
PL	0x02	Length of PV field in octets
PV	0x58 0x59	Unique assigned vendor code as given in [4] (virtual vendor code “XY” is used in this example)
PI	0x04	Device type
PL	0x01	Length of PV field in octets
PV	0x01	Single-antenna RET device type as defined in table 4.1

NOTE1: In this device scan example, the virtual vendor code "XY", the unique ID “0x58 0x59 0x07 0x5B 0xCD 0x15”, and the device type 0x01 for a single-antenna RET device are used.

NOTE2: The parameters may occur in any order in the response.

It is recommended that the response of individual devices is subject to a random delay (within the permitted response time) to aid collision detection at the primary station.

If there is no response, the primary station knows that no secondary station had those bits in its Unique ID or that the secondary stations having those bits in their unique ID already have assigned addresses, so the tree scan can be truncated at that branch.

If multiple secondary stations respond, ~~the messages may arrive after each other or at the same time. In the first case multiple responses will arrive before the timeout, in the second case~~ the responses might garble each other, unless one secondary station is close enough to overpower the signal from the other(s).

If any response arrives, a single frame, multiple frames or frames with incorrect checksums or framing errors, the ~~primary station shall assume that that~~ branch of the tree is inhabited ~~and scan through it~~.

~~NOTE: Some further work on the example given here is needed in order to align it with the device scan procedure described in section 4.8.3.~~

3GPP TSG-RAN3 Meeting #46
Phoenix, USA, 14th-18th February 2005

Tdoc ⌘ R3-050266

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.462** **CR** **006** ⌘ **rev** **1** ⌘ Current version: **6.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Editorial changes to 25.462 after RAN3#45
Source:	⌘	RAN3
Work item code:	⌘	RANimp-TiltAnt
Date:	⌘	15/02/2005
Category:	⌘	**D**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

Ph2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	Unclear specification and violation of the drafting rules
Summary of change:	⌘	Several editorial changes according to the drafting rules, addition of missing abbreviations and more precise specification
Consequences if not approved:	⌘	Specification is unclear, incomplete and not in line with the drafting rules
Clauses affected:	⌘	1, 2, 3.2, 4.6, 4.7, 4.8, 4.10, Annex A.1, Annex A.2, Annex A.7, Annex B and Annex C

Other specs affected: ⌘	Y	N		⌘
		X	Other core specifications	
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

1 Scope

The present document specifies the signalling transport related to RETAP signalling to be used across the Iuant interface. The logical Iuant interface is a Node B internal interface between the implementation specific O&M function and the RET a~~A~~ntenna c~~C~~ontrol unit function of the Node B.

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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TS 25.460: "UTRAN Iuant Interface: General Aspects and Principles".

[2] ISO/IEC 13239 (2nd Edition, March 2000): "Information Technology – Telecommunications and information exchange between systems – High-level data link control (HDLC) procedures".

[3] 3GPP TS 25.461: "UTRAN Iuant Interface: Layer 1".

[4] Antenna Interface Standards Group: "Control Interface for Antenna Line Devices", Standard No. AISG1.

3 Definitions and abbreviations

********** Unchanged Parts omitted **********

3.2 Abbreviations

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

ADDR	Address
ACK	Acknowledgment
CRC	Cyclic Redundancy Check
DISC	Disconnect (frame type)
DM	Disconnected Mode (frame type)
FCS	Frame Checking Sequence
FI	Format Identifier
FRMR	Frame Reject (frame type)
GI	Group Identifier
GL	Group Length
HDLC	High-Level Data Link Control
I	Information (frame type)
ID	Identifier
INFO	Information (field name)
NAK	Non Acknowledgment

NRM	Normal Response Mode
P/F	Poll/Final
PI	Parameter Identifier
PL	Parameter Length
PV	Parameter Value
RET	Remote Electrical Tilting
RNR	Receive Not Ready (frame type)
RR	Receive Ready (frame type)
SNRM	Set Normal Response Mode (frame type)
TWA	Two Way Alternate
UA	Unnumbered Acknowledgement (frame type)
UNC	Unbalanced Operation Normal Response Mode Class
XID	Exchange ID (frame type)

********** Unchanged Parts omitted **********

4.6 State model

The connection state model for the layer 2 of the secondary station is shown in figure 4.1. The events written in *italic* are procedures from higher levels e.g. link establishment. The HDLC frames that correspond to the events are written in bold as **command / response** messages.

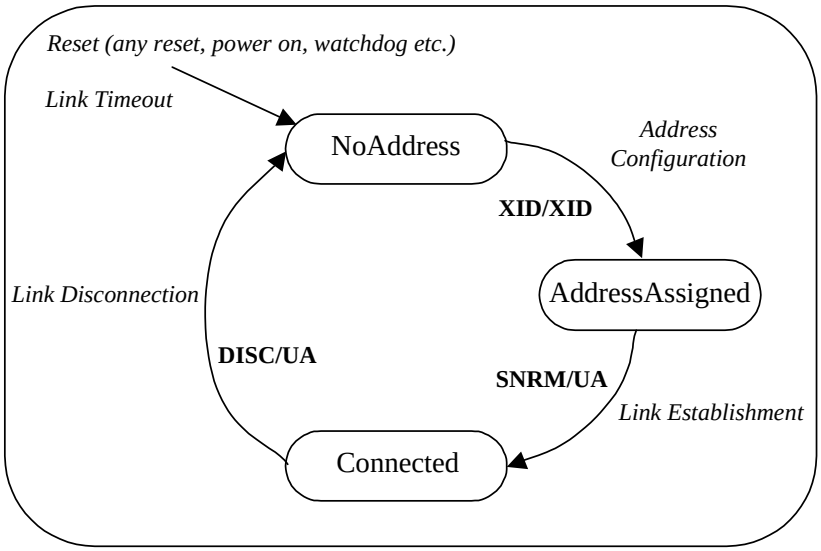

Figure 4.1: Connection sState mModel

4.7 Device types

Two device types are defined and identified by the assigned 1-octet unsigned integer code.

Table 4.7.1: Device types and codes

~~Device Type~~	~~1-octet unsigned integer code~~
~~Single-Antenna RET Device~~	~~0x01~~
~~Multi-Antenna RET Device~~	~~0x11~~

Device Type	1-octet unsigned integer code
Single-Antenna RET Device	0x01
Multi-Antenna RET Device	0x11

4.8 XID negotiation

XID negotiation shall use the standard format (see 5.5.3.1-5.5.3.2.3.2 in [2]). See Annex B for a brief description of XID negotiation and Annex C to E for examples of XID negotiations. All GL fields have a size of 1 octet.

4.8.1 HDLC parameters

Format Identifier (FI) shall be 0x81 and Group Identifier (GI) shall be 0x80. All secondary stations shall support the following parameters:

Table 4.8.1~~2~~: HDLC p~~P~~arameters for secondary stations

PI	PL	Description of PV
5	4	Maximum information field length – transmit (bits)
6	4	Maximum information field length – receive (bits)
7	1	Window size – transmit (frames)
8	1	Window size – receive (frames)

4.8.2 Protocol version

Format Identifier (FI) shall be 0x81 and Group Identifier (GI) shall be 0xF0. All secondary stations shall support the following parameter:

Table 4.8.2.1~~3~~: HDLC p~~P~~arameter for~~:~~ protocol version

PI	PL	Description of PV
5	1	3GPP Release ID~~d~~

4.8.3 Address assignment

The primary station broadcasts the XID commands. The secondary station(s) which match shall respond. The primary shall ensure that only one secondary matches the supplied parameter(s). See below for details.

Format Identifier (FI) shall be 0x81 and Group Identifier (GI) shall be 0xF0. All secondary stations shall support the following parameters:

Table 4.8.3.1~~4~~: HDLC parameters for ~~addressing~~ address assignment and device scan

PI	PL	Description of PV
1	1 to 19	Unique ID
2	1	HDLC Address
3	1 to 19	Bit Mask (for Unique ID), indicates a device scan
4	1	Device Type (see table 4.7.1)
6	2	Vendor Code as given in [4]

The XID message can be used to assign HDLC addresses or to scan for devices.

An address assignment XID command shall contain at least PI=2 (HDLC Address) and shall not contain PI=3 (Bit Mask). During an address assignment all secondary stations first assume a match and then carry out the following steps:

- If PI=1 (Unique ID) is supplied, the right-most PL octets of the secondary station's Unique ID are compared to the Unique ID in the XID command. If they are different, the secondary station does not match, and the message is ignored. If the Unique ID in the XID command is longer than the secondary station's Unique ID, the secondary station does not match, and the message is ignored.

- If PI=4 (Device Type) is supplied, the device type of the secondary station is compared to the device type in the XID command. If they are different, the secondary station does not match, and the message is ignored.

- If PI=6 (Vendor Code) is supplied, the vendor code of the secondary station is compared to the vendor code in the XID command. If they are different, the secondary station does not match, and the message is ignored.

If the secondary station still matches after these steps, the secondary station sets its HDLC address to the address specified in PI=2 and responds with an XID response which contains PI=1 and PI=4.

NOTE: Unlike the normal XID negotiation, in this XID negotiation, the XID response message returns a different set of parameters than the XID command message.

4.8.4 Device sScan

A device scan XID command shall only contain PI=1 (Unique ID) and PI=3 (Bit Mask), see table 4.8.3.14. PI=1 and PI=3 shall be of equal length PL octets. The secondary station masks the left-most PL octets of its Unique ID with the bit mask in the XID command, and compares the result with the Unique ID supplied in the XID command. If they match, the secondary station transmits an XID response message with PI=1 (Unique ID), PI=2 (HDLC Address) and PI=4 (Device Type).

For the device scan comparison, the Unique ID of the secondary station shall be padded with trailing spaces (character code 0x20) to a length of 19 octets.

The device scan messages may be utilised by the primary to identify all secondary stations on an interface.

4.9 Link establishment

Once the secondary station has been assigned an HDLC address, the primary station initiates the link establishment by sending the SNRM command frame. The secondary station responds with an UA frame and enters the state *Connected*.

4.10 Link timeout

Whenever a secondary station receives an HDLC frame addressed to itself, i.e. not an all-station address (0xFF), it shall restart a 3 minute timer. If this 3 minute timer expires, the secondary station shall enter the state *No Address*.

********** Unchanged Parts omitted **********

A.1 Basic structure

In unbalanced operation, there is one primary station (master) which controls the bus and a number of secondary stations (slaves) which only are allowed to transmit when the primary station gives them permission to do so.

All messages are transmitted as frames with the layout shown in table A.1.1:

Table A.1.1: Format of an HDLC frame

Flag 1 octet	**ADDR 1 octet**	**Control 1 octet**	**INFO N octets**	**FCS 2 octets**	**Flag 1 octet**
0x7E	Secondary Station Address	Control bits	Variable length	CRC	**0x7E**

HDLC frames begin and end with a Flag (0x7E) (see A.5 for details).

The transmitting station calculates a Frame Check Sequence (CRC16) on all octets which follow the starting flag but not including the FCS octets. The checksum is transmitted as FCS in little endian order and is followed by the closing flag.

The receiving station calculates the checksum on all octets between the flags. When it finds the closing flag, it compares the checksum to ~~a~~ 0xF0B8. If it is a match, the HDLC frame is processed.

The address field contains the HDLC address of the secondary station. If the primary station sendts the message, it is called a command and the address field contains the address of the secondary station as destination. If the secondary station sendts the message, it is called a response and the address field contains the address of the secondary station as source. Secondary stations cannot communicate directly to each other.

The control field defines one of three frame types:

- I frames contain data as well as a send and receive counter;
- S frames contain a receive counter;
- U frames contain unnumbered commands.

The INFO field is only present in I frames and XID frames. The INFO field in an I frame contains the layer 7 payload.

A.2 UNC commands

According to 6.6.2.1 in [2] the following commands in shall be supported in UNC mode:

Table A.2.1: Commands ~~required by~~supported in UNC mode

Commands (Primary Station)	Responses (Secondary Station)
Frame type I	Frame type I
Frame type RR	Frame type RR
Frame type RNR	Frame type RNR
Frame type SNRM	Frame type UA
Frame type DISC	Frame type DM
	Frame type FRMR

A.2.1 Set Normal Response Mode (SNRM)

This command is used to set the secondary station in connected mode and reset its sequence number variables.

A.2.2 Disconnect (DISC)

This command is used to terminate the connection.

A.2.3 Unnumbered Acknowledge (UA)

This response is used to confirm that the secondary station received and acted on an SNRM or DISC command.

A.2.4 Disconnected Mode (DM)

This response is used to inform the primary station that the secondary station is disconnected.

********** Unchanged Parts omitted **********

A.7 Full duplex link

The upper layer sees the HDLC link as a full duplex link, although the actual transmissions on layer 1 are half duplex. The reason for this is that the upper layer is not aware of any restrictions on transmissions or receptions between layer 2 and layer 1 or between the stations.

Whenever the upper layer wants to transmit, it places a message on the queue to layer 2. The message will not be transmitted until the primary station does a poll.

~~-~~N~~ote,~~OTE: ~~that t~~his applies to both the primary and the secondary station.

The same applies to reception. The upper layer will either be told by layer 2 when a message has arrived, or it will periodically check to see if a message has arrived at layer 2. Neither of these two methods will in any way influence the reception of a message. That only depends on when the primary does a poll.

~~-~~N~~ote~~OTE: ~~that t~~his still applies to both the primary and the secondary station.

A poll is a command frame from the primary station where the P/F (Poll/Final) bit in the control field is set to 1. This informs the secondary that it is allowed to transmit response frames.

U frames set the P/F bit, which means that they are polls. However, since the U frames used in UNC 1,4 require a specific U frame response, they are not used for I frame transmission, which is what the upper layer messages depend upon.

An I, RR or RNR frame type with the P/F bit set constitutes a poll as used above. An RNR frame prevents transmission of I frames, so it does not really apply.

