

Cellular Networking Perspectives

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Comments

We welcome comments on the format or contents of *Cellular Networking Perspectives*. We can be reached via email at:
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Next Issue: September 3rd, 2003

TIA/EIA-41 Update

It has been many years since a full version of TIA/EIA-41 was last published – Revision D in December, 1997. This specification, still known by some as IS-41 or ANSI-41, defines the Mobile Application Part that is the 'backbone network' for CDMA, TDMA and analog wireless systems, and so is vitally important, particularly to facilitate roaming.

The specification has continued to expand through the publication of various interim standards, often with a 3GPP2 TSG-N (now TSG-X) equivalent specification. Integrating this large number of specifications together into one coherent and correct whole is a very large challenge. **Table 1** lists its component specifications.

Table 1: TIA/EIA-41-E Components

Standard	Description
TIA/EIA-41-D	Previous version of the specification.
TSB-76/N.S0006	PCS Multi-band.
IS-725-A/N.S0011	OTASP and OTAPA.
IS-730/N.S0007	DCCH (TDMA digital control channel).
IS-735/N.S0008	CDMA network selection and TMSI.
IS-737/N.S0010	Circuit Mode Data Services.
IS-751/N.S0009	IMSI (International Mobile Subscription Identity)
IS-756-A	WNP (Wireless Number Portability) Phase 1 and Phase 2
IS-764/N.S0012	CNAP/CNAR (Calling Name Presentation/Restriction)
IS-771/N.S0013	Wireless Intelligent Networking (WIN Phase I)
IS-778/N.S0014	Authentication Enhancements
IS-807/N.S0016	Internationalization, including specification of global titles.
IS-812/N.S0020	Message Segmentation.
J-STD-034	Emergency Services Phase I.
Miscellaneous Enhancements 10, 10.9, 10.9b and 10.9c (internal, unpublished document)	Technical Clarifications and Compatibility

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But, completion is on the horizon. The core part of the specification, the protocol definition (Parts 000 and 5xx), is now undergoing a second ballot review. When published, it will mean that the entire protocol is

available in one place – except of course, those interim standards and other specifications that have are not going to be part of Revision E, but that must wait until Revision F!

TIA/EIA-41-E has been completely re-organized into a number of parts, as shown in **Table 2**.

Table 2: TIA/EIA-41-E Part Structure

Part	Contents	TIA/EIA-41-D
000	Introduction, including detailed list of parts	Chapter 1
2xx	Inter-System Handoff	Chapter 2
3xx	Automatic Roaming (Call Delivery, Profile Management, Location tracking and vertical features applicable while roaming)	Chapter 3
4xx	Operations, Administration and Maintenance (OA&M)	Chapter 4
5xx	Protocol Definition: Definition of protocol layers, including TCAP. Specification of all operations, parameters and data types.	Chapter 5
6xx	Procedure ('pseudo-code') Definition.	Chapter 6
7xx	Wireless Intelligent Network (WIN) Distributed Functional Plane (DFP) architecture.	IS-771

TIA TR-45.3 Status Update

Many may be surprised that there is a new version of TIA-136, the TDMA radio interface standard, being developed. This standard has taken a back seat to 3G-track standards (cdma2000 and UMTS) ever since its prime supporter, AT&T, announced it was migrating to UMTS (via GSM and GPRS), quickly followed by other North American TDMA proponents, Cingular and Rogers AT&T Wireless in Canada.

The new version (**Rev. E**) supports MEID (Mobile Equipment Identifier), similar to the IMEI which has always been used to identify GSM mobiles. The standard also is aligned with ETSI GSM standards.

Details of TR-45.3 specifications, including their current status, are shown on **Pages 7 through 11**.

3GPP Release 6 Feature Status

3GPP develops standards for GSM and UMTS radio and network interfaces.

Table 3 accompanies this article to describe the status of 3GPP Release 6 capabilities as of TSG meeting #20.

