Half-Rate DTC Support

This information element indicates whether or not the mobile station supports half-rate DTCs.

Value	Function
0	Half-Rate DTCs Not Supported
1	Half-Rate DTCs Supported

HL_FREQ

This information element is used to determine the frequency of channel measurements.

Value	Function
0	Low
1	High

Hyperband

This information element provides frequency band information as follows:

Value	Function
00	800 MHz
01	1900 MHz
All other values are reserved	

Hyperband Info

If present, this information element is used to specify the Hyperband associated with the specified channel.

Field	Length
Parameter Type	4
Hyperband	2

Hyperframe Counter

This information element is a non-critical counter used to identify which hyperframe is currently being broadcast. This counter ranges from 0 to 11.

Initial Selection Control

This flag is used to discourage a mobile station executing the Control Channel Selection procedure (initial selection) from selecting a DCCH for camping purposes.

IRA Support

This information element indicates whether or not a mobile station or BMI supports IRA address encoding in the Address Info information element.

Value	Function
0	IRA Encoding Not Supported
1	IRA Encoding Supported

LAREG

This flag indicates whether or not the mobile station is to register when the registration number of the current DCCH is not part of its registration number list used to define its location area.

Last Try

If a mobile station receives a Directed Retry and attempts a new access on another DCCH, it shall set the Last Try flag in the Origination or the Page Response message to the value of the Last Try flag received in the Directed Retry message. Otherwise the mobile station shall set the Last Try flag to not enabled at system access.

LTM Measurement

This information element provides the Channel Quality and LT_RSS of the current channel in the MACA report.

Field	Length
Parameter Type	4
WER	3
BER	3
LT_RSS and Full Measurement Indicator	6

203

The **WER** field is coded as follows:

Code	Estimated WER
000	0 %
001	> 0 - 2%
010	> 2 - 4%
011	> 4 - 8%
100	> 8 - 16%
101	> 16 - 32%
110	> 32 - 64%
111	> 64%

BER shall be encoded using Table 2.4.5.1-1 in IS-136.2.

The **LT_RSS and Full Measurement Indicator** field is defined as follows:

Field	Length
LT_RSS	5
Full Measurement Indicator	1

LT_RSS shall be encoded using Table 6-9 in Section 6.3.2.3, according to RSS Value.

The **Full Measurement Indicator** is a flag indicating whether the associated measurement is based on a full measurement or not.

MACA_8_CONTROL

This information element, together with MACA_TYPE and MACA_STATUS, determines the number of channels reported.

Field	Length
Parameter Type	4
Banana	1

The **Banana** field is coded as follows:

Value	Function
0	Page Response and Origination restricted to 8 channels other than current DCCH, see Table 6-12.
1	No MACA Report restrictions

204

MACA_LIST

This information element contains information regarding the channels, other than the current DCCH, the mobile station shall measure for mobile assisted channel allocation.

Field	Length
Parameter Type	4
Number of MACA Channels (N)	4
CHAN (Note 1)	11 per instance

Note 1: N + 1 instances of this field are included.

MACA_LIST (Other Hyperband)

This information element contains information regarding the channels other than the current DCCH. A mobile station that is not capable of performing measurements on a channel specified in this list shall report a RSS value of 00000 for that channel.

Field	Length
Parameter Type	4
Hyperband	2
Number of MACA Channels (P)	4
CHAN (Note 1)	11 per instance

Note 1: P + 1 instances of this field are included.

MACA_STATUS

This information element determines which MACA function combinations are enabled.

Value	Function
00	MACA Disabled
01	MACA LTM Enabled
10	MACA STM Enabled
11	MACA LTM and STM Both Enabled

205

MACA_TYPE

This information element determines when MACA reporting is to take place.

Value	Function
1XXX	Report MACA at Audit Confirmation
X1XX	Report MACA at Page Response
XX1X	Report MACA at Origination
XXX1	Report MACA at Registration

Manufacturer Code

This information element indicates the manufacturer of the mobile station. For administrative purposes, it is anticipated that the same value used in IS-136.2, Section 2.3.2 will be used for this field.

Max Busy/Reserved

This information element identifies the maximum number of times that BRI ≠ Idle can be detected during any given access attempt before layer 2 declares an access attempt failure (see Section 5.3.3).

Value	Function
0	1 BRI ≠ Idle Allowed
1	10 BRI ≠ Idle Allowed

Max Repetitions

This information element identifies the maximum number of times a specific burst within any given access attempt may be sent on the RACH before layer 2 declares an access attempt failure (see Section 5.3.3).

Value	Function
00	0 Repetition Allowed
01	1 Repetition Allowed
10	2 Repetitions Allowed
11	3 Repetitions Allowed

Max Retries

This information element identifies the maximum number of access attempts that layer 2 can make before it considers the access to have failed (see Section 5.3.3).

Value	Function
000	1 Access Attempt Allowed
001	2 Access Attempts Allowed
010	3 Access Attempts Allowed
011	4 Access Attempts Allowed
100	5 Access Attempts Allowed
101	6 Access Attempts Allowed
110	7 Access Attempts Allowed
111	8 Access Attempts Allowed

Max Stop Counter

This information element identifies the maximum number of times that either of the following conditions can be detected for any given access attempt before layer 2 declares an access attempt failure (see Section 5.3.3):

- BRI set to Reserved or Idle after sending an intermediate burst of an access attempt.

- R/N set to Not Received along with BRI set to Reserved or Idle after sending the last burst of an access attempt.

Value	Function
0	1 Occurrence Allowed
1	2 Occurrences Allowed

Maximum PFC

This information element indicates the maximum PFC supported by a mobile station.

Field	Length
Parameter Type	4
PFC Supported	3

The **PFC Supported** field is coded as follows:

Value	Function
000	PFC_1 is the only PFC supported
001	PFC_2 is the maximum PFC supported by the MS
010	PFC_3 is the maximum PFC supported by the MS
011	PFC_4 is the maximum PFC supported by the MS
100	PFC_5 is the maximum PFC supported by the MS
101	PFC_6 is the maximum PFC supported by the MS
110	PFC_7 is the maximum PFC supported by the MS
111	PFC_8 is the maximum PFC supported by the MS

MAX_SUPPORTED_PFC

This information element identifies the maximum paging frame class supported by a DCCH or a mobile station.

Value	Function
000	PFC_1 is the only PFC supported
001	$PFC2$ is the maximum supported Paging Frame Class
010	PFC_3 is the maximum supported Paging Frame Class
011	PFC_4 is the maximum supported Paging Frame Class
100	PFC_5 is the maximum supported Paging Frame Class
101	PFC_6 is the maximum supported Paging Frame Class
110	PFC_7 is the maximum supported Paging Frame Class
111	PFC_8 is the maximum supported Paging Frame Class

MEM

This information element indicates whether or not message encryption algorithm A and message encryption domain A (see Message Encryption Algorithm Map information element) are enabled on the assigned voice channel.

Value	Function
0	Message Encryption Algorithm A and Domain A Disabled
1	Message Encryption Algorithm A and Domain A Enabled

208

Menu Map

This information element identifies the services supported by the BMI.

Value	Function
00000 00000	No Services Supported
XXXXX XXXX1	30kHz Analog Speech Supported
XXXXX XXX1X	Half-Rate Digital Speech Supported
XXXXX XX1XX	Full-Rate Digital Speech Supported
XXXXX X1XXX	Half-Rate Data Supported
XXXXX 1XXXX	Full-Rate Data Supported
XXXX1 XXXXX	Double Rate Data Supported
XXX1X XXXXX	Triple Rate Data Supported
All other bit map positions are reserved	

Message Center Address

This information element identies the Message Center Address for the message being sent.

Field	Length
Parameter Type	4
Address Info	16 - *

Message Encryption Algorithm Map

This information element identifies the message encryption algorithms, domains and keys supported by a DCCH or a DTC.

Field	Length
Domain Map	8
Encryption Algorithms (Note 1)	4 per instance

Note 1: The Domain Map field identifies the number of instances and ordering of the Encryption Algorithms field. One instance of Encryption Algorithms will be present for every bit position in the Domain Map that is set to 1. The ordering of instances will reflect the Domain Map scanned from left to right (e.g. if only Domain A is supported then the only instance of Encryption Algorithms will be associated with Domain A).

The **Domain Map** field is coded as follows:

Code	Function
0000 0000	No Domains Supported
XXXX XXX1	Domain A Supported (Note 2)
All other bit map positions are reserved	

Note 2: Domain A consists of those portions of FACCH/SACCH messages and Analog Voice Channel messages identified as being subject to encryption according to Appendix A.

For Domain A the **Encryption Algorithms** field is coded as follows:

Code	Function
0000	No Message Encryption Algorithms Supported
XXX1	Algorithm A Supported (see Appendix A)
1XXX	Reserved for SOC/BSMC Specific Signaling
All other bit map positions are reserved	

Message Encryption Key Map

This information element identifies the message encryption keys supported by the BMI.

Value	Function
0000	No Message Encryption Keys Supported
XXX1	Message Encryption Key A Supported
1XXX	Reserved for SOC/BSMC Specific Signaling
All other bit map positions are reserved	

Message Encryption Mode

This information element identifies the selected message encryption algorithm, key and domain.

Field	Length
Parameter Type	4
MEA	3
MED	3
MEK	3

The **MEA** field is coded as follows:

Value	Function
000	No Message Encryption
001	Message Encryption Algorithm A
All other values are reserved	

The **MED** field is coded as follows:

Value	Function
001	Message Encryption Domain A
All other values are reserved	

The **MEK** field is coded as follows:

Value	Function
001	Message Encryption Key A
All other values are reserved	

Message Type

This information element identifies the function of messages. Unassigned codes are reserved.

F-BCCH Messages	Code (binary-dec)
Access Parameters	00 0001 - 1
BSMC Message Delivery	00 0010 - 2
Control Channel Selection Parameters	00 0011 - 3
DCCH Structure	00 0100 - 4
Mobile Assisted Channel Allocation	00 0101 - 5
Overload Class	00 0110 - 6
Registration Parameters	00 0111 - 7
Service Menu	00 1000 - 8
SOC Message Delivery	00 1001 - 9
SOC/BSMC Identification	00 1010 - 10
System Identity	00 1011 - 11

E-BCCH Messages	Code (binary-dec)
BSMC Message Delivery	00 0010 - 2
Emergency Information Broadcast	00 1100 - 12
Mobile Assisted Channel Allocation	00 0101 - 5
Neighbor Cell	00 1101 - 13
Neighbor Service Info	00 1110 - 14
Regulatory Configuration	00 1111 - 15
Alternate RCI Info	10 0110 - 38
Service Menu	00 1000 - 8
SOC Message Delivery	00 1001 - 9
SOC/BSMC Identification	00 1010 - 10
Time and Date	01 0000 - 16

SPACH Messages	Code (binary-dec)
Analog Voice Channel Designation	01 0001 - 17
Audit Order	01 0010 - 18
Base Station Challenge Order Confirmation	01 0011 - 19
BSMC Message Delivery	00 0010 - 2
Capability Request	01 0100 - 20
Digital Traffic Channel Designation	01 0101 - 21
Directed Retry	01 0110 - 22
Message Waiting	01 0111 - 23
Page	01 1000 - 24
Parameter Update	01 1001 - 25
R-DATA	01 1010 - 26
R-DATA ACCEPT	01 1011 - 27
R-DATA REJECT	01 1100 - 28
Registration Accept	01 1101 - 29
Registration Reject	01 1110 - 30
Release	01 1111 - 31
Reorder/Intercept	10 0000 - 32
SOC Message Delivery	00 1001 - 9
SPACH Notification	10 0001 - 33
SSD Update Order	10 0010 - 34
Test Registration Response	10 0011 - 35
Unique Challenge Order	10 0100 - 36
User Alert	10 0101 - 37

RACH Messages	Code (binary-dec)
Audit Confirmation	00 0001 - 1
Authentication	00 0010 - 2
Base Station Challenge Order	00 0011 - 3
BSMC Message Delivery	00 0100 - 4
Capability Report	00 0101 - 5
MACA Report	00 0110 - 6
Origination	00 0111 - 7
Page Response	00 1000 - 8
R-DATA	00 1001 - 9
R-DATA ACCEPT	00 1010 - 10
R-DATA REJECT	00 1011 - 11
Registration	00 1100 - 12
Serial Number	00 1101 - 13
SOC Message Delivery	00 1110 - 14
SPACH Confirmation	00 1111 - 15
SSD Update Order Confirmation	01 0000 - 16
Test Registration	01 0001 - 17
Unique Challenge Order Confirmation	01 0010 - 18

Message Waiting Info

This information element indicates the type and number of messages waiting.

