

Cellular Networking Perspectives

Editor: David.Crowe@cnp-wireless.com

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FCC Ruling on 9-1-1 Calls from 'Non-Initialized' Phones

The US FCC ruled, on April 29, 2002, that 'uninitialized' wireless phones must be identified by the number 123-456-7890. This number will be transmitted to the PSAP (Emergency Call Takers) instead of a valid Mobile Directory Number. This will inform the PSAP that callback is not possible. It will also inform a wireless system that validation of this mobile is impossible. This ruling raises a number of issues:

- No solution is provided for GSM phones without a SIM/UID, although it is certainly possible for GSM systems to use this special MDN when they detect this type of emergency call.
- No solution is provided for GSM phones with a SIM/UID designed for emergency calling. This would require a special IMSI be reserved. The same applies to IMSI-only AMPS, TDMA and CDMA phones.
- The first four digits (1234) are a valid International Roaming MIN (IRM). These numbers are normally assigned by IFAST (www.ifast.org). Luckily, IRM 1234 has not yet been assigned to a carrier.

The text of the ruling was not available at press time. The news release is at:

www.fcc.gov/Bureaus/Wireline_Compensation/News_Releases/2002/nrwc0202.html

First Emergency Services Interconnect Forum (ESIF) Meeting

ATIS ESIF (Emergency Services Interconnect Forum) will be holding its first meeting on May 7-8th in Washington DC. ESIF will attempt to resolve implementation issues with the US FCC Phase I and II wireless emergency calling mandate. Part of the problem is the number of organizations required to achieve a solution, including:

- US FCC – which made the rules for Phase I and II.
- NENA, NASNA and APCO – representing emergency service providers.
- Local Exchange Carriers (LECs) – which provide interconnect with . . .
- Wireless carriers – which provide the identity and location of wireless phones making an emergency call using equipment from . . .
- Manufacturers – who provide the ability to locate mobiles, switch calls and route information around increasingly complex networks.

ESIF will bring representatives of these groups together (with the exception of the FCC, which does not participate in industry discussions). Some issues they will be considering are:

- Default routing of wireless 911 calls.
- Responsibility for the E2 interface (Wireless carrier – LEC).
- Monitoring overflow on PSAP trunks.
- Overflow routing to 7 digit numbers when all direct 911 circuits are busy.

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Editor: David Crowe
Accounts: Evelyn Goreham
Distribution: Debbie Brandelli
Production: Doug Scofield.

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- Direct phone line between carriers (wireless and LEC) and Federal, State and Local emergency organizations.
- Qualifications for candidates for Federal Telecommunications Service Priority (TSP) circuits.
- Homeland Security liaison.
- Phase 2 location reliability.
- Documentation required to verify PSAP readiness.
- Wireless callback number.
- Calls from uninitialized phones.

More information

www.atis.org/atis/ESIF/ESIFhome.htm

ATIS TTY Testing

To meet the FCC Enhanced 911 mandate, wireless manufacturers have designed digital equipment (TDMA, CDMA, GSM) to transport TTY/TDD tones used by the deaf and hard-of-hearing to communicate with PSAPs in an emergency. In field trials, a number of compatibility issues have been identified. To facilitate interoperability, ATIS has set up a test number that can be used to determine the TCER (Total Character Error Rate). According to FCC rules, this should be below 1%. This test system is based on tones defined in TIA/EIA/IS-840-A (Minimum Performance Standards for TTY/TDD Signal Detector/Regenerator).

More information

www.atis.org/atis/twip/twipoverview.htm

3GPP RAN Overview

3GPP TSG RAN (Radio Access Network) is responsible for standardization of the UTRA network (UTRAN) in its two modes, FDD (Frequency Division Duplex) and TDD (Time Division Duplex). Its responsibilities encompass:

- Radio performance.
- Specification of the radio interface layers 1 (physical), 2 and 3 (RR – Radio Resource).
- Specification of the access network interfaces (Iu, Iub and Iur).
- Definition of O&M requirements.
- Transport of implementation specific O&M between the Management System and the base station.
- Conformance test specifications for all aspects of base stations;
- Specifications of radio performance and RF system aspects.