The working assumption for 3GPP feature development is that Stages 1 (Requirements Specification), 2 (Architecture) and 3 (Protocol Details) each take an average of six months.

The 3GPP workplan can be downloaded from:

www.3gpp.org/ftp/Information/WORK_PLAN

In this report, **teal text** indicates a change since our last report in our **April, 2003 issue**.

Links

As a free service, we provide a spectrum of links to virtually every aspect of wireless communications. If you need further information about standards and regulatory organizations, technology forums, wireless associations or wireless vendors and service providers, if you are seeking a consulting firm, or if you desire a broader news perspective by reading reports from other wireless news sources, then check out our links page at:

www.cnp-wireless.com/links.html

Table 3: 3GPP Release 6 Feature Status

Feature	Status
Evolution of Transport in Universal Terrestrial Radio Access Network (UTRAN)	Not much activity has occurred in the past few months, but this feature will be kept in the Workplan, as work is to be continued in the field of interworking between IP and ATM following completion of a study of various proposed solutions. It is possible that completion might be pushed off beyond Rel 6.
Evolution of transport in the Core Network (CN)	This feature was eliminated at CN meeting #19. It previously contained "Preferred Framing Protocol for Bearer Independent CS Architecture", but there was not enough support in CN WG 4 to continue with its development.

Table 3: 3GPP Release 6 Feature Status (continued)

Feature	Status
Release 6 Radio Interface Improvements	<ul style="list-style-type: none"> Improvement of inter-frequency and inter system measurement (RAN WG1) – completion date is not yet established. Multiple Input Multiple Output antennas (MIMO) (RAN WG1) – On schedule. Joint discussions with 3GPP2 have been completed. The work is now split into different work items for each of the RAN WGs. Completion dates are March 2004 for RAN WG1, WG2, and WG3 aspects and December 2004 for RAN WG4. Improving Receiver Performance Requirements for the FDD User Equipment (RAN WG4) – completion date is December 2003, but if no further work is presented at next RAN WG4, the completion date might slip. UMTS 850 (RAN WG4) – work is about one-quarter completed. The estimated completion date is March, 2004. Other frequency bands such as UMTS 800 were approved for inclusion at RAN#19. Coordination of work will be necessary to support these different frequency bands.
Emergency Call Enhancements – Emergency calls for Internet Protocol (IP) and Packet Switch (PS) calls with Universal Subscriber Identity Module (USIM).	<ul style="list-style-type: none"> Stage 1 Requirements have been specified by SA WG1 in TS 22.228. No specific requirement has been developed for IMS so far. Requirements for CS domain are documented in TS 22.101. Stage 2 Architecture developed by SA WG2 are targeted for completion in September 2003. Stage 3 Protocols are mostly being developed by CN WG1, with completion targeted for December 2003. TSG CN#20 approved a revised integrated WID (Work Item Description) from TSG CN for UEs with and without UICC/(U)SIM in networks supporting IMS. New WIDs have been accepted from SA WG2 to cover both emergency call enhancements for IP & PS based call with (U)SIM and emergency calls from UEs without UICC/(U)SIM in networks containing an IMS. They were two separate features before. <p>Note: There is not support for IP Multimedia Subsystem (IMS)/Packet Switch emergency calls for Rel 5, and further progress on this in Rel 6 is dependent on SA WG2 input.</p>
Location Based Service (LCS) Enhancements	<ul style="list-style-type: none"> Stage 1 Requirements – A Work Item Description was approved at SA#18, Stage 1 was completed by SA WG1 at SA#20. Stage 2 Architecture – Progressing, with completion estimated by September 2003. Stage 3 Protocols – Work has not yet started. It will be done by CN1 for most aspects and by external bodies for the inter-GMLC interface. No RAN nor GERAN impacts are foreseen. It is planned to be finished by March 2004.
Security Enhancements	<ul style="list-style-type: none"> Network Domain Security (NDS)/IP (TS 33.210) was approved at SA#18 (December 2002). The Network Domain Security Authentication Framework (NDS/AF) WID was approved at SA#19 (March 2003). The targeted completion date is March 2004. GERAN A/Gb mode security enhancements work is ongoing, with a completion dated estimated as September 2003.
IP Multimedia Subsystem (IMS) Phase 2	<ul style="list-style-type: none"> IMS Local Service – Stage 3: No work has started. Mm Interface (CSCF to external IP multimedia network) – Stage 3 (TR 29.962) was completed by CN WG3 at CN#20 (June 2003), but still has to be reviewed by SA WG2. Interworking between IMS and CS networks (and Mg interface (BGCF to MGCF – interworking with CS)) – Stage 3 in TS 29.163 is scheduled to be completed in September 2003 by CN WG3. Mn interface (IM-MGW to MGCF) enhancements – Stage 3 in TS 29.332 by CN WG4 is scheduled to be completed in December 2003. Mp (MRFC – MRFP) interface protocol definitions – Stage 3 in TS 29.333 by CN WG4 is scheduled to be completed in December 2003. Lawful Interception in the 3GPP Rel 6 architecture – The WID, approved at SA#19, will be worked by SA WG3 for completion in December 2003. IPv6/IPv4 – principle of interworking with external IPv4 networks – approved at SA WG2. Work is progressing at SA WG2. Work from IETF v6ops Drafts also to be considered. <p>Note: The CN#19 estimate is that Stage 3 will be completed by December 2003, but this is closely dependent on the progress made by IETF.</p>

