TSG-RAN Meeting #16
Marco Island, FL, USA, 4 - 7 June 2002

RP-020329

Title: **Agreed CRs (Release '99 and Rel-4/Rel-5 category A) to TS 25.324**

Source: **TSG-RAN WG2**

Agenda item: **7.2.3**

Doc-1st-	Status-	Spec	CR	Rev	Phase	Subject	Cat	Version	Versio
R2-021244	agreed	25.324	008	1	R99	Clarification on BMC message encoding	F	3.4.0	3.5.0
R2-021245	agreed	25.324	009		Rel-4	Clarification on BMC message encoding	A	4.0.0	4.1.0
R2-021246	agreed	25.324	010		Rel-5	Clarification on BMC message encoding	A	5.0.0	5.1.0

3GPP TSG-RAN WG2 Meeting #29 ***Tdoc R2-021244***
Gyeongju, Korea, 13 - 17 May 2002

CR-Form-v5.1

CHANGE REQUEST

⌘ **25.324** **CR** **008** ⌘ **rev** **r1** ⌘ Current version: **3.4.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Clarification on BMC message encoding
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	29.04.2002
Category:	⌘	**F**
Release:	⌘	R99

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)

Reason for change:	⌘	The message encoding is not clearly described. Especially, the encoding of BMC specific elements requires further clarification.
Summary of change:	⌘	Specification is included for information elements. Either by description of encoding (binary representation in case of integer) or clear references to respective specifications
Consequences if not approved:	⌘	Encoding of information elements and messages ambigous If either UE or UTRAN does not conform with this CR CBS will not work. All implementations are required to conform with this CR (they possibly do already). (different view on message encoding is obviously a problem).

Clauses affected:	⌘	6, 10.3, 11.1, 11.2, 11.3, 11.4, 11.5, 11.6, 11.7, 11.9, 11.10		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	25.324 v4.0.0, CR 009 25.324 v5.0.0, CR 010
Other comments:	⌘	No impact on test specifications identified		

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 Services provided to Upper Layers

The BM-SAP provides a broadcast/multicast transmission service in the user plane on the radio interface for common user data in unacknowledged mode.

~~NOTE: This clause depends on the specification of the CBC-RNC interface protocol ([5] under specification of TSG-RAN WG 3) and the requirements of the CB application and the underlying interfaces ([3] under specification of TSG-T WG 2 SWG 3).~~

The BMC sublayer interacts with other entities as illustrated in figure 1 of chapter 4. The interactions with the upper layer/U-plane and the RRC layer are specified in terms of primitives where the primitives represent the logical exchange of information and control between the BMC sublayer and higher layers. They do not specify or constrain implementations. The (adjacent) layers connect to each other through Service Access Points (SAPs).

Three types of primitives are used for this document, as follows:

- **REQUEST:**
  This type is used when a higher layer is requesting a service from a lower layer.

- **INDICATION:**
  This type is used by a lower layer providing a service to notify its higher layer of activities concerning that higher layer.

- **CONFIRM:**
  This type is used by a lower layer providing the requested service to confirm to the higher layer that the activity has been completed.

The primitives defined below are for communications between upper layer and BMC, as well as RRC and BMC in the same protocol stack.

For the BMC sublayer two sets of primitives are defined.

- **Primitives between BMC and upper layer (U-plane):**

  BMC - Generic name - Type: Parameters.

- **Primitives between BMC and the RRC entity:**

  CBMC - Generic name - Type: Parameters.

10 BMC Messages

10.1 General

A BMC message is equivalent with a BMC PDU. There are three types of BMC messages defined, CBS messages and CBS41 messages, which carry cell broadcast data from higher layer, and *Schedule messages*, which provide information for support of Discontinuous Reception (DRX) of cell broadcast data at the UE.

BMC messages and information elements are specified using the tabular format methodology as specified in TR 25.921, and additional text is describing the encoding.

NOTE: Only IEs marked as MP or CV in the "Need" column exists.

BMC messages (i.e. BMC PDUs) specified by tabular format consist of an ordered sequence IE1,..,IEn of information element fields.

Let $(A_{1,\mathrm{IE}},..,A_{N,\mathrm{IE}})$ be the bit string of an information element IE. $A_{1,\mathrm{IE}}$ is equal to the leftmost bit of the information element field and $A_{N,IE}$ is equal to the rightmost bit of the information element field.