~~Note~~NOTE: ~~, that w~~Whenever an I or RR poll occurs, the secondary station may transmit whatever I frame it wishes (as long as the window size is not exceeded, i.e. previous messages have been acknowledged). This means that the secondary station does not have to transmit a reply to a layer 7 instruction. It is free to transmit an alarm instruction, if an alarm has occurred. It is also free to transmit any valid reply to an earlier layer 7 instruction, if it has received (acknowledged) more than one.

Annex B (informative): HDLC parameter negotiation

See also sections 5.5.3.1 – 5.5.3.2.3.2 in [2].

Table B.1: Format of XID parameters

FI	**GI**	**GL**	**PI**	**PL**	**PV**	**PI**	**PL**	**PV**

XID parameter negotiation uses a specific format (see table C.1) to transfer parameters.

The parameters are identified by a one octet Format Identifier (FI) code and a one octet Group Identifier (GI) code. The Group Length (GL) is a one octet unsigned integer giving the length in octets of the parameters following it.

The parameters are a sequence of PI/PL/PV values. The Parameter Identifier (PI) is a one octet code identifying the parameter. Parameter Length (PL) is a one octet unsigned integer giving the length in octets of the Parameter Value. The parameter order is not defined.

The HDLC parameter negotiation is initiated by the primary station. The primary station transmits an XID frame with the values it suggests. The secondary station can either accept these or lower them. Regardless, it responds with an XID frame with the appropriate values.

Generally this means that the primary station initially uses whatever its maximum limit is for each parameter. If the secondary can accept this, it responds with the same values. If it cannot support that, it lowers the values.

Maximum frame length is a good example. If the primary suggests using a frame length of 28000 octets, the secondary station can respond with 28000, if it can use that much or even more, of maybe 70 if that is its maximum supported frame length.

The same applies to the Release ID. If a release 7 primary station attempts to communicate with a release 6 secondary station, the initial message will suggest release 7 and the response will be release 6.

On the other hand, if a release 6 primary station attempts to communicate with a release 7 secondary station, the initial message will suggest release 6 and the response will release 6.

Regardless, the primary station will have the final decision, since it can refuse to communicate with a station that does not support whatever parameter values it suggests. It can always repeat the XID negotiation with a new value.

Annex C (informative):
HDLC parameter negotiation example

XID Frame from primary station:

Table C.1: XID fFrame from pPrimary sStation

Field	Content	Description
ADDR	12	Station address
CTRL	XID	Command
FI	0x81	Format identifier
GI	0x80	HDLC Parameters set
GL	18	Length of the parameter field (PI) in octets
PI	5	Maximum I Field length Transmit
PL	4	Length of the PV field in octets
PV	341040~~65543~~	Maximum I Field length Transmit in bits
PI	6	Maximum I Field length Receive
PL	4	Length of the PV field in octets ~~value~~
PV	224000~~28000~~	Maximum I Field length Receive in bits
PI	7	Maximum window size Transmit
PL	1	Length of the PV field in octets
PV	7	Maximum window size Transmit
PI	8	Maximum window size Receive
PL	1	Length of the PV field in octets ~~window size~~
PV	3	Maximum window size Receive

Response from secondary station:

Table C.2: XID fFrame from sSecondary sStation

Field	Content	Description
ADDR	12	Station address
CTRL	XID	Command
FI	0x81	Format identifier
GI	0x80	HDLC Parameters set
GL	16	Length of the ~~PI~~ parameter field in octets
PI	5	Maximum I field length Transmit

PL	2	Length of the PV field (octets)
PV	~~400~~3200	Maximum I field length Transmit in bits
PI	6	Maximum I field length Receive
PL	4	Length of the PV field (octets)
PV	341040~~65543~~	Maximum I field length Receive in bits
PI	7	Maximum window size Transmit
PL	1	Length of the PV field (octets)
PV	3	Maximum ~~I field length Transmit~~window size Transmit
PI	8	Maximum window size Receive
PL	1	Length of the PV field (octets)
PV	1	Maximum window size Receive

********** End of Changes **********

3GPP TSG-RAN3 Meeting #46
Phoenix, USA, 14th-18th February 2005

Tdoc ⌘ R3-050267

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.462** **CR** **007** ⌘ **rev** **1** ⌘ Current version: **6.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Correction of Definition of Secondary Payload Transmit/Receive Length
Source:	⌘	RAN3
Work item code:	⌘	RANimp-TiltAnt
Date:	⌘	08/02/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

Ph2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	Specification of the default value for the Secondary Payload Transmit/Receive Length value in the definition section
Summary of change:	⌘	Split of definition and specification of the default values for the Secondary Payload Transmit/Receive Length
Consequences if not approved:	⌘	No clear separation of definition and specification

Clauses affected:	⌘	3.1 and 4.8.1			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

3 Definitions and abbreviations

3.1 Definitions

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

ASCII character: A character forming part of the International Reference Version of the 7-bit character set defined in ISO/IEC 646:1991

Octet: 8 bits as used in [2]

Device type: One octet identifying the type of a device

Vendor code: A unique ASCII 2-character code assigned to each vendor in [4]

Secondary Payload Transmit Length: The maximum length of the ~~Info~~ INFO field of an HDLC I-frame in the direction secondary station to primary station ~~The value is by default 74 octets or decided by XID negotiation. It is always 74 octets or larger.~~

Secondary Payload Receive Length: The maximum length of the ~~Info~~ INFO field of an HDLC I-frame in the direction primary station to secondary station ~~The value is by default 74 octets or decided by XID negotiation. It is always 74 octets or larger.~~

********** Unchanged Parts omitted **********

4.8 XID negotiation

XID negotiation shall use the standard format (see 5.5.3.1-5.5.3.2.3.2 in [2]). See Annex B for a brief description of XID negotiation and Annex C to E for examples of XID negotiations. All GL fields have a size of 1 octet.

4.8.1 HDLC parameters

Format Identifier (FI) shall be 0x81 and Group Identifier (GI) shall be 0x80. All secondary stations shall support the following parameters:

Table 4.2: HDLC Parameters for secondary stations

PI	PL	Description of PV
5	4	Maximum information field length – transmit (bits)
6	4	Maximum information field length – receive (bits)
7	1	Window size – transmit (frames)
8	1	Window size – receive (frames)

The SecondaryPayloadTransmitLength shall be 74 octets by default. It can be increased via XID negotiation, but shall always be 74 octets or larger.

The SecondaryPayloadReceiveLength shall be 74 octets by default. It can be increased via XID negotiation, but shall always be 74 octets or larger.

************************************ End of Changes **************************************

3GPP TSG-RAN3 Meeting #46
Phoenix, USA, 14th-18th February 2005

Tdoc ⌘ R3-050157

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.462** **CR** **008** ⌘ **rev** **-** ⌘ Current version: **6.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Clarification on HDLC Parameter Negotiation
Source:	⌘	RAN3
Work item code:	⌘	RANimp-TiltAnt
Date:	⌘	08/02/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

Ph2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	Unclear specification of the negotiation of the information field length
Summary of change:	⌘	More precise description for the negotiation of the information field length
Consequences if not approved:	⌘	Unclear specification.

Clauses affected:	⌘	Annex B			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

Annex B (informative):
HDLC parameter negotiation

See also sections 5.5.3.1 – 5.5.3.2.3.2 in [2].

Table B.1: Format of XID parameters

FI	**GI**	**GL**	**PI**	**PL**	**PV**	**PI**	**PL**	**PV**

XID parameter negotiation uses a specific format (see table C.1) to transfer parameters.

The parameters are identified by a one octet Format Identifier (FI) code and a one octet Group Identifier (GI) code. The Group Length (GL) is a one octet unsigned integer giving the length in octets of the parameters following it.

The parameters are a sequence of PI/PL/PV values. The Parameter Identifier (PI) is a one octet code identifying the parameter. Parameter Length (PL) is a one octet unsigned integer giving the length in octets of the Parameter Value. The parameter order is not defined.

The HDLC parameter negotiation is initiated by the primary station. The primary station transmits an XID frame with the values it suggests. The secondary station can either accept these or lower them. Regardless, it responds with an XID with the appropriate values.

Generally this means that the primary initially uses whatever its maximum limit is for each parameter. If the secondary can accept this, it responds with the same values. If it cannot support that, it lowers the values.

Maximum ~~frame~~ information field length is a good example. If the primary station suggests using an ~~frame~~ information field length of 28000 ~~octets~~bits (3500 octets), the secondary station can respond with 28000 bits, if it can use that much or even more, or respond with a lower number of e.g. 592 bits (~~of~~ 74 octets) ~~maybe 70~~ if that is its maximum supported ~~frame~~ information field length.

The same applies to the Release ID. If a release 7 primary station attempts to communicate with a release 6 secondary station, the initial message will suggest release 7 and the response will be release 6.

On the other hand, if a release 6 primary station attempts to communicate with a release 7 secondary station, the initial message will suggest release 6 and the response will release 6.

Regardless, the primary station will have the final decision, since it can refuse to communicate with a station that does not support whatever parameter values it suggests. It can always repeat the XID negotiation with a new value.

********** End of Changes **********

3GPP TSG-RAN WG3 #46 **Tdoc ⌘R3-050055**
Scottsdale, USA, 14 – 18 Feburary 2005

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.463** **CR** **20** ⌘**rev** **-** ⌘ Current version: **6.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Wrong numbering in table 6.7.6.2
Source:	⌘	RAN3
Work item code:	⌘	RANimp-TiltAnt
Date:	⌘	08/02/2005
Category:	⌘	**D**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

Ph2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	Wrong calculation of “number” in table 6.7.6.2
Summary of change:	⌘	Correction of calculation
Consequences if not approved:	⌘	Error in 25.463

Clauses affected:	⌘	Table 6.7.6.2

	Y	N		
Other specs affected: ⌘		X	Other core specifications	⌘
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘ In case of i=1: 2i-1=1
Consequence is that number 1 is double.

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

Table 6.7.6.2: Initiating message parameters and format for Antenna Alarm Indication

Number	Length	Type	Description
1	**1 octet**	**Unsigned integer**	**Antenna number**
2 i ~~–1~~	**1 octet**	**Unsigned integer**	**Return code i; see annex A**
2 i +1	**1 octet**	**Unsigned integer**	**State flag i**

i = 1 … N

3GPP TSG-RAN3 Meeting #46
Scottsdale, USA, 14th-18th February 2005

Tdoc ⌘ R3-050270

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.463** **CR** **023** ⌘ **rev** **1** ⌘ Current version: **6.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [ ] ME [ ] Radio Access Network [X] Core Network [ ]

Title:	⌘	Editorial changes to 25.463 after RAN3#45
Source:	⌘	RAN3
Work item code:	⌘	RANimp-TiltAnt
Date:	⌘	08/02/2005
Category:	⌘	**D**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

Ph2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	Unclear specification and violation of the drafting rules
Summary of change:	⌘	Several editorial changes according to the drafting rules, addition of missing abbreviations and more precise specification Revision 1: correction of table heading 6.3.3 (multiple -> multi)
Consequences if not approved:	⌘	Specification is unclear, incomplete and not in line with the drafting rules

Clauses affected:	⌘	3.1, 3.2, 4.1, 4.4, 5.1, 6.1 – 6.7 and several subclauses, 7, Annex A, Annex B, Annex D,

	Y	N			
Other specs affected: ⌘		X	Other core specifications	⌘	
		X	Test specifications		
		X	O&M Specifications		

Other comments: ⌘

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

3 Definitions and abbreviations

3.1 Definitions

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

Active alarm: An alarm which has an alarm state that has been raised, but not cleared.

Alarm: Persistent indication of a fault.

Alarm code: A code that identifies a specific alarm. The alarm code set is a subset of the return code set. The alarm codes are listed in a~~A~~nnex A of this TS.

Alarm state: A condition or state in the existence of an alarm. Alarm states are raised and cleared.

ASCII character: A character forming part of the International Reference Version of the 7-bit character set defined in ISO/IEC 646:1991

Calibrate: Exercise the antenna drive unit over its entire range of travel to ensure fault-free operation and synchronise the measured and actual beam tilt of the antenna

Configuration data: A stored table or function defining the relationship between the physical position of the drive and electrical beam ~~-~~tilt

Data type: A definition determining the value range and interpretation of a series of octets. The following specified data types are used in this TS:

Name:	Definition:
AlarmCode	1 octet unsigned enumerated code. All AlarmCode values are listed in annex A of this TS
FieldNumber	1 octet unsigned enumerated code All field number values are listed in annex B of this TS
ProcedureCode	1 octet unsigned enumerated code.
ReturnCode	1 octet unsigned enumerated code. All ReturnCode values are listed in annex A of this TS
TextString	Octets with integer values in the range of 32 to 126 to be interpreted as ASCII characters.

Elementary p~~P~~rocedure: The RETAP protocol consists of e~~E~~lementary p~~P~~rocedures (EPs). An e~~E~~lementary p~~P~~rocedure is a unit of interaction between the primary device (Node B) and the secondary devices (RET devices).

~~An EP consists of an initiating message and possibly a response message.~~

~~Two kinds of EPs are used:~~

- ~~**Class 1**: Elementary Procedures with response (success or failure).~~
- ~~**Class 2**: Elementary Procedures without response.~~

~~For **Class 1** EPs, the types of responses can be as follows:~~

~~Successful~~

- ~~A signalling message explicitly indicates that the elementary procedure has been successfully completed with the receipt of the response.~~

~~Unsuccessful~~

~~- A signalling message explicitly indicates that the EP failed.~~

~~**Class 2** EPs are considered always successful.~~

An EP consists of an initiating message and possibly a response message.

Two kinds of EPs are used:

- **Class 1**: Elementary procedures with response (success or failure).
- **Class 2**: Elementary procedures without response.

For **Class 1** EPs, the types of responses can be as follows:

Successful

- A signalling message explicitly indicates that the elementary procedure has been successfully completed with the receipt of the response.

Unsuccessful

- A signalling message explicitly indicates that the EP failed.

Class 2 EPs are considered always successful.

