



Mobile Station Equipment Identifier (MEID) Support for cdma2000 systems

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1 **Revision History**

Date	Version	Description
3 March 2005	0.9	Draft version submitted to the CDG MEID AdHoc
3 March 2005	1.0	Version forwarded by the CDG MEID AdHoc to the CDG board



1. Introduction

1.1 Scope of Document

This specification provides the requirements for implementing Mobile Station Equipment Identifier (MEID) & enhanced Public Long Code Mask (PLCM) features in cdma2000 Revision 0, Revision A, Revision B, or Revision C mobile station and base station and the related core network entities (such as MSC).

1.2 Organization

This document is organized as follows:

- Introduction – provides the scope of this specification
- Air interface Requirements - provides the air interface requirements for implementing MEID & enhanced PLCM features in a Revision 0, Revision A, Revision B, or Revision C mobile station and base station
- Radio Access Network (IOS) Requirements - provides the radio access network (IOS) A1 interface (MSC-BS) requirements for implementing MEID & enhanced PLCM features in a Revision 0, Revision A, Revision B, or Revision C mobile station and base station and the related core network entities (such as MSC)
- Core Network (ANSI-41) Requirements - provides the core network (Radiotelecommunications Intersystem Operations) requirements for implementing MEID & enhanced PLCM features in a Revision 0, Revision A, Revision B, or Revision C mobile station and base station and the related core network entities (such as MSC)

1.3 Reference Documents

3GPP2 reference documents can be found at http://www.3gpp2.org/Public_html/specs/index.cfm.

CDG reference documents can be found at <http://www.cdg.org>.

	Standard	Description
1	C.S0004	<i>Signaling Link Access Control (LAC) Standard for cdma2000 Spread Spectrum Systems</i>
2	C.S0005	<i>Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum Systems</i>

	Standard	Description
3	C.S0005-0-2 v1.0	<i>Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum Systems - Release 0, Addendum 2, May 2001</i>
4	C.S0005-A v6.0	<i>Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum Systems - Release A, Addendum 2, February 2002</i>
5	C.S0005-B v1.0	<i>Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum Systems - Release B, April 2002</i>
6	C.S0005-C v2.0	<i>Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum Systems - Revision C, Addendum 1, August 2004</i>
7	C.S0005-D v1.0	<i>Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum Systems - Release D, March 2004</i>
8	C.S0066-0 v1.0	<i>Over-the-Air Service Provisioning for MEID-Equipped Mobile Stations in Spread Spectrum Systems, September 2004</i>
9	C.S0016-C v1.0	<i>Over-the-Air Service Provisioning of Mobile Stations in Spread Spectrum Systems, November 2004</i>
10	FIPS 180-1	<i>National Institute of Standards and Technology, FIPS 180-1, "Secure Hash Standard," April 17, 1995</i>
11	A.S0011- 0017-C	<i>Interoperability Specification (IOS) for cdma2000 Access Network Interfaces, 3G-IOS v5.0, Version 1.0, February 2005</i>
12	X.S0004-E v1.0	<i>Radiotelecommunications Intersystem Operations, April 2004</i>
13	X.S0004-550-E v1.0	<i>MAP Parameters Signaling Protocols, April 2004</i>
14	X.S0008-0 v1.0	<i>Support for the Mobile Equipment Identity (MEID), July 2004</i>
15	X.P0033	<i>OTA Support for MEID (expected to be published in 3Q05)</i>

1.4 Acronyms and Abbreviations

Table 1-1: Acronyms and Abbreviations

Acronym / Abbreviation	Description
AC	Authentication Center
CDG	CDMA Development Group
CDMA	Code Division Multiple Access
cdma2000®	TIA/EIA/IS-2000, with a 1.2288 MHz spreading rate
ECAM	Extended Channel Assignment Message
ESN	Electronic Serial Number
HLR	Home Location Register

Acronym / Abbreviation	Description
IMSI	International Mobile Subscriber Identity
PLCM	Public Long Code Mask
MCC	Mobile Country Code
MNC	Mobile Network Code
MEID	Mobile Station Equipment Identifier
MECAM	MEID Extended Channel Assignment Message
MSC	Mobile Switching Center
MUHDM	MEID Universal Handoff Direction Message
OTASP	Over-the-Air Service Provisioning
SCM	Station Class Mark
VLR	Visited Location Register
UHDM	Universal Handoff Direction Message

1.5 Terms and Definitions

Authentication Center (AC). An entity that manages the authentication information related to the mobile station.

Base Station. A fixed station used for communicating with mobile stations. Depending upon the context, the term base station may refer to a cell, a sector within a cell, an MSC, or other part of the wireless system. See also MSC.

Code Division Multiple Access (CDMA). A technique for spread-spectrum multiple-access digital communications that creates channels through the use of unique code sequences.

Electronic Serial Number (ESN). A 32-bit number assigned by the mobile station manufacturer, uniquely identifying the mobile station equipment.

Home Location Register (HLR). The location register to which a MIN/IMSI is assigned for record purposes such as subscriber information.

IMSI_M. MIN-based IMSI using the lower 10 digits to store the MIN.

IMSI_O. Operational value of IMSI used by the mobile station for operation with the base station.

IMSI_T. True IMSI not associated with MIN. This could be 15 digits or fewer.

International Mobile Subscriber Identity (IMSI). A method of identifying stations in the land mobile service.

Mobile Country Code (MCC). A part of the E.212 IMSI identifying the home country.

- 1 **Mobile Equipment Identifier (MEID).** A 56-bit number assigned by the mobile station
2 manufacturer, uniquely identifying the mobile station equipment.
- 3 **Mobile Network Code (MNC).** A part of the E.212 IMSI identifying the home network
4 within the home country.
- 5 **Mobile Station.** A station in the Public Wireless Radio Telecommunications Service
6 intended to be used while in motion or during halts at unspecified points. Mobile stations
7 include portable units (e.g., hand-held personal units) and units installed in vehicles. A
8 mobile station consists of two parts – ME and UIM.
- 9 **Mobile Switching Center.** The MSC switches MS-originated or MS-terminated traffic.
10 An MSC is usually connected to at least one base station. It may connect to other public
11 networks PSTN, ISDN, etc., other MSCs in the same network, or MSCs in different
12 networks. (It has been referred to as Mobile Telephone Switching Office, MTSO). It
13 provides the interface for user traffic between the cellular network and other public
14 switched networks, or other MSCs
- 15 **P_REV_IN_USE** – Protocol revision level currently in use by a mobile station. It is the
16 minimum of the mobile station protocol revision and base station protocol revision.
- 17 **Pseudo-ESN.** A 32 bit number derived from MEID and used in place of ESN.
- 18 **Public Long Code.** The long code characterized by the public long code mask.
- 19 **Public Long Code Mask.** The long code mask used to form the public long code. The
20 mask can contain a permutation of the mobile station's ESN, or the particular mask
21 specified by the base station. The mask also includes the channel number when used
22 for a Supplemental Code Channel. See also Private Long Code Mask and Long Code.
- 23 **Station Class Mark (SCM).** An identification of certain characteristics of a mobile
24 station



2. Air Interface Requirements

This section provides the air interface requirements for implementing MEID & enhanced PLCM features in a Revision 0 [3], Revision A [4], Revision B [5], or Revision C [6] mobile station and base station.

The requirements for mobile station are provided in section 2.1. A Revision 0, Revision A, Revision B, or Revision C mobile station configured with a MEID shall comply with the requirements in section 2.1. A Revision D [7] and above mobile station shall comply with requirements in section 2.1 to maintain backwards compatibility with a pre-Revision D base station implementing MEID.

