3GPP TSG-CN
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Document *NP-000373*
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

23.003	**CR**	**022**	Current Version:	3.4.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	CN#08	For approval	X	strategic		*(for SMG*
list expected approval meeting # here ↑		for information		non-strategic	X	*use only)*

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio		Core Network	X

Source: N4 Chairman **Date:** 22.06.00

Subject: IMEI Formats and Encoding (extract from 22.016 Annex A)

Work item: TEI

Category: *(only one category Shall be marked With an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: This CR also moves the Annex A from 22.016 to 23.003, because S1 felt that the Annex is too detailed for S1 specification.

Clauses affected: 6.2.1, New Annex B

Other specs affected:

Other 3G core specifications	X	→ List of CRs:	22.016
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

Foreword 5
1 Scope 6
1.1 References 6
1.2 Abbreviations 7
1.3 General comments to references 7
1.4 Conventions on bitordering 7
2 Identification of mobile subscribers 7
2.1 General 7
2.2 Composition of IMSI 8
2.3 Allocation principles 8
2.4 Structure of TMSI 8
2.5 Structure of LMSI 9
2.6 Structure of TLLI 9
2.7 Structure of P-TMSI Signature 10
3 Numbering plan for mobile stations 10
3.1 General 10
3.2 Numbering plan requirements 10
3.3 Structure of MS international PSTN/ISDN number (MSISDN) 11
3.4 Mobile Station Roaming Number (MSRN) for PSTN/ISDN routeing 11
3.5 Structure of Mobile Station International Data Number 12
3.6 Handover Number 12
3.7 Structure of an IP v4 address 12
3.8 Structure of an IP v6 address 12
4 Identification of location areas and base stations 12
4.1 Composition of the Location Area Identification (LAI) 12
4.2 Composition of the Routing Area Identification (RAI) 13
4.3 Base station identification 13
4.3.1 Cell Identity (CI) and Cell Global Identification (CGI) 13
4.3.2 Base Station Identify Code (BSIC) 13
4.4 Regional Subscription Zone Identity (RSZI) 14
4.5 Location Number 14
4.6 Composition of the Service Area Identification (SAI) 15
5 Identification of MSCs and location registers 15
5.1 Identification for routing purpose 15
5.2 Identification of HLR for HLR restoration application 16
6 International Mobile Station Equipment Identity and Software Version Number 16
6.1 General 16
6.2 Composition of IMEI and IMEISV 16
6.2.1 Composition of IMEI 16
6.2.2 Composition of IMEISV 17
6.3 Allocation principles 17
7 Identification of Voice Group Call and Voice Broadcast Call Entities 18
7.1 Group Identities 18
7.2 Group Call Area Identification 18
7.3 Voice Group Call and Voice Broadcast Call References 18
8 SCCP subsystem numbers 19
8.1 Globally standardised subsystem numbers used for GSM 19
8.2 National network subsystem numbers used for GSM 19
9 Definition of Access Point Name 19
9.1 Structure of APN 20
9.1.1 Format of APN Network Identifier 20
9.1.2 Format of APN Operator Identifier 20
9.2 Definition of the Wild Card APN 21
9.2.1 Coding of the Wild Card APN 21
10 Identification of the Cordless Telephony System entities 21
10.1 General description of CTS-MS and CTS-FP Identities 21

10.2 CTS Mobile Subscriber Identities 21
10.2.1 General 21
10.2.2 Composition of the CTSMSI 21
10.2.3 Allocation principles 22
10.2.4 CTSMSI hexadecimal representation 22
10.3 Fixed Part Beacon Identity 22
10.3.1 General 22
10.3.2 Composition of the FPBI 22
10.3.2.1 FPBI general structure 22
10.3.2.2 FPBI class A 23
10.3.2.3 FPBI class B 23
10.3.3 Allocation principles 23
10.4 International Fixed Part Equipment Identity 24
10.4.1 General 24
10.4.2 Composition of the IFPEI 24
10.4.3 Allocation principles 24
10.5 International Fixed Part Subscription Identity 24
10.5.1 General 24
10.5.2 Composition of the IFPSI 25
10.5.3 Allocation principles 25
11 Identification of Localised Service Area 25
Annex A (informative): Colour Codes 27
A.1 Utilization of the BSIC 27
A.2 Guidance for planning 27
A.3 Example of PLMN Colour Codes (NCCs) for the European region 28
Annex B (normative): IMEI Check Digit computation xx
Annex C~~B~~ (informative): Change history ..... ~~29~~xx

6.2.1 Composition of IMEI

The International Mobile station Equipment Identity (IMEI) is composed as shown in figure 10.