Field	Length
Number of values	4
Type and Number of Messages Waiting (Note 1)	10 per instance

Note 1: From 1 to 16 instances of this field may be sent, providing that the Type of Messages is different for all instances. The number of instances is Number of Values + 1.

The **Type and Number of Messages Waiting** field is defined as 2 subfields as follows:

Subfield	Length
Type of Message Waiting	4
Number of Messages Waiting	6

The Type of Message Waiting subfield indicates the type of messages associated with the Number of Messages Waiting subfield, and is coded as follows:

Value	Function
0000	Voice Messages
0001	SMS Messages
0010	G3-Fax Messages
0100 to 0111	User Specific Messages
All other values are reserved	

The Number of Messages Waiting subfield indicates the number of messages waiting associated with the Message Waiting Type subfield, and is coded as follows:

Value	Function
000000	No Message
000001	1 Message
...	...
111110	62 Messages
111111	Unknown Number of Messages (One or More)

Mobile Country Code

This information element indicates the Mobile Country Code of the current DCCH.

Field	Length
Parameter Type	4
Mobile Country Code (MCC)	10

The MCC is the equivalent of the Mobile Country Code defined in CCITT recommendation E.212. The MCC values are defined in annex A of E.212. The following values are extracted from E.212 and are provided as information only. If other MCC values are required, refer to Annex A of E.212 for a complete list of MCC values.

Code (decimal)	Country
302	Canada
310	United States of America
311	United States of America
312	United States of America
313	United States of America
314	United States of America
315	United States of America
316	United States of America
334	Mexico

The 3 decimal digits of the MCC are expressed as the corresponding decimal number $(000 < = d_i d_j d_k < = 999)$ coded in 10 binary bits using a normal decimal to binary conversion (0 to 999).

Model Number

This information element identifies the mobile station model number (specific to an mobile station vendor).

MSID Assignment

This optional information element contains information specifying the MSID the mobile station shall use.

Field	Length
Parameter Type	4
IDT	2
MSID	20/24

The **IDT** field is coded as follows:

Code	Value
00	20 bit TMSI
01	24 bit TMSI
10	Reserved
11	Reserved

MS_ACC_PWR

This information element identifies the maximum nominal output power that the mobile station shall use when accessing the BMI (see Section 2.1.2.2 of IS-136.2 for tolerances). The MS_ACC_PWR is also used when determining criteria for control channel selection and reselection.

Code	Value (in dBm)
0000	36
0001	32
0010	28
0011	24
0100	20
0101	16
0110	12
0111	8
1000	4
1001	0
1010	- 4
All other codes are reserved	

1 Neighbor Cell

2 This field provides neighbor DCCH specific information as follows:

Field	Length
CHAN	11
Protocol Version	4
DVCC	8
RESEL_OFFSET	7
SS_SUFF	5
DELAY	4
HL_FREQ	1
CELL_SYNC	1
CELLTYPE	2
Network Type	3
Directed Retry Channel	1
MS_ACC_PWR	4
RSS_ACC_MIN	5
PSID/RSID Indicator	1
PSID/RSID Support Length	0 or 4
PSID/RSID Support	0 or 1 - 16

3 Neighbor Cell List (Analog)

4 This optional information element contains information regarding the analog channels the
5 mobile station shall measure with regards to the Control Channel Selection and
6 Reselection procedures. This information element always specifies analog neighbors in
7 the 800 MHz hyperband.

Field	Length
Parameter Type	4
Number of Analog Neighbor Cells (M)	5
Analog Neighbor Cell (Note 1)	49 per instance

8 Note 1: Up to "M" instances of this field may be sent.

The **Analog Neighbor Cell** field is coded as follows:

Field	Length
CHAN	11
Protocol Version	4
Digital Color Code (DCC) (as defined in IS-136.2)	2
RESEL_OFFSET	7
SS_SUFF	5
DELAY	4
HL_FREQ	1
CELLTYPE	2
Network Type	3
Directed Retry Channel	1
MS_ACC_PWR	4
RSS_ACC_MIN	5

Neighbor Cell List (Other Hyperband)

This optional information element contains information specifying the digital channels the mobile station may measure in order to acquire service in an alternate frequency band.

Field	Length
Parameter Type	4
Hyperband	2
Number of Neighbor Cells (P)	5
Neighbor Cell (Note 1)	57 - 77 per instance

Note 1: Up to "P" instances of this field may be sent.

Neighbor Cell List (TDMA)

This optional information element specifies the digital channels the mobile station shall measure with regards to the Control Channel Selection and Reselection procedures.

Field	Length
Parameter Type	4
Number of TDMA Neighbor Cells (N)	5
Neighbor Cell (Note 1)	57 - 77 per instance

Note 1: Up to "N" instances of this field may be sent.

Network Type

This information element identifies which Network Types are supported on a control channel. See Section 8.3.2 for Network Type definitions.

Network Type	Code
Public	1XX
Private	X1X
Residential	XX1

Non-Public Probability Blocks

This information element indicates whether or not each channel probability block for a given system configuration contains a DCCH for a non-public system in its current service area.

Field	Length
Parameter Type	4
Non-Public Map Length (N)	4
Non-Public Block Map (Note 1)	1 - 16

Note 1: The length of this field is N plus 1 long.

The Non-Public Block Map field indicates which probability blocks within a band are likely to contain Non-Public service.

The ordering of the bits in this field reflects the ordering of the probability blocks of a band in that the least significant bit is associated with the first probability block of a band. If a bit in this field is set to 1, then the associated probability block in the band is likely to support Non-Public service. If a bit in this field is set to 0, then the associated probability block is not likely to support Non-Public service.

For example, if the 1st, 2nd, 3rd and 5th probability blocks of a band are likely to support Non-Public service, the values of Non-Public Map Length and Non-Public Block Map shall be:

Non-Public Map Length = 0100

Non-Public Block Map =   1 0111.

If the 3rd and 16th probability blocks of a band are likely to support Non-Public service, the values of Non-Public Map Length and Non-Public Block Map shall be:

Non-Public Map Length = 1111

Non-Public Block Map =   1000 0000 0000 0100.

Non-Public Registration Control

This information element informs the mobile station whether or not a Registration attempt is allowed independent of having a PSID or RSID match (see Section 6.3.14), and whether or not the Test Registration is allowed.

Field	Length
Parameter Type	4
Non-Public Registration Control	2

The **Non-Public Registration Control** field is coded as follows:

Value	Function
X1	PSID/RSID match independent registration allowed
1X	Test Registration allowed
00	PSID/RSID match independent registration and Test Registration not allowed (Default case if information element not sent)

Number of E-BCCH

This information element identifies the number of contiguous dedicated E-BCCH slots per superframe. Set to 1 plus the value in this field.

Value	Function
000	1 E-BCCH slot per superframe
001	2 E-BCCH slots per superframe
010	3 E-BCCH slots per superframe
011	4 E-BCCH slots per superframe
100	5 E-BCCH slots per superframe
101	6 E-BCCH slots per superframe
110	7 E-BCCH slots per superframe
111	8 E-BCCH slots per superframe

Number of F-BCCH

This information element identifies the number of contiguous dedicated F-BCCH slots per superframe. Set to 3 plus the value in this field.

Value	Function
000	3 F-BCCH slots per superframe
001	4 F-BCCH slots per superframe
010	5 F-BCCH slots per superframe
011	6 F-BCCH slots per superframe
100	7 F-BCCH slots per superframe
101	8 F-BCCH slots per superframe
110	9 F-BCCH slots per superframe
111	10 F-BCCH slots per superframe

Number of Non-PCH Subchannel Slots

This information element identifies the number of SPACH slots that may not be allocated to mobile stations as PCH Subchannels.

For a half-rate DCCH, the following values apply:

Value	Function
00	All SPACH slots are eligible to be allocated as PCH Subchannels
01	The last SPACH slot cannot be allocated as a PCH Subchannel
10	The last two SPACH slots cannot be allocated as PCH Subchannels
11	The last three SPACH slots cannot be allocated as PCH Subchannels

For a full-rate DCCH, the following values apply:

Value	Function
00	All SPACH slots are eligible to be allocated as PCH Subchannels
01	The last two SPACH slots cannot be allocated as a PCH Subchannel
10	The last four SPACH slots cannot be allocated as PCH Subchannels
11	The last six SPACH slots cannot be allocated as PCH Subchannels

Number of Reserved Slots

This information element identifies the number of dedicated Reserved slots per superframe.

Number of S-BCCH

This information element identifies the number of contiguous dedicated S-BCCH slots per superframe.

OLC

This non-critical information element determines whether or not a mobile station can make an Origination, Registration or Originated Point-to-Point Teleservice. The mobile station must examine the value of the OLC bit map corresponding to its internally stored access overload class assignment. If its bit in the OLC bit map is enabled, the mobile station shall continue with its access attempt. Otherwise, it shall not make an access attempt.

The values of the Overload Class bit assignments are:

Value	Function
XXXXXXXXXXXXXXX1	Uniform distribution assigned to normal subscribers
XXXXXXXXXXXXXX1X	Uniform distribution assigned to normal subscribers
XXXXXXXXXXXXX1XX	Uniform distribution assigned to normal subscribers
XXXXXXXXXXXX1XXX	Uniform distribution assigned to normal subscribers
XXXXXXXXXXX1XXXX	Uniform distribution assigned to normal subscribers
XXXXXXXXXX1XXXXX	Uniform distribution assigned to normal subscribers
XXXXXXXXX1XXXXXX	Uniform distribution assigned to normal subscribers
XXXXXXXX1XXXXXXX	Uniform distribution assigned to normal subscribers
XXXXXXX1XXXXXXXX	Uniform distribution assigned to normal subscribers
XXXXXX1XXXXXXXXX	Uniform distribution assigned to normal subscribers
XXXXX1XXXXXXXXXX	Test Mobile Stations
XXXX1XXXXXXXXXXX	Emergency Mobile Stations
XXX1XXXXXXXXXXXX	Reserved
XX1XXXXXXXXXXXXX	Reserved
X1XXXXXXXXXXXXXX	Reserved
1XXXXXXXXXXXXXXX	Reserved

Any combination of bits are allowed to activate many OLCs at once.

For more information, refer to EIA Telecommunications Systems Bulletin No. 16 (March 1985), "Assignment of Access Overload Classes in the Cellular Telecommunications Services".

PCH_DISPLACEMENT

This information element identifies the number of additional SPACH slots the mobile station shall read when PCON is set.

Value	Function
000	0 additional SPACH slots read
001	1 additional SPACH slot read
010	2 additional SPACH slots read
...	...
111	7 additional SPACH slots read

PDREG

This flag indicates whether Power Down registration is turned on or off.

PFC Assignment

This information element identifies the Paging Frame Class that a mobile station may be assigned at registration.

Field	Length
Parameter Type	4
PFC Minus One	3

The **PFC Minus One** field is coded as follows:

Code	Value
000	Paging Frame Class 1
001	Paging Frame Class 2
010	Paging Frame Class 3
011	Paging Frame Class 4
100	Paging Frame Class 5
101	Paging Frame Class 6
110	Paging Frame Class 7
111	Paging Frame Class 8

PFC Minus One

This information element is used to indicate the current PFC of a mobile station.

Code	Value
000	Paging Frame Class 1
001	Paging Frame Class 2
010	Paging Frame Class 3
011	Paging Frame Class 4
100	Paging Frame Class 5
101	Paging Frame Class 6
110	Paging Frame Class 7
111	Paging Frame Class 8

PFC Request

This information element identifies the Paging Frame Class requested by a mobile station.