The bit string of a BMC message is defined as the concatenation $(A_{1,\mathrm{IE1}},..,A_{N,\mathrm{IE1}})$, …, $(A_{1,\mathrm{IEn}},..,A_{N,\mathrm{IEn}})$ of the bit strings of the IEs maintaining the sequence order.

10.2 BMC CBS Message

The CBS Message carries the cell broadcast data and the address information if the address information is based on GSM CBS.

RLC-SAP: UM;

Logical channel: CTCH;

Direction: UTRAN → UE.

Table 10.2-1: CBS Message

Information Element	Need	Multi	Type and reference	Semantics description
Message Type	MP		Sec. 11.1	
Message ID	MP		Sec. 11.2	
Serial Number	MP		Sec. 11.3	
Data Coding Scheme	MP		Sec. 11.4	
CB Data	MP		Sec. 11.5	

10.3 BMC Schedule Message

The BMC Schedule Message describes for the succeeding CBS schedule period the time locations for each CBS Message and the location of the Schedule Message of the following CBS schedule period.

RLC-SAP: UM.

Logical channel: CTCH.

Direction: UTRAN → UE.

Table 10. 3-1: Schedule Message

Information Element	Need	Multi	Type and reference	Semantics description
Message Type	MP		Sec. 11.1	
Offset to Begin CTCH BS index	MP		Sec. 11.6	
Length of CBS Scheduling Period	MP		Sec. 11.7	
New Message Bitmap	MP		Sec. 11.8	
Message Description	MP	1 to <Length of CBS Scheduling Period>	Sec. 11.9	Message Description IE is included for each new message (1 in the New message bitmap) as well as for each old message (0 in the New message bitmap). The i-th Message Description IE refers to the i-th bit in the New Message Bitmap IE. The multiplicity for the IE "Message Description" does not require an additional length indication in the encoded message. The multiplicity shall be derived from the IE "Length of CBS Scheduling Period".

10.4 BMC CBS41 Message

The CBS41 Message carries the cell broadcast data and the address information if the address information is based on ANSI-41 CBS.

RLC-SAP: UM.

Logical channel: CTCH.

Direction: UTRAN → UE.

Table 10.4-1: CBS41 Message

Information Element	Need	Multi	Type and reference	Semantics description
Message Type	MP		Sec. 11.1	
Broadcast Address	MP		Sec. 11.10	
CB Data41	MP		Sec. 11.11	

11 Information Elements

11.1 Message Type

Table 11.1-1: Message Type IE

IE/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Enumerated (0 .. 255) Table 11.1-2	This IE is coded as the binary representation of the Message Type. $A_{1,IE}$ denotes the least significant bit.

Coding of Message Type

Table 11.1-2: Coding of Message Type IE

1	CBS Message
2	Schedule Message
3	CBS41 Message
0, 4.. 255	Reserved for future use (PDUs with this coding will be discarded by this version of the protocol)

11.2 Message ID

Table 11.2-1: Message ID IE

IE/Group name	Need	Multi	Type and reference	Semantics description
Message ID	MP		Bitstring(16) ~~[3]~~	Identification of source and type of CBS message. This IE is encoded according to [3].

11.3 Serial Number

Table 11.3-1: Serial Number IE

IE/Group Name	Need	Multi	Type and reference	Semantics description
Serial Number	MP		Bitstring(16) ~~[3]~~	Identification of variations of a CBS message (part of the overall CBS message identification). This IE is encoded according to [3].

11.4 Data Coding Scheme

Table 11.4-1: Data Coding Scheme IE

IE/Group name	Need	Multi	Type and reference	Semantics description
Data Coding Scheme	MP		Bitstring(8) [4]	Identification of the alphabet/coding and the language applied. This IE is encoded according to [4].

11.5 CB Data

Table 11.5-1: CB Data IE

IE/Group name	Need	Multi	Type and reference	Semantics description
CB Data	MP		Bitstring(N*8) N ≥ 1	Content of CBS message. This IE is encoded according to [4]. Note: This IE contains the CB Data as received in the SABP with the length indicator of the PER aligned bit string as received on SABP being removed

NOTE: The number N is less than or equal to [1246] octets if a GSM CBS message is broadcast.

11.6 Offset to Begin CTCH Block Set Index

Table 11.6-1: Offset to Begin CTCH Block Set Index IE

IE/Group name	Need	Multi	Type and reference	Semantics description
Offset to Begin CTCH BS Index	MP		Integer (1..255)	Pointer to the first CTCH BS of the next CBS Schedule Period relative to the CTCH BS index of the current BMC Schedule Message This IE is coded as the binary representation of the Offset to Begin CTCH BS Index. $A_{1,IE}$ denotes the least significant bit.