TSG RAN has four working groups, described below and illustrated in

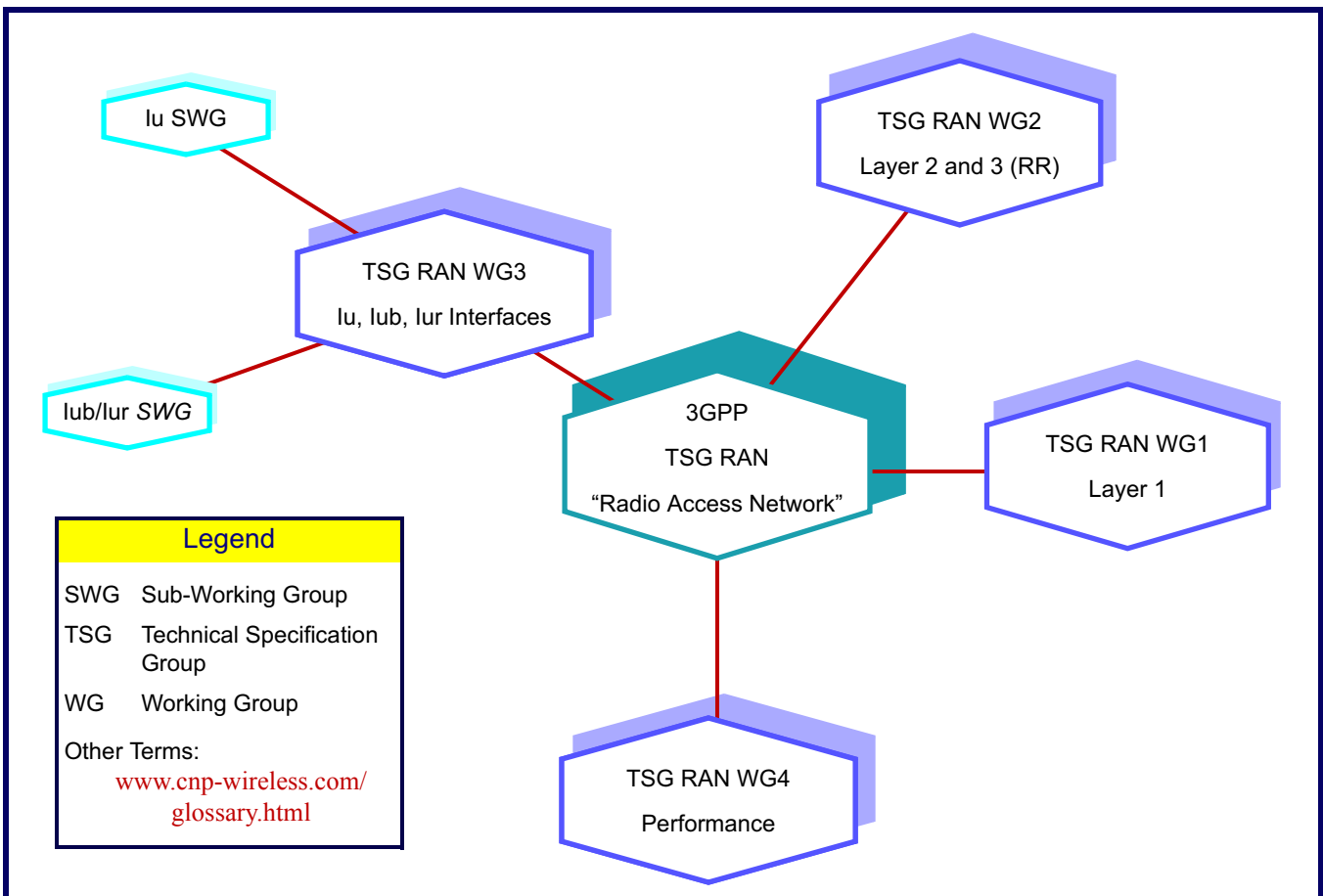
Figure 1.