Field	Length
Parameter Type	4
PFC minus one	3

PFM_DIRECTION

This information element defines whether the layer 2 PFM flag is a pull-in (reduce the Paging Frame Class by one) or a push-out flag (increment the Paging Frame Class by one).

Code	Description
0	Pull-in (Decrease Paging Frame Class one unit)
1	Push-out (Increase Paging Frame Class one unit)

Present RNUM

This information element contains the registration number that is used to define a particular mobile station's Virtual Mobile Location Area (VMLA).

Field	Length
Parameter Type	4
RNUM	10

Primary Superframe Indicator

This non-critical information element indicates whether or not the current superframe is the primary superframe within a hyperframe.

Value	Function
0	Primary
1	Secondary

Protocol Discriminator

This information element is used to identify the layer 3 protocol used for the message being sent.

Value	Function
00	IS-136
All other values are reserved	

Protocol Version

This information element identifies the Protocol Version supported:

Value	Function
0000	EIA-553 or IS-54-A
0001	TIA/EIA 627
0010	IS-136
All other values are reserved	

1 ## PSID/RSID Available

2 This information element indicates the PSID/RSIDs for which a mobile station will
3 receive service in the current SID area.

Field	Length
Parameter Type	4
Number of PSID/RSID (Note 1)	4
PSID/RSID	17 per instance

4 Note 1: The number of PSID/RSID in this set is 1 plus the value of this field.

5 The **PSID/RSID** field is structured as follows:

Field	Length
PSID/RSID Type Indicator	1
PSID/RSID Value	16

6 The PSID/RSID Type Indicator subfield is coded as follows:

Value	Function
0	PSID Indication
1	RSID Indication

7 When the PSID/RSID Value subfield contains PSID information, values are assigned as
8 follows:

Value (hex)	Function
0000	Unused
0001-2FFF	SID Specific PSIDs
3000-CFFF	SOC Specific PSIDs
D000-DFFF	Nationwide PSIDs
E000-EFFF	International PSIDs
F000 - FFFF	Reserved

9 See Section 8.3.4 for additional information regarding PSID.

When the PSID/RSID Value subfield contains RSID information, values are assigned as follows:

Value (hex)	Function
0000	Unused
0001-FFFF	SOC Specific RSID

See Section 8.3.5 for additional information regarding RSID.

PSID/RSID Indicator

This field indicates whether or not the PSID/RSID related mapping fields are present for the associated DCCH neighbor. Specifically, if the PSID/RSID Indicator value is set to 1, the PSID/RSID Support Length and PSID/RSID Support fields are present. If set to 0, the PSID/RSID Support Length and PSID/RSID Support fields are not present.

PSID/RSID Map

This information element is included in the Test Registration message to indicate which private/residential systems have been queried by the mobile station. This information element is included in the Test Registration Response message to indicate the private/residential systems on which the mobile station may receive service. The ordering of the PSID/RSID Map reflects the ordering of the PSID/RSID Set sent on the System Identity message.

Value	Function
XXXX XXXX XXXX XXX1	1st PSID/RSID Selected/Accepted
XXXX XXXX XXXX XXX0	1st PSID/RSID Not Selected/Not Accepted
...	...
1XXX XXXX XXXX XXXX	16th PSID/RSID Selected/Accepted
0XXX XXXX XXXX XXXX	16th PSID/RSID Not Selected/Not Accepted

PSID/RSID Set

A DCCH serving one or more private/residential systems shall use this information element to identify the PSID/RSID of each private/residential system that it is serving.

Field	Length
Parameter Type	4
SOC	12
Number of PSID/RSID (N)	4
PSID/RSID (Note 1)	17 per instance

Note 1: N + 1 instances of this field are present up to a maximum of 16.

The **PSID/RSID** field is structured as follows:

Field	Length
PSID/RSID Type Indicator	1
PSID/RSID Value	16

The PSID/RSID Type Indicator subfield is coded as follows:

Value	Function
0	PSID Indication
1	RSID Indication

When the PSID/RSID Value subfield contains PSID information, values are assigned as follows:

Value (hex)	Function
0000	Unused
0001-2FFF	SID Specific PSIDs
3000-CFFF	SOC Specific PSIDs
D000-DFFF	Nationwide PSIDs
E000-EFFF	International PSIDs
F000 - FFFF	Reserved

See Section 8.3.4 for additional information regarding PSID.

When the PSID/RSID Value subfield contains RSID information, values are assigned as follows:

Value (hex)	Function
0000	Unused
0001-FFFF	SOC Specific RSID

See Section 8.3.5 for additional information regarding RSID.

PSID/RSID Support

This field is only present when the PSID/RSID Indicator field is set to 1. When present, the length of this is determined by adding 1 to the value of the PSID/RSID Support Length field.

The PSID/RSID Support field indicates which PSID/RSID values identified in the PSID/RSID Set information element of the System Identity message of the current DCCH are supported by the DCCH neighbor under consideration. The ordering of the bits in this field reflects the ordering of the PSID/RSID Set sent in the System Identity message in that the least significant bit is associated with the first PSID/RSID listed in the PSID/RSID Set. If a bit in this field is set to 1, then the associated PSID/RSID entry in the PSID/RSID Set is supported by the neighbor cell under consideration. If a bit in this field is set to 0, then the associated PSID/RSID entry in the PSID/RSID Set is not supported by the DCCH neighbor under consideration.

For example, if 16 PSID/RSIDs are listed in the System Identity message and the neighbor cell supports the 1st, 2nd, 3rd and 5th PSID/RSIDs in the PSID/RSID Set, the values of PSID/RSID Support Length and PSID/RSID Support shall be:

PSID/RSID Support Length = 0100

PSID/RSID Support = 10111.

If 16 PSID/RSIDs are listed in the System Identity message and the neighbor cell supports 3rd and 16th PSID/RSIDs in the PSID/RSID Set, the values of PSID/RSID Support Length and PSID/RSID Support shall be:

PSID/RSID Support Length = 1111

PSID/RSID Support = 1000000000000100.

PSID/RSID Support Length

This field is only present when the PSID/RSID Indicator field is set to 1. When present, this field is always 4 bits long and is used to determine the length of the PSID/RSID Support field.

PUREG

This flag indicates whether or not power up registration is enabled.

R-Cause

This information element is used to qualify a R-DATA REJECT message.

Field	Length
Cause	7
Reserved	1

Cause Description	Direction	Code	
		Decimal	Binary
Unassigned (unallocated) number	B → MS	1	000 0001
No Route to Transit Network	B → MS	2	000 0010
Call barred	B → MS	10	000 1010
Short message transfer rejected	B → MS	21	001 0101
Memory capacity exceeded	MS → B	22	001 0110
Destination out of service	B → MS	27	001 1011
Unidentified subscriber	B → MS	28	001 1100
Facility rejected	B → MS	29	001 1101
Unknown subscriber	B → MS	30	001 1110
Network out of order	B → MS	38	010 0110
Temporary failure	B → MS	41	010 1001
Congestion	B → MS	42	010 1010
Resources unavailable, unspecified	B → MS	47	010 1111
Requested facility not implemented	B → MS	.69	100 0101
Invalid short message transfer reference value	B → MS	81	101 0001
Invalid message, unspecified	B → MS	95	101 1111
Mandatory information element error	both	96	110 0000
Message type non-existent or not implemented	B → MS	97	110 0001
Message not compatible with short message transfer state or message type non-existent or not implemented	B → MS	98	110 0010
Information element non-existent or not implemented	both	99	110 0011
Invalid information element contents	both	100	110 0100
Message not compatible with the short message transfer state	both	101	110 0101
Protocol error, unspecified	both	111	110 1111
Interworking, unspecified	B → MS	127	111 1111
All other values are reserved.			

R-Data Unit

This information element contains the Higher Layer Protocol Data Unit and is mandatory in an R-DATA message.

Field	Length
Length Indicator in (N) (in octets)	8
Higher Protocol Identifier	8
Higher Layer Protocol Data Unit	8 * (N - 1)

The **Higher Layer Protocol Identifier** field is coded as follows:

Value	Function
0000 0000	Network Specific
0000 0001	Point-to-Point SMS (see Section 7)
All other values are reserved	

R-Transaction Identifier

This information element is used to associate a R-DATA ACCEPT or a R-DATA REJECT message to the R-DATA message being acknowledged.

RAND

This information element identifies the random number stored by a mobile station for use in selected authentication processes.

RANDBS

This information element identifies the random number generated by the mobile station that is used in the SSD Update procedure.

RANDC

This information element identifies the number used to confirm the last RAND received by the mobile station. It is used in selected authentication processes.

RANDSSD

This information element identifies the random number generated by the BMI that is used in the SSD Update procedure.

RANDU

This information element identifies the random number generated by the BMI that is used in the Unique Challenge Response procedure.

RCF and AUTH

This information element of type flag indicates whether or not the mobile station is to read Control Filler information and send Authentication information when making an access on an ACC as a result of a Directed Retry received on the DCCH.

Field	Length
Parameter Type	4
RCF	1
AUTH	1

The **RCF** field is encoded as follows:

Value	Function
0	Do Not Read RCF
1	Read RCF

The **AUTH** field is encoded as follows:

Value	Function
0	Authentication Disabled
1	Authentication Enabled

RCI

This information element identifies a particular radio frequency system allocation, together with recommended DCCH allocation, as defined in this standard.

Value	Function
00	Allocation described in Section 6.3.1.1.1
01	Allocation described in Section 6.3.1.1.2
10	Allocation described in Section 6.3.1.1.3
11	Allocation described in Section 6.3.1.1.4

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R-DATA Message Length

This information element identifies the maximum length of an R-DATA message that a mobile station may send on the RACH.

Value	Function
000	No R-DATA message on RACH
001	31 octet R-DATA message on RACH allowed
010	63 octet R-DATA message on RACH allowed
011	127 octet R-DATA message on RACH allowed
100	Reserved
101	Reserved
110	Reserved
111	Limited only by layer 2 format

REG Period

This information element identifies the registration periodicity in number of 94 superframes. REGPER values are coded from 0 to 511 indicating 94 to 48128 superframes (approximately 1 minute to 8.5 hours).

Field	Length
Parameter Type	4
REGPER	9

REGPER	Value
00000 0000	94 Superframes
00000 0001	188 Superframes
00000 0010	282 Superframes
...	...
11111 1110	48034 Superframes
11111 1111	48128 Superframes

REGH

This flag indicates whether or not a home mobile station is allowed to register.

REGID Parameters

This non-critical information element contains information on the current REGID value and the time between stepping REGID. REGID is a system clock ranging from 0 to 1048575. REGID_PER indicates how often REGID is incremented and is expressed in superframes.

REGID_PER ranges from 0 to 15 superframes. The value 0 indicates the REGID is not incremented.

Field	Length
Parameter Type	4
REGID	20
REGID_PER	4

Registration Type

This information element identifies the type of registration the mobile station is making according to the following table:

Value	Function
0000	Power down
0001	Power up
0010	Location Area
0011	Forced
0100	Periodic
0101	Deregistration
0110	New System
0111	ACC to DCCH
1000	TMSI Timeout
1001	User Group
All other values are reserved.	

REGR

This flag indicates whether or not a roaming mobile station is allowed to register.

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Reject Time

This information element is used by the system to indicate to a mobile station the interval of time when it will be allowed to register again (see Section 6.3.11).

Field	Length
Parameter Type	4
Lower time boundary in 100 SF	4
Upper time boundary in 100 SF	4

The **Lower Time Boundary in 100 SF** field and the **Upper Time Boundary in 100 SF** field are defined as follows:

Value	Function
0000	0 SF
0001	100 SF
...	...
1101	1300 SF
1110	1400 SF
1111	Until MS power down (Note 1)

Note 1: If this value is used for both time boundaries, or if it is used only for one, the mobile station shall consider that no re-registration is allowed until mobile station power down.

The mobile station finds the re-registration time according to the following:

REREG_TMR = Lower time boundary in 100 SF + RANDNO * (Upper time boundary in 100 SF - Lower time boundary in 100 SF)

where:

- RANDNO is a random number uniformly distributed between 0.1 and 1 generated by the mobile station, with a granularity not greater than 0.1

- REREG_TMR is the time at which mobile re-registration is allowed.