11.7 Length of CBS Schedule Period

Table 11.7-1: Length of CBS Schedule Period IE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Length of CBS Schedule Period	MP		Integer (1..256)	Number of consecutive CTCH BS of the next CBS Schedule Period. Together with Offset to Begin CTCH BS Index it points to the end of the CBS schedule period. This IE is coded as the binary representation of the Message Type. $A_{1,IE}$ denotes the least significant bit.

11.8 New Message Bitmap

Table 11.8-1: New Message Bitmap IE

Information Element/Group name	Need	Multi	Type and reference	Semantics description

New Message Bitmap	MP		Bitmap(N*8)
			
			if "Length of CBS Schedule Period" mod 8 = 0 then
			N = "Length of CBS Schedule Period" div 8,
			else
			N = "Length of CBS Schedule Period" div 8 + 1.
			Table 11.8-2
				Bitmap indicating CTCH BS which contains new CBS Messages completely or partly

Coding of New Message Bitmap.

Table 11.8-2: Coding of New Message Bitmap IE

CTCH BS index B	CTCH BS index B+1	CTCH BS index B+2	...					1
								2
								...
	...	CTCH BS index E-1	CTCH BS index E	0	0	0	0	n
Legend: B First CTCH BS index of the CBS schedule period, 1 ≤ B ≤ 256 E Last CTCH BS index of the CBS schedule period, E = B + Length of CBS Schedule Period – 1								

CTCH BS Index i:
Bit i of the New CBS Message Bitmap refers to the content of CTCH BS index i. Its meaning is as follows:

1 The CTCH BS index i contains a BMC Message partly or completely which
was either not sent during the previous schedule period,
or sent unscheduled during the preceding schedule period;
or, the CTCH BS is indicated as of free usage, reading advised;
or it contains the Schedule Message partly or complete of the following CBS schedule period,
or it contains a CBS41 Message partly or complete.
The value is 1 both for the first transmission of a given BMC message in the CBS schedule period or a repetition of it within the CBS schedule period.

0 The CTCH BS is such that value 1 is not suitable.

The length of the New Message Bitmap is given by the IE Length of CBS Schedule Period. If it is not a multiple of 8 the remaining bit positions are padded with "0".

11.9 Message Description

Table 11.9-1: Message Description IE

IE/Group Name	Need	Multi	Type and reference	Semantics description
Message Description Type	MP		Enumerated(0..255) Table 11.9-3	This IE is coded as the binary representation of the Message Description Type. $A_{1,IE}$ denotes the least significant bit.
Message ID	CV MDT1		Enumerated (0 .. 2^{16}-1) [3]	This IE is coded as the binary representation of the Message ID. $A_{1,IE}$ denotes the least significant bit.
Offset to CTCH BS index of first transmission	CV MDT2		Integer (0..255)	This IE is coded as the binary representation of the Offset to CTCH BS index of first transmission. $A_{1,IE}$ denotes the least significant bit.

Table 11.9-2: Conditions

Condition	Explanation
MDT1	If Message Description Type = 1 or 5 then: the CB-Message-Id IE is included
MDT2	If Message Description Type = 0 or 4 then: the Offset to CTCH BS index of first transmission IE is included pointing to the CTCH BS index where the BMC message is transmitted the first time within the schedule period.

Table 11.9-3: Encoding of Message Description Type

Value	Explanation
0	Repetition of new BMC message within schedule period
1	New message
2	Reading advised
3	Reading optional
4	Repetition of old BMC message within schedule period
5	Old message (repetition of a message sent in a previous schedule period)
6	Schedule message
7	CBS41 message
8	no message
9.. 255	Reserved for future use (IEs received with this value will be replaced by value 3)

11.10 Broadcast Address

Table 11.10-1: Data Coding Scheme IE

IE/Group name	Need	Multi	Type and reference	Semantics description
Broadcast Address	MP		Bitstring(40) ~~[8]~~	Address information for higher layer This IE is encoded according to [8]

3GPP TSG-RAN WG2 Meeting #29 ***Tdoc R2-021245***
Gyeongju, Korea, 13 - 17 May 2002

CR-Form-v5.1

CHANGE REQUEST

⌘ **25.324** **CR** **009** ⌘ **rev** **-** ⌘ Current version: **4.0.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Clarification on BMC message encoding
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	29.04.2002
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Release:	⌘	REL-4