Glossary

For any terms you are unfamiliar with, please consult:

www.cnp-wireless.com/glossary.html

Figure 1: 3GPP TSG RAN Organization



TSG RAN WG1 (Radio Layer 1)

TSG RAN Working Group 1 (RAN1) specifies the physical layer of the radio interface for UTRA (both UE and UTRAN ends of the interface). This includes the specification of:

- Physical channel structures for UE and UTRAN.
- Transport channels to physical channel mapping.
- Spreading.
- Modulation.
- Physical layer multiplexing.
- Channel coding.
- Error detection.
- Physical layer procedures.
- Measurements provided to upper layers.

Status

The most intense work is occurring on High Speed Downlink Packet Access (HSDPA) for Release 5.

More details are shown in **Table 1**.

Table 1: TSG RAN WG 1 Radio Interface Layer 1 Specification Status

Document	Name	Status
TR (all)	All Release 4 Technical Reports	Not being upgraded from R4 to R5
TS 25.201	Physical layer - General description	Change requests being incorporated
TS 25.211	Physical Channels and Mapping of Transport Channels onto Physical (FDD)	
TS 25.214	Physical Layer Procedures (FDD)	R99 and R4 being modified. R5 version under development
TS 25.215	Physical Layer – Measurements (FDD)	
TS 25.221	Physical Channels and Mapping of Transport Channels onto Physical (TDD)	Change requests being incorporated
TS 25.222	Multiplexing and Channel Coding (TDD)	
TS 25.223	Spreading and Modulation (TDD)	
TS 25.224	Physical Layer Procedures (TDD)	

TSG RAN WG2 (Radio Layer 2 and Layer 3 RR)

TSG RAN WG2 (RAN2) specifies the:

- Protocol methodology in RAN specifications.
- Radio Interface architecture and protocols (MAC, RLC, PDCP) between UE (mobile) and RAN (base station).
- Radio Resource Control protocol.
- Strategies of Radio Resource Management.
- Radio interface protocols common to UTRAN and GERAN (e.g. PDCP).
- UE loop back functionality (being transferred from TSG-T1).
- Radio interface parameters to be exchanged between RNCs in case of Serving Radio Network Subsystem (SRNS) relocation.
- Services offered by the physical layer to upper layers (Model, transport channels, physical layer measurements).
- Cell selection and re-selection procedures
- Obtaining UE capabilities for transmission to UTRAN (in collaboration with RAN WG1)
- Radio resource management (RRM) strategies to be supported by UTRAN

Status

The status of RAN2 projects are shown in **Table 2**.

Table 2: TSG RAN Working Group 2 – Layer 2 and Layer 3 Specifications

Document	Name	Status
TS 25.303	Interlayer Procedures in Connected Mode	Change requests being incorporated
TS 25.304	UE Procedures in Idle Mode and for Cell Reselection in Connected Mode	
TS 25.305	Stage 2 Functional Specification of UE Positioning in UTRAN	
TS 25.306	UE Radio Access Capabilities	R99 and R4 versions being revised
TS 25.321	MAC Protocol Specification	Change requests being incorporated
TS 25.322	RLC Protocol Specification	
TS 25.323	Packet Data Convergence Protocol (PDCP) Specification	
TS 25.331	RRC Protocol Specification	R99 and R4 versions being revised
TR 25.834	UTRA TDD Low Chip Rate Option; Radio protocol aspects	Not being upgraded from R4 to R5.
TR 35.835	Report on Hybrid ARQ Type II/III	Being rescinded
TR 25.843	1.28 Mcps TDD UE Radio Access Capabilities	Not being upgraded from R4 to R5

Table 2: TSG RAN Working Group 2 – Layer 2 and Layer 3 Specifications (Continued)

Document	Name	Status
TR 25.844	Radio Access Bearer Support Enhancements	<i>Not</i> being upgraded from R4 to R5
TR 25.847	UE Positioning Enhancements	
TR 25.861	RNC – SMLC Location Protocol	Being rescinded
TS 25.921	Guidelines and Principles for Protocol Description and Error Handling	Change requests being incorporated
TS 25.922	Radio Resource Management Strategies	
TR 25.924	Opportunity Driven Multiple Access (ODMA)	Being rescinded
TR 25.950	UTRA High Speed Downlink Packet Access	<i>Not</i> being upgraded from R4 to R5.
TS 34.109	Terminal Logical Test Interface; Special Conformance Testing Functions	Change requests being incorporated

**TSG RAN WG3
(UTRAN Architecture)**

TSG RAN Working Group 3 (RAN3) is responsible for the specification of:

- Overall UTRAN architecture.
- Iu interface protocol specifications (access stratum).
- Iur and Iub interface protocol specifications.

