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Analog Signaling Standard for cdma2000 Spread Spectrum Systems

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7

1 No text.

1 This version is provided to correct errors and omissions in the previously published version
2 of this standard.

3 Revisions are indicated by change bars located in the left or right hand margins, and also
4 by specific markings applied to the text.

5 New text is underlined, as shown below.

6 This is how new text is identified.

7 Deleted text is crossed out, as shown below.

8 ~~This is how deleted text is identified.~~

9 A modified figure is marked similarly to modified text. A new figure is underlined; a deleted
10 figure is crossed out through the middle of the figure.

11 The table of contents does not identify revisions to any section heading, table, or figure.

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. A
5 mobile station complying with these requirements will be able to operate with analog base
6 stations complying with this document and should be able to operate with analog base
7 stations complying with [14], [34], [7], and [26] or the latest version of these standards.
- 8 **3. Requirements for Base Station Analog Operation.** This section describes the
9 requirements for analog base stations. A base station complying with these requirements
10 will be able to operate in the analog mode with mobile stations complying with this
11 document and should be able to operate in the analog mode with mobile stations complying
12 with [14], [34], [7], and [26] or the latest version of these standards.
- 13 **4. Requirements for Mobile Station Analog Options.** This section describes the
14 requirements for CDMA-analog dual-mode mobile stations, which use the 32-digit dialing
15 option on the reverse analog control channel. In addition, this section describes mobile
16 station requirements for use of the optional extended protocol.
- 17 **5. Requirements for Base Station Analog Options.** This section describes the base
18 station requirements for using the 32-digit dialing option on the reverse analog control
19 channel. In addition, this section describes base station requirements for use of the
20 optional extended protocol.
- 21 **Annex B. Mobile Station Database.** This informative annex describes a database model
22 that can be used for dual-mode mobile stations complying with this document.

23

NOTES

1. Compatibility, as used in connection with this standard, is understood to mean: Any [cdma2000](#) mobile station ~~that~~ is able to place and receive calls in ~~any 800-MHz cellular~~[cdma2000 or IS-95](#) systems. Conversely ~~all~~[any cdma2000](#) systems ~~are~~[is](#) able to place and receive calls for ~~any~~[cdma2000 and IS-95](#) mobile stations. In a subscriber's home system, all call placement must be automatic. Call placement preferably should be automatic when a mobile station is in roam status.
2. The term "dual-mode mobile station" indicates a mobile station capable of both analog (FM) and spread spectrum (CDMA) operation. The term "spread spectrum dual-mode mobile station" is used when a confusion might arise between a dual-mode mobile station complying with this document and other standards such as [26] or [34].
3. This compatibility specification is based on the specific ~~United States~~ spectrum allocations ~~for cellular systems defined by various governmental administrations.~~
4. Technical details are included for the operation of two cellular systems in a geographic area, System A and System B, each with a separate set of control channels.
5. [13] (May 1988) and [16] provide specifications and measurement methods for cellular equipment.
6. Each system is identified by a unique 15-bit digital code, the SID code. The responsibility for assignment of SID rests with the cognizant government authority of the respective country, ~~not with the EIA, TIA, or member companies.~~ Applicants, Licensees, Manufacturers or operators are encouraged to contact the responsible government agency. [28] recommends SID range for countries. Cognizant government authorities should refer to [28] when allowing SID codes.
7. Each mobile station is assigned a single unique 32-bit binary serial number (ESN) which cannot be changed by the subscriber without rendering the mobile station inoperative (see [5]).
8. Those wishing to deploy systems compliant with this standard should also take notice of the requirement to be compliant with [applicable rules and regulations of local administrations. FCC Parts 15, 22, and 24; and the referenced version of FCC Office of Engineering and Technology Bulletin 53.](#)
9. [Those wishing to deploy systems compliant with the Standard should also take notice of the electromagnetic exposure criteria for the general public and for radio frequency carriers with low frequency amplitude modulation. RF Emissions. Minimum advisory standards of ANSI and the processing guidelines of FCC are contained in ANSI C95.1-1982 Advisory Standards and FCC Rules and Regulations, respectively. Members should also take notice of the more stringent exposure criteria for the general public and for radio frequency carriers with low frequency amplitude modulation as given in NCRP Report No. 86.](#)

NOTES

- 1 10. For the optional analog extended protocol feature (see 4.1 and 5.1), the assignment
2 of message type codes (MST words) will be made using procedures described in [29].
3 This will ensure that the feature will be implemented in an orderly manner.
- 4 11. "Base station" refers to the functions performed on the land side, which are typically
5 distributed among a cell, a sector of a cell, and a mobile switching center.
- 6 12. This standard uses the following verbal forms: "Shall" and "shall not" identify
7 requirements to be followed strictly to conform to the standard and from which no
8 deviation is permitted. "Should" and "should not" indicate that one of several
9 possibilities is recommended as particularly suitable, without mentioning or
10 excluding others; that a certain course of action is preferred but not necessarily
11 required; or that (in the negative form) a certain possibility or course of action is
12 discouraged but not prohibited. "May" and "need not" indicate a course of action
13 permissible within the limits of the standard. "Can" and "cannot" are used for
14 statements of possibility and capability, whether material, physical, or causal. The
15 use of "must" and "must not" is equivalent to the use of "shall" and "shall not."
- 16 13. Unless indicated otherwise, this document presents numbers in decimal form.
17 Binary numbers are distinguished in the text by the use of single quotation marks.
- 18 14. A potential compatibility problem between [14] and this standard exists as a result
19 of differences in access channel boundary determination procedures supported in
20 these two standards. Recommended solutions to this potential compatibility
21 problem are as follows:

Preferred Solution

22 [14] (First Paging Channel) specifies the first paging channels (FIRSTCHP_p) which
23 must be stored in a cdma2000 mobile station and used to identify the first paging
24 channel in paging channel scans when the mobile station is operating in its home
25 system. Defaulting this value to the preferred system's (i.e., A or B band) first
26 dedicated control channel (834.990 MHz/879.990 MHz and 835.020 MHz/880.020
27 MHz respectively) will prevent paging/access channels from being calculated
28 differently when the cdma2000 mobile station operates on a [14] based home
29 system. This solution is used today and should continue to be used to ensure full
30 interoperability of [14] and cdma2000 mobile stations on both [14] and cdma2000
31 type systems. This solution does, however, require that both home and roaming
32 cdma2000 mobile stations use the same paging channel set (i.e., no split home-roam
33 paging channels).
34

Non-Preferred Solution

35 If a second portion of the existing spectrum is allocated for control channel use (over
36 and above the dedicated control channels) then split home-roam paging can still be
37 achieved for both [34] and [14] mobile stations. This second portion of spectrum
38 could be managed as follows:
39

- 40 • Used exclusively by home cdma2000 mobile stations, having appropriate NAM
41 programming, for both paging and access functions or,

NOTES

- 1 • Used by home cdma2000 mobile stations, having appropriate NAM
2 programming, for both paging and access functions and by home [14] mobile
3 stations, having appropriate NAM programming, for paging functions only.
4 Home [14] mobile stations would continue to use the existing dedicated control
5 channels for access functions.
- 6 15. Forward control channel mobile station control messages of greater than five words
7 in length have been shown to yield compatibility problems in some mobile stations.
8 Implementers of systems are advised that the functions performed by these optional
9 messages may be achieved on assigned voice channels without causing compatibility
10 issues. Mobile station manufacturers are advised that the length of forward control
11 channel messages defined in future standards may be different from that defined in
12 this standard.
- 13 16. The NOTES section of [14] contains technical recommendations regarding analog
14 mode operation. These recommendations also apply to mobile station(s) complying
15 with this standard operating in the analog mode. See the NOTES section of [14], [7],
16 and [26] for further details.

REFERENCES

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

REFERENCES

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17. *Common Cryptographic Algorithms*, Revision C, 1997. A TIA document subject to restricted distribution. Contact the Telecommunications Industry Association, Arlington, VA.
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 24. IEEE Standard 661-1979, *Method for Determining Objective Loudness Ratings of Telephone Connections*, 1979.
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 34. [TIA/EIA-136](#), *TDMA Cellular PCS*.
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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.

Action Time. The time at which the action implied by a message should take effect.

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.

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.

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

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

- 1 **Base Station Random Variable (RANDBS).** A 32-bit random number generated by the
2 mobile station for authenticating base station orders to update the Shared Secret Data.
- 3 **BCH Code.** See Bose-Chaudhuri-Hocquenghem Code.
- 4 **Bose-Chaudhuri-Hocquenghem Code (BCH Code).** A large class of error-correcting cyclic
5 codes. For any positive integers m , $m \geq 3$, and $t < 2^{m-1}$, there is a binary BCH code with a
6 block length n equal to $2^m - 1$ and $n - k \leq mt$ parity check bits, where k is the number of
7 information bits. The BCH code has a minimum distance of at least $2t + 1$.
- 8 **bps.** Bits per second.
- 9 **Call Disconnect.** The process that releases the resources handling a particular call. The
10 disconnect process begins either when the mobile station user indicates the end of the call
11 by generating an on-hook condition or other call release mechanism, or when the base
12 station initiates a release.
- 13 **Call History Parameter (COUNT).** A modulo-64 event counter maintained by the mobile
14 station and Authentication Center that is used for clone detection.
- 15 **CDMA.** See Code Division Multiple Access.
- 16 **CDMA Channel.** The set of channels transmitted between the base station and the mobile
17 stations within a given CDMA frequency assignment. See also Forward CDMA Channel and
18 Reverse CDMA Channel.
- 19 **CDMA Channel Number.** An 11-bit number corresponding to the center of the CDMA
20 frequency assignment.
- 21 **CDMA Frequency Assignment.** A 1.23 MHz segment of spectrum. For CDMA cellular
22 systems, the channel is centered on one of the 30 kHz channels of the existing analog
23 cellular system. For CDMA systems, the channel is centered on one of the 50 kHz
24 channels.
- 25 **Code Division Multiple Access (CDMA).** A technique for spread-spectrum multiple-access
26 digital communications that creates channels through the use of unique code sequences.
- 27 **dBm.** A measure of power expressed in terms of its ratio (in dB) to one milliwatt.
- 28 **Dedicated Control Channel.** An analog control channel used for the transmission of
29 digital control information from either a base station or a mobile station.
- 30 **Deinterleaving.** The process of unpermuting the symbols that were permuted by the
31 interleaver. Deinterleaving is performed on received symbols prior to decoding.
- 32 **Digital Color Code (DCC).** A digital signal transmitted by a base station on a forward
33 analog control channel that is used to detect the capture of a base station by an interfering
34 mobile station.
- 35 **Discontinuous Transmission (DTX).** A mode of operation in which a mobile station
36 transmitter autonomously switches between two transmitter power levels while the mobile
37 station is in the conversation state on an analog voice channel.
- 38 **DTMF.** See Dual-Tone Multifrequency.

