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

Analog Signaling Standard for cdma2000 Spread Spectrum Systems

Release A

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These technical requirements form a compatibility specification for 800 MHz cellular mobile telecommunications systems and 1.8 to 2.0 GHz Code Division Multiple Access (CDMA) systems. They ensure that a mobile station can obtain service in a cellular system manufactured according to this specification. These requirements do not address the quality or reliability of that service, nor do they cover equipment performance or measurement procedures.

To ensure compatibility (see Note 1), both radio-system parameters and call-processing procedures must be specified. The sequence of call-processing steps that the mobile stations and base stations execute to establish calls has been specified along with the digital control messages and analog signals that are exchanged between the two stations.

The base station is subject to fewer compatibility requirements than the dual-mode mobile station. Radiated power levels, both desired and undesired, are fully specified for dual-mode mobile stations to control the RF interference that one mobile station can cause another. Base stations are fixed in location and their interference is controlled by proper layout and operation of the system in which the station operates. Detailed call-processing procedures are specified for mobile stations to ensure a uniform response to all base stations. Base station call procedures are not specified in detail because they are a part of the overall design of the individual land system. However, the base station call-processing procedures must be compatible with those specified for the mobile station. This approach to writing the compatibility specification provides the land system designer with sufficient flexibility to respond to local service needs and to account for local topography and propagation conditions.

This specification includes provisions for future service additions and expansion of system capabilities.

This specification refers to the “core analog roaming standard”, [26], for specifications and procedures that are mandatory for all analog capable mobile and base stations. Except for the procedures listed in this specification, optional capabilities for IS-2000 mobile stations and base stations beyond [26] are referred to in [7],

This specification is divided into multiple parts. This part governs analog operation at 800 MHz based upon the standard, [26]. This specification provides the differences within [26], which are used by dual-mode mobile stations.

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2 No text.

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FOREWORD

1 **1. General.** This section defines the terms and numeric indications used in this
2 document.

3 **2. Requirements for Mobile Station Analog Operation.** This section describes the
4 requirements for CDMA-analog dual-mode mobile stations operating in the analog mode.
5 A mobile station complying with these requirements will be able to operate with analog
6 base stations complying with this document operating in accordance with this
7 specification and should be able to operate with analog base stations complying with [26],
8 [25], [7], and [24] or the latest version of these standards.

9 **3. Requirements for Base Station Analog Operation.** This section describes the
10 requirements for analog base stations. A base station operating in accordance with these
11 requirements will be able to operate in the analog mode with mobile stations operating in
12 accordance with this specification and should be able to operate in the analog mode with
13 mobile stations complying with [26], TIA/EIA/IS-136, [7], and [24] or the latest version of
14 these standards.

15 **4. Requirements for Mobile Station Analog Options.** This section describes the
16 requirements for CDMA-analog dual-mode mobile stations on the reverse analog control
17 channel. This section describes CDMA-analog dual-mode mobile station requirements for
18 use of the optional extended protocol.

19 **5. Requirements for Base Station Analog Options.** This section describes the base
20 station requirements for the reverse analog control channel. This section describes
21 base station requirements for use of the optional extended protocol.

22 **Annex A.** Reserved.

23 **Annex B. Mobile Station Database.** This informative annex describes a database model
24 that can be used for dual-mode mobile stations complying with this document.

NOTES

- 1 1. Compatibility, as used in connection with this specification, is understood to
2 mean: Any mobile station that is able to place and receive calls in any 800 MHz
3 cellular system. Conversely, all systems are able to place and receive calls for any
4 mobile station. In a subscriber's home system, all call placement must be
5 automatic. Call placement preferably should be automatic when a mobile station
6 is in roam status.
- 7 2. The term "dual-mode mobile station" indicates a mobile station capable of both
8 analog (FM) and spread spectrum (CDMA) operation. The term "spread spectrum
9 dual-mode mobile station" is used when a confusion might arise between a dual-
10 dual-mode mobile station complying with this document and other standards such as
11 [24] or [25].
- 12 3. This compatibility specification is based upon the specific United States spectrum
13 allocation for cellular systems.
- 14 4. Technical details are included for the operation of two cellular systems in a
15 geographic area, System A and System B, each with a separate set of control
16 channels.
- 17 5. EIA/IS-19-B (May 1988) and [28] provide specifications and measurement methods
18 for cellular equipment.
- 19 6. Each system is identified by a unique 15-bit digital code, the SID code. The
20 responsibility for assignment of SID rests with the cognizant government authority
21 of the respective country, not with the EIA, TIA, or member companies. Applicants,
22 licensees, manufacturers or operators are encouraged to contact the responsible
23 government agency. [31] recommends SID range for countries. Cognizant
24 government authorities should refer to [31] when allowing SID codes.
- 25 7. Each mobile station is assigned a single unique 32-bit binary serial number (ESN)
26 which cannot be changed by the subscriber without rendering the mobile station
27 inoperative (see 2.3.2 of [5]).
- 28 8. Those wishing to deploy systems compliant with this specification should also take
29 notice of the requirement to be compliant with FCC Parts 15, 22, and 24, along
30 with the referenced version of FCC Office of Engineering and Technology Bulletin
31 53.
- 32 9. RF Emissions. Minimum advisory standards of ANSI and the processing guidelines
33 of FCC are contained in ANSI C95.1-1991 Advisory Standards and FCC Rules and
34 Regulations, respectively. Members should also take notice of the more stringent
35 exposure criteria for the general public and for radio frequency carriers with low
36 frequency amplitude modulation as given in NCRP Report No. 86.
- 37 10. For the optional analog extended protocol feature (see 4.1 and 5.1), the assignment
38 of message type codes (MST words) will be made using procedures described in
39 [32]. This will ensure that the feature will be implemented in an orderly manner.

NOTES

- 1 11. "Base station" refers to the functions performed on the land side, which are
2 typically distributed among a cell, a sector of a cell, and a mobile switching center.
- 3 12. This specification uses the following verbal forms: "Shall" and "shall not" identify
4 requirements to be followed strictly to conform to the specification and from which
5 no deviation is permitted. "Should" and "should not" indicate that one of several
6 possibilities is recommended as particularly suitable, without mentioning or
7 excluding others; that a certain course of action is preferred but not necessarily
8 required; or that (in the negative form) a certain possibility or course of action is
9 discouraged but not prohibited. "May" and "need not" indicate a course of action
10 permissible within the limits of the specification. "Can" and "cannot" are used for
11 statements of possibility and capability, whether material, physical, or causal. The
12 use of "must" and "must not" is equivalent to the use of "shall" and "shall not."
- 13 13. Unless indicated otherwise, this document presents numbers in decimal form.
14 Binary numbers are distinguished in the text by the use of single quotation marks.
- 15 14. A potential compatibility problem between [26] and this specification exists as a
16 result of differences in access channel boundary determination procedures
17 supported in these two standards. Recommended solutions to this potential
18 compatibility problem are the following:

Preferred Solution

19
20 Section 2.3.7 of [26] (First Paging Channel) specifies the first paging channels
21 (FIRSTCHP_p) which must be stored in a mobile station compliant to this
22 specification and used to identify the first paging channel in paging channel scans
23 when the mobile station is operating in its home system. Defaulting this value to
24 the preferred system's (i.e., A or B band) first dedicated control channel (834.990
25 MHz/879.990 MHz and 835.020 MHz/880.020 MHz respectively) will prevent
26 paging/access channels from being calculated differently when the mobile station,
27 compliant to this specification, operates on a [26] based home system. This
28 solution is used today and should continue to be used to ensure full
29 interoperability of [26] and mobile stations compliant to this specification on both
30 [26] and cdma2000 type systems. This solution does, however, require that both
31 home and roaming mobile stations, compliant to this specification, use the same
32 paging channel set (i.e., no split home-roam paging channels).

Alternate (Non-Preferred) Solution

33
34 If a second portion of the existing spectrum is allocated for control channel use
35 (over and above the dedicated control channels), then split home-roam paging can
36 still be achieved for both [25] and [26] mobile stations. This second portion of
37 spectrum could be managed as follows:

- 38 • Used exclusively by home mobile stations, compliant to this specification,
39 having appropriate NAM programming, for both paging and access functions or,
- 40 • Used by home mobile stations, compliant to this specification, having
41 appropriate NAM programming, that includes both paging and access functions
42 and by home [26] mobile stations, having appropriate NAM programming, for

NOTES

- 1 paging functions only. Home [26] mobile stations would continue to use the
2 existing dedicated control channels for access functions.
- 3 15. Forward control channel mobile station control messages of greater than five words
4 in length have been shown to yield compatibility problems in some mobile stations.
5 Implementers of systems are advised that the functions performed by these
6 optional messages may be achieved on assigned voice channels without causing
7 compatibility issues. Mobile station manufacturers are advised that the length of
8 forward control channel messages defined in future standards may be different
9 from that defined in this specification.
- 10 16. The NOTES section of [26] contains technical recommendations regarding analog
11 mode operation. These recommendations also apply to mobile station(s) operating
12 in accordance with this specification while operating in the analog mode. See the
13 NOTES section of [26], [7], and [24] for further details.

REFERENCES

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

7 1.Reserved.

8 2.Reserved.

9 3.Reserved.

10 4.C.S000.4-A, *Signaling Link Access Control (LAC) Specification for cdma2000 Spread*
11 *Spectrum Systems*, April, 2000.

12 5.C.S000.5-A, *Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum*
13 *Systems*, April, 2000.

14 6.Reserved.

15 7.ANSI/EIA/TIA-691, *Mobile Station-Land Station Compatibility Standard for*
16 *Enhanced 800MHz Analog Cellular*, November, 1999.

17 8.ANSI T1.607-1990, *Integrated Services Digital Network (ISDN)-Layer 3 Signaling*
18 *Specification for Circuit Switched Bearer Service for Digital Subscriber Signaling*
19 *System Number 1 (DSS1)*, July 1990.

20 9.ANSI T1.610-1994, *Generic Procedures for the Control of ISDN Supplementary*
21 *Services*, August, 1994.

22 10. ANSI TIA/EIA-690, *Recommended Minimum Standards for 800 MHz Cellular*
23 *Subscriber Units*, date pending.

24 11. ANSI X3.4-1986, *Coded Character Set - 7-bit American National Standard Code for*
25 *Information Interchange*, 1992.

26 12. C.S0010-0, *Recommended Minimum Standards for 800 MHz Cellular Base*
27 *Stations*, November 1999.

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29 *Stations*, November 1999.

30 14. *Common Cryptographic Algorithms, Revision C*, 1997. A TIA document subject to
31 restricted distribution. Contact the Telecommunications Industry Association,
32 Arlington, VA.

33 15. CCITT Recommendation E.163, *Numbering Plan for the International Telephone*
34 *Service*, 1988. Note: merged with E.164.

35 16. CCITT Recommendation E.164 (I.331), *Numbering Plan for the ISDN Era*, 1991.

36 17. CCITT Recommendation E.212, *Identification Plan for Land Mobile Stations*, 1988.

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3 Identifications Codes, 1994.
- 4 19. ITU-T Recommendation G.162, Characteristics of Compondors for Telephony, 1989.
- 5 20. CCITT Recommendation X.121, International Numbering Plan for Public Data
6 Networks, 1992.
- 7 21. TIA/EIA/IS-690, Recommended Minimum Performance Standards for Dual-Mode
8 Spread Spectrum Cellular Mobile Stations, August 1998.
- 9 22. IEEE Standard 661-1979, Method for Determining Objective Loudness Ratings of
10 Telephone Connections, 1979.
- 11 23. Interface Specification for Common Cryptographic Algorithms, Rev C, 1997.
12 Contact the Telecommunications Industry Association, Arlington, VA.
- 13 24. TIA/EIA/IS-91-A, Mobile Station-Base Station Compatibility Standard for 800 MHz
14 Analog Cellular, Auxiliary, and Residential Service, November, 1999.
- 15 25. TIA/EIA/IS-136, TDMA Radio Interface Mobile Station-Base Station Compatibility
16 Standard.
- 17 26. TIA/EIA-553-A, Mobile Station - Land Station Compatibility Specification,
18 November, 1999.
- 19 27. C.S0015-0, Short Message Services for Wideband Spread Spectrum Cellular
20 Systems, June, 1999.
- 21 28. TIA/EIA-712, Recommended Minimum Performance Standards for Base Stations
22 Supporting Dual-Mode Spread Spectrum Cellular Mobile Stations, August 1998.
- 23 29. C.S0016-0, Over-the-Air Service Provisioning of Mobile Stations in Spread
24 Spectrum Systems, June 1998.
- 25 30. TSB16, Assignment of Access Overload Classes in the Cellular
26 Telecommunications Services, March 1985.
- 27 31. TSB29-C, International Implementation of Wireless Telecommunication Systems
28 Compliant with TIA/EIA-41, September, 1999.
- 29 32. TSB39-A, Message Type Assignments for the Extended Protocol Facility of
30 ANSI/EIA/TIA-553, EIA/TIA/IS-54, TIA/EIA/IS-88 and TIA/EIA/IS-95, October
31 1994.
- 32 33. TSB50, User Interface for Authentication Key Entry, March 1993.
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34 Spread Spectrum Standards.
- 35 35. TSB70-A, FSK Air Interface Common Message Protocol Cross-Reference.
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1. GENERAL

1.1. Terms and Numeric Information

1.1.1. Terms

Access Attempt. The entire process of sending one message and receiving (or failing to receive) an acknowledgment for that message, consisting of one or more access sub-attempts.

AC. See Authentication Center

A-key. A secret, 64-bit pattern stored in the mobile station and HLR/AC. It is used to generate/update the mobile station's Shared Secret Data.

Analog Access Channel. An analog control channel used by a mobile station to access a system to obtain service.

Analog Color Code. An analog signal (see Supervisory Audio Tone) transmitted by a base station on an analog voice channel and used to detect the capture of a mobile station by an interfering base station or the capture of a base station by an interfering mobile station.

Analog Control Channel. An analog channel used for the transmission of digital control information from a base station to a mobile station or from a mobile station to a base station.

Analog Paging Channel. A forward analog control channel that is used to page mobile stations and to send orders.

Analog Voice Channel. An analog channel on which a voice conversation occurs and on which brief digital messages may be sent from a base station to a mobile station or from a mobile station to a base station.

Authentication. A procedure used by a base station to validate a mobile station's identity.

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

Authentication Response (AUTHR). An 18-bit output of the authentication algorithm. It is used, for example, to validate mobile station registrations, originations and terminations.

AUTHBS. See Base Station Authentication Response

AUTHR. See Authentication Response

Autonomous Registration. A method of registration in which the mobile station registers without an explicit command from the base station.

Band Class. A set of frequency channels and a numbering scheme for these channels.

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

4 **Base Station Authentication Response (AUTHBS).** An 18-bit pattern generated by the
5 authentication algorithm. AUTHBS is used to confirm the validity of base station orders to
6 update the Shared Secret Data.

7 **Base Station Random Variable (RANDBS).** A 32-bit random number generated by the
8 mobile station for authenticating base station orders to update the Shared Secret Data.

9 **BCH Code.** See Bose-Chaudhuri-Hocquenghem Code.

10 **Bose-Chaudhuri-Hocquenghem Code (BCH Code).** A large class of error-correcting cyclic
11 codes. For any positive integers m , $m \geq 3$, and $t < 2^{m-1}$, there is a binary BCH code with a
12 block length n equal to $2^m - 1$ and $n - k \leq mt$ parity check bits, where k is the number of
13 information bits. The BCH code has a minimum distance of at least $2t + 1$.

14 **bps.** Bits per second.

15 **Call Disconnect.** The process that releases the resources handling a particular call. The
16 disconnect process begins either when the mobile station user indicates the end of the
17 call by generating an on-hook condition or other call release mechanism, or when the base
18 station initiates a release.

19 **Calling Number I.D. (CNI)** A display to the called party, indicating unique calling party
20 information. **CDMA.** See Code Division Multiple Access.

21 **CDMA Channel.** The set of channels transmitted between the base station and the
22 mobile stations within a given CDMA frequency assignment. See also Forward CDMA
23 Channel and Reverse CDMA Channel.

24 **CDMA Channel Number.** An 11-bit number corresponding to the center of the CDMA
25 frequency assignment.

26 **CDMA Frequency Assignment.** An assigned 1.23 MHz segment of spectrum. For CDMA
27 cellular systems, the channel is centered on one of the 30 kHz channels of the existing
28 analog cellular system. For PCS band CDMA systems, the channel is centered on one of
29 the 50 kHz channels.

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

33 **CRC.** See Cyclic Redundancy Code

34 **Cyclic Redundancy Code (CRC).** A class of linear error detecting codes which generate
35 parity check bits by finding the remainder of a polynomial division.

36 **dBm.** A measure of power expressed in terms of its ratio (in dB) to one milliwatt.

37 **DCC.** See Digital Color Code.

38 **Dedicated Control Channel.** An analog control channel used for the transmission of
39 digital control information from either a base station or a mobile station.

1 **Digital Color Code (DCC).** A digital signal transmitted by a base station on a forward
2 analog control channel that is used to detect the capture of a base station by an
3 interfering mobile station.

4 **Discontinuous Transmission (DTX).** A mode of operation in which a mobile station
5 transmitter autonomously switches between two transmitter power levels while the mobile
6 station is in the conversation state on an analog voice channel.

7 **DTMF.** See Dual-Tone Multifrequency.

8 **DTX.** See Discontinuous Transmission.

9 **Dual-Tone Multifrequency (DTMF).** Signaling by the simultaneous transmission of two
10 tones, one from a group of low frequencies and another from a group of high frequencies.
11 Each group of frequencies consists of four frequencies.

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

14 **ESN.** See Electronic Serial Number.

15 **Extended Protocol.** An optional expansion of the signaling messages between the base
16 station and mobile station to allow for the addition of new system features and operational
17 capabilities.

18 **Fade Timer.** A timer kept by the mobile station as a measure of Forward Traffic Channel
19 continuity. If the fade timer expires, the mobile station drops the call.