- The use of IP for the transport layer.
- Transport of implementation specific O&M between the Management System and the base station.

Status

Most of the work of RAN3 is focussed on Release 5, although some Release 99 and Release 4 corrections are still being made. See **Table 3** for particulars.

Release 5 IP work for UTRAN is finalized, although two issues need to be fixed before June, 2002:

- Protocol towards external interworking node.
- Exchange of transport layer information for Iu CS.

Table 3: TSG RAN WG 3 – UTRAN Architecture Specification Status

Document	Name	Status
tbd	Shared Network Support in Connected Mode	New work item
TS 25.401	UTRAN Overall Description	Change requests being incorporated
TS 25.402	Synchronisation in UTRAN Stage 2	
TS 25.413	UTRAN Iu Interface RANAP Signalling	R99 and R4 versions being revised
TS 25.414	UTRAN Iu Interface Data Transport and Transport Signalling	Change requests being incorporated
TS 25.415	UTRAN Iu Interface User Plane Protocols	
TS 25.419	UTRAN Iu-BC Interface: Service Area Broadcast Protocol	
TS 25.420	UTRAN Iur Interface General Aspects and Principles	
TS 25.423	UTRAN Iur Interface RNSAP Signalling	
TS 25.424	UTRAN Iur Interface Data Transport and Transport Signalling for Common Transport Channel Data Streams	
TS 25.425	UTRAN Iur Interface User Plane Protocols for Common Transport Channel Data Streams	
TS 25.426	UTRAN Iur and Iub Interface Data Transport and Transport Signalling for DCH Data Streams	
TS 25.433	UTRAN Iub Interface NBAP Signalling	
TS 25.434	UTRAN Iub Interface Data Transport and Transport Signalling for Common Transport Channel Data Streams	
TS 25.435	UTRAN Iub Interface User Plane Protocols for Common Transport Channel Data Streams	Change requests being incorporated
TR 25.832	Manifestations of Handover and SRNS relocation	<i>Not</i> being upgraded from R4 to R5
TR 25.837	Hybrid ARQ Type II/III (Iub/Iur aspects)	
TR 25.838	Node B (Base Station) Synchronisation for TDD (Iub/Iur aspects)	
TR 25.839	Uplink Synchronous Transmission Scheme (USTS) (Iur/Iub aspects)	

Table 3: TSG RAN WG 3 – UTRAN Architecture Specification Status (Continued)

Document	Name	Status
TR 25.849	DSCH Power Control Improvement in Soft Handover	Not being upgraded from R4 to R5
TR 25.850	UE Positioning in UTRAN Iub/Iur Protocol Aspects	
TR 25.851	RAB Quality of Service Renegotiation over Iu	
TR 25.852	Radio Access Bearer Support Enhancements for the Iu	
TR 25.853	Delay Budget within the Access Stratum	
TS 25.931	Technical Specification Group (TSG) RAN; UTRAN Functions, Examples on Signalling Procedures	Change requests being incorporated
TR 25.934	AAL2 QoS optimization	Not being upgraded from R4 to R5
TS 25.935	Radio Resource Management (RRM); Optimizations for Iur and Iub	R4 and R99 versions being upgraded. Not being upgraded from R4 to R5
TR 25.936	Handover for Real-time Services from PS-Domain	Not being upgraded from R4 to R5
TR 25.937	UTRAN TDD Low Chip Rate	
TR 25.938	Terminal Power Saving Features	Being rescinded
TR 25.946	RAB Quality of Service Negotiation over Iu	Not being upgraded from R4 to R5
TR 25.953	TrFO/TFO [Tandem Free Operation]	
TR 25.954	Migration to Modification Procedure	

**TSG RAN WG4
(Radio Performance and Protocol)**

TSG RAN Working Group 4 (RAN4) is responsible for the RF aspects of UTRAN. This includes specification of:

- Simulations of diverse RF system scenarios.