The requirements for base station are provided in section 2.2. A Revision 0, Revision A, Revision B, or Revision C base station implementing MEID support shall comply with requirements in section 2.2. A Revision D [7] and above base station shall comply with requirements in section 2.2 to maintain backwards compatibility with pre-Revision D mobile station implementing MEID.

2.1 Mobile Station Requirements

2.1.1 MEID and ESN

The mobile station shall be configured with a 56-bit MEID. MEID is used to uniquely identify a mobile station in a wireless system. The MEID value is available to procedures in the mobile station as the value of the variable MEID_p (see Table 2-1, corresponding to Table F.2.1-1 of [7]). The mobile station shall store a 32-bit pseudo-ESN value, derived from MEID as defined in 2.1.1.1, in ESN_p.

Table 2-1: Permanent Mobile Station Indicators

Indicator	Number of Bits
ESN _p	32
MEID _p	56
SCM _p	8
SLOT_CYCLE_INDEX _p	4
MOB_FIRM_REV _p	16

MOB_MODEL _p	8
MOB_MFG_CODE _p	8
For each band class supported:	
MOB_P_REV _p	8

2.1.1.1 Pseudo-ESN

Pseudo-ESN is a 32-bit identifier derived from MEID.

Mobile station shall use the following procedure to derive pseudo-ESN from MEID¹:

1. The upper 8 bits of pseudo-ESN shall be set to 0x80.
2. The lower 24 bits of pseudo-ESN shall be the 24 least significant bits of the SHA-1 digest of the MEID. See [10] for the specification of the SHA-1 algorithm.

2.1.2 Setting of the Station Class Mark field

The 8-bit Station Class Mark (SCM) field is transmitted in the *Registration Message*, *Origination Message*, *Page Response Message*, and *Terminal Information* information record [2]. Station Class Mark is defined as shown in Table 2-2 (corresponding to Table 2.3.3-1 of [7]). The mobile station shall set bit 4 (MEID support indicator) of the Station Class Mark field to '1' in the *Registration Message*, *Origination Message*, *Page Response Message*, and *Terminal Information* information record.

Table 2-2: Station Class Mark

Function	Bit(s)	Setting
Extended SCM Indicator	7	Band Classes 1,4 Other bands 1XXXXXXX 0XXXXXXX
Dual Mode	6	CDMA Only Dual Mode X0XXXXXX X1XXXXXX
Slotted Class	5	Non-Slotted Slotted XX0XXXXX XX1XXXXX
MEID support indicator ²	4	MEID not configured MEID configured XXX0XXXX XXX1XXXX

¹ Example: if the 56-bit MEID is (hexadecimal) FF 00 00 01 12 34 56, the pseudo-ESN is (hexadecimal) 80 07 37 E1.

² This is currently [2] defined as the IS-54 Power Class which is always set to '0'

25 MHz Bandwidth	3	Always 1	XXXX1XXX
Transmission	2	Continuous Discontinuous	XXXXX0XX XXXXX1XX
Power Class for Band Class 0 Analog Operation	1 – 0	Class I Class II Class III Reserved	XXXXXX00 XXXXXX01 XXXXXX10 XXXXXX11

1

2.1.3 Information Records

The MEID information record in Table 2-3 (corresponding to Table 2.7.4-1 of [7]) can be requested by the base station in *Status Request Message*, and is transmitted by mobile station in *Status Response Message* or *Extended Status Response Message*.

6

Table 2-3: Information Record Types

Information Record	Record Type (binary)	QUAL_INFO_TYPE (binary)	Message Type	r-csch	r-dsch
MEID	00100111	00000000	Status [1]	Y	Y
[1] This information record may be included in a <i>Status Response Message</i> or an <i>Extended Status Response Message</i> .					

7

The mobile station shall support the MEID information record type as shown in Table 2-3. The MEID information record can be included in a *Status Response Message* or an *Extended Status Response Message* to return the mobile station MEID. Type-specific fields of MEID information record are defined below [7]:

11

Type-Specific Field	Length (bits)
MEID_LEN	4
MEID	8 × MEID_LEN
RESERVED	0 - 7 (as needed)

12

MEID_LEN – The length of mobile station Mobile Equipment Identifier.

13

The mobile station shall set this field to the length, in units of octets, of its Mobile Equipment Identifier.

14

15

MEID – Mobile Equipment Identifier.

16

The mobile station shall set this field to MEID_p.

17

RESERVED - Reserved bits for octet alignment.

1 The mobile station shall add the minimum number of bits
2 necessary to make the record length in bits an integral
3 multiple of 8. The mobile station shall set these bits to '0'.

4 **2.1.4 Public Long Code Mask Types**

5 The mobile station shall support the following public long code mask types (as defined in
6 Table 2-6 and described in section 2.1.4.1):

- 7 • PLCM derived from ESN.
- 8 • PLCM specified by the base station.
- 9 • PLCM derived from IMSI_O_S when IMSI_O is derived from IMSI_M.
- 10 • PLCM derived from IMSI_O_S when IMSI_O is derived from IMSI_T.
- 11 • PLCM derived from MEID.

12 The mobile station shall initialize $PLCM_TYPE_S$ when entering *Page Response Substate*
13 or *Mobile Station Origination Attempt Substate* as follows[7]:

- 14 • If $P_REV_IN_USE_S$ is less than 11, set $PLCM_TYPE_S$ to '0000'; otherwise set
15 $PLCM_TYPE_S$ as described in [2].

16 **2.1.4.1 Public Long Code Mask Formats**

17 The PLCM formats described below are exactly as in [7].

18 The 42 bit Public Long Code Mask $PLCM_42$ is generated using $PLCM_37$ or $PLCM_40$
19 as defined in section 2.1.4.1.1 where the least significant bits $PLCM_37$ or $PLCM_40$ are
20 set as defined in this section below.

21 If $PLCM_TYPE_S$ is equal to '0000', the 37 least significant bits ($PLCM_37$) are set as
22 follows:

- 23 • Bits M36 through M32 shall be set to '11000';
- 24 • Bits M31 through M0 shall be set to a permutation of the mobile station's ESN as
25 follows:

26 $ESN = (E_{31}, E_{30}, E_{29}, E_{28}, E_{27}, E_{26}, E_{25}, \dots E_2, E_1, E_0)$

27 Permuted ESN = $(E_0, E_{31}, E_{22}, E_{13}, E_4, E_{26}, E_{17}, E_8, E_{30}, E_{21}, E_{12}, E_3, E_{25},$
28 $E_{16}, E_7, E_{29}, E_{20}, E_{11}, E_2, E_{24}, E_{15}, E_6, E_{28}, E_{19}, E_{10}, E_1,$
29 $E_{23}, E_{14}, E_5, E_{27}, E_{18}, E_9).$

30 If $PLCM_TYPE_S$ is equal to '0001', the 40 least significant bits ($PLCM_40$) are set as
31 follows:

- 32 • Bit M_{39} shall be set to '1';
- 33 • Bits M_{38} through M_0 of the public long code mask shall be specified by
34 $PLCM_39_S$ and shall be set as follows:

1 $PLCM_39_S = (P_{38}, P_{37}, P_{36}, P_{35}, P_{34}, P_{33}, P_{32}, \dots, P_2, P_1, P_0)$

2 If $PLCM_TYPE_S$ is equal to '0010', the 37 least significant bits ($PLCM_37$) are set as
3 follows:

- 4 • Bits M_{36} through M_{34} shall be set to '001';
- 5 • Bits M_{33} through M_0 shall be set to $IMSI_O_S$.