- 1 **Dual-Tone Multifrequency (DTMF).** Signaling by the simultaneous transmission of two
2 tones, one from a group of low frequencies and another from a group of high frequencies.
3 Each group of frequencies consists of four frequencies.
- 4 **Electronic Serial Number (ESN).** A 32-bit number assigned by the mobile station
5 manufacturer, uniquely identifying the mobile station equipment.
- 6 **ESN.** See Electronic Serial Number.
- 7 **Extended Protocol.** An optional expansion of the signaling messages between the base
8 station and mobile station to allow for the addition of new system features and operational
9 capabilities.
- 10 **Fade Timer.** A timer kept by the mobile station as a measure of Forward Traffic Channel
11 continuity. If the fade timer expires, the mobile station drops the call.
- 12 **Flash.** An indication sent on an analog voice channel or CDMA Traffic Channel indicating
13 that the user directed the mobile station to invoke special processing.
- 14 **Forward Analog Control Channel (FOCC).** An analog control channel used from a base
15 station to a mobile station.
- 16 **Forward Analog Voice Channel (FVC).** An analog voice channel used from a base station
17 to a mobile station.
- 18 **GHz.** Gigahertz (10^9 Hertz).
- 19 **Handoff.** The act of transferring communication with a mobile station from one base
20 station to another.
- 21 **HLR.** See Home Location Register.
- 22 **Home Location Register (HLR).** The location register to which a MIN/IMSI is assigned for
23 record purposes such as subscriber information.
- 24 **Home System.** The cellular system in which the mobile station subscribes for service.
- 25 **IMSI.** See International Mobile Station Identity.
- 26 **IMSI_M.** MIN-based IMSI using the lower 10 digits to store the MIN.
- 27 **IMSI_O.** Operational value of IMSI used by the mobile station for operation with the base
28 station.
- 29 **Interleaving.** The process of permuting a sequence of symbols.
- 30 **International Mobile Station Identity (IMSI).** A method of identifying stations in the land
31 mobile service as specified in CCITT Recommendation E.212.
- 32 **kHz.** Kilohertz (10^3 Hertz).
- 33 **Layering.** A method of organization for communication protocols. A layer is defined in
34 terms of its communication protocol to a peer layer in another entity and the services it
35 offers to the next higher layer in its own entity.
- 36 **Local Control.** An optional mobile station feature used to perform manufacturer-specific
37 functions.

- 1 **Message.** A data structure that conveys control information or application information. A
2 message consists of a length field (MSG_LENGTH), a message body (the part conveying the
3 information), and a CRC.
- 4 **Message CRC.** The CRC check associated with a message. See also Cyclic Redundancy
5 Code.
- 6 **Message Field.** A basic named element in a message. A message field may consist of zero
7 or more bits.
- 8 **MHz.** Megahertz (10^6 Hertz).
- 9 **MIN.** See Mobile Identification Number.
- 10 **Mobile Identification Number (MIN).** The 34-bit number that is a digital representation of
11 the 10-digit number assigned to a mobile station.
- 12 **Mobile Protocol Capability Indicator (MPCI).** A 2-bit field used to indicate the mobile
13 station's capabilities.
- 14 **Mobile Station.** A station in the Public Cellular Radio Telecommunications Service
15 intended to be used while in motion or during halts at unspecified points. Mobile stations
16 include portable units (e.g., hand-held personal units) and units installed in vehicles.
- 17 **Mobile Station Class.** Mobile station classes define mobile station characteristics such as
18 slotted operation and transmission power. See [14] and [5].
- 19 **Mobile Station Identification Number (MSIN).** A part of the E.212 IMSI identifying the
20 mobile station within its home network. See CCITT Recommendation E.212.
- 21 **Mobile Station Originated Call.** A call originating from a mobile station.
- 22 **Mobile Station Terminated Call.** A call received by a mobile station (not to be confused
23 with a disconnect or call release).
- 24 **Mobile Switching Center (MSC).** A configuration of equipment that provides cellular
25 radiotelephone service. Also called the Mobile Telephone Switching Office (MTSO).
- 26 **ms.** Millisecond (10^{-3} second).
- 27 **MSB.** Most significant bit.
- 28 **MSC.** See Mobile Switching Center.
- 29 **MSIN.** See Mobile Station Identification Number.
- 30 **NAM.** See Number Assignment Module.
- 31 **Narrow Analog.** A type of voice channel that uses 10 kHz channel spacing and uses
32 subaudible signaling.
- 33 **National Mobile Station Identity (NMSI).** A part of the E.212 IMSI identifying the mobile
34 station within its home country. The NMSI consists of the NMC and the MSIN. See ~~CCITT~~
35 ~~Recommendation E.212~~[\[20\]](#).
- 36 **NDSS.** See Network Directed System Selection.

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

- 1 **Personal Communications Switching Center (PCSC).** See Mobile Switching Center
2 (MSC).
- 3 **Power-Down Registration.** An autonomous registration method in which the mobile
4 station registers on power-down.
- 5 **Receive Objective Loudness Rating (ROLR).** A perceptually weighted transducer gain of
6 telephone receivers relating electrical excitation from a reference generator to sound
7 pressure at the earphone. The receive objective loudness rating is normally specified in dB
8 relative to one Pascal per millivolt. See ~~IEEE Standard 269-1992~~[\[35\]](#), ~~IEEE Standard 661-~~
9 ~~1979~~[\[24\]](#), ~~CCITT Recommendation P.76~~[\[36\]](#), and ~~CCITT Recommendation P.79~~[\[37\]](#).
- 10 **Registration.** The process by which a mobile station identifies its location and parameters
11 to a base station.
- 12 **Release.** A process that the mobile station and base station use to inform each other of call
13 disconnect.
- 14 **Reverse Analog Control Channel (RECC).** The analog control channel used from a mobile
15 station to a base station.
- 16 **Reverse Analog Voice Channel (RVC).** The analog voice channel used from a mobile
17 station to a base station.
- 18 **Roamer.** A mobile station operating in a cellular system (or network) other than the one
19 from which service was subscribed.
- 20 **ROLR.** See Receive Objective Loudness Rating.
- 21 **SAT.** See Supervisory Audio Tone.
- 22 **Scan of Channels.** The procedure by which a mobile station examines the signal strength
23 of each forward analog control channel.
- 24 **Seizure Precursor.** The initial digital sequence transmitted by a mobile station to a base
25 station on a reverse analog control channel.
- 26 **Shared Secret Data (SSD).** A 128-bit pattern stored in the mobile station (in semi-
27 permanent memory) and known by the base station. SSD is a concatenation of two 64-bit
28 subsets: SSD_A, which is used to support the authentication procedures, and SSD_B,
29 which serves as one of the inputs to the process generating the encryption mask and
30 private long code.
- 31 **Short Message Services (SMS).** A suite of services such as SMS Text Delivery, Digital
32 Paging (i.e., Call Back Number - CBN), and Voice Mail Notification (VMN).
- 33 **SID.** See System Identification.
- 34 **Signaling Tone.** A 10 kHz tone transmitted by a mobile station on an analog voice channel
35 to: 1) confirm orders, 2) signal flash requests, and 3) signal release requests.
- 36 **SSD.** See Shared Secret Data.
- 37 **sps.** Symbols per second.

1 **Station Class Mark (SCM).** An identification of certain characteristics of a mobile station.
 2 Classes are defined in [14] and [5].

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

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

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

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

30 **Sync Channel.** Code channel 32 in the Forward CDMA Channel which transports the
 31 synchronization message to the mobile station.

32 **Sync Channel Superframe.** An 80 ms interval consisting of three Sync Channel frames
 33 (each 26.666... ms in length).

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

37 **System Identification (SID).** A number uniquely identifying a ~~cellular~~[wireless](#) system.

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

1 **Transmit Objective Loudness Rating (TOLR).** A perceptually weighted transducer gain of
2 telephone transmitters relating sound pressure at the microphone to voltage at a reference
3 electrical termination. It is normally specified in dB relative to one millivolt per Pascal. See
4 IEEE Standard 269-1992, IEEE Standard 661-1979, CCITT Recommendation P.76, and
5 CCITT Recommendation P.79.

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

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

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

16 **UTC.** Universal Temps Coordoné. See Universal Coordinated Time.

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

21 **Voice Channel.** See Analog Voice Channel.

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

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

25 1.1.2. Numeric Information

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

- 28 • "s" indicates a value stored in a mobile station's temporary memory.
- 29 • "sv" indicates a stored value that varies as a mobile station processes various 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 *Global*
10 *Action Overhead Message*. Indicates the analog air interface protocol, such as [14],
11 supported by the system.

12 **CCLIST_s** – The list of analog control channels to be scanned by a mobile station processing
13 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 **CMAX_s** – The maximum number of channels to be scanned by a mobile station when
17 accessing a system.

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

20 **COUNT_{s-p}** – A modulo-64 count held in the mobile station. COUNT_{s-p} is maintained during
21 power off.

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

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

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

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

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

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

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

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

36 **IDHO_s** – Idle handoff indicator. Set to enabled to indicate the loss of analog control channel
37 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 Global*
9 *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 core
20 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 [14], 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 control
25 channel and finds the reverse control channel busy.
- 26 **NSZTR_{sv}** – The number of times a mobile station attempts to seize a reverse analog control
27 channel and fails.
- 28 **NXTREG_{S-p}** – Identifies when a mobile station must make its next registration to a system.
- 29 **PACA_S** – PACA call indicator. Set to enabled to indicate that the mobile station is waiting
30 for a priority access channel assignment; otherwise set to disabled. In Sections 2 and 3,
31 PACA_S = 0 is equivalent to setting PACA_S to disabled and PACA_S = 1 is equivalent to setting
32 PACA_S to enabled.
- 33 **PACA_CANCEL** – PACA call cancel indicator. Set to '1' when the mobile station is directed
34 by the user to cancel the PACA call; otherwise, set to '0'.
- 35 **PACA_SID_S** – PACA system identifier. Equal to the SID of the system on which the mobile
36 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 [14].
- 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 record
9 of the most recently received *Global Service Redirection Message* or *Service Redirection*
10 *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 station
15 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 have
20 a tolerance of $\pm 10\%$. Tolerances of other parameters are provided for guidance only. Refer
21 to [13] and [16] for the analog performance standards, definitions, tolerances, and
22 measurement methods.

23 1.3. Message Forward Compatibility Rules

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

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

32 In the specific case of overhead messages on the Forward Control Channel, if the mobile
33 station receives a BCH-code-correct but unrecognizable overhead message (including Global
34 Action Message types), the mobile station shall count the message as part of the train for
35 NAWC-counting purposes, but shall not attempt to execute the message. All other
36 messages and fields of an overhead message train that carries a message type herein
37 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 ~~TSB70~~[\[32\]](#) for details. |
5

1 No text.

2. REQUIREMENTS FOR MOBILE STATION ANALOG OPERATION

Section 2 references [14] 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 standard correspond to subsection numbers in [14]. A reference in this standard to a particular subsection in [14] applies to that subsection and all subsequent subsections beneath it. However, text in Section 2 of this standard shall take precedence over any corresponding text in [14].