Request Number

This information element is used in a Parameter Update message to allow the mobile station to recognize duplicate Parameter Update messages.

RESEL_OFFSET

This information element is used to increase/decrease the preference of a new candidate cell being considered for control channel reselection.

Code	Value (dB)
0000000	-128
0000001	-126
...	...
0111110	-4
0111111	-2
1000000	0
1000001	2
...	...
1111110	124
1111111	126

RF Channel Allocation

This information element indicates an RF channel allocation for system configurations that are not described in this standard.

Field	Length
Parameter Type	4
Number of Channel Groups (N)	6
Channel Group (Note 1)	22 per instance

Note 1: Channel Group is an ordered pair indicating the first/last RF Channel Numbers assigned to the Channel Group. N + 1 instances of this field are provided.

The **Channel Group** field is defined as follows:

Field	Length
First Channel	11
Last Channel	11

RNUM List

This information element contains the registration number that is used to define a particular mobile stations Virtual Mobile Location Area (VMLA).

Field	Length
Parameter Type	4
Number of RNUMs	6
RNUM (Note 1)	10 per instance

Note 1: Up to 50 instances may be sent.

RSS_ACC_MIN

This information element is used for the cell (re)selection process. It is the minimum received signal strength required to access the cell.

Code	Value (dBm)
00000	$-\infty$
00001	-111
...	...
11110	-53
11111	-51

S

This flag indicates whether the mobile station sends the Serial number message along with a Registration, Origination, Page Response, SPACH Confirmation due to a SPACH Notification indicating R-DATA, R-DATA, Base Station Challenge Order or Unique Challenge Order Confirmation.

SB

This flag defines whether the mobile station shall use the shortened burst initially on the assigned digital traffic channel as follows:

0 = do not send shortened burst.

1 = send shortened burst

SCANINTERVAL

This information element identifies the basic interval, in Hyperframes, between consecutive signal strength measurements. The basic interval is set to 1 plus the value of this field.

Value	Function
0000	1 Hyperframe interval
0001	2 Hyperframes interval
...	...
1110	15 Hyperframes interval
1111	16 Hyperframes interval

Scanning Option Indicator

This flag is used to control whether or not a mobile station can apply the optional enhancements (see Section 6.3.3.2) to the signal strength measurement interval applicable to NL entries. If set to 1, a mobile station may apply the optional enhancements. If set to 0, the mobile station shall not apply the optional enhancements.

SCC

This information element defines the SAT color code to be used on the assigned analog voice channel.

Bit Pattern	SAT Frequency
00	5970 Hz
01	6000 Hz
10	6030 Hz
11	Reserved

SCM

This information element denotes the power class, transmission capability and bandwidth of the mobile station (see IS-136.2).

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Selected PSID/RSID

This information element indicates which private/residential system in the PSID/RSID Set the mobile station is attempting to register on or is registered on. In the absence of this information element, the registration attempt shall be considered to be intended for the SID.

Field	Length
Parameter Type	4
Selected PSID/RSID	4

The **Selected PSID/RSID** field is coded as follows:

Value	Function
0000	1st PSID/RSID in Set
...	...
1111	16th PSID/RSID in Set

Service Code

This information element indicates the requested service.

Code	Function
0000	Analog Speech Only
0001	Digital Speech Only
0010	Analog or Digital Speech - Analog Preferred
0011	Analog or Digital Speech - Digital Preferred
0100	Async Data
0101	G3 Fax
0110	Service Rejected
All other codes are reserved	

SERV_SS

This information element is used in the control channel reselection process.

Code	Value (in dB)
0000	Service Offering Reselection Trigger Condition not allowed (see Section 6.3.3.4.1)
0001	2
"	"
1110	28
1111	30

SID

This information element provides a digital identification associated with a cellular system where each system is assigned a unique number (see Section 8.3.1).

Signal

This information element conveys alerting information to a mobile station user.

Field	Length
Parameter Type	4
Pitch	2
Cadence	6
Duration	4

The **Pitch** field is coded as follows:

Value	Function
00	Medium Pitch (standard)
01	High Pitch
10	Low Pitch
All other values are reserved	

1 The **Cadence** field is coded as follows:

Value	Function
000000	No Tone: Off
000001	Long: 2.0 s on, 4.0 s off (standard)
000010	Short-Short: 0.8 s on, 0.4 s off, 0.8 s on, 4.0 s off
000011	Short-Short-Long: 0.4 s on, 0.2 s off, 0.4 s on, 0.2 s off, 0.8 s on, 4.0 s off
000100	Short-Short-2: 1.0 s on, 1.0 s off, 1.0 s on, 3.0 s off
000101	Short-Long-Short: 0.5 s on, 0.5 s off, 1.0 s on, 0.5 s off, 0.5 s on, 3.0 s off
000110	Short-Short-Short-Short: 0.5 s on, 0.5 s off, 0.5 s on, 0.5 s off, 0.5 s on, 0.5 s off, 0.5 s on, 2.5 s off
000111	PBX Long: 1.0 s on, 2.0 s off
001000	PBX Short-Short: 0.4 s on, 0.2 s off, 0.4 s on, 2.0 s off
001001	PBX Short-Short-Long: 0.4 s on, 0.2 s off, 0.4 s on, 0.2 s off, 0.8 s on, 1.0 s off
001010	PBX Short-Long-Short: 0.4 s on, 0.2 s off, 0.8 s on, 0.2 s off, 0.4 s on, 1.0 s off
001011	PBX Short-Short-Short-Short: 0.4 s on, 0.2 s off, 0.4 s on, 0.2 s off, 0.4 s on, 0.2 s off, 0.4 s on, 0.8 s off
001100	Pip-Pip-Pip-Pip: 0.1 s on, 0.1 s off, 0.1 s on, 0.1 s off, 0.1 s on, 0.1 s off, 0.1 s on, 0.1 s off.
All other values are reserved	

2 The **Duration** field is coded as follows:

Value	Function
0000	1 Cycle of Cadence (Standard)
0001	2 Cycles of Cadence
...	...
1110	15 Cycles of Cadence
1111	Continuous Repeating of Cadence

Slot Configuration

This information element identifies the number of slots dedicated to DCCH on this frequency according to the following table:

Value	Function
00	One half-rate DCCH on slot 1
01	One full-rate DCCH on slots 1 and 4
10	One full-rate DCCH on slots 1 and 4, and One full-rate DCCH on slots 2 and 5
11	One full-rate DCCH on slots 1 and 4; One full-rate DCCH on slots 2 and 5, and One full-rate DCCH on slots 3 and 6

SMS Broadcast Support

This flag indicates whether or not the mobile station supports SMS Broadcast operation.

SMS Map

This information element identifies the extent to which the BMI supports the CMT teleservice.

Value	Function
00	CMT Teleservice Not Supported
X1	SMS SUBMIT Supported (see Section 7)
1X	SMS DELIVER Supported (see Section 7)

SOC

This information element identifies which operator is providing service. If the mobile station receives a reserved SOC value, it shall consider it as an unknown system operator code. See Annex B for SOC allocation.

Value (hex)	Function
000	Reserved / Unknown
001 - 7FF	National SOC
800	Reserved / Unknown
801 - FFF	International SOC

SOC Support

This flag indicates whether or not the mobile station supports the SOC sent on the SOC/BSMC Identification message on the BCCH.

Software Vintage

This information element is used to identify the mobile station Software Vintage (specific to an mobile station vendor).

SPACH Notification Type

This information element contains the message type identifying the message that the BMI intends to deliver to the mobile station. The valid values for SPACH Notification Type shall be limited to the Message Type associated with Page, SSD Update and R-DATA.

SSD Update Status

This information element is used to indicate the success, or reason for failure of an SSD Update Order from the mobile station perspective according to the following table:

Value	Function
00	SSD Update Successful
01	SSD Update Failed due to AUTHBS mismatch
10	Reserved
11	Reserved

SS_SUFF

This information element identifies the minimum signal strength deemed sufficient for a candidate control channel to be considered for control channel reselection. SS_SUFF is used, in some instances, to control cell reselection using an absolute threshold.

Code	Value (dBm)
00000	$-\infty$
00001	-111
...	...
11110	-53
11111	-51

STM Measurement

This information element is used to send the measured signal strength of the MACA channels.

Field	Length
Parameter Type	4
Number of values (N)	4
ST_RSS (Note 1)	5 per instance

Note 1: N + 2 instances of this field are provided. The first instance shall be the ST_RSS for the current DCCH. Other instances shall be ordered according to the sequence they appear in the Mobile Assisted Channel Allocation message (see Section 6.4.1.1.2.2).

ST_RSS shall be encoded using Table 6-9 according to RSS Value.

Subaddress

This information element identifies the subaddress of a called or calling party.

The maximum length of this information element is 180 bits.

Field	Length
Parameter Type	4
Subaddress Info	16 - 176

Subaddress Info

This information element identifies the subaddress of a called or calling party.

Field	Length
Length of Subaddress Info content (N) (in octets) (Note 1)	8
Reserved	3
Odd/Even Indicator	1
Type of Subaddress	3
Reserved	1
Subaddressing (Note 2)	8 per instance

Note 1: The minimum value for N is 1 because Odd/Even Indicator, Type of Subaddress fields shall always be included.

Note 2: Up to N-1 instances of this field may be sent.

The **Type of Subaddress** field is coded as follows:

Code	Description
000	NSAP (CCITT Recommendation X.213 or ISO 8348 AD2)
010	User-specified
All other values are reserved	

The **Odd/Even Indicator** field is coded as follows:

Code	Description
0	Even Number of Address Signals
1	Odd Number of Address Signals

Note: The Odd/Even Indicator is used when the Type of Subaddress is user-specified and the coding is BCD.

The **Subaddressing** field is defined as follows:

The NSAP address shall be encoded using the preferred binary encoding specified in CCITT Recommendation X.213 or ISO 8348 AD2.

When the AFI 50 = (encoded in BCD as 01 010000), IRA characters are encoded as specified in Tables 5 and A-1 of CCITT Recommendation T.50 or ISO 646 with the eighth bit set to zero. When AFI = 51 (encoded in BCD as 0101 0001), ASCII characters are encoded as specified in ANSI X3.4 with the eighth bit set to zero.

For a user-specified subaddress, the field is encoded according to the user specification, subject to a maximum length of 20 octets. When interworking with CCITT Recommendation X.25 networks, BCD coding should be applied.

Subaddressing Support

This flag is used to identify whether or not a BMI or a mobile station supports subaddressing.

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Supported Frequency Bands

This information element indicates the frequency bands supported by the mobile station.

Value	Function
XXXX XXX1	800 MHz A & B Bands Supported
XXXX XX1X	1900 MHz A Band Supported
XXXX X1XX	1900 MHz B Band Supported
XXXX 1XXX	1900 MHz C Band Supported
XXX1 XXXX	1900 MHz D Band Supported
XX1X XXXX	1900 MHz E Band Supported
X1XX XXXX	1900 MHz F Band Supported
1XXX XXXX	Reserved

SYREG

This flag indicates whether or not the mobile station is to register when it enters a new system identification area.

TDMA Neighbor Count

This information element identifies the number of TDMA Service Map instances present in the Neighbor Service Info message. Set to 1 plus the value in this field.

TDMA Service Info

This information element provides service attribute information for TDMA neighbors.

Field	Length
Parameter Type	4
TDMA Neighbor Count (N)	5
TDMA Service Map (Note 1)	1 or 11 per instance

Note 1: N + 1 instances of this field are present. The ordering of instances of this field shall be the same as the ordering used in the Neighbor Cell List (TDMA) information element in the Neighbor Cell message.

TDMA Service Info (Other Hyperband)

This information element provides service attribute information for Other Hyperband TDMA neighbors.

Field	Length
Parameter Type	4
Hyperband	2
TDMA Neighbor Count (P)	5
TDMA Service Map (Note 1)	1 or 11 per instance

Note 1: P + 1 instances of this field are present. The ordering of instances of this field shall be the same as the ordering used in the Neighbor Cell List (Other Hyperband) information element in the Neighbor Cell message.

TDMA Service Map

This information element provides service information for one or more TDMA neighbors.