Table 3: 3GPP Release 6 Feature Status (continued)

Feature	Status
Push Services	<ul style="list-style-type: none"> • Stage 1: Completed in TS 22.174. • The Stage 2 WID was approved in December 2002. Work began early 2003 in SA WG2. Target completion date is December 2003. • Development of Stage 3 protocols has not started.
Multimedia Messaging Service (MMS) Enhancements	<ul style="list-style-type: none"> • Stage 1 service requirements from SA 1 are stable. • Enhancements were proposed in the revised WID presented to TSG T meeting #20. • Completion date is estimated as March 2004. Work will be performed in cooperation with OMA.
Mobile Execution Environment (MExE)	<ul style="list-style-type: none"> • The Work Item for MExE Rel 6 Improvements and Investigation was completed at TSG-T#19 (March 2003). • The Work Item for MExE Run-Time Independent Framework Feasibility Study (TR 22.857) was completed in December 2002. • There have been no implementations of MExE. It has therefore been decided to stop reporting it as a feature.
Operations, Administration, Maintenance & Provisioning (OAM&P)	<ul style="list-style-type: none"> • User Equipment Management (UEM) is about 12% complete. • Trace Management is about 55% complete. • Performance Management is about 25% complete. • Principles, Requirements and Architecture is about 35% complete.
Charging Management	<ul style="list-style-type: none"> • Development of this feature is about 15% completed. • TS 32.297 was submitted for information at SA#20. • TR 32.815 was submitted for information at SA#20. • TR 23.825 work is ongoing.
Presence Service	<ul style="list-style-type: none"> • Stage 1 was approved at TSG SA#13 (September 2001) in TS 22.141. • Stage 2 was published at TSG SA#17 (September 2002) in TS 23.141. • Stage 3 is progressing in CN WG1 and CN WG5. The target completion date is December 2003. • A new WID was presented for approval at SA WG4 (Codec and Formats). Completion of this project is targeted for December 2003.
Multimedia Broadcast/Multicast Service (MBMS)	<ul style="list-style-type: none"> • Stage 1 was approved at TSG SA#13 (September 2001) in TS 22.146. • Stage 2 is being developed in TS 23.246. A draft has been submitted. The target completion date is September 2003. • Radio interface Stage 2 and Stage 3 are being developed in TS 25.346. The completion date has slipped from September 2003 to March 2004. • Stage 3 work for the core network is targeted for December 2003. • Work on the security aspects is about 50% complete in SA WG3. • Work on codec aspects has just started in SA WG4. Completion is expected 6 months after Stage 2. • Stage 3 work in GERAN is about 10% complete, with completion expected by November 2003.
Speech Recognition and Speech Enabled Services (SES)	<ul style="list-style-type: none"> • Stage 1 was approved at TSG SA#17 (September 2002) in TR 22.977 and TS 22.243. • No Work Item has been approved for Stage 2 yet. • Stage 3 work has not begun. • A new SA WG4 Work Item was approved for a codec to support a speech recognition framework for automated voice service at TSG #18. Work is ongoing in SA WG4. Completion is expected by December 2003.
Packet Switched Streaming (PSS)	<p>A new SA WG4 Work Item for enhancements for PSS was approved at TSG #18. SA WG4 has agreed to restructure the whole set of PSS specifications for Rel 6 (resulting in a new TS 26.244 and TS 26.245). The targeted completion date is December 2003.</p>

