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3RD GENERATION PARTNERSHIP PROJECT 2 "3GPP2"

Analog Signaling Standard for cdma2000 Spread Spectrum Systems

PREFACE

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

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

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

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

This standard is divided into multiple parts. This part governs analog operation at 800 MHz based upon the standard, TIA/EIA-553-A. This standard provides the differences within TIA/EIA-553-A, which are used by dual-mode mobile stations.

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TABLES

FOREWARD

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

2. Requirements for Mobile Station Analog Operation. This section describes the requirements for CDMA-analog dual-mode mobile stations operating in the analog mode. A mobile station complying with these requirements will be able to operate with analog base stations complying with this document and should be able to operate with analog base stations complying with TIA/EIA-553-A, TIA/EIA/IS-136, TIA/EIA-691, and TIA/EIA/IS-91-A or the latest version of these standards.

3. Requirements for Base Station Analog Operation. This section describes the requirements for analog base stations. A base station complying with these requirements will be able to operate in the analog mode with mobile stations complying with this document and should be able to operate in the analog mode with mobile stations complying with TIA/EIA-553-A, TIA/EIA/IS-136, TIA/EIA-691, and TIA/EIA/IS-91 or the latest version of these standards.

4. Requirements for Mobile Station Analog Options. This section describes the requirements for CDMA-analog dual-mode mobile stations, which use the 32-digit dialing option on the reverse analog control channel. In addition, this section describes mobile station requirements for use of the optional extended protocol.

5. Requirements for Base Station Analog Options. This section describes the base station requirements for using the 32-digit dialing option on the reverse analog control channel. In addition, this section describes base station requirements for use of the optional extended protocol.

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

NOTES

1. Compatibility, as used in connection with this standard, is understood to mean: Any mobile station that is able to place and receive calls in any 800 MHz cellular system. Conversely all systems are able to place and receive calls for any mobile station. 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 TIA/EIA/IS-91 or EIA/TIA/IS-136.
3. This compatibility specification is based on the specific United States spectrum allocation for cellular systems.
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. EIA/IS-19-B (May 1988) and TIA/EIA-712 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. TSB29-B recommends SID range for countries. Cognizant government authorities should refer to TSB29-B 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 2.3.2 of 3GPP2 C.S0005-0).
8. Those wishing to deploy systems compliant with this standard should also take notice of the requirement to be compliant with FCC Parts 15, 22, and 24; and the referenced version of FCC Office of Engineering and Technology Bulletin 53.
9. 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.
10. For the optional analog extended protocol feature (see 4.1 and 5.1), the assignment of message type codes (MST words) will be made using procedures described in TSB39. This will ensure that the feature will be implemented in an orderly manner.
11. "Base station" refers to the functions performed on the land side, which are typically distributed among a cell, a sector of a cell, and a mobile switching center.

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12. This standard uses the following verbal forms: "Shall" and "shall not" identify requirements to be followed strictly to conform to the standard and from which no deviation is permitted. "Should" and "should not" indicate that one of several possibilities is recommended as particularly suitable, without mentioning or excluding others; that a certain course of action is preferred but not necessarily required; or that (in the negative form) a certain possibility or course of action is discouraged but not prohibited. "May" and "need not" indicate a course of action permissible within the limits of the standard. "Can" and "cannot" are used for statements of possibility and capability, whether material, physical, or causal. The use of "must" and "must not" is equivalent to the use of "shall" and "shall not."

13. Unless indicated otherwise, this document presents numbers in decimal form. Binary numbers are distinguished in the text by the use of single quotation marks.

14. A potential compatibility problem between TIA/EIA-553-A and this standard exists as a result of differences in access channel boundary determination procedures supported in these two standards. Recommended solutions to this potential compatibility problem are as follows:

Preferred Solution

Section 2.3.7 of TIA/EIA-553-A (First Paging Channel) specifies the first paging channels ($FIRSTCHP_p$) which must be stored in a TIA/EIA/IS-2000 mobile station and used to identify the first paging channel in paging channel scans when the mobile station is operating in its home system. Defaulting this value to the preferred system's (i.e., A or B band) first dedicated control channel (834.990 MHz/879.990 MHz and 835.020 MHz/880.020 MHz respectively) will prevent paging/access channels from being calculated differently when the TIA/EIA/IS-2000 mobile station operates on a TIA/EIA-553-A based home system. This solution is used today and should continue to be used to ensure full interoperability of TIA/EIA-553-A and TIA/EIA/IS-2000 mobile stations on both TIA/EIA-553-A and TIA/EIA/IS-2000 type systems. This solution does, however, require that both home and roaming TIA/EIA/IS-2000 mobile stations use the same paging channel set (i.e., no split home-roam paging channels).

Non-Preferred Solution

If a second portion of the existing spectrum is allocated for control channel use (over and above the dedicated control channels) then split home-roam paging can still be achieved for both TIA/EIA/IS-136 and TIA/EIA-553-A mobile stations. This second portion of spectrum could be managed as follows:

- Used exclusively by home TIA/EIA/IS-2000 mobile stations, having appropriate NAM programming, for both paging and access functions or,
- Used by home TIA/EIA/IS-2000 mobile stations, having appropriate NAM programming, for both paging and access functions and by home TIA/EIA-553-A mobile stations, having appropriate NAM programming, for paging functions only. Home TIA/EIA-553-A mobile stations would continue to use the existing dedicated control channels for access functions.

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15. Forward control channel mobile station control messages of greater than five words in length have been shown to yield compatibility problems in some mobile stations. Implementers of systems are advised that the functions performed by these optional messages may be achieved on assigned voice channels without causing compatibility issues. Mobile station manufacturers are advised that the length of forward control channel messages defined in future standards may be different from that defined in this standard.

16. The NOTES section of TIA/EIA-553-A contains technical recommendations regarding analog mode operation. These recommendations also apply to mobile station(s) complying with this standard operating in the analog mode. See the NOTES section of TIA/EIA-553-A, TIA/EIA-691, and TIA/EIA/IS-91-A for further details.

REFERENCES

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

—American National Standards:

1. ANSI/EIA/TIA-691, *Mobile Station-Land Station Compatibility Standard for Enhanced 800MHz Analog Cellular,* date pending.
2. ANSI T1.607-1990, *Integrated Services Digital Network (ISDN)–Layer 3 Signaling Specification for Circuit Switched Bearer Service for Digital Subscriber Signaling System Number 1 (DSS1),* July 1990.
3. ANSI TI.610-1994, *Generic Procedures for the Control of ISDN Supplementary Services,* August, 1994.
4. ANSI TIA/EIA-690, *Recommended Minimum Standards for 800 MHz Cellular Subscriber Units*, July, 1999.
5. ANSI X3.4-1986, *Coded Character Set - 7-bit American National Standard Code for Information Interchange*, 1992.
6. ANSI TIA/EIA-712, *Recommended Minimum Standards for 800 MHz Cellular Base Stations*, July, 1997.
7. EIA/IS 19-B, Recommended Minimum Performance Standards for Dual-Mode Spread Spectrum Cellular Mobile Stations, August 1998.
8. TIA/EIA-553-A, *Mobile Station - Land Station Compatibility Specification,* date pending.
9. TIA/EIA/IS-637-A, *Short Message Services for Wideband Spread Spectrum Cellular Systems.*
10. TIA/EIA-712, *Recommended Minimum Performance Standards for Base Stations Supporting Dual-Mode Spread Spectrum Cellular Mobile Stations,* August 1998.

—Other Standards:

11. *Common Cryptographic Algorithms,* Revision C, 1997. A TIA document subject to restricted distribution. Contact the Telecommunications Industry Association, Arlington, VA.
12. CCITT Recommendation E.163, *Numbering Plan for the International Telephone Service*, 1988. Note: merged with E.164.
13. CCITT Recommendation E.164 (I.331), *Numbering Plan for the ISDN Era*, 1991.
14. CCITT Recommendation E.212, *Identification Plan for Land Mobile Stations*, 1988.

REFERENCES

15. CCITT Recommendation F.69, *The International Telex Service–Service and Operational Provisions of Telex Destination Codes and Telex Network Identifications Codes*, 1994.
16. CCITT Recommendation G.162, *Characteristics of Compandors for Telephony*.
17. CCITT Recommendation X.121, *International Numbering Plan for Public Data Networks*, 1992.
18. IEEE Standard 661-1979, *Method for Determining Objective Loudness Ratings of Telephone Connections,* 1979.
19. *Interface Specification for Common Cryptographic Algorithms,* Rev C, 1997. Contact the Telecommunications Industry Association, Arlington, VA.
20. TIA/EIA/IS-91-A, *Mobile Station-Base Station Compatibility Standard for 800 MHz Analog Cellular, Auxiliary, and Residential Service,* July, 1999.
21. TSB16, *Assignment of Access Overload Classes in the Cellular Telecommunications Services*, March 1985.
22. TSB29-B, *International Implementation of Wireless Telecommunication Systems Compliant with TIA/EIA-41,* July 1997.
23. TSB39-A, *Message Type Assignments for the Extended Protocol Facility of ANSI/EIA/TIA-553, EIA/TIA/IS-54, TIA/EIA/IS-88 and TIA/EIA/IS-95,* October 1994.
24. TSB50, *User Interface for Authentication Key Entry*, March 1993.
25. TSB58-A, *Administration of Parameter Value Assignments for TIA/EIA Wideband Spread Spectrum Standards*.
26. TSB70-A, *FSK Air Interface Common Message Protocol Cross-Reference*.
27. TIA/EIA/IS-683-A, *Over-the-Air Service Provisioning of Mobile Stations in Spread Spectrum Systems,* June 1998.

No Text.

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.

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

BCH Code. See Bose-Chaudhuri-Hocquenghem Code.

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

bps. Bits per second.

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

Call History Parameter (COUNT). A modulo-64 event counter maintained by the mobile station and Authentication Center that is used for clone detection.

CDMA. See Code Division Multiple Access.

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

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

CDMA Frequency Assignment. A 1.23 MHz segment of spectrum. For CDMA cellular systems, the channel is centered on one of the 30 kHz channels of the existing analog cellular system. For CDMA systems, the channel is centered on one of the 50 kHz channels.

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

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

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

Deinterleaving. The process of unpermuting the symbols that were permuted by the interleaver. Deinterleaving is performed on received symbols prior to decoding.

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

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

DTMF. See Dual-Tone Multifrequency.

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

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

ESN. See Electronic Serial Number.

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

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

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

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

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

GHz. Gigahertz (10^9 Hertz).

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

HLR. See Home Location Register.

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

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

IMSI. See International Mobile Station Identity.

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

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

Interleaving. The process of permuting a sequence of symbols.

International Mobile Station Identity (IMSI). A method of identifying stations in the land mobile service as specified in CCITT Recommendation E.212.

kHz. Kilohertz (10^3 Hertz).

Layering. A method of organization for communication protocols. A layer is defined in terms of its communication protocol to a peer layer in another entity and the services it offers to the next higher layer in its own entity.

Local Control. An optional mobile station feature used to perform manufacturer-specific functions.

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

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

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

MHz. Megahertz (10^6 Hertz).

MIN. See Mobile Identification Number.

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

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

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

Mobile Station Class. Mobile station classes define mobile station characteristics such as slotted operation and transmission power. See Table 2.3.3-1 of TIA/EIA-553-A and Table 2.3.3-1 of 3GPP2 C.S0005-0.