6 If $PLCM_TYPE_S$ is equal to '0011', the 37 least significant bits ($PLCM_37$) are set as
7 follows:

- 8 • Bits M_{36} through M_{34} shall be set to '000';
- 9 • Bits M_{33} through M_0 shall be set to $IMSI_O_S$.

10 If $PLCM_TYPE_S$ is equal to '0100', the 40 least significant bits ($PLCM_40$) are set as
11 follows:

- 12 • Bit M_{39} shall be set to '0';
- 13 • Bits M_{38} through M_0 shall be set as follows:

14 The 39 least significant bits of the SHA-1 digest of the MEID³. See [10] for
15 the specification of the SHA-1 algorithm.

16 **2.1.4.1.1 Public Long Code Mask $PLCM_42$**

17 If $PLCM_37$ is defined, the public long code mask $PLCM_42$ shall be as follows: bits
18 M_{36} through M_0 of the public long code mask shall be specified by $PLCM_37$ (see
19 2.1.4.1). Bits M_{41} through M_{37} shall be set to '11000'. The resulting public long code
20 mask $PLCM_42$ is shown in Figure 2-1 (a).

21 If $PLCM_40$ is defined, the public long code mask $PLCM_42$ shall be as follows: bits
22 M_{39} through M_0 of the public long code mask shall be specified by $PLCM_40$ (see
23 2.1.4.1). Bits M_{41} through M_{40} shall be set to '10'. The resulting public long code mask
24 $PLCM_42$ is shown in Figure 2-1 (b).

³ Example: if the 56-bit MEID is (hexadecimal) FF 00 00 01 12 34 56, the bits M_{38} through M_0 of $PLCM$ are (hexadecimal) 1A 0E 07 37 E1. i.e. (binary) '001 1010 0000 1110 0000 0111 0011 0111 1110 0001'.

41	40	39	...	37	36	...	0
11	000	PLCM_37					

a) Public Long Code Mask PLCM_42 given PLCM_37

41	40	39	...	0
10	PLCM_40			

b) Public Long Code Mask PLCM_42 given PLCM_40

Figure 2-1. Public Long Code Mask PLCM_42 format.

2.1.5 Reject Order

Mobile station shall support the *Mobile Station Reject Order* as specified in Table 2-4 (corresponding to Table 2.7.3-1 of [7]). The structure of the *Mobile Station Reject Order* shall be as specified in [7].

Table 2-4: Order and Order Qualification Codes Used on the r-dsch and the r-csch

r-csch Order	r-dsch Order	Order Code, ORDER (binary)	Order Qualification Code, ORDQ (binary)	More Fields other than ORDQ	Support Req'd	Name/Function
Y	Y	011111	00011100	Y	Y	<i>Mobile Station Reject Order</i> (PLCM_TYPE mismatch)

2.1.6 Channel Assignment Processing

2.1.6.1 P_REV_IN_USE greater than or equal to 11

If P_REV_IN_USE_S is greater than or equal to 11, there are no additional requirements on the mobile station.

2.1.6.2 P_REV_IN_USE equal to 9 or 10

Requirements in this section are applicable if P_REV_IN_USE_S is equal to 9 or 10.

The mobile station shall process *Extended Channel Assignment Message* in *Page Response Substate* and *Mobile Station Origination Attempt Substate* as follows:

- 1 • If $PLCM_TYPE_r$ equals '0010' and $IMSI_O$ is derived from $IMSI_T$, or if
2 $PLCM_TYPE_r$ equals '0011' and $IMSI_O$ is derived from $IMSI_M$, the mobile
3 station shall send a *Mobile Station Reject Order* with the $ORDQ$ field set to
4 '00011100' ($PLCM_TYPE$ mismatch), the mobile station shall not process the
5 message.

6 If the message is not rejected as described above, then the requirements for
7 processing *Extended Channel Assignment Message* shall be as defined in [2] with
8 additional requirements listed below:

- 9 • If $PLCM_TYPE_INCL_r$ is equal to '1' and $PLCM_TYPE_r$ is not set to '0000' or
10 '0001'; then the mobile station shall perform the following to determine the long
11 code mask to use after the channel assignment:
 - 12 – The mobile station shall use the public long code mask derived from
13 $PLCM_TYPE_s$ as specified in 2.1.4.

14 **2.1.6.3 $P_REV_IN_USE$ equal to 6, 7 or 8**

15 Requirements in this section are applicable if $P_REV_IN_USE_s$ is equal to 6, 7 or 8.

16 The mobile station shall process the *MEID Extended Channel Assignment Message* in
17 *Page Response Substate* and *Mobile Station Origination Attempt Substate* as follows:

- 18 • If $PLCM_TYPE_r$ equals '0010' and $IMSI_O$ is derived from $IMSI_T$, or if
19 $PLCM_TYPE_r$ equals '0011' and $IMSI_O$ is derived from $IMSI_M$, the mobile
20 station shall send a *Mobile Station Reject Order* with the $ORDQ$ field set to
21 '00011100' ($PLCM_TYPE$ mismatch), the mobile station shall not process the
22 message.

23 If the message is not rejected as described above, then the requirements for
24 processing *MEID Extended Channel Assignment Message* shall be same as
25 requirements for processing *Extended Channel Assignment Message* defined in [2]
26 with additional requirements listed below:

- 27 • If $PLCM_TYPE_INCL_r$ is equal to '1' the mobile station shall perform the
28 following to determine the long code mask to use after the channel assignment:
 - 29 – The mobile station shall set $PLCM_TYPE_s$ to $PLCM_TYPE_r$.
 - 30 – The mobile station shall set $PLCM_39_s$ to $PLCM_39_r$ if $PLCM_TYPE_r$ is
31 equal to '0001'.
 - 32 – The mobile station shall use the public long code mask derived from
33 $PLCM_TYPE_s$ as specified in 2.1.4.

34 **2.1.7 Handoff Processing**

35 **2.1.7.1 $P_REV_IN_USE$ greater than or equal to 11**

36 If $P_REV_IN_USE_s$ is greater than or equal to 11, there are no additional requirements
37 on the mobile station.

2.1.7.2 P_REV_IN_USE equal to 9 or 10

Requirements in this section are applicable if P_REV_IN_USE_S is equal to 9 or 10.

The mobile station shall process *Universal Handoff Direction Message* in *Traffic Channel Substate* as follows:

- If PLCM_TYPE_r equals '0010' and IMSI_O is derived from IMSI_T, or if PLCM_TYPE_r equals '0011' and IMSI_O is derived from IMSI_M, the mobile station shall send a *Mobile Station Reject Order* with the ORDQ field set to '00011100' (PLCM_TYPE mismatch), the mobile station shall not process the message.

If the message is not rejected as described above, then the requirements for processing *Universal Handoff Direction Message* shall be same as defined in [2] with additional requirements listed below:

- If public long code mask is to be used after the handoff and PLCM_TYPE_S is not set to '0000' or '0001'; then the mobile station shall perform the following to determine the long code mask to use after the handoff:
 - The mobile station shall use the public long code mask derived from PLCM_TYPE_S as specified in 2.1.4.

2.1.7.3 P_REV_IN_USE equal to 6, 7 or 8

Requirements in this section are applicable if P_REV_IN_USE_S is equal to 6, 7 or 8.