Field	Length
Service Map Indicator	1
Service Map	0 or 10

The **Service Map Indicator** field is used to indicate if the Service Map field is present. The Service Map Indicator is coded as follows:

Value	Function
0	Service Map not present
1	Service Map present

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The **Service Map** field, when present, provides service information and is coded as follows:

Value	Function
00 0000 0000	No Services Supported
XX XXXX XXX1	Analog Speech
XX XXXX XX1X	Digital Speech
XX XXXX X1XX	G3 Fax
XX XXXX 1XXX	Async Data
XX XXX1 XXXX	Voice Privacy
XX XX1X XXXX	Data Privacy
XX X1XX XXXX	Message Encryption
XX 1XXX XXXX	User Group
X1 XXXX XXXX	Point-to-Point SMS
1X XXXX XXXX	Reserved

Text Message Data Unit

This information element contains the message to be broadcast.

Field	Length
Length Indicator (N) (in octets)	8
Encoding Identifier	5
Reserved	3
Short Message Character (Notes 1, 2)	8

Note 1: As many instances as (N - 1) could be sent (providing that N > 1).

Note 2: The Text Message Data Unit is encoded as specified by the Encoding Identifier as follows:

        0 0 0 0 1   IRA, as specified by Tables 5 and A-1 of CCITT Recommendation T.50

        0 0 0 1 0   User specific

                        All other values are reserved.

If the Encoding Identifier indicates IRA, the most significant bit of each octet of Short Message Character is set to 0.

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Time Alignment

This information element indicates the absolute timing offset (see Section 2.1.3.3.5.1 of IS-136.2) from standard offset reference (SOR) position (see Section 1.2.1.1. of IS-136.2).

Description	Code
Timing offset = SOR	00000
Timing offset = 1 unit from SOR	00001
Timing offset = 2 units from SOR	00010
Timing offset = 3 units from SOR	00011
...	...
Timing offset = 28 units from SOR	11100
Timing offset =29 units from SOR	11101
Timing offset = 30 units from SOR	11110
Maintain current timing offset	11111

Time from Jan 1, 1980

This information element is a non-critical sequential time counter in seconds elapsed since January 1, 1980, 00:00 hour, 0 seconds using Greenwich Mean Time as the reference point.

Time Zone Offset

This information element is used to identify the time zone offset in minutes relative to Greenwich Mean Time (GMT).

Field	Length
Direction	1
Minutes	10
Daylight Savings Indicator	1

The **Direction** field is coded as follows:

Value	Function
0	Subtract specified minutes from GMT
1	Add specified minutes to GMT

The **Minutes** field is coded as follows:

Value	Function
00000 00000	0 Minutes
00000 00001	1 Minute
...	...
10110 10000	720 Minutes (12 Hours)
All other values are reserved	

The **Daylight Savings Indicator** field is coded as follows:

Value	Function
0	Standard Time
1	Daylight Savings Time

Tone Indicator

This information element is used to indicate the type of tone to be generated by the mobile station.

Value	Function
00	Reorder (See Section 7.4 of IS-137)
01	Intercept (See Section 7.4 of IS-137)
All other values are reserved	

Tripe Rate DTC Support

This information element indicates whether or not the mobile station supports triple rate DTCs.

Value	Function
0	Triple Rate DTCs Not Supported
1	Triple Rate DTCs Supported

User Destination Address

This information element is used to identify the user destination address of a short message.

The maximum length of this information element is network-dependent.

Field	Length
Parameter Type	4
Address Info	16 - *

User Destination Subaddress

This information element is used to identify the subaddress of the destination user of a short message. For the definition of subaddress, see CCITT Recommendations I.330 and I.334.

Field	Length
Parameter Type	4
Subaddress Info	16 - 176

User Group

This information element identifies the User Group ID that a mobile station has requested or has been allocated.

Field	Length
Parameter Type	4
User Group Status	2
User Group Type (Note 1)	0,2
User Group ID (Note 1)	0,20,24,34 or 50

Note 1: Only present if the User Group Status = 00.

The **User Group Status** field is coded as follows:

Value	Function
00	Allocate the MS to the included User Group ID
01	Allocate the MS to the BMI specified User Group ID
10	De-allocate MS from User Group ID
11	Reserved

The **User Group Type** field is coded as follows:

Value	Function
00	20-bit Local UGID
01	24-bit SOC UGID
10	34-bit National UGID
11	50-bit International UGID

User Group Map

This information element identifies whether or not the BMI supports User Group operation.

Value	Function
0	User Groups Not Supported
1	User Groups Supported

User Group Support

This information element indicates whether or not the mobile station supports User Group operation.

Value	Function
0	User Group Operation Not Supported
1	User Group Operation Supported

User Originating Address

This information element is used to identify the user originating address of a short message.

The maximum length of this information element is network-dependent.

Field	Length
Parameter Type	4
Address Info	16 - *

User Originating Address Presentation Indicator

The purpose of this information element is to identify the presentation restrictions and screening related to User Originating Address or the originating MSID.

Field	Length
Parameter Type	4
Presentation Indicator	2
Screening Indicator	2

The **Presentation Indicator** field is coded as follows:

Value	Function
00	Presentation Allowed
01	Presentation Restricted
10	Number not Available
11	Reserved

The **Screening Indicator** field is coded as follows:

Value	Function
00	User-provided, not screened
01	User-provided, verified and passed
10	User-provided, verified and failed
11	Network-provided

User Originating Subaddress

This information element is used to identify the subaddress of the originating user of a short message. For the definition of subaddress, see CCITT Recommendations I.330 and I.334.

Field	Length
Parameter Type	4
Subaddress Info	16 - 176

VMAC

This information element indicates the power level to be used on the assigned analog voice channel. The coding is according to IS-136.2, Table 2.1.2.2-1.

Voice Coder Map

This information element identifies the types of voice coders supported by the BMI.

Value	Function
00 0000	No Voice Coders Supported
XX XXX1	VSELP Voice Coder Supported
1X XXXX	Reserved for SOC/BSMC Specific Signaling
All other bit map positions are reserved	

Voice Mode

This information element identifies the mode to be used for the requested Voice Call.

Field	Length
Parameter Type	4
VC	3
PM_V	3

The VC field is coded as follows:

Value	Function
000	No Voice Coder
001	VSELP Voice Coder
110	Reserved for SOC/BSMC Specific Signaling
All other values are reserved	

The PM_V field is coded as follows:

Value	Function
000	No Voice Privacy
001	Voice Privacy Algorithm A
100	Reserved for SOC/BSMC Specific Signaling
All other values are reserved	

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Voice Privacy Mode Map

This information element identifies the forms of voice privacy supported by the BMI.

Value	Function
0000	No Voice Privacy Supported
XXX1	Voice Privacy Algorithm A Supported
1XXX	Reserved for SOC/BSMC Specific Signaling
All other bit map positions are reserved	

6.6　　　　Layer 3 Timers

The time values associated with layer 3 timers are expressed in superframes in Table 6-14.

Table 6 - 14　　Procedure Timers

Name	Possible Values (in superframes)
ACCESS_TMR	25 (Origination) 15 (Page Response)
DEREG_TMR	10
ORIG_TMR	20
PER_TMR	(REGPER + 1) * 94
REG_TMR	15
REREG_TMR	0 - 2048
SMS_ORIG_TMR	20
SMS_TMR	25
SPACH_TMR	10
SSDU_TMR	10
TMSI_TMR	67500
UGA_TMR	40
WAFO_TMR	10

The mobile station layer 3 entity shall respond to the messages listed in Table 6-15 within the time window specified in the same table. The time window starts when the last bit of the last burst of a layer 3 message is received by a mobile station and extends up to the time when the mobile station is ready to send the first bit of the first burst of the access containing the layer 3 response.

Table 6 - 15   Time Windows

Message Received by Mobile Station	Time Window (in Superframes)
Audit Order	1
Base Station Challenge Order Confirmation	2
Capability Request	1
Message Waiting	1
Page	1
Parameter Update	1
R-DATA	1
SPACH Notification	1
SSD Update Order	1
Unique Challenge Order	1

7. SMS Cellular Messaging Teleservice (CMT)

The Higher Layer Protocol Data Unit field in the R-Data Unit is used to carry the SMS CMT messages when the Higher Layer Protocol Identifier indicates Point-to-Point SMS.

It should be noted that network support for CMT operation is beyond the scope of this document and references to the Message Center are only provided to aid in describing the support of CMT operation over the air-interface.

7.1 Procedures

The following SMS message procedures apply to SMS message transactions on the DTC and on the DCCH.

7.1.1 SMS Message Delivery To MS

7.1.1.1 SMS DELIVER

This message is sent to a mobile station whenever the CMT has an SMS message to deliver to it.

The following rules apply to a mobile station upon receiving an SMS DELIVER message:

- If the mobile station supports the Validity information element, then the mobile station shall consider the received SMS DELIVER as valid according to the Validity information element.

- If the mobile station supports the Display Time information element, then the mobile station shall display the received SMS DELIVER according to the Display Time information element.

- If an SMS Signal information element is included in the SMS DELIVER message, the mobile station has not disabled the SMS alerting upon message delivery, and the mobile station is not involved in a call, the mobile station shall alert the user according to the SMS Signal information element.

- If the Delivery Acknowledgment Request information element received in an SMS DELIVER message indicates that Delivery Acknowledgment Notification is prohibited, the mobile station shall not send an SMS DELIVERY ACK message in response to the SMS DELIVER message.

- If the Delivery Acknowledgment Request information element received in an SMS DELIVER message indicates that Delivery Acknowledgment Notification is required, the mobile station shall send an SMS DELIVERY ACK message in response to the SMS DELIVER message upon delivery of the message to the user.

- If the Manual Acknowledgment Request information element received in an SMS DELIVER message indicates that Manual Acknowledgment is prohibited, the mobile station shall not send an SMS MANUAL ACK message in response to the SMS DELIVER message.

- If the Manual Acknowledgment Request information element received in an SMS DELIVER message indicates that Manual Acknowledgment is requested, the mobile station may send an SMS MANUAL ACK message in response to the SMS DELIVER message upon user indication.

- If the mobile station supports the Message Updating information element and its value indicates that it is to be updated, the mobile station shall update any previously received and stored SMS DELIVER message according to the following:

  - If the SMS DELIVER message is received in an R-DATA message which includes a User Originating Address and a User Originating Subaddress, the mobile station shall attempt to match the received Message Reference, User Originating Address and User Originating Subaddress with those received in /with any stored SMS DELIVER message. If a match is found the mobile station shall replace the old SMS DELIVER message with the new SMS DELIVER message.

  - If the SMS DELIVER message is received in an R-DATA message which includes a User Originating Address but does not include a User Originating Subaddress, the mobile station shall attempt to match the received Message Reference and the User Originating Address with those received in /with any stored SMS DELIVER message. If a match is found the mobile station shall replace the old SMS DELIVER message with the new SMS DELIVER message.

  - If the SMS DELIVER message is received in an R-DATA message which does not include a User Originating Address and a User Originating Subaddress, the mobile station shall consider the received SMS DELIVER message as new.

- If the mobile station supports the Message Updating information element and its value in the SMS DELIVER message indicates that it is new, the mobile station shall consider the received SMS DELIVER message as a new message.

7.1.1.2   SMS DELIVERY ACK

An SMS DELIVERY ACK message is sent to a mobile station as a result of successfully delivering to the destination user a previously submitted SMS SUBMIT message.

A User Originating Address shall be included in the R-DATA message containing the SMS DELIVERY ACK.

The following rules apply to a mobile station upon receiving an SMS DELIVERY ACK message:

- When a mobile station receives an SMS DELIVERY ACK message, it may attempt to match to a stored SMS SUBMIT message being acknowledged according to the following rules:

  - If the SMS DELIVERY ACK message is received in an R-DATA message which includes a User Originating Subaddress then the received Message Reference information element together with the User Originating Address and the User Originating Subaddress are used in an attempt to match to a stored SMS SUBMIT message.

  - If the SMS DELIVERY ACK message is received in an R-DATA message which does not include a User Originating Subaddress then the received Message Reference information element together with the User Originating Address are used in an attempt to match to a stored SMS SUBMIT message.

