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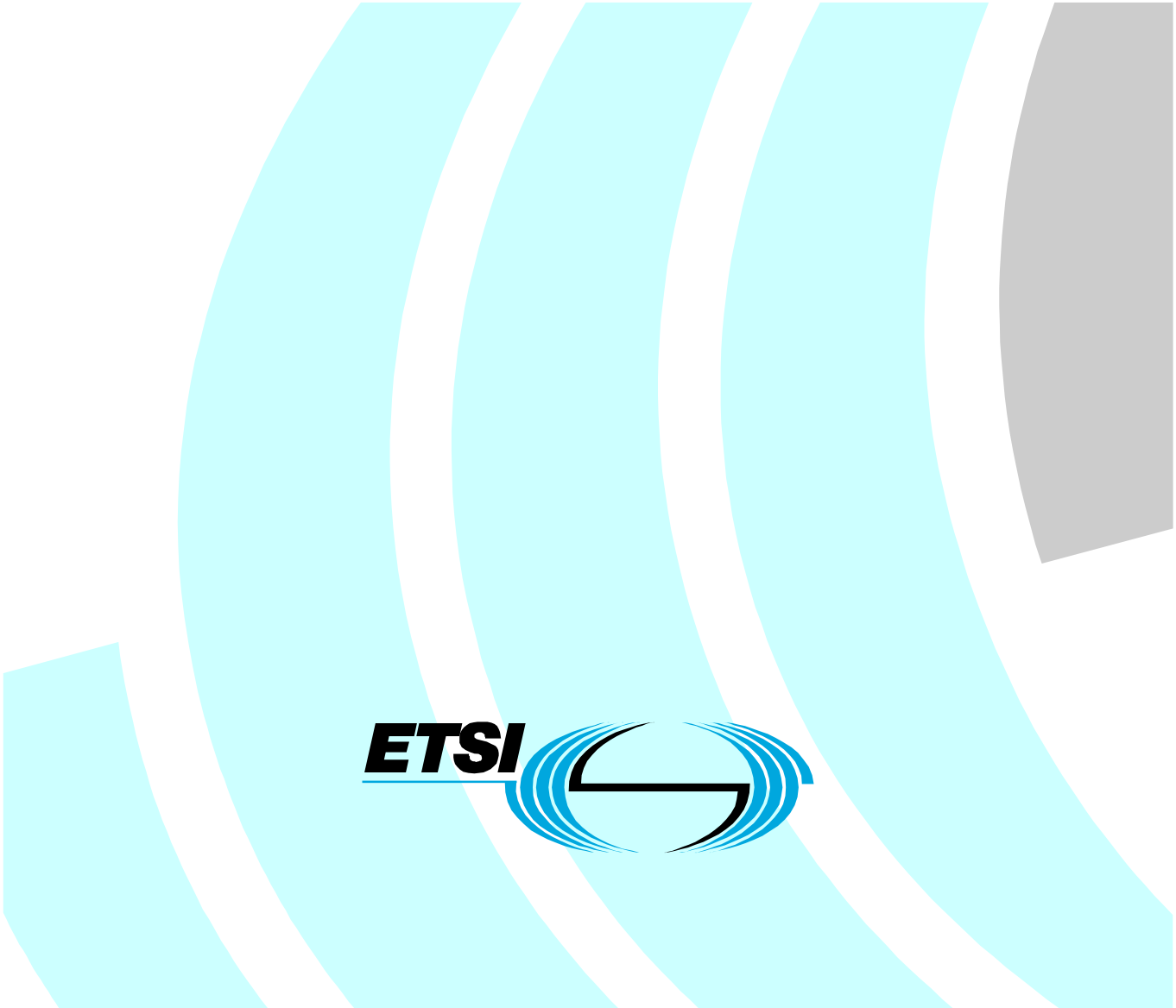
ETSI Guide

Services and Protocols for Advanced Networks (SPAN);
The structure of the TETRA numbering resource, interworking and high level policy for administration



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Foreword

This ETSI Guide (EG) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN).

Introduction

The present document provides information on the TETRA ITSI. The ITSI is similar in structure to ITU-T Recommendation E.212 [4] IMSI identity. In addition to providing background on the similarities and differences between these two identities, the present document also describes each of the individual fields of the TETRA ITSI.

