

3GPP TSG RAN#7
Madrid Spain
13 -15 March, 2000

RP#7 (00)0013

Agenda Item: 4.2

Source: RAN Vice Chairman on behalf of 3GPP2

To: RAN#7

Title: 3GPP2 MC MAP

Document for: For information

The attached document contains the necessary changes elaborated by 3GPP2 to modify MC in order to allow the inter-working of MC on an GSM-MAP core network.

The intent of this contribution is to provide RAN with information on the completion status of the harmonisation between 3GPP and 3GPP2.

1

3GPP2 C.P9003

Date: January 28, 2000



**3RD GENERATION
PARTNERSHIP
PROJECT 2
"3GPP2"**

2

***Multi-Carrier Specification for Spread Spectrum
Systems on GSM MAP (MC-MAP)
(Lower Layers Air Interface)***

3

4

5

6

COPYRIGHT

3GPP2 and its Organizational Partners claim copyright in this document and individual Organizational Partners may copyright and issue documents or standards publications in individual Organizational Partner's name based on this document. Requests for reproduction of this document should be directed to the 3GPP2 Secretariat at secretariat@3gpp2.org. Requests to reproduce individual Organizational Partner's documents should be directed to that Organizational Partner. See www.3gpp2.org for more information.

1 No text.

CONTENTS

| | | | |
|----|----------|---|------------|
| 1 | 1 | Introduction | 1-1 |
| 2 | 1.1 | Architecture | 1-1 |
| 3 | 1.2 | Terms | 1-2 |
| 4 | 1.2.1 | Definitions..... | 1-2 |
| 5 | 2 | Modifications to C.S0001-A, <i>Introduction to cdma2000 Standards for Spread Spectrum</i> | |
| 6 | | Systems | 2-1 |
| 7 | 2.1 | The cdma2000 Family of Standards..... | 2-1 |
| 8 | 3 | Modifications to C.S0002-A, <i>Physical Layer Standard for cdma2000 Standards for</i> | |
| 9 | | Spread Spectrum Systems..... | 3-1 |
| 10 | 4 | Modifications to C.S0003-A, <i>Medium Access Control (MAC) Standard for cdma2000</i> | |
| 11 | | Standards for Spread Spectrum Systems | 4-1 |
| 12 | 5 | Modifications to C.S0004-A, <i>Signaling Link Access Control (LAC) Standard for cdma2000</i> | |
| 13 | | Standards for Spread Spectrum Systems | 5-1 |
| 14 | 5.1 | Modifications to Existing Sections of 3GPP2 C.S0004-A..... | 5-4 |
| 15 | 5.1.1 | Additions to 1.1.2 of 3GPP2 C.S0004-A..... | 5-4 |
| 16 | 5.1.2 | Changes to Section 2.1.1.1.2 of 3GPP2 C.S0004-A..... | 5-5 |
| 17 | 5.1.3 | Changes to Section 2.1.1 of 3GPP2 C.S0004-A | 5-5 |
| 18 | 1.1.4 | Changes to Section 2.1.2 of 3GPP2 C.S0004-A | 5-12 |
| 19 | 1.1.5 | Changes to Section 2.2.1.2 of C. S0004-A..... | 5-15 |
| 20 | 1.1.6 | Changes to Section 3.1.2.2.1.1.2 of 3GPP2 C.S0004-A (Requirements for | |
| 21 | | Setting Page Class Fields..... | 5-16 |
| 22 | 1.1.7 | Changes to Section 3.1.2.2.1.1.2 of 3GPP2 C.S0004-A..... | 5-17 |
| 23 | | The following additional Page Type-specific Fields are defined: | 5-17 |
| 24 | 1.1.8 | Changes to Section 3.1.2.2.1.2 of 3GPP2 C.S0004-A..... | 5-20 |
| 25 | 1.1.9 | Changes to Section 3.1.2.3 of 3GPP2 C.S0004-A | 5-23 |
| 26 | 1.1.10 | Changes to Section 3.2.2.2 of 3GPP2 C.S0004-A..... | 5-23 |
| 27 | 1.2 | Enhanced Services | 5-23 |
| 28 | 1.2.1 | Description of Enhanced Services..... | 5-24 |
| 29 | 1.2.2 | Modifications to 3GPP2 C.S0004-A for Enhanced Services | 5-24 |
| 30 | 6 | Modifications to C.S0005-A, <i>Upper Layer (Layer 3) Signaling Standard for cdma2000</i> | |
| 31 | | Standards for Spread Spectrum Systems | 6-1 |
| 32 | 6.1 | RRC Services Provided to Upper Layers..... | 6-1 |
| 33 | 6.2 | Functions of MC-MAP RRC..... | 6-1 |

CONTENTS

| | | |
|----|---|-------|
| 1 | 6.3 MC-MAP RRC Procedures..... | 6-2 |
| 2 | 6.3.1 Modifications to 3GPP2 C.S0005-A Procedures..... | 6-2 |
| 3 | 1.1.2 Detailed RRC Functions..... | 6-13 |
| 4 | 1.1.3 Handoff Procedures | 6-25 |
| 5 | 1.1.4 RR-level Registration..... | 6-37 |
| 6 | 1.2 MC-MAP RRC Messages, Orders, and Information Records..... | 6-41 |
| 7 | 1.2.1 New Messages..... | 6-51 |
| 8 | 1.2.2 Modified Messages | 6-78 |
| 9 | 1.2.3 Orders..... | 6-90 |
| 10 | 1.2.4 Information Records | 6-99 |
| 11 | 1.2.5 Other Modifications | 6-105 |
| 12 | 1.3 Modifications to Support PLCM_TYPE..... | 6-106 |
| 13 | 1.4 Additions to 1.1.2.2 of 3GPP2 C.S0005-A..... | 6-114 |
| 14 | 1.5 MC-MAP Identities..... | 6-114 |
| 15 | 1.6 Revision Identification | 6-114 |
| 16 | 1.7 Example MC-MAP Call Flows | 6-115 |
| 17 | 1.7.1 Location Update..... | 6-115 |
| 18 | 1.7.2 Mobile Originated Call Setup..... | 6-116 |
| 19 | 1.7.3 Mobile Terminated Call Setup | 6-117 |
| 20 | 1.7.4 Mobile Originated Call Release | 6-118 |
| 21 | 1.7.5 MC-MAP to MC-MAP Hard Handoff | 6-119 |
| 22 | 1.7.6 Inter-system MC-MAP to GSM Handoff..... | 6-120 |
| 23 | 1.7.7 Inter-system GSM to MC-MAP Handoff..... | 6-121 |
| 24 | 1.7.8 Inter-system MC-MAP to DS-MAP Handoff..... | 6-122 |
| 25 | 1.7.9 Inter-system DS-MAP to MC-MAP Handoff..... | 6-123 |
| 26 | | |

FIGURES

| | | |
|----|--|-------|
| 1 | Figure 1.1-1. MC-MAP Radio Access Network Architecture | 1-1 |
| 2 | Figure 1.1-2. MC-MAP Protocol Stack | 1-2 |
| 3 | Figure 2.1.3.1.11-2. Long Code Mask Format for Direct Sequence Spreading | 3-2 |
| 4 | Figure 2.1.3.1.11-3. Private Long Code Mask | 3-2 |
| 5 | Figure 3.1.3.10.7-1. Forward Dedicated Control Channel Public Long Code Mask | 3-3 |
| 6 | Figure 3.1.3.11.7-1. Forward Fundamental Channel Public Long Code Mask | 3-3 |
| 7 | Figure 3.1.3.12.7-1. Forward Supplemental Channel Public Long Code Mask | 3-3 |
| 8 | Figure 3.1.3.13.7-1. Forward Supplemental Code Channel Public Long Code Mask | 3-3 |
| 9 | Figure 5-1. Forward Logical Channel Architecture for MC-MAP | 5-2 |
| 10 | Figure 5-2. Reverse Logical Channel Architecture for MC-MAP | 5-3 |
| 11 | Figure 5-3. Data Unit Processing for MC-MAP LAC | 5-4 |
| 12 | Figure 6.3.2.1.1-1: Successful RRC Connection Establishment (MS- originated) Procedure | |
| 13 | Message Flow | 6-14 |
| 14 | Figure 6.3.2.1.1-2: Successful RRC Connection Establishment (MS- terminated) Procedure | |
| 15 | Message Flow | 6-15 |
| 16 | Figure 6.3.2.1.1.1-1: Unsuccessful RRC Connection Establishment Procedure Message | |
| 17 | Flow | 6-15 |
| 18 | Figure 6.3.2.1.2-1. RRC Release Procedure | 6-16 |
| 19 | Figure 6.3.2.2-1. Mobile Station Capability Report Procedure | 6-17 |
| 20 | Figure 6.3.2.2.1-1. Mobile Station Capability Request Procedure | 6-17 |
| 21 | Figure 6.3.2.3.1-1. Initial Direct Transfer Procedure | 6-18 |
| 22 | Figure 6.3.2.3.2-1. Base Station Initiated Direct Transfer Procedure | 6-19 |
| 23 | Figure 6.3.2.3.2-2. Mobile Station Initiated Direct Transfer Procedure | 6-19 |
| 24 | Figure 6.3.2.4-1. Dedicated Mode Paging Procedure | 6-20 |
| 25 | Figure 6.3.2.5-1. Example of Security Mode Control Flow Diagram | 6-22 |
| 26 | Figure 6.3.2.5-2 Successful Case | 6-22 |
| 27 | Figure 6.3.2.5-3 Unsuccessful Case | 6-22 |
| 28 | Figure 6.9.1-1. Example Location Update Message Flow | 6-115 |
| 29 | Figure 6.9.2-1. Example Mobile Originated Call Setup Message Flow | 6-116 |
| 30 | Figure 6.9.3-1. Example Mobile Terminated Call Setup Message Flow | 6-117 |
| 31 | Figure 6.9.4-1. Example Mobile Originated Call Release Message Flow | 6-118 |
| 32 | Figure 6.9.5-1. MC-MAP to MC-MAP Hard Handoff | 6-119 |

FIGURES

| | | |
|---|--|-------|
| 1 | Figure 6.9.6-1. Inter-system MC-MAP to GSM Handoff | 6-120 |
| 2 | Figure 6.9.7-1. Inter-system GSM to MC-MAP Handoff | 6-121 |
| 3 | Figure 6.9.8-1. Inter-system MC-MAP to DS-MAP Handoff..... | 6-122 |
| 4 | Figure 6.9.9-1. Inter-system DS-MAP to MC-MAP Handoff..... | 6-123 |
| 5 | | |

TABLES

| | | |
|----|---|-------|
| 1 | Table 2.1.1.3.1.1-1. Address Types | 5-5 |
| 2 | Table 2.1.1.3.1.1-4. MC_MAP_ADDR_TYPE Address Types | 5-6 |
| 3 | Table 3.1.2.2.1.2.1-1. Address Types | 5-20 |
| 4 | Table 3.1.2.2.1.2.1-4. MC_MAP_ADDR_TYPE Address Types..... | 5-21 |
| 5 | Table 5.2.2.1.1.2-1. Allocation of SAPI values | 5-25 |
| 6 | Table 6.4-1. r-csch Messages | 6-42 |
| 7 | Table 6.4-2. r-dsch Messages (Part 1 of 2) | 6-43 |
| 8 | Table 6.4-2. r-dsch Messages (Part 2 of 2) | 6-44 |
| 9 | Table 6.4-3. f-csch Messages (Part 1 of 2)..... | 6-45 |
| 10 | Table 6.4-3. f-csch Messages (Part 2 of 2)..... | 6-46 |
| 11 | Table 6.4-4. f-dsch Messages (Part 1 of 2)..... | 6-47 |
| 12 | Table 6.4-4. f-dsch Messages (Part 2 of 2)..... | 6-49 |
| 13 | Table 6.4.1.1.3-1. CN_DOMAIN_ID values | 6-59 |
| 14 | Table 6.4.1.2.4-1. PAGING_REC_TYPE_ID values | 6-66 |
| 15 | Table 6.4.1.3.1-1. RR_Registration Type (RR_REG_TYPE) Codes | 6-68 |
| 16 | Table 6.4.1.3.2-1. OTHER_ESTABLISH_CAUSE Codes..... | 6-73 |
| 17 | Table 3.7.3.3.2.27-2. SEARCH_MODE Types..... | 6-83 |
| 18 | Table 6.4.2.2.5-1 | 6-85 |
| 19 | Table 6.4.3-1. Orders Used on the r-csch and the r-dsch..... | 6-91 |
| 20 | Table 6.4.3-2. Orders Used on the f-csch and the f-dsch..... | 6-96 |
| 21 | Table 6.4.4-1. Information Record Types used on r-csch and r-dsch | 6-100 |
| 22 | Table 6.4.4-2. Information Record Types used on f-csch and f-dsch..... | 6-101 |
| 23 | Table 3.7.2.3.2.21-x. The Public Long Code Mask Type..... | 6-113 |
| 24 | | |
| 25 | | |
| 26 | | |
| 27 | | |
| 28 | | |

TABLES

1 No text.

FOREWORD

(This foreword is not part of this Standard)

This Standard was prepared by Technical Specification Group C of the Third Generation Partnership Project 2 (3GPP2). This Standard defines changes to cdma2000 CDMA Multi-Carrier Mode standard to enable operation with the (GSM) Mobile Application Part (MAP).

This standard is part of the IMT-2000 standards for wireless systems based upon cellular principles. This standard is based upon combining the Physical Layer, Medium Access Control Layer, Link Access Control, and Radio Resource Control Layers of the IMT-2000 CDMA Multi-Carrier (MC) standard with the Connection Management (CM) and Mobility Management (MM) layers from the UTRA standards developed by 3GPP. This mode of operation is known as Multi-Carrier (MC) using GSM MAP, or MC-MAP.

This Standard defines the modifications that are required to the cdma2000 series of Standards to support operation using the Connection Management (CM) and Mobility Management (MM) layers of the UTRA standards. This Standard consists of the following sections:

1. Introduction. This section describes the basic architecture of the system that combines the GSM-MAP core network with the cdma2000 Radio Access Network. This section also provides a list of terms that are used in the Standard.

2. Modifications to C.S0001-A, *Introduction to cdma2000 Standards for Spread Spectrum Systems.* This section describes the changes that are required to 3GPP2 C.S0001-A to support MC-MAP operation.

3. Modifications to C.S0002-A, *Physical Layer Standard for cdma2000 Spread Spectrum Systems.* This section describes the changes that are required to 3GPP2 C.S0002-A to support MC-MAP operation. The changes move the assignment of the public long code mask to the Upper Layers. This is to remove the dependence on the ESN, an identity used in TIA/EIA-41 networks.

4. Modifications to C.S0003-A, *Medium Access Control (MAC) Standard for cdma2000 Standards for Spread Spectrum Systems.* No changes are required to 3GPP2 C.S0003-A to support MC-MAP operation.

5. Modifications to C.S0004-A, *Signaling Link Access Control (LAC) Standard for cdma2000 Standards for Spread Spectrum Systems.* This section describes the changes that are required to 3GPP2 C.S0004-A to support MC-MAP operation. The changes to this section add an enhanced services sublayer, add addresses used in MAP systems, disable the LAC layer authentication, and add parameters for the new messages that have been created to support GSM layer 3 signaling.

6. Modifications to C.S0005-A, *Upper Layer (Layer 3) Signaling Standard for cdma2000 Standards for Spread Spectrum Systems.* This section describes the changes that are required to 3GPP2 C.S0005-A to support MC-MAP operation. The changes to this section consist of some enhancements to the Radio Resource (RR) management function of cdma2000 and the deletion of capabilities that are specific to operation with a TIA/EIA-41 network. To aid in the understanding of the RRC, a description is provided of the RRC procedures.

NOTES

- 1 1. Compatibility, as used in connection with this Standard, is understood to mean:
2 Any mobile station supporting MC-MAP operation is able to place and receive calls
3 in any system supporting MC-MAP operation. Conversely all MC-MAP base stations
4 are able to place and receive calls for any MC-MAP mobile station.
- 5 2. “Base station” refers to the functions performed on the land side, which are typically
6 distributed among a cell, a sector of a cell, and a mobile switching center.
- 7 3. “Shall” and “shall not” identify requirements to be followed strictly to conform to the
8 standard and from which no deviation is permitted. “Should” and “should not”
9 indicate that one of several possibilities is recommended as particularly suitable,
10 without mentioning or excluding others, that a certain course of action is preferred
11 but not necessarily required, or that (in the negative form) a certain possibility or
12 course of action is discouraged but not prohibited. “May” and “need not” indicate a
13 course of action permissible within the limits of the standard. “Can” and “cannot”
14 are used for statements of possibility and capability, whether material, physical, or
15 causal.
- 16 4. Unless indicated otherwise, this Standard presents numbers in decimal form.
17 Binary numbers are distinguished in the text by the use of single quotation marks.
- 18 5. Where text from the 3GPP2 C.S000x-A series is modified, the following conventions
19 are used: Section headers reference the appropriate part of 3GPP2 C.S000x-A.
20 Ellipsis [...] indicate blocks of unchanged text. Fixed underlining/~~strikethrough~~
21 marking shows changes to existing text from the 3GPP2 C.S000x-A series.

NOTES

1 No text

REFERENCES

1 The following standards contain provisions which, through reference in this text, constitute provisions of this
2 Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and
3 parties to agreements based on this Standard are encouraged to investigate the possibility of applying the most
4 recent editions of the standards indicated below. ANSI and TIA maintain registers of currently valid national
5 standards published by them.

6 3GPP Standards:

- 7 1. TS22.002: *Universal Mobile Telecommunications System; Bearer Services (BS)*
8 *supported by a GSM Public Land Mobile Network (PLMN).*
- 9 2. TS22.011: *Universal Mobile Telecommunications System; Service accessibility.*
- 10 3. TS22.060: *Universal Mobile Telecommunications System; General Packet Radio*
11 *Service (GPRS); Service Description; Stage 1.*
- 12 4. TS23.003: *Universal Mobile Telecommunications System; Numbering, addressing*
13 *and identification.*
- 14 5. TS23.014: *Universal Mobile Telecommunications System; Support of Dual Tone Multi-*
15 *Frequency signalling (DTMF) via the GSM system.*
- 16 6. TS23.060: *Universal Mobile Telecommunications System; General Packet Radio*
17 *Service (GPRS); Service Description; Stage 2.*
- 18 7. TS23.071: *Universal Mobile Telecommunications System; Location Services;*
19 *Functional description Stage 2.*
- 20 8. TS23.022: *Universal Mobile Telecommunications System; Functions related to Mobile*
21 *Station (MS) in idle mode.*
- 22 9. TS24.007: *Universal Mobile Telecommunications System; Mobile radio interface*
23 *signalling layer 3; General aspects.*
- 24 10. TS24.008: *Universal Mobile Telecommunications System; Mobile radio interface layer*
25 *3 specification, Core Network Protocols - Stage 3.*
- 26 11. TS24.010: *Digital cellular telecommunications system ; Mobile radio interface layer 3*
27 *Supplementary services specification; General aspects.*
- 28 12. TS24.071: *Universal Mobile Telecommunications System; Mobile radio interface layer*
29 *3 location services specification.*
- 30 13. TS24.080: *Universal Mobile Telecommunications System; Mobile radio interface layer*
31 *3 supplementary services specification; Formats and coding.*
- 32 14. TS24.081: *Universal Mobile Telecommunications System; Line identification*
33 *supplementary services - Stage 3.*
- 34 15. TS24.082: *Universal Mobile Telecommunications System; Call Forwarding (CF)*
35 *supplementary services - Stage 3.*

REFERENCES

- 1 16. TS24.083: *Universal Mobile Telecommunications System; Call Waiting (CW) and Call*
2 *Hold (HOLD) supplementary services - Stage 3.*
- 3 17. TS24.084: *Universal Mobile Telecommunications System; MultiParty (MPTY)*
4 *supplementary services - Stage 3.*
- 5 18. TS24.085: *Universal Mobile Telecommunications System; Closed User Group (CUG)*
6 *supplementary services - Stage3.*
- 7 19. TS24.086: *Universal Mobile Telecommunications System; Advice of Charge (AoC)*
8 *supplementary services - Stage 3.*
- 9 20. TS25.331: *Universal Mobile Telecommunications System; RRC Protocol Specification.*
- 10 21. TS27.001: *Universal Mobile Telecommunications System; General on Terminal*
11 *Adaptation Functions (TAF) for Mobile Stations (MS).*
- 12 22. TS29.002: *Universal Mobile Telecommunications System; Mobile Application Part*
13 *(MAP) specification.*
- 14 23. TS29.007: *Universal Mobile Telecommunications System; General requirements on*
15 *interworking between the Public Land Mobile Network (PLMN) and the Integrated*
16 *Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN).*
- 17 24. TS31.102: *Universal Mobile Telecommunications System; Characteristics of the USIM*
18 *Application.*
- 19 ETSI Standards:
- 20 1. GSM01.02: *Digital cellular telecommunications system (Phase 2+); General*
21 *description of a GSM Public Land Mobile Network (PLMN).*
- 22 2. GSM01.04: *Digital cellular telecommunications system (Phase2+); Abbreviations and*
23 *acronyms.*
- 24 3. GSM02.03: *Digital cellular telecommunications system (Phase2+); Teleservices*
25 *supported by a GSM Public Land Mobile Network (PLMN).*
- 26 4. GSM02.09: *Digital cellular telecommunications system (Phase 2+); Security aspects.*
- 27 5. GSM02.17: *Digital cellular telecommunications system (Phase 2+); Subscriber*
28 *identity modules Functional characteristics.*
- 29 6. GSM02.40: *Digital cellular telecommunications system (Phase 2+); Procedures for call*
30 *progress indications.*
- 31 7. GSM03.01: *Digital cellular telecommunications system (Phase2+); Network functions.*
- 32 8. GSM03.13: *Digital cellular telecommunications system (Phase 2+); Discontinuous*
33 *Reception (DRX) in the GSM system.*
- 34 9. GSM03.20: *Digital cellular telecommunications system (Phase 2+); Security related*
35 *network functions.*

REFERENCES

- 1 10. GSM 03.64: *Digital cellular telecommunications system (Phase2+); General Packet*
2 *Radio Service (GPRS); Overall description of the GPRS radio interface; Stage 2.*
- 3 11. GSM04.02: *Digital cellular telecommunications system (Phase2+); GSM Public Land*
4 *Mobile Network (PLMN) access reference configuration.*
- 5 12. GSM04.03: *Digital cellular telecommunications system (Phase2+); Mobile Station -*
6 *Base Station System (MS - BSS) interface; Channel structures and access*
7 *capabilities.*
- 8 13. GSM04.04: *Digital cellular telecommunications system (Phase 2+); layer 1; General*
9 *requirements.*
- 10 14. GSM04.05: *Digital cellular telecommunications system (Phase 2+); Data Link (DL)*
11 *layer; General aspects.*
- 12 15. GSM04.06: *Digital cellular telecommunications system (Phase 2+); Mobile Station -*
13 *Base Station System (MS - BSS) interface Data Link (DL) layer specification.*
- 14 16. GSM04.08: *Digital cellular telecommunications system (Phase 2+); Mobile radio*
15 *interface layer 3 specification.*
- 16 17. GSM04.11: *Digital cellular telecommunications system (Phase2); Point-to-Point (PP)*
17 *Short Message Service (SMS) support on mobile radio interface.*
- 18 18. GSM04.12: *Digital cellular telecommunications system (Phase2+); Short Message*
19 *Service Cell Broadcast (SMSCB) support on the mobile radio interface.*
- 20 19. GSM 04.60: *Digital cellular telecommunications system (Phase2+); General Packet*
21 *Radio Service (GPRS); Mobile Station - Base Station System (MS-BSS) interface; Radio*
22 *Link Control and Medium Access Control (RLC/MAC) layer specification.*
- 23 20. GSM04.65: *Digital cellular telecommunications system (Phase 2+); General Packet*
24 *Radio Service (GPRS); Subnetwork Dependent Convergence Protocol (SNDCP).*
- 25 21. GSM04.88: *Digital cellular telecommunications system (Phase 2+); Call Barring (CB)*
26 *supplementary services - Stage 3.*
- 27 22. GSM05.02: *Digital cellular telecommunications system (Phase2+); Multiplexing and*
28 *multiple access on the radio path.*
- 29 23. GSM05.05: *Digital cellular telecommunications system (Phase2+); Radio*
30 *transmission and reception.*
- 31 24. GSM05.08: *Digital cellular telecommunications system (Phase2+); Radio subsystem*
32 *link control.*
- 33 25. GSM05.10: *Digital cellular telecommunications system (Phase2+); Radio subsystem*
34 *synchronization.*
- 35 26. GSM11.10: *Digital cellular telecommunications system (Phase2+); Mobile Station (MS)*
36 *conformity specification.*
- 37 27. GSM11.11: *Digital cellular telecommunications system (Phase2+); Specification of the*

REFERENCES

- 1 *Subscriber Identity Module - Mobile Equipment (SIM - ME) interface.*
- 2 28. GSM11.21: *Digital cellular telecommunications system (Phase2); The GSM Base*
- 3 *Station System (BSS) equipment specification.*
- 4 29. ETS 300 102-1: *Integrated Services Digital Network (ISDN); User-network interface*
- 5 *layer 3; Specifications for basic call control.*
- 6 30. ETS 300 102-2: *Integrated Services Digital Network (ISDN); User-network interface*
- 7 *layer 3; Specifications for basic call control.*
- 8 3GPP2 Standards:
- 9 1. C.S0001-A, *Introduction to cdma2000 Standards for Spread Spectrum Systems*
- 10 2. C.S0002-A, *Physical Layer Standard for cdma2000 Standards for Spread Spectrum*
- 11 *Systems*
- 12 3. C.S0003-A, *Medium Access Control (MAC) Standard for cdma2000 Standards for*
- 13 *Spread Spectrum Systems*
- 14 4. C.S0004-A, *Signaling Link Access Control (LAC) Standard for cdma2000 Standards*
- 15 *for Spread Spectrum Systems*
- 16 5. C.S0005-A, *Upper Layer (Layer 3) Signaling Standard for cdma2000 Standards for*
- 17 *Spread Spectrum Systems*
- 18 6. C.S0010, *Recommended Minimum Performance Standards for Base Stations*
- 19 *Supporting Dual-Mode Spread Spectrum Mobile Stations.*
- 20 7. C.S0011, *Recommended Minimum Performance Standards for Dual-Mode Spread*
- 21 *Spectrum Mobile Stations.*
- 22 8. C.R1001, *Administration of Parameter Value Assignments for TIA/EIA Spread*
- 23 *Spectrum Standards, November 1999.*
- 24 ITU Recommendations:
- 25 1. ITU-T Recommendation E.163: *Numbering plan for the international telephone*
- 26 *service.*
- 27 2. ITU-T Recommendation E.164: *Numbering plan for the ISDN era.*
- 28 3. ITU-T Recommendation E.212: *Identification plan for land mobile stations.*
- 29 4. ITU-T Recommendation F.69 (1993): *Plan for telex destination codes.*
- 30 5. ITU-T Recommendation I.330: *ISDN numbering and addressing principles.*
- 31 6. ITU-T Recommendation I.440 (1989): *ISDN user-network interface data link layer -*
- 32 *General aspects.*
- 33 7. ITU-T Recommendation I.450 (1989): *ISDN user-network interface layer 3 General*
- 34 *aspects.*
- 35 8. ITU-T Recommendation I.500 (1993): *General structure of the ISDN interworking*
- 36 *recommendations.*

REFERENCES

- 1 9. ITU-T Recommendation T.50: *International Alphabet No. 5.*
- 2 10. ITU-T Recommendation Q.931: *ISDN user-network interface layer 3 specification for*
3 *basic control.*
- 4 11. ITU-T Recommendation V.21: *300 bits per second duplex modem standardized for*
5 *use in the general switched telephone network.*
- 6 12. ITU-T Recommendation V.22: *1200 bits per second duplex modem standardized for*
7 *use in the general switched telephone network and on point-to-point 2-wire leased*
8 *telephone-type circuits.*
- 9 13. ITU-T Recommendation V.22bis: *2400 bits per second duplex modem using the*
10 *frequency division technique standardized for use on the general switched telephone*
11 *network and on point-to-point 2-wire leased telephone-type circuits.*
- 12 14. ITU-T Recommendation V.23: *600/1200-baud modem standardized for use in the*
13 *general switched telephone network.*
- 14 15. ITU-T Recommendation V.26ter: *2400 bits per second duplex modem using the echo*
15 *cancellation technique standardized for use on the general switched telephone*
16 *network and on point-to-point 2-wire leased telephone-type circuits.*
- 17 16. ITU-T Recommendation V.32: *A family of 2-wire, duplex modems operating at data*
18 *signalling rates of up to 9600 bit/s for use on the general switched telephone*
19 *network and on leased telephone-type circuits.*
- 20 17. ITU-T Recommendation V.110: *Support of data terminal equipments (DTEs) with V-*
21 *Series interfaces by an integrated services digital network.*
- 22 18. ITU-T Recommendation V.120: *Support by an ISDN of data terminal equipment with*
23 *V-Series type interfaces with provision for statistical multiplexing.*
- 24 19. ITU-T Recommendation X.21: *Interface between data terminal equipment (DTE) and*
25 *data circuit-terminating equipment (DCE) for synchronous operation on public data*
26 *networks.*
- 27 20. ITU-T Recommendation X.25: *Interface between data terminal equipment (DTE) and*
28 *data circuit-terminating equipment (DCE) for terminals operating in the packet mode*
29 *and connected to public data networks by dedicated circuit.*
- 30 21. ITU-T Recommendation X.28: *DTE/DCE interface for a start-stop mode data*
31 *terminal equipment accessing the packet assembly/disassembly facility (PAD) in a*
32 *public data network situated in the same country.*
- 33 22. ITU-T Recommendation X.30: *Support of X.21, X.21 bis and X.20 bis based data*
34 *terminal equipments (DTEs) by an integrated services digital network (ISDN).*
- 35 23. ITU-T Recommendation X.31: *Support of packet mode terminal equipment by an*
36 *ISDN.*

REFERENCES

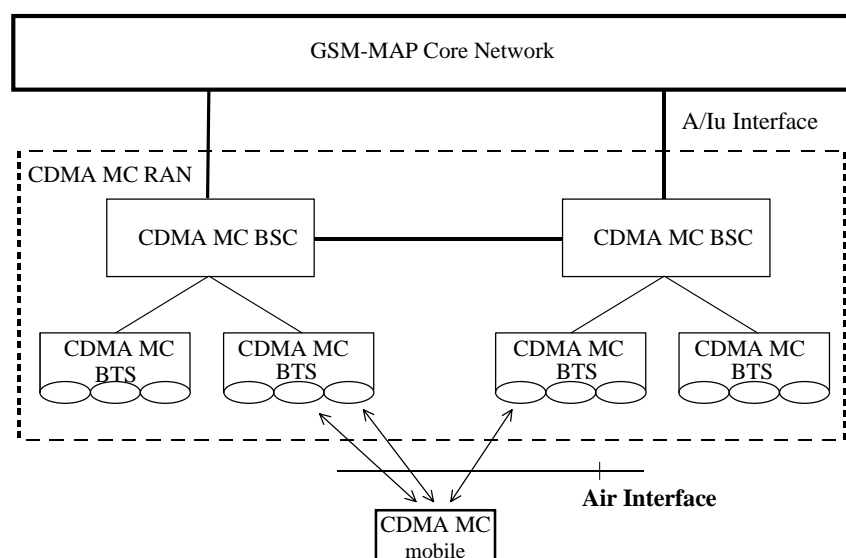
- 1 24. ITU-T Recommendation X.32: *Interface between data terminal equipment (DTE) and*
2 *data circuit-terminating equipment (DCE) for terminals operating in the packet mode*
3 *and accessing a packet switched public data network through a public switched*
4 *telephone network or an integrated services digital network or a circuit switched*
5 *public data network.*
- 6 25. ITU-T Recommendation X.75 (1988): *Packet-switched signalling system between*
7 *public networks providing data transmission services.*
- 8 26. ITU-T Recommendation X.121: *International numbering plan for public data*
9 *networks.*
- 10 Other Standards:
- 11 1. *Common Cryptographic Algorithms.* An EAR-controlled document subject to
12 restricted distribution. Contact the Telecommunications Industry Association,
13 Arlington, VA, October 1998.
- 14 2. ISO/IEC 646 (1991): *Information technology - ISO 7-bit coded character set for*
15 *information interchange.*
- 16 3. ISO/IEC 6429: *Information technology - Control functions for coded character sets.*
- 17 4. ISO 8348 (1987): *Information processing systems - Data communications - Network*
18 *service definition.*
- 19 5. ISO/IEC10646: *Universal Multiple-Octet Coded Character Set (UCS); UCS2, 16 bit*
20 *coding.*
- 21 6. IETF RFC 1034: *Domain names - Concepts and Facilities (STD 7).*

1 **1 Introduction**

2 This specification defines changes to Multi-Carrier (MC) CDMA (1X and 3X modes) needed to support
 3 operation with a core network that uses a version of the Global System for Mobile communications (GSM)
 4 Mobile Application Part (MAP). This mode of operation is known as MC over GSM MAP, or MC-MAP. Core
 5 network protocols, air interface Connection Management (CM) and Mobility Management (MM), and
 6 procedures are as defined by 3GPP.

7 **1.1 Architecture**

8 Figure 1.1-1 shows the network architecture of the CDMA MC radio access network, which supports
 9 connection to the GSM-MAP core network.



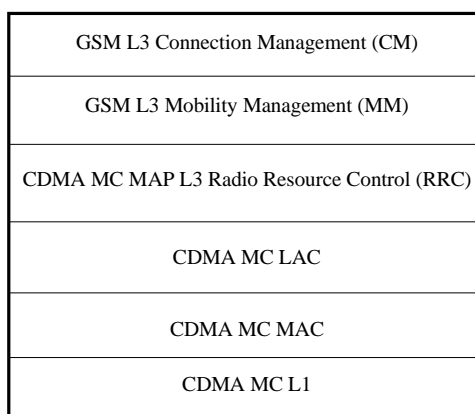
10

11 **Figure 1.1-1. MC-MAP Radio Access Network Architecture**

12 MC-MAP mobiles shall support connection to the GSM-MAP core network and shall support a Subscriber
 13 Identity Module (SIM)/UMTS Subscriber Identity Module (USIM).

14 Figure 1.1-2 shows the protocol stack for GSM-CDMA MC signaling.

15



1
2
3 **Figure 1.1-2. MC-MAP Protocol Stack**

4 There are two groups of protocols in the evolved GSM-MAP network. Non-Access Stratum (NAS) protocols
5 are terminated in the core network and include functionality related to mobility management and service aspects
6 of the system. Access Stratum protocols are terminated in the radio access networks and are responsible for the
7 radio interface aspects of the system.

8 The CDMA MC protocol stack plays the role of the access stratum protocols and is extended to support upper
9 GSM-MAP non-access stratum protocols (GSM RIL3 MM and CM, as defined in the 3GPP 24.0XX series.)

9 1.2 Terms

10 Terms defined in 3GPP2 C.S000X-A are not mentioned here. Terms specific to 3GPP and used verbatim are
11 mentioned with reference to appropriate 3GPP document that defines them. Terms specific to this document are
12 defined here.

13 1.2.1 Definitions

14 **3GPP.** Third Generation Partnership Project (1).

15 **3GPP2.** Third Generation Partnership Project 2.

16 **ANSI.** American National Standards Institute.

17 **Base Station Controller (BSC).** The intelligent section of the Base Station.

18 **Base Transceiver System (BTS).** The radio section of the Base Station

19 **BSC.** See Base Station Controller.

20 **BTS.** See Base Transceiver System.

21 **Call Control (CC).** See TR21.905

22 **CC.** See Call Control.

23 **CM.** See Connection Management.

24 **Connection Management (CM).** See TR21.905. CM includes Call Control (CC), Supplementary Services
25 (SS), and Short Message Services (SMS).

26 **ETSI.** European Telecommunications Standards Institute.

27 **IMEI.** See International Mobile Equipment Identity.

28 **International Mobile Equipment Identity (IMEI).** A number used to uniquely identify a mobile station in
29 GSM.

30 **ITU.** International Telecommunications Union.

31 **MAP.** Mobile Application Part.

32 **MAP-TMSI.** MAP Temporary Mobile Station Identity. It has the structure similar to TMSI defined in
33 TR21.905.

34 **MM.** See Mobility Management.

35 **Mobility Management (MM).** The ability to provide voice, data and location services to a user with mobility.

36 **NAS.** See Non-Access Stratum.

37 **Non-Access Stratum (NAS).** See TR21.905

38 **RAB.** See Radio Access Bearer.

1 **Radio Access Bearer (RAB)**. See TR21.905
2 **Radio Access Network (RAN)**. A network architecture element comprising the Base Station Controller and the
3 Base Transceiver System.
4 **RB**. See Radio Bearer.
5 **Radio Bearer (RAB)**. See TR21.905
6 **Radio Resource (RR)**. See TR21.905
7 **Radio Resource Control (RRC)**. See TR21.905
8 **RAN**. See Radio Access Network.
9 **RR**. See Radio Resource.
10 **RRC**. See Radio Resource Control.
11 **R-TMSI**. Radio Temporary Mobile Station Identity. It has the structure similar to TMSI defined in 3GPP2
12 C.S0005-A.
13 **SAPI**. Service Access Point Identifier.
14 **SIM**. See Subscriber Identity Module.
15 **Subscriber Identity Module (SIM)**. A smart card as defined by GSM 11.11.
16 The SIM contains subscriber-specific information and performs security
17 functions in GSM MAP networks.
18 **TIA**. Telecommunications Industry Association.
19 **UMTS**. Universal Mobile Telecommunication System.
20 **USIM**. UMTS Subscriber Identity Module. A SIM evolved to support 3G services in GSM MAP networks.
21 See the 3GPP 31.xxx series.
22
23 No Text
24

1 **2 Modifications to C.S0001-A, Introduction to cdma2000 Standards for Spread**
 2 **Spectrum Systems**

3 3GPP2 C.S0001-A provides an introduction to the cdma2000 standards. The few modifications that are given
 4 below are required to indicate that the standards are applicable to MAP networks using the modifications in this
 5 standard.

6 Section 1.1 of 3GPP2 C.S0001-A is modified as follows:

7 **2.1 The cdma2000 Family of Standards**

8 The cdma2000 family of standards specifies a spread spectrum radio interface that uses Code Division Multiple
 9 Access (CDMA) technology to meet the requirements for 3G wireless communication systems. The standards
 10 in the family are:

| | | |
|----|-------------------------------|--|
| 11 | C.S0001-AIS-2000-1 | <i>Introduction to cdma2000 Standards for Spread Spectrum Systems</i> |
| 12 | C.S0002-AIS-2000-2 | <i>Physical Layer Standard for cdma2000 Spread Spectrum Systems</i> |
| 13 | C.S0003-AIS-2000-3 | <i>Medium Access Control (MAC) Standard for cdma2000 Spread Spectrum</i> |
| 14 | | <i>Systems</i> |
| 15 | C.S0004-AIS-2000-4 | <i>Signaling Link Access Control (LAC) Standard for cdma2000 Spread</i> |
| 16 | | <i>Spectrum Systems</i> |
| 17 | C.S0005-AIS-2000-5 | <i>Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum</i> |
| 18 | | <i>Systems</i> |

19 The above standards provide the CDMA Multi-Carrier mode, IMT-2000 CDMA MC, of the ITU IMT-2000
 20 standards. Upper layer support is provided for the TIA/EIA-41 network, resulting in the MC-41 mode of
 21 operation. The cdma2000 system also includes a standard that specifies modifications that are required to
 22 support operation using the MAP Upper Layers, resulting in the MC-MAP mode of operation:

| | | |
|----|--------------------|--|
| 23 | C.S9003 | <u>cdma2000 Multi-Carrier on GSM MAP (MC-MAP) Standard for Spread Spectrum</u> |
| 24 | | <u>Systems</u> |

25 In addition, the family includes a standard that specifies analog operation, to support dual-mode mobile stations
 26 and base stations:

| | | |
|----|-------------------------------|---|
| 27 | C.S0006-AIS-2000-6 | <i>Analog Signaling Standard for cdma2000 Spread Spectrum Systems</i> |
|----|-------------------------------|---|

28 Throughout the remainder of this document, use of the term cdma2000 refers to the cdma2000 family of
 29 standards.

1 No text.

3 Modifications to C.S0002-A, Physical Layer Standard for cdma2000 Standards for Spread Spectrum Systems

3GPP2 C.S0002-A uses a permutation of the bits of the ESN for the Public Long Code Mask. MC-MAP will use the TMSI or a mask supplied by the base station, which does not depend on the availability of ESN. This requires the following deltas to 3GPP2 C.S0002-A (note that the ESN option is not required for MC-MAP).

Note: Where text from the 3GPP2 C.S000x-A series is modified, section headers reference the appropriate part of 3GPP2 C.S000x-A. Ellipsis [...] indicate blocks of unchanged text.

1.1 Terms

[...]

Public Long Code Mask. The long code mask used to form the public long code. The mask contains a permutation of the mobile station's ESN, ~~and the TMSI, or the particular mask specified by the base station.~~ The mask also includes the channel number when used for a Supplemental Code Channel. See also Private Long Code Mask and Long Code.

[...]

2.1.3.1.11 Direct Sequence Spreading

[...]

For the public long code mask, bits M_{346} through M_0 shall be specified by PLCM 37 (see 2.3.6 of 3GPP2 C.S0005-A). Bits M_{41} through M_{37} shall be set to '11000'. The resulting public long code mask is shown in Figure 2.1.3.1.11-2. ~~shall be set to a permutation of the mobile station's ESN as follows:~~

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

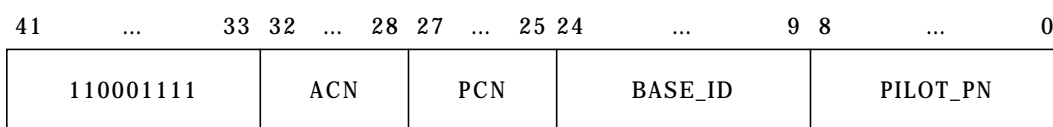
~~$Permuted\ ESN = (E_0, E_{31}, E_{22}, E_{13}, E_4, E_{26}, E_{17}, E_8, E_{30}, E_{21}, E_{12}, E_3, E_{25}, E_{16}, E_7, E_{29}, E_{20}, E_{11}, E_2, E_{24}, E_{15}, E_6, E_{28}, E_{19}, E_{10}, E_1, E_{23}, E_{14}, E_5, E_{27}, E_{18}, E_9)$~~

Bits M_{41} through M_{32} shall be set to '1100011000'. The resulting public long code mask is shown in Figure 2.1.3.1.11-2.

The private long code mask (See Fig. 2.1.3.1.11-3) shall be as follows: M_{41} through M_{40} shall be set to '01'. M_{39} through M_0 shall be the 40 least significant bits of the Voice Privacy Mask (VPM) generated by the Key_VPM_Generation procedure. M_0 of the private long code mask shall be the least significant bit of the VPM. The private long code mask is not to be changed during a call. See *Common Cryptographic Algorithms* for details of the Key_VPM_Generation procedure.

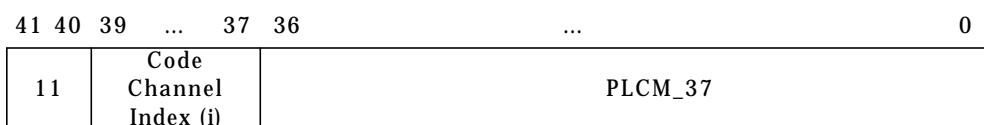
When a mobile station is transmitting on the Reverse Fundamental Channel or the Reverse Supplemental Code Channel, the mobile station shall use one of the following two long code masks unique to each channel: ~~A~~ a public long code mask ~~unique to the mobile station's ESN~~ or a private long code mask. The Reverse Fundamental Channel shall be assigned the channel number 0. Each of the $n - 1$ Reverse Supplemental Code Channels shall be assigned the numbers 1 through $n - 1$. Bits M_{39} through M_{37} of the public or private long code mask for assigned code channel i , $0 \leq i \leq n - 1 \leq NUM_REV_CODES_s$, shall be bit-by-bit XORed with the ~~binary value~~ binary value representation of i .

[...]



ACN - Access Channel Number
 PCN - Paging Channel Number
 BASE_ID - Base station identification
 PILOT_PN - Pilot PN sequence offset index for the Forward CDMA Channel

a) Access Channel Long Code Mask



Code Channel Index (i):
 '000': Reverse Fundamental Channel,
 '001' - '111': Reverse Supplemental Code Channel i, (i = 1,...,7)

b) Public Long Code Mask for the Reverse Fundamental Channel and the Reverse Supplemental Code Channels with Radio Configurations 1 and 2

Figure 2.1.3.1.11-2. Long Code Mask Format for Direct Sequence Spreading

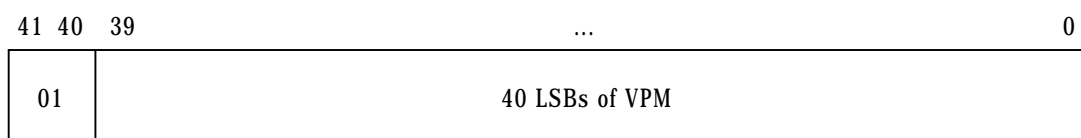


Figure 2.1.3.1.11-3. Private Long Code Mask

2.1.3.1.12 Quadrature Spreading

[...]

When transmitting on the Reverse Common Control Channel while in Designated Access Mode, the mobile station shall use one of the following three long code masks designated by the base station: ~~A~~ a public long code mask ~~unique to the mobile station's ESN~~ (see Figure 2.1.3.1.12-1), a private long code mask (see Figure 2.1.3.1.11-3), or a scheduled common long code mask. The public and private long code masks shall be as specified in 2.1.3.1.11. The scheduled common long code mask shall be as follows: bits M_{41} through M_{33} shall be set to '110001101'; bits M_{32} through M_{28} shall be set to the Reverse Common Control Channel number chosen; bits M_{27} through M_{25} shall be set to the code channel number for the associated Forward Common Control Channel (the range is 1 through 7); bits M_{24} through M_0 shall be set to $BASE_ID_s$ for the current base station; and bits M_8 through M_0 shall be set to $PILOT_PN_s$ for the current CDMA Channel (see Figure 2.1.3.1.12-2).

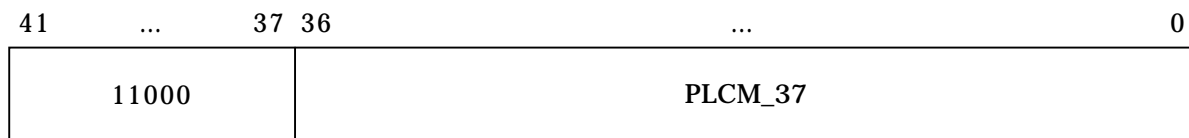
When transmitting on the Reverse Traffic Channel, the mobile station shall use one of the following two long code masks: ~~A~~ a public long code mask ~~unique to the mobile station's ESN~~ (see Figure 2.1.3.1.12-1) or a private long code mask (see Figure 2.1.3.1.11-3). The public and private long code masks shall be as specified in 2.1.3.1.11.

[...]

3.1.3.10.7 Forward Dedicated Control Channel Data Scrambling

The Forward Dedicated Control Channel shall be scrambled as specified in 3.1.3.1.9. The public long code mask shall be as shown in Figure 3.1.3.10.7-1. ~~The permutation of the ESN bits in the public long code mask shall be as specified in 2.1.3.12.~~ The generation of the private long code mask shall be as specified in 2.1.3.1.12.

1



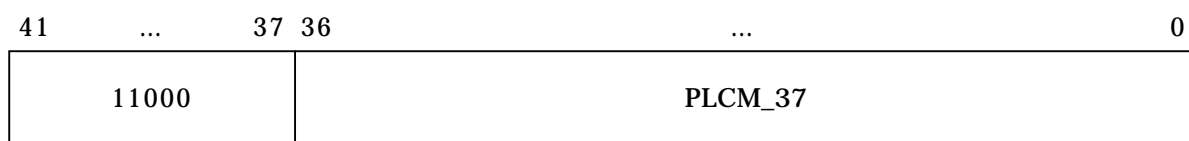
2

Figure 3.1.3.10.7-1. Forward Dedicated Control Channel Public Long Code Mask

3.1.3.11.7 Forward Fundamental Channel Data Scrambling

The Forward Fundamental Channel data shall be scrambled as specified in 3.1.3.1.9. The public long code mask shall be as shown in Figure 3.1.3.11.7-1. ~~The permutation of the ESN bits in the public long code mask shall be as specified in 2.1.3.12.~~ The generation of the private long code mask shall be as specified in 2.1.3.1.12.