20 **Flash.** An indication sent on an analog voice channel or CDMA Traffic Channel indicating
21 that the user directed the mobile station to invoke special processing.

22 **FOCC.** See Forward Analog Control Channel.

23 **Forward Analog Control Channel (FOCC).** An analog control channel used from a base
24 station to a mobile station.

25 **Forward Analog Voice Channel (FVC).** An analog voice channel used from a base station
26 to a mobile station.

27 **GHz.** Gigahertz (10^9 Hertz).

28 **Handoff.** The act of transferring communication with a mobile station from one base
29 station to another.

30 **HLR.** See Home Location Register.

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

33 **Home System.** The cellular system in which the mobile station subscribes for service.

34 **IA5.** (IA5 form appears on page 3-14, re alert with info-Need definition)

35 **IMSI.** See International Mobile Station Identity.

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

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

3 **Interleaving.** The process of permuting a sequence of symbols.

4 **International Mobile Station Identity (IMSI).** A method of identifying stations in the
5 land mobile service as specified in [17].

6 **kHz.** Kilohertz (10^3 Hertz).

7 **Local Control.** The local control order is used by a base station to initial local control
8 action in the mobile station.

9 **Message.** A data structure that conveys control information or application information. A
10 message consists of a length field (MSG_LENGTH), a message body (the part conveying the
11 information), and a CRC.

12 **Message CRC.** The CRC check associated with a message. See also Cyclic Redundancy
13 Code.

14 **Message Field.** A basic named element in a message. A message field may consist of zero
15 or more bits.

16 **MHz.** Megahertz (10^6 Hertz).

17 **MIN.** See Mobile Identification Number.

18 **Mobile Identification Number (MIN).** The 34-bit number that is a digital representation
19 of the 10-digit number assigned to a mobile station.

20 **Mobile Protocol Capability Indicator (MPCI).** A 2-bit field used to indicate the mobile
21 station's capabilities.

22 **Mobile Station.** A station in the Public Cellular Radio Telecommunications Service
23 intended to be used while in motion or during halts at unspecified points. Mobile stations
24 include portable units (e.g., hand-held personal units) and units installed in vehicles.

25 **Mobile Station Class.** Mobile station classes define mobile station characteristics such
26 as transmission power. See Table 2.3.3-1 of [26] and Table 2.3.3-1 of [5].

27 **Mobile Station Identification Number (MSIN).** A part of the E.212 IMSI identifying the
28 mobile station within its home network. See [17].

29 **Mobile Station Originated Call.** A call originating from a mobile station.

30 **Mobile Station Terminated Call.** A call received by a mobile station (not to be confused
31 with a disconnect or call release).

32 **Mobile Switching Center (MSC).** A configuration of equipment that provides cellular
33 radiotelephone service. Also called the Mobile Telephone Switching Office (MTSO).

34 **MPCI.** See Mobile Protocol Capability Indicator

35 **ms.** Millisecond (10^{-3} second).

36 **MSB.** Most significant bit.

37 **MSC.** See Mobile Switching Center.

- 1 **MSIN.** See Mobile Station Identification Number.
- 2 **NAM.** See Number Assignment Module.
- 3 **Narrow Analog.** A type of voice channel that uses 10 kHz channel spacing and uses
4 subaudible signaling.
- 5 **National Mobile Station Identity (NMSI).** A part of the E.212 IMSI identifying the mobile
6 station within its home country. The NMSI consists of the NMC and the MSIN. See [17].
- 7 **Network.** A network is a subset of a cellular system, such as an area-wide cellular
8 network, a private group of base stations, or a group of base stations set up to handle a
9 special requirement. A network can be as small or as large as needed, as long as it is fully
10 contained within a system. See also System.
- 11 **Network Directed System Selection (NDSS).** A feature that allows the mobile station to
12 automatically register with a preferred system while roaming, or to be automatically
13 directed by a service provider, typically the home service provider, to a suggested system,
14 regardless of the frequency band class, or cellular band.
- 15 **NMSI.** See National Mobile Station Identity.
- 16 **Non-Autonomous Registration.** A registration method in which the base station initiates
17 registration. See also Autonomous Registration.
- 18 **ns.** Nanosecond (10^{-9} second).
- 19 **Number Assignment Module (NAM).** A set of MIN/IMSI-related parameters stored in the
20 mobile station.
- 21 **Numeric Information.** Numeric information consists of parameters that appear as
22 numeric fields in messages exchanged by the base station and the mobile station and
23 information used to describe the operation of the mobile station.
- 24 **OLC.** See Overload Control (analog).
- 25 **Optional Field.** A field defined within a message structure that is optionally transmitted
26 to the message recipient.
- 27 **Order.** A type of message that contains control codes for either the mobile station or the
28 base station. See Table 3.7.1.1-1.
- 29 **Overhead Message.** A message sent by the base station on the Paging Channel to
30 communicate base-station-specific, network-wide and system-wide, information to mobile
31 stations.
- 32 **Overload Control (OLC).** A means to restrict reverse analog control channel accesses by
33 mobile stations. Mobile stations are assigned one (or more) of sixteen control levels.
34 Access is selectively restricted by a base station setting one or more OLC bits in *the*
35 *Overload Control Global Action Message*.
- 36 **PACA.** Priority Access and Channel Assignment. See PACA Call.
- 37 **PACA Call.** A priority mobile station originated call for which no traffic channel or voice
38 channel was immediately available, and which has been queued for a priority access
39 channel assignment.

- 1 **Paging.** The act of seeking a mobile station when a call has been placed to that mobile
2 station.
- 3 **Paging Channel (Analog).** See Analog Paging Channel.
- 4 **Parity Check Bits.** Bits added to a sequence of information bits to provide error
5 detection, correction, or both.
- 6 **Power-Down Registration.** An autonomous registration method in which the mobile
7 station registers on power-down.
- 8 **RECC.** See Reverse Analog Control Channel
- 9 **RANDBS.** See Base Station Random Variable
- 10 **Receive Objective Loudness Rating (ROLR).** A perceptually weighted transducer gain of
11 telephone receivers relating electrical excitation from a reference generator to sound
12 pressure at the earphone. The receive objective loudness rating is normally specified in
13 dB relative to one Pascal per millivolt. See [36], [22], [37], and [38].
- 14 **Registration.** The process by which a mobile station identifies its location and
15 parameters to a base station.
- 16 **Release.** A process that the mobile station and base station use to inform each other of
17 call disconnect.
- 18 **Reverse Analog Control Channel (RECC).** The analog control channel used from a
19 mobile station to a base station.
- 20 **Reverse Analog Voice Channel (RVC).** The analog voice channel used from a mobile
21 station to a base station.
- 22 **Roamer.** A mobile station operating in a cellular system (or network) other than the one
23 from which service was subscribed.
- 24 **ROLR.** See Receive Objective Loudness Rating.
- 25 **SAT.** See Supervisory Audio Tone.
- 26 **Scan of Channels.** The procedure by which a mobile station examines the signal strength
27 of each forward analog control channel.
- 28 **SDCC1, SDCC2.** See Supplementary Digital Color Code.
- 29 **Seizure Precursor.** The initial digital sequence transmitted by a mobile station to a base
30 station on a reverse analog control channel.
- 31 **Shared Secret Data (SSD).** A 128-bit pattern stored in the mobile station (in semi-
32 permanent memory) and known by the base station. SSD is a concatenation of two 64-bit
33 subsets: SSD_A, which is used to support the authentication procedures, and SSD_B,
34 which serves as one of the inputs to the process generating the encryption mask and
35 private long code.
- 36 **Short Message Services (SMS).** A suite of services such as SMS Text Delivery, Digital
37 Paging (i.e., Call Back Number - CBN), and Voice Mail Notification (VMN).
- 38 **SID.** See System Identification.

1 **Signaling Tone.** A 10 kHz tone transmitted by a mobile station on an analog voice
2 channel to: 1) confirm orders, 2) signal flash requests, and 3) signal release requests.

3 **SSD.** See Shared Secret Data.

4 **sps.** Symbols per second.

5 **Station Class Mark (SCM).** An identification of certain characteristics of a mobile station.
6 Classes are defined in Table 2.3.3-1 of [26] and Table 2.3.3-1 of [5].

7 **Status Information.** The following status information is used to describe mobile station
8 operation when using the analog system:

- 9 • **Fade Timing Status.** Indicates whether the mobile station's fade timer has expired.
- 10 • **First Idle ID Status.** A status variable used by the mobile station in association
11 with its processing of the Idle Task.
- 12 • **First Location Area ID Status.** A status variable used by the mobile station in
13 association with its processing of received Location Area ID messages.
- 14 • **First Registration ID Status.** A status variable used by the mobile station in
15 association with its processing of received Registration ID messages.
- 16 • **Local Control Status.** Indicates whether a mobile station must respond to local
17 control messages.
- 18 • **Location Registration ID Status.** A status variable used by the mobile station in
19 association with its processing of power-up registrations and location-based
20 registrations.
- 21 • **Roam Status.** Indicates whether a mobile station is in its home system.
- 22 • **Serving-System Status.** Indicates whether a mobile station is tuned to channels
23 associated with System A or System B.
- 24 • **Termination Status.** Indicates whether a mobile station must terminate the call
25 when it is on an analog voice channel.
- 26 • **Update Protocol Capability ID Status.** Indicates whether the mobile station should
27 report its protocol capability to the serving system.

28 **Supervisory Audio Tone (SAT).** One of three tones in the 6 kHz region that is
29 transmitted on the forward analog voice channel by a base station and transponded on the
30 reverse analog voice channel by a mobile station.

31 **Supplementary Digital Color Code (SDCC1, SDCC2).** Additional bits assigned to
32 increase the number of color codes from four to sixty-four, transmitted on the forward
33 analog control channel.

34 **System.** A system is a cellular telephone service or personal communications service that
35 covers a geographic area such as a city, metropolitan region, county, or group of counties.
36 See also Network.

37 **System Identification (SID).** A number uniquely identifying a cellular system.

38 **TOLR.** See Transmit Objective Loudness Rating.

1 **Transmit Objective Loudness Rating (TOLR).** A perceptually weighted transducer gain
2 of telephone transmitters relating sound pressure at the microphone to voltage at a
3 reference electrical termination. It is normally specified in dB relative to one millivolt per
4 Pascal. See [36], [22], [37], and [38].

5 **Unique Challenge Authentication Response (AUTHR).** An 18-bit pattern generated by
6 the authentication algorithm. AUTHU is used to support the Unique Challenge-Response
7 procedure.

8 **Unique Challenge-Response Procedure.** An exchange of information between a mobile
9 station and a base station for the purpose of confirming the mobile station's identity. The
10 procedure is initiated by the base station and is characterized by the use of a challenge-
11 specific random number (i.e., RANDU) instead of the random variable broadcast globally
12 (RAND).

13 **Unique Random Variable (RANDU).** A 24-bit random number generated by the base
14 station in support of the Unique Challenge-Response procedure.

15 **Universal Coordinated Time (UTC).** An internationally agreed-upon time scale
16 maintained by the Bureau International de l'Heure (BIH), used as the time reference by
17 nearly all commonly available time and frequency distribution systems (e.g., WWV, WWVH,
18 LORAN-C, Transit, Omega, and GPS).

19 **VMAC.** See Voice Mobile Attenuation Code.

20 **Voice Channel.** See Analog Voice Channel.

21 **Voice Mobile Attenuation Code (VMAC).** Indicates the mobile station power level
22 associated with the designated analog voice channel.

23 **μs.** Microsecond (10^{-6} second).

24 1.1.2. Numeric Information

25 Numeric information is used to describe the operation of the mobile station. The following
26 subscripts are used to clarify the use of the numeric information:

- 27 • "s" indicates a value stored in a mobile station's temporary memory.
- 28 • "sv" indicates a stored value that varies as a mobile station processes various
29 tasks.
- 30 • "sl" indicates the stored limits on values that vary.
- 31 • "r" indicates a value received by a mobile station over a forward analog control
32 channel or a CDMA Forward Channel.
- 33 • "p" indicates a value set in a mobile station's permanent security and identification
34 memory.
- 35 • "s-p" indicates a value stored in a mobile station's semi-permanent security and
36 identification memory.

1 1.1.2.1. Analog Numeric Information

2 **ACCOLC_p** – A four-bit number used to identify which overload class field controls access
3 attempts.

4 **BIS_s** – Identifies whether a mobile station must check for an idle-to-busy transition on a
5 reverse analog control channel when accessing a system.

6 **BSCAP_s** – The base station core analog roaming protocol received in the Access Type
7 parameters *Global Action Overhead Message*. Indicates the version of the core analog
8 roaming standard supported by the system.

9 **BSPC_s** – The base station protocol capability received in the Access Type parameters
10 *Global Action Overhead Message*. Indicates the analog air interface protocol, such as [26],
11 supported by the system.

12 **CCLIST_s** – The list of analog control channels to be scanned by a mobile station
13 processing the Directed Retry Task (see 2.6.3.14).

14 **CDMA_MODE_s** – Indicates whether the mobile station entered the analog mode of
15 operation.

16 **CMA_s** – The maximum number of channels to be scanned by a mobile station when
17 accessing a system.

18 **COUNT_{s-p}** – A modulo-64 event counter maintained by the mobile station and
19 Authentication Center that is used for clone detection. COUNT_{s-p} is maintained during
20 power off.

21 **CPA_s** – Identifies whether the access functions are combined with the paging functions on
22 the same set of analog control channels.

23 **DCC_s** – A DCC value stored in a mobile station's temporary memory.

24 **DTX_s** – Identifies in which manner the mobile station is permitted to use the
25 discontinuous transmission mode on the analog voice channel.

26 **E_s** – The stored value of the E field sent on the forward analog control channel. E_s
27 identifies whether a home mobile station must send only MIN1_p or both MIN1_p and MIN2_p
28 when accessing the system.

29 **FIRSTCHA_s** – The number of the first analog control channel used for accessing a system.

30 **FIRSTCHD_s** – The number for the first channel used as a dedicated control channel.

31 **FIRSTCHP_p** – The number of the first paging channel used as a paging channel in the
32 mobile station's "home" system.

33 **FIRSTCHP_s** – The number of the first analog control channel used for paging mobile
34 stations.

35 **HOME_SID_p** – Home System Identification. A 15-bit value that identifies the home system
36 for a MIN supported by the mobile station.

37 **IDHO_s** – Idle handoff indicator. Set to enabled to indicate the loss of analog control
38 channel radio coverage during a PACA call.

- 1 **LASTCHA_s** – The number of the last analog control channel used for accessing a system.
- 2 **LASTCHD_s** – The number for the last channel used as a dedicated control channel.
- 3 **LASTCHP_s**– The number of the last analog control channel used for paging mobile
4 stations.
- 5 **LOCAID_s** – The received location area identity.
- 6 **LOCAID_{s-p}** – Identifies the current location area.
- 7 **LRCC_s** – The last registration control channel used by a mobile station.
- 8 **LREG_s** – The stored value of the LREG field received in the most recent *Location Area*
9 *Global Action Message*.
- 10 **LT_s** – Identifies whether the next access attempt is required to be the last try.
- 11 **MAXBUSY_{s1}** – The maximum number of busy occurrences allowed on a reverse analog
12 control channel.
- 13 **MAX_REDIRECT_DELAY_s** – Indicates the maximum delay interval used when a mobile
14 station is redirected from CDMA to analog, in units of 8 seconds.
- 15 **MAXSZTR_{s1}** – The maximum number of seizure attempts allowed on a reverse analog
16 control channel.
- 17 **MIN1_p** – The 24 least significant bits of the 34-bit MIN.
- 18 **MIN2_p** – The ten most significant bits of the 34-bit MIN.
- 19 **MSCAP_p** – The mobile station core analog roaming protocol specifies the version of the
20 core analog roaming standard supported by the mobile station.
- 21 **MSPC_p** – The mobile station protocol capability identifies the analog air interface protocol,
22 such as [26], supported by the mobile station.
- 23 **N_s** – The number of analog paging channels that a mobile station must scan.
- 24 **NBUSY_{sv}** – The number of times a mobile station attempts to seize a reverse analog
25 control channel and finds the reverse control channel busy.
- 26 **NSZTR_{sv}** – The number of times a mobile station attempts to seize a reverse analog
27 control channel and fails.
- 28 **NXTREG_{s-p}** – Identifies when a mobile station must make its next registration to a
29 system.
- 30 **PACA_s** – PACA call indicator. Set to enabled to indicate that the mobile station is waiting
31 for a priority access channel assignment; otherwise set to disabled. $PACA_s = 0$ is
32 equivalent to setting PACA_s to disabled and $PACA_s = 1$ is equivalent to setting PACA_s to
33 enabled.
- 34 **PACA_CANCEL** – PACA call cancel indicator. Set to '1' when the mobile station is directed
35 by the user to cancel the PACA call; otherwise, set to '0'.
- 36 **PACA_SID_s** – PACA system identifier. Equal to the SID of the system on which the mobile
37 station originated a PACA call.