- Minimum requirements for transmission and reception parameters, and for channel demodulation for both the terminal (UE) and base station (RAN). This includes requirements for the radio link, system performance and radio resource management (RRM).

- Base station radio conformance test procedures.
 - Base Station EMC specification.
 - Requirements for other radio elements, such as Repeaters.
- The status of RAN 4 specifications is shown in **Table 4**.

Table 4: TSG RAN WG4 – Radio Performance and Protocol Specification Status

Document	Name	Status
tbd	UE Antenna Efficiency Test Methods and Requirements	New work item
tbd	Improving Receiver Performance Requirements for the FDD UE	
TS 25.101	UE Radio Transmission and Reception (FDD)	Change requests being incorporated
TS 25.102	UTRA (UE) TDD; Radio Transmission and Reception	
TS 25.104	UTRA (BS) FDD; Radio transmission and Reception	
TS 25.105	UTRA (BS) TDD; Radio transmission and Reception	
TS 25.123	Requirements for Support of Radio Resource Management (TDD)	
TS 25.133	Requirements for Support of Radio Resource Management (FDD)	
TS 25.141	Base Station Conformance Testing (FDD)	
TS 25.142	Base Station Conformance Testing (TDD)	
TS 25.143	UTRAN Iu Interface RANAP Signalling	
TR 25.845	FDD RACH and AICH Performance Requirements	Not being upgraded from R4 to R5
TR 30.504	Work Plan and Study Items - RAN WG4	

TIA TR-45.5/3GPP2 TSG-C CDMA Digital Air Interface Standards

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Note: 1. IS- Interim Standard, TSB- Telecommunications Systems Bulletin, PN- Project Number, SP- ANSI Standards Proposal.
2. TSG-C standards are identified as C.[P|R|S]dddd-[0|A..Z] vX.Y where P=Project, R=Report, S=Specification, dddd=Document number, 0,A..Z is the revision number (0 sometimes omitted), X is the publication number (0 for pre-publication) and Y the internal editing revision (which we omit).
3. Published TIA standards can be obtained from Global Engineering Documents at 1-800-854-7179.
4. **Bold Type** indicates a modification since the previous publication of this information.
Thanks to Lisa Collichio (Qualcomm) for her assistance compiling the information in this table.

First Wave - Cellular

Standard	Description	Status
IS-95	CDMA Dual-Mode Air Interface Standard (Authentication Appendix Nov. 1992)	Published 07/93
IS-96	CDMA Option 1: Voice Coder (Speech Service Option)	Published 04/94
IS-97	Base Station minimum performance standards for IS-95-A	Published 12/94
IS-98	Mobile Station (MS) minimum performance standards	Published 12/94
IS-126	Service option 2: Loopback	Published 12/94 Rescinded 08/98

Second Wave - Cellular and PCS

Standard	Description	Status
J-STD-008	IS-95 adapted for 1.8-2.0 Ghz frequency band	Published 07/96 Rescinded 11/99
J-STD-018	Mobile minimum performance standards (for J-STD-008)	Published 07/96 Rescinded 02/01
J-STD-019	Base station minimum performance standards	Published 07/96 Rescinded 02/01
IS-95-A	IS-95 Revised (Authentication Appendix "A" Nov. 1994)	Published 05/95
IS-96-A	CDMA Voice Coder	Published 05/95
IS-97-A	Base Station minimum performance standards for IS-95-A	Published 07/96
IS-98-A	Mobile minimum performance standards for IS-95-A	Published 07/96
IS-98-A-1	Additional tests for IS-95 mobile stations	Published 09/97
IS-99	Data Services (9.6 kbps Fax and Circuit Switched Data)	Published 07/95 Rescinded 10/00
IS-125	Voice coder minimum performance standards	Published 05/95 Rescinded 10/00
IS-126-A	Mobile station loopback service option	Published 07/96 Rescinded 08/98
IS-637	Short message service (rate set 1)	Published 12/95
TSB58	Parameter value assignments	Published 12/95