The mobile station shall process the *MEID Universal Handoff Direction Message* in *Traffic Channel Substate* as follows:

- If PRIVATE_LCM_r equals '1' and PLCM_TYPE_INCL_r equals '1', the mobile station shall send a *Mobile Station Reject Order* with the ORDQ field set to '00000011' (message structure not acceptable) and shall not process the message.
- If PLCM_TYPE_r equals '0010' and IMSI_O is derived from IMSI_T, or if PLCM_TYPE_r equals '0011' and IMSI_O is derived from IMSI_M, the mobile station shall send a *Mobile Station Reject Order* with the ORDQ field set to '00011100' (PLCM_TYPE mismatch), the mobile station shall not process the message.

If the message is not rejected as described above, then the requirements for processing *MEID Universal Handoff Direction Message* shall be same as requirements for processing *Universal Handoff Direction Message* defined in [7] with additional requirements listed below:

- The mobile station shall perform the following to determine the long code mask to use after the handoff:
 - If the PRIVATE_LCM field is not included and PLCM_TYPE_INCL_r equals '0', the mobile station shall continue to use the long code mask currently in use.

- 1 – If the PRIVATE_LCM field is not included and PLCM_TYPE_INCL_r
2 equals '1', the mobile station shall perform the following:
 - 3 + The mobile station shall set PLCM_TYPE_s to PLCM_TYPE_r; if
4 PLCM_TYPE_r equals '0001', the mobile station shall set PLCM_39_s
5 to PLCM_39_r.
 - 6 + The mobile station shall use the public long code mask derived from
7 PLCM_TYPE_s as specified in 2.1.4.
- 8 – If PRIVATE_LCM_r equals '1' and PLCM_TYPE_INCL_r equals '0', the
9 mobile station shall perform the following:
 - 10 + The mobile station shall use the private long code mask.
- 11 – If PRIVATE_LCM_r equals '0' and PLCM_TYPE_INCL_r equals '0', the
12 mobile station shall perform the following:
 - 13 + The mobile station shall use the public long code mask derived from
14 PLCM_TYPE_s as specified in 2.1.4.
- 15 – If PRIVATE_LCM_r equals '0' and PLCM_TYPE_INCL_r equals '1', the
16 mobile station shall perform the following:
 - 17 + The mobile station shall set PLCM_TYPE_s to PLCM_TYPE_r; if
18 PLCM_TYPE_r equals '0001', the mobile station shall set PLCM_39_s
19 to PLCM_39_r.
 - 20 + The mobile station shall use the public long code mask derived from
21 PLCM_TYPE_s as specified in 2.1.4.
- 22 – The mobile station shall indicate to the user the voice privacy mode
23 status.

24 2.1.8 Over-the-Air Service Provisioning

25 Mobile station shall support either [8] or [9].

27 2.2 Base Station Requirements

28 2.2.1 Extended Channel Assignment Message

29 If the base station determines that the mobile station is equipped with an MEID, the base
30 station may send an *Extended Channel Assignment Message* or an *MEID Extended*
31 *Channel Assignment Message* including the {PLCM_TYPE_INCL, PLCM_TYPE,
32 PLCM_39} fields.

- 33 • If the base station does not send an *MEID Extended Channel Assignment*
34 *Message*, the base station shall follow the requirements in [3], [4], [5], or [6] per
35 P_REV of the base station unless stated otherwise in this document.

- Otherwise, the base station shall follow the additional requirements below
 - The requirements for *MEID Extended Channel Assignment Message* are same as requirements for *Extended Channel Assignment Message* defined in [2] except for the changes defined in subsections below.

2.2.1.1 MSG_ID

If the base station sends an *MEID Extended Channel Assignment Message*, the base station shall set the MSG_ID field [1] of this message to '101110' as specified in Table 2-5 (corresponding to Table 3.1.2.3.1.1.2-1 of [1]).

Table 2-5: MSG_ID Values on f-csch

Message Name	MSG_TAG	MSG_ID (binary)	Logical Channel
<i>System Parameters Message</i>	SPM	000001	broadcast
[...]			
<i>Extended Channel Assignment Message</i>	ECAM	010101	general signaling
[...]			
<i>Broadcast Service Parameters Message</i>	BSPM	101101	broadcast
<i>MEID Extended Channel Assignment Message</i>	MECAM	101110	general signaling

2.2.1.2 P_REV_IN_USE greater than or equal to 11

If P_REV_IN_USE is greater than or equal to 11, base station shall not use *MEID Extended Channel Assignment Message*. There are no additional requirements on the base station.

2.2.1.3 P_REV_IN_USE equal to 9 or 10

If P_REV_IN_USE is equal to 9 or 10, base station shall not use *MEID Extended Channel Assignment Message*.

Base station requirements for setting *Extended Channel Assignment Message* shall be as per [2] except modified requirements for PLCM_TYPE field listed below:

- Base station shall set PLCM_TYPE field as specified in Table 2-6. Note that not all values in Table 2-6 are defined in [6].
 - PLCM_TYPE '0010' shall not be used when the mobile station is not in its home country (i.e., the MCC of the mobile station is different from the MCC of this base station).

- 1 ○ PLCM_TYPE '0011' shall not be used when the mobile station is not in its
2 home network (i.e., the MCC or MNC of the mobile station is different
3 from the MCC or MNC of this base station).

4 **2.2.1.4 P_REV_IN_USE equal to 8**

5 If P_REV_IN_USE is equal to 8 and the base station sends an *MEID Extended Channel*
6 *Assignment Message*, the base station shall set ASSIGN_MODE field to '100'.

7 If ASSIGN_MODE is equal to '100', the additional record fields shall be:

FREQ_INCL	1 (see [5])
[...]	[...]
1XRL_FREQ_OFFSET	0 or 2 (see [5])
RESERVED_BLOB ⁴	1
PLCM_TYPE_INCL	1
PLCM_TYPE	0 or 4
PLCM_39	0 or 39
RESERVED	0 – 7 (as needed)

8 The base station shall set all fields upto 1XRL_FREQ_OFFSET as specified in [5].

9 The base station shall set the remaining fields as follows:

- 10 RESERVED_BLOB – Reserved block of bits
11 The base station shall set this field to '0'.
- 12 PLCM_TYPE_INCL – The Public Long Code Mask type included indicator.
13 The base station shall set this field to '1' if the base station
14 includes PLCM_TYPE in the message; otherwise, the base
15 station shall set this field to '0'.
- 16 PLCM_TYPE – The Public Long Code Mask type indicator.
17 If PLCM_TYPE_INCL is set to '0', the base station shall
18 omit this field; otherwise, the base station shall include this
19 field and set it as follows:
20 The base station shall set this field to the corresponding
21 Public Long Code Mask type as specified in Table 2-6.

⁴ This bit corresponds to MSG_INT_INFO_INCL defined in [6]

Table 2-6: The Public Long Code Mask Type

PLCM_TYPE (binary)	Descriptions
0000	PLCM derived from ESN
0001	PLCM specified by the base station
0010	PLCM derived from IMSI_O_S when IMSI_O is derived from IMSI_M
0011	PLCM derived from IMSI_O_S when IMSI_O is derived from IMSI_T
0100	PLCM derived from MEID
All other values	Reserved

PLCM_TYPE '0010' shall not be used when the mobile station is not in its home country (i.e., the MCC of the mobile station is different from the MCC of this base station).

PLCM_TYPE '0011' shall not be used when the mobile station is not in its home network (i.e., the MCC or MNC of the mobile station is different from the MCC or MNC of this base station).

PLCM_39 - The 39 LSB bits of the Public Long Code Mask.

If PLCM_TYPE is not set to '0001', the base station shall omit this field; otherwise, the base station shall include this field and set it to the 39 least significant bits of the public long code mask as defined in 2.2.3.