Mobile Station Identification Number (MSIN). A part of the E.212 IMSI identifying the mobile station within its home network. See CCITT Recommendation E.212.

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

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

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

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

MSB. Most significant bit.

MSC. See Mobile Switching Center.

MSIN. See Mobile Station Identification Number.

NAM. See Number Assignment Module.

Narrow Analog. A type of voice channel that uses 10 kHz channel spacing and uses subaudible signaling.

National Mobile Station Identity (NMSI). A part of the E.212 IMSI identifying the mobile station within its home country. The NMSI consists of the NMC and the MSIN. See CCITT Recommendation E.212.

NDSS. See Network Directed System Selection.

Network. A network is a subset of a cellular system, such as an area-wide cellular network, a private group of base stations, or a group of base stations set up to handle a special requirement. A network can be as small or as large as needed, as long as it is fully contained within a system. See also System.

Network Directed System Selection (NDSS). A feature that allows the mobile station to automatically register with a preferred system while roaming, or to be automatically directed by a service provider, typically the home service provider, to a suggested system, regardless of the frequency band class, or cellular band.

NMSI. See National Mobile Station Identity.

Non-Autonomous Registration. A registration method in which the base station initiates registration. See also Autonomous Registration.

ns. Nanosecond (10^{-9} second).

Number Assignment Module (NAM). A set of MIN/IMSI-related parameters stored in the mobile station.

Numeric Information. Numeric information consists of parameters that appear as numeric fields in messages exchanged by the base station and the mobile station and information used to describe the operation of the mobile station.

OLC. See Overload Control (analog).

Optional Field. A field defined within a message structure that is optionally transmitted to the message recipient.

Order. A type of message that contains control codes for either the mobile station or the base station. See Table 3.7.1.1-1.

Overhead Message. A message sent by the base station on the Paging Channel to communicate base-station-specific and system-wide information to mobile stations.

Overload Control (OLC). A means to restrict reverse analog control channel accesses by mobile stations. Mobile stations are assigned one (or more) of sixteen control levels. Access is selectively restricted by a base station setting one or more OLC bits in *the Overload Control Global Action Message*.

PACA. Priority Access and Channel Assignment. See PACA Call.

PACA Call. A priority mobile station originated call for which no traffic channel or voice channel was immediately available, and which has been queued for a priority access channel assignment.

Paging. The act of seeking a mobile station when a call has been placed to that mobile station.

Paging Channel (Analog). See Analog Paging Channel.

Parity Check Bits. Bits added to a sequence of information bits to provide error detection, correction, or both.

PCSC. See Personal Communications Switching Center.

Personal Communications Switching Center (PCSC). See Mobile Switching Center (MSC).

Power-Down Registration. An autonomous registration method in which the mobile station registers on power-down.

Receive Objective Loudness Rating (ROLR). A perceptually weighted transducer gain of telephone receivers relating electrical excitation from a reference generator to sound pressure at the earphone. The receive objective loudness rating is normally specified in dB relative to one Pascal per millivolt. See IEEE Standard 269-1992, IEEE Standard 661-1979, CCITT Recommendation P.76, and CCITT Recommendation P.79.

Registration. The process by which a mobile station identifies its location and parameters to a base station.

Release. A process that the mobile station and base station use to inform each other of call disconnect.

Reverse Analog Control Channel (RECC). The analog control channel used from a mobile station to a base station.

Reverse Analog Voice Channel (RVC). The analog voice channel used from a mobile station to a base station.

Roamer. A mobile station operating in a cellular system (or network) other than the one from which service was subscribed.

ROLR. See Receive Objective Loudness Rating.

SAT. See Supervisory Audio Tone.

Scan of Channels. The procedure by which a mobile station examines the signal strength of each forward analog control channel.

Seizure Precursor. The initial digital sequence transmitted by a mobile station to a base station on a reverse analog control channel.

Shared Secret Data (SSD). A 128-bit pattern stored in the mobile station (in semi-permanent memory) and known by the base station. SSD is a concatenation of two 64-bit subsets: SSD_A, which is used to support the authentication procedures, and SSD_B, which serves as one of the inputs to the process generating the encryption mask and private long code.

Short Message Services (SMS). A suite of services such as SMS Text Delivery, Digital Paging (i.e., Call Back Number - CBN), and Voice Mail Notification (VMN).

SID. See System Identification.

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

SSD. See Shared Secret Data.

sps. Symbols per second.

Station Class Mark (SCM). An identification of certain characteristics of a mobile station. Classes are defined in Table 2.3.3-1 of TIA/EIA-553-A and Table 2.3.3-1 of 3GPP2 C.S0005.

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

- Fade Timing Status. Indicates whether the mobile station's fade timer has expired.
- First Idle ID Status. A status variable used by the mobile station in association with its processing of the Idle Task.
- First Location Area ID Status. A status variable used by the mobile station in association with its processing of received Location Area ID messages.
- First Registration ID Status. A status variable used by the mobile station in association with its processing of received Registration ID messages.
- Local Control Status. Indicates whether a mobile station must respond to local control messages.
- Location Registration ID Status. A status variable used by the mobile station in association with its processing of power-up registrations and location-based registrations.
- Roam Status. Indicates whether a mobile station is in its home system.
- Serving-System Status. Indicates whether a mobile station is tuned to channels associated with System A or System B.
- Termination Status. Indicates whether a mobile station must terminate the call when it is on an analog voice channel.
- Update Protocol Capability ID Status. Indicates whether the mobile station should report its protocol capability to the serving system.

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

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

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

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

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

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

TOLR. See Transmit Objective Loudness Rating.

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

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

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

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

UTC. Universal Temps Coordiné. See Universal Coordinated Time.

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

Voice Channel. See Analog Voice Channel.

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

µs. Microsecond (10^{-6} second).

1.1.2. Numeric Information

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

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

1.1.2.1. Analog Numeric Information

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

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

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

$BSPC_s$ – The base station protocol capability received in the Access Type parameters *Global Action Overhead Message*. Indicates the analog air interface protocol, such as TIA/EIA-553-A, supported by the system.

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

$CDMA\_MODE_s$ – Indicates whether the mobile station entered the analog mode of operation.

$CMAX_s$ – The maximum number of channels to be scanned by a mobile station when accessing a system.

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

$COUNT_{s\text{-}p}$ – A modulo-64 count held in the mobile station. $COUNT_{s\text{-}p}$ is maintained during power off.

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

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

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

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

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

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

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

$HOME\_SID_p$ – Home System Identification. A 15-bit value that identifies the home system for a MIN supported by the mobile station.

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

$LASTCHA_S$ – The number of the last analog control channel used for accessing a system.

$LASTCHD_S$ – The number for the last channel used as a dedicated control channel.

$LASTCHP_S$ – The number of the last analog control channel used for paging mobile stations.

$LOCAID_S$ – The received location area identity.

$LOCAID_{S-P}$ – Identifies the current location area.

$LRCC_S$ – The last registration control channel used by a mobile station.

$LREG_S$ – The stored value of the LREG field received in the most recent *Location Area Global Action Message*.

LT_S – Identifies whether the next access attempt is required to be the last try.

$MAXBUSY_{SI}$ – The maximum number of busy occurrences allowed on a reverse analog control channel.

MAX_REDIRECT_DELAY$_S$ – Indicates the maximum delay interval used when a mobile station is redirected from CDMA to analog, in units of 8 seconds.

$MAXSZTR_{SI}$ – The maximum number of seizure attempts allowed on a reverse analog control channel.

$MIN1_P$ – The 24 least significant bits of the 34-bit MIN.

$MIN2_P$ – The ten most significant bits of the 34-bit MIN.

$MSCAP_P$ – The mobile station core analog roaming protocol specifies the version of the core analog roaming standard supported by the mobile station.

$MSPC_P$ – The mobile station protocol capability identifies the analog air interface protocol, such as TIA/EIA-553-A, supported by the mobile station.

N_S – The number of analog paging channels that a mobile station must scan.

$NBUSY_{SV}$ – The number of times a mobile station attempts to seize a reverse analog control channel and finds the reverse control channel busy.

$NSZTR_{SV}$ – The number of times a mobile station attempts to seize a reverse analog control channel and fails.

$NXTREG_{S-P}$ – Identifies when a mobile station must make its next registration to a system.

$PACA_S$ – PACA call indicator. Set to enabled to indicate that the mobile station is waiting for a priority access channel assignment; otherwise set to disabled. In Sections 2 and 3, $PACA_S$ = 0 is equivalent to setting $PACA_S$ to disabled and $PACA_S$ = 1 is equivalent to setting $PACA_S$ to enabled.

PACA_CANCEL – PACA call cancel indicator. Set to '1' when the mobile station is directed by the user to cancel the PACA call; otherwise, set to '0'.

PACA_SID$_S$ – PACA system identifier. Equal to the SID of the system on which the mobile station originated a PACA call.

PACA_TIMEOUT$_S$ – PACA state timer duration. Specifies how long the mobile station should wait for a *PACA Message* from the base station.

PCI_Home$_S$ – Home mobile protocol capability flag. Indicates to the home mobile station whether it shall report its protocol capability when receiving the *Access Type Parameters Global Action Overhead Message*.

PCI_Roam$_S$ – Roaming mobile protocol capability flag. Indicates to the roaming mobile station whether it shall report its protocol capability when receiving the *Access Type Parameters Global Action Overhead Message*.

PCSID$_S$ – The stored value of the most recent SID to which the mobile station transmitted the protocol capability registration message.

PDREG$_S$ – The stored value of the PDREG field received in the most recent *Location Area Global Action Message*.

PL$_S$ – The mobile station RF power level.

PUREG$_S$ – The stored value of the PUREG field received in the most recent *Location Area Global Action Message*.

PUREG$_{S\text{-}p}$ – The semi-permanent value of PUREG$_S$.

R$_S$ – Indicates whether registration is enabled or not.

RAND$_S$ – The stored value of RAND. See 2.3.12.1.2 of TIA/EIA-553-A.

RCF$_S$ – Identifies whether the mobile station must read a *Control Filler Message* before accessing a system on a reverse analog control channel.

REGID$_S$ – The stored value of the last registration number (REGID$_r$) received on a forward analog control channel.

REGINCR$_S$ – Identifies increments between registrations by a mobile station.

S$_S$ – Identifies whether the mobile station must send its serial number when accessing a system.

SCC$_S$ – A digital number that is stored and used to identify which SAT frequency a mobile station should be receiving.

SDCC1$_S$ – The SDCC value stored in a mobile station's temporary memory.

SDCC2$_S$ – The SDCC value stored in a mobile station's temporary memory.

SID$_p$ – The home system identification stored in the mobile station's permanent security and identification memory.

SID$_r$ – The system identification received on a paging or access channel.

SID$_S$ – The system identification received on a dedicated control channel.

SID$_{S\text{-}p}$ – Identifies the system of current (last successful) registration.

UPDATE NEXTREG$_S$. Indicates whether the mobile station must update NXTREG$_{S\text{-}p}$ after it successfully registers on a new paging channel.

$WFOM_S$ – Identifies whether a mobile station must wait for an Overhead Message train before accessing a system on a reverse analog control channel.

1.1.2.2. CDMA Numeric Information

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

$ANALOG\_CHAN_S$ – Analog channel number for CDMA to analog handoff.

$REDIRECT\_REC_S$ – Holds the service redirection criteria specified in the redirection record of the most recently received *Global Service Redirection Message* or *Service Redirection Message*.