8



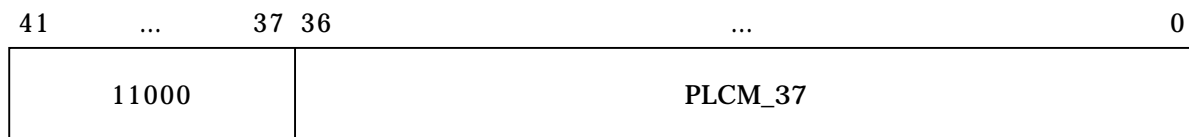
9

Figure 3.1.3.11.7-1. Forward Fundamental Channel Public Long Code Mask

3.1.3.12.7 Forward Supplemental Channel Data Scrambling

The data for Forward Supplemental Channels shall be scrambled as specified in 3.1.3.1.9. The same long code mask is used for all code channels of the Forward Traffic Channel. The public long code mask shall be as shown in Figure 3.1.3.12.7-1. ~~The permutation of the ESN bits in the public long code mask shall be as specified in 2.1.3.12.~~ The generation of the private long code mask shall be as specified in 2.1.3.1.12.

16



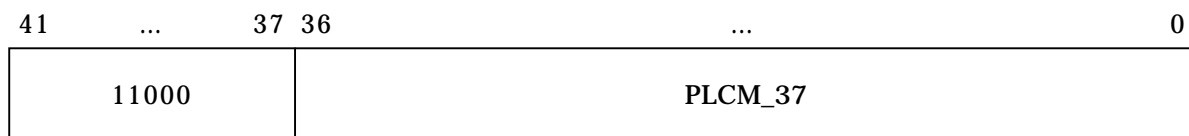
17

Figure 3.1.3.12.7-1. Forward Supplemental Channel Public Long Code Mask

3.1.3.13.7 Forward Supplemental Code Channel Data Scrambling

The data for Forward Supplemental Code Channels shall be scrambled as specified in 3.1.3.1.9. The same long code mask is used for all code channels of the Forward Traffic Channel. The public long code mask shall be as shown in Figure 3.1.3.13.7-1. ~~The permutation of the ESN bits in the public long code mask shall be as specified in 2.1.3.12.~~ The generation of the private long code mask shall be as specified in 2.1.3.1.12.

24



25

Figure 3.1.3.13.7-1. Forward Supplemental Code Channel Public Long Code Mask

26

27

- 1 4 Modifications to C.S0003-A, *Medium Access Control (MAC) Standard for*
- 2 *cdma2000 Standards for Spread Spectrum Systems*
- 3 No changes required.

1 No text.

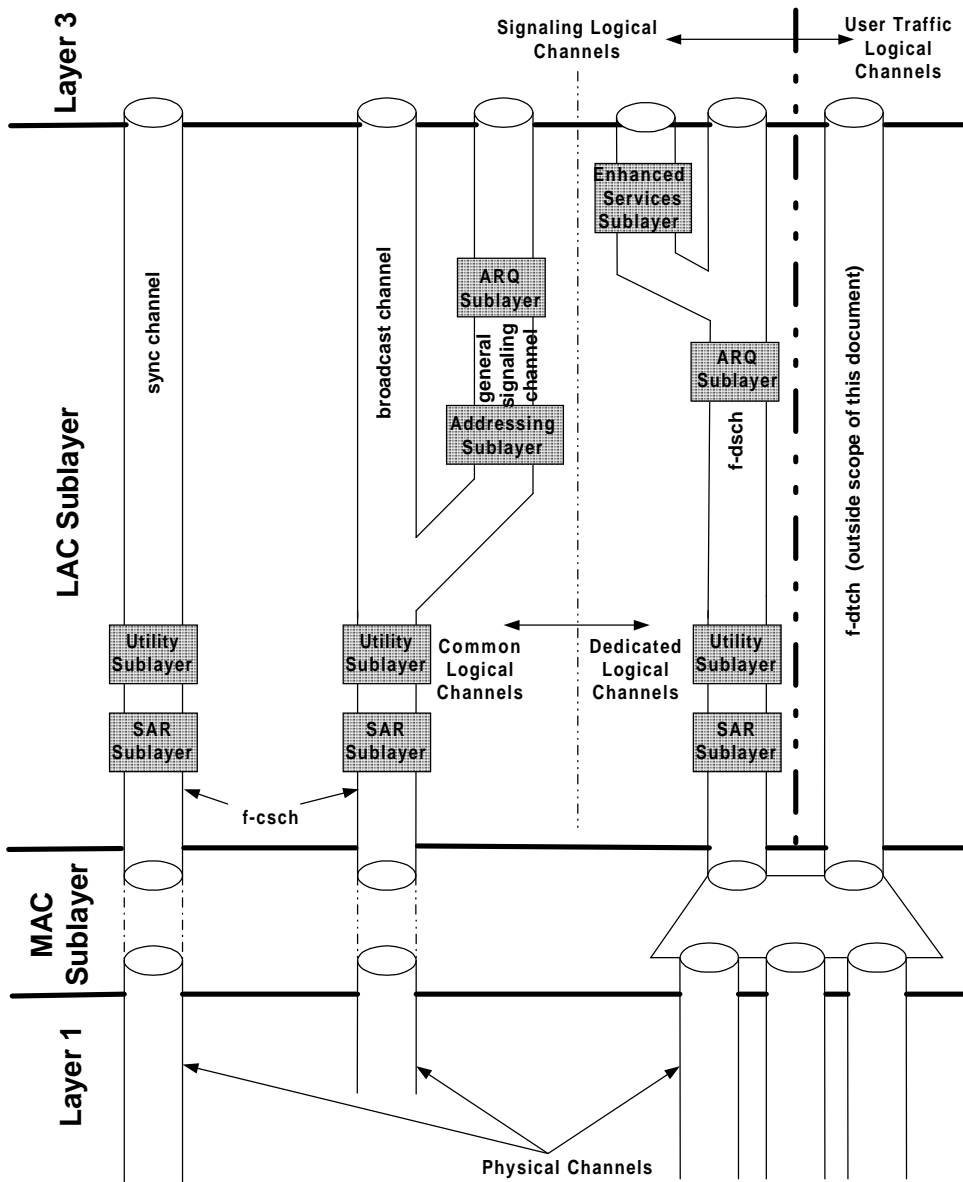
1 **5 Modifications to C.S0004-A, *Signaling Link Access Control (LAC) Standard for***
2 ***cdma2000 Standards for Spread Spectrum Systems***

3 Figure 5-1 shows the architecture for the MC-MAP LAC on the forward logical channels, and Figure 5-2 shows
4 the architecture for the MC-MAP LAC on the reverse logical channels. Figure 5-3 illustrates how data units are
5 processed in each of the LAC sublayers.

6 To support MC-MAP operations, an Enhanced Services Sublayer is added on the forward dedicated signaling
7 channel (f-dsch) and the reverse dedicated signaling channel (r-dsch) to the architecture described in 3GPP2
8 C.S0004-A. The Enhanced Services Sublayer is not used with RR messages nor MC-41 mobile stations.

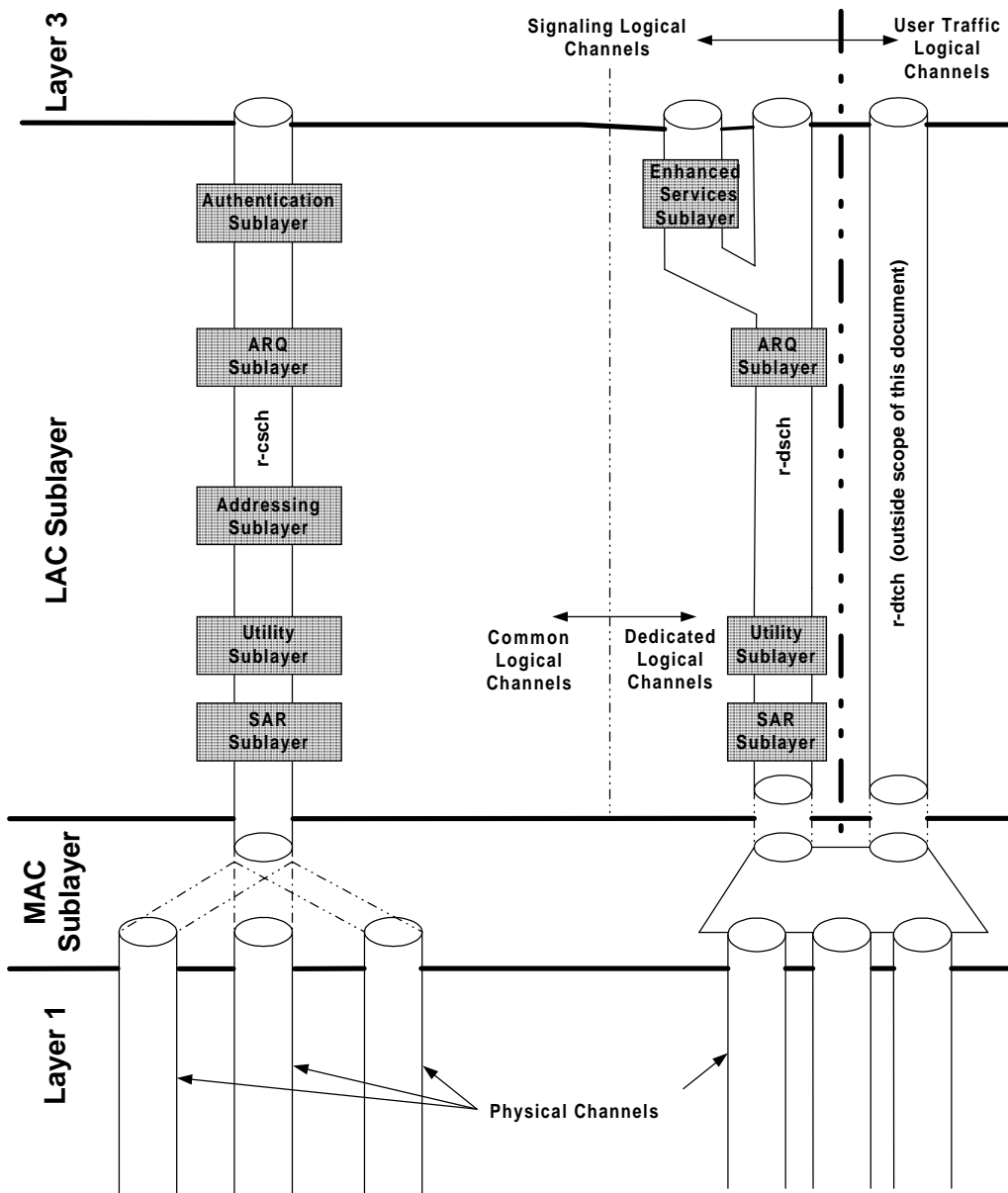
9 The functions and procedures for the Authentication Sublayer, ARQ Sublayer, Addressing Sublayer, Utility
10 Sublayer and the SAR Sublayer are described in 3GPP2 C.S0004-A. When operating with an MC-MAP mobile
11 station, the Authentication Sublayer is disabled, as the authentication services are provided at the MAP Layer 3
12 level. The ARQ sublayer is unmodified for MC-MAP operations. To support MC-MAP operations, MAP-type
13 addresses are added to the addressing sublayer. The modifications to 3GPP2 C.S0004-A required to provide the
14 functionality of 3GPP2 C.S0004-A in MC-MAP mode of operation are described in 5.1.

15 The Enhanced Services and the modifications to 3GPP2 C.S0004-A required to provide these services in MC-
16 MAP mode of operation are described in 5.2.



1
2
3
4

Figure 5-1. Forward Logical Channel Architecture for MC-MAP



1
2
3
4

Figure 5-2. Reverse Logical Channel Architecture for MC-MAP

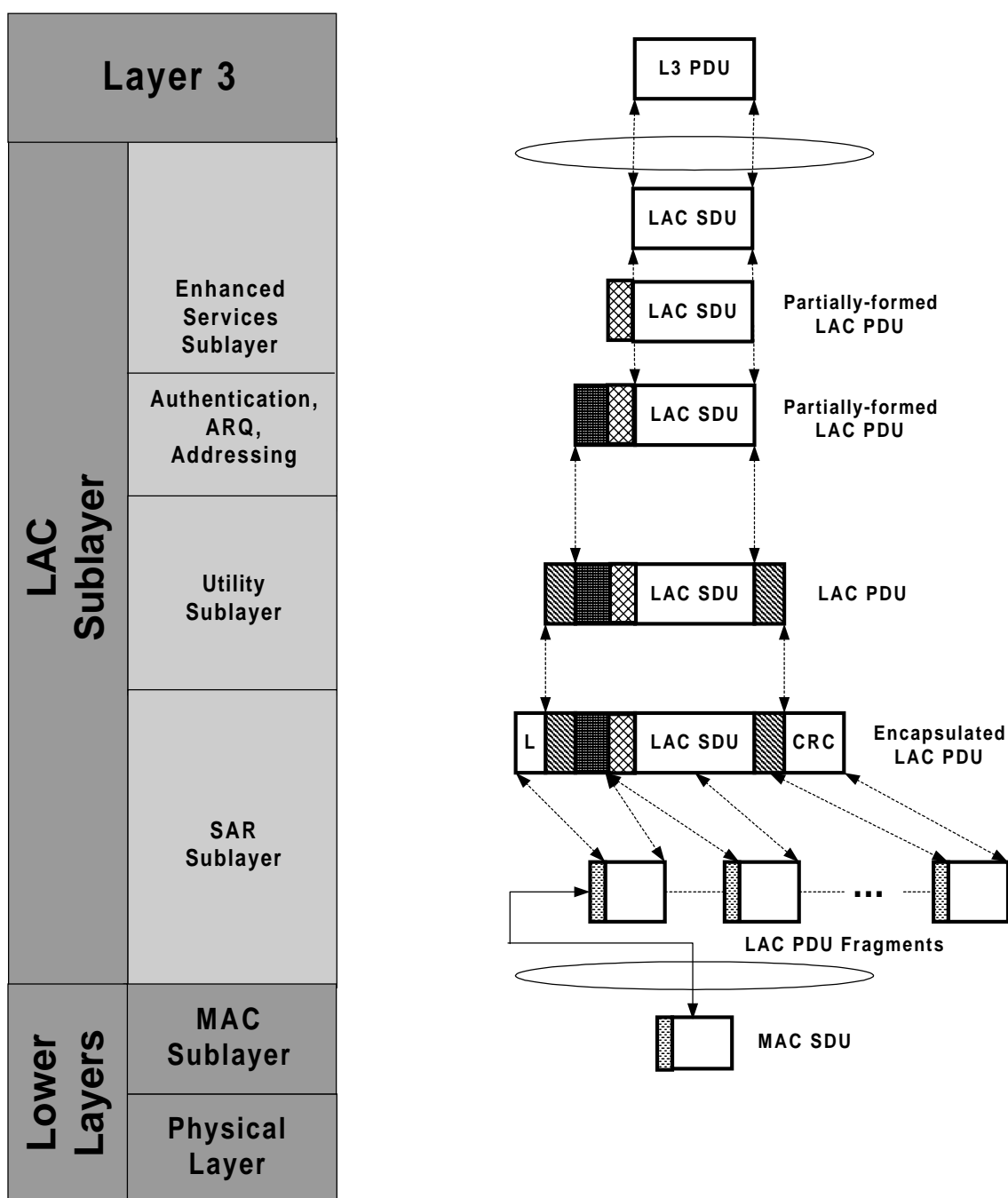


Figure 5-3. Data Unit Processing for MC-MAP LAC

1
2

3
4

5 5.1 Modifications to Existing Sections of 3GPP2 C.S0004-A

6 5.1.1 Additions to 1.1.2 of 3GPP2 C.S0004-A

7 ASSIGN_LAC_{s-p} – A 16 bit Location Area Code assigned to mobile station.

8 ASSIGN_RAC_{s-p} – A 16 bit Routing Area Code assigned to mobile station.

9 ASSIGNING_R_TMSI_ZONE_LEN_s – The 4-bit assigning R_TMSI zone length.

- 1 **ASSIGNING_R_TMSI_ZONE_s** – The 8-octet assigning TMSI zone length.
 2 **MAP-TMSI_{s-p}** – A 4-octet MAP-TMSI that uniquely identifies the mobile station within the assigned Location
 3 Area assigned by the circuit switched core network.
 4 **MAP-P-TMSI_{s-p}** – A 4-octet MAP-TMSI that uniquely identifies the mobile station within the assigned
 5 Location Area assigned by the packet switched core network.
 6 **MNC_O_s** – The Mobile Network Code of IMSI_O.
 7 **R_TMSI_CODE_s** – The 4-octet R_TMSI code that uniquely identifies the mobile station with the assigning
 8 R_TMSI zone.
 9 **R_TMSI_USED_s** – Base station's preference of the use of R_TMSI.
 10 **R_TMSI_ZONE_s** – The R_TMSI zone number of the base station, from 1 to 8 octets in length.
 11 **R_TMSI_ZONE_LEN_s** – The number of octets in TMSI zone.

12 **5.1.2 Changes to Section 2.1.1.1.2 of 3GPP2 C.S0004-A**
 13 The mobile station shall set AUTH_MODE to '00'.

14 **5.1.3 Changes to Section 2.1.1 of 3GPP2 C.S0004-A**

15 **5.1.3.1 Changes to Section 2.1.1.3.1.1 of 3GPP2 C.S0004-A**
 16 Table 2.1.1.3.1.1-1 is modified as follows:

17 **Table 2.1.1.3.1.1-1. Address Types**

| Description | MSID_TYPE (binary) | MSID_LEN (octets) |
|---|-----------------------|----------------------|
| IMSI_S and ESN (Band Class 0 only) | 000 | 9 |
| ESN | 001 | 4 |
| IMSI | 010 | 5 to 7 |
| IMSI and ESN | 011 | 9 to 11 |
| TMSI | 101 | 2 to 12 |
| <u>R-TMSI</u> | <u>110</u> | <u>2 to 12</u> |
| <u>MC-MAP Address</u> | <u>111</u> | <u>5 to 10</u> |
| All other MSID_TYPE values are reserved. | | |

18

19 The MSID field for MSID_TYPE equal to '110' and '111' are defined as follows:

20 If MSID_TYPE is equal to '110', the MSID field consists of the following subfields:

| <u>Subfield</u> | <u>Length (bits)</u> |
|-------------------------|--|
| <u>R TMSI_ZONE</u> | <u>If MSID_LEN is greater than four, $8 \times (\text{MSID_LEN} - 4)$; otherwise, 0.</u> |
| <u>R TMSI_CODE_ADDR</u> | <u>If MSID_LEN is greater than four, 32; otherwise, $8 \times \text{MSID_LEN}$.</u> |

1 If MSID_TYPE is equal to '111', the MSID field consists of the following subfields:

| <u>Subfield</u> | <u>Length (bits)</u> |
|----------------------------------|---|
| <u>MC_MAP_ADDR_TYPE</u> | <u>4</u> |
| <u>MC-MAP-specific subfields</u> | <u>$4 + 8 \times (\text{MSID_LEN} - 1)$</u> |

2 For MSID_TYPE equal to '111', additional addressing parameters are represented in Table 2.1.1.3.1.1-4.

3 Table 2.1.1.3.1.1-4. MC_MAP_ADDR_TYPE Address Types

| <u>Description</u> | <u>MC_MAP_ADDR_TYPE (binary)</u> | <u>Length of MC_MAP Type-specific Subfields (bits)</u> |
|---|--------------------------------------|--|
| <u>MAP-TMSI included</u> | <u>0000</u> | <u>36</u> |
| <u>MAP-TMSI and LAI included</u> | <u>0001</u> | <u>68</u> |
| <u>MAP-TMSI and RAI included</u> | <u>0010</u> | <u>76</u> |
| <u>IMEI included</u> | <u>0011</u> | <u>36</u> |
| <u>All other MC_MAP_ADDR_TYPE values are reserved</u> | | |

4 The MCC, MNC, and LAC comprise the Location Area Identity (LAI) (see 4.1 of 3GPP TS 23.003); the MCC,
5 MNC, LAC, and RAC comprise the Routing Area Identity (RAI).

6 If MC_MAP_ADDR_TYPE is equal to '0000', then MC-MAP-specific subfields consist of:

| <u>Subfield</u> | <u>Length (bits)</u> |
|-----------------|----------------------|
| <u>RESERVED</u> | <u>4</u> |
| <u>MAP_TMSI</u> | <u>32</u> |

7 MAP_TMSI TMSI for MAP networks.

8 The TMSI is coded as a binary number as described in 2.4 of 3GPP
9 TS 23.003.

10 If MC_MAP_ADDR_TYPE is equal to '0001', then MC-MAP-specific subfields consist of:

| <u>Subfield</u> | <u>Length (bits)</u> |
|-----------------|----------------------|
| <u>MCC</u> | <u>10</u> |
| <u>MNC</u> | <u>10</u> |
| <u>LAC</u> | <u>16</u> |
| <u>MAP_TMSI</u> | <u>32</u> |

- 1 MCC Mobile Country Code (see 2.3.1 of 3GPP2 C.S0005-A).
- 2 MNC Mobile Network Code (see 2.3.1.4 of 3GPP2 C.S0005-A).
- 3 LAC Location Area Code.
- 4 The LAC is coded as a binary number as described in 4.1 of 3GPP TS
- 5 23.003.
- 6 MAP_TMSI TMSI for MAP networks.
- 7 The TMSI is coded as a binary number as described in 2.4 of 3GPP
- 8 TS 23.003.

9 If MC_MAP_ADDR_TYPE is equal to '0010', then MC-MAP-specific subfields consist of:

| <u>Subfield</u> | <u>Length (bits)</u> |
|-----------------|----------------------|
| <u>MCC</u> | <u>10</u> |
| <u>MNC</u> | <u>10</u> |
| <u>LAC</u> | <u>16</u> |
| <u>RAC</u> | <u>8</u> |
| <u>MAP_TMSI</u> | <u>32</u> |

- 10 MCC Mobile Country Code (see 2.3.1 of 3GPP2 C.S0005-A).
- 11 MNC Mobile Network Code (see 2.3.1.4 of 3GPP2 C.S0005-A).
- 12 LAC Location Area Code.
- 13 The LAC is coded as a binary number as described in 4.1 of 3GPP TS
- 14 23.003.
- 15 RAC Routing Area Code.
- 16 The RAC is coded as a binary number as described in 4.2 of 3GPP TS
- 17 23.003.
- 18 MAP_TMSI TMSI for MAP networks.
- 19 The TMSI is coded as a binary number as described in 2.4 of 3GPP
- 20 TS 23.003.

21 If MC_MAP_ADDR_TYPE is equal to '0011', then MC-MAP-specific subfields consist of:

| <u>Subfield</u> | <u>Length (bits)</u> |
|-----------------|----------------------|
| <u>RESERVED</u> | <u>4</u> |
| <u>IMEI</u> | <u>60</u> |

1 IMEI International Mobile Equipment Identity.

2 The IMEI is coded as a sequence of 15 BCD digits as described in
3 6.2.1 of 3GPP TS 23.003.

4 5.1.3.2 Changes to Section 2.1.1.3.1.2 of 3GPP2 C.S0004-A (Requirements for Setting the
5 Addressing Fields)

6 The MC-MAP mobile station shall ignore the requirements listed in 2.1.1.3.1.2 of 3GPP2 C.S0004-A. It shall
7 determine and set the type of address to use for all PDUs sent on r-csch, as follows:

- 8 • The mobile station shall set MSID_TYPE to '010' and shall use the IMSI_O as the mobile
9 station identifier if all of the following conditions are met:

- 10 – The mobile station has been assigned an IMSI_T,
- 11 – MAP-TMSIs-p or MAP-P-TMSIs-p has not been assigned or all four octets of MAP-
12 TMSIs and MAP-P-TMSIs-p are equal to '1', and
- 13 – R_TMSI_USED_s is equal to '0'.

14 The mobile station shall include the following subfields in the MSID field:

15 IMSI_CLASS The mobile station shall set this field as specified in
16 2.1.1.3.1.3 of 3GPP2 C.S0004-A.

17 IMSI class-specific IMSI class-specific subfields.

18 subfields The mobile station shall set these fields as specified in
19 2.1.1.3.1.3 of 3GPP2 C.S0004-A.

- 20 • The mobile station shall set MSID_TYPE to '101' and shall use the R-TMSI as the mobile
21 station identifier if both of the following conditions are met:

- 22 – R_TMSI_USED_s is equal to '1';
- 23 – The bits of R-TMSI_CODE_{s-p} are not all equal to '1'.

24 The mobile station shall determine the value of the MSID_LEN field according to the
25 procedure described in 2.1.1.3.1.2.1, and then the mobile station shall include the
26 following subfields in the MSID subfields:

27 R_TMSI_ZONE If MSID_LEN is greater than four, the mobile station
28 shall set this field to the
29 ASSIGNING_R_TMSI_ZONE_LEN_s most significant
30 octets of ASSIGNING_R_TMSI_ZONE_s, the assigning
31 R_TMSI zone. If MSID_LEN is less than or is equal to
32 four, the mobile station shall omit this field.

33 R_TMSI_CODE_ADDR If R_TMSI_ZONE is included in the address, the mobile
34 station shall set this field to the 32-bit R-TMSI code
35 assigned to the mobile station.

If R_TMSI_ZONE is not included in the address, the mobile station shall set this field as follows:

1. If the most significant octet of the R_TMSI_CODE assigned to the mobile station is equal to '00000000', and if the second most significant octet of the R_TMSI_CODE assigned to the mobile station is not equal to '00000000', the mobile station shall set R_TMSI_CODE_ADDR to the 24 least significant bits of the R_TMSI_CODE assigned to the mobile station.
2. If the two most significant octets of the R_TMSI_CODE assigned to the mobile station are both equal to '00000000', the mobile station shall set R_TMSI_CODE_ADDR to the 16 least significant bits of the R_TMSI_CODE assigned to the mobile station.
3. In all other cases, the mobile station shall set R_TMSI_CODE_ADDR to the R_TMSI_CODE assigned to the mobile station.

- The mobile station shall set MSID_TYPE to '111' and MC_MAP_ADDR_TYPE to '0000', and shall use the MAP-TMSI as the mobile station identifier if all of the following conditions are met:

- R_TMSI_USED_s is equal to '0'.
- MAP-TMSI_{s-p} or MAP-P-TMSI_{s-p} has been assigned and all four octets of the corresponding TMSI are not equal to '1'.
- ASSIGN_LAC_{s-p} is equal to LAC_s, or all 16 bits of ASSIGN_LAC_{s-p} are either '0' or '1'.
- MNC_O_s is equal to MNC_s.
- MCC_O_s is equal to MCC_s.
- If MAP-P-TMSI_{s-p} is assigned, and MAP-TMSI_{s-p} is not assigned, ASSIGN_RAC_{s-p} is equal to RAC_s.

The mobile station shall include the following MC-MAP-specific subfields:

RESERVED The mobile station shall set this field to '0000'.

MAP-TMSI The mobile station shall set this field to MAP-TMSI_{s-p} if MAP-TMSI_{s-p} is assigned; otherwise the mobile station shall set this field to MAP-P-TMSI_{s-p}.

- The mobile station shall set MSID_TYPE to '111' and MC_MAP_ADDR_TYPE to '0001' and shall use the MAP-TMSI with LAI as the mobile station identifier if all of the following conditions are met:

- R_TMSI_USED_s is equal to '0'.
- MAP-TMSI_{s-p} has been assigned, and all four octets of MAP-TMSI_{s-p} not equal to '1'.
- ASSIGN_LAC_{s-p} is not equal to LAC_s, or MNC_O_s is not equal to MNC_s, or MCC_O_s is not equal to MCC_s.

The mobile station shall include the following MC-MAP-specific subfields:

MCC The mobile station shall set this field to MCC_O_s.

- 1 MNC The mobile station shall set this field to MNC_{O_s}.
- 2 LAC The mobile station shall set this field to ASSIGN_LAC_{S-p}.
- 3 MAP-TMSI The mobile station shall set this field to MAP-TMSI_{S-p}.
- 4 • The mobile station shall set MSID_TYPE to '111' and MC_MAP_ADDR_TYPE to '0010',
5 and shall use the MAP_TMSI with RAI as the mobile station identifier if all of the
6 following conditions are met:
- 7 – R_TMSI_USED_S is equal to '0'.
- 8 – MAP-TMSI_{S-p} is not assigned.
- 9 – MAP-P-TMSI_{S-p} has been assigned, and all four octets of MAP-P-TMSI_{S-p} are not
10 equal to '1'.
- 11 – ASSIGN_RAC_{S-p} is not equal to RAC_S, or ASSIGN_LAC_{S-p} is not equal to LAC_S, or
12 MNC_O_S is not equal to MNC_S, or MCC_O_S is not equal to MCC_S.
- 13 The mobile station shall include the following MC-MAP-specific subfields:
- 14 MCC The mobile station shall set this field to MCC_O_S.
- 15 MNC The mobile station shall set this field to MNC_O_S.
- 16 LAC The mobile station shall set this field to ASSIGN_LAC_{S-p}.
- 17 RAC The mobile station shall set this field to ASSIGN_RAC_{S-p}.
- 18 MAP-TMSI The mobile station shall set this field to MAP-P-TMSI_{S-p}.
- 19 • The mobile station shall set MSID_TYPE to '111' and MC_MAP_ADDR_TYPE to '0011'
20 and shall use IMEI as the mobile station identifier if all of the following conditions are
21 met:
- 22 – R_TMSI_USED_S is equal to '0'.
- 23 – The mobile station has not been assigned a valid MAP-TMSI_{S-p} or MAP-P-TMSI_{S-p}
- 24 – The mobile station has not been assigned a valid IMSI T.
- 25 The mobile station shall include the following MC-MAP-specific subfields:
- 26 RESERVED The mobile station shall set this field to '0000'.
- 27 IMEI The mobile station shall set this field to its IMEI
28 (see 6.2.1 of 3GPP TS 23.003).

29 5.1.3.3 Changes to Section 2.1.1.3.1.2.1 of 3GPP2 C.S0004-A (Value of MSID_LEN field)
30 If MSID_TYPE is not equal to '101' or '110', the mobile station shall set MSID_LEN to the number of octets
31 included in MSID (see Table 2.1.1.3.1.1-1). If MSID_TYPE is equal to '110', the mobile station shall set
32 MSID_LEN as follows:

- 33 • The mobile station shall set MSID_LEN to 4 (R_TMSI_CODE_ADDR is to include all four
34 octets of R_TMSI_CODEs) if all of the following conditions are met:
- 35 – ASSIGNING_R_TMSI_ZONE_LEN_S is equal to R_TMSI_ZONE_LEN_S,
- 36 – The least significant ASSIGNING_R_TMSI_ZONE_LEN_S octets of

- 1 - ASSIGNING R TMSI ZONE_s are equal to R TMSI ZONE_s.
- 2 - The most significant octet of R TMSI CODE_s is not equal to '00000000'.
- 3 • The mobile station shall set MSID_LEN to 3 (R TMSI CODE_ADDR is to include the
4 three least significant octets of R TMSI CODE_s) if all following conditions are met:
- 5 - ASSIGNING R TMSI ZONE_LEN_s is equal to R TMSI ZONE_LEN_s.
- 6 - The least significant ASSIGNING R TMSI ZONE_LEN_s octets of
7 ASSIGNING R TMSI ZONE_s are equal to R TMSI ZONE_s and
- 8 - The most significant octet of R TMSI CODE_s is equal to '00000000'.
- 9 - The next most significant octet of R TMSI CODE_s is not equal to '00000000'.
- 10 • The mobile station shall set MSID_LEN to 2 (R TMSI CODE_ADDR is to include the two
11 least significant octets of R TMSI CODEs) if all of the following conditions are met:
- 12 - ASSIGNING R TMSI ZONE_LEN_s is equal to R TMSI ZONE_LEN_s.
- 13 - The least significant ASSIGNING R TMSI ZONE_LEN_s octets of
14 ASSIGNING R TMSI ZONE_s are equal to R TMSI ZONE_s and
- 15 - The two most significant octets of R TMSI CODE_s are both equal to '00000000'.
- 16 • The mobile station shall set MSID_LEN to 4 + ASSIGNING R TMSI ZONE_LEN_s
17 (R TMSI ZONE is to include the ASSIGNING R TMSI ZONE_LEN_s least significant
18 octets of ASSIGNING R TMSI ZONE_s while R TMSI CODE_ADDR is to include all four
19 octets of R TMSI CODEs) if all of the following condition is met:
- 20 - ASSIGNING R TMSI ZONE_LEN_s is not equal to R TMSI ZONE_LEN_s.
- 21 - The least significant ASSIGNING R TMSI ZONE_LEN_s octets of
22 ASSIGNING R TMSI ZONE_s are not equal to R TMSI ZONE_s.

23 5.1.3.4 Changes to Section 2.1.1.4 of 3GPP2 C.S0004-A

24 The following entries are added to Table 2.1.1.4.1.1.2-1:

| Message Name | MSG_TAG | MSG_ID (binary) |
|--|----------------|--------------------|
| <i>RR-level Registration Message</i> | RRLRM | <u>001101</u> |
| <i>MC-MAP Initial L3 Message</i> | <u>MAPIL3M</u> | <u>001110</u> |
| <i>MC-MAP L3 Message</i> | <u>MAPL3M</u> | <u>001111</u> |
| <i>MC-MAP RRC Connection Request Message</i> | <u>MAPCRM</u> | <u>010000</u> |
| <i>R-TMSI Assignment Completion Message</i> | <u>RTACM</u> | <u>010001</u> |

1 5.1.4 Changes to Section 2.1.2 of 3GPP2 C.S0004-A

2 5.1.4.1 Changes to Section 2.1.2.2.1 of 3GPP2 C.S0004-A (Page Match Procedure for the 3 General Page Message)

4 The mobile station shall process the records in the *General Page Message* in the order they occur, using the
5 following procedures:

- 6 • The mobile station shall ignore all remaining bits in the message if a page record has:
 - 7 – PAGE_CLASS equal to '01' and PAGE_SUBCLASS equal to '10' or '11', or
 - 8 – PAGE_CLASS equal to '11' and PAGE_SUBCLASS equal to '11', or
 - 9 – PAGE_CLASS equal to '11', PAGE_SUBCLASS equal to '10' and
10 PAGE_SUBCLASS_EXT = '11'.
- 11 • The MC-MAP mobile station shall also ignore the remaining bits in the record if a page
12 record has PAGE_CLASS equal to '01' or '10'.
- 13 • If PAGE_CLASS is equal to '11', PAGE_SUBCLASS is equal to '01' and
14 PAGE_SUBCLASS_EXT is equal to '00', the mobile station shall declare a page match if
15 all of the following conditions are met:
 - 16 – The bits of R_TMSI_CODE_s are not all equal to '1'.
 - 17 – ASSIGNING_R_TMSI_ZONE_LEN_s is equal to R_TMSI_ZONE_LEN_s.
 - 18 – The least significant ASSIGNING_R_TMSI_ZONE_LEN_s octets of
19 ASSIGNING_R_TMSI_ZONE_s are equal to R_TMSI_ZONE_s.
 - 20 – R_TMSI_CODE_s is equal to the R_TMSI_CODE_ADDR received in the page record.
- 21 • If PAGE_CLASS is equal to '11', PAGE_SUBCLASS is equal to '01' and
22 PAGE_SUBCLASS_EXT is equal to '01', the mobile station shall declare a page match if
23 all of the following conditions are met:
 - 24 – The bits of R_TMSI_CODE_s are not all equal to '1'.
 - 25 – ASSIGNING_R_TMSI_ZONE_LEN_s is equal to R_TMSI_ZONE_LEN_s.
 - 26 – The least significant ASSIGNING_R_TMSI_ZONE_LEN_s octets of
27 ASSIGNING_R_TMSI_ZONE_s are equal to R_TMSI_ZONE_s.

- 1 - The most significant octet of R_TMSI_CODE_s is equal to '00000000'.
- 2 - The least significant 24 bits of R_TMSI_CODE_s are equal to the
- 3 R_TMSI_CODE_ADDR received in the page record.
- 4 • If PAGE_CLASS is equal to '11', PAGE_SUBCLASS is equal to '01' and
- 5 PAGE_SUBCLASS_EXT is equal to '10', the mobile station shall declare a page match if
- 6 all of the following conditions are met:
- 7 - The bits of R_TMSI_CODE_s are not all equal to '1'.
- 8 - ASSIGNING_R_TMSI_ZONE_LEN_s is equal to R_TMSI_ZONE_LEN_s.
- 9 - The least significant ASSIGNING_R_TMSI_ZONE_LEN_s octets of
- 10 ASSIGNING_R_TMSI_ZONE_s are equal to R_TMSI_ZONE_s.
- 11 - The two most significant octets of R_TMSI_CODE_s are both equal to '00000000'.
- 12 - The least significant 16 bits of R_TMSI_CODE_s are equal to the
- 13 R_TMSI_CODE_ADDR received in the page record.
- 14 • If PAGE_CLASS is equal to '11', PAGE_SUBCLASS is equal to '01' and
- 15 PAGE_SUBCLASS_EXT is equal to '11', the mobile station shall declare a page match if
- 16 all of the following conditions are met:
- 17 - The bits of R_TMSI_CODE_s are not all equal to '1'.
- 18 - ASSIGNING_R_TMSI_ZONE_LEN_s is equal to the R_TMSI_ZONE_LEN received in the
- 19 page record.
- 20 - The least significant ASSIGNING_R_TMSI_ZONE_LEN_s octets of
- 21 ASSIGNING_R_TMSI_ZONE_s are equal to the R_TMSI_ZONE received in the page
- 22 record.
- 23 - R_TMSI_CODE_s is equal to the R_TMSI_CODE_ADDR received in the page record.
- 24 • If PAGE_CLASS is equal to '11', PAGE_SUBCLASS is equal to '10' and
- 25 PAGE_SUBCLASS_EXT is equal to '00', the mobile station shall declare a page match if
- 26 any one of the following conditions is met:
- 27 - The bits of MAP-TMSI_{s-p} or MAP-P-TMSI_{s-p} are not all equal to '1'.
- 28 - Either MAP-TMSI_{s-p} or MAP-P-TMSI_{s-p} is equal to MAP-TMSI received in the page
- 29 record.
- 30 - ASSIGN_LAC_{s-p} is equal to LAC_s.
- 31 - MNC_O_s is equal to MNC_s.
- 32 - MCC_O_s is equal to MCC_s.
- 33 - If MAP-P-TMSI_{s-p} is equal to MAP-TMSI received, ASSIGN_RAC_{s-p} is equal to RAC_s.
- 34 • If PAGE_CLASS is equal to '11', PAGE_SUBCLASS is equal to '10' and
- 35 PAGE_SUBCLASS_EXT is equal to '01', the mobile station shall declare a page match if
- 36 all of the following conditions are met:

- 1 - The bits of MAP-TMSI_{S-P} are not all equal to '1'.
 2 - MAP-TMSI_{S-P} is equal to MAP-TMSI received in the page record.
 3 - ASSIGN_LAC_{S-P} is equal to LAC received in the page record.
 4 - MNC_O_S is equal to MNC received in the page record.
 5 - MCC_O_S is equal to MCC received in the page record.
 6 • If PAGE_CLASS is equal to '11', PAGE_SUBCLASS is equal to '10' and
 7 PAGE_SUBCLASS_EXT is equal to '10', the mobile station shall declare a page match if
 8 all of the following conditions are met:
 9 - The bits of MAP-P-TMSI_{S-P} are not all equal to '1'.
 10 - MAP-P-TMSI_{S-P} is equal to MAP-TMSI received in the page record.
 11 - ASSIGN_RAC_{S-P} is equal to the RAC received in the page record.
 12 - ASSIGN_LAC_{S-P} is equal to LAC received in the page record.
 13 - MNC_O_S is equal to MNC received in the page record.
 14 - MCC_O_S is equal to MCC received in the page record.

15 5.1.4.2 Addition to Section 2.1.2.2.2.2 of 3GPP2 C.S0004-A (Address Recognition
 16 Procedures for Messages other than the General Page Message)

17 The MC-MAP mobile station shall ignore the rest of the bits in the received PDU if the ADDR_TYPE is equal
 18 to '000' or '001' or '011'.

19 In additions to the procedures listed in 2.1.2.2.2.2 of 3GPP2 C.S0004-A, mobile station shall use the following
 20 procedures to determine an address match.

21 If the ADDR_TYPE is equal to '110' (the address is an R-TMSI address), the mobile station shall declare an
 22 address match if all of the following conditions are met:

- 23 • The bits of R_TMSI_CODEs are not all equal to '1', and the received ADDR_LEN is less
 24 than or equal to four:
 25 - ASSIGNING_R_TMSI_ZONE_LEN_S is equal to R_TMSI_ZONE_LEN_S.
 26 - The least significant ASSIGNING_R_TMSI_ZONE_LEN_S octets of
 27 ASSIGNING_R_TMSI_ZONE_S are equal to R_TMSI_ZONE_S.
 28 - The received ADDRESS (R_TMSI_CODE_ADDR) is equal to the ADDR_LEN least
 29 significant octets of R_TMSI_CODE_S.
 30 - Each of the four minus ADDR_LEN most significant octets of R_TMSI_CODE_S are
 31 equal to '00000000'.
 32 • The bits of R_TMSI_CODE_S are not all equal to '1' and the received ADDR_LEN is
 33 greater than four:
 34 - The ASSIGNING_R_TMSI_ZONE_LEN_S most significant octets of the received
 35 ADDRESS (R_TMSI_ZONE) are equal to the least significant
 36 ASSIGNING_R_TMSI_ZONE_LEN_S octets of R_TMSI_ZONE_S.
 37 - ADDR_LEN minus four is equal to ASSIGNING_R_TMSI_ZONE_LEN_S.

1 - The least significant four octets of ADDRESS (R_TMSI_CODE_ADDR) are equal to
 2 R_TMSI_CODE_s.

3 If the ADDR_TYPE is equal to '111' (the address is an MC-MAP address), the mobile station shall use the
 4 following procedures:

5 • If the MC_MAP_ADDR_TYPE is equal to '0000', the mobile station shall declare an
 6 address match if all of the following conditions are met:

7 - The bits of MAP-TMSI_{s-p} or MAP-P-TMSI_{s-p} are not all equal to '1'.

8 - Either MAP-TMSI_{s-p} or MAP-P-TMSI_{s-p} is equal to MAP-TMSI received in
 9 MC_MAP_ADDR_TYPE specific subfield.

10 - ASSIGN_LAC_{s-p} is equal to LAC_s.

11 - MNC_O_s is equal to MNC_s.

12 - MCC_O_s is equal to MCC_s.

13 - If MAP-P-TMSI_{s-p} is equal to MAP-TMSI received, ASSIGN_RAC_{s-p} is equal to RAC_s.

14 • If the MC_MAP_ADDR_TYPE is equal to '0001', the mobile station shall declare an
 15 address match if all of the following conditions are met:

16 - The bits of MAP-TMSI_{s-p} are not all equal to '1'.

17 - MAP-TMSI_{s-p} is equal to MAP-TMSI received in MC_MAP_ADDR_TYPE specific
 18 subfield.

19 - ASSIGN_LAC_{s-p} is equal to LAC received in the specific subfield.

20 - MNC_O_s is equal to MNC received in the specific subfield.

21 - MCC_O_s is equal to MCC received in the specific subfield.

22 • If the MC_MAP_ADDR_TYPE is equal to '0010', the mobile station shall declare an
 23 address match if all of the following conditions are met:

24 - The bits of MAP-P-TMSI_{s-p} are not all equal to '1'.

25 - MAP-P-TMSI_{s-p} is equal to MAP-TMSI received in MC_MAP_ADDR_TYPE specific
 26 subfield.

27 - ASSIGN_LAC_{s-p} is equal to LAC received in the specific subfield.

28 - ASSIGN_RAC_{s-p} is equal to RAC received in the specific subfield.

29 - MNC_O_s is equal to MNC received in the specific subfield.

30 - MCC_O_s is equal to MCC received in the specific subfield.

31 • If the MC_MAP_ADDR_TYPE is equal to '0011', the mobile station shall declare an
 32 address match if the addressed IMEI is the mobile station IMEI.

33 5.1.5 Changes to Section 2.2.1.2 of C. S0004-A

34 The following entry is added to Table 2.2.1.2.1.2-1:

| Message Name | MSG_TAG | MSG_TYPE (binary) |
|---|----------------|----------------------|
| <u>MC-MAP Initial L3 Message</u> | <u>MAPIL3M</u> | <u>00011011</u> |
| <u>MC-MAP L3 Message</u> | <u>MAPL3M</u> | <u>000111000</u> |
| <u>R-TMSI Assignment Completion Message</u> | <u>RTACM</u> | <u>00011101</u> |

1 5.1.6 Changes to Section 3.1.2.2.1.1.1.2 of 3GPP2 C.S0004-A (Requirements for Setting
2 Page Class Fields

3 The following entries are added to Table 3.1.2.2.1.1.1.2-1:
4

| Description | PAGE_CLASS (binary) | PAGE- _SUBCLASS (binary) | PAGE- _SUBCLASS- _EXT (binary) | Page Record Format Number |
|---|------------------------|--------------------------------|---|------------------------------------|
| <u>Class 3a, R-TMSI with 32-bit R TMSI CODE ADDR (R TMSI ZONE not included)</u> | <u>11</u> | <u>01</u> | <u>00</u> | <u>13</u> |
| <u>Class 3a, with 24-bit R TMSI CODE ADDR (R TMSI ZONE not included)</u> | <u>11</u> | <u>01</u> | <u>01</u> | <u>14</u> |
| <u>Class 3a, with 16-bit R TMSI CODE ADDR (R TMSI ZONE not included)</u> | <u>11</u> | <u>01</u> | <u>10</u> | <u>15</u> |
| <u>Class 3a, with 32-bit R TMSI CODE ADDR (R TMSI ZONE included)</u> | <u>11</u> | <u>01</u> | <u>11</u> | <u>16</u> |
| <u>Class 4a, MAP-TMSI</u> | <u>11</u> | <u>10</u> | <u>00</u> | <u>17</u> |
| <u>Class 4a, MAP-TMSI with LAI</u> | <u>11</u> | <u>10</u> | <u>01</u> | <u>18</u> |
| <u>Class 4a, MAP-TMSI with RAI</u> | <u>11</u> | <u>10</u> | <u>10</u> | <u>19</u> |

5 In addition to the procedures described in 3.1.2.2.1.1.1.2 of 3GPP2 C.S0004-A, the base station shall use the
6 following procedure to select the class of page record addressed to MC-MAP mobile station:

- 7 • The base station may page the mobile station using a page record with PAGE_CLASS
8 equal to '11', PAGE_SUBCLASS equal to '01' and PAGE_SUBCLASS_EXT equal to '00' if
9 the mobile station has been assigned a R-TMSI within the same R-TMSI zone as the
10 base station.
- 11 • The base station may page the mobile station using a page record with PAGE_CLASS
12 equal to '11', PAGE_SUBCLASS equal to '01' and PAGE_SUBCLASS_EXT equal to '01' if
13 both of the following conditions are met:
- 14 – The mobile station has been assigned a R-TMSI within the same R TMSI zone as the
15 base station, and

- 1 – The most significant octet of R_TMSI_CODE is equal to '00000000'.
- 2 • The base station may page the mobile station using a page record with PAGE_CLASS
3 equal to '11', PAGE_SUBCLASS equal to '01' and PAGE_SUBCLASS_EXT equal to '10' if
4 both of the following conditions are met:
- 5 – The mobile station has been assigned a R-TMSI within the same R_TMSI zone as the
6 base station, and
- 7 – The two most significant octets of R_TMSI_CODE are both equal to '00000000'.
- 8 • The base station may page the mobile station using a page record with PAGE_CLASS
9 equal to '11', PAGE_SUBCLASS equal to '01' and PAGE_SUBCLASS_EXT equal to '11' if
10 the mobile station has been assigned a R-TMSI in a different R_TMSI zone than is being
11 sent by the base station in Extended Systems Parameter Message or MC-RR Message.
- 12 • The base station may page the mobile station using a page record with PAGE_CLASS
13 equal to '11', PAGE_SUBCLASS equal to '10' and PAGE_SUBCLASS_EXT equal to '00' if
14 the mobile station has been assigned a MAP-TMSI within the same LAI (see 4.1 of 3GPP
15 TS 23.003) as the base station.
- 16 • The base station may page the mobile station using a page record with PAGE_CLASS
17 equal to '11', PAGE_SUBCLASS equal to '10' and PAGE_SUBCLASS_EXT equal to '01' if
18 the mobile station has been assigned a MAP-TMSI in a different LAI (see 4.1 of 3GPP TS
19 23.003) as the base station.
- 20 • The base station may page the mobile station using a page record with PAGE_CLASS
21 equal to '11', PAGE_SUBCLASS equal to '10' and PAGE_SUBCLASS_EXT equal to '10' if
22 the mobile station has been assigned a MAP-P-TMSI in a different RAI (see 4.2 of 3GPP
23 TS 23.003) as the base station.