Table 3: 3GPP Release 6 Feature Status (continued)

Feature	Status
Generic User Profile (GUP)	<ul style="list-style-type: none"> • Stage 1 in TS 22.240 was approved at TSG SA#19 (March 2003). • Stage 2 in TS 23.240 was approved at TSG SA#20, 3 months ahead of schedule. • An outline of a draft of TS 29.240, which will define the Stage 3, was approved at TSG CN#19. • TSG T WG2 has identified some related work required in TS 23.241 and TS 24.241. Completion of this is targeted for December 2003.
Digital Rights Management (DRM)	<ul style="list-style-type: none"> • Stage 1 in TS 22.242 has been completed. • Stages 2 and 3 have been delegated to the Open Mobile Alliance. <p>Note: The progress in OMA, and consistency between 3GPP and OMA Stage 1 Requirements will be monitored by companies which attend both meetings.</p>
Wireless Local Access Network (WLAN) / Universal Mobile Telecommunications System (UMTS) Interworking	<ul style="list-style-type: none"> • Stage 1 was approved at TSG SA#17 (September 2002) in TR 22.934. • Stage 2 in TS 23.234 was circulated for information in June 2003. It is planned to be completed by September 2003. • The draft Stage 3 security TS is about half complete, but still has many unresolved issues. • WLAN interworking security in TR 33.934 is progressing. • Stage 3 has a skeleton (outline) of a TS. The effort will be lead by CN WG4, with CN WG1 also involved. • CN WG1 may develop another TS for authentication and PLMN selection. • TSG T WG3 might also be involved (but will first wait for Stage 2 to stabilize).
Priority Service	<ul style="list-style-type: none"> • The Stage 1 Feasibility Study in TR 22.950 has been completed. CRs have been provided for existing specs. • TR 22.952, the Priority Service Implementation Guide, has been started. This TR will determine whether more CRs are needed to complete support for this feature. • CN WG4 is waiting for guidance from SA1. • The project completion date is estimated as December 2003.
Network Sharing	<ul style="list-style-type: none"> • Stage 1: The Feasibility Study in TR 22.951 was approved at TSG SA#18. CRs will be issued for existing specs TS 22.011, 22.101, 22.115, and 22.129. • Stage 2: A TR will be presented for information in September 2003 and may be completed in December 2003, a slip from the earlier date of September, 2003. • Stage 3 has not started.
Quality of Service (QoS) Improvements	<p>Feasibility Study on Dynamic Policy Control Enhancements for End-to-End QoS:</p> <ul style="list-style-type: none"> • The Stage 2 WID was revised at SA#17 to clarify the initial proposal in TR 23.917. The intended completion date is now September 2003. Technical work is ongoing at SA WG2. • Stage 3 is awaiting clarification from SA WG2. <p>Policy-based control of DiffServ:</p> <ul style="list-style-type: none"> • A new Work Item was approved at TSG #18. • SA WG1 has provided requirements on this topic. • There has not yet been any discussion at SA WG2.
Open Service Access (OSA) Improvements	<ul style="list-style-type: none"> • It was agreed to slip TSG approval from September 2003 to December 2003, to align with Parlay 5.0. • Most issues are resolved, however some are waiting for responses from SA WG2. • Technical work on Rel 6 is proceeding according to SA WG1 OSA Requirements. <p>Note: There is a structural problem causing problems for the definition of OSA Stage 2 for GUP and MMS. Whereas Stage 1 is defined by SA WG1 OSA and Stage 3 is defined by CN WG5, there is no corresponding group for Stage 2.</p>