Error: Deviation of a system from normal operation.

Fault: Lasting error condition.

Little -endian: The order of transmission in which the least-significant octets of a multi-octet representation of a number are transmitted first. Little endian only applies to binary integer representations.

Max Data Receive Length: Secondary Payload Receive Length subtracted by 3 octets. (see [3])

Max Data Transmit Length: Secondary Payload Transmit Length subtracted by 3 octets. (see [3])

Procedure code: A code identifying an elementary procedure.

Return code: A code which defines information about the outcome of an elementary procedure execution.

Tilt (also downtilt, tilt angle, beamtilt): The elevation angle between the direction orthogonal to the antenna element axis and the maximum of its main beam in the elevation plane. A positive electrical tilt angle means that the antenna beam is directed below the direction orthogonal to the antenna axis. An antenna has separate values for electrical and mechanical tilt. The mechanical tilt is fixed by the geometry of the installation. In this TS the tilt referred to is always the electrical tilt unless otherwise stated.

Tilt value: —A signed integer used in elementary procedures to define the electrical tilt setting of the antenna. The tilt value is 10 times the antenna electrical tilt angle in degrees.

3.2 Abbreviations

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

EP	Elementary Procedure
HDLC	High-Level Data Link Control
RET	Remote Electrical Tilting
RETAP	Remote Electrical Tilting Application Part

4 General

4.1 Procedure specification principles

The principle for specifying the procedure logic is to specify the functional behaviour of the RET antenna c~~C~~ontrol unit exactly and completely. The Node B functional behaviour is left unspecified.

The following specification principles have been applied for the procedure text in ~~section~~ clause 6:

- The procedure text discriminates between:

  1) Functionality which "shall" be executed

  The procedure text indicates that the receiving node "shall" perform a certain function Y under a certain condition. If the receiving node supports procedure X but cannot perform functionality Y requested in the REQUEST message of a Class 1 EP, the receiving node shall respond with the message used to report unsuccessful outcome for this procedure, containing an appropriate cause value.

  2) Functionality which "shall, if supported" be executed

  The procedure text indicates that the receiving node "shall, if supported," perform a certain function Y under a certain condition. If the receiving node supports procedure X, but does not support functionality Y, the receiving node shall proceed with the execution of the EP, possibly informing the requesting node about the not supported functionality.

********** Unchanged Parts omitted **********

4.4 Integer r~~R~~epresentation

Multi-octet integer values are transmitted in little ~~-~~endian order. Signed integers are represented as 2-complement values.

5 Services expected from signalling transport

RETAP requires an assured in-sequence delivery service from the signalling transport and notification if the assured in-sequence delivery service is no longer available.

5.1 Elementary procedure format

Layer 2 provides a full-duplex link for the transmission of RETAP messages.

There are two types of RETAP elementary procedures:

Class 1: Initiating messages are sent either from the primary to a secondary device, or from a secondary to the primary device, in order to initiate some action within the receiving device. The other device sends a response message completing the procedure.

Class 2: Initiating messages are sent either from the primary to a secondary device, or from a secondary to the primary device. No response message is expected.

All RETAP messages use the same basic format:

Table 5.1.1: Basic format for all RETAP messages

Elementary pProcedure	**Number of data octets**	**Data**
1 octet	2 octets	Max Data Receive Length or Max Data Transmit Length.

NOTE: Response messages have the same basic format as initiating messages. The elementary procedure code shall be the same in the response message as in the associated initiating message.

5.1.1 Initiating message

The data part of an initiating message may contain parameters as specified in section clause 6 of this TS.

5.1.2 Response message

Elementary procedures shall, unless otherwise specified, provide a response message within one 1 second. The response time is measured from the time the message frame was received by the transport layer to the time the response message is ready for transmit by the transport layer.

If the class1 elementary procedure requested by the initiating message was successfully executed, the response message data part from a single-antenna device shall be <OK>. Additional information may follow in the data part. The response message data part from a multi-antenna device starts with the antenna number followed by <OK> and optional additional information.

If the elementary procedure requested by the initiating message was not successfully executed, the response message data part from a single-antenna device shall be <FAIL>. Following the initiating message, a response message is expected within a default period of 1 second unless otherwise specified.

The following octet shall contain a return code which describes why the execution of the requested procedure failed. The response message data part from a multi-antenna device starts with the antenna number followed by <FAIL> and a return code which describes why the execution of the requested procedure failed.

Return codes marked with an X in the Alarm column of annex A in this TS are used to report operating conditions in alarm procedures (see sections 6.6.5 and 6.7.6 for details).

In some situations an initiating message can cause a change of operating conditions, for instance a SetTilt procedure might cause a RET device to discover that an adjuster is jammed or that a previously jammed adjuster works normally again. In these cases an alarm procedure reporting the change of operating conditions shall be used in addition to the regular <OK> or <FAIL> response message.

A complete annotated table of all return codes with their corresponding hexadecimal numbers is provided in annex A of this TS.

Return codes marked with an X in the Alarm column of annex A in this TS are used to report operating conditions in alarm procedures (see subclauses 6.6.5 and 6.7.6 for details).

6 Control elementary procedures

6.1 State mModel

The state model describing the RET device is shown in figure 6.1 with procedures written in *italic*.

The relation to the connection state model for layer 2 can be found in [3].

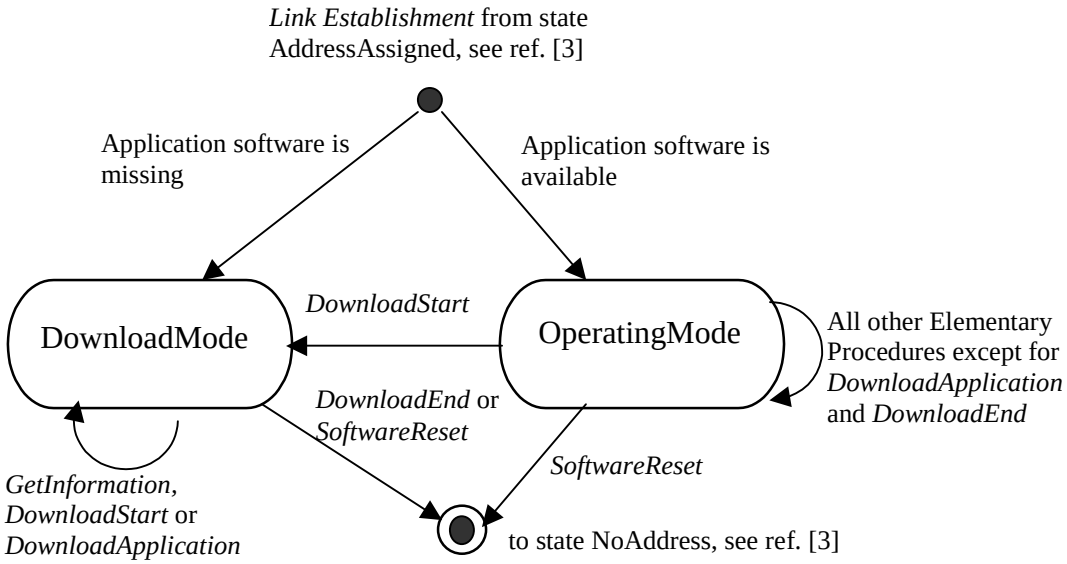

Figure 6.1: State mModel for the RET dDevice

If an application software is not missing the RET device enters the state OperatingMode.

If an application software is missing, the RET device enters the state DownloadMode. In this state only software download functionality is supported in order to restore the application software.

The primary device will be notified that the RET device has entered the state DownloadMode when a procedure which only is supported in the state OperatingMode fails with the return code WorkingSoftwareMissing.

If no software download functionality is supported, then only the state OperatingMode for the RET device is supported.

6.2 General procedure handling

All procedures are blocking i.e. no new initiation messages will have to be executed before a response message has been delivered as result of the previously initiated procedure.

The Reset-Software procedure shall always be handled in all states and never be blocked.

6.2.1 Alarms

When a fault is detected, the corresponding alarm state shall be changed to state *raised* by the secondary device. When the fault no longer exists, the corresponding alarm state shall be changed to state *cleared* by the secondary device. Alarm changes are reported through the AlarmIndication or AntennaAlarmIndication elementary procedures. Whenever an AlarmIndication or AntennaAlarmIndication elementary procedure message is transmitted, it shall contain all the alarm states changed that have not yet been reported as described in subsections clauses 6.6.5 and 6.7.6.

********** Unchanged Parts omitted **********

6.3 Overview of elementary procedures

The set of elementary procedures for RET antenna control provides procedure-oriented instructions. An overview of the procedures is given in annex D. Table 6.3.1 lists all common elementary procedures described in section subclause 6.5. Table 6.3.2 lists all elementary procedures specific for single-antenna device types described in section subclause 6.6. Table 6.3.3 lists all elementary procedures specific for multi-antenna device types described in section subclause 6.7. Section Subclause 6.4 describes how to interpret the elementary procedure definitions in sections subclauses 6.5 to 6.7.

Some elementary procedures shall be performed in sequence as described in Annex C for the software download.

Table 6.3.1: Common elementary procedure set for all device types

~~Command~~Elementary procedure	Requirement	Comment
Reset Software	mandatory	
Get Alarm Status	mandatory	
Get Information	mandatory	
Clear Active Alarms	mandatory	
Alarm Subscribe	mandatory	
Read User Data	mandatory	
Write User Data	mandatory	
Self Test	mandatory	
Download Start	optional	This procedure is mandatory if the software download feature is supported.
Download Application	optional	This procedure is mandatory if the software download feature is supported.
Download End	optional	This procedure is mandatory if the software download feature is supported.

Table 6.3.2: Elementary procedure set for single-antenna device type

~~Command~~Elementary procedure	Requirement	Comment
Calibrate	mandatory	
Send Configuration Data	mandatory	
Set Tilt	mandatory	
Get Tilt	mandatory	
Alarm Indication	mandatory	
Set Device Data	mandatory	
Get Device Data	mandatory	

Table 6.3.3: Elementary procedure set for multi~~ple~~-antenna device type

~~Command~~Elementary procedure	Requirement	Comment
Antenna Calibrate	mandatory	
Antenna Send Configuration Data	mandatory	
Antenna Set Tilt	mandatory	
Antenna Get Tilt	mandatory	
Antenna Set Device Data	mandatory	
Antenna Get Device Data	mandatory	
Antenna Alarm Indication	mandatory	
Antenna Clear Active Alarms	mandatory	

Antenna Get ~~Error~~ Alarm Status	mandatory	
Antenna Get Number Of Antennas	mandatory	

6.4 Description of elementary procedures

Table 6.4.1: Description of elementary procedures

Name: The name used to refer to the elementary procedure				
Code: The code is defined here. All other code references are informative	**Issued by:** Primary device or secondary device	**Procedure class:** Class 1 or Class 2	**DownloadMode state:** Defines whether the procedure shall be supported in the DownloadMode state.	**Power mode:** Defines the secondary device power consumption as described in [4] during the execution of the e~~E~~lementary p~~P~~rocedure.

Table 6.4.2: Initiating message parameters and format

Number	Length	Type	Description
The enumerated order in which the parameter occurs in the data field of the message. The first number is 1.	**The length of the parameter, in number of octets, if defined.**	**The data type used in the parameter**	**Description of the parameter.**

Table 6.4.3: Response message parameters and format

Number	Length	Type	Description
The enumerated order in which the parameter occurs in the data field of the message. The first number is 1.	**The length of the parameter, in number of octets, if defined.**	**The data type used in the parameter**	**Description of the parameter.**

Table 6.4.4: Response message parameters and format for common class 1 elementary procedures upon error

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code FAIL**
2	**1 octet**	**ReturnCode**	**Reason for failure**

Table 6.4.5: Response message parameters and format for single antenna class 1 elementary procedures upon error

Number	Length	Type	Description

1	**1 octet**	**ReturnCode**	**Return code FAIL**
2	**1 octet**	**ReturnCode**	**Reason for failure**

Table 6.4.6: Response message parameters and format for multi-antenna class 1 elementary procedures upon error

Number	Length	Type	Description
1	**1 octet**	**Unsigned integer**	**Antenna number**
2	**1 octet**	**ReturnCode**	**Return code FAIL**
3	**1 octet**	**ReturnCode**	**Reason for failure**

NOTE: The response message in the elementary procedure AntennaGetAntennaNumber, has the format given in table 6.4.5, although it is defined as a multi-antenna class 1 elementary procedure.

Description:

Describes the purpose of the elementary procedure.

Table 6.4.7: Return codes

OK	FAIL	Comment
All return codes applicable in a response message to a successful procedure, except "OK", are listed here. The return codes are listed by name as defined in aAnnex A.	**All return codes applicable in a response message to a failing procedure, except "FAIL" are listed here. The return codes are listed by name as defined in aAnnex A.**	**Any comment needed for clarification.**

********** Unchanged Parts omitted **********

6.5.6 Self Test

Table 6.5.6.1: Elementary procedure Self Test

Name: **SelfTest**				
Code: **0x0A**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **High**

Table 6.5.6.2: Initiating message parameters and format for Self Test

Number	Length	Type	Description
None	**0 octets**	**None**	**No data carried**

Table 6.5.6.3: Response message parameters and format for Self Test

Number	Length	Type	Description

1	**1 octet**	**ReturnCode**	**Return code OK**
i + 1	**1 octet**	**AlarmCode**	**Alarm code for fault i detected during self test.**

i = 1 … N

Description:

On receipt of the initiating message the secondary device executes a test procedure which may include a check of physical and processor functions. The specific tests to be performed are implementation specific, and may include the movement of the adjuster, which shall not exceed +-5% of total available tilting range starting from the current adjuster position.

The response message of the secondary device on the procedure provides information on detected faults or, if no fault is detected, with confidence that the operation of the device is normal in all respects.

During the test the operational parameters of the device shall not change beyond operationally acceptable limits and on completion all parameters shall be returned to their initial values.