$REDIRECTION_S$ – Service redirection indicator. Set to enabled to indicate that service redirection is currently in effect; otherwise set to disabled.

$REGISTERED_S$ – Mobile station registered indicator.

$SID\_NID\_LIST_S$ – Registration SID, NID list. The SID, NID pairs in which the mobile station has registered.

$ZONE\_LIST_S$ – Registration zone list. List of zones in which the mobile station has registered.

1.2. Analog System Tolerances

Unless otherwise specified, all call-processing timers and call-processing timing values have a tolerance of ±10%. Tolerances of other parameters are provided for guidance only. Refer to TIA/EIA-19-B and TIA/EIA-712 for the analog performance standards, definitions, tolerances, and measurement methods.

1.3. Message Forward Compatibility Rules

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

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

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

Implementers of mobile stations are cautioned that many other functions and features are deployed on the FOCC than those described in this standard. These functions frequently employ bits indicated herein as “Reserved”. Reference may be made to the current version of TSB70 for details.

No text.

2. REQUIREMENTS FOR MOBILE STATION ANALOG OPERATION

Section 2 references TIA/EIA-553-A 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 TIA/EIA-553-A. A reference in this standard to a particular subsection in TIA/EIA-553-A 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 TIA/EIA-553-A.

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

Mobile stations optionally implementing Short Message Service in the analog mode shall support Alert With Info SMS delivery (see 2.6.4 and 2.7.2.1) on the voice channel. In addition, they shall support extended protocol enhanced services operation as defined in Sections 2 and 3 of ANSI/TIA/EIA-691, 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 TIA/EIA-553-A.

2.1.1. Frequency Parameters

See the corresponding section of TIA/EIA-553-A.

2.1.2. Power Output Characteristics

See the corresponding section of TIA/EIA-553-A.

2.1.3. Modulation Characteristics

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

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.

2.1.3.1.1. Compressor

See the corresponding section of TIA/EIA-553-A.

2.1.3.1.2. Pre-Emphasis

See the corresponding section of TIA/EIA-553-A.

2.1.3.1.3. Deviation Limiter

See the corresponding section of TIA/EIA-553-A.

2.1.3.1.4. Post Deviation-Limiter Filter

See the corresponding section of TIA/EIA-553-A.

2.1.3.1.5. Transmit Audio Level Adjustment

The mobile station shall have a transmit objective loudness rating (TOLR) equal to -46 dB, when transmitting to a reference base station (see 3.2.2.1). The loudness ratings are described in IEEE Standard 661-1979. Measurement techniques are described in TIA/EIA-19-B.

2.1.3.2. Wideband Data Signals

See the corresponding section of TIA/EIA-553-A.

2.1.4. Limitations on Emissions

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

2.1.4.1. Bandwidth Occupied

See the corresponding section of TIA/EIA-553-A. Measurement techniques are defined in TIA/EIA-19-B.

2.1.4.2. Conducted Spurious Emissions

2.1.4.2.1. Suppression Inside Cellular Band

Refer to TIA/EIA-19-B.

2.1.4.2.2. Suppression Outside Cellular Band

Current FCC rules shall apply.

2.1.4.3. Radiated Spurious Emissions

Refer to TIA/EIA-19-B.

2.2. Receiver

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

2.2.1. Frequency Parameters

See the corresponding section of TIA/EIA-553-A.

2.2.2. Demodulation Characteristics

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

2.2.2.1. Voice Signals

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

- De-emphasis
- Expandor
- 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 TIA/EIA-553-A.

2.2.2.1.2. Expandor

See the corresponding section of TIA/EIA-553-A.

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. Measurement techniques are described in TIA/EIA-19-B.

2.2.3. Limitations on Emissions

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

2.2.3.1. Conducted Spurious Emissions

See the corresponding section of TIA/EIA-553-A.

2.2.3.1.1. Suppression Inside Cellular Band

See the corresponding section of TIA/EIA-553-A.

2.2.3.1.2. Suppression Outside Cellular Band

Current FCC rules shall apply.

2.2.3.2. Radiated Spurious Emissions

Refer to TIA/EIA-19-B.

2.2.4. Other Receiver Parameters

System performance is predicated upon receivers meeting TIA/EIA-19-B.

2.3. Security and Identification

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

2.3.1. Mobile Identification Number

Mobile stations operating in the analog mode use the mobile identification number (MIN). Mobile stations operating in the CDMA mode use the International Mobile Station Identity (IMSI). Mobile stations shall have two different identifiers, IMSI_T and IMSI_M (see 2.3.1of 3GPP2 C.S0005-0).

The MIN is a 10-digit (34-bit) number. The MIN consists of a 3-digit (10-bit) part called MIN2, and a 7-digit (24-bit) part called MIN1. MIN2 corresponds to the most significant three digits of MIN, and MIN1 corresponds to the least significant seven digits of MIN. The MIN shall be equal to IMSI_M_S (see 2.1.1.3 of 3GPP2 C.S0004-0).

The mobile station shall have memory to store a MIN. The 10-bit MIN2 shall be equal to $IMSI\_M\_S2_p$ and the 24-bit MIN1 shall be equal to $IMSI\_M\_S1_p$.

2.3.2. Electronic Serial Number (ESN)

See 2.3.2 of 3GPP2 C.S0005-0.

2.3.3. Station Class Mark

See the corresponding section of TIA/EIA-553-A. See 2.3.3 of 3GPP2 C.S0005-0 for information regarding SCM when operating in the CDMA mode.

2.3.4. Registration Memory

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A. See 2.3.4 of 3GPP2 C.S0005-0 for operation in the CDMA mode.

2.3.5. Access Overload Class

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A. See 2.3.5 of 3GPP2 C.S0005-0 for operation in the CDMA mode.

2.3.6. Extended Address Method

See the corresponding section of TIA/EIA-553-A.

2.3.7. First Paging Channel

See the corresponding section of TIA/EIA-553-A.

2.3.8. Home System Identification

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

Note: the indicator $HOME\_SID_p$ is used to identify the home system during analog operation, and is equivalent to the indicator SID_p defined in TIA/EIA-553-A. The requirements in TIA/EIA-553-A apply to $HOME\_SID_p$ for operation in the analog mode.

2.3.9. Local Control Option

See the corresponding section of TIA/EIA-553-A.

2.3.10. Preferred Operation Selection

See 2.3.10 of 3GPP2 C.S0005-0.

2.3.11. Discontinuous Transmission

See the corresponding section of TIA/EIA-553-A.

2.3.12. Authentication, Encryption of Signaling Information/User Data

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

2.3.12.1. Authentication

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

2.3.12.1.1. Shared Secret Data (SSD)

See 2.3.12.1.1 of 3GPP2 C.S0005-0.

2.3.12.1.2. Random Challenge Memory (RAND)

See the corresponding section of TIA/EIA-553-A.

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

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

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

2.3.12.1.4. Authentication of Mobile Station Registrations

See the corresponding section of TIA/EIA-553-A.

2.3.12.1.5. Unique Challenge-Response Procedure

See the corresponding section of TIA/EIA-553-A.

2.3.12.1.6. Authentication of Mobile Station Originations

See the corresponding section of TIA/EIA-553-A.

2.3.12.1.7. Authentication of Mobile Station Terminations

See the corresponding section of TIA/EIA-553-A.

2.3.12.1.8. Updating the Shared Secret Data (SSD)

See the corresponding section of TIA/EIA-553-A.

2.3.12.1.9. Authentication Procedures

See the corresponding section of TIA/EIA-553-A.

2.3.12.2. Signaling Message Encryption

In an effort to enhance the authentication process, and to protect sensitive subscriber information (e.g., PINs), provisions have been made to allow for the encryption of a select subset of FVC and RVC signaling messages. For messages defined in this standard, see

2.7.2.1 and 3.7.2.1 for the list of messages and fields to be encrypted. For optional enhanced protocol messages and narrow analog mode messages, see Annex A of ANSI/TIA/EIA-691 for the list of messages and fields to be encrypted.

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

2.3.12.2.1. Signaling Message Encryption Control

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

The data used to initialize the algorithm is computed based upon parameters in effect at the time the AUTHR appended to the origination/page response message was computed (see 2.3.12.1.6 and 2.3.12.1.7 of TIA/EIA-553-A). For a call initiated via the CDMA Access Channel, the data used to initialize the algorithm is computed based upon parameters in effect at the time the AUTHR was computed for the *Origination Message* or *Page Response Message* (see 2.1.1.1.2.2 of 3GPP2 C.S0004-0).

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

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

2.4. Supervision

See the corresponding section of TIA/EIA-553-A.

2.5. Malfunction Detection

See the corresponding section of TIA/EIA-553-A.

2.6. Call Processing

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

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

When power is applied to a mobile station, it shall enter the *System Determination Substate* of the *Mobile Station Initialization State* with a power-up indication (see 2.6.1.1 of 3GPP2 C.S0005-0).

2.6.1. Initialization

2.6.1.1. Retrieve System Parameters

If the First-Idle ID status is enabled (see 2.6.1.1 of 3GPP2 C.S0005-0), the mobile station must:

- Set the Location-Registration ID status to enabled.
- Set the first-registration ID status to enabled.
- Set the first-location-area ID status to enabled.
- Set the Update Protocol Capability ID status to disabled.
- Set $PUREG_S$ = 0, $PDREG_S$ = 0, $LREG_S$ = 0, $LRCC_S$ = 0, $RAND_S$ = 0, $IDHO_S$ = 0, $PACA_S$ = disabled, $PCSID_S$ = 0, $BSPC_S$ = 0, $BSCAP_S$ = 0, PCI_HOME_S = 0, PCI_ROAM_S = 0, SID_S = 0, and SID_r = 0.

If the First-Idle ID status is disabled (see 2.6.1.1 of 3GPP2 C.S0005-0), $PACA_S$ = enabled, and this task is entered as a result of loss of Control Channel Radio Link or as a result of the mobile station selecting a different Control Channel, the mobile station must set $IDHO_S$ = 1.

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

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

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

2.6.1.1.1. Scan Dedicated Control Channels

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

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

- Set $FIRSTCHD_S$ to the first dedicated control channel for System A (834.990 MHz/879.990 MHz).

- Set $LASTCHD_s = FIRSTCHD_s - 21 + 1$.

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

- Set $FIRSTCHD_s$ to the first dedicated control channel for System B (835.020 MHz/880.020 MHz).
- Set $LASTCHD_s = FIRSTCHD_s + 21 - 1$.

The mobile station examines the signal strength on each of the channels $FIRSTCHD_s$ to $LASTCHD_s$.

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

2.6.1.1.2. Update Overhead Information

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

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

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

- System identification (SID_s). Set the 14 most significant bits of SID_s to the value of the SID 1 field. Set the least significant bit of SID_s to '1', if the serving-system status is enabled; otherwise, set the bit to '0'.
- Number of paging channels (N_s). Set N_s to 1 plus the value of the N - 1 field.
- First paging channel ($FIRSTCHP_s$). Set $FIRSTCHP_s$ according to the following algorithm:
  - If $SID_s = HOME\_SID_p$, $FIRSTCHP_s = FIRSTCHP_p$
  - If SID_s is not equal to $HOME\_SID_p$, $FIRSTCHP_s = FIRSTCHD_s$
- Last paging channel ($LASTCHP_s$). Set $LASTCHP_s$ according to the following algorithm:
  - If the serving-system status is enabled, $LASTCHP_s = FIRSTCHP_s - N_s + 1$.
  - If the serving-system status is disabled, $LASTCHP_s = FIRSTCHP_s + N_s - 1$.