7.1.1.3   SMS MANUAL ACK

An SMS MANUAL ACK message is sent to a mobile station as a result of a destination terminal user responding to a previously submitted SMS SUBMIT message.

The following rules apply to a mobile station upon receiving an SMS MANUAL ACK message:

- When a mobile station receives a SMS MANUAL ACK message, it may attempt to match to a stored SMS SUBMIT message being manually acknowledged according to the following rules:

  - If the SMS MANUAL ACK message is received in an R-DATA message which includes a User Originating Address and a User Originating Subaddress, then the received Message Reference information element together with the User Originating Address and the User Originating Subaddress are used in an attempt to match to a stored SMS SUBMIT message.

  - If the SMS MANUAL ACK message is received in an R-DATA message which includes a User Originating Address and which does not include a User Originating Subaddress, then the received Message Reference information element together with the User Originating Address are used in an attempt to match to a stored SMS SUBMIT message.

- Upon receiving an SMS MANUAL ACK, mobile station specific notification is provided to the receiving mobile station user.

7.1.2 SMS Message Submission by MS

7.1.2.1 SMS SUBMIT

This message is sent by a mobile station when a user indication is detected indicating that an SMS SUBMIT message is to be sent.

The SMS SUBMIT message must be sent to the BMI in an R-DATA message containing a valid User Destination Address, otherwise the message submission will be rejected by the BMI.

The mobile station shall increment the Message Reference for every new SMS SUBMIT message it sends.

The mobile station shall use the original Message Reference for every repeated or modified SMS SUBMIT message it sends.

7.1.2.2 SMS DELIVERY ACK

An SMS DELIVERY ACK message is sent from a mobile station as a result of delivery of a previously received SMS DELIVER message to the terminal user. The mobile station shall set the Message Reference in the SMS DELIVERY ACK to the Message Reference in the SMS DELIVER message being acknowledged.

In addition, the mobile station shall set the User Destination Address and User Destination Subaddress in the R-DATA message in which the SMS DELIVERY ACK is sent to the User Originating Address (if included) and User Originating Subaddress (if included) in the R-DATA message in which the SMS DELIVER message being acknowledged was received.

7.1.2.3 SMS MANUAL ACK

An SMS MANUAL ACK message is sent from a mobile station as a result of the terminal user responding to a previously received SMS DELIVER message. The mobile station shall set the Message Reference in the SMS MANUAL ACK to the Message Reference in the SMS DELIVER message being user acknowledged.

In addition, the mobile station shall set the User Destination Address and User Destination Subaddress in the R-DATA message in which the SMS MANUAL ACK is sent to the User Originating Address (if included) and User Originating Subaddress (if included) in the R-DATA message in which the SMS DELIVER message being user acknowledged was received.

7.1.3   SMS CMT Feature Control

The SMS FEAT_CTRL_REQU message is sent by a mobile station in order to control or solicit the status of its SMS CMT features stored in the Message Center to which a subscription exists.

A mobile station may autonomously send a SMS FEAT_CTRL_REQU to the BMI with its desired feature settings. The BMI may at a later time send a status of its actual SMS CMT feature settings by sending a SMS FEAT_CTRL_STATUS to the mobile station.

7.1.4   SMS CMT Feature Status

The SMS FEAT_CTRL_STATUS message is sent to a mobile station in order to provide the status of its SMS CMT features stored in the Message Center.

The BMI may either send the SMS FEAT_CTRL_STATUS as a response to a previously received SMS FEAT_CTRL_REQU, or it may autonomously send the mobile station a SMS FEAT_CTRL_STATUS to provide information on its SMS CMT feature settings.

7.2   Message Set

This section describes the SMS messages. These messages are transported on the air interface via the layer 3 R-DATA message, more specifically within the R-Data Unit Information Element.

In all messages below the information element at the top of the tables shall be regarded as the first when delivered to layer 3. In the information elements the most significant bit (the leftmost bit in the tables) is the first bit when delivered to layer 3 when sending an SMS message. The information element descriptions are found in Section 7.3 in alphabetical order. The following coding rules apply to this section:

- An SMS message shall be padded with trailing 0 (zeros) as necessary to the nearest octet boundary.

- In the interest of backward compatibility, a received SMS message shall still be accepted if its length exceed the maximum length the receiving end is capable of understanding, i.e., the receiving end discards any layer 3 information it is incapable of understanding.

- The maximum length of a padded SMS message together with the layer 3 overhead (see Sections 6.4.3.11 and 6.4.4.9 and IS-136.2 Sections 2.7.3.1.3.2.19 and 3.7.3.1.3.2.23) shall not exceed 255 octets.

- Unless otherwise specified, a particular information element is present only once in a given message.

- Whether an information element is mandatory or optional in a message is identified by an "M" or "O" respectively in the column "Type" of the table describing a message.

- All the mandatory information elements within a message shall be delivered to layer 3 in the order that they appear in the table provided for each message.

- The optional information elements shall have a 4 bit Parameter Type code. All optional information that are included in a message shall be included in ascending order of the Parameter Type code, interpreted as an unsigned integer.

- The Parameter Type codes are message specific. The Parameter Type codes not used are reserved.

- For each optional information element within a message, there is a note which specifies when the information element is to be sent.

- All specified lengths are in bits unless otherwise noted.

- A "*" symbol in the length column of a message means that the maximum length of the associated information element is only limited by the maximum message length.

7.2.1   SMS DELIVER

This message is used in support of MS terminated SMS delivery.

Direction: BMI → MS

Information Element	Type	Length
Message Type Indicator	M	3
Message Reference	M	13
Privacy Indicator	M	3
Urgency Indicator	M	2
Delivery Acknowledgment Request	M	1
Manual Acknowledgment Request	M	1
Message Updating	M	1
Validity	M	3
Display Time	M	5
User Data Unit	M	8 - *
Message Center Time Stamp (Note 1)	O	48
SMS Signal (Note 2)	O	16

Note 1: The Message Center may include a time stamp at which the message was received at the Message Center.

Note 2: The Message Center may include the SMS Signal information element to request the mobile station to alert the user as specified within this information element. If the Signal information element is not included, the user alerting is at the discretion of the receiving mobile station.

Parameter Type Codes for Optional Information Elements

Parameter Type	Code
Message Center Time Stamp	0010
SMS Signal	0011

7.2.2 SMS SUBMIT

This message is used in support of MS originated SMS.

Direction: MS → BMI

Information Element	Type	Length
Message Type Indicator	M	3
Message Reference	M	13
Privacy Indicator	M	3
Urgency Indicator	M	2
Delivery Acknowledgment Request	M	1
Manual Acknowledgment Request	M	1
Message Updating	M	1
User Data Unit	M	8 - *
Validity Period (Notes 1 and 3)	O	13 or 49
Deferred Delivery Time (Notes 2 and 3)	O	13 or 49

Note 1: Included to indicate to the Message Center the validity of a MS submitted short message.

Note 2: Included to indicate to the Message Center the time when a MS submitted short message shall be delivered.

Note 3: If Validity Period is in conflict with Deferred Delivery Time then the Deferred Delivery Time shall be ignored.

Parameter Type Codes for Optional Information Elements

Parameter Type	Code
Validity Period	0001
Deferred Delivery Time	0010

7.2.3 SMS DELIVERY ACK

This message is sent in response to a SMS DELIVER or SMS SUBMIT message with the Delivery Acknowledgment Request information element indicating that Delivery Acknowledgment is required.

Direction: MS ↔ BMI

Information Element	Type	Length
Message Type Indicator	M	3
Message Reference	M	13
User Data Unit	M	8 - *

7.2.4 SMS MANUAL ACK

This message is sent in response to a SMS DELIVER or SMS SUBMIT message with the Manual Acknowledgment Request information element indicating that Manual Acknowledgment is requested.

Direction: MS ↔ BMI

Information Element	Type	Length
Message Type Indicator	M	3
Message Reference	M	13
User Data Unit	M	8 - *
Response Code (Note 1)	O	8

Note 1: May be included in the MS to BMI direction only if Message Center specific response is to be provided.

Parameter Type Code for Optional Information Element

Parameter Type	Code
Response Code	0001

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7.2.5   SMS FEAT_CTRL_REQU

This message is used to control or solicit the SMS feature settings.

Direction: MS → BMI

Information Element	Type	Length
Message Type Indicator	M	3
Number of Feature Set (Note 1)	M	3
Feature Set	M	9 per instance

Note 1: The Number of Feature Set indicates the number of instances of the Feature Set information element.

7.2.6   SMS FEAT_CTRL_STATUS

This message is used to allow the MS to receive information regarding its SMS feature settings. This message is sent to a mobile station in response to an SMS FEAT_CTRL_REQU or autonomously by the BMI.

Direction: BMI → MS

Information Element	Type	Length
Message Type Indicator	M	3
Number of Feature Set (Note 1)	M	3
Feature set	M	9 per instance

Note 1: The Number of Feature Set indicates the number of instances of the Feature Set information element.

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7.3 Information Element Description

The following coding rules apply to all information element descriptions:

- All specified lengths are in BITS unless otherwise noted.

Deferred Delivery Time

The Deferred Delivery Time is an optional information element included in a SMS SUBMIT, to allow the message center to deliver the message at a later time.

Two formats exist for the Deferred Delivery Time. In the first case, the Deferred Delivery provides the relative delivery time, counted from when the SMS SUBMIT is received by the Message Center. In the second case, the Deferred Delivery Time provides the absolute time for the submitted short message to be delivered.

Field	Length
Parameter Type	4
Format	1
Time Relative/Absolute	8 or 44

If Format = 0, the Time Relative/Absolute field is 8-bit long and represents a relative time. The Time Relative/Absolute field is coded as follows:

Decimal Value (DV)	Time Value
0 to 143	(DV + 1) * 5 minutes (i.e., 5 minutes intervals up to 12 hours)
144 to 167	12 hours + ((DV - 143) * 30 minutes)
168 to 196	(DV - 166) * 1 day
197 to 255	(DV-192) * 1 week

If Format = 1, the Time Relative/Absolute field is 44-bit long and represents an absolute time. The Time Relative/Absolute is further comprised of the following subfields:

Subfield	Length
Time From Jan 1, 1980	32
Time Zone Offset	12

The Time From Jan 1, 1980 subfield is a sequential time counter in seconds elapsed since January 1, 1980, 00:00 hour, 0 seconds using Greenwich Mean Time as the reference point.

The Time Zone Offset subfield is used to identify the time zone offset in minutes relative to Greenwich Mean Time (GMT). The Time Zone Offset is further comprised of the following subfields:

Subfield	Length
Direction	1
Minutes	10
Daylight Savings Indicator	1

The Direction subfield is coded as follows:

Value	Function
0	Subtract specified minutes from GMT
1	Add specified minutes to GMT

The Minutes subfield is coded as follows:

Value	Function
00000 00000	0 Minutes
00000 00001	1 Minute
...	...
10110 10000	720 Minutes (12 Hours)
All other values are reserved	

The Daylight Savings Indicator subfield is coded as follows:

Value	Function
0	Standard Time
1	Daylight Savings Time

Delivery Acknowledgment Request

The Delivery Acknowledgment Request information element is used in the SMS SUBMIT and SMS DELIVER messages to indicate that acknowledgment of message delivery to the originating user; using the SMS DELIVERY ACK message; is prohibited or required.

Value	Function
0	Delivery Acknowledgment prohibited
1	Delivery Acknowledgment required

Display Time

The Display Time information element is used to provide the receiving mobile station with display time associated with the received message.

Field	Length
Display Time	2
Reserved	3

The **Display Time** field is coded as follows:

Value	Function
00	Temporary
01	Default
10	Invoke
11	Reserved

Feature Set

The Feature Set information element is used to control or provide status regarding specific features. At least one instance of feature set is mandatory when SMS FEAT_CTRL_REQU or SMS FEAT_CTRL_STATUS message is sent. The Feature Parameter and the Feature Status are associated with the Feature ID.