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 [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 [14].

2.1.1. Frequency Parameters

See the corresponding section of [14].

2.1.2. Power Output Characteristics

See the corresponding section of [14].

2.1.3. Modulation Characteristics

In addition to the requirements in this section, see the corresponding section of [14].

2.1.3.1. Voice Signals

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

- Transmit Audio Level Adjustment
- Compressor
- Pre-emphasis
- Deviation Limiter
- Post Deviation-Limiter Filter

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

1 2.1.3.1.1. Compressor

2 See the corresponding section of [14].

3 2.1.3.1.2. Pre-Emphasis

4 See the corresponding section of [14].

5 2.1.3.1.3. Deviation Limiter

6 See the corresponding section of [14].

7 2.1.3.1.4. Post Deviation-Limiter Filter

8 See the corresponding section of [14].

9 2.1.3.1.5. Transmit Audio Level Adjustment

10 The mobile station shall have a transmit objective loudness rating (TOLR) equal to -46 dB,
11 when transmitting to a reference base station (see 3.2.2.1). The loudness ratings are
12 described in ~~IEEE Standard 661-1979~~[\[24\]](#). Measurement techniques are described in [13].

13 2.1.3.2. Wideband Data Signals

14 See the corresponding section of [14].

15 2.1.4. Limitations on Emissions

16 In addition to the requirements in this section, see the corresponding section of [14].

17 2.1.4.1. Bandwidth Occupied

18 See the corresponding section of [14]. Measurement techniques are defined in [13].

19 2.1.4.2. Conducted Spurious Emissions

20 2.1.4.2.1. Suppression Inside Cellular Band

21 Refer to [13].

22 2.1.4.2.2. Suppression Outside Cellular Band

23 Current FCC rules shall apply.

24 2.1.4.3. Radiated Spurious Emissions

25 Refer to [13].

2.2. Receiver

In addition to the requirements in this section, see the corresponding section of [14].

2.2.1. Frequency Parameters

See the corresponding section of [14].

2.2.2. Demodulation Characteristics

In addition to the requirements in this section, see the corresponding section of [14].

2.2.2.1. 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 requirements (see 2.2.2.1.1 through 2.2.2.1.3) shall be met to ensure compatibility with the transmission plan for fixed digital speech networks:

2.2.2.1.1. De-Emphasis

See the corresponding section of [14].

2.2.2.1.2. Expander

See the corresponding section of [14].

2.2.2.1.3. Receive Audio Level Adjustment

The mobile station shall have a nominal receive objective loudness rating (ROLR) equal to 51 dB when receiving from a reference base station (see 3.1.3.1). The loudness ratings are described in ~~IEEE Standard 661-1979~~[\[24\]](#). Measurement techniques are described in [13].

2.2.3. Limitations on Emissions

In addition to the requirements in this section, see the corresponding section of [14].

2.2.3.1. Conducted Spurious Emissions

See the corresponding section of [14].

2.2.3.1.1. Suppression Inside Cellular Band

See the corresponding section of [14].

1 2.2.3.1.2. Suppression Outside Cellular Band

2 Current FCC rules shall apply.

3 2.2.3.2. Radiated Spurious Emissions

4 Refer to [13].

5 2.2.4. Other Receiver Parameters

6 System performance is predicated upon receivers meeting [13].

7 **2.3. Security and Identification**

8 In addition to the requirements in this section, see the corresponding section of [14].

9 2.3.1. Mobile Identification Number

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

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

17 The mobile station shall have memory to store a MIN. The 10-bit MIN2 shall be equal to
18 IMSI_M_S2p and the 24-bit MIN1 shall be equal to IMSI_M_S1p.

19 2.3.2. Electronic Serial Number (ESN)

20 See [5].

21 2.3.3. Station Class Mark

22 See the corresponding section of [14]. See [5] for information regarding SCM when
23 operating in the CDMA mode.

24 2.3.4. Registration Memory

25 In addition to the requirements in this section, see the corresponding section of [14]. See
26 [5] for operation in the CDMA mode.

27 2.3.5. Access Overload Class

28 In addition to the requirements in this section, see the corresponding section of [14]. See
29 [5] for operation in the CDMA mode.

1 2.3.6. Extended Address Method

2 See the corresponding section of [14].

3 2.3.7. First Paging Channel

4 See the corresponding section of [14].

5 2.3.8. Home System Identification

6 In addition to the requirements in this section, see the corresponding section of [14].

7 Note: the indicator HOME_SID_p is used to identify the home system during analog
8 operation, and is equivalent to the indicator SID_p defined in [14]. The requirements in [14]
9 apply to HOME_SID_p for operation in the analog mode.

10 2.3.9. Local Control Option

11 See the corresponding section of [14].

12 2.3.10. Preferred Operation Selection

13 See [5].

14 2.3.11. Discontinuous Transmission

15 See the corresponding section of [14].

16 2.3.12. Authentication, Encryption of Signaling Information/User Data

17 In addition to the requirements in this section, see the corresponding section of [14].

18 2.3.12.1. Authentication

19 In addition to the requirements in this section, see the corresponding section of [14].

20 2.3.12.1.1. Shared Secret Data (SSD)

21 See [5].

22 2.3.12.1.2. Random Challenge Memory (RAND)

23 See the corresponding section of [14].

24 2.3.12.1.3. Call History Parameter (COUNT_{s-p})

25 In addition to the requirements in this section, see the corresponding section of [14].

26 See 2.3.12.1.3 for information regarding COUNT_{s-p} when operating in the CDMA mode.

1 2.3.12.1.4. Authentication of Mobile Station Registrations

2 See the corresponding section of [14].

3 2.3.12.1.5. Unique Challenge-Response Procedure

4 See the corresponding section of [14].

5 2.3.12.1.6. Authentication of Mobile Station Originations

6 See the corresponding section of [14].

7 2.3.12.1.7. Authentication of Mobile Station Terminations

8 See the corresponding section of [14].

9 2.3.12.1.8. Updating the Shared Secret Data (SSD)

10 See the corresponding section of [14].

11 2.3.12.1.9. Authentication Procedures

12 See the corresponding section of [14].

13 2.3.12.2. Signaling Message Encryption

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

20 Consult "Interface Specification for Common Cryptographic Algorithms," section 2.5 for a
21 description of how the algorithm is initialized and applied.

22 2.3.12.2.1. Signaling Message Encryption Control

23 Signaling message encryption is controlled on a per-call basis. The default value is "off."
24 Signaling message encryption is deactivated at the beginning of each call. The mobile
25 station support for a signaling message encryption algorithm is reported to the base station
26 in the ENCRYPTION_SUPPORTED field of the PCI Report Word of the Reverse Analog
27 Control Channel message (See 2.7.1.1). To activate signaling message encryption for a
28 mobile station assigned to an analog voice channel, the base station must send a *Message*
29 *Encryption Mode Order* with the Order Qualifier field set to '001' for the basic encryption or
30 to '010' for the enhanced encryption. Signaling message encryption can also be activated
31 during CDMA-to-analog handoff by the base station sending an *Analog Handoff Direction*
32 *Message* with the MEM field set equal to '1', if the encryption algorithm to be used on the
33 Analog Voice Channel is the same as was used on the CDMA Traffic Channel. Alternatively,

1 if a different algorithm is to be used after the CDMA-to-analog handoff, signaling message
2 encryption shall be deactivated by the base station prior to the handoff, and activated again
3 on the Analog Voice Channel by sending *the Message Encryption Mode Order*.

4 The data used to initialize the algorithm is computed based upon parameters in effect at the
5 time the AUTHR appended to the origination/page response message was computed (see
6 [14]). For a call initiated via the CDMA Access Channel, the data used to initialize the
7 algorithm is computed based upon parameters in effect at the time the AUTHR was
8 computed for the *Origination Message* or *Page Response Message* (see [4]).

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

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

13 **2.4. Supervision**

14 See the corresponding section of [14].

15 **2.5. Malfunction Detection**

16 See the corresponding section of [14].

17 **2.6. Call Processing**

18 In addition to the requirements in this section, see the corresponding section of [14].

19 The following sections describe mobile station operation as controlled by a base station.
20 Frequent references are made to the corresponding sections in the base station section and
21 to the messages that flow between a base station and a mobile station. It is helpful to read
22 2.6 and 3.6 in parallel and examine the message formats in 2.7 and 3.7 at the same time.

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

25 2.6.1. Initialization

26 2.6.1.1. Retrieve System Parameters

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

- 28 • Set the Location-Registration ID status to enabled.
- 29 • Set the first-registration ID status to enabled.
- 30 • Set the first-location-area ID status to enabled.
- 31 • Set the Update Protocol Capability ID status to disabled.

- 1 • Set $PUREG_S = 0$, $PDREG_S = 0$, $LREG_S = 0$, $LRCC_S = 0$, $RAND_S = 0$, $IDHO_S = 0$,
2 $PACA_S = \text{disabled}$, $PCSID_S = 0$, $BSPC_S = 0$, $BSCAP_S = 0$, $PCI_HOME_S = 0$,
3 $PCI_ROAM_S = 0$, $SID_S = 0$, and $SID_R = 0$.

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

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

- 9 • If $SERVSYS_S = SYS_A$, set the serving-system status to enabled.
- 10 • If $SERVSYS_S = SYS_B$, set the serving-system status to disabled.

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

13 2.6.1.1.1. Scan Dedicated Control Channels

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

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

- 18 • Set $FIRSTCHD_S$ to the first dedicated control channel for System A
19 (834.990 MHz/879.990 MHz).
- 20 • Set $LASTCHD_S = FIRSTCHD_S - 21 + 1$.

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

- 22 • Set $FIRSTCHD_S$ to the first dedicated control channel for System B
23 (835.020 MHz/880.020 MHz).
- 24 • Set $LASTCHD_S = FIRSTCHD_S + 21 - 1$.

25 The mobile station examines the signal strength on each of the channels $FIRSTCHD_S$ to
26 $LASTCHD_S$.

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

28 2.6.1.1.2. Update Overhead Information

29 Overhead messages are sent in a group called an overhead message train (see 3.7.1.2). The
30 mobile station must use the value given in the number of additional words coming (NAWC)
31 field of the *System Parameter Overhead Message* in the train to determine that all messages
32 of the train have been received. The END field must be used as a cross-check. For NAWC
33 counting purposes, inserted control filler messages (see 3.7.1) must not be counted as part
34 of the overhead message train.