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Reason for change:	⌘	The message encoding is not clearly described. Especially, the encoding of BMC specific elements requires further clarification.
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Clauses affected:	⌘	6, 10.3, 11.1, 11.2, 11.3, 11.4, 11.5, 11.6, 11.7, 11.9, 11.10		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	25.324 v3.4.0, CR 008r1 25.324 v5.0.0, CR 010
Other comments:	⌘	No impact on test specifications identified		

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~~NOTE: This clause depends on the specification of the CBC-RNC interface protocol ([5] under specification of TSG-RAN WG 3) and the requirements of the CB application and the underlying interfaces ([3] under specification of TSG-T WG 2 SWG 3).~~

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The primitives defined below are for communications between upper layer and BMC, as well as RRC and BMC in the same protocol stack.

For the BMC sublayer two sets of primitives are defined.

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10 BMC Messages

10.1 General

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NOTE: Only IEs marked as MP or CV in the "Need" column exists.

BMC messages (i.e. BMC PDUs) specified by tabular format consist of an ordered sequence IE1,..,IEn of information element fields.

Let $(A_{1,\mathrm{IE}},..,A_{N,\mathrm{IE}})$ be the bit string of an information element IE. $A_{1,\mathrm{IE}}$ is equal to the leftmost bit of the information element field and $A_{N,IE}$ is equal to the rightmost bit of the information element field.

The bit string of a BMC message is defined as the concatenation $(A_{1,\mathrm{IE1}},..,A_{N,\mathrm{IE1}})$, …, $(A_{1,\mathrm{IEn}},..,A_{N,\mathrm{IEn}})$ of the bit strings of the IEs maintaining the sequence order.

10.2 BMC CBS Message

The CBS Message carries the cell broadcast data and the address information if the address information is based on GSM CBS.

RLC-SAP: UM;

Logical channel: CTCH;

Direction: UTRAN → UE.

Table 10.2-1: CBS Message

Information Element	Need	Multi	Type and reference	Semantics description
Message Type	MP		Sec. 11.1	
Message ID	MP		Sec. 11.2	
Serial Number	MP		Sec. 11.3	
Data Coding Scheme	MP		Sec. 11.4	
CB Data	MP		Sec. 11.5	

10.3 BMC Schedule Message

The BMC Schedule Message describes for the succeeding CBS schedule period the time locations for each CBS Message and the location of the Schedule Message of the following CBS schedule period.

RLC-SAP: UM.

Logical channel: CTCH.

Direction: UTRAN → UE.

Table 10. 3-1: Schedule Message

Information Element	Need	Multi	Type and reference	Semantics description
Message Type	MP		Sec. 11.1	
Offset to Begin CTCH BS index	MP		Sec. 11.6	
Length of CBS Scheduling Period	MP		Sec. 11.7	
New Message Bitmap	MP		Sec. 11.8	
Message Description	MP	1 to <Length of CBS Scheduling Period>	Sec. 11.9	Message Description IE is included for each new message (1 in the New message bitmap) as well as for each old message (0 in the New message bitmap). The i-th Message Description IE refers to the i-th bit in the New Message Bitmap IE. The multiplicity for the IE "Message Description" does not require an additional length indication in the encoded message. The multiplicity shall be derived from the IE "Length of CBS Scheduling Period".

10.4 BMC CBS41 Message

The CBS41 Message carries the cell broadcast data and the address information if the address information is based on ANSI-41 CBS.

RLC-SAP: UM.

Logical channel: CTCH.

Direction: UTRAN → UE.

Table 10.4-1: CBS41 Message

Information Element	Need	Multi	Type and reference	Semantics description
Message Type	MP		Sec. 11.1	
Broadcast Address	MP		Sec. 11.10	
CB Data41	MP		Sec. 11.11	

11 Information Elements

11.1 Message Type

Table 11.1-1: Message Type IE

IE/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Enumerated (0 .. 255) Table 11.1-2	This IE is coded as the binary representation of the Message Type. $A_{1,IE}$ denotes the least significant bit.

Coding of Message Type

Table 11.1-2: Coding of Message Type IE

1	CBS Message
2	Schedule Message
3	CBS41 Message
0, 4.. 255	Reserved for future use (PDUs with this coding will be discarded by this version of the protocol)

11.2 Message ID

Table 11.2-1: Message ID IE

IE/Group name	Need	Multi	Type and reference	Semantics description
Message ID	MP		Bitstring(16) ~~[3]~~	Identification of source and type of CBS message. This IE is encoded according to [3].