RESERVED - Reserved bits.

The base station shall set all the bits of this field to '0' to make the entire record octet-aligned.

2.2.1.5 P_REV_IN_USE equal to 7

If P_REV_IN_USE is equal to 7 and the base station sends an *MEID Extended Channel Assignment Message*, the base station shall set ASSIGN_MODE field to '100'.

If ASSIGN_MODE is equal to '100', the additional record fields shall be:

FREQ_INCL	1 (see [4])
[...]	[...]

1XRL_FREQ_OFFSET	0 or 2 (see [4])
RESERVED_BLOB ⁵	1
PLCM_TYPE_INCL	1
PLCM_TYPE	0 or 4
PLCM_39	0 or 39
RESERVED	0 – 7 (as needed)

1 The base station shall set all fields upto 1XRL_FREQ_OFFSET as specified in [4].

2 The base station shall set the remaining fields as follows:

3 RESERVED_BLOB – Reserved block of bits

4 The base station shall set this field to '0'.

5 PLCM_TYPE_INCL - The Public Long Code Mask type included indicator.

6 The base station shall set this field to '1' if the base station
7 includes PLCM_TYPE in the message; otherwise, the base
8 station shall set this field to '0'.

9 PLCM_TYPE - The Public Long Code Mask type indicator.

10 If PLCM_TYPE_INCL is set to '0', the base station shall
11 omit this field; otherwise, the base station shall include this
12 field and set it as follows:

13 The base station shall set this field to the corresponding
14 Public Long Code Mask type as specified in Table 2-6.

15 PLCM_TYPE '0010' shall not be used when the mobile
16 station is not in its home country (i.e., the MCC of the
17 mobile station is different from the MCC of this base
18 station).

19 PLCM_TYPE '0011' shall not be used when the mobile
20 station is not in its home network (i.e., the MCC or MNC of
21 the mobile station is different from the MCC or MNC of this
22 base station).

23 PLCM_39 - The 39 LSB bits of the Public Long Code Mask.

24 If PLCM_TYPE is not set to '0001', the base station shall
25 omit this field; otherwise, the base station shall include this
26 field and set it to the 39 least significant bits of the public
27 long code mask as defined in 2.2.3.

⁵ This bit corresponds to MSG_INT_INFO_INCL defined in [6]

- 1 RESERVED - Reserved bits.
 2 The base station shall set all the bits of this field to '0' to
 3 make the entire record octet-aligned.

4 **2.2.1.6 P_REV_IN_USE equal to 6**

5 If P_REV_IN_USE is equal to 6 and the base station sends an *MEID Extended Channel*
 6 *Assignment Message*, the base station shall set ASSIGN_MODE field to '100'.

7 If ASSIGN_MODE is equal to '100', the additional record fields shall be:

FREQ_INCL	1 (see [3])
[...]	[...]
REV_PWR_CNTL_DELAY	0 or 2 (see [3])
RESERVED_BLOB ⁶	3 or 6
PLCM_TYPE_INCL	1
PLCM_TYPE	0 or 4
PLCM_39	0 or 39
RESERVED	0 – 7 (as needed)

8 The base station shall set all fields upto REV_PWR_CNTL_DELAY as specified in [3].

9 The base station shall set the remaining fields as follows:

- 10 RESERVED_BLOB - Reserved block of bits
 11 If ENCRYPT_MODE is set to '10', the base station shall
 12 set this field to '000000'; otherwise, the base station shall
 13 set this field to '000'.
 14 PLCM_TYPE_INCL - The Public Long Code Mask type included indicator.
 15 The base station shall set this field to '1' if the base station
 16 includes PLCM_TYPE in the message; otherwise, the base
 17 station shall set this field to '0'.
 18 PLCM_TYPE - The Public Long Code Mask type indicator.
 19 If PLCM_TYPE_INCL is set to '0', the base station shall
 20 omit this field; otherwise, the base station shall include this
 21 field and set it as follows:
 22 The base station shall set this field to the corresponding
 23 Public Long Code Mask type as specified in Table 2-6.

⁶ These bits correspond to ENC_KEY_SIZE, C_SIG_ENCRYPT_MODE_INCL, 3XFL_1XRL_INCL defined in [4] & MSG_INT_INFO_INCL defined in [6]

PLCM_TYPE '0010' shall not be used when the mobile station is not in its home country (i.e., the MCC of the mobile station is different from the MCC of this base station).

PLCM_TYPE '0011' shall not be used when the mobile station is not in its home network (i.e., the MCC or MNC of the mobile station is different from the MCC or MNC of this base station).

PLCM_39 - The 39 LSB bits of the Public Long Code Mask.

If PLCM_TYPE is not set to '0001', the base station shall omit this field; otherwise, the base station shall include this field and set it to the 39 least significant bits of the public long code mask as defined in 2.2.3.

RESERVED - Reserved bits.

The base station shall set all the bits of this field to '0' to make the entire record octet-aligned.

2.2.2 Universal Handoff Direction Message

If the base station determines that the mobile station is equipped with an MEID, the base station may send a *Universal Handoff Direction Message* or *MEID Universal Handoff Direction Message* including the {PLCM_TYPE_INCL, PLCM_TYPE, PLCM_39} fields.

- If the base station does not send a *MEID Universal Handoff Direction Message*, the base station shall follow the requirements in [3], [4], [5], or [6] per P_REV of the base station unless stated otherwise in this document.
- Otherwise, the base station shall follow the additional requirements below
 - The requirements for *MEID Universal Handoff Direction Message* are same as requirements for *Universal Handoff Direction Message* defined in [2] except for the changes defined in subsections below.

2.2.2.1 MSG_TYPE

If the base station sends an *MEID Universal Handoff Direction Message*, the base station shall set the MSG_TYPE field [1] of this message to '00110101' as specified in Table 2-7 (corresponding to Table 3.2.2.2.1.2-1 of [1]).

Table 2-7: MSG_TYPE Values for Regular PDUs on f-dsch

Message Name	MSG_TAG	MSG_TYPE (binary)
Order Message	ORDRM	00000001
[...]		

<i>Universal Handoff Direction Message</i>	UHDM	00100010
[...]		
<i>In-Traffic Broadcast Service Parameters Message</i>	ITBSPM	00110100
<i>MEID Universal Handoff Direction Message</i>	MUHDM	00110101

2.2.2.2 P_REV_IN_USE greater than or equal to 11

If P_REV_IN_USE is greater than or equal to 11, base station shall not use *MEID Universal Handoff Direction Message*. There are no additional requirements on the base station.

2.2.2.3 P_REV_IN_USE equal to 9 or 10

If P_REV_IN_USE is equal to 9 or 10, base station shall not use *MEID Universal Handoff Direction Message*.

Base station requirements for setting *Universal Handoff Direction Message* shall be as per [2] except modified requirements for PLCM_TYPE field listed below:

- Base station shall set PLCM_TYPE field as specified in Table 2-6. Note that not all values in Table 2-6 are defined in [6].
 - PLCM_TYPE '0010' shall not be used when the mobile station is not in its home country (i.e., the MCC of the mobile station is different from the MCC of this base station).
 - PLCM_TYPE '0011' shall not be used when the mobile station is not in its home network (i.e., the MCC or MNC of the mobile station is different from the MCC or MNC of this base station).

