

# Cellular Networking Perspectives

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The FCC has agreed to reconsider their recent decision to use 123-456-7890 as the number to indicate that an uninitialized mobile has dialed 911 and callback is not possible.

### *Punch List: Law Enforcement Wins Technical Knock Out* .....p. 1

The FCC's response to a court ruling that suspended some electronic surveillance 'punch list' items has been to provide more justification. and this time, the industry does not appear to be objecting.

### *Mobile Equipment Identifier for 3GPP2* .....p. 2

3GPP2 has agreed to adapt the GSM IMEI mobile equipment identifier to their requirements, and 3GPP has agreed to let them.

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The latest status of analog cellular standards.

## Callback Numbers for Uninitialized Phones: FCC Considers Reconsideration

We reported in our [May, 2002](#) issue that the US FCC had ruled that the number 123-456-7890 should be used as a 'no callback possible' indicator for uninitialized phones. The industry proposal, defined in J-STD-036, is to use the pseudo area code, 911, followed by a portion of the mobile equipment identifier (ESN or IMEI).

The FCC approach could create a number of problems:

- It would be impossible to distinguish between calls from different uninitialized mobiles. Using a portion of the ESN, by contrast, allows most phones to be distinguished.
- A block of international roaming MIN codes (IRM) may have to be removed from assignment.
- This special MIN cannot be provisioned in GSM phones.

The FCC based their choice of number on the marketing of about 40,000 911-only phones using this callback MIN by Magnavox. The FCC was unaware of the J-STD-036 standard solution, so it did not influence their choice.

The relatively new [Emergency Services Interconnect Forum \(ESIF\)](#) has filed a request for reconsideration and a stay of

the order. Comments should be submitted to the FCC by August 2, 2002 and reply comments by August 19, 2002.

## Punch List: Law Enforcement Wins Technical Knock Out

Since being passed in 1995, the interpretation of the US CALEA legislation for 'wireless wiretap' (lawfully authorized electronic surveillance) has been controversial, with law enforcement generally wanting a more liberal interpretation than the wireless industry, and and certainly more than civil libertarians.

The nine most contentious items were labelled the 'punch list' and were not included in the industry standard (J-STD-025). A more detailed description of these controversial capabilities can be found in our [December 1998](#), [October](#) and [November 1999](#) and [September 2000](#) issues. In 1999 an FCC ruling concluded that six of the nine items should be implemented by the US telecommunications industry. The industry did not object to implementing two of them:

- Access to content of subject-initiated conference calls.
- Timing information.

**Next Issue: August 1<sup>st</sup>, 2002**

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But, the industry did object to the other four:

- Post-cut-through dialed digit extraction (e.g. DTMF tones generated during a call)
- Party hold/join/drop
- Subject-initiated dialing and signaling (e.g hook-flash and special feature keys)
- In-band and out-of-band signaling

A 2000 Appeals court ruling overturned the FCC ruling, stating that the FCC had not provided sufficient justification. However, in April 2002, the FCC again ruled that they should be included by June 30, 2002, and this time, there seems to be no objection by the telecommunications industry. These capabilities will be released in ANSI J-STD-025

Revision A, which was held in suspension following the Appeals Court ruling.

As part of its inclusion of punch-list capabilities, the ruling broadens the J-STD-025 definition of *origin*, *destination*, *direction* and *termination*, to make it clear that these concepts are not limited to dialed digits, but can include any identifying information.

One minor modification to the punch list is that the extraction of post-cut-through digits will require a 'toggle' switch to turn it OFF. This is because not all interceptions will have the legal authority to obtain this information.

