

**TSG-RAN Meeting #24**  
**Seoul, Korea, 02-04 June 2004**

**RP-040234**

**Title:** CRs to 25.321 (Rel-5 and associated Rel-6)

**Source:** TSG-RAN WG2

**Agenda item:** 7.3.5

<b>Spec</b>	<b>CR</b>	<b>Rev</b>	<b>Phase</b>	<b>Subject</b>	<b>Cat</b>	<b>Version-Current</b>	<b>Version-New</b>	<b>Workitem</b>	<b>Doc-2nd-Level</b>
25.321	195	-	Rel-5	State variables arithmetic comparison	F	5.8.0	5.9.0	TEI5	R2-041151
25.321	196	-	Rel-6	State variables arithmetic comparison	A	6.1.0	6.2.0	TEI5	R2-041152

CR-Form-v7

## CHANGE REQUEST

# 25.321 CR 195 # rev # Current version: 5.8.0 #

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

<b>Title:</b>	# State variables arithmetic comparison		
<b>Source:</b>	# RAN WG2		
<b>Work item code:</b>	# TEI5	<b>Date:</b>	# 10 May 2004
<b>Category:</b>	# <b>F</b>	<b>Release:</b>	# Rel-5
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)		2 (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)
	<b>B</b> (addition of feature),		R97 (Release 1997)
	<b>C</b> (functional modification of feature)		R98 (Release 1998)
	<b>D</b> (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

<b>Reason for change:</b>	# [H] Currently, in the specification of the UE MAC-hs reordering entity, it is not mentioned that the MAC-hs PDU Transmission sequence numbers and the states variables of the reordering entity are affected by a modulus.
<b>Summary of change:</b>	# Arithmetic compariason rules have been added for the TSN and the state variables of the reordering entity. The rules defined are similar to the rules currently in 25.322.
<b>Consequences if not approved:</b>	# Arithmetic comparisons of state variables in the MAC-hs reordering entity of the UE may be interpreted without taking the modulus into account. This could lead to improper behaviour of the UE reordering entity leading to lost of MAC_hs PDUs.

<b>Clauses affected:</b>	# 11.6.2.3.1										
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">#</td> </tr> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">#</td> </tr> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">#</td> </tr> </table>	Y	N	#	#	#	#	#	#	Other core specifications	#
Y	N										
#	#										
#	#										
#	#										
		Test specifications									
		O&M Specifications									
<b>Other comments:</b>	#										

**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.

### 11.6.2.3.1 Definitions

In the functions described in this section the following definitions apply:

#### Parameters

- Transmitter window size (TRANSMIT\_WINDOW\_SIZE)  
TRANSMIT\_WINDOW\_SIZE is the size of the transmitter window according to the definition below. This is a parameter in the Node B and the value of the parameter is configured by higher layers.
- Receiver window size (RECEIVE\_WINDOW\_SIZE)  
RECEIVE\_WINDOW\_SIZE is the size of the receiver window according to the definition below. This is a parameter in the UE and the value of the parameter is configured by higher layers.

#### State variables

All state variables are non-negative integers. MAC-hs PDUs are numbered by modulo integer Transmission sequence numbers (TSN) cycling through the field 0 to 63. All arithmetic operations contained in the present document on next\_expected\_TSN, RcvWindow\_UpperEdge, T1\_TSN and TSN\_flush are affected by the 64 modulus. When performing arithmetic comparisons of state variables or Transmission sequence number values a 64 modulus base shall be used. This modulus base is subtracted (within the appropriate field) from all the values involved and then an absolute comparison is performed. ~~Next\_expected\_TSN~~ RcvWindow\_UpperEdge – RECEIVE\_WINDOW\_SIZE + 1 shall be assumed to be the modulus base.

- next\_expected\_TSN:  
The next\_expected\_TSN is the Transmission sequence number (TSN) following the TSN of the last in-sequence MAC-hs PDU received. It shall be updated upon the delivery to the disassembly entity of the MAC-hs PDU with TSN equal to next\_expected\_TSN. The initial value of next\_expected\_TSN =0.
- RcvWindow\_UpperEdge:  
The RcvWindow\_UpperEdge represents the TSN, which is at the upper edge of the receiver window. After the first MAC-hs PDU has been received successfully, it also corresponds to the MAC-hs PDU with the highest TSN of all received MAC-hs PDUs. The initial RcvWindow\_UpperEdge equals 63. RcvWindow\_UpperEdge is updated based on the reception of new MAC-hs PDU according to the procedure given below.
- T1\_TSN:  
The TSN of the latest MAC-hs PDU that cannot be delivered to the disassembly entity, when the timer T1 is started.

#### Timers

- Re-ordering release timer (T1):  
The Re-ordering release timer T1 controls the stall avoidance in the UE reordering buffer as described below. The value of T1 is configured by upper layers.