2.2.2.4 P_REV_IN_USE equal to 8

If P_REV_IN_USE is equal to 8, the additional record fields shall be:

Field	Length (bits)
USE_TIME	1 (see [5])
[...]	[...]
CS_SUPPORTED	1 (see [5])
RESERVED_BLOB ⁷	6
PLCM_TYPE_INCL	1

⁷ These bits correspond to CHM_SUPPORTED, CDMA_OFF_TIME_REP_SUP_IND, RELEASE_TO_IDLE_IND, MSG_INTEGRITY_SUP, GEN_2G_KEY, REGISTER_IN_IDLE defined in [6]

PLCM_TYPE	0 or 4
PLCM_39	0 or 39

1 The base station shall set all fields upto CS_SUPPORTED as specified in [5].

2 The base station shall set the remaining fields as follows:

3 RESERVED_BLOB - Reserved block of bits

4 The base station shall set this field to '000000'.

5 PLCM_TYPE_INCL - The Public Long Code Mask type included indicator.

6 The base station shall set this field to '1' if the base station
7 includes PLCM_TYPE in the message; otherwise, the base
8 station shall set this field to '0'.

9 PLCM_TYPE - The Public Long Code Mask type indicator.

10 If PLCM_TYPE_INCL is set to '0', the base station shall
11 omit this field; otherwise, the base station shall include this
12 field and set it as follows:

13 The base station shall set this field to the corresponding
14 Public Long Code Mask type as specified in Table 2-6.

15 PLCM_TYPE '0010' shall not be used when the mobile
16 station is not in its home country (i.e., the MCC of the
17 mobile station is different from the MCC of this base
18 station).

19 PLCM_TYPE '0011' shall not be used when the mobile
20 station is not in its home network (i.e., the MCC or MNC of
21 the mobile station is different from the MCC or MNC of this
22 base station).

23 PLCM_39 - The 39 LSB bits of the Public Long Code Mask.

24 If PLCM_TYPE is not set to '0001', the base station shall
25 omit this field; otherwise, the base station shall include this
26 field and set it to the 39 least significant bits of the public
27 long code mask as defined in 2.2.3.

28 **2.2.2.5 P_REV_IN_USE equal to 7**

29 If P_REV_IN_USE is equal to 7, the additional record fields shall be:

Field	Length (bits)
USE_TIME	1 (see [4])
[...]	[...]

CS_SUPPORTED	1 (see [4])
RESERVED_BLOB ⁸	6
PLCM_TYPE_INCL	1
PLCM_TYPE	0 or 4
PLCM_39	0 or 39

1 The base station shall set all fields upto CS_SUPPORTED as specified in [4].

2 The base station shall set the remaining fields as follows:

3 RESERVED_BLOB – Reserved block of bits

4 The base station shall set this field to '000000'.

5 PLCM_TYPE_INCL - The Public Long Code Mask type included indicator.

6 The base station shall set this field to '1' if the base station
7 includes PLCM_TYPE in the message; otherwise, the base
8 station shall set this field to '0'.

9 PLCM_TYPE - The Public Long Code Mask type indicator.

10 If PLCM_TYPE_INCL is set to '0', the base station shall
11 omit this field; otherwise, the base station shall include this
12 field and set it as follows:

13 The base station shall set this field to the corresponding
14 Public Long Code Mask type as specified in Table 2-6.

15 PLCM_TYPE '0010' shall not be used when the mobile
16 station is not in its home country (i.e., the MCC of the
17 mobile station is different from the MCC of this base
18 station).

19 PLCM_TYPE '0011' shall not be used when the mobile
20 station is not in its home network (i.e., the MCC or MNC of
21 the mobile station is different from the MCC or MNC of this
22 base station).

23 PLCM_39 - The 39 LSB bits of the Public Long Code Mask.

24 If PLCM_TYPE is not set to '0001', the base station shall
25 omit this field; otherwise, the base station shall include this
26 field and set it to the 39 least significant bits of the public
27 long code mask as defined in 2.2.3.

⁸ These bits correspond to CHM_SUPPORTED, CDMA_OFF_TIME_REP_SUP_IND, RELEASE_TO_IDLE_IND, MSG_INTEGRITY_SUP, GEN_2G_KEY, REGISTER_IN_IDLE defined in [6]

1 **2.2.2.6 P_REV_IN_USE equal to 6**

2 If P_REV_IN_USE is equal to 6, the additional record fields shall be:

Field	Length (bits)
USE_TIME	1 (see [3])
[...]	[...]
REV_PWR_CNTL_DELAY	0 or 2 (see [3])
RESERVED_BLOB ⁹	Variable
PLCM_TYPE_INCL	1
PLCM_TYPE	0 or 4
PLCM_39	0 or 39

3 The base station shall set all fields upto REV_PWR_CNTL_DELAY as specified in [3].

4 The base station shall set the remaining fields as follows:

5 RESERVED_BLOB – Reserved block of bits

6 The base station shall set this field as specified in Table 2-
7 8.

8 **Table 2-8: RESERVED_BLOB for P_REV_IN_USE=6**

ENCRYPT_MOD E (binary)	SCR_INCLUDED (binary)	NNSCR_INCLUDE D (binary)	RESERVED_BLOB	
			Length (bits)	Value (binary)
Not included or set to value other than 10	Not included or set to 0	Not included or set to 0	8	00000000
Not included or set to value other than 10	Not included or set to 0	1	9	000000000
Not included or set to value other than 10	1	Not included or set to 0	10	0000000000

⁹ These bits correspond to ENC_KEY_SIZE, 3XFL_1XRL_INCL, SYNC_ID_INCL, CC_INFO_INCL, CS_SUPPORTED defined in [4], CHM_SUPPORTED, CDMA_OFF_TIME_REP_SUP_IND, RELEASE_TO_IDLE_IND, MSG_INTEGRITY_SUP, GEN_2G_KEY, REGISTER_IN_IDLE defined in [6]

Not included or set to value other than 10	1	1	10	0000000000
10	Not included or set to 0	Not included or set to 0	11	0000000000
10	Not included or set to 0	1	12	000000000000
10	1	Not included or set to 0	13	000000000000 0
10	1	1	13	000000000000 0

1

2 **PLCM_TYPE_INCL** - The Public Long Code Mask type included indicator.

3 The base station shall set this field to '1' if the base station
4 includes PLCM_TYPE in the message; otherwise, the base
5 station shall set this field to '0'.

6 **PLCM_TYPE** - The Public Long Code Mask type indicator.

7 If PLCM_TYPE_INCL is set to '0', the base station shall
8 omit this field; otherwise, the base station shall include this
9 field and set it as follows:

10 The base station shall set this field to the corresponding
11 Public Long Code Mask type as specified in Table 2-6.

12 PLCM_TYPE '0010' shall not be used when the mobile
13 station is not in its home country (i.e., the MCC of the
14 mobile station is different from the MCC of this base
15 station).

16 PLCM_TYPE '0011' shall not be used when the mobile
17 station is not in its home network (i.e., the MCC or MNC of
18 the mobile station is different from the MCC or MNC of this
19 base station).

20 **PLCM_39** - The 39 LSB bits of the Public Long Code Mask.

21 If PLCM_TYPE is not set to '0001', the base station shall
22 omit this field; otherwise, the base station shall include this
23 field and set it to the 39 least significant bits of the public
24 long code mask as defined in 2.2.3.