J-STD-025 Revision B, currently scheduled for ballot in December 2002, will contain support for packet data

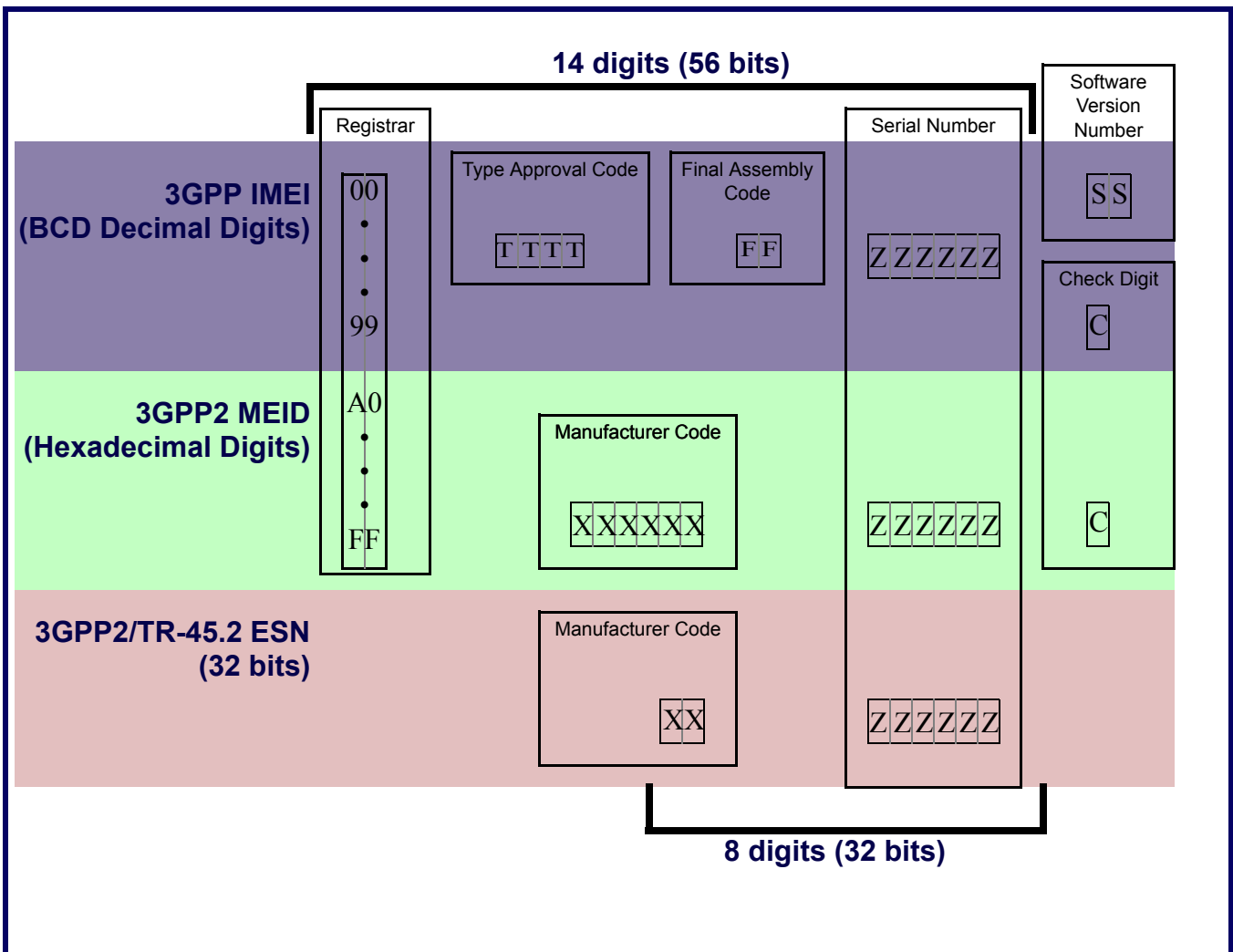
## Mobile Equipment Identifier for 3GPP2

3GPP2 has agreed to use a modified form of the GSM IMEI (International Mobile Equipment Identity) in future CDMA2000 systems, and 3GPP has agreed to allow them access to this resource. The MEID (Mobile Equipment ID) will replace the ESN. Because it is transmitted as 56 bits, it can provide millions of times the number of blocks of 24-bit serial numbers available using the 32-bit ESN.

The major difference between the MEID and the IMEI is that the MEID allows the use of the non-decimal digits, BCD digits A (10) through F (15).