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

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

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

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

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

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

35 2.6.1.2. Paging Channel Selection

36 2.6.1.2.1. Scan Paging Channels

37 See the corresponding section of [14].

1 2.6.1.2.2. Verify Overhead Information

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

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

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

- 25 • Serial number bit (S_S): Set S_S to the value in the S field.
- 26 • Registration bit (R_S): If the roam status is disabled, set R_S to the value of the REGH
27 field; if the roam status is enabled, set R_S to the value of the REGR field.
- 28 • Extended address bit (E_S): Set E_S to the value in the E field.
- 29 • Authentication bit (AUTH_S): Set AUTH_S to the value in the AUTH field.
- 30 • Discontinuous transmission bit (DTX_S): Set DTX_S to the value of the DTX field.
- 31 • Number of paging channels (N_S): Set N_S to 1 plus the value of the N-1 field.
- 32 • Read-control-filler bit (RCF_S): Set RCF_S to the value of the RCF field.
- 33 • Combined paging/access bit (CPA_S): Set CPA_S to the value of the CPA field.
- 34 • Number of access channels (CMAX_S): Set CMAX_S to 1 plus the value of the CMAX-1
35 field.
- 36 • Determine control channel boundaries for accessing the system (FIRSTCHA_S and
37 LASTCHA_S) by using the following algorithm:
 - 38 – 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 the Initialization Task was entered with an origination indication, the mobile station must
9 enter the System Access Task with an origination indication (see 2.6.3).

10 If the Initialization Task was entered with a page response indication, the mobile station
11 must enter the System Access Task with a page response indication (see 2.6.3).

12 If the Initialization Task was entered with a wait-for-page indication, the mobile station
13 must enter the Idle Task with a wait-for-page indication (see 2.6.2).

14 Otherwise, the mobile station must enter Idle at the Response to Overhead Information
15 Task (see 2.6.2.1).

16 If the mobile station cannot complete this task on the strongest paging channel, it may tune
17 to the second strongest paging channel and attempt to complete this task within a second
18 3-second interval. If it cannot complete this task on either of the two strongest control
19 channels, the mobile station must enter the *System Determination Substate* of the *Mobile*
20 *Station Initialization State* with an acquisition failure indication ([5]).

21 2.6.2. Idle

22 During the Idle Task, a mobile station must execute each of the following (sub)tasks (see
23 2.6.2.1, 2.6.2.2, 2.6.2.3, 2.6.2.4, 2.6.2.5, and 2.6.2.6) at least every 46.3 ms, the periodicity
24 of word blocks on the forward control channel. If the Idle Task was entered with a wait-for-
25 page indication, the mobile station must not enter the *System Determination Substate* of the
26 *Mobile Station Initialization State* (see [5]) for at least 6 seconds after entering the Idle Task.
27 If at any time during the Idle Task the redirect delay timer expires, the mobile station must
28 exit this task and enter the System Access Task with a registration indication (see 2.6.3).
29 Otherwise, if the mobile station is not listening to a control channel of the preferred system
30 and $REDIRECTION_S = \text{disabled}$ and $PACA_S = \text{disabled}$, it may exit this task and enter the
31 *System Determination Substate* of the *Mobile Station Initialization State* with a reselection
32 indication (see [5]).

33 2.6.2.1. Response to Overhead Information

34 Whenever a mobile station receives an overhead message train (see 3.7.1.2), the mobile
35 station compare SID_S with SID_R . If SID_R is not equal to SID_S and $PACA_S = \text{enabled}$, the
36 mobile station must set $PACA_S = \text{disabled}$, and must indicate to the user that the PACA call
37 has been canceled. If SID_S is not equal to SID_R , the mobile station must exit the Idle Task

1 and enter the *System Determination Substate* of the *Mobile Station Initialization State* with a
 2 new system indication (see [5]).

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

- 5 • Extended Protocol Indicator: If the mobile station is equipped for the optional
 6 Extended Protocol, set EP_S to the value of the EP field.
- 7 • Serial number bit (S_S): Set S_S to the value in the S field.
- 8 • Registration bit (R_S): If the roam status is disabled, set R_S to the value of the REGH
 9 field; if the roam status is enabled, set R_S to the value of the REGR field.
- 10 • Extended address bit (E_S): Set E_S to the value in the E field.
- 11 • Authentication bit ($AUTH_S$): Set $AUTH_S$ to the value in the AUTH field.
- 12 • Discontinuous transmission bit (DTX_S): Set DTX_S to the value of the DTX field.
- 13 • Number of paging channels (N_S): Set N_S to 1 plus the value of the N - 1 field.
- 14 • Read-control-filler bit (RCF_S): Set RCF_S to the value of the RCF field.
- 15 • Combined paging/access bit (CPA_S): Set CPA_S to the value of the CPA field.
- 16 • Number of access channels (C_{MAX_S}): Set C_{MAX_S} to 1 plus the value of the CMAX -
 17 1 field.
- 18 • Determine control channel boundaries for accessing the system ($FIRSTCHA_S$ and
 19 $LASTCHA_S$) by using the following algorithm:
 - 20 – If the serving-system status is enabled,
 - 21 + If $CPA_S = 1$, set $FIRSTCHA_S$ to $FIRSTCHP_S$ for System A.
 - 22 + If $CPA_S = 0$, set $FIRSTCHA_S$ to $FIRSTCHP_S$ for System A minus N_S .
 - 23 + $LASTCHA_S = FIRSTCHA_S - C_{MAX_S} + 1$.
 - 24 – If the serving-system status is disabled,
 - 25 + If $CPA_S = 1$, set $FIRSTCHA_S$ to $FIRSTCHP_S$ for System B.
 - 26 + If $CPA_S = 0$, set $FIRSTCHA_S$ to $FIRSTCHP_S$ for System B plus N_S .
 - 27 + $LASTCHA_S = FIRSTCHA_S + C_{MAX_S} - 1$.

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

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

4 If the Update Protocol Capability ID status is enabled and $PCSID_S = SID_S$, the mobile
 5 station shall initiate protocol capability registration by entering the System Access Task (see
 6 2.6.3) with a capability registration indication.

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

- 11 1. *Local Control Messages*: See the corresponding section of [14].
- 12 2. *Access Type Parameters Message*: See the corresponding section of [14].
- 13 3. *New Access Channel Set Message*: See the corresponding section of [14].
- 14 4. *Registration Increment Message*: See the corresponding section of [14].
- 15 5. *Location Area Message*: See the corresponding section of [14].
- 16 6. *Random Challenge A Message*: See the corresponding section of [14].
- 17 7. *Random Challenge B Message*: See the corresponding section of [14].
- 18 8. *Registration ID Message*: If $R_S = 1$, the mobile station must perform the following:
 - 19 • If this message is received while first-idle ID status is disabled, location-
 20 registration ID status is disabled, first-registration ID status is enabled, first-
 21 location-area ID status is enabled, and the mobile station is tuned to a control
 22 channel different from $LRCC_S$, then the mobile station shall set first-registration
 23 ID status to disabled.
 - 24 • The mobile station must set $REGID_S$ to the value of the REGID field of the
 25 received message. If the first-registration ID status is enabled, the location-
 26 registration ID status is disabled, $SID_S = SID_{S-p}$, $DIGITAL_REG_{S-p} = '00000000'$,
 27 and $CDMA_MODE_S = '0'$, the mobile station must perform the following:
 - 28 – set the first-registration ID status to disabled (see 2.6.1.1.2).
 - 29 – if autonomous registration is enabled, the mobile station must enter the
 30 Autonomous Registration Update Task (see 2.6.3.11), supplying a success
 31 indication.
 - 32 – the mobile station shall continue to process information in the overhead
 33 message stream.

34 Otherwise, the mobile station shall set the first-registration ID status to disabled
 35 (see 2.6.1.1.2) and proceed as follows:

 - 36 • If $DIGITAL_REG_{S-p} = '00000001'$, the mobile station must perform the following:
 - 37 – Set $DIGITAL_REG_{S-p} = '00000000'$

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

- 1 – Otherwise, the mobile station must ignore the message and continue to
2 process messages in the overhead message train.
- 3 9. *CDMA Capability Message*: The mobile station must perform the following:
- 4 • If PACA_S = enabled, the mobile station should ignore the *CDMA Capability*
5 *Message* and continue to process messages in the overhead message train.
 - 6 • If CDMA_AVAIL equals '1', REDIRECTION_S equals disabled, and the preferred
7 mode of operation is CDMA, the mobile station may exit this task and enter the
8 *System Determination Substate* of the *Mobile Station Initialization State* with a
9 CDMA available indication (see [5]).
 - 10 • If CDMA_AVAIL equals '1', REDIRECTION_S equals enabled, the IGNORE_CDMA
11 field of REDIRECT_REC_S equals '0', and the preferred mode of operation is
12 CDMA, the mobile station may exit this task and enter the *System Determination*
13 *Substate* of the *Mobile Station Initialization State* with a CDMA available
14 indication (see [5]).
 - 15 • If ADD_CDMA_AVAIL equals '1', REDIRECTION_S equals disabled, and the
16 preferred mode of operation is CDMA, the mobile station may exit this task and
17 enter the System Access Task with a CDMA query indication (see 2.6.3).
 - 18 • If ADD_CDMA_AVAIL equals '1', REDIRECTION_S equals enabled, the
19 IGNORE_CDMA field of REDIRECT_REC_S equals '0', and the preferred mode of
20 operation is CDMA, the mobile station may exit this task and enter the System
21 Access Task with a CDMA query indication (see 2.6.3).
 - 22 • If the mobile station has previously attempted and failed to acquire a CDMA
23 system five consecutive times as a result of receiving a *CDMA Capability*
24 *Message*, the mobile station shall ignore the *CDMA Capability Message* until
25 immediately before the next autonomous registration attempt or until the next
26 mobile station power-up.
 - 27 • If REDIRECTION_S equals enabled, and the IGNORE_CDMA field of
28 REDIRECT_REC_S equals '1', the mobile station shall ignore the *CDMA Capability*
29 *Message*.
- 30 10. *Rescan Message*: See the corresponding section of [14].
- 31 11. Any Other Message (including messages and global action types herein defined as
32 "Reserved"): Use the message for NAWC-counting, but do not attempt to execute the
33 message.

1 2.6.2.2. Page Match

2 The mobile station must monitor mobile station control messages for page messages (see
3 3.7.1.1).

- 4 • If the ROAM status is disabled, the mobile station must attempt to match $MIN1_p$ to
5 $MIN1_r$ for one-word messages and both $MIN1_p$ and $MIN2_p$ to $MIN1_r$ and $MIN2_r$,
6 respectively, for two-word messages. All decoded MIN bits must match to cause the
7 mobile station to respond to the message.
- 8 • If the ROAM status is enabled, the mobile station must attempt to match both
9 $MIN1_p$ and $MIN2_p$ to $MIN1_r$ and $MIN2_r$, respectively. All decoded MIN bits must
10 match to cause the mobile station to respond to the order.

