

CR-Form-v5

CHANGE REQUEST

⌘ **22.016 CR A013** ⌘ rev **-** ⌘ Current version: **6.2.0** ⌘

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Proposed change affects: ⌘ (U)SIM ME/UE Radio Access Network Core Network

Title:	⌘ Combining the TAC and FAC fields of the IMEI		
Source:	⌘ Vodafone		
Work item code:	⌘ TEI	Date:	⌘ 11 June 2002
Category:	⌘ F Non-critical correction agreed by consensus Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .	Release:	⌘ R97
		Use <u>one</u> of the following releases:	2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change:	⌘ CR 03.03-A055, approved in CN #16, combined the TAC and FAC fields of the IMEI. This needs to be reflected in the annex to 02.16 which defines the computation of the IMEI check digit.
Summary of change:	⌘ Combine the TAC and FAC fields of the IMEI in annex A
Consequences if not approved:	⌘ Formal incorrectness of the procedure for computing the IMEI check digit

Clauses affected:	⌘ A.1; A.3	
Other specs affected:	⌘ <input checked="" type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘ CR 03.03-A055 (approved in CN #16)
Other comments:	⌘ For Release 99 onwards, the check digit computation is defined in an annex to TS 23.003	

Annex A (normative): IMEI Check Digit computation

A.1 Representation of IMEI

The International Mobile station Equipment Identity and Software Version Number (IMEISV), as defined in TS GSM 03.03, is a 16 digit decimal number composed of four distinct elements:

- an 86 digit Type Approval Assignment 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		SNR	SVN
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).

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 ... D79 (with D79 the least significant digit of TAC); and
- FAC = D8 D7 (with D7 the least significant digit of FAC); and
- SNR = D6 D5 ... D1 (with D1 the least significant digit of SNR).

A.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.

A.3 Example of computation

IMEI (14 most significant digits):

TAC							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	
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	
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:

$$CD = 60 - 53 = 7$$