#### Other definitions

- Receiver window:  
The receiver window defines TSNs of those MAC-hs PDUs that can be received in the receiver without causing an advancement of the receiver window according to the procedure below. The size of the receiver window equals RECEIVE\_WINDOW\_SIZE and spans TSNs going from RcvWindow\_UpperEdge – RECEIVE\_WINDOW\_SIZE + 1 to RcvWindow\_UpperEdge included.

CR-Form-v7

## CHANGE REQUEST

⌘ **25.321** CR **196** ⌘ rev **6.1.0** ⌘ 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

<b>Title:</b>	⌘ State variables arithmetic comparison		
<b>Source:</b>	⌘ RAN WG2		
<b>Work item code:</b>	⌘ TEI5	<b>Date:</b>	⌘ 10 May 2004
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ Rel-6
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	2	(GSM Phase 2)
	A (corresponds to a correction in an earlier release)	R96	(Release 1996)
	B (addition of feature),	R97	(Release 1997)
	C (functional modification of feature)	R98	(Release 1998)
	D (editorial modification)	R99	(Release 1999)
	Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .	Rel-4	(Release 4)
		Rel-5	(Release 5)
		Rel-6	(Release 6)

<b>Reason for change:</b>	⌘ [H] Currently, in the specification of the UE MAC-hs reordering entity, it is not mentioned that the MAC-hs PDU Transmission sequence numbers and the states variables of the reordering entity are affected by a modulus.
<b>Summary of change:</b>	⌘ Arithmetic compariason rules have been added for the TSN and the state variables of the reordering entity. The rules defined are similar to the rules currently in 25.322.
<b>Consequences if not approved:</b>	⌘ Arithmetic comparisons of state variables in the MAC-hs reordering entity of the UE may be interpreted without taking the modulus into account. This could lead to improper behaviour of the UE reordering entity leading to lost of MAC_hs PDUs.

<b>Clauses affected:</b>	⌘ 11.6.2.3.1						
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table>	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications	⌘
Y	N						
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
	<input checked="" type="checkbox"/>	Test specifications					
	<input checked="" type="checkbox"/>	O&M Specifications					
<b>Other comments:</b>	⌘						

**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.

### 11.6.2.3.1 Definitions

In the functions described in this section the following definitions apply:

#### Parameters

- Transmitter window size (TRANSMIT\_WINDOW\_SIZE)  
TRANSMIT\_WINDOW\_SIZE is the size of the transmitter window according to the definition below. This is a parameter in the Node B and the value of the parameter is configured by higher layers.
- Receiver window size (RECEIVE\_WINDOW\_SIZE)  
RECEIVE\_WINDOW\_SIZE is the size of the receiver window according to the definition below. This is a parameter in the UE and the value of the parameter is configured by higher layers.

#### State variables

All state variables are non-negative integers. MAC-hs PDUs are numbered by modulo integer Transmission sequence numbers (TSN) cycling through the field 0 to 63. All arithmetic operations contained in the present document on next\_expected\_TSN, RcvWindow\_UpperEdge, T1\_TSN and TSN\_flush are affected by the 64 modulus. When performing arithmetic comparisons of state variables or Transmission sequence number values a 64 modulus base shall be used. This modulus base is subtracted (within the appropriate field) from all the values involved and then an absolute comparison is performed. ~~Next\_expected\_TSN~~ RcvWindow\_UpperEdge – RECEIVE\_WINDOW\_SIZE + 1 shall be assumed to be the modulus base.

- next\_expected\_TSN:  
The next\_expected\_TSN is the Transmission sequence number (TSN) following the TSN of the last in-sequence MAC-hs PDU received. It shall be updated upon the delivery to the disassembly entity of the MAC-hs PDU with TSN equal to next\_expected\_TSN. The initial value of next\_expected\_TSN =0.
- RcvWindow\_UpperEdge:  
The RcvWindow\_UpperEdge represents the TSN, which is at the upper edge of the receiver window. After the first MAC-hs PDU has been received successfully, it also corresponds to the MAC-hs PDU with the highest TSN of all received MAC-hs PDUs. The initial RcvWindow\_UpperEdge equals 63. RcvWindow\_UpperEdge is updated based on the reception of new MAC-hs PDU according to the procedure given below.
- T1\_TSN:  
The TSN of the latest MAC-hs PDU that cannot be delivered to the disassembly entity, when the timer T1 is started.

#### Timers

- Re-ordering release timer (T1):  
The Re-ordering release timer T1 controls the stall avoidance in the UE reordering buffer as described below. The value of T1 is configured by upper layers.

#### Other definitions

- Receiver window:  
The receiver window defines TSNs of those MAC-hs PDUs that can be received in the receiver without causing an advancement of the receiver window according to the procedure below. The size of the receiver window equals RECEIVE\_WINDOW\_SIZE and spans TSNs going from RcvWindow\_UpperEdge – RECEIVE\_WINDOW\_SIZE + 1 to RcvWindow\_UpperEdge included.