If $REDIRECTION_s$ = enabled, and if the EXPECTED_SID field of $REDIRECT\_REC_s$ is not equal to 0, and if SID_s is not equal to EXPECTED_SID, the mobile station must enter the *System Determination Substate* of the *Mobile Station Initialization State* with a wrong system indication (see 2.6.1.1 of 3GPP2 C.S0005-0). Otherwise, if SID_r is not equal to SID_s, the

mobile station shall set registration increment ($REGINCR_s$) to its default value of 450, set the first-registration ID status to enabled, set the first-location-area ID status to enabled, set $LRCC_s$ = 0, set $PACA_s$ = disabled, and set $RAND_s$ = 0. If SID_r is not equal to SID_s and $PACA_s$ = enabled, the mobile station must set $PACA_s$ = disabled, and must indicate to the user that the PACA call has been canceled.

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

If the mobile station cannot complete this task on the strongest dedicated control channel, it shall tune to the second strongest dedicated control channel and attempt to complete this task within a second 3-second interval. If it cannot complete this task on either of the two strongest control channels, the mobile station must enter the *System Determination Substate* of the *Mobile Station Initialization State* with an acquisition failure indication (see 2.6.1.1 of 3GPP2 C.S0005-0).

2.6.1.2. Paging Channel Selection

2.6.1.2.1. Scan Paging Channels

See the corresponding section of TIA/EIA-553-A.

2.6.1.2.2. Verify Overhead Information

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

- System identification: Set the 14 most significant bits of SID_r to the value of the SID1 field. Set the least significant bit of SID_r to '1', if the serving-system status is enabled; otherwise, set the bit to '0'.
- ROAM status: The mobile station must compare the received system identification (SID_r) with the stored system identification (SID_s). If $SID_r = SID_s$, the mobile station must compare SID_s with $HOME\_SID_p$. If $HOME\_SID_p = SID_s$, the mobile station must set the ROAM status to disabled. If $HOME\_SID_p$ is not equal to SID_s, the mobile station must set the ROAM status to enabled. If SID_r is not equal to SID_s and $PACA_s$ = enabled, the mobile station must set $PACA_s$ = disabled, and must indicate to the user that the PACA call has been canceled. If SID_r is not equal to SID_s, the mobile station must enter the *System Determination Substate* of the *Mobile Station Initialization State* with a new system indication (see 2.6.1.1 of 3GPP2 C.S0005-0).
- Local control status: If the local control option is enabled within the mobile station (see 2.3.9) and the bits of the home system identification ($HOME\_SID_p$) that comprise the group identification match the corresponding bits of SID_s, then the local control status must be enabled. Otherwise, the local control status must be disabled.
- Power-Up Registration: If $SID_r \neq SID_{s\text{-}p}$ the mobile station shall set $PUREG_{s\text{-}p}$ to '0'.

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

- Serial number bit (S_S): Set S_S to the value in the S field.
- Registration bit (R_S): If the roam status is disabled, set R_S to the value of the REGH field; if the roam status is enabled, set R_S to the value of the REGR field.
- Extended address bit (E_S): Set E_S to the value in the E field.
- Authentication bit ($AUTH_S$): Set $AUTH_S$ to the value in the AUTH field.
- Discontinuous transmission bit (DTX_S): Set DTX_S to the value of the DTX field.
- Number of paging channels (N_S): Set N_S to 1 plus the value of the N-1 field.
- Read-control-filler bit (RCF_S): Set RCF_S to the value of the RCF field.
- Combined paging/access bit (CPA_S): Set CPA_S to the value of the CPA field.
- Number of access channels ($CMAX_S$): Set $CMAX_S$ to 1 plus the value of the CMAX-1 field.
- Determine control channel boundaries for accessing the system ($FIRSTCHA_S$ and $LASTCHA_S$) by using the following algorithm:
  - If the serving-system status is enabled,
    - If $CPA_S = 1$, set $FIRSTCHA_S$ to $FIRSTCHP_S$ for System A.
    - If $CPA_S = 0$, set $FIRSTCHA_S$ to $FIRSTCHP_S$ for System A minus N_S.
    - $LASTCHA_S = FIRSTCHA_S - CMAX_S + 1$.
  - If the serving-system status is disabled,
    - If $CPA_S = 1$, set $FIRSTCHA_S$ to $FIRSTCHP_S$ for System B.
    - If $CPA_S = 0$, set $FIRSTCHA_S$ to $FIRSTCHP_S$ for System B plus N_S.
    - $LASTCHA_S = FIRSTCHA_S + CMAX_S - 1$.

If the Initialization Task was entered with an origination indication, the mobile station must enter the System Access Task with an origination indication (see 2.6.3).

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

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

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

If the mobile station cannot complete this task on the strongest paging channel, it may tune to the second strongest paging channel and attempt to complete this task within a second 3-second interval. If it cannot complete this task on either of the two strongest control channels, the mobile station must enter the *System Determination Substate* of the *Mobile*

Station Initialization State with an acquisition failure indication (see 2.6.1.1 of 3GPP2 C.S0005-0).

2.6.2. Idle

During the Idle Task, a mobile station must execute each of the following (sub)tasks (see 2.6.2.1, 2.6.2.2, 2.6.2.3, 2.6.2.4, 2.6.2.5, and 2.6.2.6) at least every 46.3 ms, the periodicity of word blocks on the forward control channel. If the Idle Task was entered with a wait-for-page indication, the mobile station must not enter the *System Determination Substate* of the *Mobile Station Initialization State* (see 2.6.1.1 of 3GPP2 C.S0005-0) for at least 6 seconds after entering the Idle Task. If at any time during the Idle Task the redirect delay timer expires, the mobile station must exit this task and enter the System Access Task with a registration indication (see 2.6.3). Otherwise, if the mobile station is not listening to a control channel of the preferred system and $REDIRECTION_S$ = disabled and $PACA_S$ = disabled, it may exit this task and enter the *System Determination Substate* of the *Mobile Station Initialization State* with a reselection indication (see 2.6.1.1 of 3GPP2 C.S0005-0).

2.6.2.1. Response to Overhead Information

Whenever a mobile station receives an overhead message train (see 3.7.1.2), the mobile station compare SID_S with SID_r. If SID_r is not equal to SID_S and $PACA_S$ = enabled, the mobile station must set $PACA_S$ = disabled, and must indicate to the user that the PACA call has been canceled. If SID_S is not equal to SID_r, the mobile station must exit the Idle Task and enter the *System Determination Substate* of the *Mobile Station Initialization State* with a new system indication (see 2.6.1.1 of 3GPP2 C.S0005-0).

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

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

- Determine control channel boundaries for accessing the system ($FIRSTCHA_S$ and $LASTCHA_S$) by using the following algorithm:
  - If the serving-system status is enabled,
    + If $CPA_S = 1$, set $FIRSTCHA_S$ to $FIRSTCHP_S$ for System A.
    + If $CPA_S = 0$, set $FIRSTCHA_S$ to $FIRSTCHP_S$ for System A minus N_S.
    + $LASTCHA_S = FIRSTCHA_S - CMAX_S + 1$.
  - If the serving-system status is disabled,
    + If $CPA_S = 1$, set $FIRSTCHA_S$ to $FIRSTCHP_S$ for System B.
    + If $CPA_S = 0$, set $FIRSTCHA_S$ to $FIRSTCHP_S$ for System B plus N_S.
    + $LASTCHA_S = FIRSTCHA_S + CMAX_S - 1$.

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

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

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

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

1. *Local Control Messages:* See the corresponding section of TIA/EIA-553-A.
2. *Access Type Parameters Message:* See the corresponding section of TIA/EIA-553-A.
3. *New Access Channel Set Message:* See the corresponding section of TIA/EIA-553-A.
4. *Registration Increment Message:* See the corresponding section of TIA/EIA-553-A.
5. *Location Area Message:* See the corresponding section of TIA/EIA-553-A.
6. *Random Challenge A Message:* See the corresponding section of TIA/EIA-553-A.
7. *Random Challenge B Message:* See the corresponding section of TIA/EIA-553-A.
8. *Registration ID Message:* If $R_S = 1$, the mobile station must perform the following:
   - If this message is received while first-idle ID status is disabled, location-registration ID status is disabled, first-registration ID status is enabled, first-location-area ID status is enabled, and the mobile station is tuned to a control channel different from $LRCC_S$, then the mobile station shall set first-registration ID status to disabled.

- The mobile station must set $REGID_s$ to the value of the REGID field of the received message. If the first-registration ID status is enabled, the location-registration ID status is disabled, and $SID_s = SID_{s-p}$, the mobile station must perform the following:
  - set the first-registration ID status to disabled (see 2.6.1.1.2).
  - if autonomous registration is enabled, the mobile station must enter the Autonomous Registration Update Task (see 2.6.3.11), supplying a success indication.
  - the mobile station shall continue to process information in the overhead message stream.

  Otherwise, the mobile station shall set the first-registration ID status to disabled (see 2.6.1.1.2) and proceed as follows:
- If $DIGITAL\_REG_{s-p}$ = '00000001', the mobile station must perform the following:
  - Set $DIGITAL\_REG_{s-p}$ = '00000000'
  - If autonomous registration is enabled, the mobile station shall set the first-registration ID status to disabled (see 2.6.1.1.2) and then enter the System Access Task with a registration indication (see 2.6.3)
- If SID_s equals the SID_{s-p} value stored in the registration memory or if $CDMA\_MODE_s = 1$, the mobile station must perform the following:
  - If $CDMA\_MODE_s = 1$, the mobile station must perform the following:
    - Set $CDMA\_MODE_s = 0$.
    - Generate a random number distributed uniformly in the interval 0 to $8 \times MAX\_REDIRECT\_DELAY_s$ seconds, and if quantized, with granularity no greater than 1 ms. The mobile station must set its redirect delay timer to this random number and continue to process messages in the overhead message train.
  - Otherwise, if the redirect delay timer is inactive, the mobile station must perform the following:
  - The mobile station must use the following (or an equivalent) algorithm to review the $NXTREG_{s-p}$ associated with the SID_{s-p} to determine if $REGID_s$ has cycled through zero:
    - If $UPDATE\_NEXTREG_s = 1$, set $NXTREG_{s-p}$ to $REGID_s + REGINCR_s$ and reset $UPDATE\_NEXTREG_s$ to 0.
    - If $NXTREG_{s-p}$ is greater than or equal to $REGID_s + REGINCR_s + 5$, then $NXTREG_{s-p}$ must be replaced by the greater of 0 or $NXTREG_{s-p} - 2^{20}$.
    - Otherwise do not change $NXTREG_{s-p}$.
  - The mobile station must then compare $REGID_s$ with the $NXTREG_{s-p}$ associated with the SID_{s-p}.

+ If $REGID_s$ is greater than or equal to $NXTREG_{s-p}$ and autonomous registration is enabled, the mobile station must set the first-registration ID status to disabled (see 2.6.1.1.2) and then enter the System Access Task with a registration indication (see 2.6.3).
+ If $REGID_s$ is greater than or equal to $NXTREG_{s-p}$ and autonomous registration is not enabled, then set $NXTREG_{s-p}$ equal to $REGID_s$.
+ Otherwise, the mobile station must ignore the message and continue to process messages in the overhead message train.