In the normal response message, ~~in which~~after the self test was executed successfully, the return codes are set to report possible detected faults during the self test. If no faults are detected, this shall be signalled by no return codes following the return code <OK>.

In the case of a failure response message, the self test could not be executed and the return code relates to the inability of the device to perform the requested self-test operation.

Table 6.5.6.4: Return codes for Self Test

OK	FAIL	Comment
All return codes marked as alarms in a~~A~~nnex A.	**FormatError** **Busy** **WorkingSoftwareMissing** **NotCalibrated** **NotScaled**	

********** Unchanged Parts omitted **********

6.5.9 Read User Data

Table 6.5.9.1: Elementary procedure Read User Data

Name: **ReadUserData**				
Code: **0x10**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **Low**

Table 6.5.9.2: Initiating message parameters and format for Read User Data

Number	Length	Type	Description
1	**2 octets**	**Unsigned integer**	**Memory offset**

2	**1 octet**	**Unsigned integer**	**Number of octets to read**

NOTE: Number of octets to read shall be less than, or equal to Max Data Transmit Length − 1.

Table 6.5.9.3: Response message parameters and format for Read User Data

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code OK**
2	**Number of octets**	**User specific**	**User data**

Description:

On receipt of the initiating message the secondary device sends back user specific data stored in a user data area to the primary device.

The user data area is intended for storage of user defined data, e.g. inventory information.

Table 6.5.9.4: Return codes for Read User Data

OK	FAIL	Comment
	FormatError **Busy** **WorkingSoftwareMissing** **OutOfRange**	**The return code OutOfRange is used, if the given memory address range is outside the valid address space.**

6.5.10 Write User Data

Table 6.5.10.1: Elementary procedure Write User Data

Name: **WriteUserData**				
Code: **0x11**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **Low**

Table 6.5.10.2: Initiating message parameters and format for Write User Data

Number	Length	Type	Description
1	**2 octets**	**Unsigned integer**	**Memory offset**
2	**1 octet**	**Unsigned integer**	**Number of octets to write**
3	**Message specific, given by parameter 2**	**User specific**	**Data to write**

NOTE: Number of octets to write shall be less or equal to Max Data Receive Length − 3.

Table 6.5.10.3: Response message parameters and format for Write User Data

Number	Length	Type	Description

1	**1 octet**	**ReturnCode**	**Return code OK**

Description:

On receipt of the initiating message the secondary device shall store user data in non-volatile memory. The user data is stored in the user data area using the relative memory address offset given in the initiating message and starting with zero.

The user data area is intended for storage of user defined data, e.g. inventory information.

Table 6.5.10.4: Return codes for Write User Data

OK	FAIL	Comment
	FormatError **Busy** **WorkingSoftwareMissing** **HardwareError** **OutOfRange**	**The return code OutOfRange is used if the given memory address range is outside the valid address space.**

********** Unchanged Parts omitted **********

6.5.12 Download Application

Table 6.5.12.1: Elementary procedure Download Application

Name: **DownloadApplication**				
Code: **0x41**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **Yes**	Power mode: **Low**

Table 6.5.12.2: Initiating message parameters and format for Download Application

Number	Length	Type	Description
~~None~~1	Less than, or equal to≤ **Max Data Receive Length**	**Vendor specific**	**Software data**

Table 6.5.12.3: Response message parameters and format for Download Application

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code OK**

Description:

This elementary procedure is used once or several times to transfer software data from the primary device to the secondary device.

Table 6.5.12.4: Return codes for Download Application

OK	FAIL	Comment
	FormatError **Busy** **HardwareError** **InvalidFileContent** **InvalidProcedureSequence**	

********** Unchanged Parts omitted **********

6.6.2 Send Configuration Data

Table 6.6.2.1: Elementary procedure Send Configuration Data

Name: **SendConfigurationData**				
Code: **0x32**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **Low**

Table 6.6.2.2: Initiating message parameters and format for Send Configuration Data

Number	Length	Type	Description
1	**Less than, or equal to≤ Max Data Transmit Length**	**Vendor specific**	**Configuration data**

Table 6.6.2.3: Response message parameters and format for Send Configuration Data

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code OK**

Description:

On receipt of the initiating message the secondary device shall store the provided vendor and antenna specific configuration data for the relationship between the movement of the drive system and the beam tilt position of the antenna.

If the configuration data exceeds Max Data Transmit Length, the data shall be split into a number of Max Data Transmit Length segments and one final segment with whatever is left. The primary device transmits the segments in order. The layer 2 sequence numbers guarantee that no segment will be lost or received out of order.

Table 6.6.2.4: Return codes for Send Configuration Data

OK	FAIL	Comment
	FormatError **Busy** **HardwareError** **WorkingSoftwareMissing** **ChecksumError** **InvalidFileContent** **UnsupportedProcedure**	

6.6.3 Set Tilt

Table 6.6.3.1: Elementary procedure Set Tilt

Name: **SetTilt**				
Code: **0x33**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **High**

Table 6.6.3.2: Initiating message parameters and format for Set Tilt

Number	Length	Type	Description
1	**2 octets**	**Signed integer**	**Tilt value**

Table 6.6.3.3: Response message parameters and format for Set Tilt

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code OK**

Description:

On receipt of the initiating message the secondary device shall set the electrical tilt in increments of 0.1°. The electrical tilt value describes the elevation angle between the direction orthogonal to the antenna element axis and the maximum of its main beam in the elevation plane. A positive electrical tilt angle means that the antenna beam is directed below the direction orthogonal to the antenna axis.

The secondary device shall respond to the initiating message in less than 2 minutes.

The value of parameter 1 is 10 times the tilt in degrees as described in subclause 3.1.

Table 6.6.3.4: Return codes for Set Tilt

OK	FAIL	Comment
	FormatError **Busy** **HardwareError**	

	WorkingSoftwareMissing **MotorJam** **ActuatorJam** **NotConfigured** **NotCalibrated** **OutOfRange** **UnsupportedProcedure**	

6.6.4 Get Tilt

Table 6.6.4.1: Elementary procedure Get Tilt

Name: **GetTilt**				
Code: **0x34**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **Low**

Table 6.6.4.2: Initiating message parameters and format for Get Tilt

Number	Length	Type	Description
None	**0 octets**	**None**	**No data carried**

Table 6.6.4.3: Response message parameters and format for Get Tilt

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code OK**
2	**2 octets**	**Signed integer**	**Tilt value**

Description:

On receipt of the initiating message the secondary device will return the current tilt value.

The returned tilt value is given in the format specified in ~~section~~ subclause 3.1~~6.6.3~~.

Table 6.6.4.4: Return codes for Get Tilt

OK	FAIL	Comment
	FormatError **Busy** **HardwareError** **WorkingSoftwareMissing** **NotCalibrated** **NotConfigured** **UnsupportedProcedure**	**HardwareError shall only be used, if error is detected in tilt detector.**

********** Unchanged Parts omitted **********

6.6.7 Get Device Data

Table 6.6.7.1: Elementary procedure Get Device Data

Name: **GetDeviceData**				
Code: **0x0F**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **Low**

Table 6.6.7.2: Initiating message parameters and format for Get Device Data

Number	Length	Type	Description
1	**1 octet**	**Unsigned integer**	**Field number; see annex B**

Table 6.6.7.3: Response message parameters and format for Get Device Data

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code OK**
2	**See annex B**	**See annex B**	**Field value**

Description:

In this procedure the secondary device shall return the data stored in the field for configuration data specified by the field number in the procedure and listed in annex B of this TS.

Table 6.6.7.4: Return codes for Get Device Data

OK	FAIL	Comment
	FormatError **Busy** **WorkingSoftwareMissing** **UnknownParameter**	

********** Unchanged Parts omitted **********

6.7.2 Antenna Set Tilt

Table 6.7.2.1: Elementary procedure Antenna Set Tilt

Name: **AntennaSetTilt**				
Code: **0x81**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **High**

Table 6.7.2.2: Initiating message parameters and format for Antenna Set Tilt

Number	Length	Type	Description
1	**1 octet**	**Signed integer**	**Antenna number**
2	**2 octets**	**Signed integer**	**Tilt value**

Table 6.7.2.3: Response message parameters and format for Antenna Set Tilt

Number	Length	Type	Description
1	**1 octet**	**Unsigned integer**	**Antenna number**
2	**1 octet**	**ReturnCode**	**Return code OK**

Description:

On receipt of the initiating message the secondary device shall set the electrical tilt of the antenna addressed by the antenna number in increments of 0.1°. The electrical tilt value describes the elevation angle between the direction orthogonal to the antenna element axis and the maximum of its main beam in the elevation plane. A positive electrical tilt angle means that the antenna beam is directed below the direction orthogonal to the antenna axis.

The secondary device shall respond to the initiating message in less than 2 minutes.

The format of the value of parameter 2 is given in ~~section~~ subclause 3.1~~6.6.3~~.

Table 6.7.2.4: Return codes for Antenna Set Tilt

OK	FAIL	Comment
	FormatError **Busy** **HardwareError** **WorkingSoftwareMissing** **MotorJam** **ActuatorJam** **NotConfigured** **NotCalibrated** **OutOfRange** **UnsupportedProcedure**	**If the addressed antenna is not existing, FormatError is returned.**

6.7.3 Antenna Get Tilt

Table 6.7.3.1: Elementary procedure Antenna Get Tilt

Name: **AntennaGetTilt**				
Code: **0x82**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **Low**

Table 6.7.3.2: Initiating message parameters and format for Antenna Get Tilt

Number	Length	Type	Description
1	**1 octet**	**Unsigned interger**	**Antenna number**

Table 6.7.3.3: Response message parameters and format for Antenna Get Tilt

Number	Length	Type	Description
1	**1 octet**	**Unsigned integer**	**Antenna number**
2	**1 octet**	**ReturnCode**	**Return code OK**
3	**2 octets**	**Signed integer**	**Tilt value**

Description:

On receipt of the initiating message the secondary device will return the current tilt value of the antenna addressed by the antenna number.

The returned tilt value is in the format specified in ~~section~~ subclause 3.1~~6.6.3~~.

Table 6.7.3.4: Return codes for Antenna Get Tilt

OK	FAIL	Comment
	FormatError **Busy** **HardwareError** **WorkingSoftwareMissing** **NotConfigured** **NotCalibrated** **UnsupportedProcedure**	**If the addressed antenna is not existing, FormatError is returned.** **HardwareError shall only be used, if ~~-~~ an error is detected in tilt detector.**

********** Unchanged Parts omitted **********

6.7.6 Antenna Alarm Indication

Table 6.7.6.1: Elementary procedure Antenna Alarm Indication

Name: **AntennaAlarmIndication**				
Code: **0x85**	Issued by: **Secondary device**	Procedure class: **2**	DownloadMode state: **No**	Power mode: **Low**

Table 6.7.6.2: Initiating message parameters and format for Antenna Alarm Indication

Number	Length	Type	Description
1	**1 octet**	**Unsigned integer**	**Antenna number**
2 i – 1	**1 octet**	**Unsigned integer**	**Return code i; see annex A**
2 i	**1 octet**	**Unsigned integer**	**State flag i**

i = 1 … N

Description:

The multi-antenna secondary device uses this procedure to report antenna alarm state changes to the primary device. This procedure shall only be performed if the secondary has performed an AlarmSubscribe procedure since its latest reset. Multi-antenna devices shall use this AntennaAlarmIndication procedure only for multi-antenna specific alarms and the AlarmIndication procedure in subclause 6.6.5 for the other alarms.

For each alarm, the current alarm state and alarm code shall be reported if and only if any change in its state has occurred during the period of time since the last reported state. An AntennaAlarmIndication procedure shall be performed if at least one alarm shall be reported. The first AntennaAlarmIndication procedure after the AlarmSubscribe procedure shall report the active alarm states.

Alarm state changes are considered as reported at the time the message is passed to the transport layer.

State flag = 0 represents alarm state *cleared*.

State flag = 1 represents alarm state *raised*.

6.7.7 Antenna Clear Active Alarms

Table 6.7.7.1: Elementary procedure Antenna Clear Active Alarms

Name: **AntennaClearActiveAlarms**				
Code: **0x86**	Issued by: **Secondary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **Low**

Table 6.7.7.2: Initiating message parameters and format for Antenna Clear Active Alarms

Number	Length	Type	Description
1	**1 octet**	**Unsigned integer**	**Antenna number**

Table 6.7.7.3: Response message parameters and format for Antenna Clear Active Alarms

Number	Length	Type	Description
1	**1 octet**	**Unsigned integer**	**Antenna number**
2	**1 octet**	**ReturnCode**	**Return code OK**

Description:

On receipt of the initiating message the secondary device shall first clear all stored alarm information for the addressed antenna and then return a procedure response message.

Table 6.7.7.4: Return codes for Antenna Clear Active Alarms

OK	FAIL	Comment
	FormatError **Busy** **WorkingSoftwareMissing** **UnsupportedProcedure**	**If the addressed antenna is not existing, FormatError is returned.**

********** Unchanged Parts omitted **********

6.7.10 Antenna Send Configuration Data

Table 6.7.10.1: Elementary procedure Antenna Send Configuration Data

Name: **AntennaSendConfigurationData**				
Code: **0x89**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **Low**

Table 6.7.10.2: Initiating message parameters and format for Antenna Send Configuration Data

Number	Length	Type	Description
1	**1 octet**	**Unsigned Integer**	**Antenna number**
2	**Less than, or equal to≤ Max Data Transmit Length**	**Vendor specific**	**Configuration data**

Table 6.7.10.3: Response message parameters and format for Antenna Send Configuration Data

Number	Length	Type	Description
1	**1 octet**	**Unsigned integer**	**Antenna number**
2	**1 octet**	**ReturnCode**	**Return code OK**

Description:

On receipt of the initiating message the secondary device shall store the provided vendor and antenna specific configuration data for the relationship between the movement of the drive system and the beam tilt position of the antenna.