24 5.1.7 Changes to Section 3.1.2.2.1.1.2 of 3GPP2 C.S0004-A

25 The following additional Page Type-specific Fields are defined:

26 If PAGE_CLASS is equal to '11', and if PAGE_SUBCLASS is equal to '01', and if
27 PAGE_SUBCLASS_EXT = '00', (page record format is equal to 13), the page type-specific
28 fields have the following format:

| Field | Length (bits) |
|-------------------------|---------------|
| <u>R_TMSI_CODE_ADDR</u> | <u>32</u> |

29 R_TMSI_CODE_ADDR Radio temporary mobile station identity code address.

30 If PAGE_CLASS is equal to '11', and if PAGE_SUBCLASS is equal to '01', and if
31 PAGE_SUBCLASS_EXT = '01', (page record format is equal to 14), the page type-specific
32 fields have the following format:

| <u>Field</u> | <u>Length (bits)</u> |
|-------------------------|----------------------|
| <u>R_TMSI_CODE_ADDR</u> | <u>24</u> |

1 R_TMSI_CODE_ADDR Radio temporary mobile station identity code address.

2 If PAGE_CLASS is equal to '11', and if PAGE_SUBCLASS is equal to '01', and if
3 PAGE_SUBCLASS_EXT = '10', (page record format is equal to 15), the page type-specific
4 fields have the following format:

| <u>Field</u> | <u>Length (bits)</u> |
|-------------------------|----------------------|
| <u>R_TMSI_CODE_ADDR</u> | <u>16</u> |

5 R_TMSI_CODE_ADDR Radio temporary mobile station identity code address.

6 If PAGE_CLASS is equal to '11', and if PAGE_SUBCLASS is equal to '01', and if
7 PAGE_SUBCLASS_EXT = '11', (page record format is equal to 16), the page type-specific
8 fields have the following format:

| <u>Field</u> | <u>Length (bits)</u> |
|-------------------------|--------------------------|
| <u>R_TMSI_ZONE_LEN</u> | <u>4</u> |
| <u>R_TMSI_ZONE</u> | <u>8 × TMSI_ZONE_LEN</u> |
| <u>R_TMSI_CODE_ADDR</u> | <u>32</u> |

9 R_TMSI_ZONE_LEN R-TMSI zone length.

10 R_TMSI_ZONE R-TMSI zone.

11 R_TMSI_CODE_ADDR Radio temporary mobile station identity code address.

12 If PAGE_CLASS is equal to '11', and if PAGE_SUBCLASS is equal to '10', and if
13 PAGE_SUBCLASS_EXT = '00', (page record format is equal to 17), the page type-specific
14 fields have the following format:

| <u>Field</u> | <u>Length (bits)</u> |
|-----------------|----------------------|
| <u>MAP_TMSI</u> | <u>32</u> |

15 MAP_TMSI TMSI for MAP networks.

16 The TMSI is coded as a binary number as described in 2.4
17 of 3GPP TS 23.003.

1 If PAGE_CLASS is equal to '11', and if PAGE_SUBCLASS is equal to '10', and if
 2 PAGE_SUBCLASS_EXT = '01', (page record format is equal to 18), the page type-specific
 3 fields have the following format:

| <u>Field</u> | <u>Length (bits)</u> |
|-----------------|----------------------|
| <u>MCC</u> | <u>10</u> |
| <u>MNC</u> | <u>10</u> |
| <u>LAC</u> | <u>16</u> |
| <u>MAP_TMSI</u> | <u>32</u> |

4 MCC Mobile Country Code (see 2.3.1 of 3GPP2 C.S0005-A).
 5 MNC Mobile Network Code (see 2.3.1.4 of 3GPP2 C.S0005-A).
 6 LAC Location Area Code.
 7 The LAC is coded as a binary number as described in 4.1
 8 of 3GPP TS 23.003.
 9 MAP_TMSI TMSI for MAP networks.
 10 The TMSI is coded as a binary number as described in 2.4
 11 of 3GPP TS 23.003.

12 If PAGE_CLASS is equal to '11', and if PAGE_SUBCLASS is equal to '10', and if
 13 PAGE_SUBCLASS_EXT = '10', (page record format is equal to 19), the page type-specific
 14 fields have the following format:

| <u>Field</u> | <u>Length (bits)</u> |
|-----------------|----------------------|
| <u>MCC</u> | <u>10</u> |
| <u>MNC</u> | <u>10</u> |
| <u>LAC</u> | <u>16</u> |
| <u>RAC</u> | <u>8</u> |
| <u>MAP_TMSI</u> | <u>32</u> |

15 MCC Mobile Country Code (see 2.3.1 of 3GPP2 C.S0005-A).
 16 MNC Mobile Network Code (see 2.3.1.4 of 3GPP2 C.S0005-A).
 17 LAC Location Area Code.
 18 The LAC is coded as a binary number as described in 4.1
 19 of 3GPP TS 23.003.
 20 RAC Routing Area Code.
 21 The RAC is coded as a binary number as described in 4.2
 22 of 3GPP TS 23.003.
 23 MAP_TMSI TMSI for MAP networks.

1 The TMSI is coded as a binary number as described in 2.4
 2 of 3GPP TS 23.003.

3 5.1.8 Changes to Section 3.1.2.2.1.2 of 3GPP2 C.S0004-A

4 5.1.8.1 Changes to Section 3.1.2.2.1.2.1 of 3GPP2 C.S0004-A (Definition of Addressing
 5 Fields)

6 Table 3.1.2.2.1.2.1-1 is modified as follows:

7 Table 3.1.2.2.1.2.1-1. Address Types

| Description | ADDR_TYPE (binary) | ADDR_LEN (octets) |
|------------------------------------|-----------------------|----------------------|
| IMSI_S | 000 | 5 |
| ESN | 001 | 4 |
| IMSI | 010 | 5 to 7 |
| TMSI | 011 | 2 to 12 |
| Reserved | 100 | - |
| BROADCAST | 101 | Variable |
| Reserved R-TMSI | 110 | <u>2 to 12</u> |
| Reserved MC-MAP Address | 111 | <u>5 to 10</u> |

8 The ADDRESS field for ADDR_TYPE equal to '110' and '111' are defined as follows:

9 If ADDR_TYPE is equal to '110', the ADDRESS field consists of the following subfields:

| <u>Subfield</u> | <u>Length (bits)</u> |
|-------------------------|---|
| <u>R_TMSI_ZONE</u> | <u>If ADDR_LEN is greater than four, $8 \times (ADDR_LEN - 4)$; otherwise, 0.</u> |
| <u>R_TMSI_CODE_ADDR</u> | <u>If ADDR_LEN is greater than four, 32; otherwise, $8 \times ADDR_LEN$.</u> |

10 If ADDR_TYPE is equal to '111', the ADDRESS field consists of the following subfields:

| <u>Subfield</u> | <u>Length (bits)</u> |
|--|--|
| <u>MC_MAP_ADDR_TYPE</u> | <u>4</u> |
| <u>MC-MAP-ADDR_TYPE-specific subfields</u> | <u>$4 + 8 \times (ADDR_LEN - 1)$</u> |

11 For ADDR_TYPE '111', additional addressing parameters are represented in Table
 12 3.1.2.2.1.2.1-4.

1 Table 3.1.2.2.1.2.1-4. MC_MAP_ADDR_TYPE Address Types

| <u>Description</u> | <u>MC_MAP - ADDR_TYPE (binary)</u> | <u>Length of MC_MAP - ADDR_TYPE - specific Subfields (bits)</u> |
|---|--|---|
| <u>MAP-TMSI</u> | <u>0000</u> | <u>36</u> |
| <u>MAP-TMSI with LAI</u> | <u>0001</u> | <u>68</u> |
| <u>MAP-TMSI with RAI</u> | <u>00010010</u> | <u>76</u> |
| <u>IMEI</u> | <u>00100011</u> | <u>64</u> |
| <u>All other MC_MAP_ADDR_TYPE values are reserved</u> | | |

2 If MC_MAP_ADDR_TYPE is equal to '0000', then MAP-TMSI type-specific subfields consist
3 of:

| <u>Subfield</u> | <u>Length (bits)</u> |
|-----------------|----------------------|
| <u>RESERVED</u> | <u>4</u> |
| <u>MAP_TMSI</u> | <u>32</u> |

4 If MC_MAP_ADDR_TYPE is equal to '0001', then MAP-TMSI with LAI type-specific subfields
5 consist of:

| <u>Subfield</u> | <u>Length (bits)</u> |
|-----------------|----------------------|
| <u>MCC</u> | <u>10</u> |
| <u>MNC</u> | <u>10</u> |
| <u>LAC</u> | <u>16</u> |
| <u>MAP_TMSI</u> | <u>32</u> |

6 If MC_MAP_ADDR_TYPE is equal to '00010010', then MAP-TMSI with RAI type-specific
7 subfields consist of:

| <u>Subfield</u> | <u>Length (bits)</u> |
|-----------------|----------------------|
| <u>MCC</u> | <u>10</u> |
| <u>MNC</u> | <u>10</u> |
| <u>LAC</u> | <u>16</u> |
| <u>RAC</u> | <u>8</u> |
| <u>MAP_TMSI</u> | <u>32</u> |

8 If MC_MAP_ADDR_TYPE is equal to '00100011', then MAP-TMSI type-specific subfields
9 consist of:

| <u>Subfield</u> | <u>Length (bits)</u> |
|-----------------|----------------------|
| <u>RESERVED</u> | <u>4</u> |
| <u>IMEI</u> | <u>60</u> |

1 MCC Mobile Country Code (see 2.3.1 of 3GPP2 C.S0005-A).

2 MNC Mobile Network Code (see 2.3.1.4 of 3GPP2 C.S0005-A).

3 LAC Location Area Code. The LAC is coded as a binary number as
4 described in 4.1 of 3GPP TS 23.003.

5 RAC Routing Area Code. The RAC is coded as a binary number as
6 described in 4.2 of 3GPP TS 23.003.

7 MAP TMSI TMSI for MAP networks. The TMSI is coded as a binary number as
8 described in 2.4 of 3GPP TS 23.003.

9 IMEI International Mobile Equipment Identity. The IMEI is coded as a
10 sequence of 15 BCD digits as described in 6.2.1 of 3GPP TS 23.003.

11 The MCC, MNC, and LAC comprise the Location Area Identity (LAI). See 4.1 of 3GPP TS 23.003); the MCC,
12 MNC, LAC, and RAC comprise the Routing Area Identity (RAI).

13 5.1.8.2 Changes to Section 3.1.2.2.1.2.2 of 3GPP2 C.S0004-A (Requirements for Setting 14 Addressing Fields)

15 The base station shall adhere to following additional requirements:

16 If the base station addresses a mobile station by R-TMSI, the base station shall set ADDR_TYPE to '101', and
17 shall set the ADDRESS field as follows:

18 • If the base station includes the R_TMSI_ZONE in the ADDRESS field, the base station
19 shall set the R_TMSI_ZONE field to the R-TMSI zone number associated with the
20 assigned R-TMSI as specified in TIA/EIA/IS-735, and shall set the ADDR_LEN field to 4
21 + the length of the R-TMSI zone number in octets. The base station shall also include
22 the R_TMSI_CODE_ADDR in the ADDRESS field, set to the 32-bit R-TMSI code assigned
23 to the mobile station.

24 • If the base station does not include the R_TMSI_ZONE in the ADDRESS field, the base
25 station shall include only the R_TMSI_CODE_ADDR in the ADDRESS field and shall set
26 this field as follows:

27 – If the most significant octet of the R_TMSI_CODE assigned to the mobile station is
28 equal to '0000000', the base station may set R_TMSI_CODE_ADDR to the 24 least
29 significant bits of the R_TMSI_CODE assigned to the mobile station and set
30 ADDR_LEN to 3.

31 – If the two most significant octets of the R_TMSI_CODE assigned to the mobile
32 station are both equal to '00000000', the base station may set
33 R_TMSI_CODE_ADDR to the 16 least significant bits of the R_TMSI_CODE assigned
34 to the mobile station and set ADDR_LEN to 2.

35 – Otherwise, the base station shall set R_TMSI_CODE_ADDR to the R_TMSI_CODE
36 assigned to the mobile station and set ADDR_LEN to 4.

1 If the base station addresses a mobile station by MAP-TMSI, the base station shall set ADDR_TYPE to '111',
 2 and shall set the ADDRESS field as follows:

- 3 • If the base station does not include the MAP-TMSI LAI or RAI in the ADDRESS field, the
 4 base station shall set MC_MAP_ADDR_TYPE field to '0000', the RESERVED subfield to
 5 '0000', MAP-TMSI subfield to MAP-TMSI or MAP-P-TMSI assigned to mobile station and
 6 set ADDR_LEN to 5.
- 7 • If the base station includes the MAP-TMSI LAI in the ADDRESS field, the base station
 8 shall set MC_MAP_ADDR_TYPE field to '0001', ADDR_LEN to 9 and shall set the MCC,
 9 MNC, LAC and MAP-TMSI fields to the respective values assigned to mobile station.
- 10 • If the base station includes the MAP-TMSI RAI in the ADDRESS field, the base station
 11 shall set MC_MAP_ADDR_TYPE field to '0010', ADDR_LEN to 10 and shall set the MCC,
 12 MNC, LAC, RAC and MAP-TMSI fields to the respective values assigned to mobile
 13 station.

14 If the base station addresses a mobile station by IMEI, the base station shall set ADDR_TYPE to '111' and
 15 MC_MAP_ADDR_TYPE to '0011'. It shall set the RESERVED subfield to '0000', set the IMEI number of the
 16 mobile station in the subfield, and shall set ADDR_LEN to 8.

17 5.1.9 Changes to Section 3.1.2.3 of 3GPP2 C.S0004-A

18 The following entries are added to Table 3.1.2.3.1.1.2-1:

| Message Name | MSG_TAG | MSG_TYPE (binary) | Logical Channel |
|--|----------------|----------------------|--------------------------|
| <u>MC-MAP Sync Channel Message</u> | <u>MAPSCHM</u> | <u>00100010</u> | <u>sync</u> |
| <u>MC-MAP System Information Message</u> | <u>MAPSIM</u> | <u>00100011</u> | <u>broadcast</u> |
| <u>MC-MAP L3 Message</u> | <u>MAPL3M</u> | <u>00100100</u> | <u>general signaling</u> |
| <u>R-TMSI Assignment Message</u> | <u>RTASM</u> | <u>00100101</u> | <u>general signaling</u> |

19 5.1.10 Changes to Section 3.2.2.2 of 3GPP2 C.S0004-A

20 The following entry is added to Table 3.2.2.2.1.2-1:

| Message Name | MSG_TAG (binary) | MSG_TYPE |
|---|---------------------|-----------------|
| <u>MC-MAP L3 Message</u> | <u>MAPL3M</u> | <u>00101001</u> |
| <u>MC-MAP GSM Handover Command Message</u> | <u>MAPGHCM</u> | <u>00101010</u> |
| <u>MC-MAP Dedicated Mode Paging Message</u> | <u>MAPDMPM</u> | <u>00101011</u> |
| <u>R-TMSI Assignment Message</u> | <u>RTASM</u> | <u>00101100</u> |

21 5.2 Enhanced Services

22 The enhanced services provided by the MC-MAP LAC sublayer are described in 5.2.1. The modifications to
 23 3GPP2 C.S0004-A required to provide the Enhanced Services are described in 5.2.2.

1 5.2.1 Description of Enhanced Services

2 Enhanced services are defined only for MM and CM messages over dedicated channels and are applied only to
3 those messages requiring such services.

- 4 1. **Priority:** Layer 2 transmits Layer 3 messages while maintaining priorities. The RR sub-
5 layer specifies the priority level to be used for a specific Layer 3 message to be
6 transmitted.
- 7 2. **Service Access Point multiplexing:** Layer 2 supports the transmission and reception of
8 Layer 3 messages related to several Service Access Point Identifiers (SAPs).
- 9 3. **Outgoing message queues flushing:** This procedure is used in a network entity to flush
10 (i.e., complete transmitting) outgoing Layer 3 messages queued by Layer 2. The purpose
11 of the outgoing message queues flushing service is to provide a mechanism for reliably
12 avoiding Layer 3 message loss (in the network) during hard handoff.
- 13 4. **Suspension/Resumption (handoff):** The purpose of the suspension and resumption
14 services is to provide a mechanism for reliably avoiding MM and CM message loss
15 during a change of dedicated channels. Change of dedicated channels, which is hard
16 handoff, includes both intra-system hard handoff (e.g., CDMA-to-CDMA), and inter-
17 system hard handoff (e.g., CDMA-to-GSM).
- 18 5. **Enhanced Services Sublayer In-order delivery:** Specific received Layer 3 messages are
19 passed to the RR according to the order they were transmitted by the Layer 3 peer
20 entity.

21 5.2.2 Modifications to 3GPP2 C.S0004-A for Enhanced Services

22 5.2.2.1 Enhanced Services Sublayer on the r-dsch for the Mobile Station

23 5.2.2.1.1 Parameters

24 The mobile station shall use the fields defined in 5.2.2.1.1.1 for PDUs transmitted on the r-dsch and shall set
25 these fields according to the requirements in 5.2.2.1.1.2

26 5.2.2.1.1.1 Definition of Enhanced Services Parameters

27 The Enhanced Services parameters have the following format:

| Field | Length (bits) |
|------------|---------------|
| SAPI | 2 |
| ORD_IND | 1 |
| L3_MSG_NUM | 0 or 2 |

28 SAPI Service access point identifier.

29 This field indicates the service access point at the peer where this
30 PDU is to be delivered.

31 ORD_IND Ordering indicator.

32 This field indicates whether ordering shall be applied to SDU carried

1 by this PDU.

2 **L3_MSG_NUM** Layer 3 message number.

3 If ORD_IND is '1', this field is the ordinal number (modulo 4) of the
4 SDU carried by this PDU. If ORD_IND is '0', this field is omitted.

5 5.2.2.1.1.2 Requirements for Setting the Enhanced Services Parameters

6 The mobile station shall set the SAPI field to the SAPI value associated with the SDU contained in this PDU, as
7 shown in Table 5.2.2.1.1.2-1.

8 **Table 5.2.2.1.1.2-1. Allocation of SAPI values**

| SAPI value | Related entity |
|------------|-----------------------------|
| 0 | CM, MM, and RR signaling |
| 3 | Short message service (SMS) |
| All others | Reserved |

9 The mobile station shall set the ORD_IND field to '1' if ordering is to be applied to this PDU by the base
10 station; otherwise, the mobile station shall set ORD_IND to '0'. If ORD_IND is set to '1', mobile station shall
11 set ACK_REQ field (see 2.2.1.1 of 3GPP2 C.S0004-A) to '1'.

12 If ORD_IND is set to '1', the mobile station shall include the L3_MSG_NUM field and set it to 0 for the first
13 message requiring ordering and to one more (modulo 4) than the last value used for all subsequent messages
14 requiring ordering.

15 5.2.2.1.2 Procedures

16 The mobile station shall maintain a transmission queue for each priority level (i.e., high, medium, and low).
17 The mobile station shall add each message to the transmission queue associated with the priority of the
18 message. For a given priority, the mobile station shall add messages to the appropriate queue in the order that
19 they are received from the Upper Layers, irrespective of the service access point at which each message is
20 received.

21 The mobile station shall transmit messages in order of priorities, i.e., all messages in the high priority
22 transmission queue, followed by all messages in the medium priority transmission queue, and finally all
23 messages in the low priority transmission queue.

24 When an indication is received to flush outgoing message queues, the mobile station shall flush all transmission
25 queues maintained at the Enhanced Services Sublayer.

26 5.2.2.2 Changes to Section 2.2.1.2.2 of 3GPP2 C.S0004-A (Procedures for the Utility 27 Sublayer)

28 If P_REV_IN_USE_s is greater than or equal to seven, the mobile station shall assemble
29 regular PDUs for the r-dsch using the following format:

30

| Parameter | Reference |
|---------------------------------|-------------------------------------|
| Message Type Field | 2.2.1.2.1.1 of 3GPP2 C.S0004-A |
| ARQ Fields | 2.2.1.1.1.1 of 3GPP2 C.S0004-A |
| <u>Enhanced Services Fields</u> | <u>5.2.2.1.1.1 of this document</u> |
| Extended-Encryption Field | 2.2.1.4.1.5 of 3GPP2 C.S0004-A |
| SDU | 3GPP2 C.S0005-A |
| PDU Padding Field | 2.2.1.2.1.1 of 3GPP2 C.S0004-A |

1 5.2.2.3 Enhanced Services Sublayer on the f-dsch for the Mobile Station

2 5.2.2.3.1 Parameters

3 The mobile station shall use the Enhanced Services fields defined in 5.2.2.1.1 for PDUs received on the f-dsch.

4 5.2.2.3.2 Procedures

5 For messages requiring ordering (PDUs with the ORD_IND set to '1'), the Enhanced Services Sublayer shall
6 deliver the SDU carried by the PDU to the Upper Layers in the order determined by the SAPI and L3-
7 MSG_NUM (modulo 4) fields of the received PDU. The Enhanced Services Sublayer shall buffer each SDU
8 that can not be delivered to the Upper Layers immediately upon reception, until all SDUs prior to it have been
9 delivered to the Upper Layers.

10 The mobile station shall deliver each SDU (subject to ordering, if needed) to Layer 3 at the service access point
11 identified by the SAPI field of the received PDU.

12 5.2.2.4 Enhanced Services Sublayer on the r-dsch for the Base Station

13 The base station shall use the Enhanced Services parameters defined in 5.2.2.1.1 and the Enhanced Services
14 procedures defined in 5.2.2.1.2.

15 5.2.2.5 Changes to Section 3.2.2.2.2 of 3GPP2 C.S0004-A (Procedures for the Utility 16 Sublayer)

17 If P_REV_IN_USE is greater than or equal to seven, the base station shall use the following format to assemble
18 regular PDUs for transmission on the f-dsch:

19

| Field | Reference |
|---------------------------------|---|
| MSG_TYPE | Section 3.2.2.2.1.1 |
| ARQ Fields | Section 3.2.2.1.1.1 |
| <u>Enhanced Services Fields</u> | <u>Section 5.2.2.1.1.1 of this document</u> |
| Extended-Encryption Fields | Section 3.2.2.2.1.1 |
| SDU | TIA/EIA/IS-2000-5 |
| PDU_PADDING | Section 3.2.2.2.1.1 |

20

21 5.2.2.6 Enhanced Services Sublayer on the r-dsch for the Base Station

22 The base station shall use the Enhanced Services parameters defined in 5.2.2.3.1 and the Enhanced Services
23 procedures defined in 5.2.2.3.2.

6 Modifications to C.S0005-A, Upper Layer (Layer 3) Signaling Standard for cdma2000 Standards for Spread Spectrum Systems

The 3GPP2 C.S0005-A standard contains RRC, MM, and CM procedures for operation with TIA/EIA-41 networks. This section provides modifications to 3GPP2 C.S0005-A to support MC-MAP operation. These modifications include indicating which messages, procedures, and sections of 3GPP2 C.S0005-A are applicable to MC-MAP operation. The result is isolation of the RRC layer of cdma2000.

Several enhancements are required to the isolated RRC layer to support MC-MAP operation: The *MC-MAP Sync Channel Message* is added to provide indication of the frequency to use when acquiring the MC-MAP system and to convey MAP identities. The *MC-MAP System Information Message* is added to encapsulate non-access stratum system information. The *MC-MAP RRC Connection Request Message* is added to request the MC RRC equivalent of an RRC connection. The *MC-MAP Initial L3 Message* and the *MC-MAP L3 Message* are added to encapsulate Direct Transfer information. Several existing cdma2000 RRC messages are modified for MC-MAP operation. Updates to procedures are given to use the new messages and the modified existing cdma2000 messages. Many of the procedures are shown in a method similar to that used in 3GPP documents. The result is an RRC layer that can support MAP services and can provide handovers to GSM systems.

Common channel operation can be on either the TIA/EIA-95-B common channels (Paging Channel and Access Channel) or the new cdma2000 common channels (Broadcast Channel, Forward Common Control Channel, Enhanced Access Channel, and Reverse Common Control Channel). The MC-MAP mobile station can be assigned from either set of common channels to any of the Spreading Rate 1 or Spreading Rate 3 radio configurations. If appropriately provisioned, either a TIA/EIA-95-B base station or a cdma2000 base station can support mobile station supporting the TIA/EIA-41 protocols, the MAP protocols, or both.

In this section, the term "Higher Layer" or "Upper Layer" refers to the 3GPP MM and CM layers. Furthermore, a "Service Option Connection" instance shall be interpreted as a radio bearer (RB) instance, rather than a service instance; the associated "Connection Reference" parameter shall be interpreted as "radio bearer identifier".

6.1 RRC Services Provided to Upper Layers

The MC-MAP RRC sublayer offers the following services to upper GSM layers:

- General Control
- Notification
- Dedicated control.

6.2 Functions of MC-MAP RRC

The MC-MAP RRC sublayer performs the following main functions:

- Broadcast of information provided by the GSM-MAP core network.
- Broadcast of information related to the CDMA MC radio access network.
- Establishment, maintenance and release of an RRC connection between the mobile station and the CDMA MC radio access network.
- Establishment, reconfiguration and release of Radio Access Bearers.
- Assignment, reconfiguration and release of radio resources for the RRC connection.
- RRC connection mobility functions.
- Routing of Upper Layer PDUs.
- Control of requested QoS.
- MS measurement reporting and control of the reporting.

- 1 • Control of ciphering.
- 2 • Paging/notification.
- 3 • Initial cell selection and re-selection in idle mode.
- 4 • RRC message integrity protection.

5 6.3 MC-MAP RRC Procedures

6 6.3.1 Modifications to 3GPP2 C.S0005-A Procedures

7 The MC-MAP RRC processing is driven by the upper GSM RIL3-MM and RIL3-CM sublayers.

8 6.3.1.1 Modifications to 3GPP2 C.S0005-A Mobile Station Procedures

9 The MC-MAP mobile station RRC processing consists of the following states as defined in 2.6 of 3GPP2
10 C.S0005-A.

- 11 • *Mobile Station Initialization State* - In this state, the mobile station selects and acquires
12 a system. See 6.3.1.1.1.
- 13 • *Mobile Station Idle State* - In this state, the mobile station monitors messages on the f-
14 csch. See 6.3.1.1.2.
- 15 • *System Access State* - In this state, the mobile station sends messages to the base
16 station on the r-csch. See 6.3.1.1.3.
- 17 • *Mobile Station Control on the Traffic Channel State* - In this state, the mobile station
18 communicates with the base station using the f-dsch and r-dsch. See 6.3.1.1.4.

19 6.3.1.1.1 Mobile Station Initialization State

20 In the *Mobile Station Initialization State* the MC-MAP mobile station shall comply with the Layer 3 processing
21 requirements specified in 2.6.1 of 3GPP2 C.S0005-A with the following modifications:

22 The MC-MAP mobile station does not maintain registration timers. The registration process (location update) is
23 the responsibility of the upper GSM RIL3-MM sublayer.

24 The MC-MAP mobile stations need not support Analog mode operation.

25 6.3.1.1.1.1 System Determination Substate

26 In MC-MAP, the process of system determination is driven by the upper GSM RIL3-MM sublayer, which is
27 responsible for network selection (PLNM selection).

28 The MC-MAP mobile station shall perform the system determination process as follows:

- 29 • The mobile station shall determine which system/network to use.
- 30 • The mobile station shall determine the band class (see C.R1001) for the selected
31 system/network.
- 32 • The mobile station shall tune to the CDMA Channel number for the selected
33 system/network.

34 The precise process of system determination is left to the mobile station manufacturer. It is typically influenced
35 by a set of expressed user preferences.

36 6.3.1.1.1.2 Pilot Channel Acquisition Substate

37 In the *Pilot Channel Acquisition Substate* the MC-MAP mobile station shall comply with the Layer 3
38 processing requirements specified in 2.6.1.2 of 3GPP2 C.S0005-A.

1 6.3.1.1.1.3 Sync Channel Acquisition Substate

2 In the *Sync Channel Acquisition Substate* the MC-MAP mobile station shall comply with the Layer 3 processing
3 requirements specified in 2.6.1.3 of 3GPP2 C.S0005-A with the following modifications:

4 In addition to the *Sync Channel Message* the MC-MAP mobile station shall receive and process the *MC-MAP*
5 *Sync Channel Message* (as described in 6.4.1.1.1) to obtain system configuration and optionally timing
6 information. The SID and NID parameters of the *Sync Channel Message* shall be ignored. The network
7 identification is taken from the *MC-MAP Sync Channel Message*. The MC-MAP mobile station shall ignore the
8 Layer 3 processing requirements related to handling of REDIRECTION_s and NDSS_ORIG_s variables.

9 6.3.1.1.1.4 Timing Change Substate

10 In the *Timing Change Substate*, the MC-MAP mobile station shall comply with the Layer 3 processing
11 requirements specified in 2.6.1.4 of 3GPP2 C.S0005-A with the following modifications:

12 The MC-MAP mobile station shall set the stored message sequence numbers variables for the following MC-
13 MAP specific messages to NULL:

- 14 • *MC-MAP System Information Message* (MAP_SYS_PAR_MSG_SEQ_s),

15 The MC-MAP mobile station shall ignore the Layer 3 processing requirements related to handling of TMSI_{s-p}
16 variable.

17 The MC-MAP mobile station shall ignore the Layer 3 processing requirements related to registration.

18 6.3.1.1.2 Mobile Station Idle State

19 In the *Mobile Station Idle State*, the MC-MAP mobile station monitors the f-csch. The MC-MAP mobile station
20 can receive broadcast messages, receive messages individually addressed to the mobile station, initiate an RR-
21 level registration or initiate establishment of an RRC connection to the base station. The MC-MAP mobile
22 station shall comply with the Layer 3 processing requirements specified in 2.6.2 of 3GPP2 C.S0005-A with the
23 following modifications:

24 The MC-MAP mobile station shall ignore the Layer 3 processing requirements related to handling of
25 REDIRECTION_s and NDSS_ORIG_s variables.

26 The MC-MAP mobile station shall ignore the Layer 3 processing requirements related to PACA operation.

27 The MC-MAP mobile station shall ignore the Layer 3 processing requirements related to registration. Instead
28 the MC-MAP mobile station shall perform RR-level registration procedures as specified in 6.3.1.2.4.

29 The MC-MAP mobile station shall ignore the Layer 3 processing requirements related to handling of Roaming
30 Status.

31 The MC-MAP mobile station shall ignore the Layer 3 processing requirements related to handling of AUTH_r,
32 AUTH_s and RAND_s, RAND_r variables.

33 The MC-MAP mobile station shall perform RRC connection establishment procedures as
34 specified in section 6.3.2.1.1.

35 If requested by the Upper Layers, the MC-MAP mobile station RRC may perform direct
36 transfer operation as specified in section 6.3.2.3.

37 The MC-MAP mobile station shall process MS Capability enquiry as specified in 6.3.2.2.

38 The MC-MAP mobile station shall perform Security Mode Control procedures as specified in
39 6.3.2.5.

40 6.3.1.1.2.1 Paging Channel and Forward Common Control Channel Monitoring Procedures

41 The MC-MAP mobile station shall comply with the Layer 3 processing requirements specified in 2.6.2.1.1 of
42 3GPP2 C.S0005-A with the following modification: The MC-MAP mobile station shall not take into account
43 user preference (SLOT_CYCLE_INDEX_p) for the calculation of the Paging Channel and QPCH slot cycle
44 index if it does not have a valid R-TMSI assigned.

45 6.3.1.1.2.2 Response to Overhead Information Operation

46 The Response to Overhead Information Operation is performed whenever the mobile station receives an
47 overhead message. The MC-MAP mobile station shall comply with the Layer 3 processing requirements
48 specified in 2.6.2.2 of 3GPP2 C.S0005-A with the following modifications:

49 The MC-MAP mobile station shall receive and process the following f-csch messages (see Table 6.4-3):

1 The overhead messages received on the Broadcast Channel are:

- 2 • *MC-MAP System Information Message*
- 3 • *MC-RR Parameters Message*
- 4 • *Enhanced Access Parameters Message*
- 5 • *Universal Neighbor List Message*
- 6 • *User Zone Identification Message*
- 7 • *Private Neighbor List Message*
- 8 • *Extended CDMA Channel List Message*

9 The overhead messages received on the Paging Channel are:

- 10 • *MC-MAP System Information Message*
- 11 • *Access Parameters Message*
- 12 • *System Parameters Message*
- 13 • *Neighbor List Message*
- 14 • *CDMA Channel List Message*
- 15 • *Extended System Parameters Message*
- 16 • *Extended Neighbor List Message*
- 17 • *General Neighbor List Message*
- 18 • *User Zone Identification Message*
- 19 • *Private Neighbor List Message*
- 20 • *Extended CDMA Channel List Message*

21 The MC-MAP mobile station shall ignore all other overhead messages received in the f-csch.

22 The MC-MAP mobile station shall store the configuration message sequence number contained in MC-MAP
 23 *MAP System Information Message* (MAP_SYS_PAR_MSG_SEQ_s). The MC-MAP mobile station shall
 24 consider the stored configuration parameters to be current if all configuration message sequence numbers
 25 including MAP_SYS_PAR_MSG_SEQ_s are equal to CONFIG_MSG_SEQ_s in addition to the other
 26 requirements specified in C.S005-A section 2.6.2.2.

27 Processing of Non-Access Stratum Information included in the *MC-MAP System Information Message*
 28 (CN_INFO_FIELDS) shall be according to the corresponding requirements defined for these parameters in the
 29 Non-Access Stratum protocols.

30 The MC-MAP mobile station shall ignore the parameters DELETE_FOR_TMSI, USE_TMSI,
 31 PREF_MSID_TYPE, TMSI_ZONE_LEN and TMSI_ZONE received *on Systems Parameter Message* and *MC-*
 32 *RR Parameters Message*.

33 The MC-MAP mobile station shall store the following additional parameters received in the *MC-RR Parameters*
 34 *Message*:

- 35 • Delete foreign R-TMSI (DELETE_FOR_R_TMSI_s = DELETE_FOR_R_TMSI_r)
- 36 • R-TMSI used indicator (R_TMSI_USED_s = R_TMSI_USED_r)
- 37 • R-TMSI zone length (R_TMSI_ZONE_LEN_s = R_TMSI_ZONE_LEN_r)
- 38 • R-TMSI zone number (R_TMSI_ZONE_s = R_TMSI_ZONE_r)

- 1 • The mobile station shall set all bits of R_TMSI_CODE_S to '1' if all of the following
 2 conditions are met:
- 3 – The bits of R_TMSI_CODE_S are not all equal to '1',
 - 4 – DELETE_FOR_R_TMSI_S is equal to '1', and
 - 5 – ASSIGNING_R_TMSI_ZONE_LEN_S is not equal to R_TMSI_ZONE_LEN_S, or the least
 6 significant ASSIGNING_R_TMSI_ZONE_LEN_S octets of ASSIGNING_R_TMSI_ZONE_S
 7 are not equal to R_TMSI_ZONE_S.

8 6.3.1.1.2.3 Mobile Station Order and Message Processing Operation

9 The mobile station Order and Message Processing Operation is performed whenever the mobile station receives
 10 messages other than overhead and page messages. The MC-MAP mobile station shall comply with the Layer 3
 11 processing requirements specified in 2.6.2.4 of 3GPP2 C.S0005-A with the following modifications:

12 The MC-MAP mobile station shall ignore all messages and orders received except for the *Data Burst Message*,
 13 *Status Request Message*, *Service Redirection Message*, *Global Service Redirection Message*, *Extended Channel*
 14 *Assignment Message*, *Extended Global Service Redirection Message*, *Security Mode Command Message*, and
 15 *R-TMSI Assignment Message*. *R-TMSI Assignment Message* is received in response to the mobile station RR-
 16 level Registration Message.

17 The mobile station shall process the R-TMSI Assignment Message as discussed in 6.3.4.

18 The MC-MAP mobile station shall then respond with a *R-TMSI Assignment Completion Message* within T_{56m}
 19 seconds.

20 6.3.1.1.3 RR-level Registration Procedures

21 Upon power on, the MC-MAP mobile station shall set all the bits of R_TMSI_CODE_S to '1'.

22 While in the *Mobile Station Idle State*, the MC-MAP mobile station shall perform the registration procedures
 23 specified in 6.3.4.

24 6.3.1.1.4 System Access State

25 In the *System Access State*, the MC-MAP mobile station sends messages to the base station on the r-csch. The
 26 MC-MAP mobile station shall comply with the layer 3 processing requirements specified in 2.6.3 of 3GPP2
 27 C.S0005-A with the following modifications:

28 The MC-MAP mobile station shall ignore the Layer 3 processing requirements related to
 29 handling of REDIRECTION_S and NDSS_ORIG_S variables.

30 The MC-MAP mobile station shall ignore the Layer 3 processing requirements related to
 31 PACA operation.

32 The MC-MAP mobile station shall ignore the Layer 3 processing requirements related to
 33 registration.

34 The MC-MAP mobile station shall ignore the Layer 3 processing requirements related to authentication.

35 Only the following substates of the *System Access State* are applicable to the MC-MAP mobile station:

- 36 • *Update Overhead Information Substate* – In this substate, the mobile station monitors
 37 the f-csch until it has received a current set of overhead messages.
- 38 • *Mobile Station Origination Attempt Substate* - In this substate, the mobile station sends
 39 an *MC-MAP RRC Connection Request Message* to the base station, in response to a
 40 request from the Upper Layers to establish an RRC connection.
- 41 • *Mobile Station Message Transmission Substate* - In this substate, the mobile station
 42 sends a *Initial MC-MAP L3 Message*, a *MC-MAP L3 Message* or a *Data Burst Message* to
 43 the base station.

- 1 • *Page Response Substate* - In this substate, the mobile station sends a *MC-MAP RRC*
 2 *Connection Request Message* to the base station, in response to receiving a *General Page*
 3 *Message* from the base station.
- 4 • *Mobile Station Order/Message Response Substate* – In this substate, the mobile station
 5 sends a message or an order to the base station, in response to receiving a message or
 6 an order from the base station.
- 7 • *RR-level Registration Access Substate* – In this substate, the mobile station sends an *RR-*
 8 *level Registration Message* to the base station.

9 6.3.1.1.4.1 Access Procedures

10 The MC-MAP mobile station shall comply with the requirements specified in 2.6.3.1 of 3GPP2 C.S0005-A.

11 6.3.1.1.4.2 Update Overhead Information Substate

12 In the *Update Overhead Information Substate*, the MC-MAP mobile station monitors f-csch channels until it
 13 has received the current configuration messages. The MC-MAP mobile station shall comply with the layer 3
 14 processing requirements specified in 2.6.3.2 of 3GPP2 C.S0005-A with the following additional modifications:
 15 The MC-MAP mobile station shall receive and process the following f-csch overhead messages (see Table 6.4-
 16 3):

17 The overhead messages received on the Broadcast Channel are:

- 18 • *MC-MAP System Information Message*
- 19 • *MC-RR Parameters Message*
- 20 • *Enhanced Access Parameters Message*
- 21 • *Universal Neighbor List Message*
- 22 • *User Zone Identification Message*
- 23 • *Private Neighbor List Message*

- 24 • *Extended CDMA Channel List Message*

25 The overhead messages received on the Paging Channel are:

- 26 • *Access Parameters Message*
- 27 • *System Parameters Message*
- 28 • *Neighbor List Message*
- 29 • *CDMA Channel List Message*
- 30 • *Extended System Parameters Message*
- 31 • *Extended Neighbor List Message*
- 32 • *General Neighbor List Message*
- 33 • *User Zone Identification Message*
- 34 • *Private Neighbor List Message*
- 35 • *Extended CDMA Channel List Message*

36 The MC-MAP mobile station shall ignore all other overhead messages received in the f-csch.

6.3.1.1.4.3 Page Response Substate

The MC-MAP mobile station enters this substate to send an *MC-MAP RRC Connection Request Message* or an *RR-level Registration Message* to the base station, in response to receiving a *General Page Message* from the base station:

- If the MC-MAP mobile station is not registered at RR level, (i.e., all the bits of $R_TMSI_CODE_s$ are equal to '1'), the MC-MAP mobile station shall send an *MC-MAP RRC Connection Request Message* requiring an RRC connection establishment.
- If the mobile station has a valid R-TMSI assigned, it shall send an *RR-level Registration Message* with RR_REG_TYPE value indicating "Page Response".

The MC-MAP mobile station shall comply with all the requirements specified in 2.6.3.3 of 3GPP2 C.S0005-A with the following additional modification:

The MC-MAP mobile station sends an *MC-MAP RRC Connection Request Message* or an *RR-level Registration Message*, instead of a *Page Response Message*, to the base station.

6.3.1.1.4.4 Mobile Station Order/Message Response Substate

In this substate, the mobile station sends a message or an order to the base station, in response to receiving a message or an order from the base station. The MC-MAP mobile station shall comply with all the requirements specified in 2.6.3.4 of 3GPP2 C.S0005-A, except for the modifications identified above for the *System Access State*.

6.3.1.1.4.5 Mobile Station Origination Attempt Substate

The MC-MAP mobile station enters this substate to send an *MC-MAP RRC Connection Request Message* to the base station, in response to a request by the Upper Layers of the mobile station to establish an RRC connection.

The MC-MAP mobile station shall comply with all the requirements specified in 2.6.3.5 of 3GPP2 C.S0005-A with the following additional modifications:

The MC-MAP mobile station sends a *MC-MAP RRC Connection Request Message*, instead of an *Origination Message* to the base station.

6.3.1.1.4.6 RR-level Registration Access Substate

The MC-MAP mobile station enters this substate to send an *RR-level Registration Message* instead of a *Registration Message*. While in this substate, the MC-MAP mobile station shall comply with the requirements in 2.6.3.6 of 3GPP2 C.S0005-A and additional requirements specified in 6.3.4.

6.3.1.1.4.7 Mobile Station Message Transmission Substate

The MC-MAP mobile station enters this substate to send a *MC-MAP Initial L3 Message*, a *MC-MAP L3 Message* or a *Data Burst Message* to the base station.

The MC-MAP mobile station shall comply with all the requirements specified in 2.6.3.7 of 3GPP2 C.S0005-A, with the following additional modification: The MC-MAP mobile station shall ignore the requirements for sending a *Flash With Information Message* to the base station.

6.3.1.1.4.8 PACA Cancel Substate

The MC-MAP mobile station shall ignore the requirements in 2.6.3.8 of 3GPP2 C.S0005-A.

6.3.1.1.5 Mobile Station Control on Traffic Channel State

In the *Mobile Station Control on the Traffic Channel State*, the MC-MAP mobile station shall comply with the requirements specified in 2.6.4 of 3GPP2 C.S0005-A with the following modifications:

6.3.1.1.5.1 Service Configuration and Negotiation

The MC-MAP mobile station shall comply with the requirements specified in 2.6.4.1.2 of 3GPP2 C.S0005-A with the following modification: The MC-MAP mobile station shall ignore all the procedures, messages, and orders related to service option negotiation.

6.3.1.1.5.2 Ordering of Messages

The MC-MAP mobile station shall ignore the requirements specified in 2.6.4.1.3 of 3GPP2 C.S0005-A. Ordered delivery of Upper Layer PDU shall be requested from the MC-MAP LAC.

1 **6.3.1.1.5.3 Processing the In-Traffic System Parameters Message**

2 The MC-MAP mobile station shall comply with the requirements specified in 2.6.4.1.4 of 3GPP2 C.S0005-A
3 with the following modification: The MC-MAP mobile station shall ignore the following fields of the *In-Traffic*
4 *System Parameters Message*: SID, NID, PACKET_ZONE_ID.

5 **6.3.1.1.5.4 Message Action Times**

6 The MC-MAP mobile station shall comply with the requirements specified in 2.6.4.1.5 of 3GPP2 C.S0005-A
7 with the following modification: The MC-MAP mobile station shall ignore the procedures related to service
8 option negotiation orders.

9 **6.3.1.1.5.5 Long Code Transition Request Processing**

10 The MC-MAP mobile station shall ignore the requirements specified in 2.6.4.1.6 of 3GPP2 C.S0005-A.

11 **6.3.1.1.5.6 Processing the Service Configuration Record**

12 The MC-MAP mobile station shall comply with the requirements specified in C.S0005-A section 2.6.4.1.14
13 with the following modifications:

14 **If a service option connection (i.e., RB instance) identified by CON_REF_DELETED has been**
15 **omitted from the received service option connection records, the RRC shall release the**
16 **corresponding radio bearer.**

17 The MC-MAP mobile station shall ignore all the procedures referring to “Call Control instance”.

18 The MC-MAP mobile station shall ignore all the procedures related to the following parameters of the service
19 option connection record: CC_INFO_INCL, RESPONSE_IND, TAG, BYPASS_ALERT_ANSWER.

20 **6.3.1.1.5.7 Traffic Channel Initialization Substate**

21 The MC-MAP mobile station shall comply with the requirements specified in 2.6.4.2 of 3GPP2 C.S0005-A
22 with the following modifications:

23 **The MC-MAP mobile station shall ignore all the procedures related to the MM functionality**
24 **(registration initialization, registration timer maintenance, TMSI_CODE_{S-P}, etc.).**

25 **The MC-MAP mobile station shall ignore all the procedures related to “Call Control**
26 **instance” and TAG_S.**

27 **The MC-MAP mobile station shall perform the following additional operations:**

- 28 • **The MC-MAP mobile station perform RR-level registration maintenance procedures as**
29 **described in 6.3.4.1.2.4.1 and 6.3.4.1.2.4.2.**
- 30 • **The MC-MAP RRC shall inform the Upper Layers that the RRC connection has been**
31 **established.**

32 **6.3.1.1.5.8 Traffic Channel Substate**

33 The MC-MAP mobile station shall comply with the requirements specified in 2.6.4.3 of 3GPP2 C.S0005-A
34 with the following modifications:

35 **The MC-MAP mobile station shall ignore all the procedures related to “Call Control**
36 **instance”, TAG_S, and communication between Layer 3 and Call Control instances.**

37 **The MC-MAP mobile station shall ignore all the procedures for handling a received *Call***
38 ***Assignment Message*; The MC-MAP mobile station shall process a *Call Assignment Message***
39 **received from the base station as specified in section 6.3.2.4.**

40 **The MC-MAP mobile station shall ignore all the procedures related to the MM functionality**
41 **(registration timer maintenance, TMSI_CODE_{S-P}, etc.).**

1 The MC-MAP mobile station shall ignore all the procedures related to service option
2 negotiation orders.

3 The MC-MAP mobile station shall ignore all the procedures related to emergency calls.

4 The MC-MAP mobile station shall perform RRC connection release procedures as specified
5 in section 6.3.2.1.2.

6 If requested by the Upper Layers, the MC-MAP mobile station RRC may perform direct
7 transfer operation as specified in section 6.3.2.3.

8 The MC-MAP mobile station shall process dedicated mode paging as specified in section
9 6.3.2.4.

10 The MC-MAP mobile station shall perform the establishment, reconfiguration, and release
11 of radio bearers (RB) as specified in section 6.3.2.6.

12 The MC-MAP mobile station shall process MS Capability enquiry as specified in 6.3.2.2.

13 The MC-MAP mobile station shall perform Security Mode Control procedures as specified in
14 6.3.2.5.

15 The MC-MAP mobile station shall process the following new MC-MAP messages received
16 from the base station as indicated:

- 17 • *MC-MAP L3 Message*: The mobile station shall process this message as specified in
18 section 6.3.2.3.2.
- 19 • *R-TMSI Assignment Message*: the MC-MAP mobile station shall process this message as
20 specified in 6.3.4. The mobile station shall then respond with a *R-TMSI Assignment*
21 *Completion Message* within T56m seconds.
- 22 • *MC-MAP GSM Handover Command Message*: the MC-MAP mobile station shall process
23 this message as specified in 6.3.3.2.1.1.

24 Procedures related to receiving the following messages from the BS shall be ignored (see
25 Tables 6.4-4 and 6.4.3-2):

- 26 • *Alert With Information Message*
- 27 • *Authentication Challenge Message*
- 28 • *Base Station Challenge Confirmation Order*
- 29 • *Continuous DTMF Tone Order*
- 30 • *Flash With Information Message*
- 31 • *Maintenance Order*
- 32 • *Mobile Station Registered Message*
- 33 • *Send Burst DTMF Message*
- 34 • *Service Option Control Order*
- 35 • *Service Option Request Order*
- 36 • *Service Option Response Order*

- 1 • *SSD Update Message*
- 2 • *TMSI Assignment Message*
- 3 • *Extended Alert With Information Message*
- 4 • *Extended Flash With Information Message*

5 6.3.1.1.5.9 Release Substate

6 The MC-MAP mobile station shall comply with the requirements specified in 2.6.4.4 of 3GPP2 C.S0005-A
7 with the following modifications:

8 The MC-MAP mobile station shall ignore all the procedures related to “Call Control
9 instance” and communication between Layer 3 and Call Control instances.

10 The MC-MAP mobile station shall ignore all the procedures related to the MM functionality
11 (registration timer maintenance, TMSI_CODE_{s-p}, etc.).