- If SID_s is not equal to the SID_{s-p} value stored in the registration memory, the mobile station must perform the following:
  – If autonomous registration is enabled, the mobile station shall set the first-registration ID status to disabled (see 2.6.1.1.2). The mobile station shall then enter the System Access Task with a registration indication supplied (see 2.6.3).
  – Otherwise, the mobile station must ignore the message and continue to process messages in the overhead message train.

9. *CDMA Capability Message:* The mobile station must perform the following:
   - If $PACA_s$ = enabled, the mobile station should ignore the *CDMA Capability Message* and continue to process messages in the overhead message train.
   - If CDMA_AVAIL equals '1', $REDIRECTION_s$ equals disabled, and the preferred mode of operation is CDMA, the mobile station may exit this task and enter the *System Determination Substate* of the *Mobile Station Initialization State* with a CDMA available indication (see 2.6.1.1 of 3GPP2 C.S0005-0).
   - If CDMA_AVAIL equals '1', $REDIRECTION_s$ equals enabled, the IGNORE_CDMA field of $REDIRECT\_REC_s$ equals '0', and the preferred mode of operation is CDMA, the mobile station may exit this task and enter the *System Determination Substate* of the *Mobile Station Initialization State* with a CDMA available indication (see 2.6.1.1 of 3GPP2 C.S0005-0).
   - If ADD_CDMA_AVAIL equals '1', $REDIRECTION_s$ equals disabled, and the preferred mode of operation is CDMA, the mobile station may exit this task and enter the System Access Task with a CDMA query indication (see 2.6.3).
   - If ADD_CDMA_AVAIL equals '1', $REDIRECTION_s$ equals enabled, the IGNORE_CDMA field of $REDIRECT\_REC_s$ equals '0', and the preferred mode of operation is CDMA, the mobile station may exit this task and enter the System Access Task with a CDMA query indication (see 2.6.3).
   - If the mobile station has previously attempted and failed to acquire a CDMA system five consecutive times as a result of receiving a *CDMA Capability Message,* the mobile station shall ignore the *CDMA Capability Message* until immediately before the next autonomous registration attempt or until the next mobile station power-up.

- If $REDIRECTION_s$ equals enabled, and the IGNORE_CDMA field of $REDIRECT\_REC_s$ equals '1', the mobile station shall ignore the *CDMA Capability Message*.

10. *Rescan Message:* See the corresponding section of TIA/EIA-553-A.
11. Any Other Message (including messages and global action types herein defined as "Reserved"): Use the message for NAWC-counting, but do not attempt to execute the message.

2.6.2.2. Page Match

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

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

When a match occurs,

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

2.6.2.3. Order

In addition to the requirements described in the corresponding section of TIA/EIA-553-A, the mobile station must respond to the following order as described below:

- *PACA Message:* If $PACA_s$ = disabled, the mobile station must ignore the message. If $PACA_s$ = enabled, the mobile station must perform the following:
  - If the message is a response to an *Origination Order* ($PURPOSE_r$ = '0000'), the mobile station must ignore the message.
  - If the message is to provide the queue position of the PACA call ($PURPOSE_r$ = '0001'), the mobile station must indicate to the user that the PACA call is still queued, and must indicate the current queue position (Q_POS_r) of the call. The mobile station shall remain in the current task.
  - If the message is to instruct the mobile station to re-originate the PACA call ($PURPOSE_r$ = '0010'), the mobile station must enter the System Access Task (see 2.6.3) with a PACA response indication and re-originate the PACA call.

– If the message is to cancel the PACA call ($PURPOSE_r$ = '0011'), the mobile station must set $PACA_s$ = disabled, indicate to the user that the PACA call has been canceled, and enter the Serving System Determination Task (see 2.6.3.12).

2.6.2.4. Call Initiation

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

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

2.6.2.5. Reserved

2.6.2.6. Power Down

See the corresponding section of TIA/EIA-553-A.

2.6.2.7. PACA Cancellation

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

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

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

2.6.3. System Access

2.6.3.1. Set Access Parameters

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

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

- If this is an origination or PACA response, to a maximum of 12 seconds.
- If this is a page response or PACA cancel, to a maximum of 6 seconds.
- If this is an order response, to a maximum of 6 seconds.
- If this is a registration other than power down registration, to a maximum of 6 seconds.
- If this is a power down registration, to a maximum of 3 seconds.

- If this is a Base Station Challenge, to a maximum of 12 seconds.
- If this is a CDMA query, to a maximum of 6 seconds.

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

2.6.3.2. Scan Access Channels

See the corresponding section of TIA/EIA-553-A.

2.6.3.3. Retrieve Access Attempt Parameters

The mobile station must set the maximum number of seizure attempts allowed ($MAXSZTR_{sl}$) to a maximum of 10, and the maximum number of busy occurrences ($MAXBUSY_{sl}$) 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 given by Table 2.1.2-1 of TIA/EIA-553-A for the value of the CMAC field of the message and the mobile station power class (see 2.3.3 of 3GPP2 C.S0005-0).

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 $PACA_S$ = 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.

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

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

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

- *Overload Control Message:*
  - If this access is an origination, the mobile station must examine the value of the overload class field (OLC) identified by $ACCOLC_p$. If the identified OLC field is set to '0', the mobile station must exit this task and enter the Serving-System Determination Task (see 2.6.3.12); if the identified OLC field is set to '1', the mobile station must continue to respond to messages in the overhead message train.
  - Otherwise, the mobile station must continue to respond to messages in the overhead message train.
- *Access Type Parameters Message:*
  - The mobile station must set the busy-idle status bit (BIS_S) to the value of the BIS field of the received message.

- The mobile station must set PCI_HOME_S to the value of the PCI_HOME field of the received message.
- The mobile station must set PCI_ROAM_S to the value of the PCI_ROAM field of the received message.
- The mobile station must set $BSPC_S$ to the value of the BSPC field of the received message.
- The mobile station must set $BSCAP_S$ to the value of the BSCAP field of the received message.
- If $BSCAP_S$ indicates that the system supports TIA/EIA-553-A or later revisions of the core analog air interface standard, then:
  - If $PCSID \neq SID_S$, then:
    - If Roam status is enabled and $PCI\_ROAM_S = 1$ or
    - If Roam status is disabled and $PCI\_HOME_S = 1$
  - Then, the mobile station shall Update Protocol Capability ID status to enabled and set $PCSID_S = SID_S$.

- *Random Challenge A Message:* The mobile station must set the corresponding portion of its internal $RAND1_S$ to the value of the RAND1_A field in the *Global Action Message* (see 2.3.12.1.2 for updating of RAND).
- *Random Challenge B Message:* The mobile station must set the corresponding portion of its internal $RAND1_S$ to the value of the RAND1_B field in the *Global Action Message* (see 2.3.12.1.2 for updating of RAND).
- *Access Attempt Parameters Message:* The mobile station must update the following parameters:
  - If this access is a page response,
    - Maximum number of seizure tries allowed ($MAXSZTR_{sl}$) must be set to the value of the MAXSZTR-PGR field of the received message.
    - Maximum number of busy occurrences allowed ($MAXBUSY_{sl}$) must be set to the value of the MAXBUSY-PGR field of the received message.
  - Otherwise,
    - Maximum number of seizure tries allowed ($MAXSZTR_{sl}$) must be set to the value of the MAXSZTR-OTHER field of the received message.
    - Maximum number of busy occurrences allowed ($MAXBUSY_{sl}$) must be set to the value of the MAXBUSY-OTHER field of the received message.

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

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

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

2.6.3.5. Seize Reverse Control Channel

See the corresponding section of TIA/EIA-553-A.

2.6.3.6. Delay After Failure

See the corresponding section of TIA/EIA-553-A.

2.6.3.7. Service Request

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

- Word A must always be sent.
- Word B must be sent if any of the following conditions hold.
  - $E_S = 1$
  - $LT_S = 1$
  - $AUTH_S = 1$
  - the ROAM status is enabled
  - the access is an order confirmation
  - the access is a registration
  - the access is a capability registration
  - the access is a CDMA query
  - the access is a base station challenge
  - the mobile station was paged with a two-word *Mobile Station Control Message*
  - RCF = 1

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

	Type of System Access			
S_S Bit	**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).

- If the access is a page response, the mobile station must enter the Await Message Task (see 2.6.3.8).
- If the access is a registration request other than a power down registration, the mobile station must enter the Await Registration Confirmation Task (see 2.6.3.9). If the registration is a power down registration, the mobile station shall power down.
- If the access is a base station challenge, the mobile station must enter the Await Message Task (see 2.6.3.8).
- If the access is a PACA response or a PCI order confirmation, the mobile station must enter the Await Message Task (see 2.6.3.8).
- If the access is a CDMA query, the mobile station must enter the Await Message Task (see 2.6.3.8).

2.6.3.8. Await Message

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

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

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

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

- *Initial Voice Channel Designation Message* (see 3.7.1.1): The mobile station must update the parameters as set in the message, delete all entries from $SID\_NID\_LIST_s$, $ZONE\_LIST_s$, $SID\_NID\_LIST_{s\text{-}p}$, and $ZONE\_LIST_{s\text{-}p}$, and set $REGISTERED_s$ to NO. If $R_s = 1$, the mobile station must enter the Autonomous Registration Update Task (see 2.6.3.11), supplying a success indication and then enter the Confirm Initial Voice Channel Task (see 2.6.4.2). If $PACA_s$ = enabled, the mobile station must set $PACA_s$ = disabled and must indicate to the user that the PACA call is in process.
- *PACA Message* (see 3.7.1.1): If $PACA_s$ = disabled, the mobile station must perform the following:
  - If the message is in response to an origination ($PURPOSE_r$ = '0000'), the mobile station must set $PACA_s$ to enabled and indicate to the user that the call has been queued as a PACA call. Also, the mobile station must indicate to the user the current queue position (Q_POS_r) of the PACA call, and must then enter the Idle Task (see 2.6.2).
  - If the message is not in response to an origination, the mobile station must ignore the message. If $PACA_s$ = enabled, the mobile station must perform the following:

- If the message is in response to an origination ($PURPOSE_r$ = '0000'), the mobile station must ignore the message.
- If the message is to provide the queue position of the PACA call ($PURPOSE_r$ = '0001'), the mobile station must indicate to the user that the PACA call is still queued, indicate the current queue position (Q_POS_r) of the call, and remain in the current task.
- If the message is to instruct the mobile station to re-originate the PACA call ($PURPOSE_r$ = '0010'), the mobile station must enter the System Access Task (see 2.6.3) with an PACA response indication and re-originate the PACA call.
- If the message is to cancel the PACA call ($PURPOSE_r$ = '0011'), the mobile station must set $PACA_s$ = disabled, indicate to the user that the PACA call has been canceled, and enter the Serving-System Determination Task (see 2.6.3.12).

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

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

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

- If ORDQ = '000', set LT_s to '0'.
- If ORDQ = '001', set LT_s to '1'.

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

- If LOCAL/MSG_TYPE = '00000' and the serving-system status is enabled, subtract CHANPOS from $FIRSTCHA_s$ + 1.
- If LOCAL/MSG_TYPE = '00000' and the serving-system status is disabled, add CHANPOS to $FIRSTCHA_s$ - 1.
- If LOCAL/MSG_TYPE = '00001' and the serving-system status is enabled, set $FIRSTCHA_s$ to the first dedicated control channel for System A (834.990 MHz/879.990 MHz) and subtract CHANPOS from $FIRSTCHA_s$ + 1. The mobile must also set $AUTH_s$ to '0'.
- If LOCAL/MSG_TYPE = '00001' and the serving-system status is disabled, set $FIRSTCHA_s$ to the first dedicated control channel for System B (835.020 MHz/880.020 MHz) and add CHANPOS to $FIRSTCHA_s$ - 1. The mobile must also set $AUTH_s$ to '0'.