11 When a match occurs,

- 12 • If $PACA_S = \text{enabled}$, the mobile station must set $PACA_S = \text{disabled}$ and must indicate
13 to the user that the PACA call has been canceled.
- 14 • The mobile station must enter the System Access Task with a page response
15 indication (see 2.6.3).

16 2.6.2.3. Order

17 In addition to the requirements described in the corresponding section of [14], the mobile
18 station must respond to the following order as described below:

- 19 • *PACA Message*: If $PACA_S = \text{disabled}$, the mobile station must ignore the message.
20 If $PACA_S = \text{enabled}$, the mobile station must perform the following:
 - 21 – If the message is a response to an *Origination Order* ($PURPOSE_r = \text{'0000'}$), the
22 mobile station must ignore the message.
 - 23 – If the message is to provide the queue position of the PACA call ($PURPOSE_r =$
24 '0001'), the mobile station must indicate to the user that the PACA call is still
25 queued, and must indicate the current queue position (Q_POS_r) of the call. The
26 mobile station shall remain in the current task.
 - 27 – If the message is to instruct the mobile station to re-originate the PACA call
28 ($PURPOSE_r = \text{'0010'}$), the mobile station must enter the System Access Task (see
29 2.6.3) with a PACA response indication and re-originate the PACA call.
 - 30 – If the message is to cancel the PACA call ($PURPOSE_r = \text{'0011'}$), the mobile station
31 must set $PACA_S = \text{disabled}$, indicate to the user that the PACA call has been
32 canceled, and enter the Serving System Determination Task (see 2.6.3.12).

33 2.6.2.4. Call Initiation

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

- 35 • If $PACA_S = \text{enabled}$, the mobile station must set $PACA_S = \text{disabled}$ and must indicate
36 to the user that the PACA call has been canceled.

- 1 • The System Access Task (see 2.6.3) must be entered with an origination indication.

2 2.6.2.5. Reserved

3 2.6.2.6. Power Down

4 See the corresponding section of [14].

5 2.6.2.7. PACA Cancellation

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

8 If $PACA_S = \text{enabled}$, the mobile station must perform the following:

- 9 • Set $PACA_S = \text{disabled}$,
- 10 • Indicate to the user that the PACA call has been canceled,
- 11 • Enter the System Access Task (see 2.6.3) with a PACA cancel indication.

12 2.6.3. System Access

13 2.6.3.1. Set Access Parameters

14 If a mobile station power down occurs during a system access and $PDREG_S = 1$, the mobile
15 station must terminate its access procedures and initiate an autonomous registration by
16 continuing this task (see 2.6.3) with a power down registration indication.

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

- 19 • If this is an origination or PACA response, to a maximum of 12 seconds.
- 20 • If this is a page response or PACA cancel, to a maximum of 6 seconds.
- 21 • If this is an order response, to a maximum of 6 seconds.
- 22 • If this is a registration other than power down registration, to a maximum of 6
23 seconds.
- 24 • If this is a power down registration, to a maximum of 3 seconds.
- 25 • If this is a Base Station Challenge, to a maximum of 12 seconds.
- 26 • If this is a CDMA query, to a maximum of 6 seconds.

27 The mobile station must set $IDHO_S = 0$ and the last-try code (LT_S) to '0', set
28 $UPDATE_NEXTREG_S$ to '0', and then enter the Scan Access Channels Task (see 2.6.3.2).

29 2.6.3.2. Scan Access Channels

30 See the corresponding section of [14].

2.6.3.3. Retrieve Access Attempt Parameters

The mobile station must set the maximum number of seizure attempts allowed ($MAXSZTR_S$) to a maximum of 10, and the maximum number of busy occurrences ($MAXBUSY_S$) to a maximum of 10.

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

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

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

- If $RCF_S = 0$, the mobile station must then within 400 ms (+100 ms, -0 ms) set DCC_S to the value in the DCC field of a received message, set $SDCC1_S$ and $SDCC2_S$ to 0, and set the power level (PL_S) to 0.
- If $RCF_S = 1$, the mobile station must then within 1000 ms (+100 ms, -0 ms) read a *Control-Filler Message*, set DCC_S , $WFOM_S$, $SDCC1_S$ and $SDCC2_S$ to the values in the DCC, WFOM, SDCC1 and SDCC2 fields of the message, respectively, and set PL_S to the power level as specified in [14] for the value of the CMAC field of the message and the mobile station power class (see [5]).

If the DCC field or the *Control-Filler Message* is not received within the time allowed, then the mobile station must examine the access timer. If the access timer has expired, the mobile station must enter the Serving-System Determination Task (see 2.6.3.12). If the access timer has not expired, the mobile station must enter the Alternate Access Channel Task (see 2.6.3.13).

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

- If $PACA_S = \text{enabled}$ or $WFOM_S = 1$, the mobile station must enter the Update Overhead Information Task (see 2.6.3.4).
- If $WFOM_S = 0$, the mobile station must wait for a random delay. Each time it waits for a random delay, a random delay must be generated with the time uniformly distributed in the interval 0 to 92 ± 1 ms and, if quantized, with granularity no more than 1 ms. The mobile station must then enter the Seize Reverse Control Channel Task (see 2.6.3.5).

2.6.3.4. Update Overhead Information

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

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

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

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

- 3 • Update System Identification (SID_R). Set the 14 most significant bits of SID_R to the
4 value of the SID1 field. Set the least significant bit of SID_R to '1' if the serving-
5 system status is enabled; otherwise, set the bit to '0'.
- 6 • If the access is a registration, the mobile station must compare SID_R with SID_S. If
7 SID_R is not equal to SID_S, the mobile station must exit the Update Overhead
8 Information Task and enter the Serving System Determination Task (see 2.6.3.12).
9 Otherwise, the mobile station shall continue to process this task.
- 10 • If this access is an origination or a page response, the mobile station must compare
11 SID_R with SID_{S-p}. If SID_R does not equal SID_{S-p}, the mobile station must set RAND_S
12 equal to zero.
- 13 • If the access is a PACA response and SID_R is not equal to SID_S and PACA_S = enabled,
14 the mobile station must set PACA_S = disabled and must indicate to the user that the
15 PACA call has been canceled. The mobile station must enter the Serving System
16 Determination Task (see 2.6.3.12).

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

- 19 • *Overload Control Message:*
 - 20 – If this access is an origination, the mobile station must examine the value of the
21 overload class field (OLC) identified by ACCOLC_p. If the identified OLC field is
22 set to '0', the mobile station must exit this task and enter the Serving-System
23 Determination Task (see 2.6.3.12); if the identified OLC field is set to '1', the
24 mobile station must continue to respond to messages in the overhead message
25 train.
 - 26 – Otherwise, the mobile station must continue to respond to messages in the
27 overhead message train.
- 28 • *Access Type Parameters Message:*
 - 29 – The mobile station must set the busy-idle status bit (BIS_S) to the value of the BIS
30 field of the received message.
 - 31 – The mobile station must set PCI_HOME_S to the value of the PCI_HOME field of
32 the received message.
 - 33 – The mobile station must set PCI_ROAM_S to the value of the PCI_ROAM field of
34 the received message.
 - 35 – The mobile station must set BSPC_S to the value of the BSPC field of the received
36 message.
 - 37 – The mobile station must set BSCAP_S to the value of the BSCAP field of the
38 received message.

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

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

- 28 • The mobile station must set REGID_S to the value of the REGID field in the message.

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

34 2.6.3.5. Seize Reverse Control Channel

35 See the corresponding section of [14].

1 2.6.3.6. Delay After Failure

2 See the corresponding section of [14].

3 2.6.3.7. Service Request

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

- 6 • Word A must always be sent.
- 7 • Word B must be sent if any of the following conditions hold.
 - 8 – $E_S = 1$
 - 9 – $LT_S = 1$
 - 10 – $AUTH_S = 1$
 - 11 – the ROAM status is enabled
 - 12 – the access is an order confirmation
 - 13 – the access is a registration
 - 14 – the access is a capability registration
 - 15 – the access is a CDMA query
 - 16 – the access is a base station challenge
 - 17 – the mobile station was paged with a two-word *Mobile Station Control Message*
 - 18 – $RCF = 1$

- 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 update-protocol-capability ID status is enabled, Protocol Capability Indicator Word C must be sent.
- If the access is a registration and 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.

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 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).
- If the access is an origination, the mobile station must enter the Await Message Task (see 2.6.3.8).

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

12 2.6.3.8. Await Message

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

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

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

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

- 23 • *Initial Voice Channel Designation Message* (see 3.7.1.1): The mobile station must
24 update the parameters as set in the message, delete all entries from $SID_NID_LIST_S$,
25 $ZONE_LIST_S$, $SID_NID_LIST_{S-p}$, and $ZONE_LIST_{S-p}$, and set $REGISTERED_S$ to NO.
26 If $R_S = 1$, the mobile station must enter the Autonomous Registration Update Task
27 (see 2.6.3.11), supplying a success indication and then enter the Confirm Initial
28 Voice Channel Task (see 2.6.4.2). If $PACA_S = \text{enabled}$, the mobile station must set
29 $PACA_S = \text{disabled}$ and must indicate to the user that the PACA call is in process.
- 30 • *PACA Message* (see 3.7.1.1): If $PACA_S = \text{disabled}$, the mobile station must perform
31 the following:
 - 32 – If the message is in response to an origination ($PURPOSE_r = '0000'$), the mobile
33 station must set $PACA_S$ to enabled and indicate to the user that the call has
34 been queued as a PACA call. Also, the mobile station must indicate to the user
35 the current queue position (Q_POS_r) of the PACA call, and must then enter the
36 Idle Task (see 2.6.2).
 - 37 – If the message is not in response to an origination, the mobile station must
38 ignore the message. If $PACA_S = \text{enabled}$, the mobile station must perform the
39 following:

- 1 – If the message is in response to an origination ($PURPOSE_R = '0000'$), the mobile
2 station must ignore the message.
- 3 – If the message is to provide the queue position of the PACA call ($PURPOSE_R =$
4 $'0001'$), the mobile station must indicate to the user that the PACA call is still
5 queued, indicate the current queue position (Q_POS_R) of the call, and remain in
6 the current task.
- 7 – If the message is to instruct the mobile station to re-originate the PACA call
8 ($PURPOSE_R = '0010'$), the mobile station must enter the System Access Task (see
9 2.6.3) with an PACA response indication and re-originate the PACA call.
- 10 – If the message is to cancel the PACA call ($PURPOSE_R = '0011'$), the mobile station
11 must set $PACA_S =$ disabled, indicate to the user that the PACA call has been
12 canceled, and enter the Serving-System Determination Task (see 2.6.3.12).

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

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

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

- 20 – If $ORDQ = '000'$, set LT_S to '0'.
- 21 – If $ORDQ = '001'$, set LT_S to '1'.