**Figure 1** compares the formats of these identifiers.

**Figure 1: Mobile Equipment Identifiers**





3GPP2 networks will accept both types of mobile equipment identifiers. Existing GSM and Wideband CDMA (3GPP) networks will only be able to accept the IMEI format (e.g. no hexadecimal digits). Consequently, dual-mode (3GPP and 3GPP2) mobiles will need to be manufactured with a 3GPP IMEI for operation in both types of network.

MEID equipped mobiles operating in systems that only support the ESN may produce a pseudo-ESN by hashing (i.e. by executing an algorithm that produces a pseudo-random number). Alternatively, they may be assigned an ESN, although within a few years, exhaustion of unique ESN codes is expected

## 3GPP TSG T (Terminal) Update

3GPP TSG Terminal (TSG T) specifies terminal interfaces (logical and physical), capabilities (such as execution environments), performance and testing. It does not cover radio aspects of terminals (see **TSG-RAN**), nor codecs for speech and multimedia codecs (see **SA4**). Refer to the pinup diagram in

our **August 2001** issue for an overall perspective of the 3GPP and its TSG subgroups.

TSG T has completed all its work for Release 5 (Rel 5), the first ‘All IP’ (IP Multimedia) version of 3GPP standards. It is now focussing on Release 6 (Rel 6), and several specifications for this release are already published. These are highlighted in green in the tables below.

Our **February, 2002** issue provides a detailed description of the structure of TSG T, its Working Groups (WG) and its Sub-Working Groups (SWG).

## TSG T WG1 Conformance Testing

TSG T Working Group 1 (T1 – Mobile Terminal Conformance Testing) specifies user equipment (terminal) conformance testing for 3GPP standards.

As of the June 2002 TSG T meeting, the status of WG 1 was:

- All RF tests required for type approval in Japan and in Europe are complete.
- A Global Certification Forum document was accepted for prioritization of the implementation of test cases.
- Conformance tests that validate fully functional protocols are scheduled for completion by December 2002.
- TSG RAN and CN are reviewing test cases relevant to their responsibilities, and they will report problems to T WG1.
- Maintenance of Release 99 (Rel 99) RF Test specifications is ongoing.
- RF tests for low chip rate TDD (Time Division Duplex) are complete.
- UMTS 1800 / 1900 MHz RF tests have been completed.

### Glossary

For any terms you are unfamiliar with, please consult:

[www.cnp-wireless.com/glossary.html](http://www.cnp-wireless.com/glossary.html)

**Table 1: TSG T Working Group 1 Specification Status**

Document	Title	Status
TS 34.108	Common Test Environments for User Equipment (UE) Conformance Testing	<ul style="list-style-type: none"> <li>• Rel 99 and Rel 4 versions are being revised.</li> </ul>
TS 34.121	Terminal Conformance Specification; Radio transmission and reception (FDD)	<ul style="list-style-type: none"> <li>• The specification is completed, except some work to Resource Management”(RRM).</li> <li>• Rel 99 and Rel 4 versions are being revised.</li> </ul>
TS 34.122	Terminal Conformance Specification; Radio transmission and reception (TDD)	<ul style="list-style-type: none"> <li>• Complete, except some work to support RRM, because the core specification is still not complete.</li> <li>• Rel 99 and Rel 4 versions are being revised.</li> </ul>
TS 34.123-1	Mobile Station (MS) conformance specification; Part 1: Protocol conformance specification	<ul style="list-style-type: none"> <li>• Rel 4 version is being revised.</li> <li>• Rel 5 version is being published.</li> </ul>
TS 34.123-2	User Equipment (UE) conformance specification; Part 2: Implementation Conformance Statement (ICS) pro forma specification	<ul style="list-style-type: none"> <li>• Rel 4 version is being revised.</li> <li>• Rel 5 version is being published.</li> <li>• CRs have been introduced to align with changes in TS 34.123-1.</li> </ul>
TR 34.910	Identification of Test requirements for regulatory purposes in different regions/countries	<ul style="list-style-type: none"> <li>• A draft of this report is available.</li> </ul>





## TSG T WG2: Mobile Terminal Services & Capabilities

TSG T WG2 (Mobile Terminal Services & Capabilities) is responsible for the Services and Capabilities to be delivered by 3GPP Terminal Equipment. This includes terminal-based applications, features and interfaces.