- 1 **PACA_TIMEOUT_s** – PACA state timer duration. Specifies how long the mobile station
2 should wait for a *PACA Message* from the base station.
- 3 **PCI_HOME_s** – Home mobile protocol capability flag. Indicates to the home mobile station
4 whether it shall report its protocol capability when receiving the *Access Type Parameters*
5 *Global Action Overhead Message*.
- 6 **PCI_ROAM_s** – Roaming mobile protocol capability flag. Indicates to the roaming mobile
7 station whether it shall report its protocol capability when receiving the *Access Type*
8 *Parameters Global Action Overhead Message*.
- 9 **PCSID_s** – The stored value of the most recent SID to which the mobile station transmitted
10 the protocol capability registration message.
- 11 **PDREG_s** – The stored value of the PDREG field received in the most recent *Location Area*
12 *Global Action Message*.
- 13 **PL_s** – The mobile station RF power level.
- 14 **PUREG_s** – The stored value of the PUREG field received in the most recent *Location Area*
15 *Global Action Message*.
- 16 **PUREG_{s-p}** – The semi-permanent value of PUREG_s.
- 17 **R_s** – Indicates whether registration is enabled or not.
- 18 **RAND_s** – The stored value of RAND. See 2.3.12.1.2 of [26].
- 19 **RCF_s** – Identifies whether the mobile station must read a *Control Filler Message* before
20 accessing a system on a reverse analog control channel.
- 21 **REGID_s** – The stored value of the last registration number (REGID_r) received on a forward
22 analog control channel.
- 23 **REGINCR_s** – Identifies increments between registrations by a mobile station.
- 24 **S_s** – Identifies whether the mobile station must send its serial number when accessing a
25 system.
- 26 **SCC_s** – A digital number that is stored and used to identify which SAT frequency a mobile
27 station should be receiving.
- 28 **SDCC1_s** – The SDCC value stored in a mobile station's temporary memory.
- 29 **SDCC2_s** – The SDCC value stored in a mobile station's temporary memory.
- 30 **SID_p** – The home system identification stored in the mobile station's permanent security
31 and identification memory.
- 32 **SID_r** – The system identification received on a paging or access channel.
- 33 **SID_s** – The system identification received on a dedicated control channel.
- 34 **SID_{s-p}** – Identifies the system of current (last successful) registration.
- 35 **UPDATE NEXTREG_s**. Indicates whether the mobile station must update NEXTREG_{s-p} after
36 it successfully registers on a new paging channel.

1 **WFOM_s** – Identifies whether a mobile station must wait for an Overhead Message train
2 before accessing a system on a reverse analog control channel.

3 1.1.2.2. CDMA Numeric Information

4 The following are numeric indicators stored by the mobile station in temporary memory.
5 These numeric indicators are primarily used when operating in the CDMA mode; however,
6 they are also used in some manner (e.g., are set) when operating in the analog mode.

7 **ANALOG_CHAN_s** – Analog channel number for CDMA to analog handoff.

8 **REDIRECT_REC_s** – Holds the service redirection criteria specified in the redirection
9 record of the most recently received *Global Service Redirection Message* or *Service*
10 *Redirection Message*.

11 **REDIRECTION_s** – Service redirection indicator. Set to enabled to indicate that service
12 redirection is currently in effect; otherwise set to disabled.

13 **REGISTERED_s** – Mobile station registered indicator.

14 **SID_NID_LIST_s** – Registration SID, NID list. The SID, NID pairs in which the mobile
15 station has registered.

16 **ZONE_LIST_s** – Registration zone list. List of zones in which the mobile station has
17 registered.

18 **1.2. Analog System Tolerances**

19 Unless otherwise specified, all call-processing timers and call-processing timing values
20 have a tolerance of $\pm 10\%$. Refer to [21] and [28] for the analog performance standards,
21 definitions, tolerances, and performance measurement methods.

22 **1.3. Message Forward Compatibility Rules**

23 In the message formats used between the mobile stations and the base stations, some bits
24 are marked as reserved (RSVD). Some or all of these reserved bits may be used in the
25 future for additional messages. Therefore, all mobile stations and base stations shall set
26 all bits that they are programmed to treat as reserved bits to '0' (zero) in all messages that
27 they transmit. All mobile stations and base stations shall ignore the state of all bits that
28 they are programmed to treat as reserved bits in all messages that they receive.

29 If a message body contains additional bits following the bits specified by the formatting
30 requirements of the message, the additional bits shall be ignored.

31 In the specific case of overhead messages on the Forward Control Channel, if the mobile
32 station receives a BCH-code-correct but unrecognizable overhead message (including
33 Global Action Message types), the mobile station shall count the message as part of the
34 train for NAWC-counting purposes, but shall not attempt to execute the message. All
35 other messages and fields of an overhead message train that carries a message type herein
36 indicated as "Reserved" shall be decoded and used as appropriate.

1 Implementers of mobile stations are cautioned that many other functions and features are
2 deployed on the FOCC than those described in this standard. These functions frequently
3 employ bits indicated herein as “Reserved”. Reference may be made to the current version
4 of [35] for details.
5

C.S0006-A

1 No text.

2

3

1 No text.

2. REQUIREMENTS FOR MOBILE STATION ANALOG OPERATION

This section references [26] to describe core analog mode operation. Only those analog capabilities that support CDMA dual-mode operation are described in detail within this document. Subsection numbers in Section 2 of this specification correspond to subsection numbers in [26]. A reference in this specification to a particular subsection in [26] applies to that subsection and all subsequent subsections beneath it; however, text in Section 2 of this specification shall take precedence over any corresponding text in [26].

Mobile stations optionally implementing PACA service in analog mode shall support *PACA Message* and *PACA Cancel* delivery (see 2.6.2, 2.6.3 and 2.7.1) on the control channel.

Mobile stations optionally implementing Short Message Service in the analog mode shall support *Alert With Info SMS* delivery (see 2.6.4 and 2.7.2.1) on the voice channel. In addition, they shall support extended protocol enhanced services operation as defined in Sections 2 and 3 of [7], on the control channel and on the voice channel for messages less than or equal to 32 digits or 14 characters.

2.1. Transmitter

In addition to the requirements in this section, see the corresponding section of [26].

2.1.1. Frequency Parameters

See the corresponding section of [26].

2.1.2. Power Output Characteristics

See the corresponding section of [26].

2.1.3. Modulation Characteristics

In addition to the requirements in this section, see the corresponding section of [26].

2.1.3.1. Voice Signals

The modulator is preceded by the following five voice-processing stages (in the order listed):

1. Transmit Audio Level Adjustment

2. Compressor

3. Pre-emphasis

4. Deviation Limiter

5. Post Deviation-Limiter Filter

1 Pending the generation of a complete speech transmission plan for dual-mode cellular
2 systems, the requirements of 2.1.3.1.1 through 2.1.3.1.5 shall be met to ensure
3 compatibility with the transmission plan for fixed digital speech networks.

4 2.1.3.1.1. Compressor

5 See the corresponding section of [26].

6 2.1.3.1.2. Pre-Emphasis

7 See the corresponding section of [26].

8 2.1.3.1.3. Deviation Limiter

9 See the corresponding section of [26].

10 2.1.3.1.4. Post Deviation-Limiter Filter

11 See the corresponding section of [26].

12 2.1.3.1.5. Transmit Audio Level Adjustment

13 The mobile station shall have a transmit objective loudness rating (TOLR) equal to -46 dB,
14 when transmitting to a reference base station (see 3.2.2.1). The loudness ratings are
15 described in [22]. Measurement techniques are described in [21].

16 2.1.3.2. Wideband Data Signals

17 See the corresponding section of [26].

18 2.1.4. Limitations on Emissions

19 In addition to the requirements in this section, see the corresponding section of [26].

20 2.1.4.1. Bandwidth Occupied

21 See the corresponding section of [26]. Measurement techniques are defined in [21].

22 2.1.4.2. Conducted Spurious Emissions

23 2.1.4.2.1. Suppression Inside Cellular Band

24 See the corresponding section of [26].

25 2.1.4.2.2. Suppression Outside Cellular Band

26 Current FCC rules shall apply.

1 2.1.4.3. Radiated Spurious Emissions

2 Refer to [21].

3 **2.2. Receiver**

4 In addition to the requirements in this section, see the corresponding section of [26].

5 2.2.1. Frequency Parameters

6 See the corresponding section of [26].

7 2.2.2. Demodulation Characteristics

8 In addition to the requirements in this section, see the corresponding section of [26].

9 2.2.2.1. Voice Signals

10 The demodulator is followed by the following three voice-signal processing stages:

- 11 • De-emphasis
- 12 • Expander
- 13 • Receive Audio Level Adjustment

14 Pending the generation of a complete speech transmission plan for dual-mode cellular
15 systems, the requirements of 2.2.2.1.1 through 2.2.2.1.3 shall be met to ensure
16 compatibility with the transmission plan for fixed digital speech networks:

17 2.2.2.1.1. De-Emphasis

18 See the corresponding section of [26].

19 2.2.2.1.2. Expander

20 See the corresponding section of [26].

21 2.2.2.1.3. Receive Audio Level Adjustment

22 The mobile station shall have a nominal receive objective loudness rating (ROLR) equal to
23 51 dB when receiving from a reference base station (see 3.1.3.1). The loudness ratings are
24 described in [22]. Measurement techniques are described in [21].

25 2.2.3. Limitations on Emissions

26 In addition to the requirements in this section, see the corresponding section of [26].

27 2.2.3.1. Conducted Spurious Emissions

28 See the corresponding section of [26].

1 2.2.3.1.1. Suppression Inside Cellular Band

2 See the corresponding section of [26].

3 2.2.3.1.2. Suppression Outside Cellular Band

4 Current FCC rules shall apply.

5 2.2.3.2. Radiated Spurious Emissions

6 Current FCC rules shall apply.

7 2.2.4. Other Receiver Parameters

8 System performance is predicated upon receivers meeting [21].

9 **2.3. Security and Identification**

10 In addition to the requirements in this section, see the corresponding section of [26].

11 2.3.1. Mobile Identification Number

12 Mobile stations operating in the analog mode use the mobile identification number (MIN).
13 Mobile stations operating in the CDMA mode use the International Mobile Station Identity
14 (IMSI). Mobile stations shall have two different identifiers, IMSI_T and IMSI_M (see 2.3.1
15 of [5]).

16 The MIN is a 10-digit (34-bit) number. The MIN consists of a 3-digit (10-bit) part called
17 MIN2, and a 7-digit (24-bit) part called MIN1. MIN2 corresponds to the most significant
18 three digits of MIN, and MIN1 corresponds to the least significant seven digits of MIN. The
19 MIN shall be equal to IMSI_M_S (see 2.1.1.3 of [4]).

20 The mobile station shall have memory to store a MIN. The 10-bit MIN2 shall be equal to
21 IMSI_M_S2_p and the 24-bit MIN1 shall be equal to IMSI_M_S1_p.

22 2.3.2. Electronic Serial Number (ESN)

23 See 2.3.2 of [5].

24 2.3.3. Station Class Mark

25 See the corresponding section of [26]. See 2.3.3 of [5] for information regarding SCM when
26 operating in the CDMA mode.

27 2.3.4. Registration Memory

28 In addition to the requirements in this section, see the corresponding section of [26]. See
29 2.3.4 of [5] for operation in the CDMA mode.

1 2.3.5. Access Overload Class

2 In addition to the requirements in this section, see the corresponding section of [26]. See
3 2.3.5 of [5] for operation in the CDMA mode.

4 2.3.6. Extended Address Method

5 See the corresponding section of [26].

6 2.3.7. First Paging Channel

7 See the corresponding section of [26].

8 2.3.8. Home System Identification

9 In addition to the requirements in this section, see the corresponding section of [26].

10 Note: the indicator HOME_SID_p is used to identify the home system during analog
11 operation, and is equivalent to the indicator SID_p defined in [26]. The requirements in
12 [26] for SID_p apply to HOME_SID_p for operation in the analog mode.

13 2.3.9. Local Control Option

14 See the corresponding section of [26].

15 2.3.10. Preferred Operation Selection

16 See 2.3.10 of [5].

17 2.3.11. Discontinuous Transmission

18 See the corresponding section of [26].

19 2.3.12. Authentication, Encryption of Signaling Information/User Data

20 In addition to the requirements in this section, see the corresponding section of [26].

21 2.3.12.1. Authentication

22 In addition to the requirements in this section, see the corresponding section of [26].

23 2.3.12.1.1. Shared Secret Data (SSD)

24 See 2.3.12.1.1 of [5].

25 2.3.12.1.2. Random Challenge Memory (RAND)

26 See the corresponding section of [26].

1 2.3.12.1.3. Call History Parameter (COUNT_{S-P})

2 In addition to the requirements in this section, see the corresponding section of [26].
3 See 2.3.12.1.3 for information regarding COUNT_{S-P} when operating in the CDMA mode.

4 2.3.12.1.4. Authentication of Mobile Station Registrations

5 See the corresponding section of [26].

6 2.3.12.1.5. Unique Challenge-Response Procedure

7 See the corresponding section of [26].

8 2.3.12.1.6. Authentication of Mobile Station Originations

9 See the corresponding section of [26].

10 2.3.12.1.7. Authentication of Mobile Station Terminations

11 See the corresponding section of [26].

12 2.3.12.1.8. Updating the Shared Secret Data (SSD)

13 See the corresponding section of [26].

14 2.3.12.1.9. Authentication Procedures

15 See the corresponding section of [26].

16 2.3.12.2. Signaling Message Encryption

17 In an effort to enhance the authentication process, and to protect sensitive subscriber
18 information (e.g., PINs), provisions have been made to allow for the encryption of a select
19 subset of FVC and RVC signaling messages. For messages defined in this specification,
20 see 2.7.2.1 and 3.7.2.1 for the list of messages and fields to be encrypted. For optional
21 enhanced protocol messages and narrow analog mode messages, see Annex A of [7] for the
22 list of messages and fields to be encrypted.

23 Consult [23] section 2.5 for a description of how the algorithm is initialized and applied.

24 2.3.12.2.1. Signaling Message Encryption Control

25 Signaling message encryption is controlled on a per-call basis. The default value is “off.”
26 Signaling message encryption is deactivated at the beginning of each call. The mobile
27 station support for a signaling message encryption algorithm is reported to the base
28 station in the ENCRYPTION_SUPPORTED field of the PCI Report Word of the Reverse
29 Analog Control Channel message (See 2.7.1.1). To activate signaling message encryption
30 for a mobile station assigned to an analog voice channel, the base station must send a
31 *Message Encryption Mode Order* with the Order Qualifier field set to ‘001’ for the basic

1 encryption or to '010' for the enhanced encryption. Signaling message encryption can also
2 be activated during CDMA-to-analog handoff by the base station sending an *Analog*
3 *Handoff Direction Message* with the MEM field set equal to '1', if the encryption algorithm
4 to be used on the Analog Voice Channel is the same as was used on the CDMA Traffic
5 Channel. Alternatively, if a different algorithm is to be used after the CDMA-to-analog
6 handoff, signaling message encryption shall be deactivated by the base station prior to the
7 handoff, and activated again on the Analog Voice Channel by sending *the Message*
8 *Encryption Mode Order*.

9 The data used to initialize the algorithm is computed based upon parameters in effect at
10 the time the AUTHR appended to the origination/page response message was computed
11 (see 2.3.12.1.6 and 2.3.12.1.7 of [26]). For a call initiated via the CDMA Access Channel,
12 the data used to initialize the algorithm is computed based upon parameters in effect at
13 the time the AUTHR was computed for the *Origination Message* or *Page Response Message*
14 (see 2.1.1.1.2.2 of [4]).

15 Once activated, signaling message encryption can be deactivated by the base station by
16 sending a *Message Encryption Mode Order* with the Order Qualifier field set to '000'.

17 In all cases both the base station and mobile station shall continue to operate in their
18 present mode until the message sent to the mobile station has been properly
19 acknowledged.

20 **2.4. Supervision**

21 See the corresponding section of [26].

22 **2.5. Malfunction Detection**

23 See the corresponding section of [26].

24 **2.6. Call Processing**

25 In addition to the requirements in this section, see the corresponding section of [26].

26 The following sections describe mobile station operation as controlled by a base station.
27 Frequent references are made to the corresponding sections in the base station section
28 and to the messages that flow between a base station and a mobile station. It is helpful to
29 read 2.6 and 3.6 in parallel and examine the message formats in 2.7 and 3.7 at the same
30 time.

31 When power is applied to a mobile station, it shall enter the *System Determination Substate*
32 of the *Mobile Station Initialization State* with a power-up indication (see 2.6.1.1 of [5]).

33 **2.6.1. Initialization**

34 **2.6.1.1. Retrieve System Parameters**

35 If the First-Idle ID status is enabled (see 2.6.1.1 of [5]), the mobile station must:

- 1 • Set the Location-Registration ID status to enabled.
- 2 • Set the first-registration ID status to enabled.
- 3 • Set the first-location-area ID status to enabled.
- 4 • Set the Update Protocol Capability ID status to disabled.
- 5 • Set $PUREG_S = 0$, $PDREG_S = 0$, $LREG_S = 0$, $LRCC_S = 0$, $RAND_S = 0$, $IDHO_S = 0$,
- 6 $PACA_S = \text{disabled}$, $PCSID_S = 0$, $BSPC_S = 0$, $BSCAP_S = 0$, $PCI_HOME_S = 0$,
- 7 $PCI_ROAM_S = 0$, $SID_S = 0$, and $SID_R = 0$.

8 If the First-Idle ID status is disabled (see 2.6.1.1 of [5]), $PACA_S = \text{enabled}$, and this task is
 9 entered as a result of loss of Control Channel Radio Link or as a result of the mobile
 10 station selecting a different Control Channel, the mobile station must set $IDHO_S = 1$.

11 The mobile station must then set the serving-system status according to the following
 12 algorithm:

- 13 • If $SERVSYS_S = \text{SYS_A}$, set the serving-system status to enabled.
- 14 • If $SERVSYS_S = \text{SYS_B}$, set the serving-system status to disabled.

15 The mobile station must then enter the Scan Dedicated Control Channels Task
 16 (see 2.6.1.1.1).

17 2.6.1.1.1. Scan Dedicated Control Channels

18 If SID_R is not equal to SID_S , the mobile station shall set registration increment ($REGINCR_S$)
 19 to its default value of 450, set the first-location-area ID status to enabled, set $LRCC_S = 0$
 20 and set $RAND_S = 0$.

21 If the serving-system status is enabled, a mobile station must:

- 22 • Set $FIRSTCHD_S$ to the first dedicated control channel for System A
 23 (834.990 MHz/879.990 MHz).
- 24 • Set $LASTCHD_S = FIRSTCHD_S - 21 + 1$.