Third Wave - Integrated Cellular and PCS

Standard	Project	Description	Status
TIA/EIA-95-B	SP-3693	IS-95 for 800 MHz and 1800 MHz frequencies (including J-STD-008)	Published 03/99
TIA/EIA-96-C	SP-4138	CDMA Voice Coder (8 kbps)	Published 08/98
TIA/EIA-97-B	SP-3814	Minimum performance standards for base stations	Published 08/98
TIA/EIA-97-C	SP-4384	Minimum performance standards for base stations (merges TIA/EIA-97-B and J-STD-019)	Published 09/99
TIA/EIA-98-B	SP-3815	MS minimum performance standards	Published 08/98
TIA/EIA-98-C	SP-4383	Merges TIA/EIA-98-B and J-STD-018	Published 11/99
TIA/EIA-125-A	SP-4682	Correction of errors in speech service option 1	Published 08/00
TIA/EIA-126-B	SP-4136	ANSI version of IS-126 (MS loopback option)	Published 08/98
TIA/EIA-126-C	SP-4578	Mobile Station loopback test	Published 08/00
TIA/EIA-637-A	SP-4391	Short message service (including service negotiation, 14.4 kbps transmission, PCS and TIA/EIA-95 support)	Published 09/99
IS-96-B		CDMA Voice Coder (8 kbps)	Published 07/96
IS-127		Option 3: Enhanced variable rate voice coder (EVRC)	Published 01/97
IS-127-1	PN-4146	Addendum #1 to IS-127	Published 08/98
IS-127-2		Addendum #2 to IS-127: TTY/TDD capabilities	Published 09/99
IS-127-3	PN-3292-AD3	Addendum #3 to IS-127	Published 09/01
IS-657		Packet data services (Internet, CDPD)	Published 07/96 Rescinded 10/00
IS-658	PN-4374	Data Services Interworking Function Interface (e.g. modem pool). Transferred to TR-45.4 for Revision A.	Published 07/96
IS-658-1		Extends the ability to perform interface status exchange at times other than call setup	Published 04/99
IS-683	PN-3569	Over the air activation (OTA) and service provisioning (Authentication Appendix A published 03/96)	Published 02/97
IS-683-A	PN-3889	OTA update: Roaming system selection and programming lock	Published 06/98
IS-707	PN-3676	14.4 kbps data services (including asynch. data, fax, STU-III and packet data)	Published 02/98
IS-707-A	PN-4145	Revision to IS-707 to be consistent with TIA/EIA-95 capabilities	Published 04/99
IS-718	PN-3648	Minimum performance standards for EVRC voice coder	Published 07/98
IS-733	PN-3972	Option 17: High rate CDMA voice coder (13 kbps)	Published 03/98
IS-733-1		Addendum #1 to IS-733: TTY/TDD capabilities	Published 09/99
IS-733-2	PN-3972-AD2	Addendum #2 to IS-733	Published 09/01
IS-736	PN-3973	Minimum performance specification for IS-733 (13 kbps voice coder)	Published 11/98
IS-736-A	PN-4653	Corrections to testing procedures in IS-736	Published 08/00
TSB58-A	PN-4158	Parameter value assignments for TIA/EIA-95-B	Published 04/99
TSB74		14.4 kbps radio link protocol and inter-band operations	Published 12/95 Rescinded 04/99
TSB79	PN-3823	IS-637 update for 14.4 kbps SMS, service negotiation and Y2K	Published 02/97

3G Version (cdma2000, IS-2000, 1xRTT, 1xEVDO)