The major change in WG2 status as of June 2002 was that TSG T agreed to upgrade all of its technical specifications (TS) and reports (TR) to Release 5, with the exception of TR 27.903 "Discussion of synchronization standards".

### SWG1 - MExE

This sub-working group specifies a standardized execution environment in user equipment (UE) and the ability to negotiate supported capabilities with a MExE service provider, allowing applications to be developed independently. Recent status changes include:

- MExE Rel-5 is complete.
- The term 'MExE Lite' has been dropped.
- Classmark 4 Common Language Infrastructure (CLI) for Rel-5 is complete.
- The first MExE conformance tests have been forwarded to WG1.

- Discussions have started on the introduction of the Wireless Game Engine as a new MExE classmark.
- MExE Java 2 Micro Edition (J2ME) interop event has been planned by ETSI for June 2002.
- The Security Analysis Work Item Description has been deleted
- A decision on whether a work item for "Binary execution feasibility study" should be initiated was postponed.

### SWG2 – UE Interfaces and Capabilities

- An ad hoc on the Generic User Profile (GUP) has been terminated. SWG2 will now work on items assigned by TSG SA WG1 and WG2.
- TR 32.802 (User Equipment Management (UEM) Feasibility Study) has been reviewed, and comments have been sent back to TSG SA WG5.
- TR 22.950 (Priority Service Feasibility Study) was reviewed as requested by TSG SA WG1.

### SWG3 – Messaging

- MMS (Multimedia Messaging Service) TS 23.140 Rel 5 has been completed, including:
  - Address Resolution
  - Interworking of different MMS environments.
  - Relay/Server – VAS Application stage 2 and 3.
  - Persistent storage.
  - Charging.
  - Header mapping.
  - Detection of duplicate messages.
  - Terminal capability negotiation between the Relay/Server and User Agent.
  - Addressing on MM1.
  - Harmonization of MMS with 3GPP2.
- EMS (Enhanced Message Service) Rel 5 has been completed, including:
  - Vector Graphics based on Wireless Vector Graphic (WVG).
  - Polyphonic sounds based on the extended object data format for SP (Scalable Polyphony) MIDI.
  - Five CRs against TS 23.040 (Release 5) vector graphics were incorporated.
- Rel 5 for SMS (Short Message Service) has been completed. Key items resolved for this release include:
  - Sub-address scheme.
  - Alternate return address.

**Table 2: TSG T WG2 Specification Status**

Document	Title	Status
tbd	MExE Release 6 Improvements and Investigations	• New work item.
tbd	MExE Run-Time Independent Framework	• New work item.
TS 23.040	Technical realization of the Short Message Service (SMS)	• Rel 5 version is being revised.
TS 23.041	Technical realization of Cell Broadcast Service (CBS)	• Rel 99 and Rel 4 versions are being revised.
TS 23.057	Mobile Execution Environment (MExE); Functional description; Stage 2	• Rel 6 version is being published.
TS 23.140	Multimedia Messaging Service (MMS); Functional description; Stage 2	• Rel 99, Rel 4 and Rel 5 versions are being revised.
TS 27.005	Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE - DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)	• Rel 99 and Rel 4 versions are being revised
TS 27.007	AT command set for User Equipment (UE)	• Rel 6 version is being published





### TSG T WG3: SIM and USIM

TSG T WG3 is responsible for the 2G Subscriber Identity Module (SIM or ‘Smart Card’) and the 3G USIM (Universal Subscriber Identity Module) with the exception of the security algorithms (developed by TSG SA WG3). It also maintains

specifications and tests for the 3G USIM and its interface with the Mobile Terminal. It has recently taken on responsibility for the ISIM (IP Multimedia Subsystem SIM).

The current WG 3 chairman, Klaus Vedder, is stepping down.