If the configuration data exceeds Max Data Transmit Length, the data shall be split into a number of Max Data Transmit Length segments and one final segment with whatever is left. The primary device transmits the segments in order. The layer 2 sequence numbers guarantee that no segment will be lost or received out of order.

Table 6.7.10.4: Return codes for Antenna Send Configuration Data

OK	FAIL	Comment
	FormatError **Busy** **HardwareError** **WorkingSoftwareMissing** **ChecksumError** **InvalidFileContent** **UnsupportedProcedure**	**If the addressed antenna is not existing, FormatError is returned.**

7 Unknown elementary procedures

If a secondary device in the OperatingMode state is receiving a correct procedure message with a procedure code not known, it shall respond with a failure message stating “UnknownProcedure” as the cause of failure.

Table 7.1.1: Response message parameters and format for unknown procedures

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code FAIL**
2	**1 octet**	**ReturnCode**	**Return code UnknownProcedure**

Annex A (normative):
Return cCodes for secondary devices

Table A.1: Return Codes for Secondary Devices

Code	Meaning		Alarm	Download Mode state
0x00	OK	Normal response		X
0x02	Motor Jam	Motor cannot move.	X	
0x03	ActuatorJam	Actuator jam has been detected. No movement of the actuator, but movement of the motor was detected.	X	
0x05	Busy	The device is busy and cannot respond until an ongoing activity is completed.		
0x06	ChecksumError	Checksum incorrect for otherwise valid data..		
0x0B	FAIL	Abnormal response. Indicates that a procedure has not been executed successfully.		X
0x0E	NotCalibrated	The device has not completed a calibration operation, or calibration has been lost.	X	
0x0F	NotConfigured	Actuator configuration data is missing.	X	
0x11	HardwareError	Any hardware error which cannot be classified. May not be reported as an alarm until the fault is likely to be persistent.	X	X
0x13	OutOfRange	A parameter given by an operator (e.g. tilt value or memory offset) is out of range.		
0x19	UnknownProcedure	Received procedure code is not defined.		X
0x1D	ReadOnly	Invalid device data parameter usage.		X
0x1E	UnknownParameter	Specified parameter is not supported for the used procedure.		X
0x21	WorkingSoftwareMissing	The unit is inDownloadMode state. Returned upon unsupported procedure when in DownloadMode state.		X
0x22	InvalidFileContent	The data being downloaded is detected to be of wrong format or size.		X
0x24	FormatError	PResponded if the procedure message is inconsistent or if an addressed field or antenna is invalid or the data parameter field length is inconsistent with the corresponding field length parameter.		X
0x25	UnsupportedProcedure	The procedure is optional and not supported or the procedure does not apply to this device type		
0x26	InvalidProcedureSequence	Responded to indicate that the pProcedure sequence as described in aAnnex C is expected but not experienced by the secondary device.		

0x27	ActuatorInterference	An actuator movement outside the control of the RET unit has been detected. Probable cause is manual interference.	X	

Annex B (normative): Assigned fields for additional data

The following standard fields have no operational impact and are used by the procedures SetDeviceData and GetDeviceData. Little -endian order is used for storage of multiple-octet numbers. Where ASCII variables are shorter than the assigned field lengths the characters are right aligned and leading blanks are filled with null characters (0x00).

Table B.1: Assigned fields for additional data

Field No.	Length (octets)	Format	Description
0x01	15	ASCII	Antenna model number
0x02	17	ASCII	Antenna serial number
0x03	2	16-bit unsigned	Antenna frequency band(s): see below
0x04	1	1 x 8-bit unsigned	Beamwidth for each band in frequency order (deg) (example 800/900 MHz, 1800/1900 MHz, 2100 MHz)
0x05	3	3 x 8-bit unsigned	Gain for each band in frequency order (dB/10) (example 800/900 MHz, 1800/1900 MHz, 2100 MHz)
0x06	2	16-bit signed	Maximum supported tilt (degrees * 10), fFormat as in ~~section~~ subclause 3.1~~6.6.3~~
0x07	2	16-bit signed	Minimum supported tilt (degrees * 10), fFormat as in ~~section~~ subclause 3.1~~6.6.3~~
0x21	6	ASCII	Installation date
0x22	5	ASCII	Installer's ID
0x23	12	ASCII	Base station ID
0x24	4	ASCII	Sector ID
0x25	2	16-bit unsigned	Antenna bearing
0x26	2	16-bit signed	Installed mechanical tilt (degrees * 10), fFormat as in ~~section~~ subclause 3.1~~6.6.3~~

Table B.2: Coding for antenna frequency bands in field 0x03

	Field 0x03
Bit No	Frequency band (MHz)
1	800
2	900
3	1500
4	1800
5	1900

6	2100
7 to 16~~and above~~	Reserved

Examples of frequency bands: 0000 0000 0001 0000 = 19~~8~~00 MHz~~,~~

0000 0000 0010~~1~~1 10~~1~~00 = 1800, 1900 and 2100 MHz

NOTE: Field numbers 0x01, 0x02, and 0x21 to 0x26 in Table B.~~:~~1 are common for multi-antenna device antennas. These fields may be addressed through any antenna number procedure.

********** Unchanged Parts omitted **********

Annex D (informative): Overview of elementary procedures

Table D.1: Elementary Procedures and Procedure Codes

Elementary Procedure	Procedure Code	Issued by	DownloadMode state
Common Procedure Set			
(Reserved)	0x01		
Reset Software	0x03	primary device	yes
Get Alarm Status	0x04	primary device	no
Get Information	0x05	primary device	yes
Clear Active Alarms	0x06	primary device	no
Read User Data	0x10	primary device	no
Write User Data	0x11	primary device	no
Alarm Subscribe	0x12	primary device	no
Self Test	0x0A	primary device	no
Download Start	0x40	primary device	yes
Download Application	0x41	primary device	yes
Download End	0x42	primary device	yes
Single-Antenna Procedure Set			
Set Device Data	0x0E	primary device	no
Get Device Data	0x0F	primary device	no
Calibrate	0x31	primary device	no
Send Configuration Data	0x32	primary device	no
Set Tilt	0x33	primary device	no
Get Tilt	0x34	primary device	no
Alarm Indication	0x07	secondary device	no
Multi-Antenna Procedure Set			
Antenna Calibrate	0x80	primary device	no
Antenna Send Configuration Data	0x89	primary device	no
Antenna Set Tilt	0x81	primary device	no
Antenna Get Tilt	0x82	primary device	no
Antenna Set Device Data	0x83	primary device	no
Antenna Get Device Data	0x84	primary device	no

Antenna Alarm Indication	0x85	secondary device	no
Antenna Clear Active Alarms	0x86	primary device	no
Antenna Get Alarm Status	0x87	primary device	no
Antenna Get Number of Antennas	0x88	primary device	no

NOTE: The notion yes in the download boot mode operation indicates that the listed procedures are mandatory if the download boot mode state can be entered by the secondary device.

********** End of Changes **********

3GPP TSG-RAN3 Meeting #46
Phoenix, USA, 14th-18th February 2005

Tdoc ⌘ R3-050158

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.463** **CR** **024** ⌘ **rev** **-** ⌘ Current version: **6.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [ ] ME [ ] Radio Access Network [X] Core Network [ ]

Title:	⌘	Minor Corrections to 25.463 after RAN3#45
Source:	⌘	RAN3
Work item code:	⌘	RANimp-TiltAnt
Date:	⌘	08/02/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

Ph2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	Wrong and unclear specification
Summary of change:	⌘	More precise specification of MaxDataTransmit/ReceiveLength. Correction of the use of MaxDataTransmit/ReceiveLength. Clearer specification of requirements. Some minor corrections and clarifications.
Consequences if not approved:	⌘	Incomplete, unclear and wrong specification.

Clauses affected:	⌘	3.1, 5.1, 5.1.2, 6.4, 6.5. and several subclauses, 6.6.and several subclauses, 6.7. and several subclauses, Annex B, Annex D,

	Y	N		
Other specs affected: ⌘		X	Other core specifications	⌘
		X	Test specifications	
		X	O&M Specifications	

Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

3 Definitions and abbreviations

3.1 Definitions

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

Active alarm: An alarm which has an alarm state that has been raised, but not cleared.

Alarm: Persistent indication of a fault.

Alarm code: A code that identifies a specific alarm. The alarm code set is a subset of the return code set. The alarm codes are listed in Annex A.

Alarm state: A condition or state in the existence of an alarm. Alarm states are raised and cleared.

ASCII character: A character forming part of the International Reference Version of the 7-bit character set defined in ISO/IEC 646:1991

Calibrate: Exercise the antenna drive unit over its entire range of travel to ensure fault-free operation and synchronise the measured and actual beam tilt of the antenna

Configuration data: A stored table or function defining the relationship between the physical position of the drive and electrical beam-tilt

Data type: A definition determining the value range and interpretation of a series of octets. The following specified data types are used in this TS:

Name:	Definition:
AlarmCode	1 octet unsigned enumerated code. All AlarmCode values are listed in annex A of this TS
FieldNumber	1 octet unsigned enumerated code All field number values are listed in annex B of this TS
ProcedureCode	1 octet unsigned enumerated code.
ReturnCode	1 octet unsigned enumerated code. All ReturnCode values are listed in annex A of this TS
TextString	Octets with integer values in the range of 32 to 126 to be interpreted as ASCII characters.

Elementary Procedure: The RETAP protocol consists of Elementary Procedures (EPs). An Elementary Procedure is a unit of interaction between the primary device (Node B) and the secondary devices (RET devices).

An EP consists of an initiating message and possibly a response message.

Two kinds of EPs are used:

- **Class 1**: Elementary Procedures with response (success or failure).
- **Class 2**: Elementary Procedures without response.

For **Class 1** EPs, the types of responses can be as follows:

Successful

- A signalling message explicitly indicates that the elementary procedure has been successfully completed with the receipt of the response.

Unsuccessful

- A signalling message explicitly indicates that the EP failed.

Class 2 EPs are considered always successful.

Error: Deviation of a system from normal operation.

Fault: Lasting error condition.

Little-endian: The order of transmission in which the least-significant octets of a multi-octet representation of a number are transmitted first. Little endian only applies to binary integer representations.

Max-Data-Receive-Length: Secondary-Payload-Receive-Length ~~subtracted by~~minus 3 octets. (see subclause 4.8.1 in [3])

Max-Data-Transmit-Length: Secondary-Payload-Transmit-Length ~~subtracted by~~minus 3 octets. (see subclause 4.8.1 in [3])

Procedure code: A code identifying an elementary procedure.

Return code: A code which defines information about the outcome of an elementary procedure execution.

Tilt (also downtilt, tilt angle, beamtilt): The elevation angle between the direction orthogonal to the antenna element axis and the maximum of its main beam in the elevation plane. A positive electrical tilt angle means that the antenna beam is directed below the direction orthogonal to the antenna axis. An antenna has separate values for electrical and mechanical tilt. The mechanical tilt is fixed by the geometry of the installation. In this TS the tilt referred to is always the electrical tilt unless otherwise stated.

Tilt value: A signed integer used in elementary procedures to define the electrical tilt setting of the antenna. The tilt value is 10 times the antenna electrical tilt angle.

********** Unchanged Parts omitted **********

5 Services expected from signalling transport

RETAP requires an assured in-sequence delivery service from the signalling transport and notification if the assured in-sequence delivery service is no longer available.

5.1 Elementary procedure format

Layer 2 provides a full-duplex link for the transmission of RETAP messages.

There are two types of RETAP elementary procedures:

Class 1: Initiating messages are sent either from the primary to a secondary device, or from a secondary to the primary device, in order to initiate some action within the receiving device. The other device sends a response message completing the procedure.

Class 2: Initiating messages are sent either from the primary to a secondary device, or from a secondary to the primary device. No response message is expected.

All RETAP messages use the same basic format:

Table 5.1.1: Basic format for all RETAP messages

Elementary Procedure	Number of data octets	Data

1 octet	2 octets	Max-Data-Receive-Length or Max-Data Transmit-Length.

NOTE: Response messages have the same basic format as initiating messages. The elementary procedure code shall be the same in the response message as in the associated initiating message.

5.1.1 Initiating message

The data part of an initiating message may contain parameters as specified in section 6 of this TS.

5.1.2 Response message

Elementary procedures shall, unless otherwise specified, provide a response message within one second. The response time is measured from the time the message frame was received by the transport layer to the time the response message is ready for ~~transmit~~ transfer by the transport layer.

If the class1 elementary procedure requested by the initiating message was successfully executed, the response message data part from a single-antenna device shall be <OK>. Additional information may follow in the data part. The response message data part from a multi-antenna device starts with the antenna number followed by <OK> and optional additional information.

If the elementary procedure requested by the initiating message was not successfully executed, the response message data part from a single-antenna device shall be <FAIL>. ~~Following the initiating message, a response message is expected within a default period of 1 second unless otherwise specified.~~

The following octet shall contain a return code which describes why the execution of the requested procedure failed. The response message data part from a multi-antenna device starts with the antenna number followed by <FAIL> and a return code which describes why the execution of the requested procedure failed.

Return codes marked with an X in the Alarm column of annex A in this TS are used to report operating conditions in alarm procedures (see sections 6.6.5 and 6.7.6 for details).

In some situations an initiating message can cause a change of operating conditions, for instance a SetTilt procedure might cause a RET device to discover that an adjuster is jammed or that a previously jammed adjuster works normally again. In these cases an alarm procedure reporting the change of operating conditions shall be used in addition to the regular <OK> or <FAIL> response message.

A complete annotated table of all return codes with their corresponding hexadecimal numbers is provided in annex A of this TS.

Return codes marked with an X in the Alarm column of annex A in this TS are used to report operating conditions in alarm procedures (see subclauses 6.6.5 and 6.7.6 for details).