– If LOCAL/MSG_TYPE = '00010' and the serving-system status is enabled, set $FIRSTCHA_S$ to the first dedicated control channel for System A (834.990 MHz/879.990 MHz) and subtract CHANPOS from $FIRSTCHA_S$ + 1. The mobile must also set $AUTH_S$ to '1'.

– If LOCAL/MSG_TYPE = '00010' and the serving-system status is disabled, set $FIRSTCHA_S$ to the first dedicated control channel for System B (835.020 MHz/880.020 MHz) and add CHANPOS to $FIRSTCHA_S$ - 1. The mobile must also set $AUTH_S$ to '1'.

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

After completing its response to the *Directed-Retry Message*, 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 Directed-Retry Task (see 2.6.3.14).

If the access is an origination or PACA response:

- *Intercept:* If $PACA_S$ = enabled, the mobile station must set $PACA_S$ = disabled, must indicate to the user that the PACA call has been canceled, and enter the Serving-System Determination Task (see 2.6.3.12). Otherwise, the mobile station must enter the Serving-System Determination Task (see 2.6.3.12).
- *Reorder:* If $PACA_S$ = enabled, the mobile station must set $PACA_S$ = disabled, must indicate to the user that the PACA call has been canceled, and enter the Serving-System Determination Task (see 2.6.3.12). Otherwise, the mobile station must enter the Serving-System Determination Task (see 2.6.3.12).

If the access is a page response:

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

If the access is a PCI order confirmation:

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

If the access is a CDMA Query:

- *CDMA Info Order:* The mobile station should exit this task and enter the *System Determination Substate* of the *Mobile Station Initialization State* with an additional CDMA available indication (see 2.6.1.1 of 3GPP2 C.S0005-0).

If the access is a Base Station Challenge:

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

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

2.6.3.9. Await Registration Confirmation

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

If the mobile station receives an *Order Confirmation Message* (see 3.7.1.1), it shall delete all entries from $SID\_NID\_LIST_S$, $ZONE\_LIST_S$, $SID\_NID\_LIST_{S\text{-}P}$, and $ZONE\_LIST_{S\text{-}P}$, and set $REGISTERED_S$ to NO as the first action it takes.

2.6.3.10. Action on Registration Failure

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

The mobile station shall delete all entries from $SID\_NID\_LIST_S$, $ZONE\_LIST_S$, $SID\_NID\_LIST_{S\text{-}P}$, and $ZONE\_LIST_{S\text{-}P}$, and shall set $REGISTERED_S$ to NO as the first action it takes.

2.6.3.11. Autonomous Registration Update

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

The mobile station shall set $CDMA\_MODE_S = 0$ and $DIGITAL\_REG_{S\text{-}P}$ = '00000000' as the first action it takes.

2.6.3.12. Serving-System Determination

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

- If $REDIRECTION_S$ equals disabled, and either the preferred mode of operation is CDMA or the serving-system status does not correspond to the preferred system, the mobile station may enter the *System Determination Substate* of the *Mobile Station Initialization State* with a reselection indication (see 2.6.1.1 of 3GPP2 C.S0005-0); otherwise, it must enter the Paging Channel Selection Task (see 2.6.1.2).

2.6.3.13. Alternate Access Channel

See the corresponding section of TIA/EIA-553-A.

2.6.3.14. Directed Retry

See the corresponding section of TIA/EIA-553-A.

2.6.4. Mobile Station Control on the Analog Voice Channel

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

2.6.4.1. Loss of Radio-Link Continuity

See the corresponding section of TIA/EIA-553-A.

2.6.4.2. Confirm Initial Voice Channel

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

Within 100 ms of the receipt of a *Channel Assignment Message* (see 3.7.2.3.2.8 of 3GPP2 C.S0005-0) containing ASSIGN_MODE = '011' and AN_CHAN_TYPE = '00', or an *Extended Channel Assignment Message* (see 3.7.2.3.2.21 of 3GPP2 C.S0005-0) containing ASSIGN_MODE = '011' and AN_CHAN_TYPE = '00', the mobile station must execute the procedures in the corresponding section of TIA/EIA-553-A.

2.6.4.3. Alerting

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

2.6.4.3.1. Waiting for Order

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

When this task is entered, in addition to the actions described in the corresponding section of TIA/EIA-553-A, the following may occur:

- If this task is entered as a result of receiving an *Analog Handoff Direction Message* (see 3.7.3.3.2.6 of 3GPP2 C.S0005-0), the mobile station must use the VMAC, ANALOG_CHAN, and SCC values obtained from the *Analog Handoff Direction Message* to perform the following operations: adjust power level, tune to new channel, adjust to new SAT, and set SCC_s to the value of the SCC field of the message (see 2.4.1 of TIA/EIA-553-A). The mobile station must then turn on the transmitter, and reset the fade timer. The mobile station must set the message encryption mode to that indicated by the MEM value obtained from the *Analog Handoff Direction Message*. The mobile station may compare the SID value obtained from the *Analog Handoff Direction Message* with $HOME\_SID_p$. If SID_r = $HOME\_SID_p$, the mobile station may set the ROAM status to disabled. If SID_r is not equal to $HOME\_SID_p$, the mobile station may set the ROAM status to enabled. The mobile station must remain in the Waiting for Order Task.
- Within 100 ms of the receipt of any of the orders listed either below (see 3.7.2) or in the corresponding section of TIA/EIA-553-A, the mobile station must compare SCC_s to the present SAT color code (PSCC) field in the received message. If SCC_s is not equal to PSCC, the order must be ignored. If SCC_s = PSCC, the action to be taken for each order is as follows:
  - *Alert With Info SMS*: Within 750 ms, the mobile station must send an *Alert With Info SMS Order Confirmation Message*, and remain in the Waiting for Order Task. If the value of the TASK_TM field of the received message is '0', reset the order timer to 10 seconds; otherwise reset the order timer to 600 ms.

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

    + If the value of the B/F field of the received message is '11' and the INFO_DATA field of the received message contains an unsegmented SMS teleservice message, the mobile station may discard any incomplete SMS teleservice message being reassembled, and should pass the INFO_DATA field of the received message to the SMS teleservice. Set the B/F field of the *Alert With Info SMS Order Confirmation Message* to '1'. If the teleservice reports an error, set the ERROR_CLASS and CAUSE_CODE fields of the *Alert With Info SMS Order Confirmation Message* to report the teleservice error.
    + If the value of the B/F field of the received message is '10', the mobile station may discard any incomplete SMS teleservice message being reassembled, and must store the INFO_DATA field of the received message as the first segment of an SMS teleservice message being reassembled. Set SEQ_NO_s to SEQ_NO_r. Set the B/F field of the *Alert With Info SMS Order Confirmation Message* to '0'.

+ If the value of the B/F field of the received message is '00' and a segmented SMS teleservice message is being reassembled, compare the value of the SEQ_NO field of the received message to SEQ_NO_S. Set the B/F field of the *Alert With Info SMS Order Confirmation Message* to '0'. The mobile station shall perform the following actions:
  - o If (SEQ_NO_S + 1) modulo 8 is equal to the value of the SEQ_NO field of the received message, store the INFO_DATA field of the received message as the next segment of the SMS teleservice message being reassembled, and increment SEQ_NO_S, modulo 8.
  - o If SEQ_NO_S is equal to the value of the SEQ_NO field of the received message, the mobile station may discard the INFO_DATA field of the received message.
  - o If neither SEQ_NO_S nor (SEQ_NO_S + 1) modulo 8 is equal to the value of the SEQ_NO field of the received message, the mobile station may discard the INFO_DATA field of the received message and may discard the incomplete SMS teleservice message being reassembled.
+ If the value of the B/F field of the received message is '00', and no segmented SMS teleservice message is being reassembled, the mobile station may discard the INFO_DATA field of the received message. Set the B/F field of the *Alert With Info SMS Order Confirmation Message* to '0'.
+ If the value of the B/F field of the received message is '01', and if a segmented SMS teleservice message is being reassembled, store the INFO_DATA field of the received message as the last segment of the SMS teleservice message and pass the complete SMS teleservice message to the SMS teleservice. Set the B/F field of the *Alert With Info SMS Order Confirmation Message* to '1'. If the teleservice reports an error, set the ERROR_CLASS and CAUSE_CODE fields of the *Alert With Info SMS Order Confirmation Message* to report the teleservice error.
+ If the value of the B/F field of the received message is '01', and if no segmented SMS teleservice message is being reassembled, the mobile station may discard the INFO_DATA field of the received message. Set the ERROR_CLASS and CAUSE_CODE fields of the *Alert With Info SMS Order Confirmation Message* to report an error due to reception of an incomplete message. Set the B/F field of the *Alert With Info SMS Order Confirmation Message* to '0'.

2.6.4.3.2. Waiting for Answer

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

When this task is entered, in addition to the actions described in the corresponding section of TIA/EIA-553-A, the following may occur:

- If this task is entered as a result of receiving an *Analog Handoff Direction Message* (see 6.6.6.2.9 of 3GPP2 C.S0005-0), the mobile station must use the VMAC, ANALOG_CHAN, and SCC values obtained from the *Analog Handoff Direction Message* to perform the following operations: adjust power level, tune to new channel, adjust to new SAT, and set SCC_s to the value of the SCC field of the message (see 2.4.1). The mobile station must then turn on the transmitter, reset the fade timer, and turn on the signaling tone. The mobile station must set the message encryption mode to that indicated by the MEM value obtained from the *Analog Handoff Direction Message*. The mobile station may compare the SID value obtained from the *Analog Handoff Direction Message* with $HOME\_SID_p$. If SID_r = $HOME\_SID_p$, the mobile station may set the ROAM status to disabled. If SID_r is not equal to $HOME\_SID_p$, the mobile station may set the ROAM status to enabled. The mobile station must remain in the Waiting for Answer Task.
- Within 100 ms of the receipt of any of the orders listed either below or in the corresponding section of TIA/EIA-553-A, the mobile station must compare SCC_s to the PSCC field in the received message. If SCC_s is not equal to PSCC, the order must be ignored. If SCC_s = PSCC, the action to be taken for each order is as follows:
  - *Alert With Info SMS:* Within 750 ms the mobile station must send an *Alert With Info SMS Order Confirmation Message*, and remain in the Waiting for Answer Task.

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

    + If the value of the B/F field of the received message is '11' and the INFO_DATA field of the received message contains an unsegmented SMS teleservice message, the mobile station may discard any incomplete SMS teleservice message being reassembled, and should pass the INFO_DATA field of the received message to the SMS teleservice. Set the B/F field of the *Alert With Info SMS Order Confirmation Message* to '1'. If the teleservice reports an error, set the ERROR_CLASS and CAUSE_CODE fields of the *Alert With Info SMS Order Confirmation Message* to report the teleservice error.
    + If the value of the B/F field of the received message is '10', the mobile station may discard any incomplete SMS teleservice message being reassembled, and must store the INFO_DATA field of the received message as the first segment of an SMS teleservice message being reassembled. Set SEQ_NO_s to SEQ_NO_r. Set the B/F field of the *Alert With Info SMS Order Confirmation Message* to '0'.