11.3 Serial Number

Table 11.3-1: Serial Number IE

IE/Group Name	Need	Multi	Type and reference	Semantics description
Serial Number	MP		Bitstring(16) ~~[3]~~	Identification of variations of a CBS message (part of the overall CBS message identification). This IE is encoded according to [3].

11.4 Data Coding Scheme

Table 11.4-1: Data Coding Scheme IE

IE/Group name	Need	Multi	Type and reference	Semantics description
Data Coding Scheme	MP		Bitstring(8) [4]	Identification of the alphabet/coding and the language applied. This IE is encoded according to [4].

11.5 CB Data

Table 11.5-1: CB Data IE

IE/Group name	Need	Multi	Type and reference	Semantics description
CB Data	MP		Bitstring(N*8) N ≥ 1	Content of CBS message. This IE is encoded according to [4]. Note: This IE contains the CB Data as received in the SABP with the length indicator of the PER aligned bit string as received on SABP being removed

NOTE: The number N is less than or equal to [1246] octets if a GSM CBS message is broadcast.

11.6 Offset to Begin CTCH Block Set Index

Table 11.6-1: Offset to Begin CTCH Block Set Index IE

IE/Group name	Need	Multi	Type and reference	Semantics description
Offset to Begin CTCH BS Index	MP		Integer (1..255)	Pointer to the first CTCH BS of the next CBS Schedule Period relative to the CTCH BS index of the current BMC Schedule Message This IE is coded as the binary representation of the Offset to Begin CTCH BS Index. $A_{1,IE}$ denotes the least significant bit.

11.7 Length of CBS Schedule Period

Table 11.7-1: Length of CBS Schedule Period IE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Length of CBS Schedule Period	MP		Integer (1..256)	Number of consecutive CTCH BS of the next CBS Schedule Period. Together with Offset to Begin CTCH BS Index it points to the end of the CBS schedule period. This IE is coded as the binary representation of the Message Type. $A_{1,IE}$ denotes the least significant bit.

11.8 New Message Bitmap

Table 11.8-1: New Message Bitmap IE

Information Element/Group name	Need	Multi	Type and reference	Semantics description

New Message Bitmap	MP		Bitmap(N*8)
			
			if "Length of CBS Schedule Period" mod 8 = 0 then
			N = "Length of CBS Schedule Period" div 8,
			else
			N = "Length of CBS Schedule Period" div 8 + 1.
			Table 11.8-2
				Bitmap indicating CTCH BS which contains new CBS Messages completely or partly

Coding of New Message Bitmap.

Table 11.8-2: Coding of New Message Bitmap IE

CTCH BS index B	CTCH BS index B+1	CTCH BS index B+2	...					1
								2
								...
	...	CTCH BS index E-1	CTCH BS index E	0	0	0	0	n
Legend: B First CTCH BS index of the CBS schedule period, 1 ≤ B ≤ 256 E Last CTCH BS index of the CBS schedule period, E = B + Length of CBS Schedule Period – 1								

CTCH BS Index i:
Bit i of the New CBS Message Bitmap refers to the content of CTCH BS index i. Its meaning is as follows:

1 The CTCH BS index i contains a BMC Message partly or completely which
was either not sent during the previous schedule period,
or sent unscheduled during the preceding schedule period;
or, the CTCH BS is indicated as of free usage, reading advised;
or it contains the Schedule Message partly or complete of the following CBS schedule period,
or it contains a CBS41 Message partly or complete.
The value is 1 both for the first transmission of a given BMC message in the CBS schedule period or a repetition of it within the CBS schedule period.

0 The CTCH BS is such that value 1 is not suitable.

The length of the New Message Bitmap is given by the IE Length of CBS Schedule Period. If it is not a multiple of 8 the remaining bit positions are padded with "0".

11.9 Message Description

Table 11.9-1: Message Description IE

IE/Group Name	Need	Multi	Type and reference	Semantics description
Message Description Type	MP		Enumerated(0..255) Table 11.9-3	This IE is coded as the binary representation of the Message Description Type. $A_{1,IE}$ denotes the least significant bit.
Message ID	CV MDT1		Enumerated (0 .. 2^{16}-1) [3]	This IE is coded as the binary representation of the Message ID. $A_{1,IE}$ denotes the least significant bit.
Offset to CTCH BS index of first transmission	CV MDT2		Integer (0..255)	This IE is coded as the binary representation of the Offset to CTCH BS index of first transmission. $A_{1,IE}$ denotes the least significant bit.