### Meetings

The last plenary meeting of TSG T was held from June 5<sup>th</sup>-7<sup>th</sup>, 2002 in Marco Island, Florida. Working Groups 1, 2 and 3 will meet in August. The next plenaries will be held in September in Biarritz, France and in December in New Orleans, USA.

**Table 3: TSG T WG 3 Specification Status**

Document	Title	Status
tdb	Test Specification for the SIM API	• New work item (WI) for Rel 5.
TS 31.102	Characteristics of the USIM Application	• Rel 99, Rel 4, and Rel 5 versions are being revised.
TS 31.103	Characteristics of the ISIM	• New specification for Rel 5.
TS 31.111	USIM Application Toolkit (USAT)	• Rel 99, Rel 4, and Rel 5 versions are being revised.
TS 31.112	USIM Application Toolkit (USAT) interpreter architecture description	• Rel 5 version is being revised.
TS 31.113	USAT Interpreter Byte Codes	• Rel 5 version is being revised. • Rel 6 version is being published.
TS 31.114	USAT Interpreter Protocol and Administration	• Rel 5 version is being revised.
TS 31.115	Secure Packet Structure for (U)SIM Toolkit Applications.	• New specification for Rel 6.
TS 31.115	Secured packet structure for (U)SIM Toolkit applications	• Draft (split from TS23.048).
TS 31.116	Remote APDU Structure for (U)SIM Toolkit applications	• New specification for Rel 6.
TS 31.116	Remote APDU Structure for (U)SIM Toolkit applications	• Draft (split from TS23.048).
TS 31.121	UICC – Terminal Interface; USIM Application Test specification	• Rel 99 and Rel 4 versions are being revised.
TS 31.122	USIM Conformance Test Specification	• Rel 99 version is being revised.
TR 31.900	SIM/USIM Interworking	• Rel 99 and Rel 4 versions replaced by Rel 5.
TR 31.900	SIM/USIM Internal and External Interworking Aspects	• Rel 5 version is being revised.
TS 51.011	SIM/ME interface	• Rel 5 version withdrawn.
TS 51.013	Test Specification for SIM API for Java Card	• Draft.

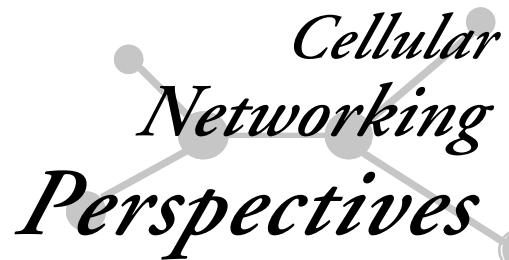




# TIA TR-45.1

## Analog Cellular

### Air Interface Standards



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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](http://www.tiaonline.org/standards/search_n_order.cfm)  
Thanks to John Kay (Motorola) for his assistance compiling the information in this table.

#### First Generation: Basic Analog

Standard	Description	Status
EIA/TIA-553	Analog air interface	Published 09/89
<b>IS-19-B</b>	<b>Mobile minimum performance standards</b>	<b>Published 06/88</b> <b>Rescinded 02/02</b>
IS-20-A	Base station minimum performance standards (replaced by TIA/EIA-712)	Published 05/88 Rescinded 07/97
IS-3-A,B,C,D	Original analog air interface standards (see EIA/TIA-553-0)	Rescinded 09/89
TSB16	Assignment of access overload classes	Published 03/85
TSB35	Cellular mobile receiver dynamic range	Published 04/92
TSB39	Message type assignment for extended protocol	Published 03/93

#### Second Generation: NAMPS, In-Building, Residential, Authentication

Standard	Description	Status
TIA/EIA-89	Elevate IS-89 to ANSI standard	Development
TIA/EIA-90	Elevate IS-90 to ANSI standard	Ballot 05/01
IS-88	Narrowband (3:1) analog air interface ("NAMPS")	Published 02/93 Being rescinded
IS-89	IS-88 base station performance standards	Published 02/93
IS-90	IS-88 mobile performance standards	Published 02/93
IS-91	Analog air interface (including "NAMPS" and authentication)	Published 10/94
IS-94	In-building analog air interface ("CAPS")	Published 05/94 Rescinded 10/00
IS-680	Residential ("cordless") interface between Wireless Residential Extension (WRE) and PSTN	Published 05/96
TSB70	Cross reference for FSK control channel	Published 12/95 Rescinded 09/99
TSB83-A	Additional modem options for IS-680 ("cordless")	Published 04/97