Table 3: 3GPP Release 6 Feature Status (continued)

Feature	Status
Compatibility with Older UEs (or provision of UE-Specific Behaviour Information to Network Entities)	<ul style="list-style-type: none">• Stage 1: not needed.• Stage 2: TS 23.195 has been approved.• For the RAN aspects, RAN#18 agreed on the “Early Hooks on the Air Interface” solution and approved CRs defining the containers for SBI (specific behaviour information) IEs (information element), to be used when the need arises. Remaining open issues (e.g. on the contents of the UE SBI) were resolved at RAN#19, therefore RAN work is completed.• For the CN aspects, CRs to Rel 5 specifications were approved at TSG CN#20.
Enhancement of Dialed Service for CAMEL	<ul style="list-style-type: none">• Stage 1: Both the WI and TS 22.078 version 6.0.0 were approved at SA#18.• Stage 2 and 3: The TSG CN WID for “Enhancement of Dialed Service for CAMEL” was approved at CN#19. Work is about one-third complete.

TIA TR-45.3

TDMA Digital

Air Interface Standards

Cellular Networking Perspectives

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- Note: 1. IS- Interim Standard, TSB- Telecommunications Systems Bulletin, PN- Project Number, SP- ANSI Standards Proposal.
2. Bold Type indicates a modification since the previous publication of this information.
3. Published TIA standards can be obtained from TIA at www.tiaonline.org/standards/search_n_order.cfm.

IS-54 – First Generation TDMA Cellular System

Standard	Description	Status
TIA/EIA-627	ANSI version of TDMA Dual-Mode Air Interface Standard	Published 06/96
TIA/EIA-627-1	Addendum to TDMA dual-mode air interface standard	Published 04/98 Rescinded 06/00
TIA/EIA-628	TDMA mobile station minimum performance standards	Published 06/96 Rescinded 06/00
TIA/EIA-629	TDMA base station minimum performance standards	Published 06/96 Rescinded 06/00
TIA/EIA-635	TDMA full-rate voice coder (3:1)	Published 06/96 Rescinded 06/00
IS-54-B	Original TDMA Dual-Mode Air Interface Standard (replaced by TIA/EIA-627)	Published 01/92 Rescinded 09/96
IS-55	TDMA mobile station minimum performance standards (Replaced by TIA/EIA-628)	Published Rescinded 09/96
IS-56	TDMA base station minimum performance standards (replaced by TIA/EIA-629)	Published Rescinded 09/96
TSB-46	Verification of Authentication for IS-54-B Mobiles	Published 03/93 Rescinded 10/00
TSB-47	IS-54 Implementation Issues	Published 05/94 Rescinded 10/00
TSB-50	User Interface for Authentication Key Entry	Published 03/93 Reaffirmed 12/02

IS-136 Revision 0 – Digital Control Channel

Standard	Description	Status
IS-130	Data services radio link protocol (RLP)	Published 04/95
IS-135	Asynchronous data and fax services	Published 04/95 Rescinded 04/00
IS-137	TDMA/analog mobile minimum performance standards	Published 12/94
IS-138	TDMA/analog base station minimum performance standards	Published 12/94
IS-136.1	Digital Control Channel (DCCH)	Published 12/94
IS-136.1/2-1	Addenda to IS-136 Rev. 0	Published 12/94
IS-136.2	FSK control channel, analog voice channel, TDMA traffic channel	Published 12/94