Table 11.9-2: Conditions

Condition	Explanation
MDT1	If Message Description Type = 1 or 5 then: the CB-Message-Id IE is included
MDT2	If Message Description Type = 0 or 4 then: the Offset to CTCH BS index of first transmission IE is included pointing to the CTCH BS index where the BMC message is transmitted the first time within the schedule period.

Table 11.9-3: Encoding of Message Description Type

Value	Explanation
0	Repetition of new BMC message within schedule period
1	New message
2	Reading advised
3	Reading optional
4	Repetition of old BMC message within schedule period
5	Old message (repetition of a message sent in a previous schedule period)
6	Schedule message
7	CBS41 message
8	no message
9.. 255	Reserved for future use (IEs received with this value will be replaced by value 3)

11.10 Broadcast Address

Table 11.10-1: Data Coding Scheme IE

IE/Group name	Need	Multi	Type and reference	Semantics description
Broadcast Address	MP		Bitstring(40) ~~[8]~~	Address information for higher layer This IE is encoded according to [8]

3GPP TSG-RAN WG2 Meeting #29 ***Tdoc R2-021246***
Gyeongju, Korea, 13 - 17 May 2002

CR-Form-v5.1

CHANGE REQUEST

⌘ **25.324** **CR** **010** ⌘ **rev** **-** ⌘ Current version: **5.0.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Clarification on BMC message encoding
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	29.04.2002
Category:	⌘	**A**
Release:	⌘	REL-5

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)

Reason for change:	⌘	The message encoding is not clearly described. Especially, the encoding of BMC specific elements requires further clarification.
Summary of change:	⌘	Specification is included for information elements. Either by description of encoding (binary representation in case of integer) or clear references to respective specifications
Consequences if not approved:	⌘	Encoding of information elements and messages ambigous If either UE or UTRAN does not conform with this CR CBS will not work. All implementations are required to conform with this CR (they possibly do already). (different view on message encoding is obviously a problem).

Clauses affected:	⌘	6, 10.3, 11.1, 11.2, 11.3, 11.4, 11.5, 11.6, 11.7, 11.9, 11.10		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	25.324 v3.4.0, CR 008r1 25.324 v4.0.0, CR 009
Other comments:	⌘	No impact on test specifications identified		

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 Services provided to Upper Layers

The BM-SAP provides a broadcast/multicast transmission service in the user plane on the radio interface for common user data in unacknowledged mode.

~~NOTE: This clause depends on the specification of the CBC-RNC interface protocol ([5] under specification of TSG-RAN WG 3) and the requirements of the CB application and the underlying interfaces ([3] under specification of TSG-T WG 2 SWG 3).~~

The BMC sublayer interacts with other entities as illustrated in figure 1 of chapter 4. The interactions with the upper layer/U-plane and the RRC layer are specified in terms of primitives where the primitives represent the logical exchange of information and control between the BMC sublayer and higher layers. They do not specify or constrain implementations. The (adjacent) layers connect to each other through Service Access Points (SAPs).

Three types of primitives are used for this document, as follows:

- **REQUEST:**
  This type is used when a higher layer is requesting a service from a lower layer.

- **INDICATION:**
  This type is used by a lower layer providing a service to notify its higher layer of activities concerning that higher layer.

- **CONFIRM:**
  This type is used by a lower layer providing the requested service to confirm to the higher layer that the activity has been completed.

The primitives defined below are for communications between upper layer and BMC, as well as RRC and BMC in the same protocol stack.

For the BMC sublayer two sets of primitives are defined.

- **Primitives between BMC and upper layer (U-plane):**

  BMC - Generic name - Type: Parameters.

- **Primitives between BMC and the RRC entity:**

  CBMC - Generic name - Type: Parameters.

10 BMC Messages

10.1 General

A BMC message is equivalent with a BMC PDU. There are three types of BMC messages defined, CBS messages and CBS41 messages, which carry cell broadcast data from higher layer, and *Schedule messages*, which provide information for support of Discontinuous Reception (DRX) of cell broadcast data at the UE.

BMC messages and information elements are specified using the tabular format methodology as specified in TR 25.921, and additional text is describing the encoding.

NOTE: Only IEs marked as MP or CV in the "Need" column exists.

BMC messages (i.e. BMC PDUs) specified by tabular format consist of an ordered sequence IE1,..,IEn of information element fields.