********** Unchanged Parts omitted **********

6.4 Description of elementary procedures

Table 6.4.1: Description of elementary procedures

Name: The name used to refer to the elementary procedure				
Code: The code is defined here. All other code references are	**Issued by:** Primary device or secondary device	**Procedure class:** Class 1 or Class 2	**DownloadMode state:** Defines whether the procedure shall be supported in the	**Power mode:** Defines the secondary device power consumption

informative			DownloadMode state.	as described in [4] during the execution of the Elementary Procedure.

Table 6.4.2: Initiating and response message parameters and format

Number	Length	Type	Description
The enumerated order in which the parameter occurs in the data field of the message. The first number is 1.	**The length of the parameter, in number of octets, if defined.**	**The data type used in the parameter.**	**Description of the parameter.**

~~**Table 6.4.3: Response message parameters and format**~~

~~Number~~	~~Length~~	~~Type~~	~~Description~~
~~**The enumerated order in which the parameter occurs in the data field of the message. The first number is 1.**~~	~~**The length of the parameter, in number of octets, if defined.**~~	~~**The data type used in the parameter**~~	~~**Description of the parameter.**~~

Table 6.4.34: Response message parameters and format for common class 1 elementary procedures upon error

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code FAIL**
2	**1 octet**	**ReturnCode**	**Reason for failure**

Table 6.4.45: Response message parameters and format for single- antenna class 1 elementary procedures upon error

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code FAIL**
2	**1 octet**	**ReturnCode**	**Reason for failure**

Table 6.4.56: Response message parameters and format for multi-antenna class 1 elementary procedures upon error

Number	Length	Type	Description
1	**1 octet**	**Unsigned integer**	**Antenna number**
2	**1 octet**	**ReturnCode**	**Return code FAIL**
3	**1 octet**	**ReturnCode**	**Reason for failure**

NOTE: The response message in the elementary procedure AntennaGetAntennaNumber, has the format given in table 6.4.45, although it is defined as a multi-antenna class 1 elementary procedure.

Description:

Describes the purpose of the elementary procedure.

Table 6.4.67: Return codes

OK	FAIL	Comment
All return codes applicable in a response message to a successful procedure, except "OK", are listed here. The return codes are listed by name as defined in Annex A.	**All return codes applicable in a response message to a failing procedure, except "FAIL" are listed here. The return codes are listed by name as defined in Annex A.**	**Any comment needed for clarification.**

********** Unchanged Parts omitted **********

6.5.2 Get Alarm Status

Table 6.5.2.1: Elementary procedure Get Alarm Status

Name: **GetAlarmStatus**				
Code: **0x04**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **Low**

Table 6.5.2.2: Initiating message parameters and format for Get Alarm Status

Number	Length	Type	Description
None	**0 octets**	**None**	**No data carried**

Table 6.5.2.3: Response message parameters and format for Get Alarm Status

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code OK**
i + 1	**1 octet**	**AlarmCode**	**Active ~~error~~ alarm number i**

i = 1 … N

Description:

On receipt of the initiating message the secondary device reports the alarm codes of the active alarms.

Table 6.5.2.4: Return codes for Get Alarm Status

OK	FAIL	Comment
All return codes marked as used	**FormatError**	

for alarms in Annex A.	**Busy** **WorkingSoftwareMissing**	

6.5.3 Get Information

Table 6.5.3.1: Elementary procedure Get Information

Name: **GetInformation**				
Code: **0x05**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **Yes**	Power mode: **Low**

Table 6.5.3.2: Initiating message parameters and format for Get Information

Number	Length	Type	Description
None	**0 octets**	**None**	**No data carried**

Table 6.5.3.3: Response message parameters and format for Get Information

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code OK**
2	**1 octet**	**Unsigned integer**	**Length of parameter 3 in number of octets**
3		**TextString**	**Product number**
4	**1 octet**	**Unsigned integer**	**Length of parameter 5 in number of octets**
5		**TextString**	**Serial number**
6	**1 octet**	**Unsigned integer**	**Length of parameter 7 in number of octets**
7		**TextString**	**Hardware Version**
8	**1 octet**	**Unsigned integer**	**Length of parameter 9 in number of octets**
9		**TextString**	**Software Version**

Description:

On receipt of the initiating message the secondary device shall return the product number ProdNr and the serial number SerNr of the secondary device. If known, also the hardware version and the software version may be returned. The software version should indicate the version number of the currently executed software.

The parameters HWVersion and SWVersion in the response message refer to the version designators of the hardware and installed software of the secondary device. If the application is missing or no version number is found, then an empty string shall be returned as the version number.

The response message length shall be less than or equal to the minimum Secondary-Payload-Transmit-Length as given in subclause 4.8.1 in [3].

Table 6.5.3.4: Return codes for Get Information

OK	FAIL	Comment
	FormatError **Busy**	

6.5.4 Clear Active Alarms

Table 6.5.4.1: Elementary procedure Clear Active Alarms

Name: **ClearActiveAlarms**				
Code: **0x06**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **Low**

Table 6.5.4.2: Initiating message parameters and format for Clear Active Alarms

Number	Length	Type	Description
None	**0 octets**	**None**	**No data carried**

Table 6.5.4.3: Response message parameters and format for Clear Active Alarms

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code OK**

Description:

On receipt of the initiating message the secondary device shall first clear~~s~~ all stored alarm information and then return~~s~~ a procedure response message.

Table 6.5.4.4: Return codes for Clear Active Alarms

OK	FAIL	Comment
	FormatError **Busy** **WorkingSoftwareMissing**	

********** Unchanged Parts omitted **********

6.5.6 Self Test

Table 6.5.6.1: Elementary procedure Self Test

Name: **SelfTest**				
Code: **0x0A**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **High**

Table 6.5.6.2: Initiating message parameters and format for Self Test

Number	Length	Type	Description
None	**0 octets**	**None**	**No data carried**

Table 6.5.6.3: Response message parameters and format for Self Test

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code OK**
i + 1	**1 octet**	**AlarmCode**	**Alarm code for ~~fault~~ alarm i detected during self test.**

i = 1 … N

Description:

On receipt of the initiating message the secondary device shall execute~~s~~ a test procedure which may include a check of physical and processor functions. The specific tests to be performed are implementation specific, and may include the movement of the adjuster, which shall not exceed +-5% of total available tilting range starting from the current adjuster position.

The response message of the secondary device on the procedure provides information on detected faults or, if no fault is detected, with confidence that the operation of the device is normal in all respects.

During the test the operational parameters of the device shall not change beyond operationally acceptable limits and on completion all parameters shall be returned to their initial values.

In the normal response message, in which the self test was executed successfully, the return codes are set to report possible detected faults during the self test. If no faults are detected, this shall be signalled by no return codes following <OK>.

In the case of a failure response message, the self test could not be executed successfully and the reported return code relates to the inability of the device to perform the requested self-test operation.

Table 6.5.6.4: Return codes for Self Test

OK	FAIL	Comment
All return codes marked as alarms in Annex A.	**FormatError** **Busy** **WorkingSoftwareMissing** **NotCalibrated** **NotScaled**	

********** Unchanged Parts omitted **********

6.5.9 Read User Data

Table 6.5.9.1: Elementary procedure Read User Data

Name: **ReadUserData**				
Code: **0x10**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **Low**

Table 6.5.9.2: Initiating message parameters and format for Read User Data

Number	Length	Type	Description
1	**2 octets**	**Unsigned integer**	**Memory offset**
2	**1 octet**	**Unsigned integer**	**Number of octets to read**

NOTE: Number of octets to read shall be less or equal to Max-Data-Transmit-Length minus 1.

Table 6.5.9.3: Response message parameters and format for Read User Data

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code OK**
2	**Number of octets given by parameter 2 of the initiating message**	**User specific**	**User data**

Description:

On receipt of the initiating message the secondary device shall sends back user specific data stored in a user data area to the primary device.

The user data area is intended for storage of user defined data, e.g. inventory information.

Table 6.5.9.4: Return codes for Read User Data

OK	FAIL	Comment
	FormatError **Busy** **WorkingSoftwareMissing** **OutOfRange**	**The return code OutOfRange is used, if the given memory address range is outside the valid address space.**

6.5.10 Write User Data

Table 6.5.10.1: Elementary procedure Write User Data

Name: **WriteUserData**				
Code: **0x11**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **Low**

Table 6.5.10.2: Initiating message parameters and format for Write User Data

Number	Length	Type	Description
1	**2 octets**	**Unsigned integer**	**Memory offset**
2	**1 octet**	**Unsigned integer**	**Number of octets to write**
3	**Message specific, given by parameter 2**	**User specific**	**Data to write**

NOTE: Number of octets to write shall be less than, or equal to Max-Data-Receive-Length minus= 3.

Table 6.5.10.3: Response message parameters and format for Write User Data

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code OK**

Description:

On receipt of the initiating message the secondary device shall store user data in non-volatile memory. The user data is stored in the user data area using the relative memory address offset given in the initiating message and starting with zero.

The user data area is intended for storage of user defined data, e.g. inventory information.

Table 6.5.10.4: Return codes for Write User Data

OK	FAIL	Comment
	FormatError **Busy** **WorkingSoftwareMissing** **HardwareError** **OutOfRange**	**The return code OutOfRange is used if the given memory address range is outside the valid address space.**

********** Unchanged Parts omitted **********

6.5.12 Download Application

Table 6.5.12.1: Elementary procedure Download Application

Name: **DownloadApplication**				
Code: **0x41**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **Yes**	Power mode: **Low**

Table 6.5.12.2: Initiating message parameters and format for Download Application

Number	Length	Type	Description
None	≤ Max-Data-Receive Length	**Vendor specific**	**Software data**

Table 6.5.12.3: Response message parameters and format for Download Application

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code OK**

Description:

This elementary procedure is used once or several times to transfer software data from the primary device to the secondary device.

Table 6.5.12.4: Return codes for Download Application

OK	FAIL	Comment
	FormatError **Busy** **HardwareError** **InvalidFileContent** **InvalidProcedureSequence**	

6.5.13 Download End

Table 6.5.13.1: Elementary procedure Download End

Name: **DownloadEnd**				
Code: **0x42**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **Yes**	Power mode: **Low**

Table 6.5.13.2: Initiating message parameters and format for Download End

Number	Length	Type	Description

None	**0 octets**	**None**	**No data carried**

Table 6.5.13.3: Response message parameters and format for Download End

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code OK**

Description:

This elementary procedure signals the end of a multi-message data transfer to the secondary device. The secondary device shall respond~~s~~ after verifying the received data. The secondary device shall reset autonomously after completion of the layer 2 response and activate the new application software.

Table 6.5.13.4: Return codes for Download End

OK	FAIL	Comment
	FormatError **Busy** **HardwareError** **ChecksumError** **InvalidFileContent** **InvalidProcedureSequence**	

********** Unchanged Parts omitted **********

6.6.2 Send Configuration Data

Table 6.6.2.1: Elementary procedure Send Configuration Data

Name: **SendConfigurationData**				
Code: **0x32**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **Low**

Table 6.6.2.2: Initiating message parameters and format for Send Configuration Data

Number	Length	Type	Description
1	**≤ Max-Data ~~Transmit~~Receive Length**	**Vendor specific**	**Configuration data**

Table 6.6.2.3: Response message parameters and format for Send Configuration Data

Number	Length	Type	Description

1	**1 octet**	**ReturnCode**	**Return code OK**

Description:

On receipt of the initiating message the secondary device shall store the provided vendor and antenna specific configuration data for the relationship between the movement of the drive system and the beam tilt position of the antenna.

If the configuration data exceeds Max-Data-~~Transmit~~Receive-Length, the data shall be split into a number of Max-Data ~~Transmit~~Receive-Length segments and one final segment with whatever is left. The primary device transmits the segments in order. The layer 2 sequence numbers guarantee that no segment will be lost or received out of order.

Table 6.6.2.4: Return codes for Send Configuration Data

OK	FAIL	Comment
	FormatError **Busy** **HardwareError** **WorkingSoftwareMissing** **ChecksumError** **InvalidFileContent** **UnsupportedProcedure**	

********** Unchanged Parts omitted **********

6.6.4 Get Tilt

Table 6.6.4.1: Elementary procedure Get Tilt

Name: **GetTilt**				
Code: **0x34**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **Low**

Table 6.6.4.2: Initiating message parameters and format for Get Tilt

Number	Length	Type	Description
None	**0 octets**	**None**	**No data carried**

Table 6.6.4.3: Response message parameters and format for Get Tilt

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code OK**
2	**2 octets**	**Signed integer**	**Tilt value**

Description:

On receipt of the initiating message the secondary device ~~will~~ shall return the current tilt value.

The returned tilt value is given in the format specified in section 6.6.3.

Table 6.6.4.4: Return codes for Get Tilt

OK	FAIL	Comment
	FormatError **Busy** **HardwareError** **WorkingSoftwareMissing** **NotCalibrated** **NotConfigured** **UnsupportedProcedure**	**HardwareError shall only be used if error is detected in tilt detector.**

6.6.5 Alarm Indication

Table 6.6.5.1: Elementary procedure Alarm Indication

Name: **AlarmIndication**				
Code: **0x07**	Issued by: **Secondary device**	Procedure class: **2**	DownloadMode state: **No**	Power mode: **Low**

Table 6.6.5.2: Initiating message parameters and format for Alarm Indication

Number	Length	Type	Description
2 i – 1	**1 octet**	**Unsigned integer**	**Return code i; see annex A**
2 i	**1 octet**	**Unsigned integer**	**State flag i**

i = 1 … N

Description:

The secondary device uses this procedure to report alarm state changes to the primary device. This procedure shall only be performed if the secondary has performed an AlarmSubscribe procedure since its latest reset.

For each alarm, the current alarm state and alarm code shall be reported if and only if any change in its state has occurred during the period of time since the last reported state. An AlarmIndication procedure shall be performed if at least one alarm shall be reported. The first AlarmIndication procedure after the AlarmSubscribe procedure shall report the active alarms ~~states~~.

Alarm state changes are considered as reported at the time the message is passed to the transport layer.

State flag = 0 represents alarm state *cleared*.

State flag = 1 represents alarm state *raised*.