+ If the value of the B/F field of the received message is '00' and a segmented SMS teleservice message is being reassembled, compare the value of the SEQ_NO field of the received message to SEQ_NO_S. Set the B/F field of the *Alert With Info SMS Order Confirmation Message* to '0'. Take action as follows:
  - o If (SEQ_NO_S + 1) modulo 8 is equal to the value of the SEQ_NO field of the received message, store the INFO_DATA field of the received message as the next segment of the SMS teleservice message being reassembled, and increment SEQ_NO_S, modulo 8.
  - o If SEQ_NO_S is equal to the value of the SEQ_NO field of the received message, the mobile station may discard the INFO_DATA field of the received message.
  - o If neither SEQ_NO_S nor (SEQ_NO_S + 1) modulo 8 is equal to the value of the SEQ_NO field of the received message, the mobile station may discard the INFO_DATA field of the received message and may discard the incomplete SMS teleservice message being reassembled.
+ If the value of the B/F field of the received message is '00', and if no segmented SMS teleservice message is being reassembled, the mobile station may discard the INFO_DATA field of the received message. Set the B/F field of *the Alert With Info SMS Order Confirmation Message* to '0'.
+ If the value of the B/F field of the received message is '01' and a segmented SMS teleservice message is being reassembled, store the INFO_DATA field of the received message as the last segment of the SMS teleservice message and pass the complete SMS teleservice message to the SMS teleservice. Set the B/F field of the *Alert With Info SMS Order Confirmation Message* to '1'. If the teleservice reports an error, set the ERROR_CLASS and CAUSE_CODE fields of the *Alert With Info SMS Order Confirmation Message* to report the teleservice error.
+ If the value of the B/F field of the received message is '01', and no segmented SMS teleservice message is being reassembled, the mobile station may discard the INFO_DATA field of the received message. Set the ERROR_CLASS and CAUSE_CODE fields of the *Alert With Info SMS Order Confirmation Message* to report an error due to reception of an incomplete message. Set the B/F field of the *Alert With Info SMS Order Confirmation Message* to '0'.

2.6.4.4. Conversation

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

When this task is entered, in addition to the actions described in the corresponding section of TIA/EIA-553-A, the following may occur:

- If this task is entered as a result of receiving an *Analog Handoff Direction Message* (see 3.7.3.3.2.6 of 3GPP2 C.S0005-0), the mobile station must use the VMAC, ANALOG_CHAN, and SCC values obtained from the *Analog Handoff Direction Message* to perform the following operations: adjust power level, tune to new channel, adjust to new SAT, and set SCC_s to the value of the SCC field of the message (see 2.4.1). The mobile station must then turn on the transmitter, and reset the fade timer. The mobile station must set the message encryption mode to that indicated by the MEM value obtained from the *Analog Handoff Direction Message*. The mobile station may compare the SID value obtained from the *Analog Handoff Direction Message* with $HOME\_SID_p$. If $SID_r = HOME\_SID_p$, the mobile station may set the ROAM status to disabled. If SID_r is not equal to $HOME\_SID_p$, the mobile station may set the ROAM status to enabled. The mobile station must remain in the Conversation Task.

- Within 100 ms of the receipt of any of the orders listed either below or in the corresponding section of TIA/EIA-553-A, the mobile station must compare SCC_s to the PSCC field in the received message. If SCC_s is not equal to PSCC, the order must be ignored. If SCC_s = PSCC, the mobile station must take the following steps. Except for the audit order, mobile stations capable of discontinuous-transmission operation (see 2.3.11) must inhibit discontinuous transmission for 1.5 seconds; that is, for at least 1.5 seconds, the mobile station must remain in the DTX-high state. Upon receipt of the audit order, mobile stations capable of discontinuous transmission must inhibit discontinuous transmission for at least 5 seconds. Immediately after determining that SCC_s = PSCC a mobile station that is not capable of discontinuous transmission or a mobile station capable of discontinuous transmission but in the DTX-high state must take the actions specified below for each order.

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

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

    Process the Alert With Info SMS message as follows:

+ If the value of the B/F field of the received message is '11', the INFO_DATA field of the received message contains an unsegmented SMS teleservice message. The mobile station may discard any incomplete SMS teleservice message being reassembled, and should pass the INFO_DATA field of the received message to the SMS teleservice. Set the B/F field of the *Alert With Info SMS Order Confirmation Message* to '1'. If the teleservice reports an error, set the ERROR_CLASS and CAUSE_CODE fields of the *Alert With Info SMS Order Confirmation Message* to report the teleservice error.

+ If the value of the B/F field of the received message is '10', the mobile station may discard any incomplete SMS teleservice message being reassembled, and must store the INFO_DATA field of the received message as the first segment of an SMS teleservice message being reassembled. Store the value of the SEQ_NO field of the received message in SEQ_NO_S. Set the B/F field of the *Alert With Info SMS Order Confirmation Message* to '0'.

+ If the value of the B/F field of the received message is '00', and if a segmented SMS teleservice message is being reassembled, compare the value of the SEQ_NO field of the received message to SEQ_NO_S. Set the B/F field of the *Alert With Info SMS Order Confirmation Message* to '0'. Take action as follows:

  - o If (SEQ_NO_S + 1) modulo 8 is equal to the value of the SEQ_NO field of the received message, store the INFO_DATA field of the received message as the next segment of the SMS teleservice message being reassembled, and increment SEQ_NO_S, modulo 8.
  - o If SEQ_NO_S is equal to the value of the SEQ_NO field of the received message, the mobile station may discard the INFO_DATA field of the received message.
  - o If neither SEQ_NO_S nor (SEQ_NO_S + 1) modulo 8 is equal to the value of the SEQ_NO field of the received message, the mobile station may discard the INFO_DATA field of the received message and may discard the incomplete SMS teleservice message being reassembled.

+ If the value of the B/F field of the received message is '00', and no segmented SMS teleservice message is being reassembled, the mobile station may discard the INFO_DATA field of the received message. Set the B/F field of the *Alert With Info SMS Order Confirmation Message* to '0'.

+ If the value of the B/F field of the received message is '01' and a segmented SMS teleservice message is being reassembled, store the INFO_DATA field of the received message as the last segment of the SMS teleservice message and pass the complete SMS teleservice message to the SMS teleservice. Set the B/F field of the *Alert With Info SMS Order Confirmation Message* to '1'. If the teleservice reports an error, set the ERROR_CLASS and CAUSE_CODE fields of the *Alert With Info SMS Order Confirmation Message* to report the teleservice error.

+ If the value of the B/F field of the received message is '01', and if no segmented SMS teleservice message is being reassembled, the mobile station may discard the INFO_DATA field of the received message. Set the ERROR_CLASS and CAUSE_CODE fields of the *Alert With Info SMS Order Confirmation Message* to report an error due to reception of an incomplete message. Set the B/F field of the *Alert With Info SMS Order Confirmation Message* to '0'.

2.6.4.5. Release

See the corresponding section of TIA/EIA-553-A.

2.6.4.6. Power Down

See the corresponding section of TIA/EIA-553-A.

2.7. Signaling Formats

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

2.7.1. Reverse Analog Control Channel (RECC)

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

2.7.1.1. Reverse Analog Control Channel (RECC) Messages

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

In addition to the message formats shown in the corresponding section of TIA/EIA-553-A, the following word(s) may be transmitted over the reverse control channel:

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

The interpretation of the data fields (not already defined in the corresponding section of TIA/EIA-553-A) is as follows:

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

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

SMSC — Short Message Service Capability.

00 - Not SMS-capable,

01 - AWI SMS order-capable,

10 - EP-SMS-capable,

11 - AWI SMS and EP-SMS-capable.

PACAC — PACA Capability. Set to ‘0’ to indicate not PACA-capable. Set to ‘1’ to indicate PACA capable.

ENCRYPTION_-SUPPORTED — Encryption algorithms supported by the mobile station.

If AUTH is equal to ‘0’, the mobile station shall set this field to ‘0000’. Otherwise, the mobile station shall set this field as specified in Table 27.1.3.2.4-5, 3GPP2 C.S0005-0.

2.7.2. Reverse Analog Voice Channel (RVC)

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

2.7.2.1. Reverse Analog Voice Channel (RVC) Messages

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

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

In addition to the RVC messages listed in the corresponding section of TIA/EIA-553-A, formats are shown for the following RVC message types:

- Alert With Info SMS Order Confirmation Message
- PCI Report Message

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

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

The interpretation of the data fields (not already defined in the corresponding section of TIA/EIA-553-A) is as follows:

B/F — Begin/Final. This field is used to indicate whether the ERROR_CLASS and CAUSE_CODE fields include the teleservice processing result for an SMS teleservice message. If no teleservice processing result is included, this field shall be set to '0'. If a teleservice processing result is included, this field shall be set to '1'.

ERROR_CLASS — Error report class.

If there is no error, this field shall be set to '00'.

If the error is caused by a temporary condition, this field shall be set to '10'. If the error is caused by a permanent condition, this field shall be set to '11'.

CAUSE_CODE — Cause code. This field provides the delivery status of SMS user data (see TIA/EIA/IS-637).

SEQ_NO — Sequence number. This field contains the SEQ_NO of the Alert With Info SMS message that is being acknowledged by the mobile station.

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

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

SMSC — Short Message Service Capability.

00 - Not SMS-capable,

01 - AWI SMS order-capable,

10 - EP-SMS-capable,

11 - AWI SMS and EP-SMS-capable.

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

2.7.2.1.1. Encrypted Control Messages

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

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

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

- SYNC[0] = 0x01
- SYNC[1] = 0x00
- DATA_TYPE= 0

No Text.

3. REQUIREMENTS FOR BASE STATION ANALOG OPERATION

Section 3 references TIA/EIA-553-A 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 TIA/EIA-553-A. A reference in this standard to a particular subsection in TIA/EIA-553-A 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 TIA/EIA-553-A.

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 TIA/EIA-553-A.

3.1.1. Frequency Parameters

See the corresponding section of TIA/EIA-553-A.

3.1.2. Power Output Characteristics

See the corresponding section of TIA/EIA-553-A.

3.1.3. Modulation Characteristics

See the corresponding section of TIA/EIA-553-A.

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.

3.1.3.1.1. Compressor

See the corresponding section of TIA/EIA-553-A.

3.1.3.1.2. Pre-emphasis

See the corresponding section of TIA/EIA-553-A.

3.1.3.1.3. Deviation Limiter

See the corresponding section of TIA/EIA-553-A.

3.1.3.1.4. Post Deviation-Limiter Filter

See the corresponding section of TIA/EIA-553-A.

3.1.3.1.5. Transmit Level Adjustment

The base station shall set the transmit level so that a 1004 Hz tone at a level of -18 dBm0 at the network interface produces a ±2.9 kHz peak frequency deviation of the transmitted carrier. Measurement techniques are described in TIA/EIA-712.

3.1.3.2. Wideband Data Signals

See the corresponding section of TIA/EIA-553-A.

3.1.4. Limitations on Emissions

3.1.4.1. Bandwidth Occupied

See the corresponding section of TIA/EIA-553-A. Measurement techniques are defined in TIA/EIA-712.

3.1.4.2. Conducted Spurious Emissions

Refer to TIA/EIA-712.

3.1.4.3. Radiated Spurious Emissions

Refer to TIA/EIA-712.

3.1.4.4. Intermodulation

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

3.2. Receiver

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

3.2.1. Frequency Parameters

See the corresponding section of TIA/EIA-553-A.