### Third Generation: Isolation of “Core” Control Channel Capabilities

Standard	Description	Status
TIA/EIA-553-A	Analog air interface (including authentication, alert/flash with info, abbrev. alert, message waiting indicator and protocol capability indicator (PCI) )	Published 11/99
TIA/EIA-690	Mobile minimum performance standards (previously IS-19-C)	Published 11/00
TIA/EIA-712	Base station minimum performance standards (prev. IS-20-A)	Published 07/97
<b>TSB16-A</b>	<b>Assignment of access overload classes</b>	<b>Published 06/01</b>
TSB39-A	Message type assignment for extended protocol (analog, TDMA and CDMA standards)	Published 10/94
TSB70-A	Updated version of TSB-70 cross reference	Published 09/99
TSB71	IS-94 enhancements and issues	Published 10/95

### Fourth Generation: Advanced Capabilities

Standard	Project	Description	Status
TIA/EIA-691	SP-3665	Enhanced analog ANSI version of IS-91-A (w/o Wireless Residential Extension)	Published 11/99
IS-91-A	PN-3476	Revised IS-91 air interface (including IS-94 functionality and sleep mode)	Published 11/99
IS-91-B	SP-3666	Revised version of IS-91 (including IMSI, OTA, priority access, 911, cryptosync and Expanded ESN)	Project cancelled
IS-713	PN-3668	1900 MHz upbanded AMPS (based on IS-91-A)	Published 11/99
IS-788	PN-4205	Portable wireless phone-to-vehicle interface: Connector	Published 06/99
<b>IS-788-A</b>	<b>PN-4660</b>	<b>IS-788 including IDB (ITS Data Bus)</b>	<b>In press</b>
IS-789	PN-4207	Portable wireless phone-to-vehicle interface: Electrical Interface	Published 07/99
IS-789-A	PN-4629	Modification to IS-789 to support SAE J2366 ITS Data Bus (IDB)	Published 04/00
IS-790	PN-4208	Portable wireless phone-to-vehicle interface: Latch	Published 03/00
IS-791	PN-4209	Portable wireless phone-to-vehicle interface: Test Specifications	Project cancelled
<b>IS-798</b>	<b>PN-4527</b>	<b>Portable wireless phone-to-vehicle interface: Mounting Envelope</b>	<b>Published 06/01</b>
<b>IS-816</b>	<b>PN-4630</b>	<b>IDB message set definition for IS-789. Publication held up by a copyright issue.</b>	<b>In press</b>
IS-817	PN-4662	Geo-location for analog cellular phones	Published 01/01
<b>IS-817-1</b>	<b>PN-4862-AD1</b>	<b>Geo-location for analog cellular phones, Addendum 1 (being re-balloted)</b>	<b>Published 02/02</b>
<b>IS-822</b>	<b>SP-4560</b>	<b> "+" (Plus Code) dialing for international calling from analog cellular phones and Enhanced 911</b>	<b>Project cancelled</b>
TSB119	PN-4559	"Intelligent Retry" for improved access to emergency calling	Published 10/00
<b>TSB121</b>	<b>PN-4558</b>	<b>Interface between wireless phone and Telephony Device for the Deaf (TDD) - 2.5 mm jack</b>	<b>Published 06/01</b>
<b>TSB121-A</b>	<b>PN-4558</b>	<b>Revised TSB121 based on input from ATIS TTY group</b>	<b>Development</b>
	<b>PN-4373</b>	<b>Analog Air Interface Support of Expanded ESN (56-bit ESNX)</b>	<b>Project cancelled</b>
	PN-4375	Analog Air Interface Support of International Mobile Station Identity (IMSI)	Project cancelled 03/00