12 Procedures related to receiving the following messages from the BS shall be ignored (see
13 Tables 6.4-4 and 6.4.3-2):

- 14 • *Alert With Information Message*
- 15 • *Mobile Station Registered Message*
- 16 • *Service Option Control Message*
- 17 • *Service Option Control Order*
- 18 • *TMSI Assignment Message*
- 19 • *Extended Alert With Information Message*

20 6.3.1.1.5.10 Call Control Processing

21 The MC-MAP mobile station shall ignore all the requirements in 2.6.10 of 3GPP2 C.S0005-A.

22 6.3.1.2 Modifications to 3GPP2 C.S0005-A Base Station Procedures

23 Base station processing consists of the following types of processing:

- 24 • *Pilot and Sync Channel Processing.* See 6.3.1.2.1.
- 25 • *Common Channel Processing.* See 6.3.1.2.2.
- 26 • *Access Channel and Enhanced Access Channel Processing.* See 6.3.1.2.3.
- 27 • *Traffic Channel Processing.* See 6.3.1.2.4.

28 The MC-MAP base station transmits on Pilot Channel, Sync Channel and Paging Channel or Forward Common
29 Control Channel to broadcast MC-MAP system information to idle and connected mode mobile stations in a
30 cell.

31 6.3.1.2.1 Pilot and Sync Channel Processing

32 The MC-MAP base station shall comply with the requirements specified in 3.6.1 of 3GPP2 C.S0005-A with the
33 following modifications(in addition to modifications corresponding to those identified in 6.3.1.1.1):

34 The MC-MAP base station shall continuously send *MC-MAP Sync Channel Message* on each Sync Channel on
35 which the base station transmits. If the base station transmits both *Sync Channel Message* and *MC-MAP Sync*
36 *Channel Message*, the base station shall not duplicate the CDMA MC specific parameters in the *MC-MAP Sync*
37 *Channel Message*.

6.3.1.2.2 Common Channel Processing

The MC-MAP base station shall comply with the requirements specified in 3.6.2 of 3GPP2 C.S0005-A with the following modifications (in addition to modifications corresponding to those identified in 6.3.1.1.2 and 6.3.1.1.3):

The MC-MAP base station shall perform RRC connection establishment procedures as specified in section 6.3.2.1.1.

If requested by the Upper Layers, the MC-MAP base station RRC may perform direct transfer operation as specified in section 6.3.2.3.

The MC-MAP base station shall perform MS Capability enquiry as specified in 6.3.2.2.

The MC-MAP base station shall perform Security Mode Control procedures as specified in 6.3.2.5.

Overhead messages sent by the MC-MAP base station on the Broadcast Channel are:

- *User Zone Identification Message*
- *Private Neighbor List Message*
- *Extended CDMA Channel List Message*
- *MC-RR Parameters Message*
- *Universal Neighbor List Message*
- *MC-MAP System Information message*
- *Enhanced Access Parameters Message*

The overhead messages sent by the MC-MAP base station on the Paging Channel are:

- *Access Parameter Message*
- *System Parameter Message*
- *CDMA Channel List Message*
- *Extended System Parameters Message*
- *Neighbor List Message*
- *Extended Neighbor List Message*
- *General Neighbor List Message*
- *User Zone Identification Message*
- *Private Neighbor List Message*
- *Extended CDMA Channel List Message*
- *MC-MAP System Information message*

The requirements related to response to *Registration Message*, *Origination Message*, and *Page Response Message* shall be ignored by the MC-MAP base station.

The MC-MAP base station shall comply with the requirements specified in 3.6.2.1 and 3.6.2.3 of 3GPP2 C.S0005-A for sending *General Page Message* to the MC-MAP mobile stations. The SERVICE_OPTION field

1 of this message shall be set to one of the MC-MAP service options defined in **C.R1001-A** (i.e., Speech Call, CS
2 Data Call, PS Data Call, or SMS) that corresponds to the “paging cause” received from the Upper Layers.

3 **6.3.1.2.3 Access Channel Processing**

4 The MC-MAP base station shall comply with the requirements specified in 3.6.3 of 3GPP2 C.S0005-A with the
5 following modifications (in addition to modifications corresponding to those identified in 6.3.1.1.2 and
6 6.3.1.1.3):

7 **The MC-MAP base station shall perform RRC connection establishment procedures as**
8 **specified in section 6.3.2.1.1.**

9 **If requested by the Upper Layers, the MC-MAP base station RRC may perform direct**
10 **transfer operation as specified in section 6.3.2.3.**

11 **The MC-MAP base station shall perform MS Capability enquiry as specified in 6.3.2.2.**

12 **The MC-MAP base station shall perform Security Mode Control procedures as specified in**
13 **6.3.2.5.**

14 **6.3.1.2.3.1 RR-level Registration**

15 RR-level Registration is the process by which a mobile station registers with the RR-layer of the base station.
16 The mobile station that wants to register with the base station at RR-layer shall send the *RR-level Registration*
17 *Message* if the R-TMSI is assigned.

18 The base station shall perform following procedures depending on RR_REG_TYPE field of the *RR-level*
19 *Registration Message*:

- 20 • If RR_REG_TYPE is equal to '0000', indicating periodic timer-based RR-level
21 registration, the MC-MAP base station shall respond with *R-TMSI Assignment Message*
22 to inform the mobile station that it is registered at RR. It may use the message to assign
23 a new R-TMSI or to release the RRC connection on common channels by setting all the
24 bits of R_TMSI_CODE to '1' in *R-TMSI Assignment Message*.
- 25 • If RR_REG_TYPE is equal to '0001' indicating zone-based RR-level registration, the MC-
26 MAP base station shall respond with *R-TMSI Assignment Message* with a new R-TMSI to
27 inform the mobile station that it is registered at RR. To release the RRC connection on
28 common channels, the base station shall set all the bits of R_TMSI_CODE to '1'.
- 29 • If RR_REG_TYPE is equal to '0010' indicating “Page Response”, RRC of the MC-MAP
30 base station shall inform the appropriate Upper Layers of the confirmation of the
31 Paging. If the Upper Layers request the establishment of dedicated traffic channel, the
32 base station may send the *Extended Channel Assignment Message* as described
33 6.3.2.1.1.3.
- 34 • If RR_REG_TYPE is equal to '0011', indicating the mobile station request for dedicated
35 traffic channels, the RRC of the MC-MAP base station shall inform the Upper Layers of
36 this request. The base station may respond with a *R-TMSI Assignment Message* to
37 inform the mobile station that it is registered at RR or to release RRC connection on
38 common channels.

39 **6.3.1.2.4 Traffic Channel Processing**

40 The MC-MAP base station shall comply with the requirements specified in 3.6.4 of 3GPP2 C.S0005-A with the
41 following modifications (in addition to modifications corresponding to those identified in 6.3.1.1.4):

1 The MC-MAP base station shall perform RRC connection release procedures as specified in
2 section 6.3.2.1.2.

3 If requested by the Upper Layers, the MC-MAP base station RRC may perform direct
4 transfer operation as specified in section 6.3.2.3.

5 The MC-MAP base station shall perform dedicated mode paging as specified in section
6 6.3.2.4.

7 The MC-MAP base station shall perform the establishment, reconfiguration, and release of
8 radio bearers (RB) as specified in section 6.3.2.6.

9 The MC-MAP base station shall perform MS Capability Enquiry as specified in 6.3.2.2.

10 The MC-MAP base station shall perform Security Mode Control procedures as specified in 6.3.2.5.

11 6.3.2 Detailed RRC Functions

12 6.3.2.1 RRC Connection Procedures

13 6.3.2.1.1 RRC Connection Establishment

14 This section describes RRC connection establishment (providing the functions of 8.1.3 of 3GPP TS 25.331).
15 RRC connection establishment procedures are performed while the mobile station is in the *Mobile Station Idle*
16 *State* or *Access State* and the base station is in *Common Channel Processing State* or *Access Channel*
17 *Processing State*.

18 The RRC connection establishment procedure establishes an RRC connection between the mobile station and
19 the base station. The MC-MAP mobile station sends an *MC-MAP RRC Connection Request Message* on the r-
20 csch. This message is used instead of the *Origination Message* and *Page Response Message*, defined in 2.6.3.3
21 and 2.6.3.5 of 3GPP2 C.S0005-A.

22 The RRC connection establishment procedure is started by a request from the MM sublayer or in response to a
23 *General Page Message* from the base station. During the RRC connection establishment procedure, the MC-
24 MAP mobile station shall update overhead system information as defined in 2.6.3.2 of 3GPP2 C.S0005-A and
25 this document. The mobile station shall then send an *MC-MAP RRC Connection Request Message* to the base
26 station as follows:

- 27 • If the RRC connection establishment is due to the request from the Upper Layers at the mobile station, then
28 the MC-MAP mobile station shall send the *MC-MAP RRC Connection Request Message* from the
29 *Origination Attempt Substate* of the *System Access State*.
- 30 • If the RRC connection establishment is due to receiving a *General Page Message*, then the MC-MAP
31 mobile station shall send the *MC-MAP RRC Connection Request Message* from the *Page Response*
32 *Substate* of the *System Access State*.

33 The *MC-MAP RRC Connection Request Message* is sent on the r-csch channel and contains (see 6.4.1.3.4 for
34 details):

- 35 • **An establishment cause:** the establishment cause indicates to the base station the
36 purpose of this RRC connection establishment request. If the “establishment cause” (as
37 received from the Upper Layers or the “paging cause” of the *General Page Message*) can
38 be mapped to one of the MC-MAP service options defined in **C.R1001-A** (i.e., Speech
39 Call, CS Data Call, PS Data Call, or SMS), then the establishment cause is carried in
40 the SERVICE_OPTION field of the *MC-MAP RRC Connection Request Message*; otherwise,
41 the establishment cause is carried in the OTHER_ESTABLISH_CAUSE field of the *MC-*
42 *MAP RRC Connection Request Message*

- 43 • **The Mobile station capability, including types of channels supported.**

44 On receipt of an *MC-MAP RRC Connection Request Message*, the base station may allocate a dedicated channel
45 to the mobile station by sending an *Extended Channel Assignment Message* on the f-csch. In determining the

1 “establishment cause” of this RRC connection request, the base station shall make use of the MS_ORIG_IND,
 2 CAUSE_IND, SERVICE_OPTION, and OTHER_ESTABLISH_CAUSE fields of the *MC-MAP RRC*
 3 *Connection Request Message* (see 6.4.1.3.4 for definition of these fields).The *Extended Channel Assignment*
 4 *Message* contains (see 6.4.2.1.7 of this document and 2.6.3 of 3GPP2 C.S0005-A for details):

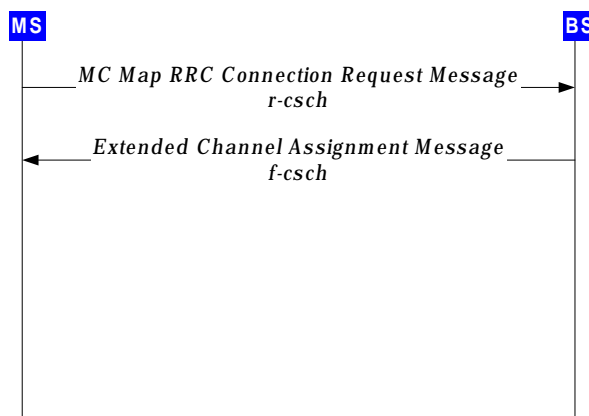
- 5 • The mobile station identification (as transmitted in the *MC-MAP RRC Connection*
 6 *Request Message* by the mobile station);
- 7 • The description of the assigned channel (channel configuration, frequency (optional),
 8 code channel, frame offset, Public Long Code Mask if PLCM_TYPE is set to '10'.)

9
 10 The following restrictions apply to the *Extended Channel Assignment Message* for MC-MAP:

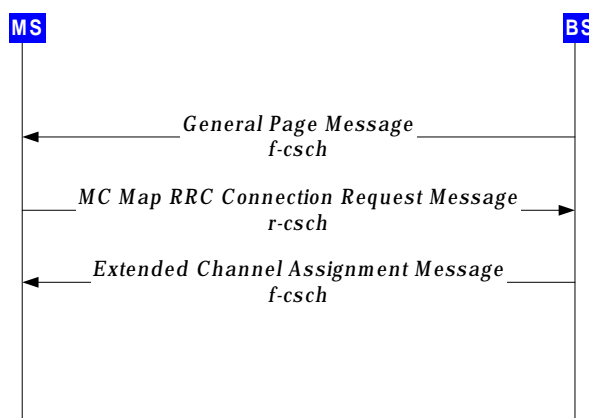
- 11 • MC-MAP uses ASSIGN_MODE of '000' and '100'.
- 12 • For ASSIGN_MODE of '000' or '100', BYPASS_ALERT_ANSWER is ignored,
 13 GRANTED_MODE is always set to '00', and ENCRYPT_MODE is always set to '00'.

14 The mobile station processes the *Extended Channel Assignment Message* according to 2.6.3.3, 2.6.3.4, and
 15 2.6.3.5 of 3GPP2 C.S0005-A.

16 The following message flows show successful RRC connection establishment. If the RRC connection
 17 establishment procedure is successfully completed, the mobile station shall enter the *Mobile Station Control on*
 18 *the Traffic Channel State*.



19
 20 **Figure 6.3.2.1.1-1: Successful RRC Connection Establishment (MS- originated)**
 21 **Procedure Message Flow**
 22



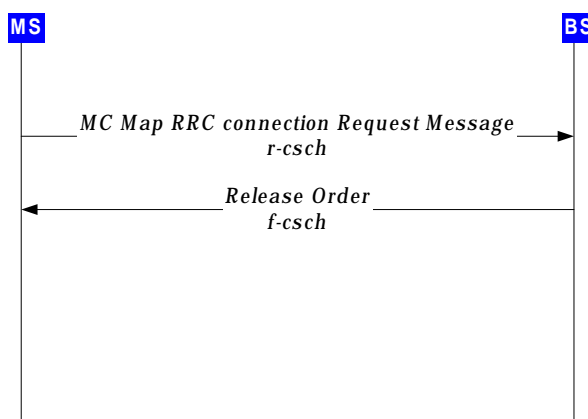
23

1 **Figure 6.3.2.1.1-2: Successful RRC Connection Establishment (MS- terminated)**
 2 **Procedure Message Flow**

3 **6.3.2.1.1.1 Rejection of MC-MAP RRC Connection Request Message**

4 If no channel is available for assignment, the base station may send to the mobile station a *Release Order*
 5 (*Order Code = '010101'*, *Order Qualification Code = '00000010'*) over the *f-csch*.

6 On receipt of a *Release Order* corresponding to one of its last *MC-MAP RRC Connection Request Messages*,
 7 the mobile station shall stop sending *MC-MAP RRC Connection Request Messages* and the mobile station shall
 8 return to idle mode. The base station may also reject the *MC-MAP RRC Connection Request Message* by
 9 sending a *Reorder Order*.



10
 11 **Figure 6.3.2.1.1.1-1: Unsuccessful RRC Connection Establishment Procedure Message**
 12 **Flow**

13 **6.3.2.1.2 RRC Connection Release**

14 The purpose of this procedure is to release the RRC connection, including the signaling link
 15 and all radio bearers between the mobile station and the base station.

16 If the mobile station has a RRC connection while on the common channels, the base station
 17 shall send a *R-TMSI Assignment Message* with all the bits of *R_TMSI_CODE* set to '1' to
 18 release the RRC connection on the common channels. The mobile station shall respond
 19 with *R-TMSI Assignment Completion Message* to confirm the receipt of the message.

20 The RRC connection release procedure can also be performed while the mobile station is in
 21 the *Mobile Station Control on the Traffic Channel State* and the base station is in the *Traffic*
 22 *Channel Processing State*.

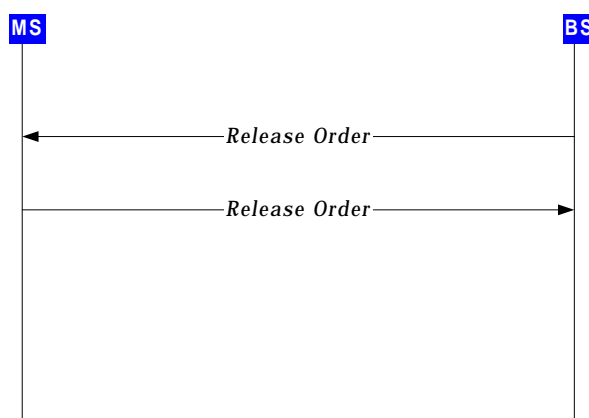


Figure 6.3.2.1.2-1. RRC Release Procedure

The base station shall perform the following procedures related to RRC connection release while in the *Traffic Channel Processing State*:

- To release an RRC connection, the base station shall first send an *R-TMSI Assignment Message* with all the bits of *R_TMSI_CODE* set to '1'. It shall then send an *Release Order* to the mobile station.
- When the base station receives a *Release Order* from the mobile station in response to the *Release Order* sent by the base station, it should release all mobile station dedicated resources.

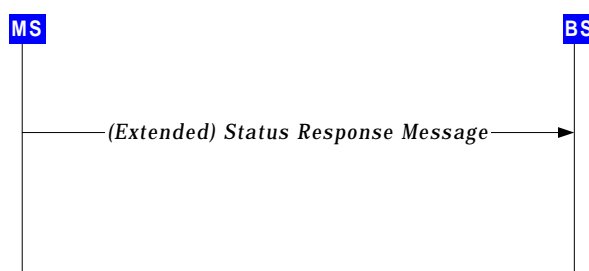
The mobile station shall perform the following procedures related to RRC connection release:

- If the mobile station receives a *R-TMSI Assignment Message*, it shall process the message as described in 6.3.4.1.2.5 and respond with *R-TMSI Assignment Completion Message*.
- If the mobile station receives a *Release Order* while in the *Traffic Channel Substate* of the *Mobile Station Control on the Traffic Channel State*, the mobile station shall enter the *Release Substate* of the *Mobile Station Control on the Traffic Channel State* with a base station release indication, shall send a *Release Order* to the base station, and shall enter the *System Determination Substate* of the *Mobile Station Initialization State* with a release indication.

6.3.2.2 Transmission of MS Capability Information

The mobile station capability update procedure is used by the mobile station to convey mobile station specific capability information to the base station.

MS Capability Transmission procedures are performed while the mobile station is in the *Mobile Station Idle State* or *Access State* and the base station is in *Common Channel Processing State* or *Access Channel Processing State* or while the mobile station is in the *Mobile Station Control on the Traffic Channel State* and the base station is in the *Traffic Channel Processing State*.



1

2

Figure 6.3.2.2-1. Mobile Station Capability Report Procedure

3

The mobile station shall perform the following procedures related to transmission of mobile station capability information:

4

- 5 • The mobile station shall initiate the mobile station capability update procedure upon
6 receiving a *Status Request Message* from the base station.
- 7 • The mobile station shall send a *Status Response Message* (on r-dsch) or an *Extended*
8 *Status Response Message* (on r-csch) to the base station, containing the appropriate
9 information records(see Tables 6.4.4-1 and 6.4.4-2).

10

The base station shall perform the following procedures related to transmission of mobile station capability information: Upon reception of a *Status Response Message* (on r-dsch) or the *Extended Status Response Message* (on r-csch), the base station shall store the capability information received from the mobile station.

11

12

13

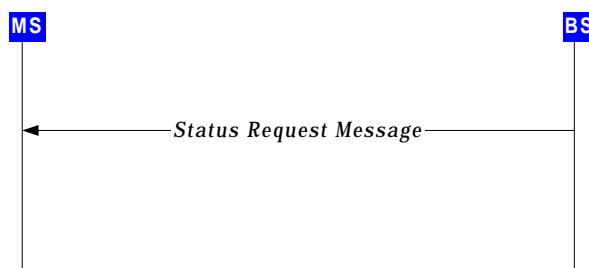
6.3.2.2.1 MS Capability Enquiry

14

The mobile station capability enquiry is used to request the mobile station to transmit its capability information related to any radio access network that is supported by the mobile station.

15

16



17

18

Figure 6.3.2.2.1-1. Mobile Station Capability Request Procedure

19

The base station shall perform the following procedure related to mobile station capability inquiry: The base station shall transmit a *Status Request Message* to the mobile station, with the RECORD_TYPE field(s) set to the type of the information record(s) requested (see Tables 6.4.4-1 and 6.4.4-2).

20

21

22

1 The mobile station shall perform the following procedure related to mobile station capability
 2 inquiry: Upon reception of a *Status Request Message*, the mobile station shall initiate the
 3 transmission of mobile station capability information, as specified in section 6.3.2.2.

4 6.3.2.3 Direct Transfer Procedures

5 The direct transfer procedure is used in both forward link and reverse link to carry all Upper Layer Non-Access
 6 Stratum messages over the radio interface.

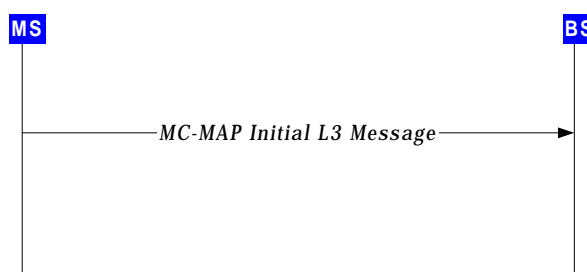
7 RRC Connection Release procedures are performed while the mobile station is in the *Mobile Station Control on*
 8 *the Traffic Channel State* and the base station is in the *Traffic Channel Processing State*.

9 6.3.2.3.1 Initial Direct Transfer Procedures

10 In the MC-MAP system, initial direct transfer is implemented through the *MC-MAP Initial L3 Message*.

11 The *MC-MAP Initial L3 Message* carries the first Upper Layer Non-Access Stratum message in the
 12 NAS_INFO_DATA field of the message. The RRC entity at the receiving side is responsible for routing the
 13 encapsulated Upper Layer Non-Access Stratum message to the appropriate Upper Layer entity.

14



15

16

Figure 6.3.2.3.1-1. Initial Direct Transfer Procedure

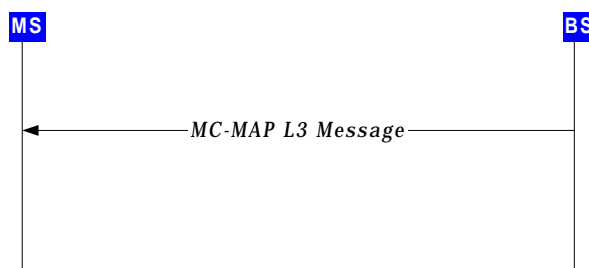
17 The mobile station shall perform the following procedure related to Initial Direct
 18 Transfer: When the Upper Layers request the RRC to initiate a session and transfer a Non-
 19 Access Stratum message, the mobile station shall transmit the *MC-MAP Initial L3 Message*,
 20 with the Non-Access Stratum message encapsulated in the NAS_INFO_DATA field of the
 21 message. The mobile station shall set the CN_DOMAIN_ID field of the message to indicate
 22 which CN node the Non-Access Stratum message is destined to as shown in Table 6-
 23 5.1.1.3-1, set the SERVICE_DESCRIPTOR field of the message to the appropriate service
 24 descriptor value as shown in Table 6-5.1.1.3-2, and set the FLOW_ID field to the flow
 25 identifier for this session.

26 The base station shall perform the following procedure related to Direct Transfer: Upon
 27 reception of an *MC-MAP Initial L3 Message* at the base station, the base station shall route
 28 the Non-Access Stratum message encapsulated within the received message to the correct
 29 Upper Layer entity, based upon the values of the CN_DOMAIN_ID, the
 30 SERVICE_DESCRIPTOR, and the FLOW_ID fields of the received message.

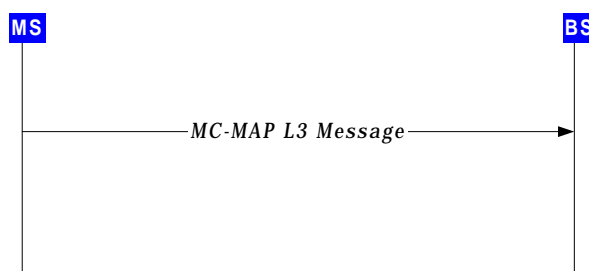
31 6.3.2.3.2 Forward Link and Reverse Link Direct Transfer Procedures

32 In the MC-MAP system, forward link and reverse link direct transfer is implemented through the *MC-MAP L3*
 33 *Message*.

- 1 The *MC-MAP L3 Message* carries the Upper Layer Non-Access Stratum message in the *NAS_INFO_DATA*
 2 field of the message. The RRC entity at the receiving side is responsible for routing the encapsulated Upper
 3 Layer Non-Access Stratum message to the appropriate Upper Layer entity.



4
 5 **Figure 6.3.2.3.2-1. Base Station Initiated Direct Transfer Procedure**



7
 8 **Figure 6.3.2.3.2-2. Mobile Station Initiated Direct Transfer Procedure**

9 The mobile station shall perform the following procedures related to Direct Transfer:

- 10 • When the Upper Layers request the RRC to transfer a Non-Access Stratum message,
 11 the mobile station shall transmit the *MC-MAP L3 Message*, with the Non-Access
 12 Stratum message encapsulated in the *NAS_INFO_DATA* field of the message. The mobile
 13 station shall set the *CN_DOMAIN_ID* field of the message to indicate which CN node the
 14 Non-Access Stratum message is destined to as shown in Table 6-5.1.1.3-1, the
 15 *SERVICE_DESCRIPTOR* field of the message to the appropriate service descriptor value
 16 as shown in Table 6-5.1.1.3-2, and the *FLOW_ID* field to the flow identifier for this
 17 session.
- 18 • Upon reception of an *MC-MAP L3 Message* at the mobile station, the mobile station shall
 19 route the Non-Access Stratum message encapsulated within the received message to
 20 the correct Upper Layer entity, based upon the values of the *CN_DOMAIN_ID*, the
 21 *SERVICE_DESCRIPTOR*, and the *FLOW_ID* fields of the received message.

1 The base station shall perform the following procedures related to Direct Transfer:

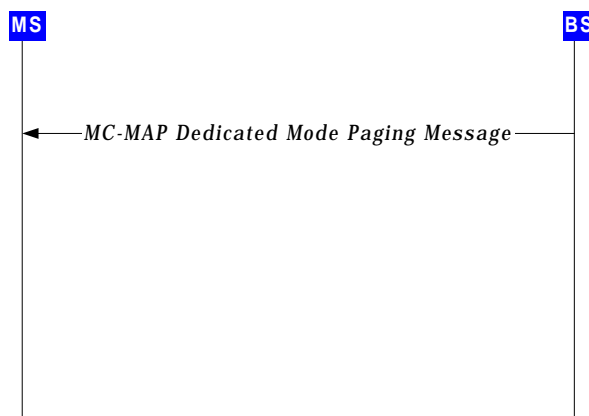
- 2 • When the Upper Layers request the RRC to transfer a Non-Access Stratum message,
 3 the base station shall transmit the *MC-MAP L3 Message*, with the Non-Access Stratum
 4 message encapsulated in the *NAS_INFO_DATA* field of the message. The base station
 5 shall set the *CN_DOMAIN_ID* field of the message to indicate which CN node the Non-
 6 Access Stratum message is originated from as shown in Table 6-5.1.1.3-1, set the
 7 *SERVICE_DESCRIPTOR* field of the message to the appropriate service descriptor value
 8 as shown in Table 6-5.1.1.3-2, and set the *FLOW_ID* field to the flow identifier for this
 9 session.
- 10 • Upon reception of an *MC-MAP L3 Message* at the base station, the base station shall
 11 route the Non-Access Stratum message encapsulated within the received message to
 12 the correct CN domain, based upon the values of the *CN_DOMAIN_ID*,
 13 *SERVICE_DESCRIPTOR*, and *FLOW_ID* fields of the received message.

14 6.3.2.4 Dedicated Mode Paging

15 This procedure is used to page a mobile station while the mobile station is in the *Mobile Station Control on the*
 16 *Traffic Channel State* and the base station is in the *Traffic Channel Processing State*.

17

18



19

20

Figure 6.3.2.4-1. Dedicated Mode Paging Procedure

21 The base station shall perform the following procedure related to dedicated mode paging: If
 22 the Upper Layers in the network request paging of a mobile station that is in the *Mobile*
 23 *Station Control on the Traffic Channel State*, the base station should transmit an *MC-MAP*
 24 *Dedicated Mode Paging Message* to the mobile station, with the fields of the message set as
 25 follows:

- 26 – The *CN_DOMAIN_ID* field shall be set to the appropriate core network identifier as
 27 shown in Table 6.4.1.1.3-1.
- 28 – The *SERVICE_OPTION* field shall be set to the appropriate value of the service
 29 option number corresponding to the “paging cause” received from the Upper Layers.
- 30 – The *PAGE_REC_TYPE_ID* field shall be set to the appropriate value of the paging
 31 record type identifier as shown in Table 6.4.1.2.4-1.

32 The mobile station shall perform the following procedures related to dedicated mode paging:

- 1 • Upon reception of an *MC-MAP Dedicated Mode Paging Message*, the mobile station shall
 2 perform the following:
- 3 – If CN_DOMAIN_ID_r equals '00', the mobile station shall set the "CN domain
 4 identifier" parameter to "PSTN/ISDN"; if CN_DOMAIN_ID_r equals '01', the mobile
 5 station shall set the "CN domain identifier" parameter to "IP"; otherwise, the mobile
 6 station shall set the "CN domain identifier" parameter to "Don't Care".
 - 7 – The mobile station shall set the "paging cause" parameter according to the value of
 8 the MC-MAP service option number given in the SERVICE_OPTION field.
 - 9 – If PAGE_REC_TYPE_ID_r equals '0000', the mobile station shall set the "paging
 10 record type identifier" parameter to "IMSI"; if PAGE_REC_TYPE_ID_r equals '0001',
 11 the mobile station shall set the "paging record type identifier" parameter to "TMSI";
 12 if PAGE_REC_TYPE_ID_r equals '0010', the mobile station shall set the "paging
 13 record type identifier" parameter to "P-IMSI";.
 - 14 – The RRC shall indicate paging and forward the "paging cause" and the "paging
 15 record type identifier" to the Upper Layer entity indicated by the "CN domain
 16 identifier" parameter.

17 6.3.2.5 Security Mode Control

18 The mobile station may request to enable or disable encryption for a particular service option connection or for
 19 signaling encryption using the *Security Mode Request Message*. The *Security Mode Request Message* message
 20 specifies the following:

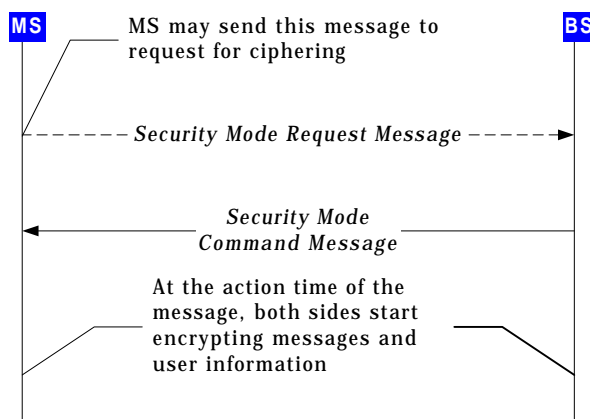
- 21 • The encryption algorithms supported by the mobile station for signaling and user
 22 information encryption,
- 23 • The service option connections (if any) that the mobile station is requesting to be
 24 encrypted, and
- 25 • A request for encrypting the signaling messages.

26 The base station sends to the mobile station the *Security Mode Command Message* which specifies the
 27 following:

- 28 • Encryption algorithm(s) to be used for encryption of signaling messages and user
 29 information,
- 30 • The activation time after which encryption is to commence as prescribed by this
 31 message,
- 32 • The core network domain (CS or PS core network) which identifies the key to be use,
 33 and
- 34 • The concealed 24 most significant bits of the crypto-sync used for encryption of
 35 signaling messages.

36 The base station may also determine the mobile station's ciphering capabilities through the *Status Request*
 37 *Message*, *Origination Message*. Therefore, the base station can autonomously send a *Security Mode Command*
 38 *Message* to the mobile station.

39 Figure 6.3.2.5-1 shows an example of security mode invocation by the mobile station.



1

Figure 6.3.2.5-1. Example of Security Mode Control Flow Diagram

2

3 The mobile station and the base station shall perform Extended-Encryption for Signaling Message and User
 4 Information as specified in 2.3.12.4 of 3GPP2 C.S0005-A.

5

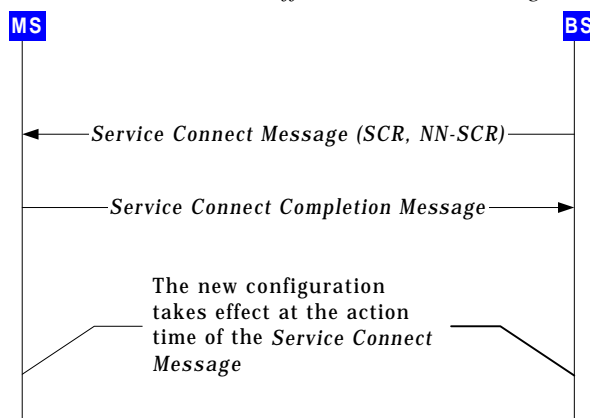
6 The mobile station shall recover the value of the 24 MSB of the crypto-sync used for extended-encryption of
 7 signaling messages from the concealed crypto-sync received in the *Security Mode Command Message* by
 XORing the 24 MSB of the AK (anonymity key) with the CONC_EXT_SEQ_H_r.

7

8 **6.3.2.6 Radio Bearer Control Procedures**

9

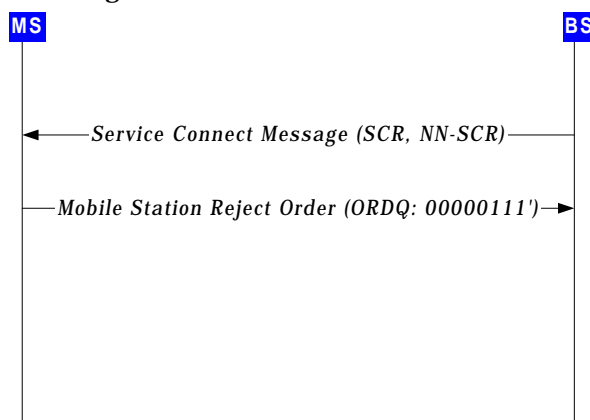
10 Radio Bearer Control procedures are performed while the mobile station is in the *Mobile Station Control on the Traffic Channel State* and the base station is in the *Traffic Channel Processing State*.



11

Figure 6.3.2.5-2 Successful Case

12



13

Figure 6.3.2.5-3 Unsuccessful Case

14

6.3.2.6.1 Radio Bearer Establishment

The purpose of this procedure is to establish new radio bearer(s).

The base station shall perform the following procedures related to radio bearer establishment:

- If the Upper Layer in the network request establishment of radio bearer(s), the base station shall transmit a *Service Connect Message* (with the Service Configuration Record and the Non-Negotiable Service Configuration Record included). The SERVICE_OPTION field of the service option connection record entry for the new radio bearer specifies the new radio bearer type and the CON_REF field specifies an identifier for this radio bearer. The base station shall also include the core domain identity, NAS binding info, and radio bearer identity (as specified by the Upper Layers) in the CN_DOMAIN_ID, NAS_BINDING_INFO, and RB_ID fields of the Service Configuration Record, respectively, for the new radio bearer. For all already existing radio bearers, the base station should not include the CN_DOMAIN_ID and NAS_BINDING_INFO fields in the service option connection record entry corresponding to those radio bearers (as specified in 6.4.4.2)
- The base station should take the mobile station capabilities into account when setting the new configuration.
- When the base station has received the *Service Connect Completion Message*, the base station may delete any old configuration. The accepted configuration takes effect at the action time of the *Service Connect Message*.

The mobile station shall perform the following procedure related to radio bearer establishment: Upon reception of a *Service Connect Message*, the mobile station shall perform actions as specified in 6.3.1.1.5.6. If the mobile station accepts the new configuration, the mobile station shall transmit a *Service Connect Completion Message* and shall enter the *Normal Service subfunction*; the received configuration takes effect at the action time of the *Service Connect Message*. If the mobile station does not support the new configuration, the mobile station shall transmit a *Mobile Station Reject Order* (ORDQ = '00000111') and shall enter the *Normal Service subfunction*.

6.3.2.6.2 Radio Bearer Reconfiguration

The radio bearer reconfiguration procedure is used to reconfigure parameters for a radio bearer or the signaling link to reflect a change in QoS.

The base station shall perform the following procedures related to radio bearer reconfiguration:

- The base station shall transmit a *Service Connect Message*. The parameters of the Service Configuration Record and the Non-Negotiable Service Configuration Record included in this message specify the reconfigured radio bearers.
- The base station should take the mobile station capabilities into account when setting the new configuration.
- When the base station has received the *Service Connect Completion Message*, the base station may delete the old configuration. The new configuration takes effect at the action time of the *Service Connect Message*.

1 The mobile station shall perform the following procedure related to radio bearer
 2 reconfiguration: Upon reception of a *Service Connect Message* specifying radio bearer
 3 reconfiguration, the mobile station shall perform actions as specified in 6.3.1.1.5.6. If the
 4 mobile station accepts the reconfiguration, the mobile station shall transmit a *Service*
 5 *Connect Completion Message* on and shall enter the *Normal Service subfunction*; the new
 6 configuration takes effect at the action time of the *Service Connect Message*. If the mobile
 7 station does not support the reconfiguration, the mobile station shall transmit a *Mobile*
 8 *Station Reject Order* (ORDQ = '0000111') and shall enter the *Normal Service subfunction*.

9 6.3.2.6.3 Radio Bearer Release

10 The purpose of this procedure is to release existing radio bearer(s).

11 The base station shall perform the following procedures related to radio bearer release:

- 12 • If the Upper Layer in the network requests release of radio bearer(s), the base station
 13 shall transmit a *Service Connect Message* (with the Service Configuration Record and
 14 the Non-Negotiable Service Configuration Record included). The base station shall omit
 15 the CON_REF (and the corresponding service option connection record entry) for the
 16 radio bearer(s) to be released.
- 17 • The base station should take the mobile station capabilities into account when setting
 18 the new configuration.
- 19 • When the base station has received the *Service Connect Completion Message*, the base
 20 station may delete any old configuration. The new configuration takes effect at the
 21 action time of the *Service Connect Message*.

22 The mobile station shall perform the following procedure related to radio bearer
 23 release: Upon reception of a *Service Connect Message*, the mobile station shall perform
 24 actions as specified in 6.3.1.1.5.6. If the mobile station accepts the new configuration, the
 25 mobile station shall transmit a *Service Connect Completion Message* and shall enter the
 26 *Normal Service subfunction*; the new configuration takes effect at the action time of the
 27 *Service Connect Message*. If the mobile station does not support the new configuration, the
 28 mobile station shall transmit a *Mobile Station Reject Order* (ORDQ = '0000111') and shall
 29 enter the *Normal Service subfunction*.

30 6.3.2.7 RRC Connection Mobility Procedures

31 When the MC-MAP mobile station successfully sends an *RRC Connection Request Message*, the base station
 32 can infer the mobile station's location and hence mobile station performs implicit RR-level registration. The
 33 base station should notify the mobile station that it is registered at RR level by sending *R-TMSI Assignment*
 34 *Message* with a valid R-TMSI.

35 While the RRC connection is established and the MC-MAP mobile station is in *Traffic Channel Substate*, it
 36 implicitly performs Traffic Channel RR-level Registration. The base station may notify the mobile station that it
 37 is registered at RR level by sending *R-TMSI Assignment Message*. The base station may also assign the mobile
 38 a new R-TMSI.

39 If the call is timed out, the base station may direct the MC-MAP mobile station to common channels by sending
 40 a *Release Order*. RRC connection on common channels is achieved by maintaining the RR-level registration of
 41 the mobile station and a valid R-TMSI. While monitoring the common channels, the MC-MAP mobile station
 42 shall perform periodic, zone-based or ordered RR-level registration as specified in 6.3.2. by sending *RR-level*
 43 *Registration Message*.

44 The base station may accept the registration and allocate the mobile station a new R-TMSI by sending the *R-*
 45 *TMSI Assignment Message*. If the base station sends the mobile station *RTMSI Assignment Message* with all bits
 46 of R_TMSI_CODE set to '1', the mobile station shall set all bits of R_TMSI_CODE_s to '1' and shall set

1 RR_REG_ENABLED_S to 'NO'. When this message with all bits of R_TMSI_CODE set to '1' is sent, the
 2 connection of the mobile station gets closed on all layers of access stratum till a RRC Connection is established.
 3 If the mobile station does a periodic RR-registration in the same R-TMSI zone as the one in which in has
 4 already registered, the base station may or may not assign it a new R-TMSI. If the mobile station registers at RR
 5 in a new R-TMSI zone, the base station shall assign it a new R-TMSI or reject RR- registration by sending R-
 6 *TMSI Assignment Message*.
 7 Exact requirements related to RR-level registration are specified in 6.3.2.

8 6.3.3 Handoff Procedures

9 6.3.3.1 Soft Handoff

10 See 2.6.6.1 and 2.6.6.2 of 3GPP2 C.S0005-A.

11 6.3.3.2 Inter-System MC-MAP to GSM Handoff

12 6.3.3.2.1 Mobile Station Procedures

13 6.3.3.2.1.1 Processing of Forward Traffic Channel Handoff Messages

- 14 1. *MC-MAP GSM Handover Command Message*: The mobile station shall process the
 15 message as follows:

16 When the message takes effect, the mobile station shall:

- 17 • If GSM_T_REF_INCL is equal to '1', store the following parameters:

- 18 – CDMA time (CDMA_TIME_S = CDMA_TIME_T)
- 19 – GSM frame number (GSM_FRAME_S = GSM_FRAME_T)
- 20 – GSM frame fraction (GSM_FRACT_S = GSM_FRACT_T)

- 21 • Process the GSM_INFO_LEN and GSM_INFO_DATA fields of the message in
 22 accordance with the requirements stated in GSM 04.08.

- 23 2. *Candidate Frequency Search Request Message*: The mobile station shall process the
 24 message as follows:

25 If SEARCH_MODE_T is equal to '0000' or '0001', the mobile station shall process the message as
 26 specified in 2.6.6.2.5.1 of 3GPP2 C.S0005-A.

27 If SEARCH_MODE_T is equal to '0010', and if the mobile station supports GSM channel searching, the
 28 mobile station shall process the *Candidate Frequency Search Request Message* as follows:

- 29 • The mobile station shall send a *Mobile Station Reject Order* with the ORDQ field
 30 set to '0001101' (search period too short), if SEARCH_TYPE_T is equal to '11' and
 31 *search_period* is less than (max (*fwd_time*, *rev_time*) + T_{71m}) seconds where
 32 *search_period*, *fwd_time* and *rev_time* are defined below.

33 (In the following, *rec_search_set* is the set of GSM channels specified in the *Candidate*
 34 *Frequency Search Request Message*.)

35 *search_period* = time period corresponding to SEARCH_PERIOD_T shown in

36 Table 2.6.6.2.8.3.2-1 of 3GPP2 C.S0005-A.

37 *fwd_time* = the mobile station's estimate of the total length of time, in seconds, for
 38 which the mobile station will need to suspend its current Forward
 39 Traffic Channel processing in order to tune to each GSM channel in
 40 *rec_search_set* and measure its strength, and to re-tune to the Serving
 41 Frequency; if the mobile station searches *rec_search_set* in multiple

1 visits, *fwd_time* is the total time for all visits away from the Serving
 2 Frequency in a search period
 3 *rev_time* = the mobile station's estimate of the total length of time, in seconds, for
 4 which the mobile station will need to suspend its current Reverse
 5 Traffic Channel processing in order to tune to each GSM channel in
 6 *rec_search_set* and measure its strength, and to re-tune to the Serving
 7 Frequency; if the mobile station searches *rec_search_set* in multiple
 8 visits, *rev_time* is the total time for all visits away from the Serving
 9 Frequency in a search period

- 10 • If the mobile station does not send a *Mobile Station Reject Order* in response to
 11 the *Candidate Frequency Search Request Message* , it shall perform the following:
 - 12 – The mobile station shall send a *Candidate Frequency Search Response*
 13 *Message* in assured mode within T_{56m} seconds of receiving the *Candidate*
 14 *Frequency Search Request Message* . The mobile station shall set the fields of
 15 the *Candidate Frequency Search Response Message* as follows:
 - 16 + The mobile station shall set TOTAL_OFF_TIME_FWD and
 17 TOTAL_OFF_TIME_REV to its estimate of the total number of frames or
 18 power control groups for which it will need to suspend its current
 19 Forward Traffic Channel processing and Reverse Traffic Channel
 20 processing, respectively, in order to tune to each GSM channel in
 21 *rec_search_set* , and to re-tune to the Serving Frequency. If the mobile
 22 station searches *rec_search_set* in multiple visits away from the Serving
 23 Frequency, the mobile station shall report the total number of frames or
 24 power control groups in all visits in a search period for which it will need
 25 to suspend its current Forward Traffic Channel and the Reverse Traffic
 26 Channel processing.
 - 27 + The mobile station shall set MAX_OFF_TIME_FWD and
 28 MAX_OFF_TIME_REV to its estimate of the maximum number of frames
 29 or power control groups for which it will need to suspend its current
 30 Forward Traffic Channel processing and Reverse Traffic Channel
 31 processing, respectively, during any single visit away from the Serving
 32 Frequency, to search a subset of *rec_search_set* , and to re-tune to the
 33 Serving Frequency.
 - 34 + The mobile station shall set PCG_OFF_TIMES to '1' if
 35 TOTAL_OFF_TIME_FWD, MAX_OFF_TIME_FWD, TOTAL_OFF_TIME_
 36 FWD and MAX_OFF_TIME_FWD are expressed in units of power control
 37 groups. If these time estimates are expressed in units of frames, the
 38 mobile station shall set PCG_OFF_TIMES to '0'.

- 1 + If $ALIGN_TIMING_R$ is equal to '1', the mobile station shall set
2 $ALIGN_TIMING_USED$ to '1' to indicate that it will align its search as
3 requested by the base station; otherwise, the mobile station shall set
4 $ALIGN_TIMING_USED$ to '0'. If $ALIGN_TIMING_USED$ is set to '1', the
5 mobile station shall set NUM_VISITS to the number of visits per search
6 period minus one and, if NUM_VISITS is not equal to 0, the mobile
7 station shall set $INTER_VISIT_TIME$, in units of frames or power control
8 groups, to its estimate of the time between subsequent visits within the
9 same search period.
- 10 – When the message takes effect, the mobile station shall perform the following
11 actions:
- 12 + If any periodic search is in progress, the mobile station shall abort it (see
13 2.6.6.2.8.3.4 and 2.6.6.2.10.4 of 3GPP2 C.S0005-A and 6.6.3.2.1.2.4 of
14 this document).
- 15 + If $SEARCH_TYPE_R$ is equal to '00', the mobile station may stop
16 maintaining the average of the Serving Frequency received power that is
17 used in the handoff and search procedures.
- 18 + If $SEARCH_TYPE_R$ is equal to '01' or '11', and the mobile station uses
19 received power measurements in the search procedure, it should start
20 monitoring the received power on the Serving Frequency, if it is not
21 already doing so. While it is tuned to the Serving Frequency, the mobile
22 station should measure the received power once every frame (0.02
23 seconds), and should maintain an average of the received power over the
24 last N_{12m} frames.
- 25 + Store the following parameters from the *Candidate Frequency Search*
26 *Request Message*:
- 27 o Candidate Frequency Search Request Message sequence number
28 ($CFSRM_SEQ_S = CFSRM_SEQ_R$)
- 29 o Periodic search flag: If $SEARCH_TYPE_R$ is equal to '11', the mobile
30 station shall set $PERIODIC_SEARCH_S$ to '1'; otherwise, the mobile
31 station shall set $PERIODIC_SEARCH_S$ to '0'.
- 32 o Search period for the GSM Channels search
33 ($SEARCH_PERIOD_S = SEARCH_PERIOD_R$)
- 34 o Candidate Frequency search mode
35 ($SEARCH_MODE_S = SEARCH_MODE_R$)
- 36 o Serving Frequency total pilot E_c threshold
37 ($SF_TOTAL_EC_THRESH_S = SF_TOTAL_EC_THRESH_R$)
- 38 o Serving Frequency total pilot E_c/I_0 threshold
39 ($SF_TOTAL_EC_IO_THRESH_S = SF_TOTAL_EC_IO_THRESH_R$)

- 1 o GSM RXLEV threshold
2 (GSM_RXLEV_THRESH_S = GSM_RXLEV_THRESH_T)
- 3 o Base transceiver station identity code verification required indicator
4 (BSIC_VERIF_REQ_S = BSIC_VERIF_REQ_T)
- 5 o Network color code
6 (N_COL_CODE_S = N_COL_CODE_T)
- 7 o If GSM_T_REF_INCL is equal to '1', store the CDMA time
8 (CDMA_TIME_S = CDMA_TIME_T)
- 9 o Candidate Frequency GSM Search Set: The mobile station shall
10 replace the Candidate Frequency GSM Search Set with the GSM
11 channels included in the *Candidate Frequency Search Request*
12 *Message*. For each GSM channel specified in the message, the
13 mobile station shall store the following:
- 14 ◇ GSM frequency band (GSM_FREQ_BAND)
- 15 ◇ Absolute Radio Frequency Channel Number (ARFCN).
- 16 ◇ If GSM_T_REF_INCL is equal to '1', store the GSM frame number
17 (GSM_FRAME)
- 18 ◇ If GSM_T_REF_INCL is equal to '1', store the GSM frame fraction
19 (GSM_FRACT)
- 20 o If ALIGN_TIMING_T is equal to '1', store the search offset time
21 (SEARCH_OFFSET_S = SEARCH_OFFSET_T)
- 22 + If ALIGN_TIMING_T is equal to '1' and the mobile station will align its
23 search as requested by the base station, the mobile station shall set
24 ALIGN_TIMING_USED_S to '1'; otherwise, the mobile station shall set
25 ALIGN_TIMING_USED_S to '0'.
- 26 + If the mobile station uses power control groups as the unit of delay, it
27 shall set SEARCH_TIME_RESOLUTION_S to 0.00125; otherwise, it shall
28 set SEARCH_TIME_RESOLUTION_S to 0.02.
- 29 + If SEARCH_TYPE_T is equal to '01', the mobile station shall perform a
30 single search of the Candidate Frequency GSM Search Set as described
31 in 6.6.3.2.1.2.1 of this document. If SEARCH_TYPE_T is equal to '11', the
32 mobile station shall perform the periodic search procedures described in
33 6.6.3.2.1.2.2 of this document.
- 34 3. *Candidate Frequency Search Control Message*: The mobile station shall process the
35 message as follows:
36 If SEARCH_MODE_T is equal to '0000' or '0001', the mobile station shall process the message as
37 specified in 6.6.6.2.5.1 of 3GPP2 C.S0005-A.
38 If SEARCH_MODE_S is equal to '0010':
- 39 • The mobile station shall send a *Mobile Station Reject Order* with the ORDQ field

1 set to '00001010' (search set not specified), if $SEARCH_TYPE_r$ is not equal to '00'
 2 and the Candidate Frequency GSM Search Set is empty.