25 If the serving-system status is disabled, a mobile station must:

- 26 • Set $FIRSTCHD_S$ to the first dedicated control channel for System B
 27 (835.020 MHz/880.020 MHz).
- 28 • Set $LASTCHD_S = FIRSTCHD_S + 21 - 1$.

29 The mobile station must examine the signal strength on each of the channels $FIRSTCHD_S$
 30 to $LASTCHD_S$.

31 The mobile station must then enter the Update Overhead Information Task (see 2.6.1.1.2).

32 2.6.1.1.2. Update Overhead Information

33 Overhead messages are sent in a group called an overhead message train (see 3.7.1.2).
 34 The mobile station must use the value given in the number of additional words coming
 35 (NAWC) field of the *System Parameter Overhead Message* in the train to determine that all

1 messages of the train have been received. The END field must be used as a cross-check.
 2 For NAWC counting purposes, inserted control filler messages (see 3.7.1) must not be
 3 counted as part of the overhead message train.

4 If the mobile station receives a BCH-code-correct but unrecognizable *System Parameter*
 5 *Overhead Message*, the mobile station must count that message as part of the train for
 6 NAWC counting purposes, but must not attempt to execute the message.

7 The mobile station must tune to the strongest dedicated control channel and, within 3
 8 seconds, receive a *System Parameter Overhead Message* (see 3.7.1.2) and update the
 9 following numeric information:

- 10 • System identification (SID_S). Set the 14 most significant bits of SID_S to the value of
 11 the SID 1 field. Set the least significant bit of SID_S to '1', if the serving-system
 12 status is enabled; otherwise, set the bit to '0'.
- 13 • Number of paging channels (N_S). Set N_S to 1 plus the value of the N - 1 field.
- 14 • First paging channel ($FIRSTCHP_S$). Set $FIRSTCHP_S$ according to the following
 15 algorithm:
 16 – If $SID_S = HOME_SID_P$, $FIRSTCHP_S = FIRSTCHP_P$
 17 – If SID_S is not equal to $HOME_SID_P$, $FIRSTCHP_S = FIRSTCHD_S$
- 18 • Last paging channel ($LASTCHP_S$). Set $LASTCHP_S$ according to the following
 19 algorithm:
 20 – If the serving-system status is enabled, $LASTCHP_S = FIRSTCHP_S - N_S + 1$.
 21 – If the serving-system status is disabled, $LASTCHP_S = FIRSTCHP_S + N_S - 1$.

22 If $REDIRECTION_S = \text{enabled}$, and if the $EXPECTED_SID$ field of $REDIRECT_REC_S$ is not
 23 equal to 0, and if SID_S is not equal to $EXPECTED_SID$, the mobile station must enter the
 24 *System Determination Substate of the Mobile Station Initialization State* with a wrong system
 25 indication (see 2.6.1.1 of [5]). Otherwise, if SID_T is not equal to SID_S , the mobile station
 26 shall set registration increment ($REGINCR_S$) to its default value of 450, set the first-
 27 registration ID status to enabled, set the first-location-area ID status to enabled, set
 28 $LRCC_S = 0$, set $PACA_S = \text{disabled}$, and set $RAND_S = 0$. If SID_T is not equal to SID_S and
 29 $PACA_S = \text{enabled}$, the mobile station must set $PACA_S = \text{disabled}$, and must indicate to the
 30 user that the PACA call has been canceled.

31 The mobile station must then enter the Paging Channel Selection Task (see 2.6.1.2).

32 If the mobile station cannot complete this task on the strongest dedicated control channel,
 33 it shall tune to the second strongest dedicated control channel and attempt to complete
 34 this task within a second 3-second interval. If it cannot complete this task on either of the
 35 two strongest control channels, the mobile station must enter the *System Determination*
 36 *Substate of the Mobile Station Initialization State* with an acquisition failure indication (see
 37 2.6.1.1 of [5]).

2.6.1.2. Paging Channel Selection

2.6.1.2.1. Scan Paging Channels

See the corresponding section of [26].

2.6.1.2.2. Verify Overhead Information

The mobile station must set the Wait-for-Overhead-Message bit (WFOM_S) to '0'; the mobile station must then tune to the strongest paging channel and, within 3 seconds, receive an overhead message train (see 3.7.1.2) and update the following:

- System identification: Set the 14 most significant bits of SID_R to the value of the SID1 field. Set the least significant bit of SID_R to '1', if the serving-system status is enabled; otherwise, set the bit to '0'.
- ROAM status: The mobile station must compare the received system identification (SID_R) with the stored system identification (SID_S). If SID_R = SID_S, the mobile station must compare SID_S with HOME_SID_P. If HOME_SID_P = SID_S, the mobile station must set the ROAM status to disabled. If HOME_SID_P is not equal to SID_S, the mobile station must set the ROAM status to enabled. If SID_R is not equal to SID_S and PACA_S = enabled, the mobile station must set PACA_S = disabled, and must indicate to the user that the PACA call has been canceled. If SID_R is not equal to SID_S, the mobile station must enter the *System Determination Substate* of the *Mobile Station Initialization State* with a new system indication (see 2.6.1.1 of [5]).
- Local control status: If the local control option is enabled within the mobile station (see 2.3.9) and the bits of the home system identification (HOME_SID_P) that comprise the group identification match the corresponding bits of SID_S, then the local control status must be enabled; otherwise, the local control status must be disabled.
- Power-Up Registration: If SID_R ≠ SID_{S-P} the mobile station shall set PUREG_{S-P} to '0'.

If the Initialization Task was entered with an origination or page response indication, the mobile station must also update the following numeric values:

- Serial number bit (S_S): Set S_S to the value in the S field.
- Registration bit (R_S): If the roam status is disabled, set R_S to the value of the REGH field; if the roam status is enabled, set R_S to the value of the REGR field.
- Extended address bit (E_S): Set E_S to the value in the E field.
- Authentication bit (AUTH_S): Set AUTH_S to the value in the AUTH field.
- Discontinuous transmission bit (DTX_S): Set DTX_S to the value of the DTX field.
- Number of paging channels (N_S): Set N_S to 1 plus the value of the N-1 field.
- Read-control-filler bit (RCF_S): Set RCF_S to the value of the RCF field.
- Combined paging/access bit (CPA_S): Set CPA_S to the value of the CPA field.

- 1 • Number of access channels (C_{MAX_S}): Set C_{MAX_S} to 1 plus the value of the CMAX-
- 2 1 field.
- 3 • Determine control channel boundaries for accessing the system ($FIRSTCHA_S$ and
- 4 $LASTCHA_S$) by using the following algorithm:
- 5 – If the serving-system status is enabled,
- 6 + If $CPA_S = 1$, set $FIRSTCHA_S$ to $FIRSTCHP_S$ for System A.
- 7 + If $CPA_S = 0$, set $FIRSTCHA_S$ to $FIRSTCHP_S$ for System A minus N_S .
- 8 + $LASTCHA_S = FIRSTCHA_S - C_{MAX_S} + 1$.
- 9 – If the serving-system status is disabled,
- 10 + If $CPA_S = 1$, set $FIRSTCHA_S$ to $FIRSTCHP_S$ for System B.
- 11 + If $CPA_S = 0$, set $FIRSTCHA_S$ to $FIRSTCHP_S$ for System B plus N_S .
- 12 + $LASTCHA_S = FIRSTCHA_S + C_{MAX_S} - 1$.

13 If the Initialization Task was entered with an origination indication, the mobile station

14 must enter the System Access Task with an origination indication (see 2.6.3).

15 If the Initialization Task was entered with a page response indication, the mobile station

16 must enter the System Access Task with a page response indication (see 2.6.3).

17 If the Initialization Task was entered with a wait-for-page indication, the mobile station

18 must enter the Idle Task with a wait-for-page indication (see 2.6.2).

19 Otherwise, the mobile station must enter Idle at the Response to Overhead Information

20 Task (see 2.6.2.1).

21 If the mobile station cannot complete this task on the strongest paging channel, it may

22 tune to the second strongest paging channel and attempt to complete this task within a

23 second 3-second interval. If it cannot complete this task on either of the two strongest

24 control channels, the mobile station must enter the *System Determination Substate* of the

25 *Mobile Station Initialization State* with an acquisition failure indication (see 2.6.1.1 [5]).

2.6.2. Idle

During the Idle Task, a mobile station must execute each of the following (sub)tasks (see 2.6.2.1, 2.6.2.2, 2.6.2.3, 2.6.2.4, 2.6.2.5, and 2.6.2.5) at least every 46.3 ms, the periodicity of word blocks on the forward control channel. If the Idle Task was entered with a wait-for-page indication, the mobile station must not enter the *System Determination Substate* of the *Mobile Station Initialization State* (see 2.6.1.1 of [5]) for at least 6 seconds after entering the Idle Task. If at any time during the Idle Task the redirect delay timer expires, the mobile station must exit this task and enter the System Access Task with a registration indication (see 2.6.3). Otherwise, if the mobile station is not listening to a control channel of the preferred system and REDIRECTION_S = disabled and PACA_S = disabled, it may exit this task and enter the *System Determination Substate* of the *Mobile Station Initialization State* with a reselection indication (see 2.6.1.1 of [5]).

2.6.2.1. Response to Overhead Information

Whenever a mobile station receives an overhead message train (see 3.7.1.2), the mobile station compare SID_S with SID_R. If SID_R is not equal to SID_S and PACA_S = enabled, the mobile station must set PACA_S = disabled, and must indicate to the user that the PACA call has been canceled. If SID_S is not equal to SID_R, the mobile station must exit the Idle Task and enter the *System Determination Substate* of the *Mobile Station Initialization State* with a new system indication (see 2.6.1.1 of [5]).

If SID_S = SID_R, the mobile station shall update the following numeric values using information contained in the *System Parameter Overhead Message*:

- Extended Protocol Indicator: If the mobile station is equipped for the optional Extended Protocol, set EP_S to the value of the EP field.
- Serial number bit (S_S): Set S_S to the value in the S field.
- Registration bit (R_S): If the roam status is disabled, set R_S to the value of the REGH field; if the roam status is enabled, set R_S to the value of the REGR field.
- Extended address bit (E_S): Set E_S to the value in the E field.
- Authentication bit (AUTH_S): Set AUTH_S to the value in the AUTH field.
- Discontinuous transmission bit (DTX_S): Set DTX_S to the value of the DTX field.
- Number of paging channels (N_S): Set N_S to 1 plus the value of the N - 1 field.
- Read-control-filler bit (RCF_S): Set RCF_S to the value of the RCF field.
- Combined paging/access bit (CPA_S): Set CPA_S to the value of the CPA field.
- Number of access channels (CMAX_S): Set CMAX_S to 1 plus the value of the CMAX - 1 field.
- Determine control channel boundaries for accessing the system (FIRSTCHA_S and LASTCHA_S) by using the following algorithm:
 - If the serving-system status is enabled,

- 1 + If $CPA_S = 1$, set $FIRSTCHA_S$ to $FIRSTCHP_S$ for System A.
- 2 + If $CPA_S = 0$, set $FIRSTCHA_S$ to $FIRSTCHP_S$ for System A minus N_S .
- 3 + $LASTCHA_S = FIRSTCHA_S - CMAX_S + 1$.
- 4 – If the serving-system status is disabled,
 - 5 + If $CPA_S = 1$, set $FIRSTCHA_S$ to $FIRSTCHP_S$ for System B.
 - 6 + If $CPA_S = 0$, set $FIRSTCHA_S$ to $FIRSTCHP_S$ for System B plus N_S .
 - 7 + $LASTCHA_S = FIRSTCHA_S + CMAX_S - 1$.

8 If $SID_S = SID_{S-p}$, $PUREG_{S-p} = 1$, and if the First-Idle ID status is enabled, the mobile
 9 station shall initiate an autonomous registration by entering the System Access Task (see
 10 2.6.3) with a registration indication.

11 If $SID_S = SID_{S-p}$, $PACA_S = \text{enabled}$, and if $IDHO_S = 1$, the mobile station must enter the
 12 System Access Task (see 2.6.3) with a PACA response indication to re-originate the PACA
 13 call.

14 If the Update Protocol Capability ID status is enabled, and if $PCSID_S = SID_S$, the mobile
 15 station shall initiate protocol capability registration by entering the System Access Task
 16 (see 2.6.3) with a capability registration indication.

17 The mobile station must then respond as indicated to each of the following messages, if
 18 received in the overhead message train. The order in which the mobile station must
 19 respond to the messages, if two or more are received, is given by their order in the
 20 following list:

- 21 1. *Local Control Messages*: See the corresponding section of [26].
- 22 2. *Access Type Parameters Message*: See the corresponding section of [26].
- 23 3. *New Access Channel Set Message*: See the corresponding section of [26].
- 24 4. *Registration Increment Message*: See the corresponding section of [26].
- 25 5. *Location Area Message*: See the corresponding section of [26].
- 26 6. *Random Challenge A Message*: See the corresponding section of [26].
- 27 7. *Random Challenge B Message*: See the corresponding section of [26].
- 28 8. *Registration ID Message*: If $R_S = 1$, the mobile station must perform the following:
 - 29 • If this message is received while first-idle ID status is disabled, and if location-
 30 registration ID status is disabled, and if first-registration ID status is enabled,
 31 and if first-location-area ID status is enabled, and if the mobile station is
 32 tuned to a control channel different from $LRCC_S$, then the mobile station shall
 33 set first-registration ID status to disabled.

- 1 • The mobile station must set $REGID_S$ to the value of the $REGID$ field of the
2 received message. If the first-registration ID status is enabled, and if the
3 location-registration ID status is disabled, $SID_S = SID_{S-p}$, $DIGITAL_REG_{S-p} =$
4 '00000000', and $CDMA_MODE_p = '0'$, the mobile station must perform the
5 following:
- 6 – Set the first-registration ID status to disabled (see 2.6.1.1.2).
7 – If autonomous registration is enabled, the mobile station must enter the
8 Autonomous Registration Update Task (see 2.6.3.11), supplying a success
9 indication.
10 – The mobile station shall continue to process information in the overhead
11 message stream.
- 12 Otherwise, the mobile station shall set the first-registration ID status to
13 disabled (see 2.6.1.1.2) and proceed as follows:
- 14 • If $DIGITAL_REG_{S-p} = '00000001'$, the mobile station must perform the
15 following:
- 16 – Set $DIGITAL_REG_{S-p} = '00000000'$
17 – If autonomous registration is enabled, the mobile station shall set the first-
18 registration ID status to disabled (see 2.6.1.1.2) and then enter the System
19 Access Task with a registration indication (see 2.6.3)
- 20 • If SID_S equals the SID_{S-p} value stored in the registration memory or if
21 $CDMA_MODE_S = 1$, the mobile station must perform the following:
- 22 – If $CDMA_MODE_S = 1$, the mobile station must perform the following:
- 23 + Set $CDMA_MODE_S = 0$.
24 + Generate a random number distributed uniformly in the interval 0 to
25 $8 \square MAX_REDIRECT_DELAY_S$ seconds, and if quantized, with
26 granularity no greater than 1 ms. The mobile station must set its
27 redirect delay timer to this random number and must continue to
28 process messages in the overhead message train.
- 29 – Otherwise, if the redirect delay timer is inactive, the mobile station must
30 perform the following:
- 31 – The mobile station must use the following (or an equivalent) algorithm to
32 review the $NXTREG_{S-p}$ associated with the SID_{S-p} to determine if $REGID_S$
33 has cycled through zero:
- 34 + If $UPDATE_NEXTREG_S = 1$, set $NXTREG_{S-p}$ to $REGID_S + REGINCR_S$ and
35 reset $UPDATE_NEXTREG_S$ to 0.
36 + If $NXTREG_{S-p}$ is greater than or equal to $REGID_S + REGINCR_S + 5$, then
37 $NXTREG_{S-p}$ must be replaced by the greater of 0 or $NXTREG_{S-p} - 2^{20}$.
38 + Otherwise do not change $NXTREG_{S-p}$.

- 1 – The mobile station must then compare $REGID_S$ with the $NXTREG_{S-p}$
2 associated with the SID_{S-p} .
- 3 + If $REGID_S$ is greater than or equal to $NXTREG_{S-p}$ and if autonomous
4 registration is enabled, the mobile station must set the first-registration
5 ID status to disabled (see 2.6.1.1.2) and then enter the System Access
6 Task with a registration indication (see 2.6.3).
- 7 + If $REGID_S$ is greater than or equal to $NXTREG_{S-p}$ and if autonomous
8 registration is not enabled, then set $NXTREG_{S-p}$ equal to $REGID_S$.
- 9 + Otherwise, the mobile station must ignore the message and continue to
10 process messages in the overhead message train.
- 11 • If SID_S is not equal to the SID_{S-p} value stored in the registration memory, the
12 mobile station must perform the following:
- 13 – If autonomous registration is enabled, the mobile station shall set the first-
14 registration ID status to disabled (see 2.6.1.1.2). The mobile station shall
15 then enter the System Access Task with a registration indication supplied
16 (see 2.6.3).
- 17 – Otherwise, the mobile station must ignore the message and continue to
18 process messages in the overhead message train.

19 9. *CDMA Capability Message*: The mobile station must perform the following:

- 20 • If $PACA_S =$ enabled or the mobile station entered this task with a wait-for-page
21 indication, the mobile station should ignore the *CDMA Capability Message* and
22 continue to process messages in the overhead message train.
- 23 • If $CDMA_AVAIL$ equals '1', and if $REDIRECTION_S$ equals disabled, and if the
24 preferred mode of operation is CDMA, the mobile station may exit this task and
25 enter the *System Determination Substate* of the *Mobile Station Initialization State*
26 with a CDMA available indication (see 2.6.1.1 of [5]).
- 27 • If $CDMA_AVAIL$ equals '1', and if $REDIRECTION_S$ equals enabled, and if the
28 $IGNORE_CDMA$ field of $REDIRECT_REC_S$ equals '0', and if the preferred mode of
29 operation is CDMA, the mobile station may exit this task and enter the *System*
30 *Determination Substate* of the *Mobile Station Initialization State* with a CDMA
31 available indication (see 2.6.1.1 of [5]).
- 32 • If ADD_CDMA_AVAIL equals '1', and if $REDIRECTION_S$ equals disabled, and if
33 the preferred mode of operation is CDMA, the mobile station may exit this task
34 and enter the System Access Task with a CDMA query indication (see 2.6.3).
- 35 • If ADD_CDMA_AVAIL equals '1', and if $REDIRECTION_S$ equals enabled, the
36 $IGNORE_CDMA$ field of $REDIRECT_REC_S$ equals '0', and if the preferred mode of
37 operation is CDMA, the mobile station may exit this task and enter the System
38 Access Task with a CDMA query indication (see 2.6.3).