Field	Length
Feature ID	4
Feature Parameter	3
Feature Status	2

The **Feature ID** field is used to identify the feature associated with a given instance of Feature Status and Feature Parameter within the SMS FEAT_CTRL_REQ and SMS FEAT_CTRL_STATUS messages. The Feature ID field is coded as follows:

Value	Function
0000	SMS
All other values are reserved	

The **Feature Parameter** field is used in a SMS FEAT_CTRL_STATUS and SMS FEAT_CTRL_REQU to identify the feature parameter associated with a given Feature ID. If the Feature ID indicates SMS, the feature parameters are defined as follows:

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Value	Function
000	Accept All Messages
001	Store All Messages
010	Accept Messages according to user specific selection criteria
All other values are reserved	

The **Feature Status** is a 2-bit field used to indicate the status (in SMS FEAT_CTRL_STATUS message) or the requested feature status (in SMS FEAT_CTRL_REQU):

Value	Function
00	Feature Parameter OFF
01	Feature Parameter ON.
All other values are reserved	

Manual Acknowledgment Request

The Manual Acknowledgment Request information element is used in the SMS SUBMIT and SMS DELIVER messages to indicate that manual acknowledgment of the message using a SMS MANUAL ACK message is prohibited or requested.

Value	Function
0	Manual Acknowledgment Prohibited
1	Manual Acknowledgment Requested

Message Center Time Stamp

The Message Center Time Stamp is optionally included in a SMS DELIVER message, to indicate the time when the Message Center received the short message.

Field	Length
Parameter Type	4
Time From Jan 1, 1980	32
Time Zone Offset	12

The **Time From Jan 1, 1980** field is a sequential time counter in seconds elapsed since January 1, 1980, 00:00 hour, 0 seconds using Greenwich Mean Time as the reference point.

The **Time Zone Offset** field is used to identify the time zone offset in minutes relative to Greenwich Mean Time (GMT). The Time Zone Offset is further comprised of the following subfields:

Subfield	Length
Direction	1
Minutes	10
Daylight Savings Indicator	1

The Direction subfield is coded as follows:

Value	Function
0	Subtract specified minutes from GMT
1	Add specified minutes to GMT

The Minutes subfield is coded as follows:

Value	Function
00000 00000	0 Minutes
00000 00001	1 Minute
...	...
10110 10000	720 Minutes (12 Hours)
All other values are reserved	

The Daylight Savings Indicator subfield is coded as follows:

Value	Function
0	Standard Time
1	Daylight Savings Time

Message Reference

The Message Reference gives an integer representation of a reference number of the short message.

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Message Type Indicator

The Message Type Indicator is coded as follows:

Value	Function	
	BMI → MS	MS → BMI
000	SMS DELIVER	SMS SUBMIT
001	SMS DELIVERY ACK	SMS DELIVERY ACK
010	SMS MANUAL ACK	SMS MANUAL ACK
011	SMS FEAT_CTRL_STATUS	SMS FEAT_CTRL_REQU
All other values are reserved		

Message Updating

The Message Updating is used to indicate to the receiving terminal whether or not the current message overwrites a previously received message.

Value	Function
0	Update (overwrite)
1	New (do not overwrite)

Number of Feature Set

The Number of Feature Set identifies the number of instances of Feature Set information element which are present in a SMS FEAT_CTRL_REQU or a SMS FEAT_CTRL_STATUS message.

Value	Function
000	Reserved
001	1 Feature Set
010	2 Feature Sets
011	3 Feature Sets
100	4 Feature Sets
101	5 Feature Sets
110	6 Feature Sets
111	7 Feature Sets

Privacy Indicator

The privacy indicator is used in the SMS DELIVER and SMS SUBMIT messages to allow the sending user to set a level of privacy to the message being sent.

A mobile station receiving a SMS DELIVER may process the message differently, based on the level of privacy (e.g. added protection by using different passwords to be entered by the mobile station user to read the incoming SMS DELIVER messages).

Value	Function
000	Not Restricted (Privacy Level 0)
001	Restricted (Privacy Level 1)
010	Confidential (Privacy Level 2)
011	Secret (Privacy Level 3)
All other values are reserved	

Response Code

The Response Code is used to carry the MS user response to a previously received short message. The Response Code values used are Message Center specific.

Field	Length
Parameter Type	4
Response Value	4

The **Response Value** field is coded as follows:

Value	Function
0000 to 1111	Message Center specific response.

SMS Signal

The SMS Signal information element is used to request the receiving mobile station to alert the user according to the information contained within this information element.

Field	Length
Parameter Type	4
Pitch	2
Cadence	6
Duration	4

The **Pitch** field is coded as follows:

Value	Function
00	Medium Pitch (standard)
01	High Pitch
10	Low Pitch
All other values are reserved	

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The **Cadence** field is coded as follows:

Value	Function
000000	No Tone: Off
000001	Long: 2.0 s on, 4.0 s off (standard)
000010	Short-Short: 0.8 s on, 0.4 s off, 0.8 s on, 4.0 s off
000011	Short-Short-Long: 0.4 s on, 0.2 s off, 0.4 s on, 0.2 s off, 0.8 s on, 4.0 s off
000100	Short-Short-2: 1.0 s on, 1.0 s off, 1.0 s on, 3.0 s off
000101	Short-Long-Short: 0.5 s on, 0.5 s off, 1.0 s on, 0.5 s off, 0.5 s on, 3.0 s off
000110	Short-Short-Short-Short: 0.5 s on, 0.5 s off, 0.5 s on, 0.5 s off, 0.5 s on, 0.5 s off, 0.5 s on, 2.5 s off
000111	PBX Long: 1.0 s on, 2.0 s off
001000	PBX Short-Short: 0.4 s on, 0.2 s off, 0.4 s on, 2.0 s off
001001	PBX Short-Short-Long: 0.4 s on, 0.2 s off, 0.4 s on, 0.2 s off, 0.8 s on, 1.0 s off
001010	PBX Short-Long-Short: 0.4 s on, 0.2 s off, 0.8 s on, 0.2 s off, 0.4 s on, 1.0 s off
001011	PBX Short-Short-Short-Short: 0.4 s on, 0.2 s off, 0.4 s on, 0.2 s off, 0.4 s on, 0.2 s off, 0.4 s on, 0.8 s off
001100	Pip-Pip-Pip-Pip: 0.1 s on, 0.1 s off, 0.1 s on, 0.1 s off, 0.1 s on, 0.1 s off, 0.1 s on, 0.1 s off.
All other values are reserved	

The **Duration** field is coded as follows:

Value	Function
0000	1 Cycle of Cadence (Standard)
0001	2 Cycles of Cadence
...	...
1110	15 Cycles of Cadence
1111	Continuous Repeating of Cadence

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Urgency Indicator

The Urgency Indicator information element is used to allow the sender of a short message to provide levels of urgency to a short message. For example, the MS could use the Urgency Indicator to provide different user notification.

Value	Function
00	Bulk
01	Normal
10	Urgent
11	Very Urgent

User Data Unit

The User Data Unit information element is used to carry the user text message.

Field	Length
Length Indicator (in octets) (N)	8
Encoding Identifier	5
Reserved	3
User Data	(N - 1) * 8

The **Encoding Identifier** field indicates the encoding used in the User Data field. The Encoding Identifier is coded as follows:

Value	Function
00001	IRA, as specified by Tables 5 and A-1 of CCITT Recommendation T.50
00010	User specific
All other values are reserved	

The User Data represents the user message, and is encoded as specified by the Encoding identifier. If the Encoding Identifier indicates IRA, the most significant bit of each octet of User Data is set to 0.

Validity

The Validity information element is used to provide the receiving mobile station with validity information associated with the received message.

Value	Function
000	Indefinite
001	Power Down
010	System ID based Registration Area
011	Display Only
All other values are reserved	

Validity Period

The Validity Period information element is used in MS originated short message to indicate to the Message Center the time after which the message could be deleted if the message was not delivered to the destination user.

The Validity Period field is given in either integer or offset since January 1, 1980. In the first case, the Validity Period provides the length of the validity period, counted from when the SMS SUBMIT is received by the Message Center. In the second case, the Validity period provides the absolute time of the validity period termination. The Validity Period Format field indicates the format used to code the Validity Period.

Field	Length
Parameter Type	4
Format	1
Time Relative/Absolute	8 or 44

If Format = 0, the Time Relative/Absolute field is 8-bit long and represents a relative time. The Time Relative/Absolute field is coded as follows:

Decimal Value (DV)	Time Value
0 to 143	(DV + 1) * 5 minutes (i.e., 5 minutes intervals up to 12 hours)
144 to 167	12 hours + ((DV - 143) * 30 minutes)
168 to 196	(DV - 166) * 1 day
197 to 255	(DV-192) * 1 week

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If Format = 1, the Time Relative/Absolute field is 44-bit long and represents an absolute time. The Time Relative/Absolute is further comprised of the following subfields:

Subfield	Length
Time From Jan 1, 1980	32
Time Zone Offset	12

The Time From Jan 1, 1980 subfield is a sequential time counter in seconds elapsed since January 1, 1980, 00:00 hour, 0 seconds using Greenwich Meantime as the reference point.

The Time Zone Offset subfield is used to identify the time zone offset in minutes relative to Greenwich Meantime (GMT). The Time Zone Offset is further comprised of the following subfields:

Subfield	Length
Direction	1
Minutes	10
Daylight Savings Indicator	1

The Direction subfield is coded as follows:

Value	Function
0	Subtract specified minutes from GMT
1	Add specified minutes to GMT

The Minutes subfield is coded as follows:

Value	Function
00000 00000	0 Minutes
00000 00001	1 Minute
...	...
10110 10000	720 Minutes (12 Hours)
All other values are reserved	

The Daylight Savings Indicator subfield is coded as follows:

Value	Function
0	Standard Time
1	Daylight Savings Time

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8. Identification

8.1 Mobile Station Identification (MSID)

All mobile stations may be identified using one or more of the following MSID formats included in the air interface:

- IMSI (encoded as a 50 bit MSID).

- TMSI (a 20 or 24 bit MSID).

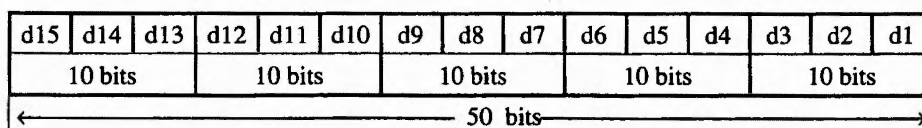- MIN (a 34 bit MSID).

8.1.1 IMSI

8.1.1.1 Definition

The International Mobile Station Identity (IMSI) is a number with a maximum length of 15 decimal digits, as defined in CCITT Recommendation E.212.

8.1.1.2 IMSI Encoding

For transmission over the air interface the IMSI is always encoded as a 50-bit MSID as follows:

- Any IMSI less than 15 decimal digits in length is first padded with leading zero digits (i.e., d15, d14,...) as necessary to produce a 15 decimal digit string as shown in Figure 8-2.

- The 15 decimal digits are then divided in 5 groups of 3 digits each.

- Each 3 digit group is translated into its 10 bit binary equivalent using a normal decimal to binary conversion (e.g. 271 = 01 0000 1111).

- The resulting 10 bit groups are then concatenated to form a 50 bit MSID for transmission over the air interface.

- At the receiving end, the actual IMSI is recovered by removing all leading zero digits that may result when translating the 50 bit MSID back into 15 decimal digits.

Figure 8 - 2   IMSI Encoding

d15	d14	d13	d12	d11	d10	d9	d8	d7	d6	d5	d4	d3	d2	d1
10 bits			10 bits			10 bits			10 bits			10 bits		
←─────────────────────────── 50 bits ───────────────────────────→														

8.1.2 TMSI

The Temporary Mobile Station Identity (TMSI) is a 20 or 24 bit MSID sent over the air interface and is assigned dynamically by the network to the mobile stations. The TMSI may be used by the network to page or deliver a message to a mobile station on the SPACH. The TMSI may also be used by a mobile station to make accesses on the RACH.

8.1.2.1 TMSI Assignment

The BMI may assign a mobile station a 20 or 24 bit TMSI in response to a mobile station registration. If assigned by the BMI, a TMSI will be provided in the MSID Assignment information element of a Registration Accept message (see Section 6.4.3.14).

8.1.2.2 TMSI Maintenance

A mobile station shall treat its currently assigned TMSI as valid until any of the following conditions occurs:

- The mobile station powers down.