IS-136 Revision A – ACELP Voice Coder

Standard	Description	Status
IS-130-A	Data Services Radio Link Protocol (RLP)	Published 09/97 Rescinded 04/00
IS-137-A	Mobile minimum performance standards for IS-136-A	Published 07/96 Rescinded 04/00
IS-138-A	Base station minimum performance standards for IS-136-A	Published 07/96 Rescinded 04/00
IS-641-A	Enhanced full-rate (ACELP) voice coder, Revision A	Published 05/96 Rescinded 02/02
IS-684	Isosynchronous radio link protocol for data (for STU-III). Replaced by TIA/EIA-136-320	Published 07/96 Rescinded 04/00
IS-686	Enhanced full rate voice coder performance standards	Published 12/96 Rescinded 04/00
IS-727	Discontinuous transmission (DTX) with ACELP (IS-641) voice coder, including generation of comfort noise	Published 07/98 Rescinded 02/02
IS-136.1-A	Enhanced digital control channel (9-1-1, OTA, Calling Name ID, One-button Callback, Private Networks (enhanced), PACA)	Published 10/96 Rescinded
IS-136.1-A-1/2	IS-136 Rev. A corrections (two addenda)	Published 11/96, 12/97
IS-136.2-A	FSK control channel, analog voice channel, TDMA traffic channel	Published 10/96 Rescinded
TSB-73	IS-136 Rev. 0/Rev. A compatibility issues	Published 07/96 Rescinded 07/02
TSB-77	Interoperable Implementation Issues in IS-641 (ACELP voice coder)	Published 07/97 Rescinded 07/02
TSB-105	Audit order clarification	Published 03/99
TSB-108	Determining when R-DATA is encrypted	Published 03/99

TIA/EIA-136 Revision 0

Standard	Description	Status
TIA/EIA-136	SMS enhancements and double/triple rate channels (symmetrical/asymmetrical)	Published 03/99
TIA/EIA-136-005-A-1	TDMA Cellular/PCS addendum 1	Published 10/00
TIA/EIA-136-010	Optional mobile station facilities	
TIA/EIA-136-020	SOC, BSMC and carrier specific HLPI assignments	
TIA/EIA-136-100	Introduction to channels	
TIA/EIA-136-110	RF channel assignments	
TIA/EIA-136-12x	Digital control channel (DCCH) layer 1 (136-121), 2 (136-122) and 3 (136-123)	
TIA/EIA-136-13x	Digital traffic channel (DTC) layer 1 (136-131), 2 (136-132) and 3 (136-133)	
TIA/EIA-136-140	Analog (FSK) control channel	
TIA/EIA-136-150	Analog voice channel	
TIA/EIA-136-2x0	Minimum performance requirements for ACELP voice coder (136-210), VSELP voice coder (136-220), mobile station (136-270) and base station (136-280)	
TIA/EIA-136-410	ACELP voice coder	
TIA/EIA-136-420	VSELP voice coder	
TIA/EIA-136-510	Authentication and encryption of signaling information, user data and voice	

TIA/EIA-136-7x0	SMS: Introduction to teleservices (700), text/numeric messaging (710), Over-the-Air Activation (OATS; 720) and Over-the-Air Programming for intelligent roaming (OPTS; 730)
TIA/EIA-136-910	Informative information

TIA/EIA-136 Revision A – Packet Data

Standard	Description	Status
TIA/EIA-136-A	Revised parts include 136-010, 020, 100, 121,131,133,140,150,270, 280, 510, 700, 710, 720 and 910. New parts are listed separately	Published 12/99
TIA/EIA-136-310-1	Radio link protocol (RLP) 1 (for data services)	
TIA/EIA-136-310-A-1	Addendum to RLP	Published 06/01
TIA/EIA-136-350-A-1	Data services control addendum	Published 06/01
TIA/EIA-136-410-1	ACELP voice coder, addendum 1	Published 10/01
TIA/EIA-136-430	US1 voice coder (GSM compatible)	
TIA/EIA-136-511	List of messages subject to encryption	
TIA/EIA-136-620	TSAR: Teleservice Segmentation and Reassembly	
TIA/EIA-136-620-1	TSAR addendum	
TIA/EIA-136-630	BATS: broadcast short message	
TIA/EIA-136-730-1	OPTS: over-the-air programming teleservice to support intelligent roaming	
TIA/EIA-136-750	GUTS: general UDP transport service	