2.2.3 Base Station assigned PLCM

If PLCM_TYPE field is included in *Extended Channel Assignment Message*, *Universal Handoff Direction Message*, *MEID Extended Channel Assignment Message* or *MEID Universal Handoff Direction Message* and is set to '0001', the base station shall include PLCM_39 field in the message and shall set it as follows (this is exactly as defined in [7]):

P38 P37 are set as specified in the Table 2-9 (corresponding to Table 3.6.4.1.10-1 of [7]):

Table 2-9: The Base Station Assigned Public Long Code Mask Type

P38 (binary)	P37	Descriptions
00		Proprietary Approach
01		Latitude-Longitude Approach
10		Reserved
11		Reserved

If P38 P37 is equal to '01'; the base station shall set the fields as follows:

$P_{36}, P_{35}, P_{34}, P_{33}, P_{32}, P_{31}, P_{30}, P_{29}, P_{28}, P_{27}, P_{26} = ((\text{BASE_LONG} \gg 5) \square \cos|\text{BASE_LAT}|) \square (2^{11}),$

$P_{25}, P_{24}, P_{23}, P_{22}, P_{21}, P_{20}, P_{19}, P_{18}, P_{17}, P_{16}, P_{15} = (\text{BASE_LAT} \gg 5) \square (2^{11}),$

$P_{14}, P_{13}, \dots, P_2, P_1, P_0 = \text{identifiers assigned by the base station},$

where:

BASE_LONG is the longitude of the base station in units of 0.25 seconds, expressed as a two's complement signed number with positive numbers signifying East longitude, and,

BASE_LAT is the latitude of the base station in units of 0.25 seconds, expressed as a two's complement signed number with positive numbers signifying North latitude



3. Radio Access Network (IOS) Requirements

This section provides the radio access network (IOS) A1 interface (MSC-BS) requirements for implementing MEID & enhanced PLCM features in a Revision 0, Revision A, Revision B, or Revision C mobile station and base station and the related core network entities (such as MSC).

Assumptions used in this section:

- Only procedures, messages, information elements, and fields/sub fields within information elements impacted due to the MEID Solution specified in this document are indicated below
- All procedures and messages identified below are supported in [11]
- Information elements that are not identified below but are part of the messages indicated below should be included as part of the messages, in compliance with the IOS specification, corresponding to the IOS Revision Level configured in the MSC and the BS, for support of MEID Solution specified in this document
- "IS-54 Power Class" field within the Station Class Mark is renamed to "MEID support indicator" as specified in 2.1.2.
- ESN field received from a mobile station and conveyed by the BS to the MSC and from the MSC to the BS may contain pseudo-ESN if the mobile is configured with MEID
- Minimum IOS Revision Level configured and enabled in an operator's network is IOS 4.0.0.

MSC-BS A1 Interface impacts and solution are as specified in Table 3-1.

Table 3-1: MSC-BS A1 Interface impacts and solution

#	Procedure Name	Message Name	Message Direction	Information Element(s) Within Message	Field(s)/ Sub field(s) Within Information Element(s)	Current Setting/ Behavior	Impact Due to MEID solution specified in this document	Comment(s)
1	Mobile Registration	Location Updating Request	BS → MSC	Classmark Information Type 2	Station Class Mark, MEID support	Set to zero (as IS-54 Power Class)	Set to one if mobile is configured with MEID	No backward compatibility issues as "IS-54 Power Class"

#	Procedure Name	Message Name	Message Direction	Information Element(s) Within Message	Field(s)/ Sub field(s) Within Information Element(s)	Current Setting/ Behavior	Impact Due to MEID solution specified in this document	Comment(s)
					indicator		Set to zero if mobile is not configured with MEID	applies to TDMA systems and is set to zero by CDMA mobiles. "IS-95" field in Classmark Information Type 2 indicates mobile is a CDMA mobile.
2	Mobile Origination	CM Service Request	BS → MSC	Classmark Information Type 2	Station Class Mark, MEID support indicator	Set to zero (as IS-54 Power Class)	Set to one if mobile is configured with MEID Set to zero if mobile is not configured with MEID	No backward compatibility issues as "IS-54 Power Class" applies to TDMA systems and is set to zero by CDMA mobiles. "IS-95" field in Classmark Information Type 2 indicates mobile is a CDMA mobile.
3	Mobile Termination	Paging Response	BS → MSC	Classmark Information Type 2	Station Class Mark, MEID support indicator	Set to zero (as IS-54 Power Class)	Set to one if mobile is configured with MEID Set to zero if mobile is not configured with MEID	No backward compatibility issues as "IS-54 Power Class" applies to TDMA systems and is set to zero by CDMA mobiles. "IS-95" field in Classmark Information Type 2 indicates mobile is a CDMA mobile.
4	MSC request to a BS to retrieve MEID from a mobile	Status Request	MSC → BS	Information Record Requested	Information Record Type	Set to "0DH" to retrieve ESN for traffic channel procedure. Control channel procedure allows any value.	Set to "27H" to retrieve MEID for both control channel and traffic channel procedures	Procedure could be performed either on the control channel or on the traffic channel, or both. Backward compatibility issue – an MSC may time out if it does not receive the Status Response message from a BS for any

#	Procedure Name	Message Name	Message Direction	Information Element(s) Within Message	Field(s)/ Sub field(s) Within Information Element(s)	Current Setting/ Behavior	Impact Due to MEID solution specified in this document	Comment(s)
								reason (for example, BS does not support the "MEID solution specified in this document").
5	BS response to the MSC to deliver MEID retrieved from the mobile	Status Response	BS → MSC	MS Information Records	Information Record Type	Any value	Set to "27H" for MEID MEID Information Record shall be coded as defined in the air interface chapter of this document".	Procedure could be performed either on the control channel or on the traffic channel, or both. No backward compatibility issues.
				MS Information Records	Information Record Content	Any value	Set to the MEID retrieved from the mobile. MEID Information Record shall be coded as defined in the air interface chapter of this document.	MEID shall be included within the MS Information Records element versus a standalone Mobile Identity (MEID) element. Procedure could be performed either on the control channel or on the traffic channel, or both. No backward compatibility issues.

#	Procedure Name	Message Name	Message Direction	Information Element(s) Within Message	Field(s)/ Sub field(s) Within Information Element(s)	Current Setting/ Behavior	Impact Due to MEID solution specified in this document	Comment(s)
6	Hard handoff with MSC involvement	Handoff Required	BS → MSC	Public Long Code Mask Identifier	PLCM_42	Any value	PLCM generated and used at the source BS	Backward compatibility issues – A source BS may not include this element. A source MSC may ignore this element without conveying it to the target BS or to the target MSC. A target MSC may ignore this element without conveying it to the target BS. For example, source BS, or source MSC, or target MSC does not support the “MEID solution specified in this document”.
				Public Long Code Mask Identifier	PLCM_TY P E	Any value	BS assigned	Could be MEID based, ESN based, IMSI_M based, or IMSI_T based
				Classmark Information Type 2	Station Class Mark, MEID support indicator	Set to zero (as IS-54 Power Class)	Set to one if mobile is configured with MEID Set to zero if mobile is not configured with MEID	No backward compatibility issues as “IS-54 Power Class” applies to TDMA systems and is set to zero by CDMA mobiles. “IS-95” field in Classmark Information Type 2 indicates mobile is a CDMA mobile.