- 1 • If the mobile station has previously attempted and failed to acquire a CDMA
2 system five consecutive times as a result of receiving a *CDMA Capability*
3 *Message*, the mobile station shall ignore the *CDMA Capability Message* until
4 immediately before the next autonomous registration attempt or until the next
5 mobile station power-up.
- 6 • If REDIRECTION_S equals enabled, and if the IGNORE_CDMA field of
7 REDIRECT_REC_S equals '1', the mobile station shall ignore the *CDMA Capability*
8 *Message*.

9 10. *Rescan Message*: See the corresponding section of [26].

10 11. Any Other Message (including messages and global action types herein defined as
11 "Reserved"): Use the message for NAWC-counting, but do not attempt to execute
12 the message.

13 2.6.2.2. Page Match

14 The mobile station must monitor mobile station control messages for page messages (see
15 3.7.1.1).

- 16 • If the ROAM status is disabled, the mobile station must attempt to match MIN1_P to
17 MIN1_R for one-word messages and both MIN1_P and MIN2_P to MIN1_R and MIN2_R,
18 respectively, for two-word messages. All decoded MIN bits must match to cause
19 the mobile station to respond to the message.
- 20 • If the ROAM status is enabled, the mobile station must attempt to match both
21 MIN1_P and MIN2_P to MIN1_R and MIN2_R, respectively. All decoded MIN bits must
22 match to cause the mobile station to respond to the order.

23 When a match occurs,

- 24 • If PACA_S = enabled, the mobile station must set PACA_S = disabled and must
25 indicate to the user that the PACA call has been canceled.
- 26 • The mobile station must enter the System Access Task with a page response
27 indication (see 2.6.3).

28 2.6.2.3. Order

29 In addition to the requirements described in the corresponding section of [26], the mobile
30 station must respond to the following order as described below:

- 31 • *PACA Message*: If PACA_S = disabled, the mobile station must ignore the message.
32 If PACA_S = enabled, the mobile station must perform the following:
 - 33 – If the message is a response to an *Origination Order* (PURPOSE_R = '0000'), the
34 mobile station must ignore the message.
 - 35 – If the message is to provide the queue position of the PACA call (PURPOSE_R =
36 '0001'), the mobile station must indicate to the user that the PACA call is still
37 queued, and must indicate the current queue position (Q_POS_R) of the call.
38 The mobile station shall remain in the current task.

- 1 – If the message is to instruct the mobile station to re-originate the PACA call
 2 (PURPOSE_r = '0010'), the mobile station must enter the System Access Task
 3 (see 2.6.3) with a PACA response indication and re-originate the PACA call.
 4 – If the message is to cancel the PACA call (PURPOSE_r = '0011'), the mobile
 5 station must set PACA_s = disabled, indicate to the user that the PACA call has
 6 been canceled, and enter the Serving System Determination Task (see
 7 2.6.3.12).

8 2.6.2.4. Call Initiation

9 When the user initiates a call, the mobile station must perform the following:

- 10 • If PACA_s = enabled, the mobile station must set PACA_s = disabled and must
 11 indicate to the user that the PACA call has been canceled.
 12 • The System Access Task (see 2.6.3) must be entered with an origination indication.

13 2.6.2.5. Power Down

14 2.6.2.6. Reserved

15 See the corresponding section of [26].

16 2.6.2.7. PACA Cancellation

17 The mobile station PACA Cancel Operation is performed when the user directs the mobile
 18 station to cancel the PACA call.

19 If PACA_s = enabled, the mobile station must perform the following:

- 20 • Set PACA_s = disabled,
 21 • Indicate to the user that the PACA call has been canceled,
 22 • Enter the System Access Task (see 2.6.3) with a PACA cancel indication.

23 2.6.3. System Access

24 2.6.3.1. Set Access Parameters

25 If a mobile station powers down occurs during a system access, and if PDREG_s = 1, the
 26 mobile station must terminate its access procedures and initiate an autonomous
 27 registration by continuing this task (see 2.6.3) with a power down registration indication.

28 When the System Access Task is started, a timer, called the access timer, must be set as
 29 follows:

- 30 • If this is an origination or PACA response, set to a maximum of 12 seconds.
 31 • If this is a page response or PACA cancel, set to a maximum of 6 seconds.
 32 • If this is an order response, set to a maximum of 6 seconds.

- 1 • If this is a registration other than power down registration, set to a maximum of 6
- 2 seconds.
- 3 • If this is a power down registration, set to a maximum of 3 seconds.
- 4 • If this is a Base Station Challenge, set to a maximum of 12 seconds.
- 5 • If this is a CDMA query, set to a maximum of 6 seconds.

6 The mobile station must set $IDHO_S = 0$, and set the last-try code (LT_S) to '0', set

7 $UPDATE_NEXTREG_S$ to '0', and then enter the Scan Access Channels Task (see 2.6.3.2).

8 2.6.3.2. Scan Access Channels

9 See the corresponding section of [26].

10 2.6.3.3. Retrieve Access Attempt Parameters

11 The mobile station must set the maximum number of seizure attempts allowed

12 ($MAXSZTR_S$) to a maximum of 10, and the maximum number of busy occurrences

13 ($MAXBUSY_S$) to a maximum of 10.

14 The mobile station must then initialize the following variables to zero:

- 15 • Number of busy occurrences ($NBUSY_{SV}$)
- 16 • Number of unsuccessful seizure attempts ($NSZTR_{SV}$)

17 The mobile station must then examine the read control-filler bit (RCF_S).

- 18 • If $RCF_S = 0$, the mobile station must then within 400 ms (+100 ms, -0 ms) set DCC_S
- 19 to the value in the DCC field of a received message, set $SDCC1_S$ and $SDCC2_S$ to 0,
- 20 and set the power level (PL_S) to 0.
- 21 • If $RCF_S = 1$, the mobile station must then, within 1000 ms (+100 ms, -0 ms), read
- 22 a *Control-Filler Message*, set DCC_S , $WFOM_S$, $SDCC1_S$ and $SDCC2_S$ to the values in
- 23 the DCC, WFOM, SDCC1 and SDCC2 fields of the message, respectively, and set
- 24 PL_S to the power level given by Table 2.1.2-1 of [26] for the value of the CMAC field
- 25 of the message and the mobile station power class (see 2.3.3 of [5]).

26 If the DCC field or the *Control-Filler Message* is not received within the time allowed, then

27 the mobile station must examine the access timer. If the access timer has expired, the

28 mobile station must enter the Serving-System Determination Task (see 2.6.3.12). If the

29 access timer has not expired, the mobile station must enter the Alternate Access Channel

30 Task (see 2.6.3.13).

31 The mobile station must then set BIS_S to '1' and examine the $WFOM_S$ bit.

- 32 • If $PACA_S = \text{enabled}$ or if $WFOM_S = 1$, the mobile station must enter the Update
- 33 Overhead Information Task (see 2.6.3.4).

- 1 • If $WFOM_S = 0$, the mobile station must wait for a random delay. Each time it waits
2 for a random delay, a random delay must be generated with the time uniformly
3 distributed in the interval 0 to 92 ± 1 ms and, if quantized, with granularity no more
4 than 1 ms. The mobile station must then enter the Seize Reverse Control Channel
5 Task (see 2.6.3.5).

6 2.6.3.4. Update Overhead Information

7 If this task is not completed within 1.5 seconds, the mobile station must exit this task and
8 enter the Serving-System Determination Task (see 2.6.3.12). If the Update Overhead
9 Information Task is completed, the mobile station must enter the Seize Reverse Control
10 Channel Task (see 2.6.3.5).

11 The mobile station must receive an overhead message train (see 3.7.1.2).

- 12 • Authentication bit ($AUTH_S$): Set $AUTH_S$ to the value in the AUTH field.
- 13 • Extended Protocol bit (EP_S): If the mobile station is capable of supporting Extended
14 Protocol, set EP_S to the value in the EP field.

15 If the access is a registration, an origination, a PACA response, or a page response, the
16 mobile station shall perform the following:

- 17 • Update System Identification (SID_R). Set the 14 most significant bits of SID_R to the
18 value of the SID1 field. Set the least significant bit of SID_R to '1' if the serving-
19 system status is enabled; otherwise, set the bit to '0'.
- 20 • If the access is a registration, the mobile station must compare SID_R with SID_S . If
21 SID_R is not equal to SID_S , the mobile station must exit the Update Overhead
22 Information Task and enter the Serving System Determination Task (see 2.6.3.12).
23 Otherwise, the mobile station shall continue to process this task.
- 24 • If this access is an origination or a page response, the mobile station must
25 compare SID_R with SID_{S-p} . If SID_R does not equal SID_{S-p} , the mobile station must
26 set $RAND_S$ equal to zero.
- 27 • If the access is a PACA response and if SID_R is not equal to SID_S and if $PACA_S =$
28 enabled, the mobile station must set $PACA_S =$ disabled and must indicate to the
29 user that the PACA call has been canceled. The mobile station must enter the
30 Serving System Determination Task (see 2.6.3.12).

31 The mobile station must act as indicated below in response to the following global action
32 messages, if received in the message train:

- 33 • *Overload Control Message:*
 - 34 – If this access is an origination, the mobile station must examine the value of
35 the overload class field (OLC) identified by $ACCOLC_p$. If the identified OLC field
36 is set to '0', the mobile station must exit this task and enter the Serving-System
37 Determination Task (see 2.6.3.12); if the identified OLC field is set to '1', the
38 mobile station must continue to respond to messages in the overhead message
39 train.

- 1 – Otherwise, the mobile station must continue to respond to messages in the
2 overhead message train.
- 3 • *Access Type Parameters Message:*
- 4 – The mobile station must set the busy-idle status bit (BIS_S) to the value of the
5 BIS field of the received message.
- 6 – The mobile station must set PCI_HOME_S to the value of the PCI_HOME field of
7 the received message.
- 8 – The mobile station must set PCI_ROAM_S to the value of the PCI_ROAM field of
9 the received message.
- 10 – The mobile station must set BSPC_S to the value of the BSPC field of the
11 received message.
- 12 – The mobile station must set BSCAP_S to the value of the BSCAP field of the
13 received message.
- 14 – If BSCAP_S indicates that the system supports [26] or later revisions of the core
15 analog air interface standard, then:
- 16 + If PCSID ≠ SID_S, then:
- 17 □ If Roam status is enabled, and if PCI_ROAM_S = 1, or
- 18 □ If Roam status is disabled, and if PCI_HOME_S = 1,
- 19 + then, the mobile station shall Update Protocol Capability ID status to
20 enabled and set PCSID_S = SID_S.
- 21 • *Random Challenge A Message:* The mobile station must set the corresponding
22 portion of its internal RAND1_S to the value of the RAND1_A field in the *Global*
23 *Action Message* (see 2.3.12.1.2 for updating of RAND).
- 24 • *Random Challenge B Message:* The mobile station must set the corresponding
25 portion of its internal RAND1_S to the value of the RAND1_B field in the *Global*
26 *Action Message* (see 2.3.12.1.2 for updating of RAND).
- 27 • *Access Attempt Parameters Message:* The mobile station must update the following
28 parameters:
- 29 – If this access is a page response,
- 30 + Maximum number of seizure tries allowed (MAXSZTR_{S1}) must be set to the
31 value of the MAXSZTR-PGR field of the received message.
- 32 + Maximum number of busy occurrences allowed (MAXBUSY_{S1}) must be set to
33 the value of the MAXBUSY-PGR field of the received message.
- 34 – Otherwise,
- 35 + Maximum number of seizure tries allowed (MAXSZTR_{S1}) must be set to the
36 value of the MAXSZTR-OTHER field of the received message.

1 + Maximum number of busy occurrences allowed ($MAXBUSY_S$) must be set to
2 the value of the $MAXBUSY-OTHER$ field of the received message.

3 If the access is a registration access, the mobile station must respond as indicated to the
4 registration identification message, if received in the overhead message train:

5 The mobile station must set $REGID_S$ to the value of the $REGID$ field in the message.

6 After the overhead message train is received and processed as required above, the mobile
7 station must wait a random time. Each time this task is executed, a different random
8 delay must be generated, distributed uniformly in the interval 0 to 750 ms, and if
9 quantized, with granularity no greater than 1 ms. At the end of the delay, the mobile
10 station must enter the Seize Reverse Control Channel Task (see 2.6.3.5).

11 2.6.3.5. Seize Reverse Control Channel

12 See the corresponding section of [26].

13 2.6.3.6. Delay After Failure

14 See the corresponding section of [26].

15 2.6.3.7. Service Request

16 The mobile station must continue to send its message to the base station. The
17 information that must be sent is as follows (with the formats given in 2.7.1):

- 18 • Word A must always be sent.
- 19 • Word B must be sent if any of the following conditions hold.
 - 20 – $E_S = 1$
 - 21 – $LT_S = 1$
 - 22 – $AUTH_S = 1$
 - 23 – the ROAM status is enabled
 - 24 – the ROAM status is disabled and $Exp = 1$
 - 25 – the access is an order confirmation
 - 26 – the access is an autonomous registration
 - 27 – the access is a capability registration
 - 28 – the access is a power down registration
 - 29 – the access is a CDMA query
 - 30 – the access is a base station challenge
 - 31 – the mobile station was paged with a two-word *Mobile Station Control Message*
 - 32 – $RCF = 1$

- Word C must be sent as shown in the following table:

S_s Bit	Type of System Access			
	Registration, Origination, PACA Cancel, PACA Response, or Page Response where AUTH_s = 0 Order Confirmation*	Registration, Origination, PACA Cancel, PACA Response, or Page Response where AUTH_s = 1	Unique Challenge Order Confirmation	Base Station Challenge
0	Do Not Send Word C	Send Authentication Word C	Send Unique Challenge Order Confirmation Word C	Send Base Station Challenge Word C
1	Send Serial Number Word C	Send Serial Number Word C and Authentication Word C	Send Serial Number Word C and Unique Challenge Order Confirmation Word C	Send Serial Number Word C and Base Station Challenge Word C

* Order Confirmation other than Unique Challenge

- If the access is a capability registration and if update-protocol-capability ID status is enabled, Protocol Capability Indicator Word C must be sent.
- If the access is a registration and if Update Protocol Capability ID status is enabled, Protocol Capability Indicator Word C must be sent.
- If the access is a protocol capability indicator order confirmation, then Protocol Capability Indicator Word C shall be sent.
- If the access is an origination or PACA response, word D must be sent.
- If the access is an origination or a PACA response, and if 9 or more digits were dialed, word E must be sent.
- If the access is an origination or a PACA response, and if 17 or more digits were dialed, word F must be sent. If the access is an origination or PACA response, and if 25 to 32 digits were dialed, then word G must be sent.
- If the access is an origination or PACA response, and if 25 to 32 digits were dialed, then word G must be sent.

When the mobile station has sent its complete message, it must continue to send unmodulated carrier signal for a nominal duration of 25 ms and must then turn off the transmitter.

The next task to be entered depends upon the type of access by the mobile station:

- If the access is an order confirmation or a PACA cancel, the mobile station must enter the Serving-System Determination Task (see 2.6.3.12).

- 1 • If the access is an origination, the mobile station must enter the Await Message
2 Task (see 2.6.3.8).
- 3 • If the access is a page response, the mobile station must enter the Await Message
4 Task (see 2.6.3.8).
- 5 • If the access is a registration request (including capability information) other than
6 a power down registration, the mobile station must enter the Await Registration
7 Confirmation Task (see 2.6.3.9). If the registration is a power down registration,
8 the mobile station shall power down.
- 9 • If the access is a base station challenge, the mobile station must enter the Await
10 Message Task (see 2.6.3.8).
- 11 • If the access is a PACA response or a PCI order confirmation, the mobile station
12 must enter the Await Message Task (see 2.6.3.8).
- 13 • If the access is a CDMA query, the mobile station must enter the Await Message
14 Task (see 2.6.3.8).

15 2.6.3.8. Await Message

16 If this task is not completed within 10 seconds for a Base Station Challenge, or if it is not
17 completed within 5 seconds for all other messages and orders, the mobile station must
18 exit this task and enter the Serving System Determination Task (see 2.6.3.12).

19 The mobile station must monitor mobile station control messages (see 3.7.1.1). If the
20 mobile station sent Word B as part of the Service Request (see 2.6.3.7), then the mobile
21 station must attempt to match MIN1_p and MIN2_p to MIN1_r and MIN2_r, respectively;
22 otherwise, the mobile station must attempt to match MIN1_p to MIN1_r only.

23 The mobile station must respond as indicated to any of the following messages if all
24 decoded MIN bits match.

25 If the access is an origination, PACA response, or page response:

- 26 • *Initial Voice Channel Designation Message* (see 3.7.1.1): The mobile station must
27 update the parameters as set in the message, delete all entries from SID_NID-
28 _LIST_s, ZONE_LIST_s, SID_NID_LIST_{s-p}, and ZONE_LIST_{s-p}, and set REGISTERED_s
29 to NO. If R_s = 1, the mobile station must enter the Autonomous Registration
30 Update Task (see 2.6.3.11), supplying a success indication. If R_s = 0, the mobile
31 station shall enter the Confirm Initial Voice Channel Task (see 2.6.4.2). If PACA_s =
32 enabled, the mobile station must set PACA_s = disabled and must indicate to the
33 user that the PACA call is in process.
- 34 • *PACA Message* (see 3.7.1.1): If PACA_s = disabled, the mobile station must perform
35 the following:
 - 36 – If the message is in response to an origination (PURPOSE_r = '0000'), the mobile
37 station must set PACA_s to enabled and indicate to the user that the call has
38 been queued as a PACA call. Also, the mobile station must indicate to the user
39 the current queue position (Q_POS_r) of the PACA call, and must then enter the
40 Idle Task (see 2.6.2).