22 The mobile station must then clear $CCLIST_S$ and examine each $CHANPOS$ field in
23 Words 3 and 4 of the message. For each nonzero $CHANPOS$ field, the mobile station
24 must calculate a corresponding channel number according to the following
25 algorithm:

- 26 – If $LOCAL/MSG_TYPE = '00000'$ and the serving-system status is enabled,
27 subtract $CHANPOS$ from $FIRSTCHA_S + 1$.
- 28 – If $LOCAL/MSG_TYPE = '00000'$ and the serving-system status is disabled, add
29 $CHANPOS$ to $FIRSTCHA_S - 1$.
- 30 – If $LOCAL/MSG_TYPE = '00001'$ and the serving-system status is enabled, set
31 $FIRSTCHA_S$ to the first dedicated control channel for System A (834.990
32 MHz/879.990 MHz) and subtract $CHANPOS$ from $FIRSTCHA_S + 1$. The mobile
33 must also set $AUTH_S$ to '0'.
- 34 – If $LOCAL/MSG_TYPE = '00001'$ and the serving-system status is disabled, set
35 $FIRSTCHA_S$ to the first dedicated control channel for System B (835.020
36 MHz/880.020 MHz) and add $CHANPOS$ to $FIRSTCHA_S - 1$. The mobile must also
37 set $AUTH_S$ to '0'.

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

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

12 After completing its response to the *Directed-Retry Message*, the mobile station must
13 examine the access timer. If the access timer has expired, the mobile station must
14 enter the Serving-System Determination Task (see 2.6.3.12). If the access timer has
15 not expired, the mobile station must enter the Directed-Retry Task (see 2.6.3.14).

16 If the access is an origination or PACA response:

- 17 • *Intercept*: If PACA_S = enabled, the mobile station must set PACA_S = disabled, must
18 indicate to the user that the PACA call has been canceled, and enter the Serving-
19 System Determination Task (see 2.6.3.12). Otherwise, the mobile station must enter
20 the Serving-System Determination Task (see 2.6.3.12).
- 21 • *Reorder*: If PACA_S = enabled, the mobile station must set PACA_S = disabled, must
22 indicate to the user that the PACA call has been canceled, and enter the Serving-
23 System Determination Task (see 2.6.3.12). Otherwise, the mobile station must enter
24 the Serving-System Determination Task (see 2.6.3.12).

25 If the access is a page response:

- 26 • *Release*: The mobile station must enter the Serving-System Determination Task (see
27 2.6.3.12).

28 If the access is a PCI order confirmation:

- 29 • *Release*: The mobile station must enter the Serving-System Determination Task (see
30 2.6.3.12).
- 31 • *Message Waiting Order*: If the mobile station is capable of performing Message
32 Waiting Notification, the mobile station shall indicate the presence of messages
33 waiting based upon the information contained in the message type field of the
34 Message Waiting order (*i.e.*, 0 for clear or no messages, other non-zero values
35 indicate the number of messages waiting). The mobile station then enters the
36 System Access Task (see 2.6.3) with an order confirmation indication.

37 If the access is a CDMA Query:

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

1 If the access is a Base Station Challenge:

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

11 If the access is an origination and the user terminates a call during this task, the
12 termination status must be enabled so that the call can be released on a voice channel (see
13 2.6.4.4) instead of on a control channel.

14 2.6.3.9. Await Registration Confirmation

15 In addition to the requirements in this section, see the corresponding section of [14].

16 If the mobile station receives an *Order Confirmation Message* (see 3.7.1.1), it shall delete all
17 entries from $SID_NID_LIST_S$, $ZONE_LIST_S$, $SID_NID_LIST_{S-p}$, and $ZONE_LIST_{S-p}$, and set
18 $REGISTERED_S$ to NO as the first action it takes.

19 2.6.3.10. Action on Registration Failure

20 In addition to the requirements in this section, see the corresponding section of [14].

21 The mobile station shall delete all entries from $SID_NID_LIST_S$, $ZONE_LIST_S$,
22 $SID_NID_LIST_{S-p}$, and $ZONE_LIST_{S-p}$, and shall set $REGISTERED_S$ to NO as the first action
23 it takes.

24 2.6.3.11. Autonomous Registration Update

25 In addition to the requirements in this section, see the corresponding section of [14].

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

28 2.6.3.12. Serving-System Determination

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

- 31 • If $REDIRECTION_S$ equals disabled, and either the preferred mode of operation is
32 CDMA or the serving-system status does not correspond to the preferred system, the
33 mobile station may enter the *System Determination Substate* of the *Mobile Station*
34 *Initialization State* with a reselection indication (see [5]); otherwise, it must enter the
35 *Paging Channel Selection Task* (see 2.6.1.2).

1 2.6.3.13. Alternate Access Channel

2 See the corresponding section of [14].

3 2.6.3.14. Directed Retry

4 See the corresponding section of [14].

5 2.6.4. Mobile Station Control on the Analog Voice Channel

6 In addition to the requirements in this section, see the corresponding section of [14].

7 2.6.4.1. Loss of Radio-Link Continuity

8 See the corresponding section of [14].

9 2.6.4.2. Confirm Initial Voice Channel

10 In addition to the requirements in this section, see the corresponding section of [14].

11 Within 100 ms of the receipt of a *Channel Assignment Message* (see [5]) containing
 12 ASSIGN_MODE = '011' and AN_CHAN_TYPE = '00', or an *Extended Channel Assignment*
 13 *Message* (see [5]) containing ASSIGN_MODE = '011' and AN_CHAN_TYPE = '00', the mobile
 14 station must execute the procedures in the corresponding section of [14].

15 2.6.4.3. Alerting

16 In addition to the requirements in this section, see the corresponding section of [14].

17 2.6.4.3.1. Waiting for Order

18 In addition to the requirements in this section, see the corresponding section of [14].

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

- 21 • If this task is entered as a result of receiving an *Analog Handoff Direction Message*
 22 (see [5]), the mobile station must use the VMAC, ANALOG_CHAN, and SCC values
 23 obtained from the *Analog Handoff Direction Message* to perform the following
 24 operations: adjust power level, tune to new channel, adjust to new SAT, and set
 25 SCC_s to the value of the SCC field of the message (see [14]). The mobile station
 26 must then turn on the transmitter, and reset the fade timer. The mobile station
 27 must set the message encryption mode to that indicated by the MEM value obtained
 28 from the *Analog Handoff Direction Message*. The mobile station may compare the
 29 SID value obtained from the *Analog Handoff Direction Message* with HOME_SID_p. If
 30 SID_r = HOME_SID_p, the mobile station may set the ROAM status to disabled. If
 31 SID_r is not equal to HOME_SID_p, the mobile station may set the ROAM status to
 32 enabled. The mobile station must remain in the Waiting for Order Task.

- 1 • Within 100 ms of the receipt of any of the orders listed either below (see 3.7.2) or in
2 the corresponding section of [14], the mobile station must compare SCC_S to the
3 present SAT color code (PSCC) field in the received message. If SCC_S is not equal to
4 PSCC, the order must be ignored. If $SCC_S = PSCC$, the action to be taken for each
5 order is as follows:
- 6 – *Alert With Info SMS*: Within 750 ms, the mobile station must send an *Alert With*
7 *Info SMS Order Confirmation Message*, and remain in the Waiting for Order Task.
8 If the value of the TASK_TM field of the received message is '0', reset the order
9 timer to 10 seconds; otherwise reset the order timer to 600 ms.

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

- 11 + If the value of the B/F field of the received message is '11' and the
12 INFO_DATA field of the received message contains an unsegmented SMS
13 teleservice message, the mobile station may discard any incomplete SMS
14 teleservice message being reassembled, and should pass the INFO_DATA
15 field of the received message to the SMS teleservice. Set the B/F field of the
16 *Alert With Info SMS Order Confirmation Message* to '1'. If the teleservice
17 reports an error, set the ERROR_CLASS and CAUSE_CODE fields of the *Alert*
18 *With Info SMS Order Confirmation Message* to report the teleservice error.
- 19 + If the value of the B/F field of the received message is '10', the mobile station
20 may discard any incomplete SMS teleservice message being reassembled,
21 and must store the INFO_DATA field of the received message as the first
22 segment of an SMS teleservice message being reassembled. Set SEQ_{NO_S} to
23 SEQ_{NO_R} . Set the B/F field of the *Alert With Info SMS Order Confirmation*
24 *Message* to '0'.
- 25 + If the value of the B/F field of the received message is '00' and a segmented
26 SMS teleservice message is being reassembled, compare the value of the
27 SEQ_NO field of the received message to SEQ_{NO_S} . Set the B/F field of the
28 *Alert With Info SMS Order Confirmation Message* to '0'. The mobile station
29 shall perform the following actions:
- 30 o If $(SEQ_{NO_S} + 1)$ modulo 8 is equal to the value of the SEQ_NO field of
31 the received message, store the INFO_DATA field of the received message
32 as the next segment of the SMS teleservice message being reassembled,
33 and increment SEQ_{NO_S} , modulo 8.
- 34 o If SEQ_{NO_S} is equal to the value of the SEQ_NO field of the received
35 message, the mobile station may discard the INFO_DATA field of the
36 received message.
- 37 o If neither SEQ_{NO_S} nor $(SEQ_{NO_S} + 1)$ modulo 8 is equal to the value of
38 the SEQ_NO field of the received message, the mobile station may discard
39 the INFO_DATA field of the received message and may discard the
40 incomplete SMS teleservice message being reassembled.

- 1 + If the value of the B/F field of the received message is '00', and no segmented
2 SMS teleservice message is being reassembled, the mobile station may
3 discard the INFO_DATA field of the received message. Set the B/F field of
4 the *Alert With Info SMS Order Confirmation Message* to '0'.
- 5 + If the value of the B/F field of the received message is '01', and if a
6 segmented SMS teleservice message is being reassembled, store the
7 INFO_DATA field of the received message as the last segment of the SMS
8 teleservice message and pass the complete SMS teleservice message to the
9 SMS teleservice. Set the B/F field of the *Alert With Info SMS Order*
10 *Confirmation Message* to '1'. If the teleservice reports an error, set the
11 ERROR_CLASS and CAUSE_CODE fields of the *Alert With Info SMS Order*
12 *Confirmation Message* to report the teleservice error.
- 13 + If the value of the B/F field of the received message is '01', and if no
14 segmented SMS teleservice message is being reassembled, the mobile station
15 may discard the INFO_DATA field of the received message. Set the
16 ERROR_CLASS and CAUSE_CODE fields of the *Alert With Info SMS Order*
17 *Confirmation Message* to report an error due to reception of an incomplete
18 message. Set the B/F field of the *Alert With Info SMS Order Confirmation*
19 *Message* to '0'.

