3GPP2 X.P(R)0070-0 v0.4

January 2015

International Implementation of Wireless Telecommunication Systems Compliant with X.S0004

REVISION HISTORY

Revision	**Description of Changes**	**Date**
N.S0017	Publication, January 2000	Initial publication
N.S0017-A	Publication, April 2001	First revision
N.S0017-B	Publication, January 2003	Second revision.
X.R0070-0 v1.0	Publication, tbd 2015	Third revision

CONTENTS

FOREWORD

This foreword is not part of this document.

This document contains information on international implementations of wireless telecommunications systems compliant with X.S0004 and is based on the TIA information document, TSB-29. The document addresses System ID (SID), MIN (Mobile Identification Number) codes, other numbering resources and their administration both within and outside the North American Numbering Plan area (NANPA).

1 INTRODUCTION

1.1 Scope

When the first edition of the Mobile Station – Land Station Compatibility Specification (*IS-3*, now *TIA/EIA-553-A*) was issued, it was envisioned that it would be adopted for use within North America. Provisions were included for international implementation; however, detailed guidelines to assist with such implementations were not included. TIA Subcommittee TR-45.2 (now TIA TR-45.8) recognized the need to provide such guidance and chartered a Working Group (Working Group VI, since dissolved) with this responsibility. The result of this Working Group's deliberations has been the production of TSB-29 as well as ongoing internationalization of other TIA standards, such as, *TIA/EIA-41-D (N.S0005), TIA-751 (N.S0009), TIA/EIA/IS-807 (N.S0016), TIA/EIA/IS-875 (N.S0027), TIA/EIA-124 (N.S0026), TIA/EIA-136, IS-95, IS-91*, and *TIA/EIA-2000 (C.S0001~6)*. TSG-N TSG-X (formerly TSG-N) has taken TSB-29 and produced the specification N.S0017, now updated as X.R0070.

The principle aspects of international implementation addressed by this document are:

- The administration and assignment of System Identification Numbers (SIDs)
- The administration and assignment of Mobile Identification Numbers (MINs)
- Format of International Mobile Subscriber Identifiers (IMSIs)

The goal of this publication is to provide the international wireless telecommunications industry with the framework permitting the coordinated implementation of Wireless Radio Telecommunication Systems in compliance with the provisions of the AMPS family of air interface standards (e.g., *TIA/EIA-553, IS-54, IS-91, IS-95, TIA/EIA-2000,* and *TIA/EIA-136*).

1.2 Document Conventions

This is an informative document so no statements should be interpreted as requirements.

2 REFERENCES

2.1 Informative References

American National Standards Institute (ANSI) standards:

- ANSI T1.112, Signaling Connection Control Part Formats and Codes; 1988
- ANSI T1.114-1988, Signaling System Number 7 – Transaction Capabilities Application Part (TCAP); 1988.

International Telecommunications Union - Telecommunications (ITU-T standards:

- Series E: Overall Network Operation, Telephone Service, Service Operation and Human Factors; November 1998.
- Recommendation E.212, The International Identification Plan for Mobile Terminals and Mobile Users; ITU-T; May 2008.
- Recommendation E.164, Numbering Plan for the ISDN era; CCITT; November 2010.
- Annex to ITU Operational Bulletin No. 615 (1.III.1996) No. 803 (1.I.2004) List of Mobile Country or Geographical Area Codes; January 2004.
- Annex B of ITU Q.713 SCCP formats and codes; March 2001.

Telecommunications Industry Association (TIA) – ANSI standards and Interim Standards:

- TIA/EIA-41-E, Cellular Radio-Telecommunications Intersystem Operations; 2005. (ANSI-41)
- 3GPP2 X.S0004-E v7.0, Mobile Application Part (MAP); June 2009.
- TIA/EIA-553-A Mobile Station – Land Station Compatibility Specification; November 1999.
- TIA/EIA Interim Standard IS-91-A, Mobile Station – Land Station Compatibility Standard; Telecommunications Industry Association; November 1999.
- TIA/EIA Interim Standard IS-95-BTIA-2000-F, Mobile Station – Base Station Compatibility Standard for Dual-Mode Wideband Spread Spectrum Cellular System; Telecommunications Industry Association; July 2014.
- TIA/EIA-124-E, Cellular Radio Telecommunications Intersystem Non-Signaling Data Communications (DMH); Telecommunications Industry Association; February 2005.
- TIA/EIA-136-D, Cellular System Mobile Station — Land Station Compatibility Standard; Telecommunications Industry Association; April 2002.
- TIA-751, TIA/EIA-41-D Modifications to Support IMSI; Telecommunications Industry Association; January 2002.
- TIA/EIA Interim Standard IS-807, TIA/EIA-41-D Internationalization; Telecommunications Industry Association; 1999.

3 TERMS

ANSI	American National Standards Institute
AMPS	Advanced Mobile Phone Service
BID	Billing ID
CCITT	International Telegraph and Telephone Consultative Committee
CCS7	ITU-T Common Channel Signaling System 7
EIA	Electronics Industry Alliance
GTT	Global Title Translation
HLR	Home Location Register
IFAST	International Forum on ANSI-41 Standards Technology
IMSI	International Mobile Subscriber Identity
IRM	International Roaming MIN
ISDN	Integrated Services Digital Network
ITU-T	International Telecommunications Union – Telecommunications
MAP	Mobile Application Part
MC	Message Center
MCC	Mobile Country Code
MDN	Mobile Directory Number
MIN	Mobile Identification Number
MNC	Mobile Network Code
MS	Mobile Station
MSIN	Mobile Subscriber Identification Number
MTP	Message Transfer Point
NANP	North American Numbering Plan
NMSI	National Mobile Subscriber Identity
NPA	Number Plan Area
SCCP	Signaling Connection Control Part
SID	System Identification
SS7	ANSI Signaling System 7
STP	Signaling Transfer Point
TCAP	Transaction Capabilities Application Part
TIA	Telecommunications Industry Association
TSB	Telecommunication Systems Bulletin
VLR	Visitor Location Register

4 MOBILE IDENTIFICATION NUMBERS

A 10-digit mobile identification number, known as MIN, is used to identify MSs according to most air interface standards published before 1994. Since then, most air interface standards have also supported IMSI.