- 1 – If the message is not in response to an origination, the mobile station must
2 ignore the message. If PACA_S = enabled, the mobile station must perform the
3 following:
- 4 – If the message is in response to an origination (PURPOSE_r = '0000'), the mobile
5 station must ignore the message.
- 6 – If the message is to provide the queue position of the PACA call (PURPOSE_r =
7 '0001'), the mobile station must indicate to the user that the PACA call is still
8 queued, indicate the current queue position (Q_POS_r) of the call, and remain in
9 the current task.
- 10 – If the message is to instruct the mobile station to re-originate the PACA call
11 (PURPOSE_r = '0010'), the mobile station must enter the System Access Task
12 (see 2.6.3) with an PACA response indication and re-originate the PACA call.
- 13 – If the message is to cancel the PACA call (PURPOSE_r = '0011'), the mobile
14 station must set PACA_S = disabled, indicate to the user that the PACA call has
15 been canceled, and enter the Serving-System Determination Task (see
16 2.6.3.12).

- 17 • *Directed-Retry Message* (see 3.7.1.1): If the mobile station is equipped for directed
18 retry, it must respond to the *Directed-Retry Message* as follows:

19 If the mobile station encounters the start of a new message before it receives all
20 four words of the *Directed-Retry Message*, it must exit this task and enter the
21 Serving-System Determination Task (see 2.6.3.12).

22 The mobile station must set the last-try code (LT_S) according to the ORDQ field of
23 the message:

- 24 – If ORDQ = '000', set LT_S to '0'.
25 – If ORDQ = '001', set LT_S to '1'.

26 The mobile station must then clear CCLIST_S and must examine each CHANPOS
27 field in Words 3 and 4 of the message. For each nonzero CHANPOS field, the
28 mobile station must calculate a corresponding channel number according to the
29 following algorithm:

- 30 – If LOCAL/MSG_TYPE = '00000' , and if the serving-system status is enabled,
31 subtract CHANPOS from FIRSTCHA_S + 1.
- 32 – If LOCAL/MSG_TYPE = '00000' and, if the serving-system status is disabled,
33 add CHANPOS to FIRSTCHA_S - 1.
- 34 – If LOCAL/MSG_TYPE = '00001', and if the serving-system status is enabled, set
35 FIRSTCHA_S to the first dedicated control channel for System A (834.990
36 MHz/879.990 MHz) and subtract CHANPOS from FIRSTCHA_S + 1. The mobile
37 must also set AUTH_S to '0'.

- 1 – If LOCAL/MSG_TYPE = '00001', and if the serving-system status is disabled, set
2 FIRSTCHA_S to the first dedicated control channel for System B (835.020
3 MHz/880.020 MHz) and add CHANPOS to FIRSTCHA_S - 1. The mobile must
4 also set AUTH_S to '0'.
- 5 – If LOCAL/MSG_TYPE = '00010', and if the serving-system status is enabled,
6 set FIRSTCHA_S to the first dedicated control channel for System A (834.990
7 MHz/879.990 MHz) and subtract CHANPOS from FIRSTCHA_S + 1. The mobile
8 must also set AUTH_S to '1'.
- 9 – If LOCAL/MSG_TYPE = '00010', and if the serving-system status is disabled,
10 set FIRSTCHA_S to the first dedicated control channel for System B (835.020
11 MHz/880.020 MHz) and add CHANPOS to FIRSTCHA_S - 1. The mobile must
12 also set AUTH_S to '1'.

13 The mobile station must then determine whether each channel number is within
14 the set allocated to cellular systems; and, if so, must list the channel number in
15 CCLIST_S.

16 After completing its response to the *Directed-Retry Message*, the mobile station
17 must examine the access timer. If the access timer has expired, the mobile station
18 must enter the Serving-System Determination Task (see 2.6.3.12). If the access
19 timer has not expired, the mobile station must enter the Directed-Retry Task (see
20 2.6.3.14).

21 If the access is an origination or PACA response:

- 22 • *Intercept*: If PACA_S = enabled, the mobile station must set PACA_S = disabled, must
23 indicate to the user that the PACA call has been canceled, and must enter the
24 Serving-System Determination Task (see 2.6.3.12; otherwise, the mobile station
25 must enter the Serving-System Determination Task (see 2.6.3.12).
- 26 • *Reorder*: If PACA_S = enabled, the mobile station must set PACA_S = disabled, must
27 indicate to the user that the PACA call has been canceled, and must enter the
28 Serving-System Determination Task (see 2.6.3.12). Otherwise, the mobile station
29 must enter the Serving-System Determination Task (see 2.6.3.12).

30 If the access is a page response:

- 31 • *Release*: The mobile station must enter the Serving-System Determination Task
32 (see 2.6.3.12).

33 If the access is a PCI order confirmation:

- 34 • *Release*: The mobile station must enter the Serving-System Determination Task
35 (see 2.6.3.12).
- 36 • *Message Waiting Order*: If the mobile station is capable of performing Message
37 Waiting Notification, the mobile station shall indicate the presence of messages
38 waiting based upon the information contained in the message type field of the
39 Message Waiting order (*i.e.*, 0 for clear or no messages, other non-zero values
40 indicate the number of messages waiting). The mobile station then enters the
41 System Access Task (see 2.6.3) with an order confirmation indication.

1 If the access is a CDMA Query:

- 2 • *CDMA Info Order*: The mobile station should exit this task and enter the *System*
3 *Determination Substate* of the *Mobile Station Initialization State* with an additional
4 CDMA available indication (see 2.6.1.1 of [5]).

5 If the access is a Base Station Challenge:

- 6 • *Base Station Challenge Order Confirmation*: The mobile station compares the
7 AUTHBS received in the *Base Station Challenge Order Confirmation Message* to that
8 computed internally. The mobile station must then acknowledge receipt of the
9 *SSD Update Order* by the *SSD Update Order Confirmation Message* with a success or
10 failure indication as described in 2.3.12.1.8 by entering the System Access Task
11 (see 2.6.3) with an order response indication (see 2.6.3.1). If the mobile station
12 fails to receive the *Base Station Challenge Order Confirmation* within 10 seconds of
13 the time when the *Base Station Challenge Order* was transmitted, terminate the
14 SSD update process.

15 If the access is an origination, and if the user terminates a call during this task, the
16 termination status must be enabled so that the call can be released on a voice channel
17 (see 2.6.4.4) instead of on a control channel.

18 2.6.3.9. Await Registration Confirmation

19 If the mobile station receives an *Order Confirmation Message* (see 3.7.1.1), it shall delete
20 all entries from $SID_NID_LIST_S$, $ZONE_LIST_S$, $SID_NID_LIST_{S-p}$, and $ZONE_LIST_{S-p}$ and
21 shall set $REGISTERED_S$ to NO as the first action it takes.

22 In addition to the requirements in this section, see the corresponding section of [26].

23 2.6.3.10. Action on Registration Failure

24 The mobile station shall delete all entries from $SID_NID_LIST_S$, $ZONE_LIST_S$,
25 $SID_NID_LIST_{S-p}$, and $ZONE_LIST_{S-p}$, and shall set $REGISTERED_S$ to NO as the first action
26 it takes.

27 In addition to the requirements in this section, see the corresponding section of [26].

28 2.6.3.11. Autonomous Registration Update

29 The mobile station shall set $CDMA_MODE_S = 0$ and $DIGITAL_REG_{S-p} = '00000000'$ as the
30 first action it takes.

31 In addition to the requirements in this section, see the corresponding section of [26].

32 2.6.3.12. Serving-System Determination

33 If this task is entered as a result of a power down registration attempt, the mobile station
34 must immediately power down. Otherwise, the mobile station shall proceed as follows:

- 1 • If REDIRECTION_s equals disabled, and if either the preferred mode of operation is
2 CDMA or the serving-system status does not correspond to the preferred system,
3 the mobile station may enter the *System Determination Substate of the Mobile*
4 *Station Initialization State* with a reselection indication (see 2.6.1.1 of [5]); otherwise,
5 it must enter the Paging Channel Selection Task (see 2.6.1.2).

6 2.6.3.13. Alternate Access Channel

7 See the corresponding section of [26].

8 2.6.3.14. Directed Retry

9 See the corresponding section of [26].

10 2.6.4. Mobile Station Control on the Analog Voice Channel

11 In addition to the requirements in this section, see the corresponding section of [26].

12 2.6.4.1. Loss of Radio-Link Continuity

13 See the corresponding section of [26].

14 2.6.4.2. Confirm Initial Voice Channel

15 In addition to the requirements in this section, see the corresponding section of [26].

16 Within 100 ms of the receipt of a *Channel Assignment Message* (see 3.7.2.3.2.8 of [5])
17 containing ASSIGN_MODE = '011' and AN_CHAN_TYPE = '00', or an *Extended Channel*
18 *Assignment Message* (see 3.7.2.3.2.21 of [5]) containing ASSIGN_MODE = '011' and
19 AN_CHAN_TYPE = '00', the mobile station must execute the procedures in the
20 corresponding section of [26].

21 2.6.4.3. Alerting

22 In addition to the requirements in this section, see the corresponding section of [26].

23 2.6.4.3.1. Waiting for Order

24 In addition to the requirements in this section, see the corresponding section of [26].

1 When this task is entered, in addition to the actions described in the corresponding
2 section of [26], the following may occur:

- 3 • If this task is entered as a result of receiving an *Analog Handoff Direction Message*
4 (see 3.7.3.3.2.6 of [5]), the mobile station must use the VMAC, ANALOG_CHAN,
5 and SCC values obtained from the *Analog Handoff Direction Message* to perform the
6 following operations: Adjust power level, tune to new channel, adjust to new SAT,
7 and set SCC_S to the value of the SCC field of the message (see 2.4.1 of [26]). The
8 mobile station must then turn on the transmitter, and reset the fade timer. The
9 mobile station must set the message encryption mode to that indicated by the
10 MEM value obtained from the *Analog Handoff Direction Message*. The mobile
11 station may compare the SID value obtained from the *Analog Handoff Direction*
12 *Message* with HOME_SID_P. If SID_R = HOME_SID_P, the mobile station may set the
13 ROAM status to disabled. If SID_R is not equal to HOME_SID_P, the mobile station
14 may set the ROAM status to enabled. The mobile station must remain in the
15 *Waiting for Order Task*.
- 16 • Within 100 ms of the receipt of any of the orders listed either below (see 3.7.2) or in
17 the corresponding section of [26], the mobile station must compare SCC_S to the
18 present SAT color code (PSCC) field in the received message. If SCC_S is not equal
19 to PSCC, the order must be ignored. If SCC_S = PSCC, the action to be taken for
20 each order is as follows:
 - 21 – *Alert With Info SMS*: Within 750 ms, the mobile station must send an *Alert With*
22 *Info SMS Order Confirmation Message*, and remain in the *Waiting for Order*
23 *Task*. If the value of the TASK_TM field of the received message is '0', reset the
24 order timer to 10 seconds; otherwise reset the order timer to 600 ms.

25 Process the *Alert With Info SMS Message* as follows:

- 26 + If the value of the B/F field of the received message is '11', and if the
27 INFO_DATA field of the received message contains an unsegmented SMS
28 teleservice message, the mobile station may discard any incomplete SMS
29 teleservice message being reassembled and should pass the INFO_DATA
30 field of the received message to the SMS teleservice. Set the B/F field of the
31 *Alert With Info SMS Order Confirmation Message* to '1'. If the teleservice
32 reports an error, set the ERROR_CLASS and CAUSE_CODE fields of the
33 *Alert With Info SMS Order Confirmation Message* to report the teleservice
34 error.
- 35 + If the value of the B/F field of the received message is '10', the mobile
36 station may discard any incomplete SMS teleservice message being
37 reassembled, and must store the INFO_DATA field of the received message
38 as the first segment of an SMS teleservice message being reassembled. Set
39 SEQ_NO_S to SEQ_NO_R. Set the B/F field of the *Alert With Info SMS Order*
40 *Confirmation Message* to '0'.

- 1 + If the value of the B/F field of the received message is '00', and if a
2 segmented SMS teleservice message is being reassembled, compare the
3 value of the SEQ_NO field of the received message to SEQ_NO_S. Set the
4 B/F field of the *Alert With Info SMS Order Confirmation Message* to '0'. The
5 mobile station shall perform the following actions:
- 6 □ If (SEQ_NO_S + 1) modulo 8 is equal to the value of the SEQ_NO field of
7 the received message, store the INFO_DATA field of the received
8 message as the next segment of the SMS teleservice message being
9 reassembled, and increment SEQ_NO_S, modulo 8.
- 10 □ If SEQ_NO_S is equal to the value of the SEQ_NO field of the received
11 message, the mobile station may discard the INFO_DATA field of the
12 received message.
- 13 □ If neither SEQ_NO_S nor (SEQ_NO_S + 1) modulo 8 is equal to the value of
14 the SEQ_NO field of the received message, the mobile station may
15 discard the INFO_DATA field of the received message and may discard
16 the incomplete SMS teleservice message being reassembled.
- 17 + If the value of the B/F field of the received message is '00', and if no
18 segmented SMS teleservice message is being reassembled, the mobile
19 station may discard the INFO_DATA field of the received message. Set the
20 B/F field of the *Alert With Info SMS Order Confirmation Message* to '0'.
- 21 + If the value of the B/F field of the received message is '01', and if a
22 segmented SMS teleservice message is being reassembled, store the
23 INFO_DATA field of the received message as the last segment of the SMS
24 teleservice message and pass the complete SMS teleservice message to the
25 SMS teleservice. Set the B/F field of the *Alert With Info SMS Order*
26 *Confirmation Message* to '1'. If the teleservice reports an error, set the
27 ERROR_CLASS and CAUSE_CODE fields of the *Alert With Info SMS Order*
28 *Confirmation Message* to report the teleservice error.
- 29 + If the value of the B/F field of the received message is '01', and if no
30 segmented SMS teleservice message is being reassembled, the mobile
31 station may discard the INFO_DATA field of the received message. Set the
32 ERROR_CLASS and CAUSE_CODE fields of the *Alert With Info SMS Order*
33 *Confirmation Message* to report an error due to reception of an incomplete
34 message. Set the B/F field of the *Alert With Info SMS Order Confirmation*
35 *Message* to '0'.

- 1 – *Message Encryption Mode Order*: The base station is activating/deactivating
 2 signaling message encryption. If the order qualifier field in the received
 3 message is set to '001', activate basic signaling message encryption. If the
 4 order qualifier field in the received message is set to '010', activate
 5 enhanced signaling message encryption. If the order qualifier field in the
 6 received message is set to '000', deactivate signaling message encryption.
 7 In any case, send an "order confirmation" message to the base station (see
 8 2.7.2), remain in the Waiting for Order Task and reset the order timer to 10
 9 seconds if the mobile station is waiting for a response to a Base Station
 10 Challenge order, or to 5 seconds if waiting for any other response.

11 2.6.4.3.2. Waiting for Answer

12 In addition to the requirements in this section, see the corresponding section of [26].

13 When this task is entered, in addition to the actions described in the corresponding
 14 section of [26], the following may occur:

- 15 • If this task is entered as a result of receiving an *Analog Handoff Direction Message*
 16 (see [5]), the mobile station must use the VMAC, ANALOG_CHAN, and SCC values
 17 obtained from the *Analog Handoff Direction Message* to perform the following
 18 operations: adjust power level, tune to new channel, adjust to new SAT, and set
 19 SCC_S to the value of the SCC field of the message (see 2.4.1). The mobile station
 20 must then turn on the transmitter, reset the fade timer, and turn on the signaling
 21 tone. The mobile station must set the message encryption mode to that indicated
 22 by the MEM value obtained from the *Analog Handoff Direction Message*. The mobile
 23 station may compare the SID value obtained from the *Analog Handoff Direction*
 24 *Message* with HOME_SID_p. If SID_r = HOME_SID_p, the mobile station may set the
 25 ROAM status to disabled. If SID_r is not equal to HOME_SID_p, the mobile station
 26 may set the ROAM status to enabled. The mobile station must remain in the
 27 Waiting for Answer Task.
- 28 • Within 100 ms of the receipt of any of the orders listed, either below or in the
 29 corresponding section of [26], the mobile station must compare SCC_S to the PSCC
 30 field in the received message. If SCC_S is not equal to PSCC, the order must be
 31 ignored. If $SCC_S = PSCC$, the action to be taken for each order is as follows:
 - 32 – *Alert With Info SMS*: Within 750 ms the mobile station must send an *Alert With*
 33 *Info SMS Order Confirmation Message*, and remain in the Waiting for Answer
 34 Task.