TIA/EIA-136 Revision B – ITU-R 3G Proposal (UWC-136)

Standard	Description	Status
TIA/EIA-136-B	Revision B. Only new parts are listed. Includes EPE and charge rate indicator	Published 03/00
TIA/EIA-136-123-A-1	TDMA Control Channel Layer 3, Addendum 1	Published 08/00
TIA/EIA-136-133-A-1	TDMA Traffic Channel Layer 3, Addendum 1	Published 08/00
TIA/EIA-136-230	US1 (GSM) voice coder minimum performance requirements	
TIA/EIA-136-270-1	MS minimum performance standards (Addendum)	
TIA/EIA-136-290	RF minimum performance for 200 kHz and 1.6MHz bearers (136HS)	
TIA/EIA-136-320	Radio link protocol 2 (RLP 2)	
TIA/EIA-136-330	Packet data service - overview	
TIA/EIA-136-331	Packet data service - physical layer	
TIA/EIA-136-332	Packet data service - medium access control (MAC)	
TIA/EIA-136-333	Packet data service - logical link control. Based on GSM 04.64.	
TIA/EIA-136-334	Packet data service - subnetwork dependent convergence protocol. Based on GSM 04.65.	
TIA/EIA-136-335	Packet data service - radio resource management	
TIA/EIA-136-336	Packet data service - mobility management	
TIA/EIA-136-337	Packet data service - tunneling of signaling messages. Subset of GSM 09.18	
TIA/EIA-136-34X	Outdoor high-speed packet data service: Overview (340), Physical layer (341) and MAC (342)	
TIA/EIA-136-36X	Indoor high-speed packet data service: Overview (360), Physical layer (361) and MAC (362)	
TIA/EIA-136-511	Messages subject to encryption	
TIA/EIA-136-610	R-DATA/SMDPP Transport	
TIA/EIA-136-720-A-1	Over-the-Air Activation (OATS) Addendum 1	Published 06/00
TIA/EIA-136-760	Charge-rate indication teleservice (CIT)	

TIA/EIA-136-900	Introduction to Annexes and Appendixes	
TIA/EIA-136-905	Normative information	
TIA/EIA-136-932	Packet data services - Stage 2 description	
TIA/EIA-136-933	Packet data services - Description of MAC layer	
TIA/EIA-136-940	Capacity and performance characteristics of UWC-136 (TIA/EIA-136-B)	
IS-839	R-UIM Overview, Operation, and File Structure Support in TIA/EIA-136, Rev B	Published 11/00
IS-842	GSM Hosted SMS Teleservice (GHOST)	Replaced by TIA/EIA-136-711