Let $(A_{1,\mathrm{IE}},..,A_{N,\mathrm{IE}})$ be the bit string of an information element IE. $A_{1,\mathrm{IE}}$ is equal to the leftmost bit of the information element field and $A_{N,IE}$ is equal to the rightmost bit of the information element field.

The bit string of a BMC message is defined as the concatenation $(A_{1,\mathrm{IE1}},..,A_{N,\mathrm{IE1}})$, …, $(A_{1,\mathrm{IEn}},..,A_{N,\mathrm{IEn}})$ of the bit strings of the IEs maintaining the sequence order.

10.2 BMC CBS Message

The CBS Message carries the cell broadcast data and the address information if the address information is based on GSM CBS.

RLC-SAP: UM;

Logical channel: CTCH;

Direction: UTRAN → UE.

Table 10.2-1: CBS Message

Information Element	Need	Multi	Type and reference	Semantics description
Message Type	MP		Sec. 11.1	
Message ID	MP		Sec. 11.2	
Serial Number	MP		Sec. 11.3	
Data Coding Scheme	MP		Sec. 11.4	
CB Data	MP		Sec. 11.5	

10.3 BMC Schedule Message

The BMC Schedule Message describes for the succeeding CBS schedule period the time locations for each CBS Message and the location of the Schedule Message of the following CBS schedule period.

RLC-SAP: UM.

Logical channel: CTCH.

Direction: UTRAN → UE.

Table 10. 3-1: Schedule Message

Information Element	Need	Multi	Type and reference	Semantics description
Message Type	MP		Sec. 11.1	
Offset to Begin CTCH BS index	MP		Sec. 11.6	
Length of CBS Scheduling Period	MP		Sec. 11.7	
New Message Bitmap	MP		Sec. 11.8	
Message Description	MP	1 to <Length of CBS Scheduling Period>	Sec. 11.9	Message Description IE is included for each new message (1 in the New message bitmap) as well as for each old message (0 in the New message bitmap). The i-th Message Description IE refers to the i-th bit in the New Message Bitmap IE. The multiplicity for the IE "Message Description" does not require an additional length indication in the encoded message. The multiplicity shall be derived from the IE "Length of CBS Scheduling Period".

10.4 BMC CBS41 Message

The CBS41 Message carries the cell broadcast data and the address information if the address information is based on ANSI-41 CBS.

RLC-SAP: UM.

Logical channel: CTCH.

Direction: UTRAN → UE.

Table 10.4-1: CBS41 Message

Information Element	Need	Multi	Type and reference	Semantics description
Message Type	MP		Sec. 11.1	
Broadcast Address	MP		Sec. 11.10	
CB Data41	MP		Sec. 11.11	

11 Information Elements

11.1 Message Type

Table 11.1-1: Message Type IE

IE/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Enumerated (0 .. 255) Table 11.1-2	This IE is coded as the binary representation of the Message Type. $A_{1,IE}$ denotes the least significant bit.

Coding of Message Type

Table 11.1-2: Coding of Message Type IE

1	CBS Message
2	Schedule Message
3	CBS41 Message
0, 4.. 255	Reserved for future use (PDUs with this coding will be discarded by this version of the protocol)

11.2 Message ID

Table 11.2-1: Message ID IE

IE/Group name	Need	Multi	Type and reference	Semantics description
Message ID	MP		Bitstring(16) ~~[3]~~	Identification of source and type of CBS message. This IE is encoded according to [3].

11.3 Serial Number

Table 11.3-1: Serial Number IE

IE/Group Name	Need	Multi	Type and reference	Semantics description
Serial Number	MP		Bitstring(16) ~~[3]~~	Identification of variations of a CBS message (part of the overall CBS message identification). This IE is encoded according to [3].

11.4 Data Coding Scheme

Table 11.4-1: Data Coding Scheme IE

IE/Group name	Need	Multi	Type and reference	Semantics description
Data Coding Scheme	MP		Bitstring(8) [4]	Identification of the alphabet/coding and the language applied. This IE is encoded according to [4].

11.5 CB Data

Table 11.5-1: CB Data IE

IE/Group name	Need	Multi	Type and reference	Semantics description
CB Data	MP		Bitstring(N*8) N ≥ 1	Content of CBS message. This IE is encoded according to [4]. Note: This IE contains the CB Data as received in the SABP with the length indicator of the PER aligned bit string as received on SABP being removed

NOTE: The number N is less than or equal to [1246] octets if a GSM CBS message is broadcast.