35 Process the *Alert With Info SMS Message* as follows:

- 1 + If the value of the B/F field of the received message is '11', and if the
2 INFO_DATA field of the received message contains an unsegmented SMS
3 teleservice message, the mobile station may discard any incomplete SMS
4 teleservice message being reassembled and should pass the INFO_DATA
5 field of the received message to the SMS teleservice. Set the B/F field of the
6 *Alert With Info SMS Order Confirmation Message* to '1'. If the teleservice
7 reports an error, set the ERROR_CLASS and CAUSE_CODE fields of the
8 *Alert With Info SMS Order Confirmation Message* to report the teleservice
9 error.
- 10 + If the value of the B/F field of the received message is '10', the mobile
11 station may discard any incomplete SMS teleservice message being
12 reassembled and must store the INFO_DATA field of the received message
13 as the first segment of an SMS teleservice message being reassembled. Set
14 SEQ_NO_s to SEQ_NO_r. Set the B/F field of the *Alert With Info SMS Order*
15 *Confirmation Message* to '0'.
- 16 + If the value of the B/F field of the received message is '00', and if a
17 segmented SMS teleservice message is being reassembled, compare the
18 value of the SEQ_NO field of the received message to SEQ_NO_s. Set the
19 B/F field of the *Alert With Info SMS Order Confirmation Message* to '0'. Take
20 action as follows:
- 21 If $(SEQ_NO_s + 1)$ modulo 8 is equal to the value of the SEQ_NO field of
22 the received message, store the INFO_DATA field of the received
23 message as the next segment of the SMS teleservice message being
24 reassembled and increment SEQ_NO_s, modulo 8.
- 25 If SEQ_NO_s is equal to the value of the SEQ_NO field of the received
26 message, the mobile station may discard the INFO_DATA field of the
27 received message.
- 28 If neither SEQ_NO_s nor $(SEQ_NO_s + 1)$ modulo 8 is equal to the value of
29 the SEQ_NO field of the received message, the mobile station may
30 discard the INFO_DATA field of the received message and may discard
31 the incomplete SMS teleservice message being reassembled.
- 32 + If the value of the B/F field of the received message is '00', and if no
33 segmented SMS teleservice message is being reassembled, the mobile
34 station may discard the INFO_DATA field of the received message. Set the
35 B/F field of the *Alert With Info SMS Order Confirmation Message* to '0'.
- 36 + If the value of the B/F field of the received message is '01', and if a
37 segmented SMS teleservice message is being reassembled, store the
38 INFO_DATA field of the received message as the last segment of the SMS
39 teleservice message and pass the complete SMS teleservice message to the
40 SMS teleservice. Set the B/F field of the *Alert With Info SMS Order*
41 *Confirmation Message* to '1'. If the teleservice reports an error, set the
42 ERROR_CLASS and CAUSE_CODE fields of the *Alert With Info SMS Order*
43 *Confirmation Message* to report the teleservice error.

- 1 + If the value of the B/F field of the received message is '01', and if no
2 segmented SMS teleservice message is being reassembled, the mobile
3 station may discard the INFO_DATA field of the received message. Set the
4 ERROR_CLASS and CAUSE_CODE fields of the *Alert With Info SMS Order*
5 *Confirmation Message* to report an error due to reception of an incomplete
6 message. Set the B/F field of the *Alert With Info SMS Order Confirmation*
7 *Message* to '0'.
- 8 – *Message Encryption Mode Order*: The base station is activating/deactivating
9 signaling message encryption. If the order qualifier field in the received
10 message is set to '001', activate basic signaling message encryption. If the order
11 qualifier field in the received message is set to '010', activate enhanced
12 signaling message encryption. If the order qualifier field in the received
13 message is set to '000', deactivate signaling message encryption. In any case,
14 send an "order confirmation" message to the base station (see 2.7.2), remain in
15 the Waiting for Order Task and reset the order timer to 10 seconds if the mobile
16 station is waiting for a response to a Base Station Challenge order, or to 5
17 seconds if waiting for any other response.

18 2.6.4.4. Conversation

19 In addition to the requirements in this section, see the corresponding section of [26].

20 When this task is entered, in addition to the actions described in the corresponding
21 section of [26], the following may occur:

- 22 • If this task is entered as a result of receiving an *Analog Handoff Direction Message*
23 (see 3.7.3.3.2.6 of [5]), the mobile station must use the VMAC, ANALOG_CHAN,
24 and SCC values obtained from the *Analog Handoff Direction Message* to perform the
25 following operations: Adjust power level, tune to new channel, adjust to new SAT,
26 and set SCC_s to the value of the SCC field of the message (see 2.4.1). The mobile
27 station must then turn on the transmitter and reset the fade timer. The mobile
28 station must set the message encryption mode to that indicated by the MEM value
29 obtained from the *Analog Handoff Direction Message*. The mobile station may
30 compare the SID value obtained from the *Analog Handoff Direction Message* with
31 HOME_SID_p. If SID_r = HOME_SID_p, the mobile station may set the ROAM status
32 to disabled. If SID_r is not equal to HOME_SID_p, the mobile station may set the
33 ROAM status to enabled. The mobile station must remain in the Conversation
34 Task.

- 1 • Within 100 ms of the receipt of any of the orders listed either below or in the
2 corresponding section of [26], the mobile station must compare SCC_S to the PSCC
3 field in the received message. If SCC_S is not equal to PSCC, the order must be
4 ignored. If $SCC_S = PSCC$, the mobile station must take the following steps. Except
5 for the audit order, mobile stations capable of discontinuous-transmission
6 operation (see 2.3.11) must inhibit discontinuous transmission for 1.5 seconds;
7 that is, for a period of at least 1.5 seconds, the mobile station must remain in the
8 DTX-high state. Upon receipt of the audit order, mobile stations capable of
9 discontinuous transmission must inhibit discontinuous transmission for at least 5
10 seconds. Immediately after determining that $SCC_S = PSCC$, a mobile station that is
11 not capable of discontinuous transmission or a mobile station capable of
12 discontinuous transmission but in the DTX-high state must take the actions
13 specified below for each order.

14 If the mobile station is capable of discontinuous transmission and is in the DTX-
15 low state or the transition state when the order arrives, the mobile station must
16 enter the DTX-high state and wait 200 ms. Then it must take the actions specified
17 below for each order.

- 18 – *Alert With Info SMS*: Within 750 ms the mobile station must send *an Alert With*
19 *Info SMS Order Confirmation Message*, and remain in the Conversation Task.

20 Process the *Alert With Info SMS* message as follows:

- 21 + If the value of the B/F field of the received message is '11', the INFO_DATA
22 field of the received message contains an unsegmented SMS teleservice
23 message. The mobile station may discard any incomplete SMS teleservice
24 message being reassembled, and should pass the INFO_DATA field of the
25 received message to the SMS teleservice. Set the B/F field of the *Alert With*
26 *Info SMS Order Confirmation Message* to '1'. If the teleservice reports an
27 error, set the ERROR_CLASS and CAUSE_CODE fields of the *Alert With Info*
28 *SMS Order Confirmation Message* to report the teleservice error.
- 29 + If the value of the B/F field of the received message is '10', the mobile
30 station may discard any incomplete SMS teleservice message being
31 reassembled, and must store the INFO_DATA field of the received message
32 as the first segment of an SMS teleservice message being reassembled.
33 Store the value of the SEQ_NO field of the received message in SEQ_{NO_S} .
34 Set the B/F field of the *Alert With Info SMS Order Confirmation Message* to
35 '0'.
- 36 + If the value of the B/F field of the received message is '00', and if a
37 segmented SMS teleservice message is being reassembled, compare the
38 value of the SEQ_NO field of the received message to SEQ_{NO_S} . Set the
39 B/F field of the *Alert With Info SMS Order Confirmation Message* to '0'. Take
40 action as follows:

- 1 □ If $(SEQ_NO_S + 1)$ modulo 8 is equal to the value of the SEQ_NO field of
2 the received message, store the INFO_DATA field of the received
3 message as the next segment of the SMS teleservice message being
4 reassembled, and increment SEQ_NO_S, modulo 8.
- 5 □ If SEQ_NO_S is equal to the value of the SEQ_NO field of the received
6 message, the mobile station may discard the INFO_DATA field of the
7 received message.
- 8 □ If neither SEQ_NO_S nor $(SEQ_NO_S + 1)$ modulo 8 is equal to the value of
9 the SEQ_NO field of the received message, the mobile station may
10 discard the INFO_DATA field of the received message and may discard
11 the incomplete SMS teleservice message being reassembled.
- 12 + If the value of the B/F field of the received message is '00', and if no
13 segmented SMS teleservice message is being reassembled, the mobile
14 station may discard the INFO_DATA field of the received message. Set the
15 B/F field of the *Alert With Info SMS Order Confirmation Message* to '0'.
- 16 + If the value of the B/F field of the received message is '01', and if a
17 segmented SMS teleservice message is being reassembled, store the
18 INFO_DATA field of the received message as the last segment of the SMS
19 teleservice message and pass the complete SMS teleservice message to the
20 SMS teleservice. Set the B/F field of the *Alert With Info SMS Order*
21 *Confirmation Message* to '1'. If the teleservice reports an error, set the
22 ERROR_CLASS and CAUSE_CODE fields of the *Alert With Info SMS Order*
23 *Confirmation Message* to report the teleservice error.
- 24 + If the value of the B/F field of the received message is '01', and if no
25 segmented SMS teleservice message is being reassembled, the mobile
26 station may discard the INFO_DATA field of the received message. Set the
27 ERROR_CLASS and CAUSE_CODE fields of the *Alert With Info SMS Order*
28 *Confirmation Message* to report an error due to reception of an incomplete
29 message. Set the B/F field of the *Alert With Info SMS Order Confirmation*
30 *Message* to '0'.
- 31 – *Message Encryption Mode Order*: The base station is activating/deactivating
32 signaling message encryption. If the order qualifier field in the received
33 message is set to '001', activate basic signaling message encryption. If the order
34 qualifier field in the received message is set to '010', activate enhanced
35 signaling message encryption. If the order qualifier field in the received
36 message is set to '000', deactivate signaling message encryption. In any case,
37 send an "order confirmation" message to the base station (see 2.7.2), remain in
38 the Waiting for Order Task and reset the order timer to 10 seconds if the mobile
39 station is waiting for a response to a Base Station Challenge order, or to 5
40 seconds if waiting for any other response.

41 2.6.4.5. Release

42 See the corresponding section of [26].

1 2.6.4.6. Power Down

2 See the corresponding section of [26].

3 **2.7. Signaling Formats**

4 In addition to the requirements in this section, see the corresponding section of [26].

5 2.7.1. Reverse Analog Control Channel (RECC)

6 In addition to the requirements in this section, see the corresponding section of [26].

7 2.7.1.1. Reverse Analog Control Channel (RECC) Messages

8 In addition to the requirements in this section, see the corresponding section of [26].

9 In addition to the message formats shown in the corresponding section of [26], the
10 following word(s) may be transmitted over the reverse control channel:

11 Word C - PCI Report Word

Information Element	Length (bits)
F = 0	1
NAWC	3
MSPC	4
MSCAP	3
CLIC	1
MWNC	1
SMSC	2
PACAC	1
ENCRYPTION_SUPPORTED	4
RSVD = 000...000	16
P	12

12

1 The interpretation of the data fields (not already defined in the corresponding section of
2 [26]) is as follows:

3 CLIC — Calling Line Identification Capability. Set to '0' to indicate
4 not EP (Extended Protocol) CLI-capable. Set to '1' to indicate
5 EP-CLI-capable.

6 MWNC — Message Waiting Notification Capability. Set to '0' to indicate
7 not EP-Voice Mail capable. Set to '1' to indicate EP-Voice
8 Mail Status-capable.

9 SMSC — Short Message Service Capability.

10 00 - Not SMS-capable,

11 01 - AWI SMS order-capable,

12 10 - EP-SMS-capable,

13 11 - AWI SMS and EP-SMS-capable.

14 PACAC — PACA Capability. Set to '0' to indicate not PACA-capable. Set
15 to '1' to indicate PACA capable.

16 ENCRYPTION_-

17 SUPPORTED — Encryption algorithms supported by the mobile station.

18 If AUTH is equal to '0', the mobile station shall set this field
19 to '0000'. Otherwise, the mobile station shall set this field as
20 specified in [5].

21 2.7.2. Reverse Analog Voice Channel (RVC)

22 In addition to the requirements in this section, see the corresponding section of [26].

23 2.7.2.1. Reverse Analog Voice Channel (RVC) Messages

24 In addition to the requirements in this section, see the corresponding section of [26].

25 Selected Control Messages (see 2.7.2.1.1) are enciphered using the Cellular Message
26 Encryption Algorithm (see 2.5.1 [14]) or the Enhanced Cellular Message Encryption
27 Algorithm (see 2.5.2[14]). For each message, the enciphered fields are designated. The
28 messages are grouped by channel designation.

29 In addition to the RVC messages listed in the corresponding section of [26], formats are
30 shown for the following RVC message types:

- 31 • Alert With Info SMS Order Confirmation Message
- 32 • PCI Report Message

33

1 Alert With Info SMS Order Confirmation Message

Information Element	Length (bits)
F = 1	1
NAWC = 00	2
T = 1	1
LOCAL/MSG_TYPE = 00001	5
ORDQ = 000	3
ORDER = 10001	5
B/F	1
ERROR_CLASS	2
CAUSE_CODE	8
SEQ_NO	3
RSVD = 00000	5
P	12

2

3 PCI Report Message

Information Element	Length (bits)
F = 1	1
NAWC = 00	2
T = 1	1
MSG_TYPE	5
ORDQ = 100	3
ORDER = 11010	5
MSPC	4
MSCAP	3
CLIC	1
MWNC	1
SMSC	2
PACAC	1
RSVD = 0000000	7
P	12

4

1 The interpretation of the data fields (not already defined in the corresponding section of
2 [26]) is as follows:

- 3 B/F — Begin/Final. This field is used to indicate whether the
4 ERROR_CLASS and CAUSE_CODE fields include the
5 teleservice processing result for an SMS teleservice message.
6 If no teleservice processing result is included, this field shall
7 be set to '0'. If a teleservice processing result is included,
8 this field shall be set to '1'.
- 9 ERROR_CLASS — Error report class.
10 If there is no error, this field shall be set to '00'.
11 If the error is caused by a temporary condition, this field
12 shall be set to '10'. If the error is caused by a permanent
13 condition, this field shall be set to '11'.
- 14 CAUSE_CODE — Cause code. This field provides the delivery status of SMS
15 user data (see [27]).
- 16 SEQ_NO — Sequence number. This field contains the SEQ_NO of the
17 Alert With Info SMS message that is being acknowledged by
18 the mobile station.
- 19 CLIC — Calling Line Identification Capability. Set to '0' to indicate
20 not EP (Extended Protocol) CLI-capable. Set to '1' to indicate
21 EP-CLI-capable.
- 22 MWNC — Message Waiting Notification Capability. Set to '0' to indicate
23 not EP-Voice Mail capable. Set to '1' to indicate EP-Voice
24 Mail Status-capable.
- 25 SMSC — Short Message Service Capability.
26 00 - Not SMS-capable,
27 01 - AWI SMS order-capable,
28 10 - EP-SMS-capable,
29 11 - AWI SMS and EP-SMS-capable.
- 30 PACAC — PACA Capability. Set to '0' to indicate not PACA-capable. Set
31 to '1' to indicate PACA-capable.

32 2.7.2.1.1. Encrypted Control Messages

33 The 32 bits in Word 1 – First Word of the *Called Address Message* which comprise digits 1
34 – 8 are encrypted. These 32 bits are treated by the encryption procedure as a new single
35 message. No additional fields in Word 1 are encrypted.

36 The 32 bits in each Word 2 (and in Word 3 and in Word 4 when sent for 32-Digit Dialing)
37 of the *Called Address Message* which comprise further dialed digits are encrypted. These
38 32 bits are treated by the encryption procedure as a new single message. No additional
39 fields in these words are encrypted.

40 If the Enhanced Cellular Message Encryption Algorithm (see 2.5.2[14]) is used, the input
41 parameters shall be set as follows:

- 1 • SYNC[0] = 0x01
- 2 • SYNC[1] = 0x00
- 3 • DATA_TYPE= 0
- 4

C.S0006-A

1

2 No Text.

3

3. REQUIREMENTS FOR BASE STATION ANALOG OPERATION

Section 3 references [26] to describe core analog mode operation. Only those analog capabilities that support the CDMA dual-mode of operation are described in detail in this section. Subsection numbers in Section 3 of this specification correspond to subsection numbers in [26]. A reference in this specification to a particular subsection in [26] applies to that subsection and to all subsequent subsections; however, text in a subsection of Section 3 of this specification shall take precedence over any text in the corresponding subsection text in [26].

Base stations optionally implementing PACA service in the analog mode shall support *PACA Message* and *PACA Cancel* delivery (see 3.6.2, 3.6.3, 3.6.4 and 3.7.1) on the control channel. Base stations optionally implementing Extended Protocol enhanced features should refer to [7] for additional information.

3.1. Transmitter

In addition to the requirements in this section, see the corresponding section of [26].

3.1.1. Frequency Parameters

See the corresponding section of [26].

3.1.2. Power Output Characteristics

See the corresponding section of [26].

3.1.3. Modulation Characteristics

See the corresponding section of [26].

3.1.3.1. Analog Voice Signals

The (FM) modulator is preceded by the following five voice-processing stages (in the order listed):

1. Transmit Audio Level Adjustment
2. Compressor
3. Pre-Emphasis
4. Deviation Limiter
5. Post Deviation-Limiter Filter

Pending the generation of a complete speech transmission plan for dual-mode cellular systems, the following requirements shall be met to ensure compatibility with the transmission plan for fixed digital speech networks.

1 3.1.3.1.1. Compressor

2 See the corresponding section of [26].

3 3.1.3.1.2. Pre-emphasis

4 See the corresponding section of [26].

5 3.1.3.1.3. Deviation Limiter

6 See the corresponding section of [26].

7 3.1.3.1.4. Post Deviation-Limiter Filter

8 See the corresponding section of [26].

9 3.1.3.1.5. Transmit Level Adjustment

10 The base station shall set the transmit level so that a 1004 Hz tone at a level of -18 dBm₀
11 at the network interface produces a ± 2.9 kHz peak frequency deviation of the transmitted
12 carrier. Measurement techniques are described in [28].

13 3.1.3.2. Wideband Data Signals

14 See the corresponding section of [26].

15 3.1.4. Limitations on Emissions

16 3.1.4.1. Bandwidth Occupied

17 See the corresponding section of [26]. Measurement techniques are defined in [28].

18 3.1.4.2. Conducted Spurious Emissions

19 Refer to [28].

20 3.1.4.3. Radiated Spurious Emissions

21 Refer to [28].

22 3.1.4.4. Intermodulation

23 Radiated products from co-located transmitters shall not exceed FCC spurious and
24 harmonic level requirements that would apply to any of the transmitters operated singly.