6.6.6 Set Device Data

Table 6.6.6.1: Elementary procedure Set Device Data

Name: **SetDeviceData**				
Code: **0x0E**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **Low**

Table 6.6.6.2: Initiating message parameters and format for Set Device Data

Number	Length	Type	Description
1	**1 octet**	**Unsigned integer**	**Field number, see annex B**
2	**See annex B**	**See annex B**	**Data to write**

Table 6.6.6.3: Response message parameters and format for Set Device Data

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code OK**

Description:

On receipt of the initiating message the secondary device ~~should~~ shall write the data given in the parameters of the initiating message into the fields optionally provided for configuration data and listed in annex B of this TS. If an attempt is made to write to fields which are designated as read only, the return code *ReadOnly* is returned and the data for those fields is ignored. If an attempt is made to write to fields which are not supported by the device the return code *UnknownParameter* is returned and the data for those fields is ignored.

Table 6.6.6.4: Return codes for Set Device Data

OK	FAIL	Comment
	FormatError **Busy** **WorkingSoftwareMissing** **HardwareError** **ReadOnly** **UnknownParameter**	

********** Unchanged Parts omitted **********

6.7.2 Antenna Set Tilt

Table 6.7.2.1: Elementary procedure Antenna Set Tilt

Name: **AntennaSetTilt**				
Code: **0x81**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **High**

Table 6.7.2.2: Initiating message parameters and format for Antenna Set Tilt

Number	Length	Type	Description
1	**1 octet**	**UnsSigned integer**	**Antenna number**
2	**2 octets**	**Signed integer**	**Tilt value**

Table 6.7.2.3: Response message parameters and format for Antenna Set Tilt

Number	Length	Type	Description
1	**1 octet**	**Unsigned integer**	**Antenna number**
2	**1 octet**	**ReturnCode**	**Return code OK**

Description:

On receipt of the initiating message the secondary device shall set the electrical tilt of the antenna addressed by the antenna number in increments of 0.1°. The electrical tilt value describes the elevation angle between the direction orthogonal to the antenna element axis and the maximum of its main beam in the elevation plane. A positive electrical tilt angle means that the antenna beam is directed below the direction orthogonal to the antenna axis.

The secondary device shall respond to the initiating message in less than 2 minutes.

The format of the value of parameter 2 is given in section 6.6.3.

Table 6.7.2.4: Return codes for Antenna Set Tilt

OK	FAIL	Comment
	FormatError **Busy** **HardwareError** **WorkingSoftwareMissing** **MotorJam** **ActuatorJam** **NotConfigured** **NotCalibrated** **OutOfRange** **UnsupportedProcedure**	**If the addressed antenna is not existing, FormatError is returned.**

6.7.3 Antenna Get Tilt

Table 6.7.3.1: Elementary procedure Antenna Get Tilt

Name: **AntennaGetTilt**				
Code: **0x82**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **Low**

Table 6.7.3.2: Initiating message parameters and format for Antenna Get Tilt

Number	Length	Type	Description
1	**1 octet**	**Unsigned interger**	**Antenna number**

Table 6.7.3.3: Response message parameters and format for Antenna Get Tilt

Number	Length	Type	Description
1	**1 octet**	**Unsigned integer**	**Antenna number**
2	**1 octet**	**ReturnCode**	**Return code OK**
3	**2 octets**	**Signed integer**	**Tilt value**

Description:

On receipt of the initiating message the secondary device ~~will~~ shall return the current tilt value of the antenna addressed by the antenna number.

The returned tilt value is in the format specified in section 6.6.3.

Table 6.7.3.4: Return codes for Antenna Get Tilt

OK	FAIL	Comment
	FormatError **Busy** **HardwareError** **WorkingSoftwareMissing** **NotConfigured** **NotCalibrated** **UnsupportedProcedure**	**If the addressed antenna is not existing, FormatError is returned.** **HardwareError shall only be used if error is detected in tilt detector.**

6.7.4 Antenna Set Device Data

Table 6.7.4.1: Elementary procedure Antenna Set Device Data

Name: **AntennaSetDeviceData**				
Code:	Issued by:	Procedure class:	DownloadMode state:	Power mode:

0x83	**Primary device**	**1**	**No**	**Low**

Table 6.7.4.2: Initiating message parameters and format for Antenna Set Device Data

Number	Length	Type	Description
1	**1 octet**	**Unsigned integer**	**Antenna number**
2	**1 octet**	**Unsigned integer**	**Field number; see annex B**
3	**See annex B**	**See annex B**	**Data to write**

Table 6.7.4.3: Response message parameters and format for Antenna Set Device Data

Number	Length	Type	Description
1	**1 octet**	**Unsigned integer**	**Antenna number**
2	**1 octet**	**ReturnCode**	**Return code OK**

Description:

On receipt of the initiating message the secondary device ~~should~~ shall write the provided data for the antenna addressed by the antenna number into the fields optionally provided for configuration data and listed in annex B of this TS. If an attempt is made to write to fields which are not supported by a particular device no error is returned but the data for those fields is ignored. If an attempt is made to write to fields which are not supported for the addressed antenna the return code UnknownParameter is returned and the data for those fields is ignored.

Table 6.7.4.4: Return codes for Antenna Set Device Data

OK	FAIL	Comment
	FormatError **Busy** **HardwareError** **WorkingSoftwareMissing** **ReadOnly** **UnknownParameter** **UnsupportedProcedure**	**If the addressed antenna is not existing, FormatError is returned.**

********** Unchanged Parts omitted **********

6.7.6 Antenna Alarm Indication

Table 6.7.6.1: Elementary procedure Antenna Alarm Indication

Name: **AntennaAlarmIndication**

Code: 0x85	Issued by: **Secondary device**	Procedure class: **2**	DownloadMode state: **No**	Power mode: **Low**

Table 6.7.6.2: Initiating message parameters and format for Antenna Alarm Indication

Number	Length	Type	Description
1	**1 octet**	**Unsigned integer**	**Antenna number**
2 i – 1	**1 octet**	**Unsigned integer**	**Return code i; see annex A**
2 i	**1 octet**	**Unsigned integer**	**State flag i**

i = 1 … N

Description:

The multi-antenna secondary device uses this procedure to report antenna alarm state changes to the primary device. This procedure shall only be performed if the secondary has performed an AlarmSubscribe procedure since its latest reset. Multi-antenna devices shall use this *AntennaAlarmIndication* procedure only for multi-antenna specific alarms and the *AlarmIndication* procedure in subclause 6.6.5 for the other alarms.

For each alarm, the current alarm state and alarm code shall be reported if and only if any change in its state has occurred during the period of time since the last reported state. An AntennaAlarmIndication procedure shall be performed if at least one multi-antenna specific alarm shall be reported. The first AntennaAlarmIndication procedure after the AlarmSubscribe procedure shall report the active alarms ~~states~~.

Alarm state changes are considered as reported at the time the message is passed to the transport layer.

State flag = 0 represents alarm state *cleared*.

State flag = 1 represents alarm state *raised*.

********** Unchanged Parts omitted **********

6.7.8 Antenna Get Alarm Status

Table 6.7.8.1: Elementary procedure Antenna Get Alarm Status

Name: **AntennaGetAlarmStatus**				
Code: **0x87**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **Low**

Table 6.7.8.2: Initiating message parameters and format for Antenna Get Alarm Status

Number	Length	Type	Description
1	**1 octet**	**Unsigned integer**	**Antenna number**

Table 6.7.8.3: Response message parameters and format for Antenna Get Alarm Status

Number	Length	Type	Description

1	**1 octet**	**Unsigned integer**	**Antenna number**
2	**1 octet**	**ReturnCode**	**Return code OK**
i + 2	**1 octet**	**AlarmCode**	**Alarm code for ~~error~~ alarm number i**

i = 1 ... N

Description:

On receipt of the initiating message the secondary device shall report the alarm codes of the active alarms for the addressed antenna.

Table 6.7.8.4: Return codes for Antenna Get Alarm Status

OK	FAIL	Comment
All return codes marked as used for alarms in Annex A	**FormatError** **Busy** **WorkingSoftwareMissing** **UnsupportedProcedure**	**If the addressed antenna is not existing, FormatError is returned.**

********** Unchanged Parts omitted **********

6.7.10 Antenna Send Configuration Data

Table 6.7.10.1: Elementary procedure Antenna Send Configuration Data

Name: **AntennaSendConfigurationData**				
Code: **0x89**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **Low**

Table 6.7.10.2: Initiating message parameters and format for Antenna Send Configuration Data

Number	Length	Type	Description
1	**1 octet**	**Unsigned Integer**	**Antenna number**
2	**≤ Max~~-~~Data ~~Transmit~~Receive Length minus 1**	**Vendor specific**	**Configuration data**

Table 6.7.10.3: Response message parameters and format for Antenna Send Configuration Data

Number	Length	Type	Description
1	**1 octet**	**Unsigned integer**	**Antenna number**
2	**1 octet**	**ReturnCode**	**Return code OK**

Description:

On receipt of the initiating message the secondary device shall store the provided vendor and antenna specific configuration data for the relationship between the movement of the drive system and the beam tilt position of the addressed antenna.

If the configuration data exceeds Max-Data-~~Transmit~~Receive-Length, the data shall be split into a number of Max-Data ~~Transmit~~Receive-Length minus 1segments and one final segment with whatever is left. The primary device transmits the segments in order. The layer 2 sequence numbers guarantee that no segment will be lost or received out of order.

Table 6.7.10.4: Return codes for Antenna Send Configuration Data

OK	FAIL	Comment
	FormatError **Busy** **HardwareError** **WorkingSoftwareMissing** **ChecksumError** **InvalidFileContent** **UnsupportedProcedure**	**If the addressed antenna is not existing, FormatError is returned.**

********** Unchanged Parts omitted **********

Annex B (normative): Assigned fields for additional data

The following standard fields have no operational impact and are used by the procedures SetDeviceData, ~~and~~ GetDeviceData, AntennaSetDeviceData and AntennaGetDeviceData. Little-endian order is used for storage of multiple-octet numbers. Where ASCII variables are shorter than the assigned field lengths the characters are right aligned and leading blanks are filled with null characters (0x00).

Table B.1: Assigned fields for additional data

Field No.	Length (octets)	Format	Description
0x01	15	ASCII	Antenna model number
0x02	17	ASCII	Antenna serial number
0x03	2	16-bit unsigned	Antenna frequency band(s): see below
0x04	1	1 x 8-bit unsigned	Beamwidth for each band in frequency order (deg) (example 800/900MHz, 1800/1900MHz, 2100MHz)
0x05	3	3 x 8-bit unsigned	Gain for each band in frequency order (dB/10) (example 800/900MHz, 1800/1900MHz, 2100MHz)
0x06	2	16-bit signed	Maximum supported tilt (degrees * 10), Format as in section 6.6.3

0x07	2	16-bit signed	Minimum supported tilt (degrees * 10), Format as in section 6.6.3
0x21	6	ASCII	Installation date
0x22	5	ASCII	Installer's ID
0x23	12	ASCII	Base station ID
0x24	4	ASCII	Sector ID
0x25	2	16-bit unsigned	Antenna bearing
0x26	2	16-bit signed	Installed mechanical tilt (degrees * 10), Format as in section 6.6.3

********** Unchanged Parts omitted **********

Annex D (informative): Overview of elementary procedures

Table D.1: Elementary Procedures and Procedure Codes

Elementary Procedure	Procedure Code	Issued by	DownloadMode state
Common Procedure Set			
(Reserved)	0x01		
Reset Software	0x03	primary device	yes
Get Alarm Status	0x04	primary device	no
Get Information	0x05	primary device	yes
Clear Active Alarms	0x06	primary device	no
Read User Data	0x10	primary device	no
Write User Data	0x11	primary device	no
Alarm Subscribe	0x12	primary device	no
Self Test	0x0A	primary device	no
Download Start	0x40	primary device	yes
Download Application	0x41	primary device	yes
Download End	0x42	primary device	yes
Single-Antenna Procedure Set			
Set Device Data	0x0E	primary device	no
Get Device Data	0x0F	primary device	no
Calibrate	0x31	primary device	no
Send Configuration Data	0x32	primary device	no

Set Tilt	0x33	primary device	no
Get Tilt	0x34	primary device	no
Alarm Indication	0x07	secondary device	no
Multi-Antenna Procedure Set			
Antenna Calibrate	0x80	primary device	no
Antenna Send Configuration Data	0x89	primary device	no
Antenna Set Tilt	0x81	primary device	no
Antenna Get Tilt	0x82	primary device	no
Antenna Set Data	0x83	primary device	no
Antenna Get Data	0x84	primary device	no
Antenna Alarm Indication	0x85	secondary device	no
Antenna Clear Active Alarms	0x86	primary device	no
Antenna Get Alarm Status	0x87	primary device	no
Antenna Get Number of Antennas	0x88	primary device	no

NOTE: The notion "yes" in the Ddownload Mode ~~boot mode~~state column ~~operation~~ indicates that the listed procedures are mandatory if the Ddownload Mode ~~boot mode~~ state can be entered by the secondary device.

********** End of Changes **********

3GPP TSG RAN WG3 Meeting #46 R3-050287
Scottsdale, USA, 14 - 18 February 2005

CR-Form-v7.1

CHANGE REQUEST

⌘ 25.463 CR 25 ⌘rev 2 ⌘ Current version: 6.1.0 ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Clarification on antenna movement during Set Tilt
Source:	⌘	RAN3
Work item code:	⌘	RANimp-TiltAnt
Date:	⌘	7/02/2005
Category:	⌘	F
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

Ph2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	During a Set Tilt operation if the antenna moves outside the range between Current Tilt and the Tilt value in the Set Tilt, there is a risk that the motor may get jammed outside this range. This can cause interference to neighbouring cells and in worst case may need to shut down the cell. Also such antenna movements also increase interference during the operation itself.
Summary of change:	⌘	R2: Editorial changes. R1: An overshoot of half a degree is allowed. It is clarified that during the Set Tilt operation, the actual tilt should not go outside the range between the Current tilt and the Tilt value requested in the Set Tilt command
Consequences if not approved:	⌘	Risk of increased interference and possibility that the cell might have to be shut down until the motor jam is rectified.