3.2.2. Demodulation Characteristics

See the corresponding section of TIA/EIA-553-A.

3.2.2.1. Analog Voice Signals

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

- De-emphasis
- Expandor
- Receive Audio Level Adjustment

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

3.2.2.1.1. De-emphasis

See the corresponding section of TIA/EIA-553-A.

3.2.2.1.2. Expandor

See the corresponding section of TIA/EIA-553-A.

3.2.2.1.3. Audio Level Adjustment

The base station shall set the audio level so that a received 1004 Hz tone with a ±2.9 kHz peak frequency deviation produces a level of -18 dBm0 at the network interface. Measurement techniques are described in TIA/EIA-712.

3.2.3. Limitations on Emissions

Refer to TIA/EIA-712.

3.2.4. Other Receiver Parameters

System performance is predicated upon receivers meeting TIA/EIA-712.

3.3. Security and Identification

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

3.3.1. Authentication

See the corresponding section of TIA/EIA-553-A.

3.3.2. Encryption

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

3.4. Supervision

See the corresponding section of TIA/EIA-553-A.

3.5. Malfunction Detection

Reserved.

3.6. Call Processing

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A.

3.6.1. Overhead Functions for Mobile Station Initiation

See the corresponding section of TIA/EIA-553-A.

3.6.2. Mobile Station Control on the Control Channel

3.6.2.1. Overhead Information

In addition to the overhead information defined in the corresponding section of TIA/EIA-553-A, the following overhead information is sent as required in messages appended to a *System Parameter Overhead Message* (see 3.7.1.2 for message formats):

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

3.6.2.2. Page

See the corresponding section of TIA/EIA-553-A.

3.6.2.3. Order

In addition to the orders and order confirmations defined in the corresponding section of TIA/EIA-553-A, the following orders and order confirmations may be transmitted:

- *PACA Message*.
- *CDMA Info Order.*

3.6.2.4. Local Control

See the corresponding section of TIA/EIA-553-A.

3.6.3. Base Station Support of System Access by Mobile Stations

3.6.3.1. Overhead Information

See the corresponding section of TIA/EIA-553-A.

3.6.3.2. Reverse Control Channel Seizure by Mobile Stations

See the corresponding section of TIA/EIA-553-A.

3.6.3.3. Response to Mobile Station Messages

In addition to the mobile station message responses defined in the corresponding section of TIA/EIA-553-A, the following response to mobile station messages may be sent:

- *PACA Response*. Send one of the following orders:
  - *Initial Voice Channel Designation,*
  - *Directed Retry,*
  - *Intercept,*
  - *Reorder.*
- *Order Message*. When the base station receives a *Base Station Challenge Order* from the mobile station, it should perform the authentication procedure as defined in 2.3.12.1.9. The base station must then send the order confirmation to the mobile station containing the algorithm output. When the base station receives a *CDMA Query Order* from the mobile station, it must send the *CDMA Info Order* to the mobile station. For all other orders, the base station should send one of the following orders:
  - *Order Confirmation*
  - *Release*

3.6.4. Mobile Station Control on Voice Channel

See the corresponding section of TIA/EIA-553-A.

3.6.4.1. Loss of Radio-Link Continuity

Reserved.

3.6.4.2. Initial Voice Channel Confirmation

See the corresponding section of TIA/EIA-553-A.

3.6.4.3. Alerting

3.6.4.3.1. Waiting for Order

When the mobile station confirms the initial voice channel designation after having been paged, it enters this task. In addition to the orders listed in the corresponding section of TIA/EIA-553-A, the following orders can be sent to the mobile station, with the resultant confirmation and action to be taken as follows:

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

3.6.4.3.2. Waiting for Answer

When this task is entered, an alert timer may be set. In addition to the orders listed in the corresponding section of TIA/EIA-553-A, the following orders can be sent with the confirmation and action to be taken as follows:

- *Handoff (to Digital Traffic Channel).* Requires further study.

- *Alert with Info SMS.* Within 750 ms, the mobile station confirms the order by sending an *Alert With Info SMS Order Confirmation Message*. The SEQ_NO received in the *Alert With Info SMS Order Confirmation Message*, SEQ_NO_r, is compared to the SEQ_NO transmitted in the last *Alert With Info SMS Message*, SEQ_NO_s. If the comparison results in a match, the base station may transmit the next pending *Alert With Info SMS Message*. If the comparison results in a mismatch, the base station must not transmit any new Alert With Info SMS messages and may re-transmit the unacknowledged *Alert With Info SMS Message* until that outstanding *Alert With Info SMS Message* is received as indicated by a match of SEQ_NO_r and SEQ_NO_s. Then, if the channel was allocated to deliver SMS messages, the base station should send a *Release Order*. Otherwise the base station must remain in the Waiting for Answer Task.

3.6.4.4. Conversation

While the base station is in the Conversation Task, in addition to the orders listed in the corresponding section of TIA/EIA-553-A, the following orders can be sent to the mobile station, with confirmation and action to be taken as follows:

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

If the call is mobile station originated and it is re-originated using the *PACA Message* ($PURPOSE_r$ = '0010'), the base station should send an *Alert With Information Message*.

3.6.5. Delivery of Character Information

See Section 3.7.2.2 of this standard.

3.7. Signaling Formats

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A for operation in the analog mode.

3.7.1. Forward Analog Control Channel

See the corresponding section of TIA/EIA-553-A.

3.7.1.1. Mobile Station Control Message

In addition to the message formats defined in the corresponding section of TIA/EIA-553-A, the *Mobile Station Control Message* can contain the following words:

Word 3 - PACA Word

Information Element	Length (bits)
T_1T_2 = 10	2
SCC = 11	2
PURPOSE	4
Q_POS	8
RSVD = 000…000	12
P	12

Word 3 – First CDMA Info Word

Information Element	Length (bits)
T_1T_2 = 10	2
SCC = 11	2
BAND_CLASS	5
CDMA_FREQ	11
RSVD = 00000000	8
P	12

Word 4 – Second CDMA Info Word

Information Element	Length (bits)
T_1T_2 = 10	2
SCC = 11	2
SID	15
RSVD = 000…000	9
P	12

The interpretation of the data fields (not already defined in the corresponding section of TIA/EIA-553-A) is as follows:

PURPOSE — Purpose of PACA message. The base station must set this field to the appropriate PURPOSE code from Table 3.7.1.1-2 to indicate the purpose of the message.

Q_POS — PACA queue position. If the PURPOSE field of this message is set to '0000' or '0001', the base station must set this field to the queue position of the PACA call. If the queue position is unknown, the base station must set this field to '00000000'. If the queue position exceeds 255, the base station must set this field to '11111111'.

CDMA_FREQ — CDMA frequency. The base station must set this field to the CDMA Channel number of the CDMA frequency assignment to acquire.

SID — System identification. The base station must set this field to the system identification of the CDMA system.

Table 3.7.1.1-1. Order, Order Qualification, and Message Type Codes

Order Code	Qual Code	Message Type	Function
10001	000	00001	Alert With Info SMS
00010	010	00000	PACA Message (or PACA Response)
00011	100	00000	PACA Cancel
11010	000	10000	CDMA Query Order/CDMA Info Order
[Base station initiated messages only - Mobile Station Authentication and Privacy]			
10111	001	00000	Message Encryption Mode Order with Basic Message Encryption enable indication
10111	010	00000	Message Encryption Mode Order with Enhanced Message Encryption enable indication

The order and order qualification codes defined in Table 3.7.1.1-1 are in addition to the codes defined in TIA/EIA-553-A, Table 3.7.1-1. All other codes are reserved.

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 *Origination Message*.
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.

3.7.1.2. Overhead Message

See the corresponding section of TIA/EIA-553-A.

3.7.1.2.1. System Parameter Overhead Message

In addition to the requirements in this section, see the corresponding section of TIA/EIA-553-A for operation in the analog mode.

Note: The base station shall set EP = '0' in Word 1 of the *System Parameter Overhead Message*, except when implementing optional extended protocol services (see the corresponding section of TIA/EIA-691).

3.7.1.2.2. Global Action Overhead Message

In addition to the *Global Action Overhead Messages* listed in this section, see the corresponding section of TIA/EIA-553-A for operation in the analog mode.

CDMA Capability Global Action Message

Information Element	Length (bits)
T_1T_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

The interpretation of the data fields (not already defined in the corresponding section of TIA/EIA-553-A) is as follows:

CDMA_FREQ — Channel number of the CDMA frequency assignment to acquire.

CDMA_AVAIL — Set to '1' if Band Class 0 CDMA is available.

ADD_CDMA_AVAIL — Set to '1' if additional CDMA systems are available.

3.7.1.2.3. Registration ID Message

In addition to the definitions in this section, see the corresponding section of TIA/EIA-553-A for operation in analog mode.

Table 3.7.1.2.3-1. Global Action Message Types

Action Code	Type
0100	CDMA Capability

The *Global Action Message* codes defined in Table 3.7.1.2.3-1 are in addition to the codes defined in Table 3.7.1-4 of TIA/EIA-553-A.

3.7.1.2.4. Control-Filler Message

See the corresponding section of TIA/EIA-553-A for operation in the analog mode.

3.7.1.3. Data Restrictions

See the corresponding section of TIA/EIA-553-A for operation in the analog mode.

3.7.2. Forward Analog Voice Channel

See the corresponding section of TIA/EIA-553-A.

3.7.2.1. Mobile Station Control Message

In addition to the *Mobile Station Control Message* defined in this section, see the corresponding section of TIA/EIA-553-A for operation in the analog mode.

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

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

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

The interpretation of the data fields (not already defined in the corresponding section of TIA/EIA-553-A) is as follows:

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

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

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

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

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

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

Selected Control Messages (see 2.7.2.1.1 and 3.7.2.1.1) are enciphered using the Cellular Message Encryption Algorithm (see 2.5.1, "Common Cryptographic Algorithms," Revision C) or the Enhanced Cellular Message Encryption Algorithm (see 2.5.2, "Common Cryptographic Algorithms," Revision C). For each message, the enciphered fields are designated. The messages are grouped by channel designation.

3.7.2.1.1. Encrypted Control Messages

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

3.7.2.1.2. Alert With Info Message

See the corresponding section of TIA/EIA-553-A.

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

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

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

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

- SYNC[0] = 0x00
- SYNC[1] = 0x00
- DATA_TYPE=0

3.7.2.1.3. Flash With Info Message

See the corresponding section of TIA/EIA-553-A.

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

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

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

- SYNC[0] = 0x00
- SYNC[1] = 0x00
- DATA_TYPE= 0

3.7.2.1.4. Alert With Info SMS Message

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

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

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

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

- SYNC[0] = 0x00
- SYNC[1] = 0x00
- 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.

4. REQUIREMENTS FOR MOBILE STATION ANALOG OPTIONS

See the corresponding section of TIA/EIA-691 for optional extended protocol services.

1 No text.

5. REQUIREMENTS FOR BASE STATION ANALOG OPTIONS

See the corresponding section of TIA/EIA-691 for optional extended protocol services.

No text.

A. ANNEX A

Reserved.

No text.

B. ANNEX B MOBILE STATION DATABASE

B.1 Introduction

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

- Mobile station indicators — These indicators are global to the mobile station and independent of the mobile station's NAMs.
- NAM indicators — These indicators specify parameters associated with the mobile station's NAM.

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

B.2 Mobile Station Indicators

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

B.2.1 Permanent Mobile Station Indicators

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

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

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	

B.3 NAM Indicators

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

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	