25 **3.2. Receiver**

26 In addition to the requirements in this section, see the corresponding section of [26].

3.2.1. Frequency Parameters

See the corresponding section of [26].

3.2.2. Demodulation Characteristics

See the corresponding section of [26].

3.2.2.1. Analog Voice Signals

The demodulator is followed by the following three voice-signal processing stages:

- De-emphasis
- Expander
- Receive Audio Level Adjustment

Pending the generation of a complete speech transmission plan for dual-mode cellular systems, the following requirements shall be met to ensure compatibility with the transmission plan for fixed digital speech networks.

3.2.2.1.1. De-emphasis

See the corresponding section of [26].

3.2.2.1.2. Expander

See the corresponding section of [26].

3.2.2.1.3. Audio Level Adjustment

The base station shall set the audio level so that a received 1004 Hz tone with a ± 2.9 kHz peak frequency deviation produces a level of -18 dBm0 at the network interface. Measurement techniques are described in [28].

3.2.3. Limitations on Emissions

Refer to [28].

3.2.4. Other Receiver Parameters

System performance is predicated upon receivers meeting [28].

3.3. Security and Identification

In addition to the requirements in this section, see the corresponding section of [26].

3.3.1. Authentication

See the corresponding section of [26].

1 3.3.2. Encryption

2 If the base station supports mobile station authentication (see 3.3.1), it may also support
3 message encryption by providing the capability to send encrypted control messages and to
4 perform the operations of encryption and decryption as specified in 2.3.12.2.

5 **3.4. Supervision**

6 See the corresponding section of [26].

7 **3.5. Malfunction Detection**

8 Reserved.

9 **3.6. Call Processing**

10 In addition to the requirements in this section, see the corresponding section of [26].

11 3.6.1. Overhead Functions for Mobile Station Initiation

12 See the corresponding section of [26].

13 3.6.2. Mobile Station Control on the Control Channel

14 3.6.2.1. Overhead Information

15 In addition to the overhead information defined in the corresponding section of [26], the
16 following overhead information is sent as required in messages appended to a *System*
17 *Parameter Overhead Message* (see 3.7.1.2 for message formats):

- 18 • *CDMA Capability*. A system may indicate that it is capable of CDMA operation by
19 sending the *CDMA Capability Global Action Message* with the CDMA_AVAIL field set
20 to '1'. If CDMA_AVAIL is set to '1', the base station must set the CDMA_FREQ field
21 to the channel number of the CDMA frequency assignment that the mobile station
22 is to acquire. A system may also indicate the availability of additional CDMA
23 systems by sending the *CDMA Capability Global Action Message* with the
24 ADD_CDMA_AVAIL field set to '1'.

25 3.6.2.2. Page

26 See the corresponding section of [26].

27 3.6.2.3. Order

28 In addition to the orders and order confirmations defined in the corresponding section of
29 [26], the following orders and order confirmations may be transmitted:

- 30 • *PACA Message*.
- 31 • *CDMA Info Order*.

1 3.6.2.4. Local Control

2 See the corresponding section of [26].

3 3.6.3. Base Station Support of System Access by Mobile Stations

4 3.6.3.1. Overhead Information

5 See the corresponding section of [26].

6 3.6.3.2. Reverse Control Channel Seizure by Mobile Stations

7 See the corresponding section of [26].

8 3.6.3.3. Response to Mobile Station Messages

9 In addition to the mobile station message responses defined in the corresponding section
10 of [26], the following response to mobile station messages may be sent:

- 11 • *PACA Response*. Send one of the following:
 - 12 – *Initial Voice Channel Designation*,
 - 13 – *PACA Message*
 - 14 – *Directed Retry*,
 - 15 – *Intercept*,
 - 16 – *Reorder*.
- 17 • *Order Message*. When the base station receives a *Base Station Challenge Order*
18 from the mobile station, it should perform the authentication procedure as defined
19 in 2.3.12.1.9. The base station must then send the order confirmation to the
20 mobile station containing the algorithm output. When the base station receives a
21 *CDMA Query Order* from the mobile station, it must send the *CDMA Info Order* to
22 the mobile station. For all other orders, the base station should send one of the
23 following orders:
 - 24 – *Order Confirmation*
 - 25 – *Release*

26 3.6.4. Mobile Station Control on Voice Channel

27 See the corresponding section of [26].

28 3.6.4.1. Loss of Radio-Link Continuity

29 Reserved.

1 3.6.4.2. Initial Voice Channel Confirmation

2 See the corresponding section of [26].

3 3.6.4.3. Alerting

4 3.6.4.3.1. Waiting for Order

5 When the mobile station confirms the initial voice channel designation after having been
6 paged, it enters this task. In addition to the orders listed in the corresponding section of
7 [26], the following orders can be sent to the mobile station, with the resultant
8 confirmation and action to be taken as follows:

- 9 • *Handoff (to Digital Traffic Channel)*. Requires further study.
- 10 • *Alert with Info SMS*. Within 750 ms, the mobile station confirms the order by
11 sending an *Alert With Info SMS Order Confirmation Message*. The SEQ_NO received
12 in the *Alert With Info SMS Order Confirmation Message*, SEQ_NO_r, is compared to
13 the SEQ_NO transmitted in the last *Alert With Info SMS Message*, SEQ_NO_s. If the
14 comparison results in a match, the base station may transmit the next pending
15 *Alert With Info SMS Message*. If the comparison results in a mismatch, the base
16 station must not transmit any new Alert With Info SMS messages and may re-
17 transmit the unacknowledged *Alert With Info SMS Message* until the
18 unacknowledged outstanding *Alert With Info SMS Message* is received as indicated
19 by a match of SEQ_NO_r and SEQ_NO_s. Then, if the channel was allocated to
20 deliver SMS messages, the base station should send a *Release Order*. Otherwise
21 the base station must remain in the Waiting for Order Task.

22 3.6.4.3.2. Waiting for Answer

23 When this task is entered, an alert timer may be set. In addition to the orders listed in the
24 corresponding section of [26], the following orders can be sent with the confirmation and
25 action to be taken as follows:

- 26 • *Handoff (to Digital Traffic Channel)*. Requires further study.
- 27 • *Alert with Info SMS*. Within 750 ms, the mobile station confirms the order by
28 sending an *Alert With Info SMS Order Confirmation Message*. The SEQ_NO received
29 in the *Alert With Info SMS Order Confirmation Message*, SEQ_NO_r, is compared to
30 the SEQ_NO transmitted in the last *Alert With Info SMS Message*, SEQ_NO_s. If the
31 comparison results in a match, the base station may transmit the next pending
32 *Alert With Info SMS Message*. If the comparison results in a mismatch, the base
33 station must not transmit any new Alert With Info SMS messages and may re-
34 transmit the unacknowledged *Alert With Info SMS Message* until that outstanding
35 *Alert With Info SMS Message* is received as indicated by a match of SEQ_NO_r and
36 SEQ_NO_s. Then, if the channel was allocated to deliver SMS messages, the base
37 station should send a *Release Order*. Otherwise the base station must remain in
38 the Waiting for Answer Task.

1 3.6.4.4. Conversation

2 While the base station is in the Conversation Task, in addition to the orders listed in the
3 corresponding section of [26], the following orders can be sent to the mobile station, with
4 confirmation and action to be taken as follows:

- 5 • *Alert with Info SMS*. Within 750 ms, the mobile station confirms the order by
6 sending an *Alert With Info SMS Order Confirmation Message*. The SEQ_NO received
7 in the *Alert With Info SMS Order Confirmation Message*, SEQ_NO_r, is compared to
8 the SEQ_NO transmitted in the last *Alert With Info SMS Message*, SEQ_NO_s. If the
9 comparison results in a match, the base station may transmit the next pending
10 Alert With Info SMS message. If the comparison results in a mismatch, the base
11 station must not transmit any new Alert With Info SMS messages and may re-
12 transmit the unacknowledged *Alert With Info SMS Message* until that outstanding
13 *Alert With Info SMS Message* is received as indicated by a match of SEQ_NO_r and
14 SEQ_NO_s. The base station must remain in the Conversation Task.

15 If the call is mobile station originated, and if the mobile station re-originated the call
16 based on receiving a *PACA Message* (PURPOSE_r = '0010'), the base station should send an
17 *Alert With Information Message*.

18 3.6.5. Delivery of Character Information

19 Character information is delivered to a mobile station via the Mobile Station Control
20 Message over the forward voice channel. The Alert With Info and Flash With Info orders
21 are designated in the Mobile Station Control Message.

22 Whenever two sets of character information need to be delivered to a mobile station, the
23 base station shall transmit the second set of character information using the Flash With
24 Info order. This allows for PI and SI information to be uniquely specified for each instance
25 of CNI.

26

27

1

2 **3.7. Signaling Formats**

3 In addition to the requirements in this section, see the corresponding section of [26] for
4 operation in the analog mode.

5 3.7.1. Forward Analog Control Channel

6 See the corresponding section of [26].

7 3.7.1.1. Mobile Station Control Message

8 In addition to the message formats defined in the corresponding section of [26], the *Mobile*
9 *Station Control Message* may contain the following words:

1 Word 3 - PACA Word

Information Element	Length (bits)
T ₁ T ₂ = 10	2
SCC □ 11	2
PURPOSE	4
Q_POS	8
RSVD = 000...000	12
P	12

2 Word 3 - First CDMA Info Word

Information Element	Length (bits)
T ₁ T ₂ = 10	2
SCC □ 11	2
BAND_CLASS	5
CDMA_FREQ	11
RSVD = 00000000	8
P	12

3 Word 4 - Second CDMA Info Word

Information Element	Length (bits)
T ₁ T ₂ = 10	2
SCC □ 11	2
SID	15
RSVD = 000...000	9
P	12

4 The interpretation of the data fields (not already defined in the corresponding section of
5 [26]) is as follows:

1

Table 3.7.1.1-2. PACA PURPOSE Codes

PURPOSE Code	Function
0000	Indicates that the purpose of the PACA message is to respond to an <i>Origination Message</i> .
0001	Indicates that the purpose of the PACA message is to provide the queue position of the PACA call.
0010	Indicates that the purpose of the PACA message is to instruct the mobile station to re-originate the PACA call.
0011	Indicates that the purpose of the PACA message is to cancel the PACA call.

2

3 **3.7.1.2. Overhead Message**

4 See the corresponding section of [26].

5 **3.7.1.2.1. System Parameter Overhead Message**6 In addition to the requirements in this section, see the corresponding section of [26] for
7 operation in the analog mode.8 Note: The base station shall set EP = '0' in Word 1 of the *System Parameter Overhead*
9 *Message*, except when implementing optional extended protocol services (see the
10 corresponding section of [7]).11 **3.7.1.2.2. Global Action Overhead Message**12 In addition to the *Global Action Overhead Messages* listed in this section, see the
13 corresponding section of [26] for operation in the analog mode.

1 CDMA Capability Global Action Message

Information Element	Length (bits)
T ₁ T ₂ = 11	2
DCC	2
ACT = 0100	4
CDMA_FREQ	11
CDMA_AVAIL	1
ADD_CDMA_AVAIL	1
RSVD = 000	3
END	1
OHD = 100	3
P	12

2

3 The interpretation of the data fields (not already defined in the corresponding section of
4 [26]) is as follows:

- 5 CDMA_FREQ — Channel number of the CDMA frequency assignment to
6 acquire.
- 7 CDMA_AVAIL — Set to '1' if Band Class 0 CDMA is available (see [5]).
- 8 ADD_CDMA_AVAIL — Set to '1' if additional CDMA systems are available.

9 The *Global Action Message* codes defined in Table 3.7.1.2.3-1 are in addition to the codes
10 defined in Table 3.7.1-4 of [26].

11

**Table 3.7.1.2.3-1. Global Action Message
Types**

12

Action Code	Type
0100	CDMA Capability

13

14 3.7.1.2.3. Registration ID Message

15 In addition to the definitions in this section, see the corresponding section of [26] for
16 operation in analog mode.

17 3.7.1.2.4. Control-Filler Message

18 See the corresponding section of [26] for operation in the analog mode.

1 3.7.1.3. Data Restrictions

2 See the corresponding section of [26] for operation in the analog mode.

3 3.7.2. Forward Analog Voice Channel

4 See the corresponding section of [26].

5 3.7.2.1. Mobile Station Control Message

6 In addition to the *Mobile Station Control Message* defined in this section, see the
7 corresponding section of [26] for operation in the analog mode.

8 Word 2 - First Alert With Info SMS Word

Information Element	Length (bits)
T ₁ T ₂ = 01	2
RL_W	7
SEQ_NO	3
B/F	2
TASK_TM	1
RSVD = 00000	5
INFO_DATA	8
P	12

9 Word 3 - Second Alert With Info SMS Word

Information Element	Length (bits)
T ₁ T ₂ = 01	2
RSVD = 00	2
INFO_DATA	24
P	12

10 Word N - (N-1) Alert With Info SMS Word

Information Element	Length (bits)
T ₁ T ₂ = 01	2
RSVD = 00	2
INFO_DATA	24
P	12

11

1 The interpretation of the data fields (not already defined in the corresponding section of
2 [26]) is as follows:

3 RL_W — The remaining length, in Words, of the Alert With Info SMS
4 word.

5 SEQ_NO — Sequence number. This field contains the modulo-8
6 sequence number of the *Alert With Info SMS Message*. This
7 field shall be initialized to '000', and reset to '000' when
8 transmitting a new SMS teleservice message.

9 If an SMS teleservice message spans more than one *Alert*
10 *With Info SMS Message*, the sequence number shall be
11 incremented by 1, modulo 8, for each additional *Alert With*
12 *Info SMS Message* that is a segment of the SMS teleservice
13 message.

14 B/F — Begin/Final. This field is used to specify whether the SMS
15 teleservice message has been segmented into multiple *Alert*
16 *With Info SMS Messages*. If the SMS teleservice message is
17 completely contained in a single *Alert With Info SMS Message*,
18 this field shall be set to '11'. For an SMS teleservice message
19 contained in multiple *Alert With Info SMS* messages, the first
20 segment shall have a value of '10', intermediate segments
21 shall have a value of '00' and the final segment shall have a
22 value of '01'. A mobile station must assemble messages for
23 receipt by the SMS teleservice.

24 TASK_TM — Task Timer. This field is included in the *Alert With Info SMS*
25 *Message* to specify the Waiting for Order Task timeout period.
26 A value of '0' indicates a 10 second order timer shall be used
27 by the mobile station, and a value of '1' indicates that a 600
28 ms order timer shall be used.

29 INFO_DATA — Info data. This field contains the SMS teleservice message
30 data (see [27]).

31 Selected Control Messages (see 2.7.2.1.1 and 3.7.2.1.1) are enciphered using the Cellular
32 Message Encryption Algorithm (see 2.5.1 in [14]” Revision C) or the Enhanced Cellular
33 Message Encryption Algorithm (see 2.5.2 in [14]). For each message, the enciphered fields
34 are designated. The messages are grouped by channel designation.

35 **3.7.2.1.1. Encrypted Control Messages**

36 Word 1 of the Mobile Station Control Message contains the order and order qualifier fields
37 that identify this message as *Alert With Info Message*. No field in Word 1 is encrypted.

38 **3.7.2.1.2. Alert With Info Message**

39 See the corresponding section of [26].

40 No field in Word 2 – First Alert With Info Word is encrypted.

41 The subsequent words contain a character representation. Each character transmitted is
42 represented in IA5 form in a field of 8 bits. Each word contains up to three characters.

1 The 24 bits that comprise the three characters in each FVC word are treated by the
2 encryption procedure as a single message. No additional fields are encrypted.

3 If the Enhanced Cellular Encryption Algorithm is used, the input parameters shall be set
4 as follows:

- 5 • SYNC[0] = 0x00
- 6 • SYNC[1] = 0x00
- 7 • DATA_TYPE=0

8 3.7.2.1.3. Flash With Info Message

9 See the corresponding section of [26].

10 No field in Word 2 - Flash With Info Word is encrypted.

11 The subsequent words contain a character representation. Each character transmitted is
12 represented in IA5 form in a field of 8 bits. Each word contains up to three characters. The
13 24 bits that comprise the three characters in each FVC word are treated by the encryption
14 procedure as a single message. No additional fields are encrypted.

15 If the Enhanced Cellular Message Encryption Algorithm is used, the input parameters
16 shall be set as follows:

- 17 • SYNC[0] = 0x00
- 18 • SYNC[1] = 0x00
- 19 • DATA_TYPE= 0

20 3.7.2.1.4. Alert With Info SMS Message

21 The Word 2 – First Alert With Info SMS Word contains fields B/F, TASK_TM, RSVD and
22 INFO_DATA that are encrypted by the encryption procedure. No additional fields in Word
23 2 are encrypted.

24 Subsequent Alert With Info SMS Words contain the INFO_DATA field – representation of
25 message data sent by the SMS teleservice. The INFO_DATA fields of all subsequent Alert
26 With Info SMS Words are encrypted. No additional fields of subsequent Alert With Info
27 SMS Words are encrypted.

28 The encrypted fields of Word 2 – First Alert With SMS Word and all INFO_DATA fields of
29 the same Alert With Info SMS message are treated by the encryption procedure as a single
30 message.

31 If the Enhanced Cellular Message Encryption Algorithm is used, the input parameters
32 shall be set as follows:

- 33 • SYNC[0] = 0x00
- 34 • SYNC[1] = 0x00
- 35 • DATA_TYPE= 1

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1

2 3.7.2.2. Reserved

3

1

2 **4. REQUIREMENTS FOR MOBILE STATION ANALOG OPTIONS**

3 See the corresponding section of [7] for optional extended protocol services.

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1 No text.

1 **5. REQUIREMENTS FOR BASE STATION ANALOG OPTIONS**

2 See the corresponding section of [7] for optional extended protocol services.

C.S0006-A

1

2 No text.

3