Clauses affected:	⌘	6.6.3, 6.7.2

		Y	N		
Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

6.6.3 Set Tilt

Table 6.6.3.1: Elementary procedure Set Tilt

Name: **SetTilt**				
Code: **0x33**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **High**

Table 6.6.3.2: Initiating message parameters and format for Set Tilt

Number	Length	Type	Description
1	**2 octets**	**Signed integer**	**Tilt value**

Table 6.6.3.3: Response message parameters and format for Set Tilt

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code OK**

Description:

On receipt of the initiating message the secondary device shall set the electrical tilt in increments of 0.1°. The electrical tilt value describes the elevation angle between the direction orthogonal to the antenna element axis and the maximum of its main beam in the elevation plane. A positive electrical tilt angle means that the antenna beam is directed below the direction orthogonal to the antenna axis.

The secondary device shall respond to the initiating message in less than 2 minutes.

The actual tilt angle shall not go outside of the range between the current tilt and the requested tilt value during this operation by more than 0.5°.

The value of parameter 1 is 10 times the tilt in degrees.

Table 6.6.3.4: Return codes for Set Tilt

OK	FAIL	Comment
	FormatError **Busy** **HardwareError** **WorkingSoftwareMissing** **MotorJam** **ActuatorJam** **NotConfigured** **NotCalibrated** **OutOfRange** **UnsupportedProcedure**	

*****Next Change *****

6.7.2 Antenna Set Tilt

Table 6.7.2.1: Elementary procedure Antenna Set Tilt

Name: **AntennaSetTilt**				
Code: **0x81**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state: **No**	Power mode: **High**

Table 6.7.2.2: Initiating message parameters and format for Antenna Set Tilt

Number	Length	Type	Description
1	**1 octet**	**Signed integer**	**Antenna number**
2	**2 octets**	**Signed integer**	**Tilt value**

Table 6.7.2.3: Response message parameters and format for Antenna Set Tilt

Number	Length	Type	Description
1	**1 octet**	**Unsigned integer**	**Antenna number**
2	**1 octet**	**ReturnCode**	**Return code OK**

Description:

On receipt of the initiating message the secondary device shall set the electrical tilt of the antenna addressed by the antenna number in increments of 0.1°. The electrical tilt value describes the elevation angle between the direction orthogonal to the antenna element axis and the maximum of its main beam in the elevation plane. A positive electrical tilt angle means that the antenna beam is directed below the direction orthogonal to the antenna axis.

The secondary device shall respond to the initiating message in less than 2 minutes.

The actual tilt angle shall not go outside of the range between the current tilt and the requested tilt value during this operation by more than 0.5°.

The format of the value of parameter 2 is given in section 6.6.3.

Table 6.7.2.4: Return codes for Antenna Set Tilt

OK	FAIL	Comment
	FormatError **Busy** **HardwareError** **WorkingSoftwareMissing**	**If the addressed antenna is not existing, FormatError is returned.**

	MotorJam **ActuatorJam** **NotConfigured** **NotCalibrated** **OutOfRange** **UnsupportedProcedure**	

3GPP TSG-RAN3 Meeting #46
Scottsdale, USA, 14th – 18th February 2005

Tdoc ⌘ R3-050271

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.463** **CR** **26** ⌘ **rev** **1** ⌘ Current version: **6.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Redefinition or the Software Reset procedure
Source:	⌘	RAN3
Work item code:	⌘	RANimp-TiltAnt
Date:	⌘	15/02/2005
Category:	⌘	**C**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
Ph2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)
Rel-7 (Release 7)

Reason for change:	⌘	The current reset definition does only refer to the adress state of the device – other states or aspects are not affected. The name Software Reset indicates that the application should be reset rather than the transport layer addressing.
Summary of change:	⌘	Refer the reset process to the power on process. Apply Reset Software to the application layer
Consequences if not approved:	⌘	Reset will affect the transport layer addressing only. No ordinary reset is available in the RET instructions.

Clauses affected:	⌘	3.1, 6.1, 6.2.1, 6.5.1,

Other specs affected: ⌘	Y	N	
		X	Other core specifications
		X	Test specifications
		X	O&M Specifications

⌘

Other comments: ⌘

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

3.1 Definitions

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

Active alarm: An alarm which has an alarm state that has been raised, but not cleared.

Alarm: Persistent indication of a fault.

Alarm code: A code that identifies a specific alarm. The alarm code set is a subset of the return code set. The alarm codes are listed in Annex A.

Alarm state: A condition or state in the existence of an alarm. Alarm states are raised and cleared.

ASCII character: A character forming part of the International Reference Version of the 7-bit character set defined in ISO/IEC 646:1991

Calibrate: Exercise the antenna drive unit over its entire range of travel to ensure fault-free operation and synchronise the measured and actual beam tilt of the antenna

Configuration data: A stored table or function defining the relationship between the physical position of the drive and electrical beam-tilt

Data type: A definition determining the value range and interpretation of a series of octets. The following specified data types are used in this TS:

Name:	Definition:
AlarmCode	1 octet unsigned enumerated code. All AlarmCode values are listed in annex A of this TS
FieldNumber	1 octet unsigned enumerated code All field number values are listed in annex B of this TS
ProcedureCode	1 octet unsigned enumerated code.
ReturnCode	1 octet unsigned enumerated code. All ReturnCode values are listed in annex A of this TS
TextString	Octets with integer values in the range of 32 to 126 to be interpreted as ASCII characters.

Elementary Procedure: The RETAP protocol consists of Elementary Procedures (EPs). An Elementary Procedure is a unit of interaction between the primary device (Node B) and the secondary devices (RET devices).

An EP consists of an initiating message and possibly a response message.

Two kinds of EPs are used:

- **Class 1**: Elementary Procedures with response (success or failure).
- **Class 2**: Elementary Procedures without response.

For **Class 1** EPs, the types of responses can be as follows:

Successful

- A signalling message explicitly indicates that the elementary procedure has been successfully completed with the receipt of the response.

Unsuccessful

- A signalling message explicitly indicates that the EP failed.

Class 2 EPs are considered always successful.

Error: Deviation of a system from normal operation.

Fault: Lasting error condition.

Little-endian: The order of transmission in which the least-significant octets of a multi-octet representation of a number are transmitted first. Little endian only applies to binary integer representations.

Max Data Receive Length: Secondary Payload Receive Length subtracted by 3 octets. (see [3])

Max Data Transmit Length: Secondary Payload Transmit Length subtracted by 3 octets. (see [3])

Procedure code: A code identifying an elementary procedure.

Reset: A process by which the device is put in the state it reaches after a completed power-up

Return code: A code which defines information about the outcome of an elementary procedure execution.

Tilt (also downtilt, tilt angle, beamtilt): The elevation angle between the direction orthogonal to the antenna element axis and the maximum of its main beam in the elevation plane. A positive electrical tilt angle means that the antenna beam is directed below the direction orthogonal to the antenna axis. An antenna has separate values for electrical and mechanical tilt. The mechanical tilt is fixed by the geometry of the installation. In this TS the tilt referred to is always the electrical tilt unless otherwise stated.

Tilt value: A signed integer used in elementary procedures to define the electrical tilt setting of the antenna. The tilt value is 10 times the antenna electrical tilt angle.

----------Unchanged section omitted----------

6.1 State Model

The state model describing the RET device is shown in figure 6.1 with procedures written in *italic*.

The relation to the connection state model for layer 2 can be found in [3].

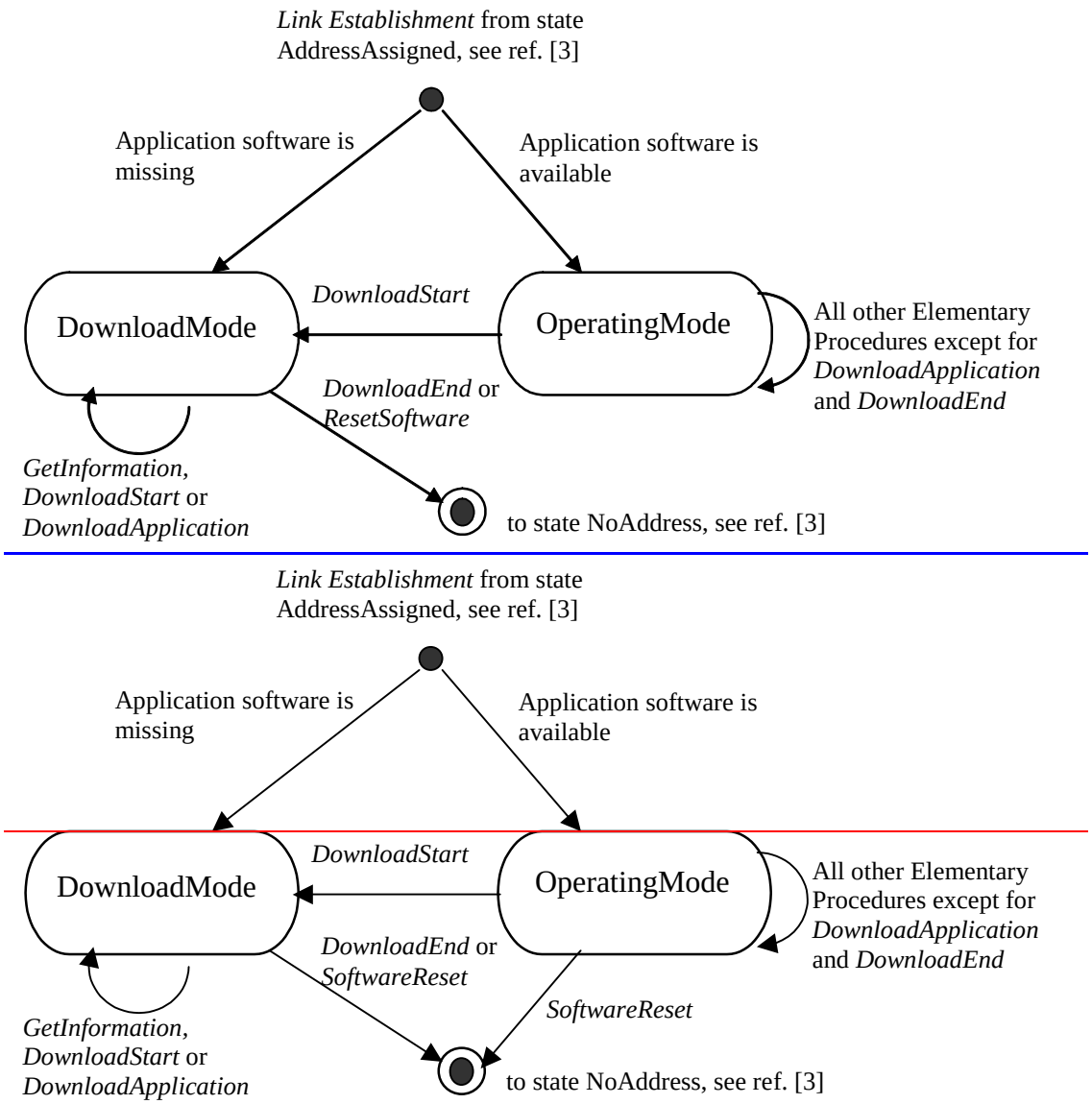

Figure 6.1: State Model for the RET Device

If an application software is not missing the RET device enters the state OperatingMode.

If an application software is missing, the RET device enters the state DownloadMode. In this state only software download functionality is supported in order to restore the application software.

The primary device will be notified that the RET device has entered the state DownloadMode when a procedure which only is supported in the state OperatingMode fails with the return code WorkingSoftwareMissing.

If no software download functionality is supported, then only the state OperatingMode for the RET device is supported.

6.2 General procedure handling

All procedures are blocking i.e. no new initiation messages will have to be executed before a response message has been delivered as result of the previously initiated procedure.

The Reset Software procedure shall always be handled in all states and never be blocked.

6.2.1 Alarms

When a fault is detected, the corresponding alarm state shall be changed to state *raised* by the secondary device. When the fault no longer exists, the corresponding alarm state shall be changed to state *cleared* by the secondary device. Alarm changes are reported through the AlarmIndication or AntennaAlarmIndication elementary procedures. Whenever an AlarmIndication or AntennaAlarmIndication elementary procedure message is transmitted, it shall contain all the alarm states changed that have not yet been reported as described in sections 6.6.5 and 6.7.6.

All alarm states shall be cleared by any type of reset.

----------Unchanged section omitted----------

6.5 Common elementary procedures

6.5.1 Reset Software

Table 6.5.1.1: Elementary procedure Reset Software

Name: **ResetSoftware**				
Code: **0x03**	Issued by: **Primary device**	Procedure class: **1**	DownloadMode state. **Yes**	Power mode: **Low**

Table 6.5.1.2: Initiating message parameters and format for Reset Software

Number	Length	Type	Description
None	**0 octets**	**None**	**No data carried**

Table 6.5.1.3: Response message parameters and format for Reset Software

Number	Length	Type	Description
1	**1 octet**	**ReturnCode**	**Return code OK**

Description:

On the receipt of the initiating message the secondary device shall ~~set the HDLC address to the No-station address and place the device in the *No Address* state.~~ reset the application. All alarm states shall be cleared.

If the initiating message is received in the OperatingMode state, the transport layer shall remain unaffected.

If the initiating message is received in the DownloadMode state, the ResetSoftware procedure shall reset the entire device without activating any new application software downloaded since entering the DownloadMode state.

The device shall not execute the reset procedure before transport layer acknowledgement through sequence number update is received for the response.

~~The secondary device shall not fail to reset for any reason.~~

Table 6.5.1.4: Return codes for Reset Software

OK	FAIL	Comment

	FormatError	**In case of format error, the procedure code validity is not secured.**