4.1 North American Number Plan (NANP) Mobile Stations

The NANP MSs are those whose home system is within the NANP, as defined in ITU-T Recommendation E.164 – The United States (its possessions and territories), Canada, Jamaica, Barbados, Antigua and Barbuda, Cayman Islands, British Virgin Islands, Bermuda, Bahamas, Dominican Republic, Grenada, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Turks and Caicos Islands, Puerto Rico and the US Virgin Islands. For such MSs, the MIN is usually derived from the 10-digit national significant number, commonly referred to as the "directory number." The format of this number is NPA-NXX-XXXX, where:

- "NPA" represents the 3-digit Numbering Plan Area,
- "NXX" represents the 3-digit mobile exchange code, and
- "XXXX" represents the 4-digit telecommunication number within the exchange.

MSs that have not been assigned an NANP MDN are treated as non-NANP mobile stations.

4.2 Non-NANP Mobile Stations

Non-NANP MSs are those MSs whose home system is external to the North American Numbering Plan (NANP).

It is recommended that the MINs be assigned from the set of the MINs that is allocated to the MS's home country (or home service provider) by the International Forum on ANSI-41 Standards Technology (IFAST). For such MSs, the format of the 10-digit MIN is "0XXX+6 Digits", "1XXX+6 Digits", "XXX0+6 Digits" or "XXX1+6 Digits". The first four digits of this IRM will be assigned by IFAST to carriers that require international roaming. The MS's home service provider will assign the last 6-digits of the MIN.

4.2.1 IRMs

See the IFAST Web Site for the most current assignment of IRMs. The URL for the site is: **http://ifast.org**

5 INTERNATIONAL MOBILE SUBSCRIBER IDENTITY

The ITU-T Recommendation E.212 International Mobile Subscriber Identity (IMSI) is incorporated as an alternate MS identifier in newer MS air interface standards (e.g., TIA/EIA IS-136 and TIA/EIA IS-95 Revision A). The utilization of IMSIs should be such that not more than the first 6 digits of the IMSI have to be analyzed in a visited public network for querying the home network. This identifier has the following format:

MCC	**MNC**	**MSIN**
3 digits	2-3 digits	Maximum of 10 digits
IMSI Maximum of 15 digits		

Where:

MCC Mobile Country Code

MNC Mobile Network Code

MSIN Mobile Subscriber Identification Number

IMSI International Mobile Subscriber Identity

It is recommended that the IMSI format be used in accordance with the ITU-T E.212 recommendation. The application of E.212 beyond this recommendation is a national issue.

5.1 Guidelines for IMSI Assignment

Use of the following guidelines minimizes international roaming problems:

a. Use the MCC assigned to the country that a wireless system serves.

b. The use of an MNC will allow optimal routing by signaling networks outside the home country.

c. The length of an MNC should be restricted to no more than 3-digits until international agreements adopt longer values.

d. CDMA MSs may need to be identified by a MIN-based IMSI as defined by TIA-751.

6 SYSTEM IDENTIFICATION NUMBER

A 15-bit system identification (SID_p) must be stored in the mobile station and used to identify the mobile station's home system (see §2.6.1.1.2 of EIA/TIA-553). This document assumes that SIDs are globally unique regardless of band class (See J-STD-008). These SID codes range in value from 0 to 32767.

6.1 System Identification Number Data Tables

This section identifies the organizations responsible for assigning subsets of the SID numbering space.

See the IFAST Web Site for the most current assignment of SIDs. The URL for the site is: **http://ifast.org**

6.1.1 Reserved Blocks or Spare Codes

Codes with values from 32768 through 65535 cannot be transmitted by a wireless system. However, these codes, known as BID (Billing ID) codes, are available for use to identify groups of wireless systems within ANSI-41 MAP and the wireless industry's accounting infrastructure. Wireless technologies that do not use ANSI-41 MAP can use codes 65536 through 99999 within the wireless industry's accounting infrastructure.

6.1.2 SID Assignment Organizations

Table 1: SID Assignment Organizations

Low SID	High SID	Assignment Organization/Purpose
0	32767	IFAST/Transmissible SID code[1]
32768	65535	Cibernet/ANSI-41 compatible BID
65536	99999	Cibernet/BID (not ANSI-41 compatible)

[1] Cibernet has indicated that codes that they assigned within this range for use as BID codes can be reassigned in a higher range by Cibernet, or registered with IFAST.

7 OTHER PARAMETER NUMBERING CONSIDERATIONS

3GPP2 X.S0004 (TIA/EIA-41) supports several parameters that may require national network administration. Some of these parameters are:

a. BillingID (BILLID)
b. CarrierDigits (CARDGTS)
c. MobileSwitchingCenterIdentification (MSCID)
d. MSCIdentificationNumber (MSCIN)
e. PointCode_SubSystemNumber (PC_SSN)
f. SenderIdentificationNumber (SENDERIN)

8 ADMINISTRATION OF THIS DOCUMENT

While every effort has been made to ensure the accuracy of this document, especially in the case of those wireless systems that have already been commissioned, it is possible that an error or omission might exist. In recognition of this possibility, and therefore in order to provide for expedited updating, this document has been issued by TIA as a Telecommunication Systems Bulletin and by 3GPP2 as X.R0070.

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