- 3 • The mobile station shall send a *Mobile Station Reject Order* with the $ORDQ$ field
 4 set to '0001101' (search period too short), if $SEARCH_TYPE_r$ is equal to '11' and
 5 *search_period* is less than $(\max(fwd_time, rev_time) + T_{71m})$ seconds, where

6 *search_period* = time period corresponding to $SEARCH_PERIOD_r$ shown in

7 Table 2.6.6.2.8.3.2-1 of 3GPP2 C.S0005-A,

8 *fwd_time* = the mobile station's estimate of the total length of time, in seconds, for
 9 which the mobile station will need to suspend its current Forward
 10 Traffic Channel processing in order to tune to each GSM channel in the
 11 Candidate Frequency GSM Search Set and measure its strength, and to
 12 re-tune to the Serving Frequency; if the mobile station searches the
 13 Candidate Frequency GSM Search Set in multiple visits, *fwd_time* is
 14 the total time for all visits away from the Serving Frequency in a search
 15 period (see 6.3.3.2.1.2.2),

16 and

17 *rev_time* = the mobile station's estimate of the total length of time, in seconds, for
 18 which the mobile station will need to suspend its current Reverse
 19 Traffic Channel processing in order to tune to each GSM channel in the
 20 Candidate Frequency GSM Search Set and measure its strength, and to
 21 re-tune to the Serving Frequency; if the mobile station searches the
 22 Candidate Frequency GSM Search Set in multiple visits, *rev_time* is
 23 the total time for all visits away from the Serving Frequency in a search
 24 period (see 6.3.3.2.1.2.2).

- 25 • If the mobile station does not reject the *Candidate Frequency Search Control*
 26 *Message*, it shall perform the following actions when the message takes
 27 effect:

- 28 – If any periodic search is in progress, the mobile station shall abort it (see
 29 2.6.6.2.8.3.4 and 2.6.6.2.10.4 of 3GPP2 C.S0005-A and 6.6.3.2.1.2.4 of this
 30 document).

- 31 – If $SEARCH_TYPE_r$ is equal to '00':

- 32 + The mobile station shall set $PERIODIC_SEARCH_s$ to '0'.

- 33 + The mobile station may stop maintaining the average of the Serving
 34 Frequency received power that is used in the handoff and search
 35 procedures.

- 36 – If $SEARCH_TYPE_r$ is equal to '01':

- 37 + The mobile station shall set $PERIODIC_SEARCH_s$ to '0'.

- 38 + If mobile station uses received power measurements in the search
 39 procedure, it should start monitoring the received power on the Serving
 40 Frequency, if it is not already doing so. While it is tuned to the Serving
 41 Frequency, the mobile station should measure the received power once
 42 every frame (0.02 seconds), and should maintain an average of the
 43 received power over the last N_{12m} frames.

- 1 + The mobile station shall perform a single search of the Candidate
- 2 Frequency GSM Search Set, as described in 6.6.3.2.1.2.1. of this
- 3 document.
- 4 – If SEARCH_TYPE_r is equal to '11':
- 5 + The mobile station shall set PERIODIC_SEARCH_s to '1'.
- 6 + If mobile station uses received power measurements in the search
- 7 procedure, it should start monitoring the received power on the Serving
- 8 Frequency, if it is not already doing so. While it is tuned to the Serving
- 9 Frequency, the mobile station should measure the received power once
- 10 every frame (0.02 seconds), and should maintain an average of the
- 11 received power over the last N_{12m} frames.
- 12 + The mobile station shall perform the periodic search procedures for the
- 13 Candidate Frequency GSM Search Set, as described in 6.6.3.2.1.2.2 of
- 14 this document.

15 6.3.3.2.1.2 Search of GSM Channels

16 If SEARCH_MODE_s is equal to '0001', and if the mobile station supports GSM channel searching, the mobile
 17 station shall do the following: If PERIODIC_SEARCH_s is equal to '0', the mobile station shall search the
 18 Candidate Frequency GSM Search Set once, as described in 6.6.3.2.1.2.1 of this document; otherwise, the
 19 mobile station shall search the Candidate Frequency GSM Search Set periodically, as described in 6.6.3.2.1.2.2
 20 of this document.

21 6.3.3.2.1.2.1 GSM Channels Single Search

22 The mobile station does a single search of the Candidate Frequency GSM Search Set by performing the
 23 following actions at the action time of the *Candidate Frequency Search Control Message* or the *Candidate*
 24 *Frequency Search Request Message*:

- 25 • The mobile station shall measure the strength of all GSM channels in the Candidate
- 26 Frequency GSM Search Set in one or more visits away from the Serving Frequency,
- 27 as described in 6.6.3.2.1.2.3 of this document.
- 28 • If ALIGN_TIMING_USED_s is set to '1', the mobile station shall schedule visits to the
- 29 Candidate Frequency as follows:
 - 30 – The mobile station shall make the first visit away from the Serving Frequency
 - 31 schedule at $(0.00125 \times \text{SEARCH_OFFSET}_s)$ seconds after the action time of the
 - 32 *Candidate Frequency Search Request Message* or the *Candidate Frequency*
 - 33 *Search Control Message* that started the search.
 - 34 – If the mobile station makes multiple visits away from the Serving Frequency, the
 - 35 mobile station shall schedule the second and each subsequent visit to occur
 - 36 $(\text{SEARCH_TIME_RESOLUTION}_s \times \text{inter_visit_time})$ seconds after the previous
 - 37 visit, where *inter_visit_time* is the value of the INTER_VISIT_TIME field of the last
 - 38 *Candidate Frequency Search Response Message* sent by the mobile station.
- 39 • The mobile station shall complete the measurements and send a *Candidate*
- 40 *Frequency Search Report Message* within *freshness_interval* seconds after the action
- 41 time of the *Candidate Frequency Search Control Message* or the *Candidate*
- 42 *Frequency Search Request Message*, where *freshness_interval* is determined as

1 follows:

- 2 – If the value of the TOTAL_OFF_TIME_FWD field or of the TOTAL_OFF_TIME_REV
3 field of the last *Candidate Frequency Search Response Message* sent by the
4 mobile station to the base station is greater than or equal to $\lceil (T_{70m} - T_{71m}) /$
5 SEARCH_TIME_RESOLUTION_S \rceil , then

6
$$freshness_interval = \max(fwd_time, rev_time) + T_{71m} \text{ seconds,}$$

7 where

8
$$fwd_time = \text{SEARCH_TIME_RESOLUTION}_S \times$$

9 (value of the TOTAL_OFF_TIME_FWD field of the last
10 *Candidate Frequency Search Response Message* sent by the
11 mobile station),

12 and

13
$$rev_time = \text{SEARCH_TIME_RESOLUTION}_S \times$$

14 (value of the TOTAL_OFF_TIME_REV field of the last
15 *Candidate Frequency Search Response Message* sent by the
16 mobile station).

- 17 – Otherwise,

18
$$freshness_interval = T_{70m} \text{ seconds.}$$

19 The mobile station shall set the fields of the *Candidate Frequency Search Report*
20 *Message* as follows:

- 21 – The mobile station shall report the received power on the Serving Frequency in
22 the SF_TOTAL_RX_PWR field.
- 23 – For each GSM channel whose received power measures above
24 GSM_RXLEV_TRESH_S, the mobile station shall report its GSM Frequency band,
25 Absolute Radio Frequency channel number, base transceiver identity code and
26 the GSM RXLEV (as defined in section 8.1.4 of GSM 05.08), in the
27 GSM_FREQ_BAND, ARFCN, BSIC and GSM_RXLEV fields, respectively..
- 28 • The mobile station may stop maintaining the average of the Serving Frequency
29 received power that is used in the handoff and search procedures.

30 6.3.3.2.1.2.2 GSM Channels Periodic Search

31 When the mobile station performs a periodic search, it periodically searches the Candidate Frequency GSM
32 Search Set, and reports the results to the base station in the *Candidate Frequency Search Report Message*, as
33 described in this section. The mobile station may measure all GSM channels in the Candidate Frequency GSM
34 Search Set in one visit away from the Serving Frequency, or it may make multiple visits in a search period, each
35 time measuring all or some of the GSM channels in the Candidate Frequency GSM Search Set, as described in
36 6.6.3.2.1.2.3 of this document.

37 If SF_TOTAL_EC_THRESH_S is not equal to '11111', while the mobile station is tuned to the Serving
38 Frequency, the mobile station shall measure the total received power spectral density, in mW/1.23 MHz, on the
39 Serving Frequency at least once every frame (0.02 second) and shall maintain the average of the spectral density
40 (*spec_density*) over the last N_{12m} frames.

41 (In the following, $(E_c/I_o)_{total}$ is the total E_c/I_o of the pilots in the Active Set, measured as specified in 2.6.6.2.2,
42 and *total_ec* is defined as $(10 \times \log_{10} ((E_c/I_o)_{total} \times spec_density))$.)

43 The mobile station shall maintain a periodic search timer as follows:

- 44 • When the mobile station starts a periodic search, it shall set the periodic search

- 1 timer to the value in Table 2.6.6.2.8.3.2-1 of 3GPP2 C.S0005-A corresponding to
 2 SEARCH_PERIOD_S and shall enable the timer. If ALIGN_TIMING_USED_S is set to
 3 '1', then the mobile station shall begin the first search ($0.00125 \times$
 4 SEARCH_OFFSET_S) seconds after the action time of the *Candidate Frequency*
 5 *Search Request Message* or the *Candidate Frequency Search Control Message* that
 6 started the search; otherwise, the mobile station shall begin the first search at the
 7 action time of the *Candidate Frequency Search Request Message* or the *Candidate*
 8 *Frequency Search Control Message* that started the search.
- 9 • When the periodic search timer expires, the mobile station shall reset the periodic
 10 search timer to the value in Table 2.6.6.2.8.3.2-1 of 3GPP2 C.S0005-A
 11 corresponding to SEARCH_PERIOD_S and shall re-enable the timer.
 - 12 • If ALIGN_TIMING_USED_S is set to '0', SF_TOTAL_EC_THRESH_S is not equal to
 13 '11111' and SF_TOTAL_EC_IO_THRESH_S is equal to '11111', the mobile station
 14 shall perform the following actions once per frame:
 - 15 – Disable the periodic search timer if *total_ec* is not less than
 16 $(-120 + 2 \times \text{SF_TOTAL_EC_THRESH}_S)$.
 - 17 – Reset the expiration time of the periodic search timer to the value in
 18 Table 2.6.6.2.8.3.2-1 of 3GPP2 C.S0005-A corresponding to SEARCH_PERIOD_S,
 19 and re-enable the timer if both of the following conditions are true:
 - 20 + the periodic search timer is disabled, and
 - 21 + *total_ec* is less than $(-120 + 2 \times \text{SF_TOTAL_EC_THRESH}_S)$.
 - 22 • If ALIGN_TIMING_USED_S is set to '0', SF_TOTAL_EC_THRESH_S is equal to '11111'
 23 and SF_TOTAL_EC_IO_THRESH_S is not equal to '11111', the mobile station shall
 24 perform the following actions once per frame:
 - 25 – Disable the periodic search timer if $(-20 \times \log_{10} (E_c/I_o)_{\text{total}})$ is not greater than
 26 SF_TOTAL_EC_IO_THRESH_S.
 - 27 – Reset the expiration time of the periodic search timer to the value in
 28 Table 2.6.6.2.8.3.2-1 of 3GPP2 C.S0005-A corresponding to SEARCH_PERIOD_S,
 29 and re-enable the timer if the following conditions are true:
 - 30 + the periodic search timer is disabled, and
 - 31 + $(-20 \times \log_{10} (E_c/I_o)_{\text{total}})$ is greater than SF_TOTAL_EC_IO_THRESH_S.
 - 32 • If ALIGN_TIMING_USED_S is set to '0', SF_TOTAL_EC_THRESH_S is not equal to
 33 '11111', and if SF_TOTAL_EC_IO_THRESH_S is not equal to '11111', the mobile
 34 station shall perform the following actions once per frame:
 - 35 – Disable the periodic search timer if both of the following conditions are true:
 - 36 + *total_ec* is not less than $(-120 + 2 \times \text{SF_TOTAL_EC_THRESH}_S)$, and
 - 37 + $(-20 \times \log_{10} (E_c/I_o)_{\text{total}})$ is not greater than SF_TOTAL_EC_IO_THRESH_S.
 - 38 – Reset the expiration time of the periodic search timer to the value in

1 Table 2.6.6.2.8.3.2-1 of 3GPP2 C.S0005-A corresponding to SEARCH_PERIOD_S,
2 and re-enable the timer if any of the following conditions are true:

- 3 + the periodic search timer is disabled, and
- 4 + *total_ec* is less than $(-120 + 2 \times \text{SF_TOTAL_EC_THRESH}_S)$, or
- 5 $(-20 \times \log_{10} (E_c/I_o)_{\text{total}})$ is greater than SF_TOTAL_EC_IO_THRESH_S.
- 6 • The mobile station shall maintain the periodic search timer independent of the total
- 7 E_c and the total E_c/I_o of the pilots in the Serving Frequency Active Set, if any of the
- 8 following conditions is true:
 - 9 – ALIGN_TIMING_USED_S is set to '1', or
 - 10 – SF_TOTAL_EC_THRESH_S is equal to '11111', and SF_TOTAL_EC_IO_THRESH_S is
 - 11 equal to '11111'.

12 If the periodic search timer is enabled, the mobile station shall perform the following actions before the timer
13 expires:

- 14 • The mobile station shall measure the strength of all GSM channels in the Candidate
- 15 Frequency GSM Search Set at least once in one or more visits away from the Serving
- 16 Frequency, as described in 6.3.3.2.1.2.3 of this document.
- 17 • If ALIGN_TIMING_USED_S is set to '1', the mobile station shall schedule visits away
- 18 from the Serving Frequency as follows:
 - 19 – The mobile station shall make the first visit away from the Serving Frequency
 - 20 when the search period begins, i.e., when the periodic search timer is reset.
 - 21 – If the mobile station makes multiple visits away from the Serving Frequency
 - 22 during a search period, it shall schedule the second and each subsequent visit
 - 23 within the same search period to occur (SEARCH_TIME_RESOLUTION_S ×
 - 24 *inter_visit_time*) seconds after the previous visit, where *inter_visit_time* is the
 - 25 value of the INTER_VISIT_TIME field of the last *Candidate Frequency Search*
 - 26 *Response Message* sent by the mobile station.
 - 27 – The mobile station shall abort a scheduled visit away from the Serving
 - 28 Frequency if at the scheduled time, one or both of the following conditions hold:
 - 29 + SF_TOTAL_EC_THRESH_S is not equal to '11111', and *total_ec* is not less
 - 30 than
 - 31 $(-120 + 2 \times \text{SF_TOTAL_EC_THRESH}_S)$, or
 - 32 + SF_TOTAL_EC_IO_THRESH_S is not equal to '11111', and $(-20 \times \log_{10}$
 - 33 $(E_c/I_o)_{\text{total}})$ is not greater than SF_TOTAL_EC_IO_THRESH_S.
 - 34 – If the mobile station aborts a scheduled visit during a search period, it may
 - 35 abort all remaining scheduled visits in that search period.
- 36 • The mobile station shall send a *Candidate Frequency Search Report Message* with
- 37 the fields of the message set as follows:
 - 38 – The mobile station shall report the received power on the Serving Frequency in
 - 39 the SF_TOTAL_RX_PWR field.

- 1 – For each GSM channel whose received power measures above
2 GSM_RXLEV_TRESH_S, the mobile station shall report its GSM Frequency band,
3 Absolute Radio Frequency channel number, base transceiver identity code and
4 the GSM RXLEV (as defined in section 8.1.4 of GSM 05.08), in the
5 GSM_FREQ_BAND, ARFCN, BSIC and GSM_RXLEV fields, respectively..
- 6 • The mobile station shall ensure that the strength measurements for all GSM
7 channels in the Candidate Frequency GSM Search Set were obtained within
8 *freshness_interval* before the *Candidate Frequency Search Report Message* is sent,
9 where *freshness_interval* is determined as follows:
- 10 – If the value of the TOTAL_OFF_TIME_FWD field or of the TOTAL_OFF_TIME_REV
11 field of the last *Candidate Frequency Search Response Message* sent by the
12 mobile station to the base station is greater than or equal to $\lceil (T_{70m} - T_{71m}) /$
13 SEARCH_TIME_RESOLUTION_S \rceil , then
14
$$freshness_interval = \max (fwd_time, rev_time) + T_{71m} \text{ seconds,}$$
- 15 where
- 16
$$fwd_time = \text{SEARCH_TIME_RESOLUTION}_S \times$$

17 (value of the TOTAL_OFF_TIME_FWD field of the last
18 *Candidate Frequency Search Response Message* sent by the
19 mobile station),
- 20 and
- 21
$$rev_time = \text{SEARCH_TIME_RESOLUTION}_S \times$$

22 (value of the TOTAL_OFF_TIME_REV field of the last
23 *Candidate Frequency Search Response Message* sent by the
24 mobile station).
- 25 – Otherwise,
26
$$freshness_interval = T_{70m} \text{ seconds.}$$

27 6.3.3.2.1.2.3 GSM Channel Measurements

28 The mobile station measures the strength of all GSM channels in the Candidate Frequency GSM Search Set in
29 one or more visits away from the Serving Frequency. The mobile station shall perform the following actions
30 during each visit away from the Serving Frequency to measure GSM channel signal strengths:

- 31 • If the mobile station is processing the Forward Fundamental Channel, the mobile
32 station shall stop processing the Forward Fundamental Channel. If the mobile
33 station is transmitting on the Reverse Fundamental Channel, the mobile station
34 shall stop transmitting on Reverse Fundamental Channel.
- 35 • If the mobile station is processing the Forward Dedicated Control Channel, the
36 mobile station shall stop processing Forward Dedicated Control Channel. If the
37 mobile station is transmitting on the Reverse Dedicated Control Channel, the mobile
38 station shall stop transmitting on Reverse Dedicated Control Channel.
- 39 • The mobile station shall stop processing the Forward Supplemental Code Channels
40 and Forward Supplemental Channels (if any). The mobile station shall stop
41 transmitting on the Reverse Supplemental Code Channels and Reverse
42 Supplemental Channels (if any).
- 43 • The mobile station shall disable the fade timer (see 2.6.4.1.8 of 3GPP2 C.S0005-A)

- 1 and the handoff drop timers corresponding to its current Active Set and Candidate
2 Set (see 2.6.6.2.3 of 3GPP2 C.S0005-A), and shall suspend incrementing
3 TOT_FRAMES_s and BAD_FRAMES_s (see 2.6.4.1.1 of 3GPP2 C.S0005-A).
- 4 • If Rate Set 2 is in use on the Reverse Traffic Channel, the mobile station shall store
5 the erasure indicator bits for the last two frames received on the Forward Traffic
6 Channel (see 2.1.2.3.1 of 3GPP2 C.S0002-A).
 - 7 • The mobile station shall lock the accumulation of valid level changes in the closed
8 loop mean output power and shall ignore received power control bits related to the
9 period that the transmitter is disabled (see 3GPP2 C.S0002-A).
 - 10 • The mobile station shall tune to one of the GSM channels in the Candidate
11 Frequency GSM Search Set.
 - 12 – If BSIC_VERIF_REQ_s is equal to '0', the mobile station shall measure the
13 received power on the GSM channel and read its base transceiver identity code.
 - 14 – If BSIC_VERIF_REQ_s is equal to '1', and if Network Color Code received on the
15 channel is equal to N_COL_CODE_s, the mobile station shall measure the
16 received power on the GSM channel and read its base transceiver identity code.
 - 17 • The mobile station shall include a GSM channel in the *Candidate Frequency Search*
18 *Report Message* if the received power on the GSM channel measures above
19 GSM_RXLEV_THRESH_s.
 - 20 • The mobile station may tune to other GSM channels in the Candidate Frequency
21 GSM Search Set and make power measurements during this visit away from the
22 Serving Frequency.
 - 23 • The mobile station shall not change its time reference (see 2.1.5 of 3GPP2 C.S0002-
24 A) until it resumes using the Serving Frequency Active Set, as described below.
 - 25 • The mobile station shall tune to the Serving Frequency and resume using the
26 Serving Frequency Active Set as follows:
 - 27 – If the mobile station was processing the Forward Fundamental Channel prior to
28 tuning to the Candidate Frequency, the mobile station shall resume processing
29 the Forward Fundamental Channel. If the mobile station was transmitting on
30 the Reverse Fundamental Channel prior to tuning to the Candidate Frequency,
31 the mobile station shall resume transmitting on the Reverse Fundamental
32 Channel.
 - 33 – If the mobile station was processing the Forward Dedicated Control Channel
34 prior to tuning to the Candidate Frequency, the mobile station shall resume
35 processing the Forward Dedicated Control Channel. If the mobile station was
36 transmitting on the Reverse Dedicated Control Channel prior to tuning to the
37 Candidate Frequency, the mobile station shall resume transmitting on the
38 Reverse Dedicated Control Channel.
 - 39 – If the Forward Supplemental Code Channels or Forward Supplemental Channels
40 assignment has not expired, the mobile station shall resume processing the

- 1 Forward Supplemental Code Channels or Forward Supplemental Channels
2 respectively (if any).
- 3 – If the Reverse Supplemental Code Channel or Reverse Supplemental Channels
4 assignment has not expired, the mobile station may resume transmitting on the
5 Reverse Supplemental Code Channels or Reverse Supplemental Channels
6 respectively (if any).
- 7 – When the mobile station resumes transmission on the Reverse Traffic Channel,
8 it shall use the following rules to re-enable its transmitter:
- 9 + If the interval between the time that the mobile station disables its
10 transmitter and the time that it resumes using the Serving Frequency Active
11 Set is equal to or greater than $(N_{2m} \times 20)$ ms, then the mobile station shall
12 wait to receive a period of $(N_{3m} \times 20)$ ms with sufficient signal quality (e.g.
13 good frames) on the physical channel corresponding to $FPC_PRI_CHAN_S$
14 before it re-enables its transmitter.
- 15 + Otherwise, the mobile station shall re-enable its transmitter no later than
16 $N_{3m} \times 20$ ms after the mobile station tunes to the Serving Frequency. The
17 mobile station should re-enable its transmitter earlier. After the mobile
18 station re-enables its transmitter, the mean output power shall be as
19 specified in 2.1.2.4.1 of 3GPP2 C.S0002-A for a step change in input power.
20 If the mobile station re-enables its transmitter earlier than $N_{3m} \times 20$ ms
21 after it tunes to the Serving Frequency, the initial mean output power shall
22 be as specified in 2.1.2.3.1 of 3GPP2 C.S0002-A, where the initial mean
23 input power estimate is either:
- 24 o within 6 dB of the actual mean input power, or
- 25 o equal to the mean input power before the mobile station tuned to the
26 Target Frequency.
- 27 • The mobile station shall enable the fade timer and the handoff drop timers
28 corresponding to the pilots in its Active Set and Candidate Set. The mobile station
29 shall resume incrementing TOT_FRAMES_S and BAD_FRAMES_S as specified in
30 2.6.4.1.1.
- 31 • If Rate Set 2 is in use on the Reverse Traffic Channel, the mobile station shall set
32 the erasure indicator bits as specified in 2.2.2.2 of 3GPP2 C.S0002-A.

33 6.3.3.2.1.2.4 Aborting GSM Channels Periodic Search

34 When the mobile station aborts a periodic search, it shall do the following:

- 35 • The mobile station shall cancel any remaining visits away from the Serving
36 Frequency in the current search period and shall not send a *Candidate Frequency*
37 *Search Report Message* for the current search period.
- 38 • The mobile station shall disable the periodic search timer.
- 39 • The mobile station may stop maintaining the average of the Serving Frequency
40 received power that is used in the handoff and search procedures.

6.3.3.2.2 Base Station Procedures

6.3.3.2.2.1 Processing the MC-MAP GSM Handover Command Message

The base station shall send an *MC-MAP GSM Handover Command Message* to the mobile station to direct the mobile station from a MC-MAP system to a GSM system.

6.3.4 RR-level Registration

6.3.4.1 Forms of RR-level Registration

The MC-MAP system supports following different forms of RR-level registration:

1. **Timer-based RR-registration.** The mobile station registers when a timer expires.
2. **Zone-based RR-registration.** The mobile station registers when it enters a new zone.
3. **Implicit RR-registration.** When a mobile station successfully sends an *RRC Connection Request Message*, the base station can infer the mobile station's location. This is considered an implicit registration.
4. **Traffic Channel RR-registration.** Whenever the base station has registration information for a mobile station that has been assigned to a Traffic Channel, the base station can notify the mobile station that it is registered.

To support the above forms of RR-level registration during *Idle State*, *System Access State* and *Mobile Station Control on Traffic Channel State*, MC-MAP mobile station shall follow the corresponding requirements specified in 2.6.5 of 3GPP2 C.S0005-A with certain modifications.

6.3.4.1.1.1 Timer based RR-Registration

Timer based RR registration causes the mobile station to register at RR at regular intervals. The mobile station shall maintain a timer-based registration enable status ($TIMER_REG_S$). The base station disables timer-based RR registration by setting to zero the $RR_TMSI_EXP_PRD$ field of the *R-TMSI Assignment Message*. The mobile station shall compute and store the timer expiration count ($RR_REG_COUNT_MAX_S$) as

$$RR_REG_COUNT_MAX_S = 2^{R_TMSI_EXP_PRD} / 4.$$

The mobile station shall also maintain a timer-based RR registration counter ($RR_REG_COUNT_S$) that takes a pseudo random value between 0 and $RR_REG_COUNT_MAX_S - 1$.

Timer-based RR registration counter $RR_REG_COUNT_S$ increments each time the Paging Channel or a Forward Common Control Channel slot counter (equivalent to a timer with time increments of 80 ms) increments. If $TIMER_REG_S$ is equal to 'YES', and if the bits of $R_TMSI_CODE_S$ are not all equal to '1', the timer-based RR registration is performed when the counter reaches a value greater than equal to $RR_REG_COUNT_MAX_S$ (that is controlled by the base station via the $R_TMSI_EXP_PRD$ field of the *R-TMSI Assignment Message*).

The timer-based counter $RR_REG_COUNT_S$ is reset each time the mobile station receives the *R-TMSI Assignment Message* or the timer-based RR registration enable status $TIMER_REG_S$ is changed from 'NO' to 'YES'. The mobile station shall set $RR_REG_COUNT_S$ to a pseudo random value between 0 and $RR_REG_COUNT_MAX_S - 1$, using the pseudo random number generator specified in 2.6.7.2 of 3GPP2 C.S0005-A.

The mobile station shall increment the counter $RR_REG_COUNT_S$ after each interval of 80 ms as specified in 2.6.5.1.3 of 3GPP2 C.S0005-A.

6.3.4.1.1.2 Zone-based RR-Registration

Each RR-registration zone is identified by the R-TMSI zone within a given network.

1 Zone-based RR Registration causes a mobile station to register at RR-level whenever it moves into a new R-
 2 TMSI zone, not on its internally stored list of visited zones. A zone is added to the list whenever an RR-
 3 registration is completed by the assignment of a new R-TMSI in the new R-TMSI zone, and is deleted upon the
 4 expiration of a timer.

5 A mobile station can be registered in more than one R-TMSI zone. The mobile station shall store a list of the
 6 zones in which the mobile station has registered (R_ZONE_LIST_s). Each entry in R_ZONE_LIST_s shall
 7 include the R_TMSI_ZONE, R_TMSI_CODE, R_TMSI_COUNT, R_TMSI_COUNT_MAX and a zone list
 8 entry timer. The mobile station shall provide a means to increment R_TMSI_COUNT every 80 ms. The mobile
 9 station shall also provide a means to examine each timer's value while the timer is active, so that the age of the
 10 list entries can be compared. The zone entry timer is reset each time R_TMSI_COUNT is reassigned.

11 The base station controls the maximum number of zones in which the mobile station may be considered
 12 registered, by means of the TOT_R_TMSI_ZONES field of the R-TMSI Assignment Message, whenever a new
 13 R-TMSI is assigned in a new R-TMSI zone. Whenever an entry is added to the R_ZONE list, or if
 14 TOT_R_TMSI_ZONES_s is decreased, the mobile station removes entries from the list if there are more entries
 15 than allowed by setting of the TOT_R_TMSI_ZONES_s.

16 Whenever R_ZONE_LIST_s contains more than TOT_R_TMSI_ZONES_s entries, the mobile station shall delete
 17 the excess entries according to the following rules:

- 18 • If TOT_R_TMSI_ZONES_s is equal to zero, the mobile station shall delete all
 19 entries.
- 20 • If TOT_R_TMSI_ZONES_s is not equal to zero, the mobile station shall delete
 21 those entries having active zone list entry timers, starting with the oldest entry,
 22 as determined by the timer values, and continuing in order of decreasing age
 23 until no more than TOT_R_TMSI_ZONES_s entries remain.

24

25 6.3.4.1.2 RR-Registration Procedures

26 6.3.4.1.2.1 Actions in the Mobile Station Initialization State

27 If the mobile station enters the Systems Determination Substate with a power up indication, the mobile station
 28 shall perform the following actions:

- 29 • Delete all entries of R_ZONE_LIST_s.
- 30 • Set all the bits of R_TMSI_CODE_s to '1'.
- 31 • Set RR_REG_ENABLED_s to 'NO'.
- 32 • Set timer-based RR registration counter (TIMER_REG_s) to NO.

33 6.3.4.1.2.2 Actions in the Mobile Station Idle State

34 While in the Mobile Station Idle State, the mobile station shall perform RR registration procedures only if
 35 RR_REG_ENABLED_s is set to '1'.

36 6.3.4.1.2.2.1 Idle RR Registration Procedures

37 The mobile station shall perform following actions in the order given below. If any action necessitates RR
 38 registration, the mobile station shall enter the Update Overhead Information Substate of the System Access State
 39 with RR-registration indication.

- 40 1. In Response to Overhead Information Operation, if R_TMSI_ZONE_s is different from
 41 ASSIGNING_R_TMSI_ZONE_s but R_TMSI_ZONE_s is on one of the entries of
 42 R_ZONE_LIST_s, the mobile station shall set the ASSIGNING_R_TMSI_ZONE_s.

1 R_TMSI_CODE_s and RR_REG_COUNT_MAX_s and RR_REG_COUNT_s to the
 2 corresponding values of the zone list entry.

3 2. If any R_ZONE_LIST entry time has expired (i.e., R_TMSI_COUNT has reached a
 4 value greater than or equal to the maximum value R_TMSI_COUNT_MAX), the
 5 mobile station shall delete the corresponding entry from the R_ZONE_LIST_s if
 6 R_TMSI_ZONE entry of the list is not equal to ASSIGNING_R_TMSI_ZONE_s.

7 3. The mobile station shall perform timer-based RR registration if TIMER_REG_s is
 8 equal to 'YES', and if RR_REG_ENABLED_s is equal to 'YES', and if the stored
 9 configuration parameters are current (2.6.5.1.3 of 3GPP2 C.S0005-A), and if all the
 10 bits of R_TMSI_CODE_s are not all equal to '1', and if RR_REG_COUNT_s is greater
 11 than or equal to RR_REG_COUNT_MAX_s.

12 4. The mobile station shall perform zone-based RR registration if all of the following
 13 conditions are met:

- 14 • TOT_R_TMSI_ZONES_s is not equal to zero; and
- 15 • The stored configuration parameters are current (2.6.2.2 of 3GPP2 C.S0005-A);
 16 and
- 17 • RR_REG_ENABLED_s is equal to YES; and
- 18 • There is no entry of R_ZONE_LIST_s whose R_TMSI_ZONE fields is not equal to
 19 stored R_TMSI_ZONE_s.

20 6.3.4.1.2.2 Mobile Station Message and Order Processing Operation

21 While in the Mobile Station Idle State, the mobile station may receive R-TMSI Assignment
 22 Message. The mobile stations shall process this message as specified in 6.3.4.1.2.5.

24 6.3.4.1.2.3 Actions in the System Access State

25 If the MC-MAP mobile station successfully sends MC-MAP RRC Connection Request Message or RR-level
 26 Registration Message, it shall set RR_REG_ENABLED_s to 'YES'. If the mobile station doesn't receive the R-
 27 TMSI Assignment Message within time T75_m, it shall set all the bits of R_TMSI_CODE_s to '1'.

28 If R-TMSI Assignment Message is received in time T75_m, it shall perform the procedures specified in
 29 6.3.4.1.2.5.

30 If the mobile station declares an access attempt failure when in the System Access State, it shall set
 31 RR_REG_ENABLED_s to 'NO', set all the bits of R_TMSI_CODE_s to '1', and delete all the entries in
 32 R_ZONE_LIST_s.

34 6.3.4.1.2.4 Actions in the Mobile Station Control on Traffic Channel State

35 The mobile station shall perform following additional procedures while in different substates of the Mobile
 36 Station Control on Traffic Channel State.

37 6.3.4.1.2.4.1 Traffic Channel Initialization

38 Upon entering the Traffic Channel Initialization Substate of the Mobile Station Control of Traffic Channel
 39 State, the mobile station shall set TIMER_REG_s to 'NO'.

1 6.3.4.1.2.4.2 Expiration Timer Maintenance

2 While in the Mobile Station Control of Traffic Channel State, the mobile station shall maintain all expiration
 3 timers. If any R_ZONE_LIST_s entry time has expired, the mobile station shall remove the corresponding entry
 4 from the list.

5 If the RR_REG_COUNT_s is greater than or equal to the value of RR_REG_COUNT_MAX_s, the mobile
 6 station shall set all the bits of R_TMSI_CODE_s to '1'.

7 6.3.4.1.2.4.3 Traffic Channel Substate

8 On receiving the R-TMSI Assignment Message, the mobile station shall perform the procedures specified in
 9 6.3.4.1.2.5.

10 6.3.4.1.2.4.4 Release Substate

11 If all the bits of R_TMSI_CODE_s are equal to '1', the mobile station shall set RR_REG_ENABLED_s to 'NO';
 12 otherwise it shall activate the timer based RR registration by setting TIMER_REG_s to 'YES'.

14 6.3.4.1.2.5 Processing of R-TMSI Assignment Message

15 On receiving R-TMSI Assignment Message, the mobile station shall store the following fields:

- 16 • If R_TMSI_INCL is equal to 1, the mobile station shall store the R-TMSI zone, code and
 17 expiration counters as follows:
 - 18 - The mobile station shall store the length of the R-TMSI zone field by setting
 19 ASSIGNING_R_TMSI_ZONE_LEN_s to R_TMSI_ZONE_LEN_r;
 - 20 - The mobile station shall store the assigning R-TMSI zone number by setting the
 21 ASSIGNING_R_TMSI_ZONE_LEN_s least significant octets of
 22 ASSIGNING_R_TMSI_ZONE_s to R_TMSI_ZONE_r;
 - 23 - The mobile station shall store the R-TMSI code by setting R_TMSI_CODE_s to
 24 R_TMSI_CODE_r.
 - 25 - The mobile station shall read the R_TMSI_EXP_PRD field. If all the bits of
 26 R_TMSI_EXP_PRD field are equal to '0', the mobile station shall set the
 27 TIMER_REG_s to 'NO'. If all the bits of R_TMSI_EXP_PRD field are not all equal to '0',
 28 the mobile station shall set TIMER_REG_s to 'YES' and shall set the
 29 RR_REG_COUNT_MAX_s as specified in 6.3.4.1.1.1. It shall then set the
 30 RR_REG_COUNT_s as specified in 6.3.4.1.1.1.
- 31 • If R_TMSI_INCL is equal to 1, the mobile station shall also store the R-TMSI zone, code
 32 and counters as R_ZONE_LIST_s entries and enable the entry timer.
- 33 • If R_TMSI_INCL is equal to 1, and if all bits of R_TMSI_CODE_r are set to '1', the mobile
 34 station shall set 'RR_REG_ENABLED_s' to 'NO'.
- 35 • If ZONE_INFO_INC is equal to '1', the mobile station shall perform the following actions:
 - 36 - The mobile station shall store TOT_R_TMSI_ZONES_s to TOT_R_TMSI_ZONES_r.
 - 37 - If R_ZONE_LIST_s contains more entries than TOT_R_TMSI_ZONES_s, the mobile
 38 station shall delete excess entries according to the rules specified in 6.3.4.1.1.2.

1 - The mobile station shall read the R_PREV_ZONE_PRD field and set the following
2 fields of the zone entry corresponding to the last R-TMSI zone it had registered as
3 follows:

- 4 • The mobile station shall compute and set R_TMSI_COUNT_MAX as:
5 $R_TMSI_COUNT_MAX_s = 2^{R_PREV_ZONE_PRD}/4$.
- 6 • The mobile station shall set R_TMSI_COUNT_s to a pseudo random value between
7 0 and R_TMSI_COUNT_MAX_s - 1, using the pseudo random number generator
8 specified in 2.6.7.2 of 3GPP2 C.S0005-A.
- 9 • The mobile station shall reset the zone list entry timer.

11 6.4 MC-MAP RRC Messages, Orders, and Information Records

12 Tables 6.4-1, 6.4-2, 6.4-3, and 6.4-4 below list all the messages used in 3GPP2 C.S0005-A, and state their
13 disposition in the MC-MAP standard. These tables also list the new messages defined for the MC-MAP
14 standard.

1

Table 6.4-1. r-csch Messages

| Message Name | MSG_TAG | Section Number | Disposition in MC-MAP |
|--|---------|---------------------------|--|
| <i>Registration Message</i> | RGM | C.S0005-A 2.7.1.3.2.1 | Not used. |
| <i>Order Message</i> | ORDM | C.S0005-A 2.7.1.3.2.2 | Used, with restrictions (see Table 6.4.3-1). |
| <i>Data Burst Message</i> | DBM | C.S0005-A 2.7.1.3.2.3 | Used, as is. |
| <i>Origination Message</i> | ORM | C.S0005-A 2.7.1.3.2.4 | Not used. |
| <i>Page Response Message</i> | PRM | C.S0005-A 2.7.1.3.2.5 | Not used. |
| <i>Authentication Challenge Response Message</i> | AUCRM | C.S0005-A 2.7.1.3.2.6 | Not used. |
| <i>Status Response Message</i> | STRPM | C.S0005-A 2.7.1.3.2.7 | Not used. |
| <i>TMSI Assignment Completion Message</i> | TACM | C.S0005-A 2.7.1.3.2.8 | Not used. |
| <i>PACA Cancel Message</i> | PACNM | C.S0005-A 2.7.1.3.2.9 | Not used. |
| <i>Extended Status Response Message</i> | ESTRPM | C.S0005-A 2.7.1.3.2.10 | Used, with restrictions (see Table 6.4.4-1). |
| <i>Flash With Information Message</i> | FWIM | C.S0005-A 2.7.1.3.2.11 | Not used. |
| <i>Security Mode Request Message</i> | SMRM | C.S0005-A 2.7.1.3.2.14 | Used, as is. |
| <i>RR-level Registration Message</i> | RRLRM | 6.4.1.3.1 | New MC-MAP message |
| <i>MC-MAP Initial L3 Message</i> | MAPIL3M | 6.4.1.3.2 | New MC-MAP message |
| <i>MC-MAP L3 Message</i> | MAPL3M | 6.4.1.3.3 | New MC-MAP message |
| <i>MC-MAP RRC Connection Request Message</i> | MAPCRM | 6.4.1.3.4 | New MC-MAP message |
| <i>R-TMSI Assignment Completion Message</i> | RTACM | 6.4.1.3.5 | New MC-MAP message |

1

Table 6.4-2. r-dsch Messages (Part 1 of 2)

| Message Name | MSG_TAG | Section Number | Disposition in MC-MAP |
|--|---------|---------------------------|--|
| <i>Order Message</i> | ORDM | C.S0005-A 2.7.2.3.2.1 | Used, with restrictions (see Table 6.4.3-1). |
| <i>Authentication Challenge Response Message</i> | AUCRM | C.S0005-A 2.7.2.3.2.2 | Not used. |
| <i>Flash With Information Message</i> | FWIM | C.S0005-A 2.7.2.3.2.3 | Not used. |
| <i>Data Burst Message</i> | DBM | C.S0005-A 2.7.2.3.2.4 | Used, as is. |
| <i>Pilot Strength Measurement Message</i> | PSMM | C.S0005-A 2.7.2.3.2.5 | Used, as is. |
| <i>Power Measurement Report Message</i> | PMRM | C.S0005-A 2.7.2.3.2.6 | Used, as is. |
| <i>Send Burst DTMF Message</i> | BDTMFM | C.S0005-A 2.7.2.3.2.7 | Not used. |
| <i>Status Message</i> | STM | C.S0005-A 2.7.2.3.2.8 | Not Used. |
| <i>Origination Continuation Message</i> | ORCM | C.S0005-A 2.7.2.3.2.9 | Not used. |
| <i>Handoff Completion Message</i> | HOCM | C.S0005-A 2.7.2.3.2.10 | Used, as is. |
| <i>Parameters Response Message</i> | PRSM | C.S0005-A 2.7.2.3.2.11 | Used as is. |
| <i>Service Request Message</i> | SRQM | C.S0005-A 2.7.2.3.2.12 | Used, as is. |
| <i>Service Response Message</i> | SRPM | C.S0005-A 2.7.2.3.2.13 | Used, as is. |
| <i>Service Connect Completion Message</i> | SCCM | C.S0005-A 2.7.2.3.2.14 | Used, as is. |
| <i>Service Option Control Message</i> | SOCM | C.S0005-A 2.7.2.3.2.15 | Used, as is. |
| <i>Status Response Message</i> | STRPM | C.S0005-A 2.7.2.3.2.16 | Used, with restrictions (see Table 6.4.4-1). |
| <i>TMSI Assignment Completion Message</i> | TACM | C.S0005-A 2.7.2.3.2.17 | Not used. |
| <i>Supplemental Channel Request Message</i> | SCRM | C.S0005-A 2.7.2.3.2.18 | Used, as is. |
| <i>Candidate Frequency Search Response Message</i> | CFSRSM | C.S0005-A 2.7.2.3.2.19 | Used, as is |
| <i>Candidate Frequency Search Report Message</i> | CFSRPM | C.S0005-A 2.7.2.3.2.20 | Used, with modifications (see 6.4.2.4.1) |
| <i>Periodic Pilot Strength Measurement Message</i> | PPSMM | C.S0005-A 2.7.2.3.2.21 | Used, as is. |

1

Table 6.4-2. r-dsch Messages (Part 2 of 2)

| Message Name | MSG_TAG | Section Number | Disposition in MC-MAP |
|---|---------|---------------------------|-----------------------|
| <i>Outer Loop Report Message</i> | OLRM | C.S0005-A 2.7.2.3.2.22 | Used, as is. |
| <i>Resource Request Message</i> | RRM | C.S0005-A 2.7.2.3.2.23 | Used, as is. |
| <i>Extended Release Response Message</i> | ERRM | C.S0005-A 2.7.2.3.2.25 | Used, as is. |
| <i>Extended Release Response Mini Message</i> | ERRMM | C.S0005-A 2.7.2.3.2.26 | Used, as is. |
| <i>Pilot Strength Measurement Mini Message</i> | PSMMM | C.S0005-A 2.7.2.3.2.27 | Used, as is. |
| <i>Supplemental Channel Request Mini Message</i> | SCRMM | C.S0005-A 2.7.2.3.2.28 | Used, as is. |
| <i>Enhanced Origination Message</i> | EOM | C.S0005-A 2.7.2.3.2.29 | Not Used. |
| <i>Extended Flash With Information Message</i> | EFWIM | C.S0005-A 2.7.2.3.2.30 | Not Used. |
| <i>Extended Pilot Strength Measurement Message</i> | EPSMM | C.S0005-A 2.7.2.3.2.31 | Used, as is. |
| <i>Extended Handoff Completion Message</i> | EHOCM | C.S0005-A 2.7.2.3.2.32 | Used, as is. |
| <i>Mobile Station Resource Release Request Message</i> | MSRRRM | C.S0005-A 2.7.2.3.2.33 | Used, as is. |
| <i>Mobile Station Resource Release Request Mini Message</i> | MSRRRMM | C.S0005-A 2.7.2.3.2.34 | Used, as is. |
| <i>Security Mode Request Message</i> | SMRM | C.S0005-A 2.7.2.3.2.37 | Used, as is. |
| <i>MC-MAP Initial L3 Message</i> | MAPIL3M | 6.4.1.4.1 | New MC-MAP message. |
| <i>MC-MAP L3 Message</i> | MAPL3M | 6.4.1.4.2 | New MC-MAP message. |
| <i>R-TMSI Assignment Completion Message</i> | RTACM | 6.4.1.4.3 | New MC-MAP message. |

1

Table 6.4-3. f-csch Messages (Part 1 of 2)

| Message Name | MSG_TAG | Section Number | Disposition in MC-MAP |
|---|---------|---------------------------|---|
| <i>System Parameters Message</i> | SPM | C.S0005-A 3.7.2.3.2.1 | Used, with modifications (see 6.4.2.1.1). |
| <i>Access Parameters Message</i> | APM | C.S0005-A 3.7.2.3.2.2 | Used, with modifications (see 6.4.2.1.2). |
| <i>Neighbor List Message (Band Class 0 only)</i> | NLM | C.S0005-A 3.7.2.3.2.3 | Used, as is. |
| <i>CDMA Channel List Message</i> | CCLM | C.S0005-A 3.7.2.3.2.4 | Used, as is. |
| <i>Order Message</i> | ORDM | C.S0005-A 3.7.2.3.2.7 | Used, with restrictions (see Table 6.4.3-2). |
| <i>Channel Assignment Message</i> | CAM | C.S0005-A 3.7.2.3.2.8 | Not used. |
| <i>Data Burst Message</i> | DBM | C.S0005-A 3.7.2.3.2.9 | Used, as is. |
| <i>Authentication Challenge Message</i> | AUCM | C.S0005-A 3.7.2.3.2.10 | Not used. |
| <i>SSD Update Message</i> | SSDUM | C.S0005-A 3.7.2.3.2.11 | Not used. |
| <i>Feature Notification Message</i> | FNM | C.S0005-A 3.7.2.3.2.12 | Not Used. |
| <i>Extended System Parameters Message</i> | ESPM | C.S0005-A 3.7.2.3.2.13 | Used, with modifications (see 6.4.2.1.3). |
| <i>Extended Neighbor List Message (Band Class 1 only)</i> | ENLM | C.S0005-A 3.7.2.3.2.14 | Used, as is. |
| <i>Status Request Message</i> | STRQM | C.S0005-A 3.7.2.3.2.15 | Used, with restrictions, (see Table 6.4.4-2). |
| <i>Service Redirection Message</i> | SRDM | C.S0005-A 3.7.2.3.2.16 | Used, with modifications (see 6.4.2.1.4). |
| <i>General Page Message</i> | GPM | C.S0005-A 3.7.2.3.2.17 | Used, with modifications (see 6.4.2.1.5). |
| <i>Global Service Redirection Message</i> | GSRDM | C.S0005-A 3.7.2.3.2.18 | Used, with modifications (see 6.4.2.1.6). |
| <i>TMSI Assignment Message</i> | TASM | C.S0005-A 3.7.2.3.2.19 | Not used. |