20 2.6.4.3.2. Waiting for Answer

21 In addition to the requirements in this section, see the corresponding section of [14].

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

- 24 • If this task is entered as a result of receiving an *Analog Handoff Direction Message*
25 (see [5]), the mobile station must use the VMAC, ANALOG_CHAN, and SCC values
26 obtained from the *Analog Handoff Direction Message* to perform the following
27 operations: adjust power level, tune to new channel, adjust to new SAT, and set
28 SCC_S to the value of the SCC field of the message (see 2.4.1). The mobile station
29 must then turn on the transmitter, reset the fade timer, and turn on the signaling
30 tone. The mobile station must set the message encryption mode to that indicated by
31 the MEM value obtained from the *Analog Handoff Direction Message*. The mobile
32 station may compare the SID value obtained from the *Analog Handoff Direction*
33 *Message* with HOME_SID_p. If SID_r = HOME_SID_p, the mobile station may set the
34 ROAM status to disabled. If SID_r is not equal to HOME_SID_p, the mobile station
35 may set the ROAM status to enabled. The mobile station must remain in the
36 Waiting for Answer Task.
- 37 • Within 100 ms of the receipt of any of the orders listed either below or in the
38 corresponding section of [14], the mobile station must compare SCC_S to the PSCC
39 field in the received message. If SCC_S is not equal to PSCC, the order must be
40 ignored. If $SCC_S = PSCC$, the action to be taken for each order is as follows:

- 1 – *Alert With Info SMS*: Within 750 ms the mobile station must send an *Alert With*
2 *Info SMS Order Confirmation Message*, and remain in the Waiting for Answer
3 Task.

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

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

- 1 + If the value of the B/F field of the received message is '01' and a segmented
2 SMS teleservice message is being reassembled, store the INFO_DATA field of
3 the received message as the last segment of the SMS teleservice message and
4 pass the complete SMS teleservice message to the SMS teleservice. Set the
5 B/F field of the *Alert With Info SMS Order Confirmation Message* to '1'. If the
6 teleservice reports an error, set the ERROR_CLASS and CAUSE_CODE fields
7 of the *Alert With Info SMS Order Confirmation Message* to report the
8 teleservice error.
- 9 + If the value of the B/F field of the received message is '01', and no segmented
10 SMS teleservice message is being reassembled, the mobile station may
11 discard the INFO_DATA field of the received message. Set the
12 ERROR_CLASS and CAUSE_CODE fields of the *Alert With Info SMS Order*
13 *Confirmation Message* to report an error due to reception of an incomplete
14 message. Set the B/F field of the *Alert With Info SMS Order Confirmation*
15 *Message* to '0'.

16 2.6.4.4. Conversation

17 In addition to the requirements in this section, see the corresponding section of [14].

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

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

- 1 • Within 100 ms of the receipt of any of the orders listed either below or in the
2 corresponding section of [14], 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 operation
6 (see 2.3.11) must inhibit discontinuous transmission for 1.5 seconds; that is, for at
7 least 1.5 seconds, the mobile station must remain in the DTX-high state. Upon
8 receipt of the audit order, mobile stations capable of discontinuous transmission
9 must inhibit discontinuous transmission for at least 5 seconds. Immediately after
10 determining that $SCC_S = PSCC$ a mobile station that is not capable of discontinuous
11 transmission or a mobile station capable of discontinuous transmission but in the
12 DTX-high state must take the actions specified below for each order.

- 13 – *Send Called-Address:*

- 14 + If received within 10 seconds of the completion of the last valid flash, send
15 the called-address to the base station (see 2.7.2) and remain in the
16 Conversation Task. The contents of the called address field may depend on
17 the desired action to be taken by the network, such as:
 - 18 o If the flash was a result of the user indicating User Selective Call
19 Forwarding, the called-address should indicate either the:
 - 20 ◇ feature code for User Selective Call Forwarding to pre-registered
21 number, or
 - 22 ◇ feature code for User Selective Call Forwarding followed by the
23 desired forwarding to number, or
 - 24 ◇ feature code for User Selective Call Forwarding to voice mail.
 - 25 o If the flash was a result of the user activation or deactivation of Answer
26 Holding, the called-address should indicate the feature code for Answer
27 Holding.
- 28 + Otherwise, ignore the order and remain in the Conversation Task.

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

- 33 – *Alert With Info SMS:* Within 750 ms the mobile station must send *an Alert With*
34 *Info SMS Order Confirmation Message*, and remain in the Conversation 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', the INFO_DATA
2 field of the received message contains an unsegmented SMS teleservice
3 message. The mobile station may discard any incomplete SMS teleservice
4 message being reassembled, and should pass the INFO_DATA field of the
5 received message to the SMS teleservice. Set the B/F field of the *Alert With*
6 *Info SMS Order Confirmation Message* to '1'. If the teleservice reports an
7 error, set the ERROR_CLASS and CAUSE_CODE fields of the *Alert With Info*
8 *SMS Order Confirmation Message* to report the teleservice error.
- 9 + If the value of the B/F field of the received message is '10', the mobile station
10 may discard any incomplete SMS teleservice message being reassembled,
11 and must store the INFO_DATA field of the received message as the first
12 segment of an SMS teleservice message being reassembled. Store the value
13 of the SEQ_NO field of the received message in SEQ_NO_S. Set the B/F field
14 of the *Alert With Info SMS Order Confirmation Message* to '0'.
- 15 + If the value of the B/F field of the received message is '00', and if a
16 segmented SMS teleservice message is being reassembled, compare the value
17 of the SEQ_NO field of the received message to SEQ_NO_S. Set the B/F field
18 of the *Alert With Info SMS Order Confirmation Message* to '0'. Take action as
19 follows:
- 20 o If $(SEQ_NO_S + 1) \text{ modulo } 8$ is equal to the value of the SEQ_NO field of
21 the received message, store the INFO_DATA field of the received message
22 as the next segment of the SMS teleservice message being reassembled,
23 and increment SEQ_NO_S, modulo 8.
- 24 o If SEQ_NO_S is equal to the value of the SEQ_NO field of the received
25 message, the mobile station may discard the INFO_DATA field of the
26 received message.
- 27 o If neither SEQ_NO_S nor $(SEQ_NO_S + 1) \text{ modulo } 8$ is equal to the value of
28 the SEQ_NO field of the received message, the mobile station may discard
29 the INFO_DATA field of the received message and may discard the
30 incomplete SMS teleservice message being reassembled.
- 31 + If the value of the B/F field of the received message is '00', and no segmented
32 SMS teleservice message is being reassembled, the mobile station may
33 discard the INFO_DATA field of the received message. Set the B/F field of
34 the *Alert With Info SMS Order Confirmation Message* to '0'.
- 35 + If the value of the B/F field of the received message is '01' and a segmented
36 SMS teleservice message is being reassembled, store the INFO_DATA field of
37 the received message as the last segment of the SMS teleservice message and
38 pass the complete SMS teleservice message to the SMS teleservice. Set the
39 B/F field of the *Alert With Info SMS Order Confirmation Message* to '1'. If the
40 teleservice reports an error, set the ERROR_CLASS and CAUSE_CODE fields
41 of the *Alert With Info SMS Order Confirmation Message* to report the
42 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 station
3 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 2.6.4.5. Release

9 See the corresponding section of [14].

10 2.6.4.6. Power Down

11 See the corresponding section of [14].

12 **2.7. Signaling Formats**

13 In addition to the requirements in this section, see the corresponding section of [14].

14 2.7.1. Reverse Analog Control Channel (RECC)

15 In addition to the requirements in this section, see the corresponding section of [14].

16 2.7.1.1. Reverse Analog Control Channel (RECC) Messages

17 In addition to the requirements in this section, see the corresponding section of [14].

18 In addition to the message formats shown in the corresponding section of [14], the following
19 word(s) may be transmitted over the reverse control channel:

1 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

2

3 The interpretation of the data fields (not already defined in the corresponding section of
4 [14]) is as follows:

- 5 CLIC — Calling Line Identification Capability. Set to '0' to indicate not
6 EP (Extended Protocol) CLI-capable. Set to '1' to indicate EP-
7 CLI-capable.
- 8 MWNC — Message Waiting Notification Capability. Set to '0' to indicate
9 not EP-Voice Mail capable. Set to '1' to indicate EP-Voice Mail
10 Status-capable.
- 11 SMSC — Short Message Service Capability.
12 00 - Not SMS-capable,
13 01 - AWI SMS order-capable,
14 10 - EP-SMS-capable,
15 11 - AWI SMS and EP-SMS-capable.
- 16 PACAC — PACA Capability. Set to '0' to indicate not PACA-capable. Set
17 to '1' to indicate PACA capable.
- 18 ENCRYPTION_
19 SUPPORTED — Encryption algorithms supported by the mobile station.
20 If AUTH is equal to '0', the mobile station shall set this field to
21 '0000'. Otherwise, the mobile station shall set this field as
22 specified in [5].

23 2.7.2. Reverse Analog Voice Channel (RVC)

24 In addition to the requirements in this section, see the corresponding section of [14].

1 2.7.2.1. Reverse Analog Voice Channel (RVC) Messages

2 In addition to the requirements in this section, see the corresponding section of [14].

3 Selected Control Messages (see 2.7.2.1.1) are enciphered using the Cellular Message
 4 Encryption Algorithm (see 2.5.1, "Common Cryptographic Algorithms," Revision C) or the
 5 Enhanced Cellular Message Encryption Algorithm (see 2.5.2, "Common Cryptographic
 6 Algorithms," Revision C). For each message, the enciphered fields are designated. The
 7 messages are grouped by channel designation.

8 In addition to the RVC messages listed in the corresponding section of [14], formats are
 9 shown for the following RVC message types:

- 10 • Alert With Info SMS Order Confirmation Message
- 11 • PCI Report Message

12

13 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

14

1 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

2

1 The interpretation of the data fields (not already defined in the corresponding section of
2 [14]) 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, this
8			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 shall
12			be set to '10'. If the error is caused by a permanent condition,
13			this field shall be set to '11'.
14	CAUSE_CODE	—	Cause code. This field provides the delivery status of SMS
15			user data (see [15]).
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 not
20			EP (Extended Protocol) CLI-capable. Set to '1' to indicate EP-
21			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 Mail
24			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 Word 3 and 4 when sent for 32-Digit Dialing) of the *Called*
37 *Address Message* which comprise further dialed digits are encrypted. These 32 bits are
38 treated by the encryption procedure as a new single message. No additional fields in these
39 words are encrypted.

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

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

1

2 No Text.

3

3. REQUIREMENTS FOR BASE STATION ANALOG OPERATION

Section 3 references [14] 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 standard correspond to subsection numbers in [14]. A reference in this standard to a particular subsection in [14] applies to that subsection and to all subsequent subsections. However, text in a subsection of Section 3 of this standard shall take precedence over any text in the corresponding subsection text in [14].

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.