TIA/EIA-136 Revision C – GSM Voice Coder (AMR) and GPRS

Standard	Description	Status
TIA/EIA-136-C	Revised parts include 000-C, 005-B, 010-C, 020-C, 100-B, 110-B, 123-C, 131-C, 133-C, 210-A, 270-C, 280-C, 290-A, 350-B, 610-A, 620-A, 700-C	Published 06/01
TIA/EIA-136-030	R-UIM (Smart Card) overview and operation	
TIA/EIA-136-033	R-UIM/ME file structure	
TIA/EIA-136-033-1	R-UIM/ME file structure addendum 1	Published 10/01
TIA/EIA-136-034	R-UIM/ME interface procedures	
TIA/EIA-136-036	Personalization of mobile equipment (ME)	
TIA/EIA-136-037	R-UIM/ME application toolkit	
TIA/EIA-136-240	AMR (Adaptive Multi-Rate Vocoder) minimum performance	
TIA/EIA-136-250	VAD (Voice Activity Detection) minimum performance	
TIA/EIA-136-270-C-1	MS minimum performance standards (Addendum)	Published 01/02
TIA/EIA-136-351	EGPRS-136 - AT commands	
TIA/EIA-136-370	EGPRS-136 - Overview	
TIA/EIA-136-376	EGPRS-136 - Mobility management	
TIA/EIA-136-377	EGPRS-136 - Gs interface specifications	
TIA/EIA-136-440	AMR adaptive multirate codec (also used in GSM and UMTS)	Published 09/01
TIA/EIA-136-440-1	Revision to AMR (adaptive multirate codec)	Published 08/01
TIA/EIA-136-440-2	Second revision to AMR adaptive multirate codec	Published 08/02
TIA/EIA-136-620-A	Teleservice Segmentation and Reassembly	
TIA/EIA-136-670	Broadcast teleservices over GSM SMS (TOGS)	
TIA/EIA-136-740	SAMPS - System assisted MS positioning through satellite (i.e. GPS)	
TIA/EIA-136-972	EGPRS-136 - Stage 2 descriptions	
IS-823	Modification to ACELP voice coder to transmit 45.45 and 50 bps TTY/TDD tones	Published 05/00 Rescinded 02/02
IS-823-A	Modification to ACELP voice coder to transmit 45.45 and 50 bps TTY/TDD tones	Published 09/01
IS-840	Minimum performance for TTY/TDD detector and regenerator	Published 05/00 Rescinded 02/02
IS-840-A	Minimum performance for TTY/TDD detector and regenerator	Published 09/01
IS-869	Analog SAMPS support in TIA/EIA-136-C	Replaced by TIA/EIA-136-741
TSB-138	Clarification of IS-823-A (ACELP voice coder)	Published 04/02

TIA/EIA-136 Revision D

Standard	Description	Status
TIA/EIA-136-271	MS minimum performance for global circulation	Published 04/02
TIA/EIA-136-710	Cellular messaging teleservice (text SMS)	Published 04/02
TIA/EIA-136-711	GSM hosted SMS teleservice (GHOST)	Published 04/02
TIA/EIA-136-741	Analog SAMPS (System Assisted Mobile Positioning through Satellite)	Published 04/02
TIA/EIA-136-D	Revised parts 000-D, 020-D, 030-A, 033-A, 034-A, 037-A, 123-D, 133-D, 280-D, 350-C, 610-B, 700-D, 710-C, 720-C, 730-A, 760-A, 910-C	Published 04/02
TSB-132	UIM elementary file alignment issues in TIA/EIA-136-033	Published

TIA/EIA-136 Revision E – MEID Support

Standard	Description	Status
TIA/EIA-136-000-E	List of Parts for Revision E of TDMA Cellular/PCS	Development
TIA/EIA-136-005-C	Introduction, Identification (including MEID and Pseudo-ESN) and Semi-Permanent Memory	Development
TIA/EIA-136-030-B	R-UIM Overview and Operation (updated references)	Development
TIA/EIA-136-123-E	MEID Support for Digital Control Channel, Layer 3	Development
TIA/EIA-136-133-E	MEID Support for Digital Traffic Channel, Layer 3	Development
TIA/EIA-136-370-A	Inclusion of GERAN (GSM) in Enhanced GPRS Overview and Reference Updates	Development
TIA/EIA-136-376-A	Enhanced GPRS Mobility Management (MM) - Updated References	Development
TIA/EIA-136-377-A	Enhanced GPRS Gs Interface - Updated References	Development
TIA/EIA-136-440-A	Adaptive Multi-Rate Codec (AMR) - Update from GSM to ETSI References	Development
TIA/EIA-136-905-A	Normative Annexes. Includes details of MEID support in TIA/EIA-136-E.	Development