Standard	Project	Description	Status
TIA/EIA-97-D		Minimum performance standards for IS-2000 base stations	Published 06/01
TIA/EIA-98-D		MS minimum performance standards	Published 06/01
TIA/EIA-99	PN-4617	9.6 kbps data service option for IS-2000	Published Rescinded 10/00
TIA/EIA-126-D	SP-4578-RV4	Mobile Station loopback test	Published 06/01
TIA/EIA-637-B	SP-4391-RV2	Short message service	Published 01/02
TIA/EIA-864	PN-4913	Minimum performance standards for cdma2000 high rate packet data access network	Published 02/02
TIA/EIA-866	PN-4916	Minimum performance for cdma2000 high rate packet data access terminal (TSG-C.P9012)	Published 02/02
TIA/EIA-898	PN-0031	Signaling conformance tests for cdma2000	Published 12/01
IS-683-B	SP-4742	OTA update, including preferred user zone list	Published 12/01
IS-707-A-1	PN-4541	Adds cdma2000 radio link protocol 3E support to 14.4kbps data	Published 12/99
IS-707-A-2	PN-4692	Data support for IS-2000-A	Published 03/01
IS-801	PN-4535	Position determination services (e.g. for E911 Phase II)	Published 11/99
IS-801-1	PN-4535-AD1	Addendum to position determination	Published 03/01
IS-834	PN-4707	Direct Spread Specification for CDMA on ANSI-41 (DS41) Upper Layers Air Interface	Published 03/00
IS-856	PN-4875	High Rate Packet Data Air Interface Specification (1XEV DO)	Published 11/00
IS-856-1	PN-4875-AD1	Addendum 1 to cdma2000 High Rate Packet Data Air Interface Specification (1XEV DO)	Published 01/02
IS-870	PN-4877	Test Data Service Option (TDSO) for cdma2000 spread spectrum systems	Published 04/01
IS-871	PN-4876	Markov Service Option (MSO) for determining frame error rates	Published 04/01
IS-889	PN-4905	Minimum Performance Specification for Text Telephone (TTY) Signal Detector and Regenerator	Ballot 05/01
IS-890	PN-0018	Test application specification for high rate packet data air interface (1XEV-DO)	Published 07/01
IS-893	PN-4575	Selectable mode voice coder (speech and capacity-sensitive, formerly known as EVRC)	Ballot 07/01
IS-894	PN-0029	Selectable mode voice coder minimum performance	Ballot 01/02
IS-2000.1	PN-4427	cdma2000 Introduction and Overview	Published 08/99
IS-2000.2	PN-4428	cdma2000 Physical Layer	Published 08/99
IS-2000.3	PN-4429	cdma2000 Media Access Control (MAC) layer	Published 08/99
IS-2000.4	PN-4430	cdma2000 Signaling Layer 2 Link Access Control (LAC)	Published 08/99
IS-2000.5	PN-4431	cdma2000 Signaling Layer 3	Published 08/99
IS-2000.6	PN-4432	cdma2000 Analog Operation	Published 08/99
IS-2000.X-A	PN-4693	cdma2000 (all 6 (X=1-6) parts revised)	Published 03/00
IS-2000-A-1	PN-4698-AD1	Addendum for IS-2000-A. Revised parts 2 through 5	Published 11/00
IS-2000-0-2	PN-4698-AD2	Addendum for IS-2000. Revises all 6 parts.	Published 08/01
IS-2000.X-B		cdma2000. All 6 parts being revised (X=1..6)	Ballot 03/02
IS-2000-A-2		Second addendum for IS-2000-A. Revises all 6 parts.	Ballot 08/01
IS-2000-0-1	PN-4698-AD2	First addendum for IS-2000. Revises all 6 parts.	Development 08/01
IS-2000.X-C		cdma2000. All 6 parts being revised (X=1..6)	Ballot 04/02
TIA-907	PN-0046	Video streaming	Development
TIA-916	PN-0058	Recommended Minimum Performance Standards for IS-801-1 Spread Spectrum Mobile Stations	Ballot 02/02

TIA-918	PN-0056	Signaling conformance tests for cdma2000 wireless IP networks	Ballot 02/02
TIA-919	PN-0057	Signaling conformance for cdma2000 high rate packet data networks (1XRTT)	Ballot 03/02
TSB58-B	PN-4691	Parameter value assignments for IS-2000	Published 12/99
TSB58-C		Parameter value assignments for IS-2000-A	Published 05/00
TSB58-D	PN-4619-RV4	Parameter value assignments for IS-2000-B	Published 05/01
TSB58-E	PN-4619-RV5	Parameter value assignments for IS-2000-C	Published 01/02
TSB2000	PN-4534	Capabilities requirements mapping for cdma2000 standards	Published 09/99
	PN-4651	EVRC simulation (TTY/TDD update)	Development