1

Table 6.4-3. f-csch Messages (Part 2 of 2)

| Message Name | MSG_TAG | Section Number | Disposition in MC-MAP |
|--|----------|---------------------------|--|
| <i>PACA Message</i> | PACAM | C.S0005-A 3.7.2.3.2.20 | Not used. |
| <i>Extended Channel Assignment Message</i> | ECAM | C.S0005-A 3.7.2.3.2.21 | Used, with modifications (see 6.4.2.1.7). |
| <i>General Neighbor List Message</i> | GNLM | C.S0005-A 3.7.2.3.2.22 | Used, as is. |
| <i>User Zone Identification Message</i> | UZIM | C.S0005-A 3.7.2.3.2.23 | Used, as is. |
| <i>Private Neighbor List Message</i> | PNLM | C.S0005-A 3.7.2.3.2.24 | Used, as is. |
| <i>Sync Channel Message</i> | SCHM | C.S0005-A 3.7.2.3.2.25 | Used, with modifications (see 6.4.2.1.8). |
| <i>Extended Global Service Redirection Message</i> | EGSRM | C.S0005-A 3.7.2.3.2.26 | Used, with modifications (see 6.4.2.1.9). |
| <i>Extended CDMA Channel List Message</i> | ECCLM | C.S0005-A 3.7.2.3.2.27 | Used, as is. |
| <i>ANSI-41 System Parameters Message</i> | A41SPM | C.S0005-A 3.7.2.3.2.28 | Not used. |
| <i>MC-RR Parameters Message</i> | MCR RPM | C.S0005-A 3.7.2.3.2.29 | Used, with modification (see 6.4.2.1.12) |
| <i>ANSI-41 RAND Message</i> | A41RANDM | C.S0005-A 3.7.2.3.2.30 | Not used. |
| <i>Enhanced Access Parameters Message</i> | EAPM | C.S0005-A 3.7.2.3.2.31 | Used, with modifications (see 6.4.2.1.10). |
| <i>Universal Neighbor List Message</i> | UNLM | C.S0005-A 3.7.2.3.2.32 | Used, as is. |
| <i>Security Mode Command Message</i> | SMCM | C.S0005-A 3.7.2.3.2.33 | Used, with modifications (see 6.4.2.1.11) |
| <i>MC-MAP Sync Channel Message</i> | MAPSCHM | 6.4.1.1.1 | New MC-MAP message. |
| <i>MC-MAP System Information Message</i> | MAPSIM | 6.4.1.1.2 | New MC-MAP message. |
| <i>MC-MAP L3 Message</i> | MAPL3M | 6.4.1.1.3 | New MC-MAP message. |
| <i>R-TMSI Assignment Message</i> | RTASM | 6.4.1.2.4 | New MC-MAP message. |

1

Table 6.4-4. f-dsch Messages (Part 1 of 2)

| Message Name | MSG_TAG | Section Number | Disposition in MC-MAP |
|---|---------|---------------------------|--|
| <i>Order Message</i> | ORDRM | C.S0005-A 3.7.3.3.2.1 | Used, with restrictions (see Table 6.4.3-2). |
| <i>Authentication Challenge Message</i> | AUCM | C.S0005-A 3.7.3.3.2.2 | Not used. |
| <i>Alert With Information Message</i> | AWIM | C.S0005-A 3.7.3.3.2.3 | Not used. |
| <i>Data Burst Message</i> | DBM | C.S0005-A 3.7.3.3.2.4 | Used, as is. |
| <i>Analog Handoff Direction Message</i> | AHDM | C.S0005-A 3.7.3.3.2.6 | Not used. |
| <i>In-Traffic System Parameters Message</i> | ITSPM | C.S0005-A 3.7.3.3.2.7 | Used, with modifications (see 6.4.2.2.1). |
| <i>Neighbor List Update Message</i> | NLUM | C.S0005-A 3.7.3.3.2.8 | Used, as it is. |
| <i>Send Burst DTMF Message</i> | BDTMFM | C.S0005-A 3.7.3.3.2.9 | Not used. |
| <i>Power Control Parameters Message</i> | PCNPM | C.S0005-A 3.7.3.3.2.10 | Used, as is. |
| <i>Retrieve Parameters Message</i> | RTPM | C.S0005-A 3.7.3.3.2.11 | Used, as is. |
| <i>Set Parameters Message</i> | STPM | C.S0005-A 3.7.3.3.2.12 | Used, as is. |
| <i>SSD Update Message</i> | SSDUM | C.S0005-A 3.7.3.3.2.13 | Not used. |
| <i>Flash With Information Message</i> | FWIM | C.S0005-A 3.7.3.3.2.14 | Not used. |
| <i>Mobile Station Registered Message</i> | MSRM | C.S0005-A 3.7.3.3.2.15 | Not used. |
| <i>Status Request Message</i> | STRQM | C.S0005-A 3.7.3.3.2.16 | Used, with restrictions (see Table 6.4.4-2). |
| <i>Extended Handoff Direction Message</i> | EHDM | C.S0005-A 3.7.3.3.2.17 | Used, as is. |
| <i>Service Request Message</i> | SRQM | C.S0005-A 3.7.3.3.2.18 | Used, as is. |
| <i>Service Response Message</i> | SRPM | C.S0005-A 3.7.3.3.2.19 | Used, as is. |
| <i>Service Connect Message</i> | SCM | C.S0005-A 3.7.3.3.2.20 | Used, as is. |
| <i>Service Option Control Message</i> | SOCM | C.S0005-A 3.7.3.3.2.21 | Used, as is. |
| <i>TMSI Assignment Message</i> | TASM | C.S0005-A 3.7.3.3.2.22 | Not used. |

| | | | |
|--|------|---------------------------|---|
| <i>Service Redirection Message</i> | SRDM | C.S0005-A 3.7.3.3.2.23 | Used, with modifications (see 6.4.2.2.2). |
| <i>Supplemental Channel Assignment Message</i> | SCAM | C.S0005-A 3.7.3.3.2.24 | Used, as is. |
| <i>Power Control Message</i> | PCNM | C.S0005-A 3.7.3.3.2.25 | Used, as is. |

1

Table 6.4-4. f-dsch Messages (Part 2 of 2)

| Message Name | MSG_TAG | Section Number | Disposition in MC-MAP |
|---|---------|---------------------------|---|
| <i>Extended Neighbor List Update Message</i> | ENLUM | C.S0005-A 3.7.3.3.2.26 | Used, as is. |
| <i>Candidate Frequency Search Request Message</i> | CFSRQM | C.S0005-A 3.7.3.3.2.27 | Used, with modification (see 6.4.2.2.5) |
| <i>Candidate Frequency Search Control Message</i> | CFSCNM | C.S0005-A 3.7.3.3.2.28 | Used, as is |
| <i>Power Up Function Message</i> | PUFM | C.S0005-A 3.7.3.3.2.29 | Used, as is. |
| <i>Power Up Function Completion Message</i> | PUFCM | C.S0005-A 3.7.3.3.2.30 | Used, as is. |
| <i>General Handoff Direction Message</i> | GHDM | C.S0005-A 3.7.3.3.2.31 | Used, with modifications (see 6.4.2.2.3). |
| <i>Resource Allocation Message</i> | RAM | C.S0005-A 3.7.3.3.2.32 | Used, as is. |
| <i>Resource Allocation Mini Message</i> | RAMM | C.S0005-A 3.7.3.3.2.33 | Used, as is. |
| <i>Extended Release Message</i> | ERM | C.S0005-A 3.7.3.3.2.34 | Used, as is. |
| <i>Extended Release Mini Message</i> | ERMM | C.S0005-A 3.7.3.3.2.35 | Used, as is. |
| <i>Universal Handoff Direction Message</i> | UHDM | C.S0005-A 3.7.3.3.2.36 | Used, with modifications (see 6.4.2.2.4). |
| <i>Extended Supplemental Channel Assignment Message</i> | ESCAM | C.S0005-A 3.7.3.3.2.37 | Used, as is. |
| <i>Forward Supplemental Channel Assignment Mini Message</i> | FSCAMM | C.S0005-A 3.7.3.3.2.38 | Used, as is. |
| <i>Reverse Supplemental Channel Assignment Mini Message</i> | RSCAMM | C.S0005-A 3.7.3.3.2.39 | Used, as is. |
| <i>Mobile Assisted Burst Operation Parameters Message</i> | MABOPM | C.S0005-A 3.7.3.3.2.40 | Used, as is. |
| <i>Call Assignment Message</i> | CLAM | C.S0005-A 3.7.3.3.2.41 | Not used. |
| <i>Extended Alert With Information Message</i> | EAWIM | C.S0005-A 3.7.3.3.2.42 | Not used. |
| <i>Extended Flash With Information Message</i> | EFWIM | C.S0005-A 3.7.3.3.2.42 | Not Used. |
| <i>Security Mode Command Message</i> | SMCM | C.S0005-A 3.7.3.3.2.42 | Used, with modification (see 6.4.2.2.6) |
| <i>MC-MAP L3 Message</i> | MAPL3M | 6.4.1.2.1 | New MC-MAP message. |
| <i>MC-MAP GSM Handover Command Message</i> | MAPGHCM | 6.4.1.2.2 | New MC-MAP message. |
| <i>R-TMSI Assignment Message</i> | RTASM | 6.4.1.2.3 | New MC-MAP message. |

| | | | |
|---|---------|-----------|---------------------|
| <i>MC-MAP Dedicated Mode Paging Message</i> | MAPDMPM | 6.4.1.2.4 | New MC-MAP message. |
|---|---------|-----------|---------------------|

1 **6.4.1 New Messages**

2 This section lists new MC-MAP messages; hence, underlining of text is implied.

3 **6.4.1.1 f-csch**4 **6.4.1.1.1 MC-MAP Sync Channel Message**5 **MSG_TAG: MAPSCHM**

| Field | Length (bits) |
|----------------|---------------|
| NUM_ID_RECORDS | 3 |

6 NUM_ID_RECORDS occurrences of the following record:

| | |
|--------------|-------------------------------|
| CN_ID_TYPE | 3 |
| CN_ID_LEN | 4 |
| CN_ID_FIELDS | $8 \times \text{CN_ID_LEN}$ |

7 Followed by the field:

| | |
|-----------------|---|
| MC_PARAMS | 1 |
| DIF_FREQ_PARAMS | 1 |

8 If MC_PARAMS=1, there shall be following additional fields:

| | |
|----------|----|
| PILOT_PN | 9 |
| LC_STATE | 42 |
| SYS_TIME | 36 |
| LP_SEC | 8 |
| LTM_OFF | 6 |
| DAYLT | 1 |

9

- 1 If DIF_FREQ_PARAMS = '1', there shall be following additional fields:

| | |
|----------------------|---------|
| P_REV_LEVEL | 8 |
| MIN_P_REV_LEVEL | 8 |
| PRAT | 2 |
| CDMA_FREQ | 11 |
| EXT_CDMA_FREQ | 11 |
| SR1_BCCH_SUPPORTED | 1 |
| SR1_NON_TD_FREQ_INCL | 0 or 1 |
| SR1_CDMA_FREQ_NON_TD | 0 or 11 |
| SR1_BRAT_NON_TD | 0 or 2 |
| SR1_TD_INCL | 0 or 1 |
| SR1_CDMA_FREQ_TD | 0 or 11 |
| SR1_BRAT_TD | 0 or 2 |
| SR1_TD_MODE | 0 or 2 |
| SR1_TD_POWER_LEVEL | 0 or 2 |
| SR3_SUPPORTED | 1 |
| SR3_CENTER_FREQ_INCL | 0 or 1 |
| SR3_CENTER_FREQ | 0 or 11 |
| SR3_BRAT | 0 or 2 |
| SR3_PRIMARY_PILOT | 0 or 2 |
| SR3_PILOT_POWER1 | 0 or 3 |
| SR3_PILOT_POWER2 | 0 or 3 |

- 2 If CN_ID_TYPE = '001', the CN_ID_FIELDS shall be:

| | |
|-------|---|
| MCC_1 | 4 |
| MCC_2 | 4 |
| MCC_3 | 4 |
| MNC_1 | 4 |
| MNC_2 | 4 |
| MNC_3 | 4 |

3

| | | |
|----|--|--|
| 1 | NUM_ID_RECORDS | Number of Identification records. |
| 2 | | The base station shall set this field to the number of different |
| 3 | | identification types network may have. Each type is then |
| 4 | | specified in the record that follows. |
| 5 | CN_ID_TYPE. | Core Network Identification Type. |
| 6 | | The base station shall set this field to specify the type of |
| 7 | | network identification. |
| 8 | CN_ID_LEN | Core Network Identification length. |
| 9 | | The base station shall set this field to the number of octets in |
| 10 | | the CN_ID_FIELDS included in this identification record. |
| 11 | CN_ID_FIELDS | Core Network Identification fields. |
| 12 | | The identification record fields are determined by the value of |
| 13 | | CN_ID_TYPE, as described below. |
| 14 | If the CN_ID_TYPE field is set to '001', the base station shall include the following fields, specifying GSM | |
| 15 | Location Area Identification: | |
| 16 | MCC_1 | BCD coded first digit of the Mobile Country Code (MCC). |
| 17 | MCC_2 | BCD coded second digit of the MCC. |
| 18 | MCC_3 | BCD coded third digit of the MCC. |
| 19 | | The MCC field is coded as in CCITT Rec.E212, Annex A. |
| 20 | MNC_1 | BCD coded first digit of the Mobile Network code (MNC). |
| 21 | MNC_2 | BCD coded second digit of the MNC. |
| 22 | | The coding of MNC field is the responsibility of the |
| 23 | | administration. |
| 24 | MNC_3 | BCD coded third digit of the MNC. |
| 25 | | For the network IDs having two digit MNC, the third digit |
| 26 | | shall be coded as '1111'. |
| 27 | MC_PARAMS | One-bit field to denote whether CDMA MC specific parameters |
| 28 | | follow. |
| 29 | | The base station shall set this field to '0' if CDMA MC specific |
| 30 | | parameters are sent in <i>Sync Channel Message</i> (see |
| 31 | | 3.7.2.3.2.26 of 3GPP2 C.S0005-A); otherwise it shall set this |
| 32 | | field to '1'. |
| 33 | | The CDMA MC specific parameters are specified in <i>Sync</i> |
| 34 | | <i>Channel Message</i> in 3.7.2.3.2.26 of 3GPP2 C.S0005-A. |
| 35 | | If the <i>Sync Channel Message</i> is not being sent on the f-csch |
| 36 | | (Sync Channel), the base station shall set MC_PARAMS to '1'. |
| 37 | | If the <i>Sync Channel Message</i> is being sent, the base station |

1

should not set MC_PARAMS to '1'.

1 **DIF_FREQ_PARAMS** One bit field the base station shall use to direct the MS to
 2 operate on different frequency if MC_PARAMS = '0' (i.e., if
 3 CDMA MC specific parameters are also sent in *Sync Channel*
 4 *Message*).

5 If MC_PARAMS = '0', the base station shall set
 6 DIF_FREQ_PARAMS to '1', if it supports different frequency
 7 channels for MC-MAP operation. The base station shall then
 8 include the frequency related fields as specified (see
 9 3.7.2.3.2.26 of 3GPP2 C.S0005-A for definition); otherwise it
 10 shall set DIF_FREQ_PARAMS to '0'.

11 If MC_PARAMS = '1', the base station shall set
 12 DIF_FREQ_PARAMS to '1'. The frequency related fields are
 13 always included.

14 6.4.1.1.2 MC-MAP System Information Message

15 MSG_TAG: MAPSIM

| Field | Length (bits) |
|------------------|---------------|
| PILOT_PN | 9 |
| CONFIG_MSG_SEQ | 6 |
| NUM_INFO_RECORDS | 3 |

16 NUM_INFO_RECORDS occurrences of the following record:

| | |
|----------------|-----------------|
| CN_INFO_TYPE | 3 |
| CN_INFO_LEN | 6 |
| CN_INFO_FIELDS | 8 × CN_INFO_LEN |

17 Followed by the field:

| | |
|-----------|---|
| MC_PARAMS | 1 |
|-----------|---|

18 **PILOT_PN** Pilot PN sequence offset index.

19 The base station shall set this field to the pilot PN
 20 sequence offset for this base station, in units of 64 PN
 21 chips.

22 **CONFIG_MSG_SEQ** Configuration message sequence number.

23 The base station shall set this field to CONFIG_SEQ
 24 (see 3.6.2.2 of 3GPP2 C.S0005-A).

25 **NUM_INFO_RECORDS** Number of Information records.

26 The base station shall set this field to the number of

| | | |
|----|----------------|--|
| 1 | | different information records. Each type is then |
| 2 | | specified in the record that follows. |
| 3 | CN_INFO_TYPE | Core Network Information Type. |
| 4 | | The network shall set this field to specify the type of |
| 5 | | network identification. |
| 6 | CN_INFO_LEN | Core Network Information length. |
| 7 | | The network shall set this field to the number of octets |
| 8 | | in the CN_INFO_FIELDS included in this information |
| 9 | | record. |
| 10 | CN_INFO_FIELDS | Network Information fields. |
| 11 | | The identification record fields are determined by the |
| 12 | | value of CN_INFO_TYPE, as described below. If the |
| 13 | | CN_ID_TYPE field is set to '001', the base station shall |
| 14 | | include the following fields: |
| 15 | LAI | Location Area Identification. |
| 16 | | The coding of the LAI field is the responsibility of the |
| 17 | | administration. LAI fields are encoded as under: |
| 18 | | |

| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | |
|-----------------|---|---|---|-------------|---|---|---|---------|
| | | | | | | | | Octet 1 |
| MNC digit 3 | | | | | | | | Octet 2 |
| MNC digit 2 | | | | MNC digit 1 | | | | Octet 3 |
| LAC | | | | | | | | Octet 4 |
| LAC (continued) | | | | | | | | Octet 5 |

| | | |
|----|-------------|---|
| 19 | MNC | Mobile Network Code. |
| 20 | | Mobile Network code digits (refer to GSM 03.03) and LAC are |
| 21 | | Location Area Code digits. For the network IDs having two- |
| 22 | | digit MNC, the third digit shall be coded as '1111'. |
| 23 | CELL_ID | Cell Identity. |
| 24 | | The purpose of the Cell Identity is to identify a cell within a |
| 25 | | location area. The coding of the Cell Identity is the |
| 26 | | responsibility of each administration. |
| 27 | GEN_SYS_IND | General System Indicators. |
| 28 | | This includes several general indicators and flags specifying |
| 29 | | the current functionality of the system, and how the mobile |
| 30 | | stations shall behave while operating in the system. This field |
| 31 | | is encoded as: |
| 32 | | |

| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|-----|----|----------|-----|----------|-----------|---|---|
| BAR | RE | Reserved | ATT | Reserved | 000 spare | | |

- 1
- 2
- 3
- 4

BAR

Cell Barred Access indicator.

This field indicates if the cell is barred for access. If the BAR field is set to '0', the cell is not barred. If the BAR field is set to '1', then the cell is barred.

| | | |
|----|------------------|---|
| 1 | RE | Call Reestablishment Allowed indicator. |
| 2 | | This field indicates whether call reestablishment is |
| 3 | | allowed in the cell. |
| 4 | | If the RE field is set to '0', then call reestablishment is |
| 5 | | allowed in the cell. If the RE field is set to '1', then call |
| 6 | | reestablishment is not allowed in the cell. |
| 7 | ATT | IMSI Attach/Detach Indicator. |
| 8 | | The base station shall set this field to '0' if mobile |
| 9 | | stations in the cell are not allowed to apply IMSI |
| 10 | | attach and detach procedure. |
| 11 | | The base station shall set this field to '1' if mobile |
| 12 | | stations in the cell shall apply IMSI attach and detach |
| 13 | | procedure. |
| 14 | PER_LOC_UP_TIMER | Periodic Location Update Timer (GSM T3212). |
| 15 | | This field is coded as the binary representation of the |
| 16 | | timeout value for periodic updating in decihours. |
| 17 | | The value 0 is used for infinite timeout value, i.e., |
| 18 | | periodic updating shall not be used within the cell. |
| 19 | MC_PARAMS | MC parameters message indicator. |
| 20 | | One-bit field that tells mobile station which message |
| 21 | | includes the CDMA MC specific RRC fields. |
| 22 | | When this message is sent on Forward Common |
| 23 | | Control Channel, MC_PARAMS shall be set to '1'. Base |
| 24 | | station shall send the CDMA MC specific fields in <i>MC-</i> |
| 25 | | <i>RR Parameters Message</i> (see 3.7.2.3.2.30 of 3GPP2 |
| 26 | | C.S0005-A). |
| 27 | | When this message is sent on Paging Channel, the |
| 28 | | base station shall set this bit as follows: |
| 29 | | If <i>Systems Parameter Message</i> is transmitted, base |
| 30 | | station shall set MC_PARAMS to '0'. CDMA MC specific |
| 31 | | fields can be read from <i>Systems Parameter Message</i> |
| 32 | | (see 3.7.2.3.2.1 of 3GPP2 C.S0005-A) and <i>Extended</i> |
| 33 | | <i>Systems Parameter Message</i> (see 3.7.2.3.2.13 of |
| 34 | | 3GPP2 C.S0005-A). |
| 35 | | If <i>Systems Parameter Message</i> is not transmitted, base |
| 36 | | station shall set MC_PARAMS to '1'. Base station shall |
| 37 | | send the CDMA MC specific fields in <i>MC-RR</i> |
| 38 | | <i>Parameters Message</i> (see 3.7.2.3.2.30 of 3GPP2 |
| 39 | | C.S0005-A). |

1 6.4.1.1.3 MC-MAP L3 Message

2 MSG_TAG: MAPL3M

| Field | Length (bits) |
|---------------|------------------|
| CN_DOMAIN_ID | 2 |
| | |
| NAS_INFO_LEN | 12 |
| NAS_INFO_DATA | 8 × NAS_INFO_LEN |

3

4 CN_DOMAIN_ID Core Network Domain Identifier.

5 The base station shall set CN_DOMAIN_ID field to the
6 appropriate value as shown in Table 6.4.1.1.3-1.

7

Table 6.4.1.1.3-1. CN_DOMAIN_ID values

| CN_DOMAIN_ID (binary) | Core network domain identifier |
|-------------------------------|--------------------------------|
| 00 | PSTN/ISDN |
| 01 | IP |
| 11 | Don't Care |
| All other values are reserved | |

8

9 NAS_INFO_LEN Non Access Stratum Information Length.

10 The base station shall set this field to the number of
11 octets in the NAS_INFO_DATA fields included in this
12 message.

13 NAS_INFO_DATA Non Access Stratum Information Data.

14 These fields include the Upper Layer Non-Access
15 Stratum message received by the RRC entity of the
16 base station.

17 6.4.1.1.4 R-TMSI Assignment Message

18 MSG_TAG: RTASM

| Field | Length (bits) |
|------------------|---------------------|
| R_TMSI_INCL | 1 |
| R_TMSI_ZONE_LEN | 0 or 4 |
| R_TMSI_ZONE | 8 × R_TMSI_ZONE_LEN |
| R_TMSI_CODE | 0 or 32 |
| R_TMSI_EXP_PRD | 0 or 7 |
| ZONE_INFO_INCL | 0 or 1 |
| TOT_R_TMSI_ZONES | 0 or 3 |
| R_PREV_ZONE_PRD | 0 or 7 |

1

2 R_TMSI_INCL One bit flag to denote whether Radio TMSI is included
3 or not.

4 The base station shall set this field to '1' if it wants to
5 assign new R-TMSI to the mobile station; otherwise it
6 shall set the field to '0'.

7 If R_TMSI_INCL is set to '1', the base station shall
8 include the following fields:

9 R_TMSI_ZONE_LEN Radio TMSI zone length.

10 The base station shall set this field to the number of
11 octets included in the R_TMSI_ZONE. The base
12 station shall set this field to a value in the range 1 to 8
13 inclusive.

14 R_TMSI_ZONE Radio TMSI zone.

15 The base station shall set this field to the Radio TMSI
16 zone number.

17 R_TMSI_CODE Radio temporary mobile station identity code.

18 The base station shall set this field to the 32-bit Radio
19 TMSI code assigned to the mobile station.

20 If the base station is to deassign the Radio TMSI, the
21 base station shall set all the bits in this field to '1'.

| | | |
|----|-------------------------|--|
| 1 | R_TMSI_EXP_PRD | Radio TMSI expiration period. |
| 2 | | If mobile station is not to perform timer-based RR |
| 3 | | registration, the base station shall set this field to |
| 4 | | ‘000000’. If mobile station is to perform timer-based |
| 5 | | RR registration, the base station shall set this field to |
| 6 | | the value in the range 28 to 85 inclusive, such that the |
| 7 | | desired timer value is |
| 8 | | $\lfloor 2^{\text{REG_PRD}/4} \rfloor \times 0.08$ seconds. |
| 9 | ZONE_INFO_INCL | One-bit flag to indicate if the information for |
| 10 | | maintenance of R_ZONE_LIST _s is included or not. |
| 11 | | The base station shall set this field to ‘1’ if the mobile |
| 12 | | station is registering in a new zone and shall include |
| 13 | | the following fields; otherwise it shall set this field to |
| 14 | | ‘0’. |
| 15 | TOT_R_TMSI_ZONES | Number of R-TMSI zones to be retained. |
| 16 | | The base station shall set this field to the number of R- |
| 17 | | TMSI zones the mobile station is to retain for purposes |
| 18 | | of zone-based RR-level registration (see 2.6.5.1.5). |
| 19 | | If zone-based RR-level registration is to be disabled, |
| 20 | | the base station shall set this field to ‘000’. |
| 21 | R_PREV_ZONE_PRD | R-TMSI previous zone expiration. |
| 22 | | The base station shall set this field to the value in the |
| 23 | | range 24 to 85 inclusive, such that the desired timer |
| 24 | | value for expiration of previous zone R-TMSI is |
| 25 | | $\lfloor 2^{\text{REG_PRD}/4} \rfloor \times 0.08$ seconds. |
| 26 | | |

1 6.4.1.2 f-dsch

2 6.4.1.2.1 MC-MAP L3 Message

3 MSG_TAG: MAPL3M

| Field | Length (bits) |
|---------------|------------------|
| CN_DOMAIN_ID | 2 |
| | |
| | |
| NAS_INFO_LEN | 12 |
| NAS_INFO_DATA | 8 × NAS_INFO_LEN |

4 CN_DOMAIN_ID

Core Network Domain Identifier.

5 The base station shall set CN_DOMAIN_ID field to the
6 appropriate value as shown in Table 6.4.1.1.3-1.

7 NAS_INFO_LEN

Non Access Stratum Information Length.

8 The base station shall set this field to the number of
9 octets in the NAS_INFO_DATA fields included in this
10 message.

11 NAS_INFO_DATA

Non Access Stratum Information Data.

12 These fields include the Upper Layer Non-Access
13 Stratum message received by the RRC entity of the
14 base station.

15 6.4.1.2.2 MC-MAP GSM Handover Command Message

16 MSG_TAG: MAPGHCM

| Field | Length (bits) |
|-----------------|------------------|
| USE_TIME | 1 |
| ACTION_TIME | 0 or 6 |
| GSM_T_REF_INCL | 1 |
| CDMA_TIME | 0 or 6 |
| GSM_FRAME | 0 or 19 |
| GSM_FRAME_FRACT | 0 or 9 |
| GSM_INFO_LEN | 12 |
| GSM_INFO_DATA | 8 × GSM_INFO_LEN |

17 USE_TIME

Use action time indicator.

18 This field indicates whether an explicit action time is

| | | |
|----|------------------------|--|
| 1 | | specified in this message. If an explicit action time is |
| 2 | | specified in this message, the base station shall set |
| 3 | | this field to '1'; otherwise, the base station shall set |
| 4 | | this field to '0'. |
| 5 | ACTION_TIME | Action time. |
| 6 | | If the USE_TIME field is set to '1', the base station |
| 7 | | shall set this field to the System Time, in units of 80 |
| 8 | | ms (modulo 64), at which the handover is to take |
| 9 | | effect. If the USE_TIME field is set to '0' the base |
| 10 | | station shall omit this field. |
| 11 | GSM_T_REF_INCL | GSM Time Reference Included. |
| 12 | | This field indicates whether a GSM Time Reference is |
| 13 | | included in this message. If GSM Time Reference is |
| 14 | | specified in this message, the base station shall set |
| 15 | | this field to '1'; otherwise, the base station shall set |
| 16 | | this field to '0'. |
| 17 | CDMA_TIME- | CDMA Time. |
| 18 | | If the GSM_T_REF_INCL is set to '1', the base station |
| 19 | | shall set this field to the CDMA System Time, in units |
| 20 | | of 80 ms (modulo 64), to which the GSM_FRAME is |
| 21 | | referred. If the USE_TIME field is set to '0' the base |
| 22 | | station shall omit this field. |
| 23 | GSM_FRAME- | GSM Frame number. |
| 24 | | If the GSM_T_REF_INCL is set to '1', the base station |
| 25 | | shall set this field to the GSM frame number valid at |
| 26 | | the time specified by CDMA_TIME in the GSM target |
| 27 | | base station, as specified in Section 3.3.2.2 of GSM |
| 28 | | 05.02. If the GSM_T_REF_INCL field is set to '0' the |
| 29 | | base station shall omit this field. |
| 30 | GSM_FRAME_FRACT | GSM Frame Fraction. |
| 31 | | If the GSM_T_REF_INCL is set to '1', the base station |
| 32 | | shall set this field to the number of $1/2^9$ fractions of a |
| 33 | | GSM frame valid at the time specified by CDMA_TIME |
| 34 | | in the GSM target base station, with range 0 to (2^9-1) . |
| 35 | | The GSM frame duration is specified in Section 4.3.1 |
| 36 | | of GSM 05.02 as $24/5200$ s. If the GSM_T_REF_INCL |
| 37 | | field is set to '0', the base station shall omit this field. |

| | | |
|---|----------------------|--|
| 1 | GSM_INFO_LEN | GSM Information Length. |
| 2 | | The base station shall set this field to the number of |
| 3 | | octets in the GSM_INFO_DATA fields included in this |
| 4 | | message. |
| 5 | | |
| 6 | GSM_INFO_DATA | GSM Information Data. |
| 7 | | The base station shall set this field as the information |
| 8 | | elements included in the Handover Command, as |
| 9 | | specified in Section 9.1.15 of GSM 04.08 (FFS). |

10

11

12 **6.4.1.2.3 R-TMSI Assignment Message**13 **MSG_TAG: RTASM**

| Field | Length (bits) |
|------------------|-------------------------------|
| R_TMSI_INCL | 1 |
| R_TMSI_ZONE_LEN | 0 or 4 |
| R_TMSI_ZONE | $8 \times R_TMSI_ZONE_LEN$ |
| R_TMSI_CODE | 0 or 32 |
| R_TMSI_EXP_PRD | 0 or 7 |
| ZONE_INFO_INCL | 0 or 1 |
| TOT_R_TMSI_ZONES | 0 or 3 |
| R_PREV_ZONE_PRD | 0 or 7 |

14 **R_TMSI_INCL** One bit flag to denote whether Radio TMSI is included
15 or not.

16 The base station shall set this field to '1' if it wants to
17 assign new R-TMSI to the mobile station; otherwise it
18 shall set the field to '0'.

19 If R_TMSI_INCL is set to '1', the base station shall
20 include the following fields:

21 **R_TMSI_ZONE_LEN** Radio TMSI zone length.

22 The base station shall set this field to the number of
23 octets included in the R_TMSI_ZONE. The base
24 station shall set this field to a value in the range 1 to 8
25 inclusive.

26 **R_TMSI_ZONE** Radio TMSI zone.

| | | |
|----|---|--|
| 1 | | The base station shall set this field to the Radio TMSI |
| 2 | | zone number. |
| 3 | R_TMSI_CODE | Radio temporary mobile station identity code. |
| 4 | | The base station shall set this field to the 32-bit Radio |
| 5 | | TMSI code assigned to the mobile station. |
| 6 | | If the base station is to deassign the Radio TMSI, the |
| 7 | | base station shall set all the bits in this field to '1'. |
| 8 | R_TMSI_EXP_PRD | Radio TMSI expiration time. |
| 9 | | If mobile station is not to perform timer-based RR |
| 10 | | registration, the base station shall set this field to |
| 11 | | '0000000'. If mobile station is to perform timer-based |
| 12 | | RR registration, the base station shall set this field to |
| 13 | | the value in the range 28 to 85 inclusive, such that the |
| 14 | | desired timer value is |
| 15 | | $\lfloor 2^{\text{REG_PRD}/4} \rfloor \times 0.08 \text{ seconds.}$ |
| 16 | ZONE_INFO_INCL | One bit flag to indicate if the information for |
| 17 | | maintenance of R_ZONE_LIST _s is included or not. |
| 18 | | The base station shall set this field to '1' if the mobile |
| 19 | | station is registering in a new zone and include the |
| 20 | | following fields; otherwise it shall set this field to '0'. |
| 21 | TOT_R_TMSI_ZONES | Number of R-TMSI zones to be retained. |
| 22 | | The base station shall set this field to the number of R- |
| 23 | | TMSI zones the mobile station is to retain for purposes |
| 24 | | of zone-based RR-level registration (see 2.6.5.1.5). |
| 25 | | If zone-based RR-level registration is to be disabled, |
| 26 | | the base station shall set this field to '000'. |
| 27 | R_PREV_ZONE_PRD | R-TMSI previous zone expiration. |
| 28 | | The base station shall set this field to the value in the |
| 29 | | range 24 to 85 inclusive, such that the desired timer |
| 30 | | value for expiration of previous zone R-TMSI is |
| 31 | | $\lfloor 2^{\text{REG_PRD}/4} \rfloor \times 0.08 \text{ seconds.}$ |
| 32 | 6.4.1.2.4 MC-MAP Dedicated Mode Paging Message | |
| 33 | MSG_TAG: MAPDMPM | |

| Field | Length (bits) |
|------------------|---------------|
| CN_DOMAIN_ID | 2 |
| SERVICE_OPTION | 16 |
| PAGE_REC_TYPE_ID | 4 |

- 1 CN_DOMAIN_ID Core Network Domain Identifier.
- 2 The base station shall set this field to the appropriate
- 3 value as shown in Table 6.4.1.1.3-1.
- 4 SERVICE_OPTION Service Option Number.
- 5 The base station shall set this field to the appropriate
- 6 value of the service option number corresponding to
- 7 the “paging cause” received from the Upper Layers.
- 8 PAGE_REC_TYPE_ID Paging Record Type Identifier.
- 9 The base station shall set this field to the appropriate
- 10 value of the paging record type identifier as shown in
- 11 Table 6.4.1.2.4-1.

12 Table 6.4.1.2.4-1. PAGING_REC_TYPE_ID values

| PAGING_REC_ TYPE_ID (binary) | Paging Record Type Identifier |
|------------------------------------|----------------------------------|
| 0000 | IMSI |
| 0001 | TMSI |
| 0010 | P-TMSI |
| All other values are reserved | |

1 6.4.1.3 r-csch

2 6.4.1.3.1 RR-level Registration Message

3 MSG_TAG: RRLRM

| Field | Length (bits) |
|------------------|---------------|
| RR_REG_TYPE | 4 |
| SLOT_CYCLE_INDEX | 3 |
| MOB_P_REV | 8 |
| KEY_SEQ_NEW | 0 or 4 |

4

5 RR_REG_TYPE

Registration type.

6 This field indicates which type of event generated the
7 RR-level registration attempt.

8 The mobile station shall set this field to the REG_TYPE
9 value shown in Table 6.4.1.3.1-1 corresponding to the
10 event that caused this registration to occur.

11 SLOT_CYCLE_INDEX

Preferred slot cycle index.

12 If the mobile station is configured for slotted mode
13 operation, the mobile station shall set this field to the
14 preferred slot cycle index, SLOT_CYCLE_INDEX_p (see
15 2.6.2.1.1 of 3GPP2 C.S0005-A). Otherwise, the mobile
16 station shall set this field to '000'.

17 MOB_P_REV

Protocol revision of the mobile station.

18 KEY_SEQ_NEW

New key sequence number.

19 The key sequence number corresponding to the new
20 encryption key generated by the mobile station.

21 The mobile station shall set this field to
22 KEY_SEQ_NEW_{s-p}, the sequence number associated
23 with the new encryption key generated by the mobile
24 station.

25

26

Table 6.4.1.3.1-1. RR_Registration Type (RR_REG_TYPE)
Codes

| RR_REG_TYPE (binary) | Type of RR Registration |
|--|-------------------------|
| 0000 | Timer-based |
| 0001 | Zone-based |
| 0010 | Page response |
| 0011 | Channel needed |
| All other RR_REG_TYPE values are reserved. | |

6.4.1.3.2 MC-MAP Initial L3 Message
MSG_TAG: MAPIL3M

| Field | Length (bits) |
|--------------------|------------------|
| CN_DOMAIN_ID | 2 |
| SERVICE_DESCRIPTOR | 8 |
| FLOW_ID | 4 |
| NAS_INFO_LEN | 12 |
| NAS_INFO_DATA | 8 × NAS_INFO_LEN |

| | |
|--------------------|---|
| CN_DOMAIN_ID | Core Network Domain Identifier. The mobile station shall set CN_DOMAIN_ID to the appropriate value as shown in Table 6.4.1.1.3-1. |
| SERVICE_DESCRIPTOR | Service Descriptor. The mobile station shall set the SERVICE_DESCRIPTOR field to the appropriate value as shown in 11.2.3.1.1 of TS24.007. |
| FLOW_ID | Flow Identifier. The mobile station shall set this field to the flow identifier corresponding to this message. |
| NAS_INFO_LEN | Non Access Stratum Information Length. The mobile station shall set this field to the number of octets in the NAS_INFO_DATA fields included in this message. |
| NAS_INFO_DATA | Non Access Stratum Information Data. These fields include the Upper Layer Non-Access Stratum message received by the RRC entity of the |

1

mobile station.

1 **6.4.1.3.3 MC-MAP L3 Message**
 2 MSG_TAG: MAPL3M

| Field | Length (bits) |
|---------------|------------------|
| | |
| | |
| FLOW_ID | 4 |
| NAS_INFO_LEN | 12 |
| NAS_INFO_DATA | 8 × NAS_INFO_LEN |

| | | |
|----|---------------|--|
| 3 | FLOW_ID | Flow Identifier. |
| 4 | | The mobile station shall set this field to the flow |
| 5 | | identifier corresponding to this message. |
| 6 | NAS_INFO_LEN | Non Access Stratum Information Length. |
| 7 | | The mobile station shall set this field to the number of |
| 8 | | octets in the NAS_INFO_DATA fields included in this |
| 9 | | message. |
| 10 | NAS_INFO_DATA | Non Access Stratum Information Data. |
| 11 | | These fields include the Upper Layer Non-Access |
| 12 | | Stratum message received by the RRC entity of the |
| 13 | | mobile station. |

1 6.4.1.3.4 MC-MAP RRC Connection Request Message
 2 MSG_TAG: MAPCRM

| Field | Length (bits) |
|--------------------------------------|---------------|
| MS_ORIG_IND | 1 |
| CAUSE_IND | 1 |
| SERVICE_OPTION | 0 or 16 |
| OTHER_ESTABLISH_CAUSE | 0 or 4 |
| SLOT_CYCLE_INDEX | 3 |
| MOB_P_REV | 8 |
| OTD_SUPPORTED | 0 or 1 |
| QPCH_SUPPORTED | 0 or 1 |
| ENHANCED_RC | 0 or 1 |
| FOR_RC_PREF | 0 or 5 |
| REV_RC_PREF | 0 or 5 |
| FCH_SUPPORTED | 0 or 1 |
| FCH Capability Type-specific fields | 0 or variable |
| DCCH_SUPPORTED | 0 or 1 |
| DCCH Capability Type-specific fields | 0 or variable |
| REV_FCH_GATING_MODE | 0 or 1 |
| SILENT_REORG | 0 or 1 |
| STS_SUPPORTED | 0 or 1 |
| ENC_INFO_INCL | 1 |
| SIG_ENCRYPT_SUP | 0 or 8 |
| SIG_ENCRYPT_REQ | 0 or 1 |
| KEY_SEQ_NEW | 0 or 4 |
| UI_ENCRYPT_SUP | 0 or 8 |
| UI_ENCRYPT_REQ | 0 or 1 |

3 MS_ORIG_IND Mobile Station Origination Indicator.

4 If this message is being sent in response to a request from
 5 Upper Layers, the mobile station shall set this field to '1';
 6 otherwise (if the message is being sent due to receiving a
 7 *General Page Message* from the base station) the mobile
 8 station shall set this field to '0'.

9 CAUSE_IND Establishment cause indicator.

10 If the "establishment cause" (as received from the Upper
 11 Layers or the "paging cause" of the *General Page Message*) of
 12 this RRC connection request can be mapped to one of the MC-

1 MAP service options defined in **C.R1001-A** (i.e., Speech Call,
2 CS Data Call, PS Data Call, or SMS), the mobile station shall
3 set this field to '1'; otherwise, it shall set this field to '0'.

4 **SERVICE_OPTION** Service option number.

5 If the CAUSE_IND field of this message is set to '0', the mobile
6 station shall omit this field; otherwise, the mobile station shall
7 include this field and set it as follows:

8 The mobile station shall set this field to the appropriate MC-
9 MAP service option defined in **C.R1001-A** (i.e., Speech Call, CS
10 Data Call, PS Data Call, or SMS) that corresponds to the
11 "establishment cause" (as received from the Upper Layers or
12 the "paging cause" of the *General Page Message*) of this RRC
13 connection request.

14 **OTHER_ESTABLISH_CAUSE** Other RRC connection establishment Cause.

15 If the CAUSE_IND field of this message is set to '1', the mobile
16 station shall omit this field; otherwise, the mobile station shall
17 include this field and set it as follows:

18 The mobile station shall set this field to the "establishment
19 cause" of this RRC connection request (as received from the
20 Upper Layers), as shown in Table 6.4.1.3.2-1.

1

Table 6.4.1.3.2-1. OTHER_ESTABLISH_CAUSE Codes

| OTHER_ESTABLISH_CAUSE (binary) | Connection Establishment Condition |
|---|---------------------------------------|
| | |
| | |
| | |
| 0000 | Emergency Call |
| 0001 | Inter-system cell re-selection |
| 0010 | Location Update (LAU and RAU) |
| 0011 | IMSI Detach |
| | |
| All other OTHER_ESTABLISH_CAUSE values are reserved | |

2 The remaining fields are MC-specific fields (as specified in 2.7.1.3.2.4 of 3GPP2 C.S0005-A).

| | | |
|----|-------------------------|---|
| 3 | SLOT_CYCLE_INDEX | Slot cycle index. |
| 4 | | If the mobile station is configured for slotted mode |
| 5 | | operation, the mobile station shall set this field to the |
| 6 | | preferred slot cycle index, SLOT_CYCLE_INDEX_p (see |
| 7 | | 2.6.2.1.1); otherwise, the mobile station shall set this |
| 8 | | field to '000'. |
| 9 | MOB_P_REV | Protocol revision of the mobile station. |
| 10 | | The mobile station shall set this field to '00000111'. |
| 11 | OTD_SUPPORTED | Orthogonal Transmit Diversity supported indicator. |
| 12 | | If P_REV_IN_USE_s is less than six, the mobile station |
| 13 | | shall omit this field; otherwise, the mobile station shall |
| 14 | | include this field and set it as follows. |
| 15 | | If the mobile station supports orthogonal transmit |
| 16 | | diversity, it shall set this field to '1'; otherwise, the |
| 17 | | mobile station shall set this field to '0'. |
| 18 | | |
| 19 | QPCH_SUPPORTED | Quick Paging Channel supported indicator. |
| 20 | | If P_REV_IN_USE is less than six, the mobile station |
| 21 | | shall omit this field; otherwise, the mobile station shall |
| 22 | | include this field and set it as follows: |
| 23 | | If the mobile station supports the Quick Paging |
| 24 | | Channel, the mobile station shall set this field to '1'; |

| | | |
|----|---------------|---|
| 1 | | otherwise, the mobile station shall set this field to '0'. |
| 2 | ENHANCED_RC | Enhanced radio configuration supported indicator. |
| 3 | | If P_REV_IN_USE _g is less than six, the mobile station |
| 4 | | shall omit this field; otherwise, the mobile station shall |
| 5 | | include this field and set it as follows: |
| 6 | | If the mobile station supports any radio configuration |
| 7 | | in the Radio Configuration Class 2 (see 1.1.1), the |
| 8 | | mobile station shall set this field to '1'; otherwise, the |
| 9 | | mobile station shall set this field to '0'. |
| 10 | FOR_RC_PREF | Forward Radio Configuration preference. |
| 11 | | If P_REV_IN_USE _g is less than six, the mobile station |
| 12 | | shall omit this field; otherwise, the mobile station shall |
| 13 | | include this field and set this field as follows: |
| 14 | | The mobile station shall set this field to its preferred |
| 15 | | Radio Configuration for the Forward Traffic Channel. |
| 16 | REV_RC_PREF | Reverse FCH Radio Configuration Preference. |
| 17 | | If P_REV_IN_USE _g is less than six, the mobile station |
| 18 | | shall omit this field; otherwise, the mobile station shall |
| 19 | | include this field and set it as follows: |
| 20 | | The mobile station shall set this field to its preferred |
| 21 | | Radio Configuration for the Reverse Traffic Channel. |
| 22 | FCH_SUPPORTED | Fundamental Channel supported indicator. |
| 23 | | If P_REV_IN_USE _g is less than six, the mobile station |
| 24 | | shall omit this field; otherwise, the mobile station shall |
| 25 | | include this field and set it as follows: |
| 26 | | The mobile station shall set this field to '1' if the |
| 27 | | mobile station supports Fundamental Channel; |
| 28 | | otherwise, the mobile station shall set this field to '0'. |
| 29 | | FCH Capability. Type-specific fields. Fundamental |
| 30 | | Channel capability information. If the |
| 31 | | FCH_SUPPORTED field is set to '1', the mobile station |
| 32 | | shall include this field and set it as defined in |
| 33 | | 2.7.4.27.1; otherwise, the mobile station shall omit |
| 34 | | this field. |

| | | |
|----|----------------------------|---|
| 1 | DCCH_SUPPORTED | Dedicated Control Channel supported indicator. |
| 2 | | If P_REV_IN_USE _s is less than six, the mobile station |
| 3 | | shall omit this field; otherwise the mobile station shall |
| 4 | | include this field and set it as follows. |
| 5 | | The mobile station shall set this field to '1' if the |
| 6 | | mobile station supports Dedicated Control Channel; |
| 7 | | otherwise, the mobile station shall set this field to '0'. |
| 8 | | DCCH Capability. Type specific fields. Dedicated |
| 9 | | Control Channel capability information. |
| 10 | | If the DCCH_SUPPORTED field is set to '1', the mobile |
| 11 | | station shall include this field and set it as defined in |
| 12 | | 2.7.4.27.2; otherwise, the mobile station shall omit |
| 13 | | this field. |
| 14 | REV_FCH_GATING_MODE | Reverse Fundamental gating mode request indicator. |
| 15 | | If MOB_P_REV_IN_USE is less than six, the mobile |
| 16 | | station shall omit this field; otherwise, the mobile |
| 17 | | station shall include this field and set it as follows: |
| 18 | | If REV_FCH_GATING_SUP _s is equal to '1' and if the |
| 19 | | mobile station requests to turn on eighth gating mode |
| 20 | | on the Reverse Fundamental Channel, the mobile |
| 21 | | station shall set this field to '1'; otherwise, the mobile |
| 22 | | station shall set this field to '0'. |
| 23 | SILENT_REORG | Silent Re-Origination indicator. |
| 24 | | If P_REV_IN_USE _s is less than six, the mobile station |
| 25 | | shall omit this field; otherwise, the mobile station shall |
| 26 | | include this field and set it as follows. |
| 27 | | The mobile station shall set this field to '1', if this |
| 28 | | message is a result of a silent re-origination; |
| 29 | | otherwise, the mobile station shall set this field to '0'. |
| 30 | STS_SUPPORTED | STS supported indicator. |
| 31 | | If P_REV_IN_USE _s is less than six, the mobile station |
| 32 | | shall omit this field; otherwise, the mobile station shall |
| 33 | | include this field and set it as follows. |
| 34 | | The mobile station shall set this field to '1' if the |
| 35 | | mobile station supports Space Time Spreading |
| 36 | | Transmit Diversity; otherwise, the mobile station shall |
| 37 | | set this field to '0'. |

| | | |
|----|-----------------|---|
| 1 | ENC_INFO_INCL | Encryption fields included. |
| 2 | | The mobile station shall set this field to '1' if the |
| 3 | | encryption related fields are included; otherwise the |
| 4 | | mobile station shall set this field to '0'. The mobile |
| 5 | | station shall set this field to '1' if it is unable to |
| 6 | | determine the base station support for encryption. The |
| 7 | | mobile station shall set this field to '0' if the base |
| 8 | | station does not support encryption or if the mobile |
| 9 | | station does not support any of the encryption modes |
| 10 | | supported by the base station. |
| 11 | SIG_ENCRYPT_SUP | Signaling Encryption supported indicator. |
| 12 | | The mobile station shall include this field only if |
| 13 | | ENC_INFO_INCL is equal to '1'. If included, this field |
| 14 | | indicates which signaling encryption algorithms are |
| 15 | | supported by the mobile station. |
| 16 | | This field consists of the subfields shown in Table |
| 17 | | 2.7.1.3.2.1-4 of 3GPP2 C.S0005-A. |
| 18 | SIG_ENCRYPT_REQ | Signaling Message encryption request indicator. |
| 19 | | The mobile station shall include this field if |
| 20 | | SIG_ENC_INCL is equal to '1'. If this field is included |
| 21 | | the mobile station shall set this field to '1' to request |
| 22 | | signaling encryption to be turned on for signaling |
| 23 | | messages sent on f-dsch, r-dsch, f-csch, and r-csch. |
| 24 | KEY_SEQ_NEW | The key sequence number corresponding to the new |
| 25 | | encryption key generated by the mobile station. |
| 26 | | The mobile station shall include this field only if |
| 27 | | ENC_INFO_INCL is equal to '1' and STORE_KEYS is |
| 28 | | equal to '1'. If this field is included, the mobile station |
| 29 | | shall set this field to KEY_SEQ_NEW _{S-p} , the sequence |
| 30 | | number associated with the new encryption key |
| 31 | | generated by the mobile station. |
| 32 | UI_ENCRYPT_SUP | User information Encryption supported indicator. |
| 33 | | The mobile station shall include this field only |
| 34 | | ENC_INFO_INCL is equal to '1'. If this field is |
| 35 | | included, the mobile station shall set this field to |
| 36 | | indicate the supported user information encryption |
| 37 | | algorithms. |
| 38 | | This field consists of the subfields shown in Table |
| 39 | | 2.7.1.3.2.4-7 of 3GPP2 C.S0005-A. |

1 **UI_ENCRYPT_REQ** Request for user information encryption on the traffic
 2 channel indicator.
 3 The mobile station shall include this field only if
 4 ENC_INFO_INCL is equal to '1'. If included, the mobile
 5 station shall set this field to '1' to request user
 6 information encryption. Otherwise, the mobile station
 7 shall set this field to '0'.