11.6 Offset to Begin CTCH Block Set Index

Table 11.6-1: Offset to Begin CTCH Block Set Index IE

IE/Group name	Need	Multi	Type and reference	Semantics description
Offset to Begin CTCH BS Index	MP		Integer (1..255)	Pointer to the first CTCH BS of the next CBS Schedule Period relative to the CTCH BS index of the current BMC Schedule Message This IE is coded as the binary representation of the Offset to Begin CTCH BS Index. $A_{1,IE}$ denotes the least significant bit.

11.7 Length of CBS Schedule Period

Table 11.7-1: Length of CBS Schedule Period IE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Length of CBS Schedule Period	MP		Integer (1..256)	Number of consecutive CTCH BS of the next CBS Schedule Period. Together with Offset to Begin CTCH BS Index it points to the end of the CBS schedule period. This IE is coded as the binary representation of the Message Type. $A_{1,IE}$ denotes the least significant bit.

11.8 New Message Bitmap

Table 11.8-1: New Message Bitmap IE

Information Element/Group name	Need	Multi	Type and reference	Semantics description

New Message Bitmap	MP		Bitmap(N*8)
			
			if "Length of CBS Schedule Period" mod 8 = 0 then
			N = "Length of CBS Schedule Period" div 8,
			else
			N = "Length of CBS Schedule Period" div 8 + 1.
			Table 11.8-2
				Bitmap indicating CTCH BS which contains new CBS Messages completely or partly

Coding of New Message Bitmap.

Table 11.8-2: Coding of New Message Bitmap IE

CTCH BS index B	CTCH BS index B+1	CTCH BS index B+2	...					1
								2
								...
	...	CTCH BS index E-1	CTCH BS index E	0	0	0	0	n
Legend: B First CTCH BS index of the CBS schedule period, 1 ≤ B ≤ 256 E Last CTCH BS index of the CBS schedule period, E = B + Length of CBS Schedule Period – 1								

CTCH BS Index i:
Bit i of the New CBS Message Bitmap refers to the content of CTCH BS index i. Its meaning is as follows:

1 The CTCH BS index i contains a BMC Message partly or completely which
was either not sent during the previous schedule period,
or sent unscheduled during the preceding schedule period;
or, the CTCH BS is indicated as of free usage, reading advised;
or it contains the Schedule Message partly or complete of the following CBS schedule period,
or it contains a CBS41 Message partly or complete.
The value is 1 both for the first transmission of a given BMC message in the CBS schedule period or a repetition of it within the CBS schedule period.

0 The CTCH BS is such that value 1 is not suitable.

The length of the New Message Bitmap is given by the IE Length of CBS Schedule Period. If it is not a multiple of 8 the remaining bit positions are padded with "0".

11.9 Message Description

Table 11.9-1: Message Description IE

IE/Group Name	Need	Multi	Type and reference	Semantics description
Message Description Type	MP		Enumerated(0..255) Table 11.9-3	This IE is coded as the binary representation of the Message Description Type. $A_{1,IE}$ denotes the least significant bit.
Message ID	CV MDT1		Enumerated (0 .. 2^{16}-1) [3]	This IE is coded as the binary representation of the Message ID. $A_{1,IE}$ denotes the least significant bit.
Offset to CTCH BS index of first transmission	CV MDT2		Integer (0..255)	This IE is coded as the binary representation of the Offset to CTCH BS index of first transmission. $A_{1,IE}$ denotes the least significant bit.

Table 11.9-2: Conditions

Condition	Explanation
MDT1	If Message Description Type = 1 or 5 then: the CB-Message-Id IE is included
MDT2	If Message Description Type = 0 or 4 then: the Offset to CTCH BS index of first transmission IE is included pointing to the CTCH BS index where the BMC message is transmitted the first time within the schedule period.

Table 11.9-3: Encoding of Message Description Type

Value	Explanation
0	Repetition of new BMC message within schedule period
1	New message
2	Reading advised
3	Reading optional
4	Repetition of old BMC message within schedule period
5	Old message (repetition of a message sent in a previous schedule period)
6	Schedule message
7	CBS41 message
8	no message
9.. 255	Reserved for future use (IEs received with this value will be replaced by value 3)

11.10 Broadcast Address

Table 11.10-1: Data Coding Scheme IE

IE/Group name	Need	Multi	Type and reference	Semantics description
Broadcast Address	MP		Bitstring(40) ~~[8]~~	Address information for higher layer This IE is encoded according to [8]