#	Procedure Name	Message Name	Message Direction	Information Element(s) Within Message	Field(s)/ Sub field(s) Within Information Element(s)	Current Setting/ Behavior	Impact Due to MEID solution specified in this document	Comment(s)
7	Hard handoff with MSC involvement	Handoff Request	MSC → BS	Public Long Code Mask Identifier	PLCM_42	Any value	PLCM generated and used at the source BS	Backward compatibility issue – a target BS may ignore this element (for example, target BS does not support the “MEID solution specified in this document”).
				Public Long Code Mask Identifier	PLCM_TYPE	Any value	BS assigned	Could be MEID based, ESN based, IMSI_M based, or IMSI_T based
				Classmark Information Type 2	Station Class Mark, MEID support indicator	Set to zero (as IS-54 Power Class)	Set to one if mobile is configured with MEID Set to zero if mobile is not configured with MEID	No backward compatibility issues as “IS-54 Power Class” applies to TDMA systems and is set to zero by CDMA mobiles. “IS-95” field in Classmark Information Type 2 indicates mobile is a CDMA mobile.
				Mobile Identity (MEID)	MEID Identity Digits	Set to a mobile's MEID	Retrieved from the source VLR and set to the mobile's MEID	Could be used by the target BS to generate MEID based PLCM

#	Procedure Name	Message Name	Message Direction	Information Element(s) Within Message	Field(s)/ Sub field(s) Within Information Element(s)	Current Setting/ Behavior	Impact Due to MEID solution specified in this document	Comment(s)
8	Hard handoff with MSC involvement	Handoff Request Acknowledge	BS → MSC	Public Long Code Mask Identifier	PLCM_42	Any value	PLCM generated by the target BS to be used after hard handoff	Backward compatibility issues – a target BS may not include this element (for example, it does not support the “MEID solution specified in this document”). A target MSC may ignore this element without conveying it to the source BS or to the source MSC (for example, target MSC does not support the “MEID solution specified in this document”).
				Public Long Code Mask Identifier	PLCM_TYPER	Any value	BS assigned	Could be MEID based, ESN based, IMSI_M based, or IMSI_T based
9	Hard handoff with MSC involvement	Handoff Command	MSC → BS	Public Long Code Mask Identifier	PLCM_42	Any value	PLCM generated by the target BS to be used after hard handoff	Backward compatibility issue – source BS may not receive this element from the source MSC (for example, source MSC does not support the “MEID solution specified in this document”).
				Public Long Code Mask Identifier	PLCM_TYPER	Any value	BS assigned	Could be MEID based, ESN based, IMSI_M based, or IMSI_T based

#	Procedure Name	Message Name	Message Direction	Information Element(s) Within Message	Field(s)/ Sub field(s) Within Information Element(s)	Current Setting/ Behavior	Impact Due to MEID solution specified in this document	Comment(s)
10	Global System Reset	Reset	MSC → BS	Software Version	IOS Major Revision Level (X)	Set to the IOS Major Revision Level supported and configured in the MSC and BS. Set to four.	Set to five	
				Software Version	IOS Minor Revision Level (Y)	Set to the IOS Minor Revision Level supported and configured in the MSC and BS. Set to zero, one, two, or three.	Set to zero	
				Software Version	IOS Point Revision Level (Z)	Set to the IOS Point Revision Level supported and configured in the MSC and BS. Set to zero or one.	Set to zero	
11	Global System Reset	Reset Acknowledge	BS → MSC	Software Version	IOS Major Revision Level (X)	Set to the IOS Major Revision Level supported and configured in the MSC and BS. Set to four.	Set to five	

#	Procedure Name	Message Name	Message Direction	Information Element(s) Within Message	Field(s)/ Sub field(s) Within Information Element(s)	Current Setting/ Behavior	Impact Due to MEID solution specified in this document	Comment(s)
				Software Version	IOS Minor Revision Level (Y)	Set to the IOS Minor Revision Level supported and configured in the MSC and BS. Set to zero, one, two, or three.	Set to zero	
				Software Version	IOS Point Revision Level (Z)	Set to the IOS Point Revision Level supported and configured in the MSC and BS. Set to zero or one.	Set to zero	
12	Global System Reset	Reset	BS → MSC	Software Version	IOS Major Revision Level (X)	Set to four	Set to five	
				Software Version	IOS Minor Revision Level (Y)	Set to zero, one, two, or three.	Set to zero	
				Software Version	IOS Point Revision Level (Z)	Set to zero or one	Set to zero	
13	Global System Reset	Reset Acknowledge	MSC → BS	Software Version	IOS Major Revision Level (X)	Set to four	Set to five	
				Software Version	IOS Minor Revision Level (Y)	Set to zero, one, two, or three.	Set to zero	
				Software Version	IOS Point Revision Level (Z)	Set to zero or one	Set to zero	
14	Dormant Mode Handoff, Mobile Origination of CCPD Mode	ADDS Transfer	BS → MSC	Classmark Information Type 2	Station Class Mark, MEID support indicator	Set to zero (as IS-54 Power Class)	Set to one if mobile is configured with MEID Set to zero if mobile is not configured with MEID	No backward compatibility issues as "IS-54 Power Class" applies to TDMA systems and is set to zero by CDMA mobiles. "IS-95" field in Classmark Information Type 2 indicates

#	Procedure Name	Message Name	Message Direction	Information Element(s) Within Message	Field(s)/ Sub field(s) Within Information Element(s)	Current Setting/ Behavior	Impact Due to MEID solution specified in this document	Comment(s)
								mobile is a CDMA mobile.
15	OTASP	ADDs Deliver	MSC → BS	ADDs User Part	Application Type/Data Burst Type	Set to 04H for OTASP	Set to 04H for OTASP	No backward compatibility issues
				ADDs User Part	Application Data Message	Carries the IS-683-A OTASP messages	TIA-158 OTASP Protocol Capability Request Message shall request the MEID Information Record from a mobile	BS shall transparently convey the contents of the Application Data Message to the mobile
16	OTASP	ADDs Deliver	BS → MSC	ADDs User Part	Application Type/Data Burst Type	Set to 04H for OTASP	Set to 04H for OTASP	No backward compatibility issues
				ADDs User Part	Application Data Message	Carries the IS-683-A OTASP messages	TIA-158 OTASP Extended Protocol Capability Response Message shall return the MEID Information Record for the mobile	BS shall transparently convey the contents of the Application Data Message to the MSC
17	Mobile Termination	Paging Request	MSC → BS	Mobile Identity (MEID)	MEID Identity Digits	Mobile Identity (MEID) is not supported in Paging Request in IOS v5.0	Retrieved from the VLR and set to a mobile's MEID	Could be used by the source BS to generate MEID based PLCM, or for other uses
18	Mobile Origination	Assignment Request	MSC → BS	Mobile Identity (MEID)	MEID Identity Digits	Mobile Identity (MEID) is not supported in Assignment Request in IOS v5.0	Retrieved from the VLR and set to a mobile's MEID	Could be used by the source BS to generate MEID based PLCM, or for other uses



4. Core Network (ANSI-41) Requirements

This section provides the core network (X.S0004-E/TIA-41 Revision E [12]) requirements for implementing MEID & enhanced PLCM features in a Revision 0, Revision A, Revision B, or Revision C mobile station and base station and the related core network entities (such as MSC)¹⁰.

The HLR/AC [12] shall support:

1. The recommendations in 3GPP2 specification X.S0008/TIA-928, "Support for the Mobile Equipment Identity (MEID)" [14]
2. The recommendations in draft 3GPP2 specification X.P0033, "OTA Support for MEID" [15]

The MSC/VLR [12] shall support:

1. The recommendations in 3GPP2 specification X.S0008/TIA-928, "Support for the Mobile Equipment Identity (MEID)" [14]
2. The recommendations in draft 3GPP2 specification X.P0033, "OTA Support for MEID" [15]
3. The IOS 'bag' parameters CDMA2000HandoffInvokeIOSData and CDMA2000HandoffResponseIOSData from [13]

¹⁰ It should be noted that the TIA-41 implementation requirements for MEID are the same both for the MEID solution as specified in this document and for Core Network support of full cdma2000 Release D functionality as specified in [7] (i.e. no standards change is required)