8 **6.4.1.3.5 R-TMSI Assignment Completion Message**

9 MSG_TAG: RTACM

10 There are no Layer 3 fields associated with this message.

11 **6.4.1.4 r-dsch**

12 **6.4.1.4.1 MC-MAP Initial L3 Message**

13 MSG_TAG: MAPL3M

| Field | Length (bits) |
|--------------------|------------------|
| CN_DOMAIN_ID | 2 |
| SERVICE_DESCRIPTOR | 8 |
| FLOW_ID | 4 |
| NAS_INFO_LEN | 12 |
| NAS_INFO_DATA | 8 □□NAS_INFO_LEN |

14 **CN_DOMAIN_ID** Core Network Domain Identifier.

15 The mobile station shall set CN_DOMAIN_ID to the
 16 appropriate value as shown in Table 6.4.1.1.3-1.

17 **SERVICE_DESCRIPTOR** Service Descriptor.

18 The mobile station shall set the
 19 **SERVICE_DESCRIPTOR** field to the appropriate value
 20 as shown in 11.2.3.1.1 of TS24.007.

21 **FLOW_ID** Flow Identifier.

22 The mobile station shall set this field to the flow
 23 identifier corresponding to this message.

24 **NAS_INFO_LEN** Non Access Stratum Information Length.

25 The mobile station shall set this field to the number of
 26 octets in the NAS_INFO_DATA fields included in this

1 message.

2 NAS_INFO_DATA Non Access Stratum Information Data.

3 These fields include the Upper Layer Non-Access
4 Stratum message received by the RRC entity of the
5 mobile station.

6 6.4.1.4.2 MC-MAP L3 Message

7 MSG_TAG: MAPL3M

| Field | Length (bits) |
|---------------|------------------|
| | |
| | |
| FLOW_ID | 4 |
| NAS_INFO_LEN | 12 |
| NAS_INFO_DATA | 8 × NAS_INFO_LEN |

8 FLOW_ID Flow Identifier.

9 The mobile station shall set this field to the flow
10 identifier corresponding to this message.

11 NAS_INFO_LEN Non Access Stratum Information Length.

12 The mobile station shall set this field to the number of
13 octets in the NAS_INFO_DATA fields included in this
14 message.

15 NAS_INFO_DATA Non Access Stratum Information Data.

16 These fields include the Upper Layer Non-Access
17 Stratum message received by the RRC entity of the
18 mobile station.

19

20

21 6.4.1.4.3 R-TMSI Assignment Completion Message

22 MSG_TAG: RTACM

23 There are no Layer 3 fields associated with this message.

24 6.4.2 Modified Messages

25 This section shows changes and fields that are not used or that are ignored in messages from 3GPP2 C.S0005-
26 A.

- 1 **6.4.2.1 f-csch**
- 2 **6.4.2.1.1 System Parameters Message**
3 The following fields of this message shall not be used: SID, NID, REG_ZONE.
- 4 **6.4.2.1.2 Access Parameters Message**
5 The following fields of this message shall not be used: AUTH, RANDS, REG_PSIST.
- 6 **6.4.2.1.3 Extended Systems Parameters Message**
7 The following fields of this message shall not be used: DELETE_FOR_TMSI, USE_TMSI.
- 8 **6.4.2.1.4 Service Redirection Message**
9 The following fields of this message shall not be used: DELETE_TMSI, NDSS redirection related fields.
- 10 **6.4.2.1.5 General Page Message**
11 The following fields of this message shall not be used: TMSI_DONE, ORDERED_TMSI.
- 12 **6.4.2.1.6 Global Service Redirection Message**
13 The following fields of this message shall not be used: DELETE_TMSI, NDSS redirection related fields.
- 14 **6.4.2.1.7 Extended Channel Assignment Message**
15 The following fields of this message shall not be used: BYPASS_ALERT_ANSWER. Restricted values for
16 GRANTED_MODE.
- 17 **6.4.2.1.8 Sync Channel Message**
18 The following fields of this message shall not be used: SID, NID.
- 19 **6.4.2.1.9 Extended Global Service Redirection Message**
20 The following fields of this message shall not be used: DELETE_TMSI, NDSS redirection related fields.
- 21 **6.4.2.1.10 Enhanced Access Parameters Message**
22 The following fields of this message shall not be used: REG_PSIST_EACH.
- 23 **6.4.2.1.11 Security Mode Command Message**
24 MSG_TAG: SMCM

| Field | Length (bits) |
|------------------|---------------|
| SIG_ENCRYPT_MODE | 3 |
| NUM_RECS | 3 |

NUM_RECS occurrences of the following two-field record

| | |
|-----------------|---|
| CON_REF | 8 |
| UI_ENCRYPT_MODE | 3 |

| | |
|----------------|-----------------|
| KEY_SIZE | 3 |
| ACTION_TIME | 6 |
| USE_NEW_KEY | 0 or 1 |
| KEY_SEQ | 0 or 4 |
| CN_ENC_DOMAIN | 0 or 2 |
| CONC_EXT_SEQ_H | 0 or 24 |
| RESERVED | 0-7 (as needed) |

1 [...]

2

CN_ENC_DOMAIN Core Network Encryption Domain identifier.

The base station shall include this field only if this message is directed to a mobile station that is operating in the MC-MAP mode. If this field is included, the base station shall set this field as follows:

- The base station shall set this field to '01' to indicate that the encryption key corresponding to the packet switched core network domain is to be used for signaling encryption and encryption of the service option connections included in this message.
- The base station shall set this field to '00' to indicate that the encryption key corresponding to the circuit switched core network domain is to be used for signaling encryption and encryption of the service option connections included in this message.

3
4
5
6
7
8
9
10
11
12
13
14
15
16

1 CONC_EXT_SEQ_H Concealed 24 most significant bits of the crypto-sync.

2 The base station shall include this field only if this message is
3 directed to a mobile station that is operating in the MC-MAP
4 mode.

5 If this field is included, the base station shall set this field to
6 the XOR of the 24 most significant bits of AK (anonymity key)
7 and 24 most significant bits of the crypto-sync (use for
8 encryption/decryption of signaling messages).

9 RESERVED Reserved bits.

10 The mobile station shall add reserved bits as needed in order
11 to make the length of the entire message equal to an integer
12 number of octets. The mobile station shall set these bits
13 to '0'.

14 1.1.1.1.12 MC-RR Parameters Message

15 Additions to the MC-RR Parameters Message (MCRRPM):

| | |
|--------------------------|---|
| <u>R_TMSI_USED</u> | <u>1</u> |
| <u>DELETE_FOR_R_TMSI</u> | <u>0 or 1</u> |
| <u>R_TMSI_ZONE_LEN</u> | <u>0 or 4</u> |
| <u>R_TMSI_ZONE</u> | <u>0 or</u> <u>8 × TMSI_ZONE_LEN</u> |

17 R_TMSI_USED Radio TMSIs used.

18 The base station shall set this field to '1' if radio TMSIs
19 are used by the base station; otherwise, the base
20 station shall set this field to '1'. If the base station sets
21 this field to '0', then the mobile station is to delete a
22 previously assigned R_TMSI.

23 DELETE_FOR_R_TMSI Delete foreign R_TMSI.

24 The base station shall set this field to '1' to cause the
25 mobile station to delete its R_TMSI if the R_TMSI was
26 assigned in a different R_TMSI zone from that specified
27 by the R_TMSI_ZONE field of this message; otherwise,
28 the base station shall set this field to '0'. If
29 R_TMSI_USED is set to '0', the base station shall omit
30 this field.

31 R_TMSI_ZONE_LEN TMSI zone length.

32 The base station shall set this field to the number of
33 octets included in the R_TMSI_ZONE. The base

1 station shall set this field to a value in the range 1 to 8
 2 inclusive. If R_TMSI_USED is set to '0', the base
 3 station shall omit this field.

4 R_TMSI_ZONE TMSI zone.

5 The base station shall set this field to the R_TMSI zone
 6 number. If R_TMSI_USED is set to '0', the base station
 7 shall omit this field.

8 6.4.2.2 f-dsch

9 6.4.2.2.1 In-Traffic Systems Parameter Message

10 The following fields of this message shall not be used: SID, NID, PACKET_ZONE_ID.

11 6.4.2.2.2 Service Redirection Message

12 The following fields of this message shall not be used: DELET_TMSI, EXPECTED_SID.

13 6.4.2.2.3 General Handoff Direction Message

14 The following fields of this message shall not be used: PACKET_ZONE_ID.

15 6.4.2.2.4 Universal Handoff Direction Message

16 The following fields of this message shall not be used: PACKET_ZONE_ID.

17 6.4.2.2.5 Candidate Frequency Search Request Message

18 MSG_TAG: CFSRQM

| Field | Length (bits) |
|----------------------|--------------------------|
| USE_TIME | 1 |
| ACTION_TIME | 6 |
| RESERVED_1 | 4 |
| CFSRM_SEQ | 2 |
| SEARCH_TYPE | 2 |
| SEARCH_PERIOD | 4 |
| SEARCH_MODE | 4 |
| MODE_SPECIFIC_LEN | 8 |
| Mode-specific fields | 8 × MODE_SPECIFIC_LEN |
| ALIGN_TIMING | 1 |
| SEARCH_OFFSET | 0 or 6 |

19
 20 [...]

21 SEARCH_MODE Search mode.
 22 The base station shall set this field to the SEARCH_MODE
 23 value specified in Table 3.7.3.3.2.27-2 corresponding to the
 24 type of search specified by this message.

1

Table 3.7.3.3.2.27-2. SEARCH_MODE Types

| SEARCH_MODE (binary) | Description |
|-------------------------|--|
| 0000 | Searches for CDMA pilots on a Candidate Frequency. |
| 0001 | Searches for analog channels. |
| <u>0010</u> | <u>Search for GSM channels</u> |
| <u>0011-1111</u> | Reserved |

2 [...]

3 If SEARCH_MODE is equal to '0010', the base station shall include the following fields:

| Field | Length (bits) |
|------------------------------|---------------|
| <u>SF TOTAL EC THRESH</u> | <u>5</u> |
| <u>SF TOTAL EC IO THRESH</u> | <u>5</u> |
| <u>GSM RXLEV THRESH</u> | <u>6</u> |
| <u>BSIC VERIF REQ</u> | <u>1</u> |
| <u>N COL CODE</u> | <u>0 or 3</u> |
| <u>GSM T REF INCL</u> | <u>1</u> |
| <u>CDMA TIME</u> | <u>0 or 6</u> |
| <u>NUM GSM CHAN</u> | <u>5</u> |

NUM GSM CHAN occurrences of the following record:

| | |
|------------------------|----------------|
| <u>GSM FREQ BAND</u> | <u>3</u> |
| <u>ARFCN</u> | <u>10</u> |
| <u>GSM FRAME</u> | <u>0 or 19</u> |
| <u>GSM FRAME FRACT</u> | <u>0 or 9</u> |

| | |
|-------------------|------------|
| <u>RESERVED_6</u> | <u>0-7</u> |
|-------------------|------------|

4

SF TOTAL EC- THRESH Serving Frequency total pilot E_c threshold.

5

If the mobile station is not to use the measurement of total E_c of the pilots in the Serving Frequency Active

6

Set in the GSM Frequencies periodic search procedure, the base station shall set this field to '11111';

7

8

otherwise, the base station shall set this field to

9

10

 $\lceil (10 \times \log_{10} (total\ ec\ thresh) + 120) / 2 \rceil$

11

where total ec thresh is defined by the following rule:

12

The mobile station is not to visit any GSM frequency if the total E_c of the pilots in the Serving Frequency

13

14

Active Set is greater than total ec thresh.

15

| | | |
|----|------------------------------|---|
| 1 | <u>SF_TOTAL_EC_IO_THRESH</u> | <u>Serving Frequency total pilot E_c/I_o threshold.</u> |
| 2 | | <u>If the mobile station is not to use the measurement of</u> |
| 3 | | <u>total E_c/I_o of the pilots in the Serving Frequency</u> |
| 4 | | <u>Active Set in the GSM Frequencies periodic search</u> |
| 5 | | <u>procedure, the base station shall set this field to</u> |
| 6 | | <u>'11111'; otherwise, the base station shall set this field</u> |
| 7 | | <u>to</u> |
| 8 | | <u>$\lfloor -20 \times \log_{10}(\text{total ec io thresh}) \rfloor$</u> |
| 9 | | <u>where <i>total ec io thresh</i> is defined by the following</u> |
| 10 | | <u>rule: The mobile station is not to visit any GSM</u> |
| 11 | | <u>frequency if the total E_c/I_o of the pilots in the Serving</u> |
| 12 | | <u>Frequency Active Set is greater than <i>total ec io thresh</i>.</u> |
| 13 | <u>GSM_RXLEV_THRESH</u> | <u>GSM RXLEV Threshold.</u> |
| 14 | | <u>The base station shall set this field to the minimum</u> |
| 15 | | <u>GSM RXLEV for which the mobile station is to include</u> |
| 16 | | <u>a candidate frequency and to send the Candidate</u> |
| 17 | | <u>Frequency Search Report Message. The GSM RXLEV is</u> |
| 18 | | <u>defined in Section 8.1.4 of GSM 05.08</u> |
| 19 | <u>BSIC_VERIF_REQ</u> | <u>Base transceiver Station Identity Code verification</u> |
| 20 | | <u>required.</u> |
| 21 | | <u>The base station shall set this field to '1' if the</u> |
| 22 | | <u>verification of the Network Color Code included in the</u> |
| 23 | | <u>Base transceiver Station Identity Code is required for</u> |
| 24 | | <u>the corresponding ARFCN (see Section A.1 of GSM</u> |
| 25 | | <u>03.03) ; otherwise, the base station shall set it to '0'.</u> |
| 26 | <u>N_COL_CODE</u> | <u>Network Color Code.</u> |
| 27 | | <u>If the BSIC_VERIF_REQ is set to '1', the base station</u> |
| 28 | | <u>shall set this field to the Network Color Code of the</u> |
| 29 | | <u>GSM system to search as specified in Section 4.3.2 of</u> |
| 30 | | <u>GSM 03.03. If the BSIC_VERIF_REQ field is set to '0'</u> |
| 31 | | <u>the base station shall omit this field.</u> |
| 32 | <u>GSM_T_REF_INCL</u> | <u>GSM Time Reference Included.</u> |
| 33 | | <u>This field indicates whether a GSM Time Reference is</u> |
| 34 | | <u>included in this message.</u> |
| 35 | | <u>If GSM Time Reference is specified in this message, the</u> |
| 36 | | <u>base station shall set this field to '1'; otherwise, the</u> |
| 37 | | <u>base station shall set this field to '0'.</u> |
| 38 | <u>CDMA_TIME</u> | <u>CDMA Time.</u> |
| 39 | | <u>If the GSM_T_REF_INCL is set to '1', the base station</u> |
| 40 | | <u>shall set this field to the CDMA System Time, in units</u> |

of 80 ms (modulo 64), to which the GSM_FRAME is referred. If the USE_TIME field is set to '0' the base station shall omit this field.

NUM_GSM_CHAN Number of GSM Channels.

The base station shall set this field to the number of GSM_ARFCN to search.

The base station shall include NUM_GSM_CHAN occurrences of the following six-field record, one for each GSM channel.

GSM_FREQ_BAND GSM Frequency band.

The base station shall set this field to the GSM Frequency Band of the GSM_ARFCN to search as specified in Table 6.4.2.2.5-1.

Table 6.4.2.2.5-1

| <u>GSM_FREQ_BAND</u> (binary) | <u>GSM Frequency Band</u> |
|----------------------------------|---------------------------|
| <u>000</u> | <u>P-GSM 900</u> |
| <u>001</u> | <u>E-GSM 900</u> |
| <u>010</u> | <u>R-GSM 900</u> |
| <u>011</u> | <u>DCS 1800</u> |
| <u>100</u> | <u>PCS 1900</u> |
| <u>101 - 111</u> | <u>Reserved</u> |

ARFCN Absolute Radio Frequency Channel Number.

The base station shall set this field to the Absolute Radio Frequency Channel Number to search as specified in Section 2 of GSM 05.05.

GSM_FRAME GSM Frame number.

If the GSM_T_REF_INCL is set to '1', the base station shall set this field to the GSM frame number valid at the time specified by CDMA_TIME in the GSM target base station, as specified in Section 3.3.2.2 of GSM 05.02. If the GSM_T_REF_INCL field is set to '0', the base station shall omit this field.

GSM_FRAME_FRACT GSM Frame Fraction.

1 If the GSM T_REF_INCL is set to '1', the base station shall set
2 this field to the number of $1/2^9$ fractions of a GSM frame
3 valid at the time specified by CDMA_TIME in the GSM target
4 base station, with range 0 to (2^9-1) . The GSM frame duration
5 is specified in Section 4.3.1 of GSM 05.02 as 24/5200 s. If the
6 GSM T_REF_INCL field is set to '0' the base station shall omit
7 this field.

8 RESERVED_6 The mobile station shall add reserved bits as needed in order
9 to make the length of the Mode-specific fields equal to an
10 integer number of octets. The mobile station shall set each of
11 these bits to '0'.

1

2 6.4.2.2.6 Security Mode Command Message

3 MSG_TAG: SMCM

| Field | Length (bits) |
|--|-----------------|
| SIG_ENCRYPT_MODE | 3 |
| NUM_RECS | 3 |
| NUM_RECS occurrences of the following two-field record | |
| CON_REF | 8 |
| UI_ENCRYPT_MODE | 3 |
| KEY_SIZE | 3 |
| ACTION_TIME | 6 |
| USE_NEW_KEY | 0 or 1 |
| KEY_SEQ | 0 or 4 |
| CN_ENC_DOMAIN | 0 or 2 |
| CONC_EXT_SEQ_H | 0 or 24 |
| RESERVED | 0-7 (as needed) |

4 [...]

5 CN_ENC_DOMAIN Core Network Encryption Domain identifier.

6 The base station shall include this field only if this message is
7 directed to a mobile station that is operating in the MC-MAP
8 mode. If included, the base station shall set this field as
9 follows:

- 10 • The base station shall set this field to '01' to indicate that
11 the encryption key corresponding to the packet switched
12 core network domain is to be used for signaling encryption
13 and encryption of the service option connections included
14 in this message.
- 15 • The base station shall set this field to '00' to indicate that
16 the encryption key corresponding to the circuit switched
17 core network domain is to be used for signaling encryption
18 and encryption of the service option connections included
19 in this message.

20 CONC_EXT_SEQ_H Concealed 24 most significant bits of the crypto-sync.

21 The base station shall include this field only if this message is
22 directed to a mobile station that is operating in the MC-MAP
23 mode. If this field is included, the base station shall set this

1 field to the XOR of the 24 most significant bits of AK
 2 (anonymity key) and 24 most significant bits of the crypto-
 3 sync (use for encryption/decryption of signaling messages).

4 **RESERVED** Reserved bits.

5 The mobile station shall add reserved bits as needed in order
 6 to make the length of the entire message equal to an integer
 7 number of octets. The mobile station shall set these bits
 8 to '0'.

9 **6.4.2.3 r-csch**

10 **6.4.2.4 r-dsch**

11 **6.4.2.4.1 Candidate Frequency Search Report Message**

12 **MSG_TAG: CFSRPM**

| Field | Length (bits) |
|----------------------|--------------------------|
| LAST_SRCH_MSG | 1 |
| LAST_SRCH_MSG_SEQ | 2 |
| SEARCH_MODE | 4 |
| MODE_SPECIFIC_LEN | 8 |
| Mode-specific fields | 8 × MODE_SPECIFIC_LEN |

14 [...]

15 If SEARCH_MODE is equal to '0010', the mobile station shall include the following fields:

| Field | Length (bits) |
|------------------------|---------------|
| <u>SF_TOTAL_RX_PWR</u> | <u>5</u> |
| <u>NUM_GSM_CHAN</u> | <u>5</u> |

NUM_GSM_CHAN occurrences of the following record:

| | |
|----------------------|-----------|
| <u>GSM_FREQ_BAND</u> | <u>3</u> |
| <u>ARFCN</u> | <u>10</u> |
| <u>BSIC</u> | <u>6</u> |
| <u>GSM_RXLEV</u> | <u>6</u> |

| | |
|-------------------|--------------------------|
| <u>RESERVED_4</u> | <u>0 - 7 (as needed)</u> |
|-------------------|--------------------------|

18
 19
 20 SF_TOTAL_RX_PWR - Indicates the total received power on the Serving Frequency.
 21

1 The mobile station shall set this field to
2 $\min(31, \lceil (total\ received\ power + 110) / 2 \rceil)$
3 where *total received power* is the mean input power received
4 by the mobile station on the Serving Frequency, in dBm/1.23
5 MHz.

6 NUM_GSM_CHAN - Number of GSM Channels.

7 The mobile station shall set this field to the number of GSM
8 channels included in this message.

9 The mobile station shall include NUM_GSM_CHAN occurrences of the following four-field
10 record, one for each GSM channel.

11 GSM_FREQ_BAND - GSM Frequency band

12 The mobile station shall set this field to the GSM Frequency
13 Band of the reported ARFCN as specified in .

14 ARFCN - Absolute Radio Frequency Channel Number.

15 The mobile station shall set this field to the Absolute Radio
16 Frequency Channel Number of the reported GSM channel as
17 specified in Section 2 of GSM 05.05.

18 BSIC - Base transceiver Station Identity Code.

19 The mobile station shall set this field to the Base transceiver
20 Station Identity Code of the reported GSM channel as
21 specified in Section 4.3.2 of GSM 03.03.

22 GSM_RXLEV - GSM RXLEV.

23 The mobile station shall set this field to the GSM RXLEV of
24 the reported GSM channel as specified in Section 8.1.4 of
25 GSM 05.08. RESERVED_4 - Reserved.
26 The mobile station shall add reserved bits as needed in order to make the
27 length of the Mode-specific fields equal to an integer number of octets. The
28 mobile station shall set each of these bits to '0'.

1 **6.4.3 Orders**

2 Table 6.4.3-1 lists all the r-csch and r-dsch orders used in 3GPP2 C.S0005-A, and states their disposition in the
3 MC-MAP standard. See 2.7.3 of 3GPP2 C.S0005-A for details of these orders.

1

Table 6.4.3-1. Orders Used on the r-csch and the r-dsch

| r-csch Order | r-dsch Order | Name/Function | Disposition in MC-MAP |
|--------------|--------------|--|-----------------------|
| Y | Y | <i>Base Station Challenge Order</i> (see 2.7.3.1 of C.S0005-A) | Not used. |
| Y | Y | <i>SSD Update Confirmation Order</i> | Not used. |
| Y | Y | <i>SSD Update Rejection Order</i> | Not used. |
| N | Y | <i>Parameter Update Confirmation Order</i> (where 'nnnn' is the Request Number) | Used, as it is. |
| N | Y | <i>Request Wide Analog Service Order</i> | Not used. |
| N | Y | <i>Request Narrow Analog Service Order</i> | Not used. |
| N | Y | <i>Request Analog Service Order</i> | Not used. |
| Y | Y | <i>Mobile Station Acknowledgment Order</i> (see C.S0004-A) | Used, as it is. |
| N | Y | <i>Service Option Request Order</i> (Band Class 0 only) (see 2.7.3.2 of C.S0005-A) | Not used. |
| N | Y | <i>Service Option Response Order</i> (Band Class 0 only) (see 2.7.3.3 of C.S0005-A) | Not used. |
| Y | Y | <i>Release Order</i> (normal release) | Used, as it is. |
| Y | Y | <i>Release Order</i> (with power-down indication) | Used, as it is. |
| N | Y | <i>Long Code Transition Request Order</i> (request public) | Not used. |
| N | Y | <i>Long Code Transition Request Order</i> (request private) | Not used. |
| N | Y | <i>Long Code Transition Response Order</i> (use public) | Not used. |
| N | Y | <i>Long Code Transition Response Order</i> (use private) | Not used. |

| | | | |
|---|---|--|-----------------|
| N | Y | <i>Connect Order</i> | Not used. |
| N | Y | <i>Continuous DTMF Tone Order</i> (where 'nnnn' is the tone per Table 2.7.1.3.2.4-4 of C.S0005-A). | Not used. |
| N | Y | <i>Continuous DTMF Tone Order</i> (Stop continuous DTMF tone) | Not used. |
| N | Y | <i>Service Option Control Order</i> (Band Class 0 only) (the specific control is designated by 'nnnnnnnn' as determined by each service option) | Not used. |
| Y | Y | <i>Local Control Response Order</i> (specific response as designated by 'nnnnnnnn' as determined by each system) | Used, as it is. |
| Y | Y | <i>Mobile Station Reject Order</i> (unspecified reason; see 2.7.3.4 of C.S0005-A) | Used, as it is. |
| Y | Y | <i>Mobile Station Reject Order</i> (message not accepted in this state; see 2.7.3.4 of C.S0005- A) | Used, as it is. |
| Y | Y | <i>Mobile Station Reject Order</i> (message structure not acceptable; see 2.7.3.4 of C.S0005-A) | Used, as it is. |
| Y | Y | <i>Mobile Station Reject Order</i> (message field not in valid range; see 2.7.3.4 of C.S0005-A) | Used, as it is. |
| N | Y | <i>Mobile Station Reject Order</i> (message type or order code not understood; see 2.7.3.4 of C.S0005-A) | Used, as it is. |
| Y | Y | <i>Mobile Station Reject Order</i> (message requires a capability that is not supported by the mobile station; see 2.7.3.4 of C.S0005-A) | Used, as it is. |

| | | | |
|---|---|---|-----------------|
| Y | Y | <i>Mobile Station Reject Order</i> (message cannot be handled by the current mobile station configuration; see 2.7.3.4 of C.S0005-A) | Used, as it is. |
| Y | Y | <i>Mobile Station Reject Order</i> (response message would exceed allowable length; see 2.7.3.4 of C.S0005-A) | Used, as it is. |
| Y | Y | <i>Mobile Station Reject Order</i> (information record is not supported for the specified band class and operating mode; see 2.7.3.4 of C.S0005-A) | Used, as it is. |
| N | Y | <i>Mobile Station Reject Order</i> (search set not specified; see 2.6.6.2.5.1 of C.S0005-A) | Used, as it is. |
| N | Y | <i>Mobile Station Reject Order</i> (invalid search request; see 2.6.6.2.5.1 of C.S0005-A) | Used, as it is. |
| N | Y | <i>Mobile Station Reject Order</i> (invalid Frequency Assignment; see 2.6.6.2.5.1 of C.S0005-A) | Used, as it is. |
| N | Y | <i>Mobile Station Reject Order</i> (search period too short; see 2.6.6.2.5.1 of C.S0005-A) | Used, as it is. |
| Y | N | <i>Mobile Station Reject Order</i> (RC does not match with the value in the field DEFAULT_CONFIG; see 2.6.3.3 and 2.6.3.5 of C.S0005-A) | Used, as it is. |
| Y | N | <i>Mobile Station Reject Order</i> (Encryption key with the specified KEY_SEQ not stored) | Used, as it is. |
| N | Y | <i>Mobile Station Reject Order</i> (call assignment not accepted) | Not Used. |

| | | | |
|---|---|--|-----------|
| N | Y | <i>Mobile Station Reject Order</i> (no call control instance present with the specified identifier) | Not Used. |
| N | Y | <i>Mobile Station Reject Order</i> (a call control instance is already present with the specified identifier) | Not Used. |

- 1 Table 6.4.3-2 lists all the f-csch and f-dsch orders used in 3GPP2 C.S0005-A, and states their disposition in the
- 2 MC-MAP standard. See 3.7.4 of 3GPP2 C.S0005-A for details of these orders.

1

Table 6.4.3-2. Orders Used on the f-csch and the f-dsch

| f-csch Order | f-dsch Order | Name/Function | Disposition in MC-MAP |
|--------------|--------------|--|-----------------------|
| Y | N | <i>Abbreviated Alert Order</i> | Not used. |
| Y | Y | <i>Base Station Challenge Confirmation Order</i> (see 3.7.4.1 of C.S0005-A) | Not used. |
| N | Y | <i>Message Encryption Mode Order</i> (where nn is the mode per Table 3.7.2.3.2.8-2 of C.S0005-A) | Used, as it is. |
| Y | N | <i>Reorder Order</i> | Not used. |
| N | Y | <i>Parameter Update Order</i> (where 'nnnn' is the Request Number) | Used, as it is. |
| Y | Y | <i>Audit Order</i> | Used, as it is. |
| Y | N | <i>Intercept Order</i> | Used, as it is. |
| N | Y | <i>Maintenance Order</i> | Not used. |
| N | Y | <i>Pilot Measurement Request Order</i> | Used, as it is. |
| N | Y | <i>Periodic Pilot Measurement Request Order</i> (see 3.7.4.6 of C.S0005-A) | Used, as it is. |
| Y | Y | <i>Lock Until Power-Cycled Order</i> (where nnnn is the lock reason) | Used, as it is. |
| Y | Y | <i>Maintenance Required Order</i> (where nnnn is the maintenance reason) | Used, as it is. |
| Y | N | <i>Unlock Order</i> | Used, as it is. |
| N | Y | <i>Service Option Request Order</i> (Band Class 0 only) (see 3.7.4.2 of C.S0005-A) | Not used. |

| | | | |
|---|---|---|-----------------|
| N | Y | <i>Service Option Response Order (Band Class 0 only; see 3.7.4.3 of C.S0005-A)</i> | Not used. |
| Y | Y | <i>Release Order (no reason given)</i> | Used, as it is. |
| Y | Y | <i>Release Order (indicates that requested service option is rejected)</i> | Used, as it is. |
| N | Y | <i>Outer Loop Report Order</i> | Used, as it is. |
| N | Y | <i>Long Code Transition Request Order (request public)</i> | Not used. |
| N | Y | <i>Long Code Transition Request Order (request private)</i> | Not used. |
| N | Y | <i>Continuous DTMF Tone Order (where the tone is designated by 'nnnn' as defined in Table 2.7.1.3.2.4-4 of C.S0005-A)</i> | Not used. |
| N | Y | <i>Continuous DTMF Tone Order (stop continuous DTMF tone)</i> | Not used. |
| N | Y | <i>Status Request Order (see 3.7.4.4 of C.S0005-A)</i> | Used, as it is. |
| Y | N | <i>Registration Accepted Order (ROAM_INDI not included; see 3.7.4.5 of C.S0005-A)</i> | Not Used. |
| Y | N | <i>Registration Request Order</i> | Not used. |
| Y | N | <i>Registration Rejected Order</i> | Not used. |
| Y | N | <i>Registration Rejected Order (delete TMSI)</i> | Not Used. |

| | | | |
|---|---|---|-----------------|
| Y | N | <i>Registration Accepted Order</i> (ROAM_INDI included; see 3.7.4.5 of C.S0005-A) | Not used. |
| Y | N | <i>Registration Accepted Order</i> (ROAM_INDI, EXT_ENC_MSB, SIG_ENCRYPT_MODE, and KEY_SIZE included; see 3.7.4.5 of C.S0005-A) | Not used. |
| N | Y | <i>Service Option Control Order</i> (Band Class 0 only) (the specific control is designated by 'nnnnnnnn' as determined by each service option) | Not used. |
| Y | Y | <i>Local Control Order</i> (the specific order is designated by 'nnnnnnnn' as determined by each system) | Used, as it is. |
| Y | N | <i>Slotted Mode Order</i> (transition to the slotted mode operation.) | Used, as it is. |
| Y | Y | <i>Retry Order</i> (indicates that the requested service is rejected and retry delay is included, see 3.7.4.7 of C.S0005-A) | Used, as it is. |

1 **6.4.4 Information Records**

2 Table 6.4.4-1 lists all the r-csch and r-dsch information records used in 3GPP2 C.S0005-A, and states their
3 disposition in the MC-MAP standard. See 2.7.4 of 3GPP2 C.S0005-A for details of these information records.

1

Table 6.4.4-1. Information Record Types used on r-csch and r-dsch

| Information Record | r-csch | r-dsch | Disposition in MC-MAP |
|--|--------|--------|--|
| Feature Indicator | N | Y | Not used. |
| Keypad Facility | N | Y | Not used. |
| Called Party Number | N | Y | Not used. |
| Calling Party Number | N | Y | Not used. |
| Call Mode | N | Y | Not used. |
| Terminal Information | Y | Y | Used, as it is. |
| Roaming Information | Y | Y | Not used. |
| Security Status | N | Y | Used, with modifications (see 6.4.4.1) |
| Connected Number | N | Y | Not used. |
| IMSI | Y | Y | Used, as it is. |
| ESN | N | N | Used, as it is. |
| Band Class Information | Y | Y | Used, as it is. |
| Power Class Information | Y | Y | Used, as it is. |
| Operating Mode Information | Y | Y | Used, as it is. |
| Service Option Information | Y | Y | Used, as it is. |
| Multiplex Option Information | Y | Y | Used, as it is. |
| Service Configuration Information | N | Y | Used, with modifications (see 6.4.4.2) |
| Called Party Subaddress | N | Y | Not used. |
| Calling Party Subaddress | N | Y | Not used. |
| Connected Subaddress | N | Y | Not used. |
| Power Control Information | Y | Y | Used, as it is. |
| IMSI_M | N | N | Not Used. |
| IMSI_T | Y | Y | Used, as it is. |
| Capability Information | Y | Y | Used, as it is. |
| Channel Configuration Capability Information | Y | Y | Used, as it is. |
| Extended Multiplex Option Information | Y | Y | Used, as it is. |
| User Zone Update Request | N | Y | Not used. |
| Global Emergency Call | N | Y | Not used. |
| Hook Status | Y | Y | Not used. |
| QoS Parameters | Y | Y | Not used. |
| Geo-location Information | Y | Y | Not used. |

| | |
|--------------------------------------|-----------|
| Extended Record Type — International | Not used. |
|--------------------------------------|-----------|

1

2 Table 6.4.4-2 lists all the f-csch and f-dsch information records used in 3GPP2 C.S0005-A, and states their
3 disposition in the MC-MAP standard. See 3.7.5 of 3GPP2 C.S0005-A for details of these information records.

4

Table 6.4.4-2. Information Record Types used on f-csch and f-dsch

| Information Record | f-csch | f-dsch | Disposition in MC-MAP |
|--------------------------------------|--------|--------|--|
| Display | Y | Y | Not used. |
| Called Party Number | Y | Y | Not used. |
| Calling Party Number | Y | Y | Not used. |
| Connected Number | N | Y | Not used. |
| Signal | Y | Y | Not used. |
| Message Waiting | Y | Y | Not used. |
| Service Configuration | N | Y | Used, with modifications (see 6.4.4.2) |
| Called Party Subaddress | Y | Y | Not used. |
| Calling Party Subaddress | Y | Y | Not used. |
| Connected Subaddress | N | Y | Not used. |
| Redirecting Number | Y | Y | Not used. |
| Redirecting Subaddress | Y | Y | Not used. |
| Meter Pulses | N | Y | Not used. |
| Parametric Alerting | Y | Y | Not used. |
| Line Control | N | Y | Not used. |
| Extended Display | Y | Y | Not used. |
| User Zone Update | N | Y | Not used. |
| User Zone Reject | Y | Y | Not used. |
| Non-Negotiable Service Configuration | N | Y | Used, as it is. |
| Multiple Character Extended Display | Y | Y | Not used. |
| Call Waiting Indicator | N | Y | Not used. |
| Extended Record Type – International | | | Not used. |

5

1 **6.4.4.1 Security Status**

2 The following field of this information record shall not be used: AUTH_MODE.

3 **6.4.4.2 Service Configuration**4 The Service Configuration Record defined in 3GPP2 C.S0005-A is modified as follows for MC-MAP
5 operation:

- 6 • The fields CC_INFO_INCL, RESPONSE_IND, TAG, BYPASS_ALERT_ANSWER shall be
7 ignored by the MC-MAP mobile station and base station.
- 8 • The following new fields are added: NEW_RB_INCL, CN_DOMAIN_ID, NAS_BINDING_INFO,
9 RB_ID, and CN_ENC_DOMAIN.

10

| Type-Specific Field | Length (bits) |
|---------------------|---------------|
| [...] | [...] |
| NUM_CON_REC | 8 |

NUM_CON_REC occurrences of the following variable length record:

| | |
|-------------------------|-----------------|
| RECORD_LEN | 8 |
| [...] | [...] |
| UI_ENCRYPT_MODE | 3 |
| <u>NEW_RB_INCL</u> | <u>0 or 1</u> |
| <u>CN_DOMAIN_ID</u> | <u>0 or 2</u> |
| <u>NAS_BINDING_INFO</u> | <u>0 or 16</u> |
| <u>RB_ID</u> | <u>0 or 4</u> |
| RESERVED | 0-7 (as needed) |

| Type-Specific Field | Length (bits) |
|----------------------|-----------------|
| [...] | [...] |
| <u>CN_ENC_DOMAIN</u> | <u>0 or 2</u> |
| RESERVED | 0-7 (as needed) |
| [...] | [...] |

11 The definitions of these new fields are as follows on the base station side (3.7.5.7 of 3GPP2 C.S0005-A):

12 NEW_RB_INCL New Radio Bearer included indicator.13 The base station shall include this field only if being sent to a MC-MAP
14 mobile station.

| | | |
|----|-------------------------|--|
| 1 | | <u>If the radio bearer is part of the current service configuration,</u> |
| 2 | | <u>the base station should set this field to '0'; otherwise, the base</u> |
| 3 | | <u>station shall set this field to '1'.</u> |
| 4 | <u>CN_DOMAIN_ID</u> | <u>Core network domain identity.</u> |
| 5 | | <u>If NEW_RB_INCL is set to '0', the base station shall omit this</u> |
| 6 | | <u>field; otherwise, the base station shall include this field and</u> |
| 7 | | <u>set it as follows:</u> |
| 8 | | <u>The base station shall set this field to the core network</u> |
| 9 | | <u>domain identity corresponding to this radio bearer, as shown</u> |
| 10 | | <u>in Table 6.4.1.1.3-1.</u> |
| 11 | <u>NAS_BINDING_INFO</u> | <u>Non Access Stratum binding information.</u> |
| 12 | | <u>If NEW_RB_INCL is set to '0', the base station shall omit this</u> |
| 13 | | <u>field; otherwise, the base station shall include this field and</u> |
| 14 | | <u>set it as follows:</u> |
| 15 | | <u>The base station shall set this field to the NAS binding info</u> |
| 16 | | <u>corresponding to this radio bearer.</u> |
| 17 | <u>RB_ID</u> | <u>Radio Bearer identity.</u> |
| 18 | | <u>The base station shall include this field only if being sent to a MC-MAP</u> |
| 19 | | <u>mobile station.</u> |
| 20 | | <u>The base station shall set this field to the identity</u> |
| 21 | | <u>corresponding to this radio bearer.</u> |
| 22 | [...] | |
| 23 | <u>CN_ENC_DOMAIN</u> | <u>Core Network Encryption Domain identifier.</u> |
| 24 | | <u>The base station shall include this field only if this message is</u> |
| 25 | | <u>directed to a mobile station that is operating in the MC-MAP</u> |
| 26 | | <u>mode. If included, the base station shall set this field to '01'</u> |
| 27 | | <u>to indicate that the encryption key corresponding to the</u> |
| 28 | | <u>packet switched core network domain is to be used for</u> |
| 29 | | <u>signaling encryption and encryption of the service option</u> |
| 30 | | <u>connections included in this message. The base station shall</u> |
| 31 | | <u>set this field to '00' to indicate that the encryption key</u> |
| 32 | | <u>corresponding to the circuit switched core network domain is</u> |
| 33 | | <u>to be used for signaling encryption and encryption of the</u> |
| 34 | | <u>service option connections included in this message.</u> |
| 35 | | The definitions of these new fields are as follows on the mobile station side (2.7.4.18 of 3GPP2 C.S0005-A): |
| 36 | <u>NEW_RB_INCL</u> | <u>New Radio Bearer included indicator.</u> |
| 37 | | <u>For a <i>Status Response Message</i>, the mobile station shall set</u> |
| 38 | | <u>this field to '1'.</u> |

| | | |
|----|-------------------------|---|
| 1 | | <u>For a <i>Service Request Message</i> and a <i>Service Response Message</i>, if the radio bearer is part of the current service configuration, the mobile station shall set this field to '0'; otherwise, the mobile station shall set this field to '1'.</u> |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | <u>CN DOMAIN ID</u> | <u>Core network domain identity.</u> |
| 6 | | <u>If NEW_RB_INCL is set to '0', the mobile station shall omit this field; otherwise, the mobile station shall include this field and set it as follows:</u> |
| 7 | | |
| 8 | | |
| 9 | | <u>For a <i>Status Response Message</i>, the mobile station shall set this field to the core network domain identity corresponding to this radio bearer.</u> |
| 10 | | |
| 11 | | |
| 12 | | <u>For a <i>Service Request Message</i> and a <i>Service Response Message</i>, the mobile station shall set this field to the core network domain identity set by the base station to this radio bearer.</u> |
| 13 | | |
| 14 | | |
| 15 | | |
| 16 | <u>NAS BINDING INFO</u> | <u>Non Access Stratum binding information.</u> |
| 17 | | <u>If NEW_RB_INCL is set to '0', the mobile station shall omit this field; otherwise, the mobile station shall include this field and set it as follows:</u> |
| 18 | | |
| 19 | | |
| 20 | | <u>For a <i>Status Response Message</i>, the mobile station shall set this field to the NAS binding info corresponding to this radio bearer.</u> |
| 21 | | |
| 22 | | |
| 23 | | <u>For a <i>Service Request Message</i> and a <i>Service Response Message</i>, the mobile station shall set this field to the NAS binding info set by the base station to this radio bearer.</u> |
| 24 | | |
| 25 | | |
| 26 | <u>RB ID</u> | <u>Radio Bearer identity.</u> |
| 27 | | <u>For a <i>Status Response Message</i>, the mobile station shall set this field to the identity corresponding to this radio bearer.</u> |
| 28 | | |
| 29 | | <u>For a <i>Service Request Message</i> and a <i>Service Response Message</i>, the mobile station shall set this field to the identity set by the base station to this radio bearer.</u> |
| 30 | | |
| 31 | | |
| 32 | [...] | |
| 33 | <u>CN_ENC_DOMAIN</u> | <u>Core Network Domain identifier.</u> |
| 34 | | <u>The mobile station shall include this field only if operating in the MC-MAP mode. If included, the base station shall set this field to '01' to indicate that the encryption key corresponding</u> |
| 35 | | |
| 36 | | |

1 to the packet switched core network domain is to be used for
2 signaling encryption and encryption of the service option
3 connections included in this message. The base station shall
4 set this field to '00' to indicate that the encryption key
5 corresponding to the circuit switched core network domain is
6 to be used for signaling encryption and encryption of the
7 service option connections included in this message.

8 6.4.5 Other Modifications

9 The following change applies to "Encoding of the MNC":

10 The MNC binary mapping is defined as follows:

- 11 1. Represent the Mobile Network Code as $D_1 D_2 D_3$ with the digit equal to zero being
12 given the value of ten. If the Mobile Network Code consists of two digits, then set
13 D_1 equal to ten.
- 14 2. Compute $100 \times D_1 + 10 \times D_2 + D_3 - 111$.
- 15 3. Convert the result in step (2) to binary by a standard decimal-to-binary conversion
16 as described in Table 2.3.1.1-1 of 3GPP2 C.S0005-A.

6.5 Modifications to Support PLCM_TYPE

The addition of PLCM_TYPE requires the following changes to 3GPP2 C.S0005-A:

Note: Where text from the 3GPP2 C.S000x-A series is modified, section headers point to the associated part of 3GPP2 C.S0005-A. Ellipsis [...] indicate blocks of unchanged text.

1.1.2.2 CDMA Numeric Information

[...]

Public Long Code Mask. The long code mask used to form the public long code. The mask can contain a permutation of the mobile station's ESN, the TMSI code, or the particular mask specified by the base station. The mask also includes the channel number when used for a Supplemental Code Channel. See also Private Long Code Mask and Long Code.

[...]

2.3.6 Public Long Code Mask

The Public Long Code Mask consists of 42 bits. The 37 least significant bits (PLCM 37) are set as follows:

If PLCM_TYPE_s is equal to '00', bits M₃₆ through M₃₂ shall be set to '11000'; bits M₃₁ through M₀ shall be set to a permutation of the mobile station's ESN as follows:

- ESN = (E₃₁, E₃₀, E₂₉, E₂₈, E₂₇, E₂₆, E₂₅, . . . E₂, E₁, E₀)
- Permuted ESN = (E₀, E₃₁, E₂₂, E₁₃, E₄, E₂₆, E₁₇, E₈, E₃₀, E₂₁, E₁₂, E₃, E₂₅, E₁₆, E₇, E₂₉, E₂₀, E₁₁, E₂, E₂₄, E₁₅, E₆, E₂₈, E₁₉, E₁₀, E₁, E₂₃, E₁₄, E₅, E₂₇, E₁₈, E₉)
= (M₃₁, M₃₀, M₂₉, . . . M₂, M₁, M₀).

If PLCM_TYPE_s is equal to '01', bits M₃₆ through M₃₂ shall be set to '11010'; bits M₃₁ through M₀ shall be set as follows.

- If TMSI code is four octets, bits M₃₁ through M₀ shall be set to the mobile station's TMSI CODE:

$$\text{TMSI CODE} = (T_{31}, T_{30}, T_{29}, \dots, T_2, T_1, T_0) = (M_{31}, M_{30}, M_{29}, \dots, M_2, M_1, M_0).$$

- If TMSI code is less than four octets, the (32 – the length of TMSI CODE) the remaining bits shall be set as the least significant bits of TMSI_ZONE. Bits M₃₁ through M₀ shall be set as follows (where TZ stands for the bits of TMSI_ZONE and T stands for the bits of TMSI CODE):

- (M₃₁, M₃₀, M₂₉, . . . M₂, M₁, M₀) = (TZ₇, . . . , TZ₀, T₂₃, . . . , T₀), if TMSI_ZONE is 3 octets.

- (M₃₁, M₃₀, M₂₉, . . . M₂, M₁, M₀) = (TZ₁₅, . . . , TZ₀, T₁₅, . . . , T₀), if TMSI_ZONE is 2 octets.

If PLCM_TYPE_s is equal to '10', bits M₃₆ through M₃₂ shall be set to '11011'; bits M₃₁ through M₀ of the public long code mask are specified by PLCM 32_s as follows:

$$\text{PLCM 32}_s = (P_{31}, P_{30}, P_{29}, \dots, P_2, P_1, P_0) = (M_{31}, M_{30}, M_{29}, \dots, M_2, M_1, M_0).$$

If PLCM_TYPE_s is equal to '11', bits M₃₆ through M₃₂ shall be set to '11010'; bits M₃₁ through M₀ shall be set to the mobile station's R TMSI CODE:

$$\text{R TMSI CODE} = (R_{31}, R_{30}, R_{29}, \dots, R_2, R_1, R_0) = (M_{31}, M_{30}, M_{29}, \dots, M_2, M_1, M_0).$$

2.6.3.3 Page Response Substate

In this substate, the mobile station sends a *Page Response Message* in response to a *General Page Message* from a base station. If a base station responds to the *Page Response Message* with an authentication request, the mobile station responds in this substate.

1 Upon entering the *Page Response Substate*, the mobile station shall set RL_GAIN_ADJ_S to '0000' , set
 2 PLCM_TYPE_S to '00', and send a *Page Response Message*.