3.1. Transmitter

In addition to the requirements in this section, see the corresponding section of [14].

3.1.1. Frequency Parameters

See the corresponding section of [14].

3.1.2. Power Output Characteristics

See the corresponding section of [14].

3.1.3. Modulation Characteristics

See the corresponding section of [14].

3.1.3.1. Analog Voice Signals

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

- Transmit Audio Level Adjustment
- Compressor
- Pre-Emphasis
- Deviation Limiter
- 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 [14].

3 3.1.3.1.2. Pre-emphasis

4 See the corresponding section of [14].

5 3.1.3.1.3. Deviation Limiter

6 See the corresponding section of [14].

7 3.1.3.1.4. Post Deviation-Limiter Filter

8 See the corresponding section of [14].

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 [16].

13 3.1.3.2. Wideband Data Signals

14 See the corresponding section of [14].

15 3.1.4. Limitations on Emissions

16 3.1.4.1. Bandwidth Occupied

17 See the corresponding section of [14]. Measurement techniques are defined in [16].

18 3.1.4.2. Conducted Spurious Emissions

19 Refer to [16].

20 3.1.4.3. Radiated Spurious Emissions

21 Refer to [16].

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 [14].

1 3.2.1. Frequency Parameters

2 See the corresponding section of [14].

3 3.2.2. Demodulation Characteristics

4 See the corresponding section of [14].

5 3.2.2.1. Analog Voice Signals

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

- 7 • De-emphasis
- 8 • Expander
- 9 • Receive Audio Level Adjustment

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

13 3.2.2.1.1. De-emphasis

14 See the corresponding section of [14].

15 3.2.2.1.2. Expander

16 See the corresponding section of [14].

17 3.2.2.1.3. Audio Level Adjustment

18 The base station shall set the audio level so that a received 1004 Hz tone with a ± 2.9 kHz
19 peak frequency deviation produces a level of -18 dBm0 at the network interface.
20 Measurement techniques are described in [16].

21 3.2.3. Limitations on Emissions

22 Refer to [16].

23 3.2.4. Other Receiver Parameters

24 System performance is predicated upon receivers meeting [16].

25 **3.3. Security and Identification**

26 In addition to the requirements in this section, see the corresponding section of [14].

27 3.3.1. Authentication

28 See the corresponding section of [14].

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 [14].

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 [14].

11 3.6.1. Overhead Functions for Mobile Station Initiation

12 See the corresponding section of [14].

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 [14], 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 is
22 to acquire. A system may also indicate the availability of additional CDMA systems
23 by sending the *CDMA Capability Global Action Message* with the ADD_CDMA_AVAIL
24 field set to '1'.

25 3.6.2.2. Page

26 See the corresponding section of [14].

27 3.6.2.3. Order

28 In addition to the orders and order confirmations defined in the corresponding section of
29 [14], the following orders and order confirmations may be transmitted:

- 30 • *PACA Message*.

- 1 • *CDMA Info Order*.

2 3.6.2.4. Local Control

3 See the corresponding section of [14].

4 3.6.3. Base Station Support of System Access by Mobile Stations

5 3.6.3.1. Overhead Information

6 See the corresponding section of [14].

7 3.6.3.2. Reverse Control Channel Seizure by Mobile Stations

8 See the corresponding section of [14].

9 3.6.3.3. Response to Mobile Station Messages

10 In addition to the mobile station message responses defined in the corresponding section of
11 [14], the following response to mobile station messages may be sent:

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

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 [14].

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 [14], the following orders can be sent to the mobile station, with the resultant confirmation
8 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 the
13 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 *Alert*
15 *With Info SMS Message*. If the comparison results in a mismatch, the base station
16 must not transmit any new Alert With Info SMS messages and may re-transmit the
17 unacknowledged *Alert With Info SMS Message* until the unacknowledged outstanding
18 *Alert With Info SMS Message* is received as indicated by a match of SEQ_NO_r and
19 SEQ_NO_s. Then, if the channel was allocated to deliver SMS messages, the base
20 station should send a *Release Order*. Otherwise the base station must remain in the
21 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 [14], 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 the
30 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 *Alert*
32 *With Info SMS Message*. If the comparison results in a mismatch, the base station
33 must not transmit any new Alert With Info SMS messages and may re-transmit the
34 unacknowledged *Alert With Info SMS Message* until that outstanding *Alert With Info*
35 *SMS Message* is received as indicated by a match of SEQ_NO_r and SEQ_NO_s. Then,
36 if the channel was allocated to deliver SMS messages, the base station should send
37 a *Release Order*. Otherwise the base station must remain in the Waiting for Answer
38 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 [14], 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 the
8 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 it is re-originated using the *PACA Message*
16 (PURPOSE_r = '0010'), the base station should send an *Alert With Information Message*.

17 3.6.5. Delivery of Character Information

18 See Section 3.7.2.2 of this standard.

19

1

2 **3.7. Signaling Formats**

3 In addition to the requirements in this section, see the corresponding section of [14] for
4 operation in the analog mode.

5 3.7.1. Forward Analog Control Channel

6 See the corresponding section of [14].

7 3.7.1.1. Mobile Station Control Message

8 In addition to the message formats defined in the corresponding section of [14], the *Mobile*
9 *Station Control Message* can 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 [14]) 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 [14].

5 3.7.1.2.1. System Parameter Overhead Message

6 In addition to the requirements in this section, see the corresponding section of [14] 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 [14] 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 [14]) 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.
- 8 ADD_CDMA_AVAIL — Set to '1' if additional CDMA systems are available.

9 3.7.1.2.3. Registration ID Message

10 In addition to the definitions in this section, see the corresponding section of [14] for
11 operation in analog mode.

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

Action Code	Type
0100	CDMA Capability

13 The *Global Action Message* codes defined in Table 3.7.1.2.3-1 are in addition to the codes
14 defined in [14].

15 3.7.1.2.4. Control-Filler Message

16 See the corresponding section of [14] for operation in the analog mode.

17 3.7.1.3. Data Restrictions

18 See the corresponding section of [14] for operation in the analog mode.

1 3.7.2. Forward Analog Voice Channel

2 See the corresponding section of [14].

3 3.7.2.1. Mobile Station Control Message

4 In addition to the *Mobile Station Control Message* defined in this section, see the
5 corresponding section of [14] for operation in the analog mode.

6 Word 2 - First Alert With Info SMS Word

Information Element	Length (bits)
$T_1T_2 = 01$	2
RL_W	7
SEQ_NO	3
B/F	2
TASK_TM	1
RSVD = 00000	5
INFO_DATA	8
P	12

7 Word 3 - Second Alert With Info SMS Word

Information Element	Length (bits)
$T_1T_2 = 01$	2
RSVD = 00	2
INFO_DATA	24
P	12

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

Information Element	Length (bits)
$T_1T_2 = 01$	2
RSVD = 00	2
INFO_DATA	24
P	12

9

1 The interpretation of the data fields (not already defined in the corresponding section of
2 [14]) 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 sequence
6 number of the *Alert With Info SMS Message*. This field shall be
7 initialized to '000', and reset to '000' when transmitting a new
8 SMS teleservice message.

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

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

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

28 INFO_DATA — Info data. This field contains the SMS teleservice message
29 data (see TIA/EIA-637-A).

30 Selected Control Messages (see 2.7.2.1.1 and 3.7.2.1.1) are enciphered using the Cellular
31 Message Encryption Algorithm (see 2.5.1, "Common Cryptographic Algorithms," Revision C)
32 or the Enhanced Cellular Message Encryption Algorithm (see 2.5.2, "Common
33 Cryptographic Algorithms," Revision C). For each message, the enciphered fields are
34 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 [14].

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. The

1 24 bits that comprise the three characters in each FVC word are treated by the encryption
2 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 as
4 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 [14].

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 shall
16 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 2
23 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 SMS
27 Words are encrypted.

28 The encrypted fields of Word 2 - First Alert With SMS Word and all INFO_DATA fields of the
29 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 shall
32 be set as follows:

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

1

2 3.7.2.2. Calling Number Identification (CNI)

3 Whenever two instances of CNI need to be sent to a mobile station on the Forward Analog
4 Voice Channel, then the base station shall transmit the second instance of CNI using a
5 *Flash With Info Message*. This allows for PI and SI information to be uniquely specified for
6 each instance of CNI.

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

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

- 1 No text.

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

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

1

2 No text.

1 **A RESERVED**

2

3

- 1 No text.

1 B MOBILE STATION DATABASE

2 B.1 Introduction

3 This is an informative annex that lists the numeric indicators that are described in this
 4 document and are stored in the mobile station's permanent or semi-permanent memory.
 5 Some of these indicators are required; other indicators are optional and are so noted.
 6 The indicators are organized in this annex according to two categories:

- 7 • Mobile station indicators These indicators are global to the mobile station and
 8 independent of the mobile station's NAMs.
- 9 • NAM indicators These indicators specify parameters associated with the
 10 mobile station's NAM.

11 The description of each indicator shown below includes the indicator's name, the number of
 12 bits it contains, and the section in this document where it is defined. Permanent indicators
 13 are denoted by the "p" subscript; semi-permanent indicators are denoted by the "s-p"
 14 subscript.

15 B.2 Mobile Station Indicators

16 Mobile station indicators are organized into permanent mobile station indicators and semi-
 17 permanent mobile station indicators.

18 B.2.1 Permanent Mobile Station Indicators

19 Permanent mobile station indicators specify physical station configuration and attributes,
 20 independent of NAM. No additional permanent indicators are defined in this document.
 21

22 Semi-permanent mobile station indicators are retained when the mobile station power is
 23 turned off. These indicators are associated with mobile station registration. They are
 24 independent of the NAM in use. Analog indicators are listed in Table B.2.2-1.
 25

26 **Table B.2.2-1. Analog Semi-permanent Mobile Station Indicators**

Indicator	Number of Bits	Where Defined	Notes
NXTREG _{S-p}	21	2.3.4.1	
SID _{S-p}	15	2.3.4.1	
LOCAID _{S-p}	12	2.3.4.2	
PUREG _{S-p}	1	2.3.4.2	

27

28 B.3 NAM Indicators

29 Each mobile station contains one or more NAMs. Table B.3-1 lists the permanent and
 30 semi-permanent values associated with each NAM.
 31

1

Table B.3-1. NAM Indicators

Indicator	Number of Bits	Where Defined	Notes
FIRSTCHP _p	11	2.3.7	
SSD_A _{s-p}	64	2.3.12.1.1	Shared Secret Data A
SSD_B _{s-p}	64	2.3.12.1.1	Shared Secret Data B
COUNT _{s-p}	6	2.3.12.1.3	Call History Parameter
IMSI_M_S _p	34	2.3.1	Includes IMSI_M_S1 _p and IMSI_M_S2 _p .
HOME_SID _p	15	2.3.8	
ACCOLC _p	4	2.3.5	

2