- The mobile station camps on a DCCH outside its TMSI domain. The TMSI domain consists of the set of DCCHs broadcasting the same SID and Mobile Country Code (if broadcasted) as the DCCH used by the mobile station when it received the Registration Accept message containing its currently assigned TMSI.

- The mobile station decides to make any of the following registrations on a DCCH within its TMSI domain:

    - A Forced registration (see Section 6.3.7).

    - A TMSI Timeout registration (see Section 6.3.7).

    - A Deregistration registration (see Section 6.3.7).

- The mobile station receives a Registration Accept message with a new TMSI assignment.

- The mobile station receives a Registration Reject message with any cause code.

- The mobile station receives a Release message with cause code = Unknown MSID.

- The mobile station receives a Reorder/Intercept message with cause code = Unknown MSID.

It should be noted that a mobile station assigned a TMSI in a Registration Accept message sent by the BMI using ARQ mode, will only treat the assigned TMSI as valid if the ARQ transaction was successfully completed from a layer 2 perspective (see Section 5.4).

Proper TMSI administration requires that Power Up registration be enabled.

8.1.3 MIN

The Mobile Station Identification Number (MIN) is a 34-bit MSID sent over the air interface and is derived from the 10 digit network addresses used in world zone 1 as defined by annex A of CCITT E.163. The MIN may be used by the network to page or deliver a message to a mobile station on the SPACH. The MIN may also be used by a mobile station to make accesses on the RACH. Refer to Section 2.3.1 of IS-136.2 for MIN encoding rules.

8.1.4 MSID Management

The issue of MSID management involves the process by which the BMI and a mobile station determine which MSID formats can be used over the air interface.

8.1.4.1 MSID Selection

The BMI and mobile station process of selecting which MSID to use in conjunction with messages sent over the air interface is as follows:

- When making an autonomous system access (e.g. an Origination or Registration message), mobile stations having a valid TMSI (see Section 8.1.2.2) shall use it as the MSID.

- When making an autonomous system access, mobile stations having only a MIN shall use it as the MSID.

- When making an autonomous system access, mobile stations having only an IMSI shall use it as the MSID.

- When making an autonomous system access, mobile stations having both MIN and IMSI but no TMSI shall proceed as follows:

  - If the BMI is not broadcasting a Mobile Country Code but is broadcasting a SID that a mobile station recognizes as its home SID, then the mobile station shall use MIN as the MSID.

  - If the BMI is not broadcasting a Mobile Country Code but is broadcasting a SID that a mobile station does not recognize as its home SID, then the mobile station shall use MIN as the MSID if both its home SID and the broadcasted SID have been assigned to either the United States or Canada.

  - If the BMI is broadcasting a Mobile Country Code that a mobile station recognizes as its home Mobile Country Code, then the mobile station shall use MIN as the MSID.

  - If the BMI is broadcasting a Mobile Country Code that a mobile station does not recognize as its home Mobile Country Code, then the mobile station shall use MIN as the MSID if both its home Mobile Country Code and the broadcasted Mobile Country Code have been assigned to either the United States or Canada.

  - Otherwise, the mobile station shall use IMSI as the MSID.

- When sending a SPACH message in response to an autonomous system access made by a mobile station, the BMI shall use the same MSID as was received in the mobile station's autonomous system access.

- When making an autonomous SPACH transmission (e.g. a Page or SPACH Notification message) to a mobile station, the BMI may use whatever MSID it deems to be appropriate.

- When making a system access in response to an autonomous SPACH transmission, the mobile station shall use the same MSID as was received in the BMI's autonomous SPACH transmission.

- When making a system access in response to a User Group Page sent on the SPACH (i.e., no MSID included by the BMI), the mobile station shall select an MSID as if it were making an autonomous system access.

8.1.4.2 Authentication and MSID Selection

The 24-bit value referred to as MIN1 and the 8-bit value referred to as MIN2 in the Authentication procedures shall be derived as follows:

- If a mobile station has a MIN, then the following values shall be used:

  - The MIN1 portion of MIN as described within IS-136.2 shall be used as MIN1.

  - The 8 least significant bits of the MIN2 portion of MIN as described within IS-136.2 shall be used as MIN2.

- If a mobile station has an IMSI but does not have a MIN, then the following values shall be used:

  - The least significant 24 bits of the binary encoded IMSI shall be used as MIN1.

  - The next 8 most significant bits of the binary encoded IMSI shall be used as MIN2.

8.2 Mobile ESN

The ESN value is used in the Authentication process (see Section 6.3.12). The mobile station sends its ESN to the BMI in a Serial Number message (see Section 6.4.4.13) at system access when the value of the "S" information element in the Access Parameters message (see Section 6.4.1.1.1.2) is set to 1. The ESN is as defined in IS-136.2.

8.3 System Identification

The BMI shall always broadcast system identification information in the form of SID and Network Type.

The BMI may also optionally broadcast system identification information in the form of Mobile Country Code, Private System ID, Residential System ID, System Operator Code (SOC) and Base Station Manufacturer Code (BSMC). These SOC and BSMC values will be needed when proprietary signaling is used. In addition the SOC is needed for residential and System Operator specific private network access.

System identification information provides support for nationwide private BMI identification as well as for system operator specific private BMI identification. Supervision of identity assignments are handled differently for nationwide and system operator specific private BMIs.

8.3.1 SID

The SID is broadcast to provide support for system discrimination and is defined in IS-136.2.

8.3.2 Network Type

The Network Type is used to identify whether a BMI supports Public, Private and/or Residential service. Private and Residential networks will only be accessible to specific mobile stations. An example of a Residential network is a "home base station" (similar to a cordless phone).

8.3.3 Mobile Country Code

Mobile Country Code may be included in system broadcast information in support of international applications of IS-136 and international roaming. When included, Mobile Country Code assignments shall be as per the Mobile Country Codes described in CCITT Recommendation E.212.

Note: If a E.212 Mobile Country Code has not been allocated for any given country of system application, then no Mobile Country Code shall be included in the system broadcast information. However, in this case the system may not be able to support international roaming.

8.3.4 Private System ID

A Private System ID (PSID) is used in support of identifying a private BMI.

8.3.4.1 PSID Match

A PSID is assigned by the system operator to a particular private system. It is the responsibility of the system operator to assign the same PSID to the same private network in different SID areas.

If the PSID is in the SID Specific range, the PSID, Mobile Country Code and SID combination shall be used by a mobile station to verify its access rights to a BMI. If the Mobile Country Code is not broadcast by the serving BMI, then the two most significant bits of the SID (see Section 2.3.8 of IS-136.2) are used instead.

A section of the PSID range is reserved for nationwide use. These assignments will only be used in the case where different operators handle a particular private system.

If the PSID is in the nationwide range the mobile station does not need to check the SOC combination for a match as only the PSID and Mobile Country Code need be examined. This would be the case when multiple operators are used to give nationwide coverage for a private system. If the Mobile Country Code is not broadcast by the serving BMI, then the two most significant bits of the SID (see Section 2.3.8 of IS-136.2) are used instead.

If the PSID is in the SOC Specific range and the SOC associated with the PSID is in the international range, then the PSID and SOC combination shall be used by a mobile station to verify its access rights to a BMI.

If the PSID is in the SOC Specific range and the SOC associated with PSID is in the national range, the PSID, Mobile Country Code and SOC combination shall be used by a mobile station to verify its access rights to a BMI. If the Mobile Country Code is not broadcast by the serving BMI, then the two most significant bits of the SID (see Section 2.3.8 of IS-136-2) are used instead.

If the PSID is in the International range, the mobile station shall only check the PSID to verify its access rights to the BMI.

The BMI may, at its discretion, verify that a particular mobile station has access rights using an extension or enhancement to the existing Registration/authentication procedures. These SOC/BSMC specific procedures are beyond the scope of this specification.

8.3.4.2 Multi PSID DCCH

A DCCH supporting one or more private systems shall broadcast the PSID of each private system that it supports, up to a maximum of 16.

8.3.5 Residential System ID

A Residential System ID (RSID) is used in support of identifying a residential BMI.

8.3.5.1 RSID Match

A RSID is assigned by the system operator to a particular residential system.

If the SOC associated with an RSID is in the national range, the RSID, Mobile Country Code, and SOC combination shall be used by a mobile station to uniquely identify a residential BMI and determine its access rights. If the Mobile Country Code is not broadcast by the serving BMI, then the two most significant bits of the SID (see Section 2.3.8 of IS-136.2) are used instead.

Otherwise, if the SOC associated with an RSID is in the international range, the RSID and SOC combination shall be used by a mobile station to uniquely identify a residential BMI and determine its access rights.

8.3.5.2 Multi RSID DCCH

A DCCH supporting one or more residential systems shall broadcast the RSID of each residential system that it supports, up to a maximum of 16.

8.3.6 SOC and BSMC

The SOC and BSMC may be used by a mobile station in order to acquire the services offered by a specific system operator or a specific vendor's base station. The SOC is also used by a mobile station to uniquely identify a residential BMI and to uniquely identify a system operator specific private BMI.

8.4 User Group

User Group Operation may be activated or deactivated by a mobile station via registration (see Section 6.3.7). When activated, a mobile station shall listen to a PCH Subchannel based on its assigned User Group (see Section 4.10).

8.4.1 User Group Maintenance

A mobile station having User Group operation activated shall, upon camping on a DCCH in its current User Group domain (Local UGID or SOC UGID or National UGID) that does not support user groups, immediately begin monitoring a PCH Subchannel based on its PMSID (see Section 4.10).

The domain of a Local UGID is defined to be the set of DCCHs broadcasting the same SID and Mobile Country Code (if broadcasted) as the DCCH used by the mobile station to activate User Group operation for a Local UGID.

If a mobile station activates User Group operation for a SOC UGID on a DCCH broadcasting an international SOC, then the domain of the SOC UGID is defined to be the set of DCCHs broadcasting the same SOC.

If a mobile station activates User Group operation for a SOC UGID on a DCCH broadcasting a national SOC, then the domain of the SOC UGID is defined to be the set of DCCHs broadcasting the same SOC and Mobile Country Code (if broadcasted).

The domain of a National UGID is defined to be the set of DCCHs broadcasting the same Mobile Country Code (if broadcasted) as the DCCH used by the mobile station to activate User Group operation for a National UGID.

The domain of an International UGID is global.

A mobile station having User Group operation activated for a Local UGID shall, upon camping on a DCCH outside its Local UGID domain, immediately deactivate User Group operation and begin monitoring a PCH Subchannel based on its PMSID.

A mobile station having User Group operation activated for a SOC UGID shall, upon camping on a DCCH outside its SOC UGID domain, immediately deactivate User Group operation and begin monitoring a PCH Subchannel based on its PMSID.

A mobile station having User Group operation activated for a National UGID shall, upon camping on a DCCH outside its National UGID domain, immediately deactivate User Group operation and begin monitoring a PCH Subchannel based on its PMSID.

9. Mobile Station Semi-Permanent Memory

$COUNT_{s-p}$	A modulo-64 count (call history parameter) held in the mobile station (see Section 6.3.12.1).
$LOCAID_{s-p}$	A 12-bit Location Area Identifier used to identify changes in location area (see Section 2.6.2.1 of IS-136.2).
$NXTREG_{s-p}$	Identifies when a mobile station must make its next registration to a system (see Section 6.3.2).
$PSID/RSID_{s-p}$ List	The list of PSID/RSIDs received in a Registration Accept message
Last Network$_{s-p}$	The last type of network the mobile station successfully registered on.
$PSID_{s-p}$	Identifies the last private system ID on which a mobile station successfully registered on.
$RSID_{s-p}$	Identifies the last residential system ID on which a mobile station successfully registered on.
RCI_{s-p}	Identifies the most recent RCI read on a DCCH.
$PUREG_{s-p}$	The semi-permanent value of PUREG.
$RNUM_{s-p}$ List	See Section 6.3.7.
SID_{s-p}	Identifies the last system ID on which the mobile station successfully registered.
SSD_{s-p}	See Section 6.3.12.1.
User Group ID	This bit controls whether or not a mobile station may register with UGID. If this bit is set, UGID may be included in the Registration message.