GSM MAP and Smart Card Support

Standard	Project	Description	Status
IS-820	PN-4690	R-UIM (Removable "Smart Card")	Published 05/00
IS-820-1	PN-4690-AD1	CDMA Removable UIM Addendum 1	Published 06/01
IS-820-A	PN-4690-RV1	R-UIM (Removable "Smart Card")	Ballot 12/01
IS-833	PN-4706	Multi-carrier specification for CDMA systems on GSM MAP (MC-MAP) lower layers air interface	Published 03/00
IS-915	PN-0051	CDMA Card Application Toolkit	Ballot 12/01

TSG-C Cross-Reference

TSG-C Spec	Description	Status
C.R1000-0	Requirements Mapping for cdma2000	See TSB2000
C.R1001-0	Parameter value assignments	See TSB58-B
C.R1001-A	Parameter value assignments	See TSB58-C
C.S0007-0	Direct spread spectrum specification for spread spectrum systems on ANSI-41 (DS-41)	See IS-834
C.S0008-0	Multi-carrier specification for spread spectrum systems on GSM MAP (MC-MAP)	See IS-833
C.S0009-0	Speech service option	See TIA/EIA-96-C
C.S000X-0	cdma2000 (parts identified as C.S0001-C.S0006)	See IS-2000.X
C.S000X-1	cdma2000 Revision A	See IS-2000.X-A
C.S0010-0	Base station minimum performance	See TIA/EIA-97-C
C.S0010-A	Base station minimum performance	See TIA/EIA-97-D
C.S0011-0	Mobile station minimum performance	See TIA/EIA-98-C
C.S0011-A	Mobile station minimum performance	See TIA/EIA-98-D
C.S0012-0	Minimum performance	See TIA/EIA-125-A
C.S0013-0	MS loopback test	See TIA/EIA-126-C
C.S0013-A	MS loopback test	See TIA/EIA-126-D
C.S0014-0	Enhanced Variable Rate Voice Coder (EVRC)	See IS-127
C.S0014-0-1	EVRC addendum to remove 'bit exact'	See IS-127-1
C.S0014-0-2	EVRC addendum to add TTY/TDD symbol support	See IS-127-2
C.S0014-0-3	EVRC addendum 3	See IS-127-3
C.S0015-0	Short Message Service (SMS)	See IS-637-A
C.S0016-0	Over-the air service provisioning (OTASP)	See IS-683-A
C.S0016-A	Over-the air service provisioning (OTASP)	See IS-683-B
C.S0017-0	14.4 kbps data, without STU-III	See IS-707-A
C.S0017-0-1	Radio link protocol (RLP) modifications and additional packet data support	See IS-707-A-1

C.S0017-0-2	64kbps data, plus TTY/TDD support	See IS-707-A-2
C.S0018-0	Minimum performance for EVRC	See IS-718
C.S0019	Bit exact specification for EVRC	See IS-719
C.S0020-0	High rate (13 kbps) speech coder	See IS-733
C.S0020-0-1	TTY/TDD support for high rate speech coder	See IS-733-1
C.S0020-0-2	TTY/TDD support for high rate speech coder	See IS-733-2
C.S0021-0	Minimum performance for high rate speech coder	See IS-736-A
C.S0022-0	Location services	See IS-801
C.S0022-0-1	Location services addendum	See IS-801-1
C.S0023	Removable user identity module (R-UIM)	See IS-820
C.S0023-0-1	Removable user identity module (R-UIM)	See IS-820-1
C.S0024	High rate packet data air interface	See IS-856
C.S0024-1	High rate packet data air interface (addendum 1)	See IS-856-1
C.S0025	Markov service option (MSO) for determining frame error rates	See TIA/EIA-871
C.S0026	Test data service option (TDSO)	
C.S0028	TTY/TDD minimum performance specification	
C.S0029-0	Test application specification for high rate packet data air interface	See IS-890
C.S0030	Selectable mode voice coder	See IS-893
C.S0031-0	Signaling conformance tests	See IS-898
C.S0032	Minimum performance standards for high rate packet data network	See IS-864
C.S0033	Minimum performance standards for high rate packet data terminal	See IS-866
C.S0036	Minimum performance standards for GPS equipped CDMA mobiles	Published
C.P-9011	Minimum performance standards for cdma2000 high rate packet data access network	See TIA/EIA-864
C.P-9012	Minimum performance for cdma2000 high rate packet data access terminal (TSG-C.P9012)	See PN-4916