3 [...]

4 5. *Extended Channel Assignment Message*: The mobile station shall process the
 5 message as follows:

- 6 • If ASSIGN_MODER equals '000', the mobile station shall perform the following
 7 actions:

- 8 - If FREQ_INCL_T equals '0', the mobile station shall perform the following
 9 actions:

10 [...]

- 11 + The mobile station shall set FPC_SUBCHAN_GAIN_S to
 12 FPC_SUBCHAN_GAIN_T.

- 13 + The mobile station shall set RL_GAIN_ADJ_S to RL_GAIN_ADJ_T.

- 14 + The mobile station shall set PLCM_TYPE_S to PLCM_TYPE_T if
 15 PLCM_TYPE_INCL_T is equal to '1'; otherwise, the base station shall set
 16 PLCM_TYPE_S to '00'.

- 17 + The mobile station shall set PLCM_32_S to PLCM_32_T if PLCM_TYPE_T is
 18 equal to '10'.

- 19 + The mobile station shall then enter the *Traffic Channel Initialization*
 20 *Substate of the Mobile Station Control on the Traffic Channel State*.

- 21 - If FREQ_INCL_T equals '1', and if the band class is not supported by the
 22 mobile station, the mobile station shall send a *Mobile Station Reject Order*
 23 with ORDQ field set to '00000110' (capability not supported by the mobile
 24 station) and shall remain in the *Page Response Substate*.

- 25 - If FREQ_INCL_T equals '1', and if the band class is supported by the mobile
 26 station, the mobile station shall perform the following actions:

27 [...]

- 28 + The mobile station shall set FPC_SUBCHAN_GAIN_S to
 29 FPC_SUBCHAN_GAIN_T.

- 30 + The mobile station shall set RL_GAIN_ADJ_S to RL_GAIN_ADJ_T.

- 31 + The mobile station shall set PLCM_TYPE_S to PLCM_TYPE_T if
 32 PLCM_TYPE_INCL_T is equal to '1'; otherwise, the base station shall set
 33 PLCM_TYPE_S to '00'.

- 34 + The mobile station shall set PLCM_32_S to PLCM_32_T if PLCM_TYPE_T is
 35 equal to '10'.

- 36 + The mobile station shall initialize CODE_CHAN_LIST as described in
 37 2.6.8, and shall set SERV_NEG_S to enabled.

- 1 + The mobile station shall then tune to the new Frequency Assignment and
 2 shall enter the *Traffic Channel Initialization Substate* of the *Mobile Station*
 3 *Control on the Traffic Channel State*.
 4 [...]
- 5 • If ASSIGN_MODER equals '100', the mobile station shall perform the following
 6 actions:
 7 [...]
- 8 – The mobile station shall store the Forward power control subchannel relative
 9 gain [FPC_SUBCHAN_GAIN_S = FPC_SUBCHAN_GAIN_P].
- 10 – The mobile station shall set RL_GAIN_ADJ_S to RL_GAIN_ADJ_P.
- 11 – The mobile station shall set PLCM_TYPE_S to PLCM_TYPE_P if
 12 PLCM_TYPE_INCL_P is equal to '1'; otherwise, the base station shall set
 13 PLCM_TYPE_S to '00'.
- 14 – The mobile station shall set PLCM_32_S to PLCM_32_P if PLCM_TYPE_P is equal
 15 to '10'.
 16 [...]
- 17 2.6.3.5 Mobile Station Origination Attempt Substate
 18 In this substate, the mobile station sends an *Origination Message*. If the base station responds to the
 19 *Origination Message* with an authentication request, the mobile station responds in this substate.
 20 Upon entering the *Mobile Station Origination Attempt Substate*, the mobile station shall set RL_GAIN_ADJ_S to
 21 '0000', set PLCM_TYPE_S to '00', and perform the following:
 22 [...]
- 23 5. *Extended Channel Assignment Message*: The mobile station shall process the
 24 message as follows:
- 25 • If ASSIGN_MODE_P equals '000', the mobile station shall perform the following
 26 actions:
 27 [...]
- 28 – If FREQ_INCL_P equals '0', the mobile station shall perform the following
 29 actions:
 30 [...]
- 31 + The mobile station shall set RL_GAIN_ADJ_S to RL_GAIN_ADJ_P.
- 32 + The mobile station shall set PLCM_TYPE_S to PLCM_TYPE_P if
 33 PLCM_TYPE_INCL_P is equal to '1'; otherwise, the base station shall set
 34 PLCM_TYPE_S to '00'.
- 35 + The mobile station shall set PLCM_32_S to PLCM_32_P if PLCM_TYPE_P is
 36 equal to '10'.
- 37 + The mobile station shall then enter the *Traffic Channel Initialization*
 38 *Substate* of the *Mobile Station Control on the Traffic Channel State*.
 39 [...]
- 40 – If FREQ_INCL_P equals '1', the mobile station shall perform the following
 41 actions:

- 1 [...]
- 2 + The mobile station shall set $RL_GAIN_ADJ_S$ to $RL_GAIN_ADJ_R$.
- 3 + The mobile station shall set $PLCM_TYPE_S$ to $PLCM_TYPE_R$ if
- 4 $PLCM_TYPE_INCL_R$ is equal to '1'; otherwise, the base station shall set
- 5 $PLCM_TYPE_S$ to '00'.
- 6 + The mobile station shall set $PLCM_32_S$ to $PLCM_32_R$ if $PLCM_TYPE_R$ is
- 7 equal to '10'.
- 8 + The mobile station shall then tune to the new Frequency Assignment and
- 9 enter the *Traffic Channel Initialization Substate* of the *Mobile Station*
- 10 *Control on the Traffic Channel State*.
- 11 [...]

- 1 • If ASSIGN_MODE_r equals '100', the mobile station shall perform the following
 2 actions:
 3 [...]
- 4 – The mobile station shall set RL_GAIN_ADJ_s to RL_GAIN_ADJ_r.
 - 5 – The mobile station shall set PLCM_TYPE_s to PLCM_TYPE_r if
 6 PLCM_TYPE_INCL_r is equal to '1'; otherwise, the base station shall set
 7 PLCM_TYPE_s to '00'.
 - 8 – The mobile station shall set PLCM_32_s to PLCM_32_r if PLCM_TYPE_r is equal
 9 to '10'.
 - 10 – The mobile station shall store the channel indicator (CH_IND_FROM_MSG_s =
 11 CH_IND_r) and the mobile station shall perform the following actions:
 12 [...]
- 13 3.7.2.3.2.21 Extended Channel Assignment Message
 14 MSG_TAG: ECAM

| Field | Length (bits) |
|--------------------------|--------------------------------|
| ASSIGN_MODE | 3 |
| RESERVED_2 | 5 |
| Additional record fields | 8 × (ADD_RECORD_LEN - 1) |

15

- 1 If ASSIGN_MODE = '000', the additional record fields shall be:

| | |
|---------------------|---------|
| FREQ_INCL | 1 |
| DEFAULT_CONFIG | 3 |
| BYPASS_ALERT_ANSWER | 1 |
| RESERVED | 1 |
| NUM_PILOTS | 3 |
| GRANTED_MODE | 2 |
| FRAME_OFFSET | 4 |
| ENCRYPT_MODE | 2 |
| BAND_CLASS | 0 or 5 |
| CDMA_FREQ | 0 or 11 |

NUM_PILOTS plus one occurrence of the following record:

| | |
|--------------|---|
| PILOT_PN | 9 |
| PWR_COMB_IND | 1 |
| CODE_CHAN | 8 |

| | |
|-----------------------|-------------------|
| FOR_FCH_RC | 5 |
| REV_FCH_RC | 5 |
| FPC_FCH_INIT_SETPT | 8 |
| FPC_SUBCHAN_GAIN | 5 |
| RL_GAIN_ADJ | 4 |
| FPC_FCH_FER | 5 |
| FPC_FCH_MIN_SETPT | 8 |
| FPC_FCH_MAX_SETPT | 8 |
| <u>PLCM_TYPE_INCL</u> | <u>1</u> |
| <u>PLCM_TYPE</u> | <u>0 or 2</u> |
| <u>PLCM_32</u> | <u>0 or 32</u> |
| RESERVED | 0 - 7 (as needed) |

2

1 [...]

2 If ASSIGN_MODE = '100', the additional record fields shall be:

| | |
|-----------------------|-------------------|
| FREQ_INCL | 1 |
| BAND_CLASS | 0 or 5 |
| CDMA_FREQ | 0 or 11 |
| BYPASS_ALERT_ANSWER | 1 |
| GRANTED_MODE | 2 |
| DEFAULT_CONFIG | 3 |
| FOR_RC | 5 |
| REV_RC | 5 |
| FRAME_OFFSET | 4 |
| ENCRYPT_MODE | 2 |
| FPC_SUBCHAN_GAIN | 5 |
| RL_GAIN_ADJ | 4 |
| NUM_PILOTS | 3 |
| CH_IND | 2 |
| CH_RECORD_LEN | 5 |
| CH_RECORD_FIELDS | 8 × CH_RECORD_LEN |
| <u>PLCM_TYPE_INCL</u> | <u>1</u> |
| <u>PLCM_TYPE</u> | <u>0 or 2</u> |
| <u>PLCM_32</u> | <u>0 or 32</u> |
| RESERVED | 0 - 7 (as needed) |

3 If the ASSIGN_MODE field is set to '000', the base station shall include the following fields:

4 [...]

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 include **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 omit this field; otherwise, the
11 base station shall include this field and set it to the
12 corresponding Public Long Code Mask type as specified in
13 Table 3.7.2.3.2.21 - x.

Table 3.7.2.3.2.21-x. The Public Long Code Mask Type

| <u>PLCM_TYPE</u> <u>(binary)</u> | <u>Descriptions</u> |
|-------------------------------------|--------------------------|
| <u>00</u> | <u>ESN</u> |
| <u>01</u> | <u>TMSI</u> |
| <u>10</u> | <u>The Specific PLCM</u> |
| <u>11</u> | <u>Reserved</u> |

| | | |
|----|----------------|--|
| 2 | PLCM_32 | The 32 LSBs bits of the Public Long Code Mask. |
| 3 | | If PLCM_TYPE is set to '10', the base station shall include this |
| 4 | | field and set it to the 32 least significant bits of the public |
| 5 | | long code mask used by the mobile station; otherwise, the |
| 6 | | base station shall omit this field. |
| 7 | | If the ASSIGN_MODE field is set to '100', the base station |
| 8 | | shall include the following fields: |
| 9 | [...] | |
| 10 | PLCM_TYPE_INCL | The Public Long Code Mask type included indicator. |
| 11 | | The base station shall set this field to '1' if the base station |
| 12 | | include PLCM_TYPE in the message; otherwise, the base |
| 13 | | station shall set this field to '0'. |
| 14 | PLCM_TYPE | The Public Long Code Mask type indicator. |
| 15 | | If PLCM_TYPE_INCL is set to '0', the base station shall omit |
| 16 | | this field; otherwise, the base station shall include this field |
| 17 | | and set it as follows: The base station shall set this field to |
| 18 | | the corresponding Public Long Code Mask type as specified in |
| 19 | | Table 3.7.2.3.2.21 - x. |
| 20 | PLCM_32 | The 32 LSBs bits of the Public Long Code Mask. |
| 21 | | If PLCM_TYPE is set to '10', the base station shall include this |
| 22 | | field and set it to the 32 least significant bits of the public |
| 23 | | long code mask used by the mobile station; otherwise, the |
| 24 | | base station shall omit this field. |
| 25 | | |

1 6.6 Additions to 1.1.2.2 of 3GPP2 C.S0005-A

2 ASSIGNING R TMSI ZONE_s. Assigning Radio TMSI zone. The R-TMSI zone with which the mobile
3 station most recently registered.

4 MAP SYS PAR MSG SEQ_s – MC-MAP *Systems Information Message* sequence number.

5 RR REG COUNT_s. Timer-based counter maintained by mobile station for timer-based RR registration.

6 RR REG COUNT MAX_s. Maximum value that RR_REG_COUNT_s can have.

7 RR REG ENABLED_s. One-bit flag to indicate if the mobile station can perform RR-level registration. Set to
8 '1' only if the mobile station has a valid R-TMSI assigned.

9 R TMSI CODE_s. Radio TMSI code. The R-TMSI code corresponding to the zone with which the mobile
10 station most recently registered.

11 R ZONE LIST_s. Radio TMSI zone list. List of R-TMSIs the mobile station has been assigned each time it
12 registerd.

13 TIMER REG_s. Flag to indicate whether timer based RR registration is enabled or not.

14 TOT R TMSI ZONES_s. Number of entries in R_ZONE_LIST_s.

15 6.7 MC-MAP Identities

16 A unique International Mobile Subscriber Identity (IMSI) is allocated to each mobile subscriber. Temporary
17 Mobile Subscriber Identities (TMSI) may be allocated to support the subscriber identity confidentiality. A
18 mobile station may be allocated two TMSIs, one for services provided through the MSC, and the other for
19 services provided through the SGSN (P-TMSI). IMSI and TMSI are defined in section 2 of 3GPP TS 23.003.
20 Location areas and base stations are identified as shown in section 4 of 3GPP TS 23.003.

21 The mobile station equipment is uniquely defined by the International Mobile station Equipment Identity and
22 Software Version Number (IMEISV) or the International Mobile station Equipment Identity (IMEI) The IMEI
23 and IMEISV are defined in section 6 of 3GPP TS 23.003.

24 6.8 Revision Identification

25 The MC-MAP air interface revision is identified by P_REV, MOB_P_REV and MIN_P_REV fields in the
26 signaling messages as specified in 3GPP2 C.S0005-A, with the following modification: The above fields
27 identify only the revision level of the following MC-MAP protocol layers: Layer 1, MAC, LAC and MC-MAP
28 RRC.

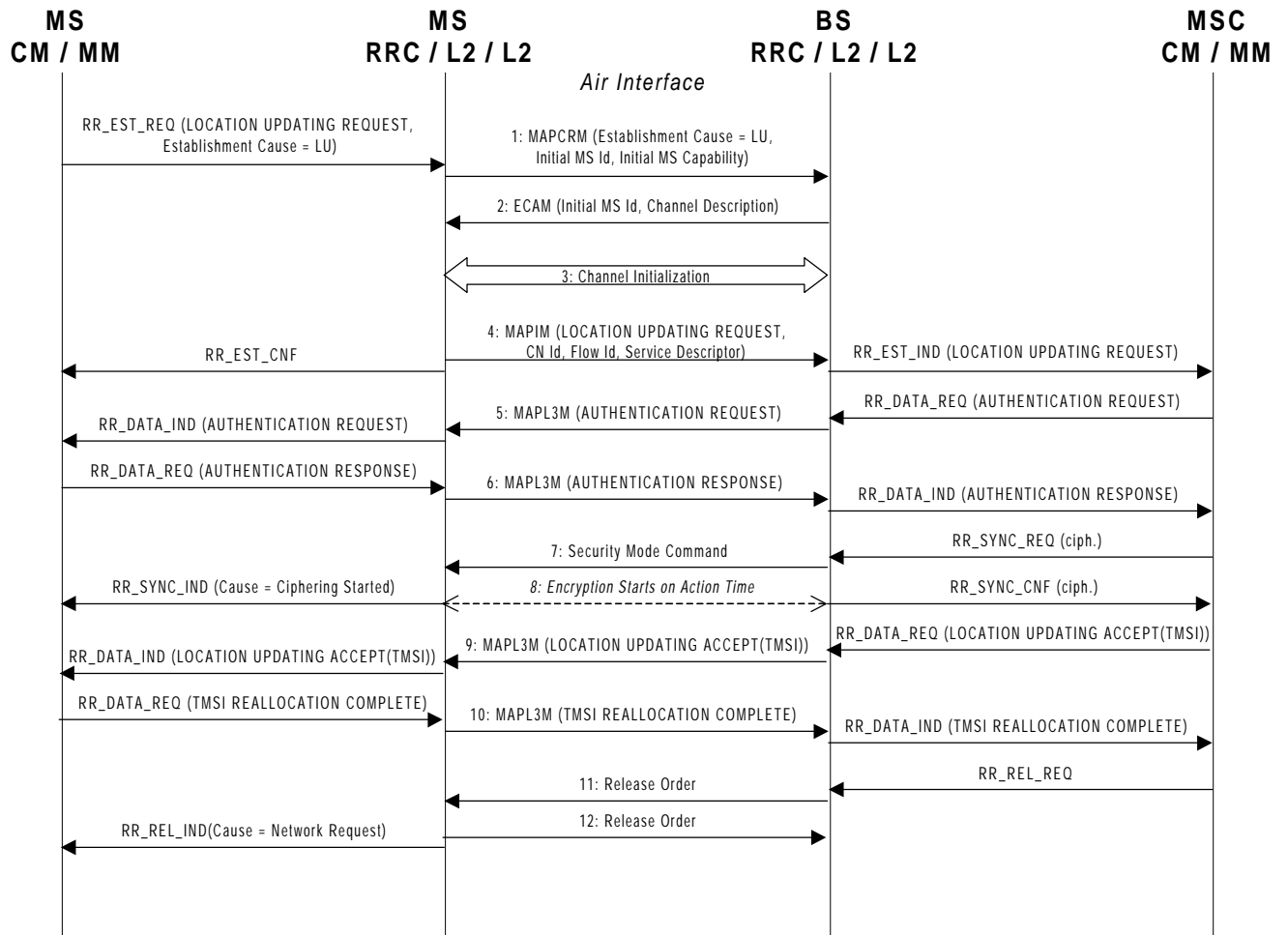
29 The P_REV and MOB_P_REV associated with the current release of the MC-MAP specification are equal to
30 '00000111'.

1 **6.9 Example MC-MAP Call Flows**

2 This section presents example message flows in the MC-MAP system.

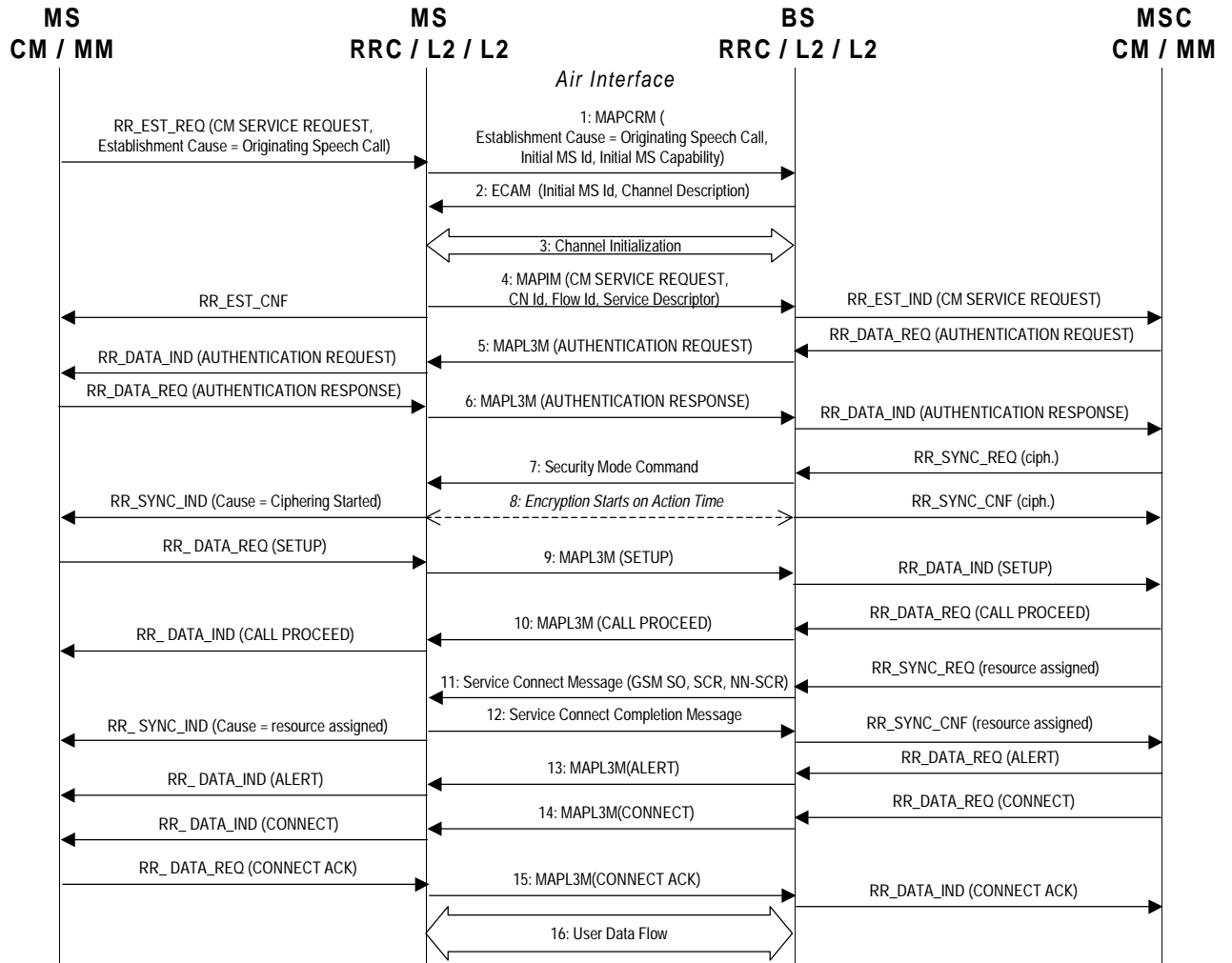
3 **6.9.1 Location Update**

4 Figure 6.9.1-1 shows example message flow of mobile station location update.



5
6
7 **Figure 6.9.1-1. Example Location Update Message Flow**

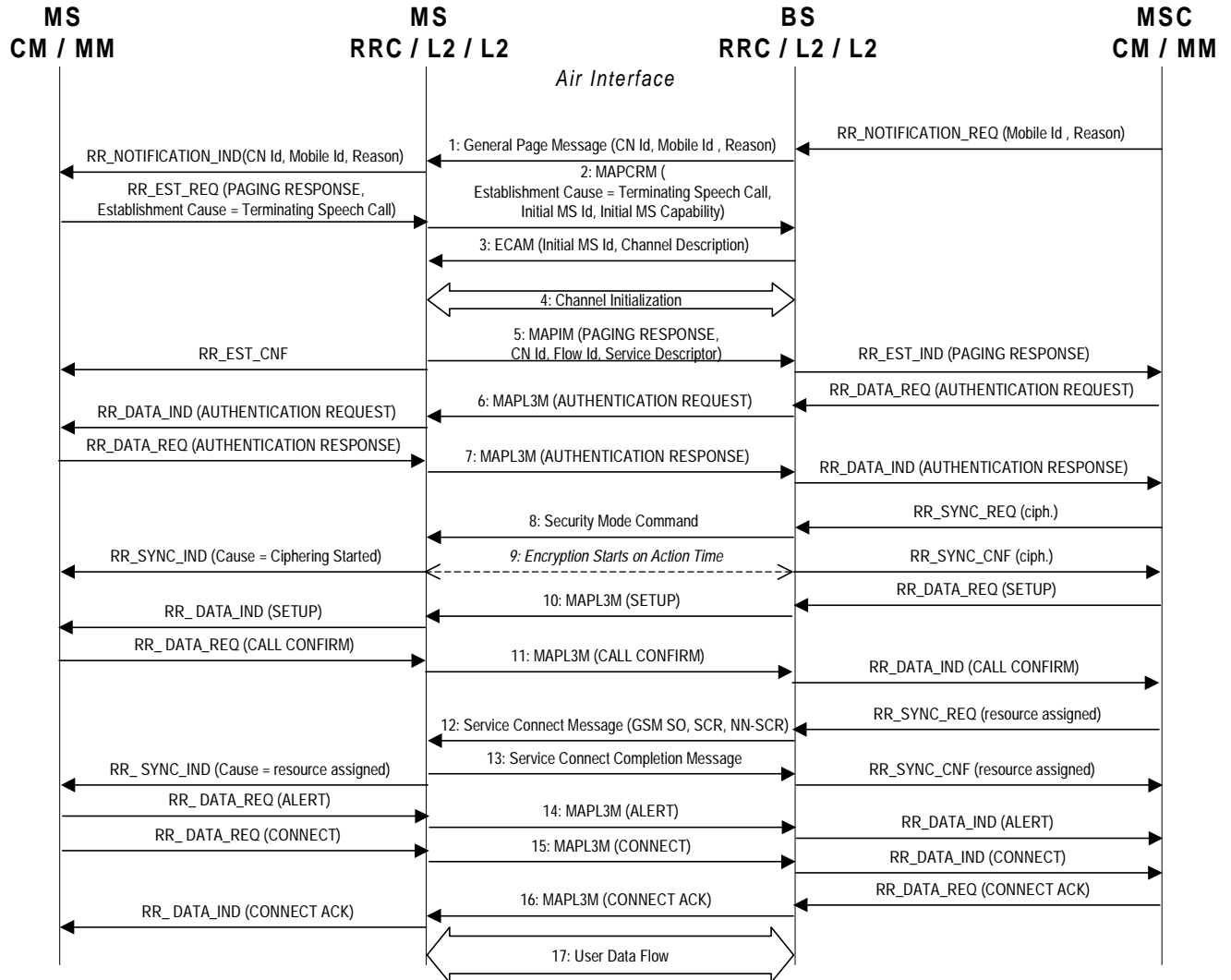
1 **6.9.2 Mobile Originated Call Setup**
 2 Figure 6.9.2-1 shows example message flow of mobile originated voice call setup.
 3



4
 5
 6
 7

Figure 6.9.2-1. Example Mobile Originated Call Setup Message Flow

1 **6.9.3 Mobile Terminated Call Setup**
 2 Figure 6.9.2-1 shows example message flow of mobile terminated voice call setup.
 3

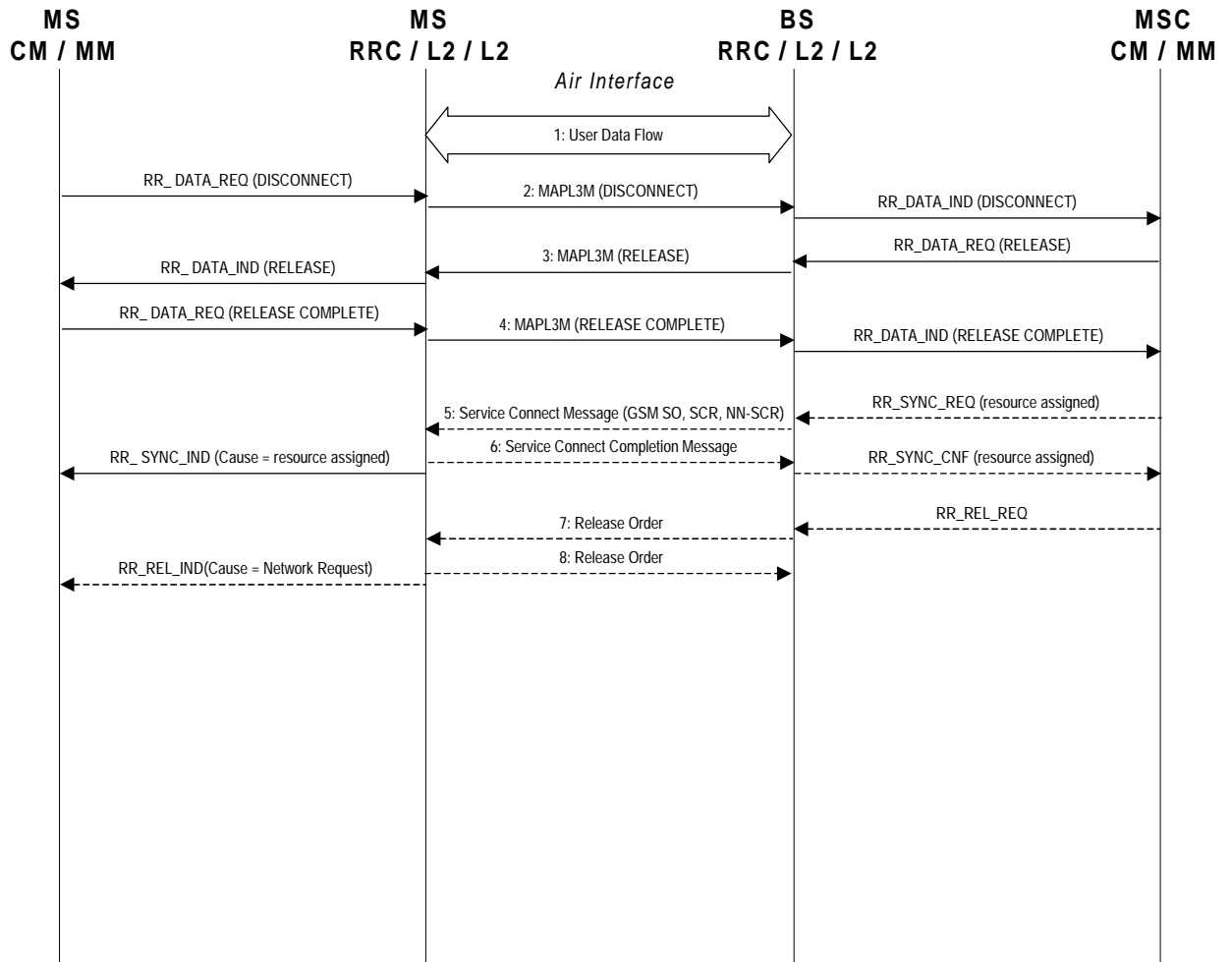


4
 5
 6

Figure 6.9.3-1. Example Mobile Terminated Call Setup Message Flow

1 **6.9.4 Mobile Originated Call Release**

2 Figure 6.9.4-1 shows example message flow of mobile originated call release.



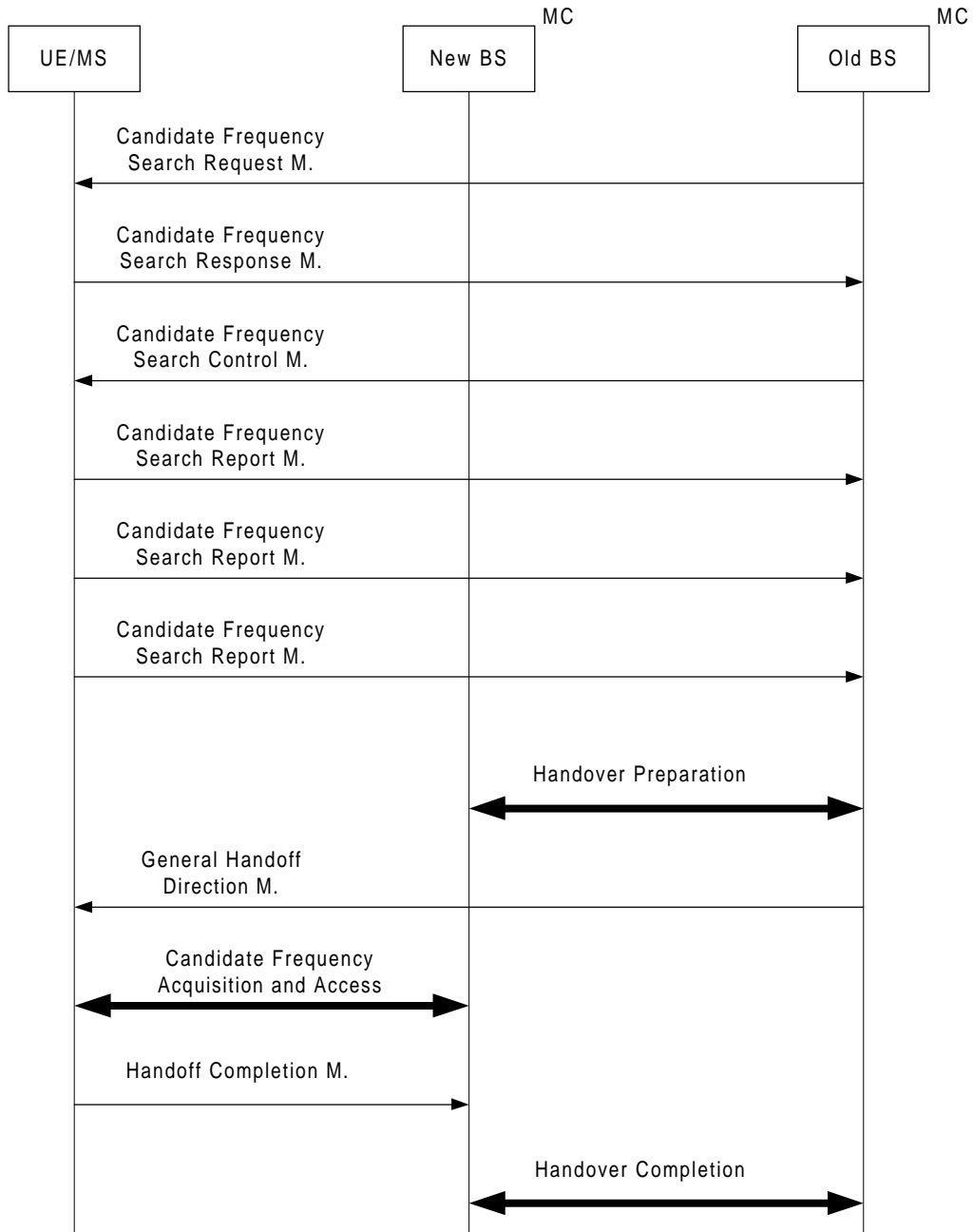
3
4

5 **Figure 6.9.4-1. Example Mobile Originated Call Release Message Flow**

6 See Annex B of 3GPP2 C.S0005-A for the use of the *Service Connect Message* and *Release Order*.

1 6.9.5 MC-MAP to MC-MAP Hard Handoff

2



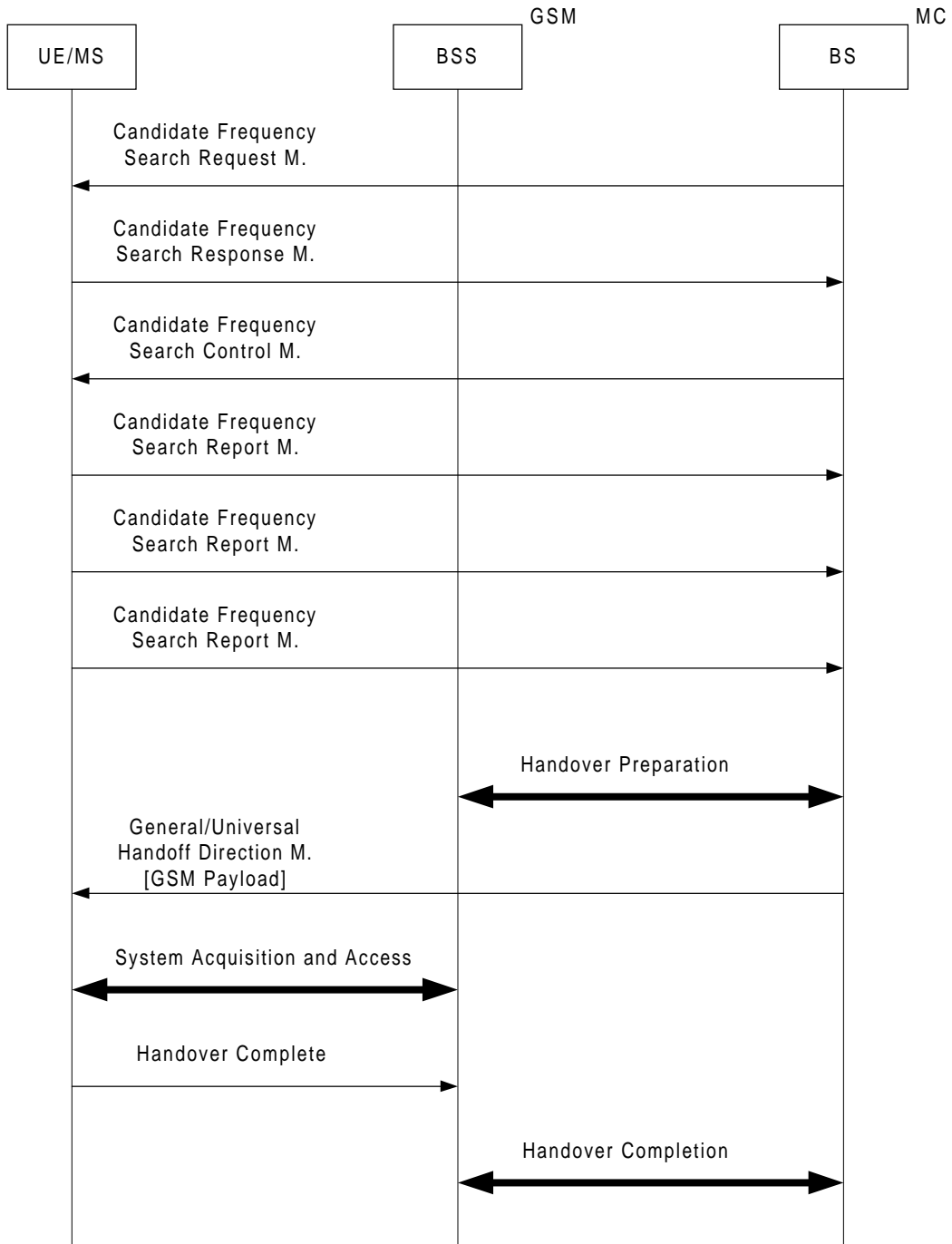
3

4

Figure 6.9.5-1. MC-MAP to MC-MAP Hard Handoff

1 6.9.6 Inter-system MC-MAP to GSM Handoff

2



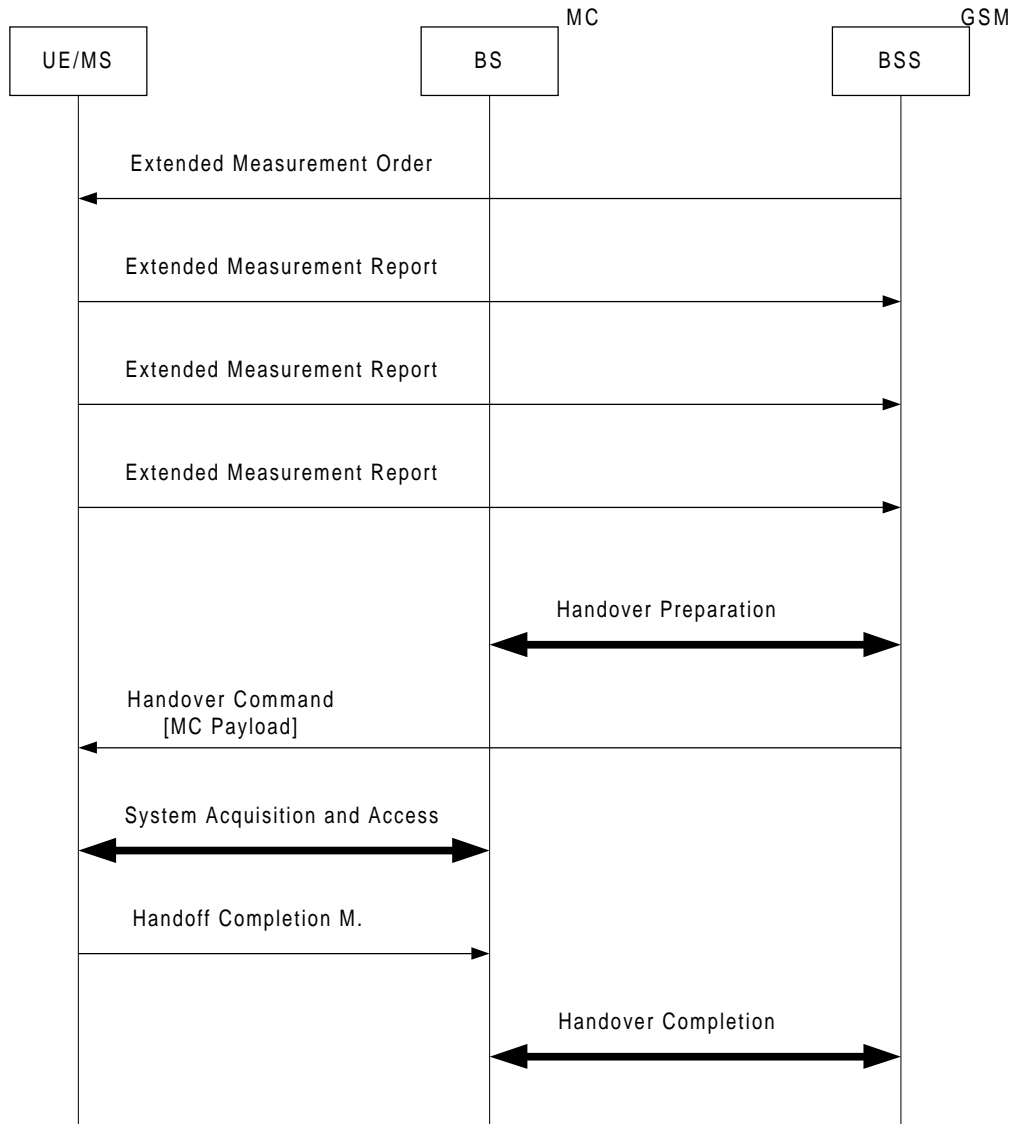
3

4

Figure 6.9.6-1. Inter-system MC-MAP to GSM Handoff

1 6.9.7 Inter-system GSM to MC-MAP Handoff

2



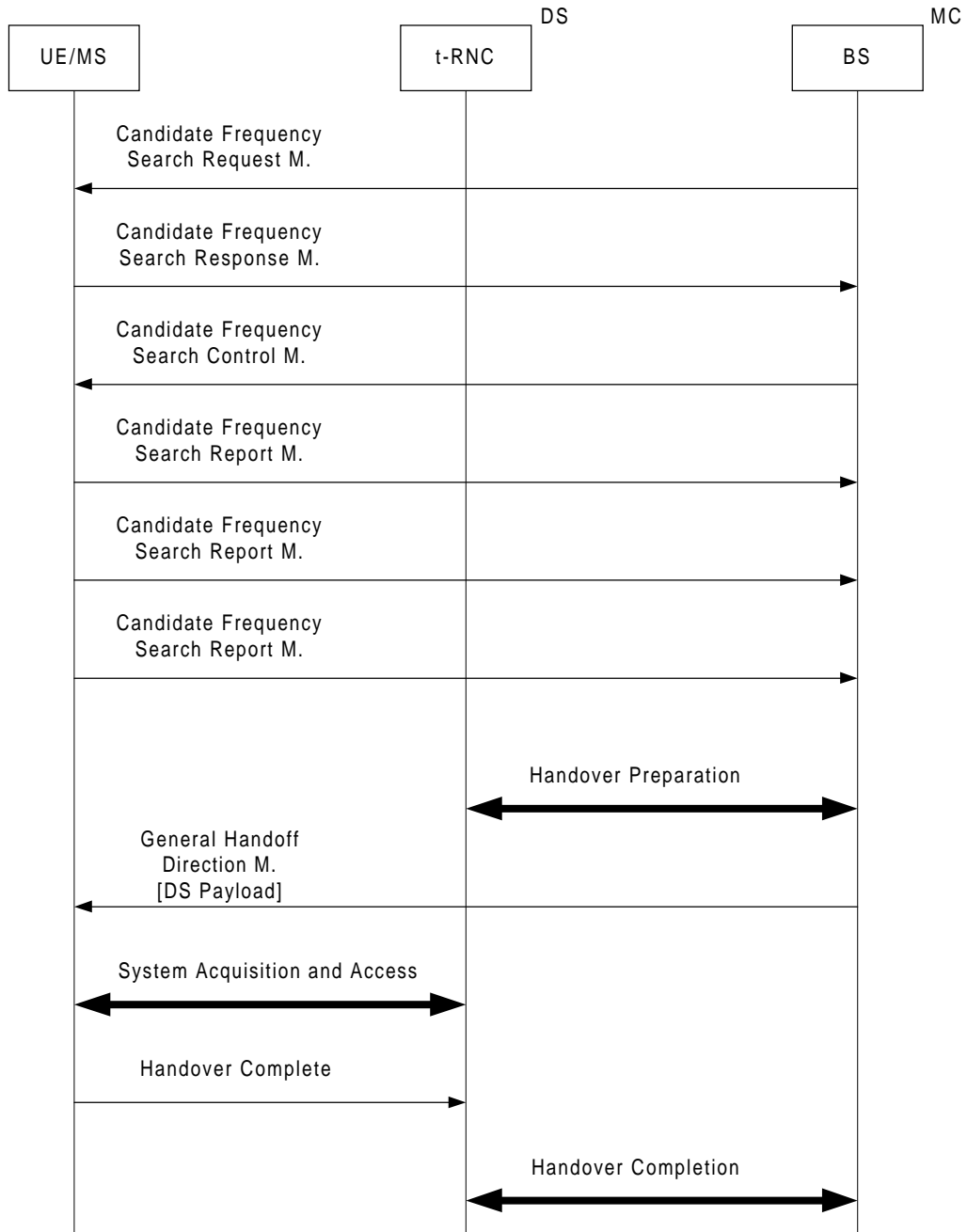
3

4

Figure 6.9.7-1. Inter-system GSM to MC-MAP Handoff

1 6.9.8 Inter-system MC-MAP to DS-MAP Handoff

2



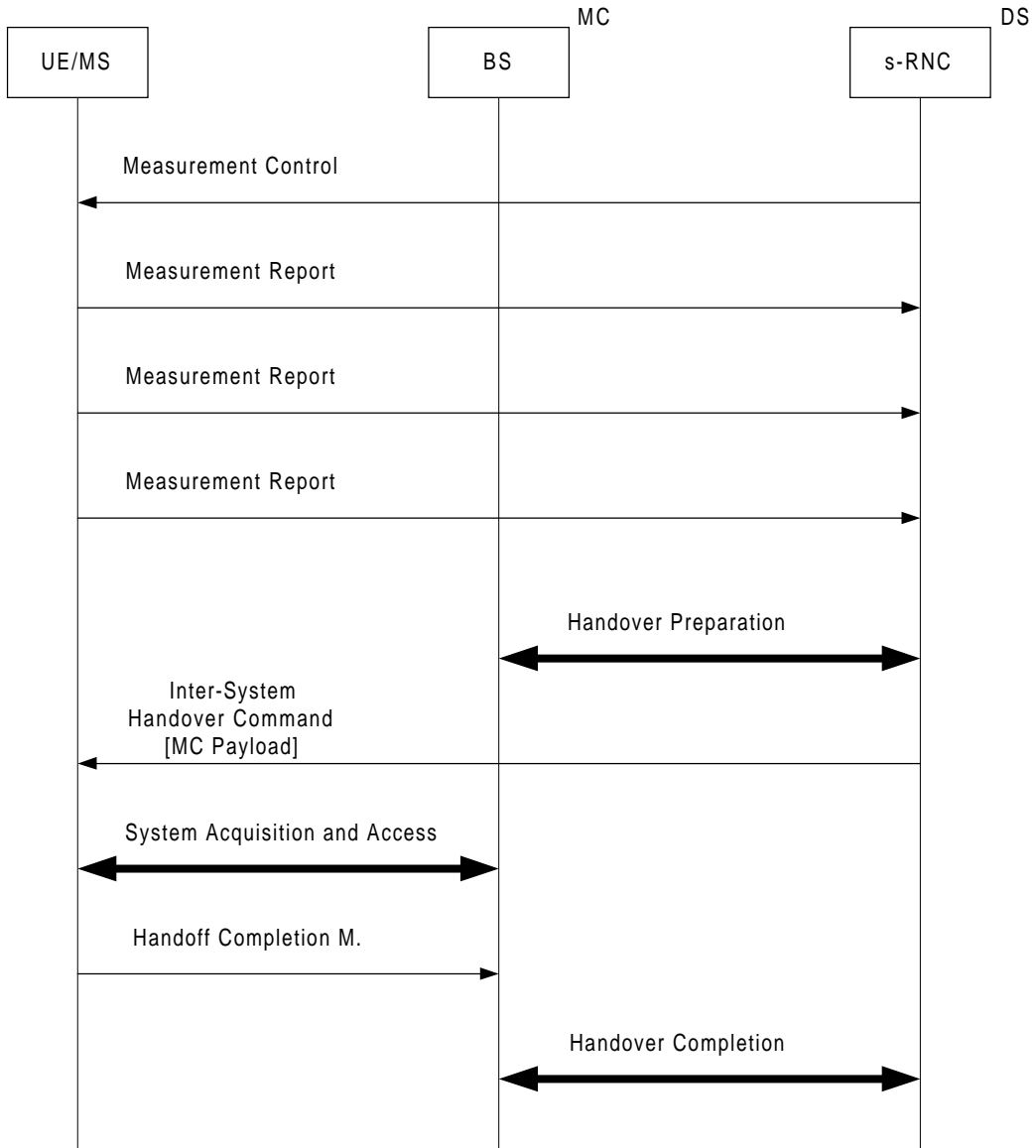
3

4

Figure 6.9.8-1. Inter-system MC-MAP to DS-MAP Handoff

1 6.9.9 Inter-system DS-MAP to MC-MAP Handoff

2



3

4

5

Figure 6.9.9-1. Inter-system DS-MAP to MC-MAP Handoff