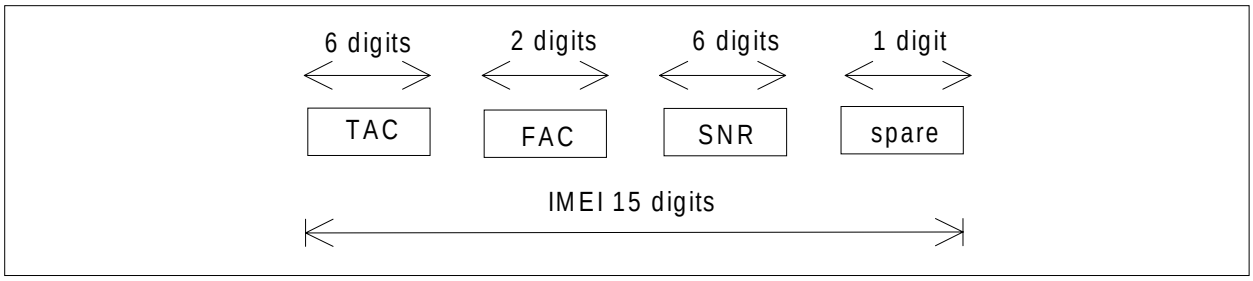

Figure 10: Structure of IMEI

The IMEI is composed of the following elements (each element shall consist of decimal digits only):

- Type Approval Code (TAC). Its length is 6 digits;
- Final Assembly Code (FAC) identifies the place of manufacture/final assembly. Its length is 2 digits;
- Serial Number (SNR) is an individual serial number uniquely identifying each equipment within each TAC and FAC. Its length is 6 digits;
- Spare digit: this digit shall be zero, when transmitted by the MS.

The IMEI (14 digits) is complemented by a check digit. The check digit is not part of the digits transmitted at IMEI check occasions, as described below. The Check Digit shall avoid manual transmission errors, e.g. when customers register stolen MEs at the operators customer care desk. The Check Digit is defined according to the Luhn formula, as defined in annex B.

NOTE: The Check Digit is not applied to the Software Version Number.

The security requirements of the IMEI are defined in 3G TS 22.016.

********** NEXT MODIFICATION **********

Annex B (normative): IMEI Check Digit computation

B.1 Representation of IMEI

The International Mobile station Equipment Identity and Software Version Number (IMEISV), as defined in TS 23.003, is a 16 digit decimal number composed of four distinct elements:

- a 6 digit Type Approval Code (TAC);
- a 2 digit Final Assembly Code (FAC);
- a 6 digit Serial Number (SNR); and
- a 2 digit Software Version Number (SVN).

The IMEISV is formed by concatenating these four elements as illustrated below:

TAC	FAC	SNR	SVN

Figure A.1: Composition of the IMEISV

The IMEI is complemented by a check digit as defined in section 3. The Luhn Check Digit (CD) is computed on the 14 most significant digits of the IMEISV, that is on the value obtained by ignoring the SVN digits.

The method for computing the Luhn check is defined in Annex B of the International Standard "Identification cards - Numbering system and registration procedure for issuer identifiers" (ISO/IEC 7812) [3].

In order to specify precisely how the CD is computed for the IMEI, it is necessary to label the individual digits of the IMEISV, excluding the SVN. This is done as follows:

The (14 most significant) digits of the IMEISV are labelled D14 D13 ... D1, where:

- TAC = D14 D13 ... D9 (with D9 the least significant digit of TAC);
- FAC = D8 D7 (with D7 the least significant digit of FAC); and
- SNR = D6 D5 ... D1 (with D1 the least significant digit of SNR).

B.2 Computation of CD for an IMEI

Computation of CD from the IMEI proceeds as follows:

Step 1: Double the values of the odd labelled digits D1, D3, D5 ... D13 of the IMEI.

Step 2: Add together the individual digits of all the seven numbers obtained in Step 1, and then add this sum to the sum of all the even labelled digits D2, D4, D6 ... D14 of the IMEI.

Step 3: If the number obtained in Step 2 ends in 0, then set CD to be 0. If the number obtained in Step 2 does not end in 0, then set CD to be that number subtracted from the next higher number which does end in 0.

B.3 Example of computation

IMEI (14 most significant digits):

TAC						FAC		SNR					
D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1
2	6	0	5	3	1	7	9	3	1	1	3	8	3

Step 1:

2	6	0	5	3	1	7	9	3	1	1	3	8	3
	x2		x2		x2		x2		x2		x2		x2
	12		10		2		18		2		6		6

Step 2:

2 + 1 + 2 + 0 + 1 + 0 + 3 + 2 + 7 + 1 + 8 + 3 + 2 + 1 + 6 + 8 + 6 = 53

Step 3:

CD = 60 - 53 = 7

Annex ~~B~~ C (informative): Change history