In certain circumstances operators may have to relate these two resources together. Given the management of the individual elements of the ITSI (the TETRA Mobile Country Code, the TETRA Mobile Network Code and the Short Subscriber Identity), the present document describes how an approach taken by a National TETRA Numbering Administrator, responsible for managing the TETRA MNC, might assist an operator in the use of both resources.

TETRA Mobile Country Codes (T)MCC are currently administered by the TETRA Memorandum of Understanding (MoU) Group, an industry organisation, which has aligned the digital value of the (T) MCC with the ITU-T Recommendation E.212 [4] MCC. An issue has been raised as to how countries know that these codes are formally/legally assigned to the country allocated. Discussions are under way to move the administration of (T) MCC resources to the ITU-TSB.

1 Scope

The present document provides guidance on the allocation and management of the country code and network code parts of the Individual TETRA Subscriber Identity (ITSI) used in TETRA. It applies to all TETRA networks irrespective of their interconnection arrangements. It includes guidance on the effect of dual mode operations with the GSM family of systems on the allocation of TETRA codes.

The present document is intended primarily for use by National Numbering Plan Administrator and National TETRA Numbering Administrator (NTNA) and network operators.

TR 102 300-5 [2] gives further information about the implementation of the ITSI and the various dialling arrangements that may be used.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

[1] ETSI EN 300 392-1: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 1: General network design". Clause 7 Addressing and Identities.

[2] ETSI TR102 300-5: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Designers' guide; Part 5: Guidance on numbering and addressing".

[3] ITU-T Recommendation E.190: "Principles and responsibilities for the management, assignment and reclamation of E-series international numbering resources".

[4] ITU-T Recommendation E.212: "The international identification plan for mobile terminals and mobile users".

[5] ITU-T Recommendation X.121: "International numbering plan for public data networks".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

administration body: body responsible for the allocation and management of the TETRA Mobile Country Code, currently the TETRA MoU Group

National TETRA Numbering Administrator (NTNA): body responsible for the national allocation and management of the TETRA Mobile Network Codes

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ITSI	Individual TETRA Subscriber Identity
IMSI	International Mobile Subscriber Identity
HLR	Home Location Register
MCC	Mobile Country Code
MNC	Mobile Network Code
MoU	Memorandum of Understanding
MSIN	Mobile Subscriber Identification Number
NRA	National Regulatory Authority
NTNA	National TETRA Numbering Administrator
SSI	Short Subscriber Identity
SP	Service Provider
TETRA	TErrestrial Trunked RAdio
(T)MCC	TETRA Mobile Country Code
(T)MNC	TETRA Mobile Network Code

4 Structure of the TETRA ITSI

An Individual TETRA Subscriber Identity (ITSI) has 3 component parts, a TETRA Mobile Country Code ((T)MCC), TETRA Mobile Network Code ((T)MNC), and a network specific short subscriber identity (SSI) which have fixed number lengths. The ITSI structure and format are as shown in figure 1.

NOTE: In the present document the TETRA MCC and MNC are called (T)MCC and (T)MNC to distinguish them from the ITU-T Recommendation E.212 [4] MCC and MNC. The TETRA main standards use the terms MCC and MNC because they assume the TETRA context.

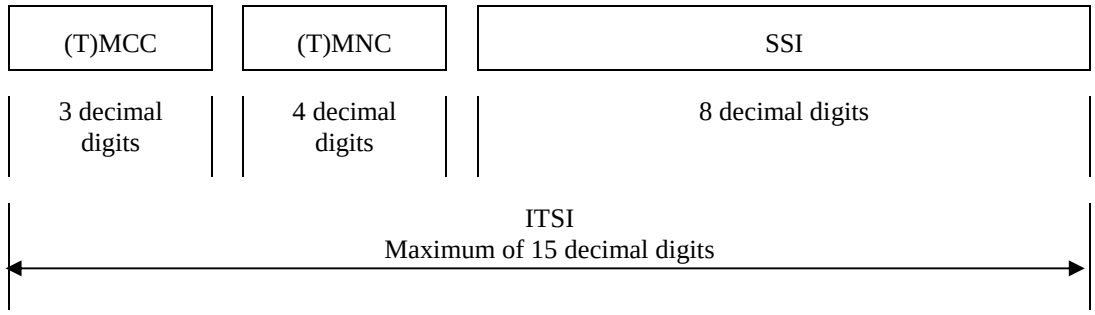

Figure 1: Structure of ITSI

The format of the identity is defined only at the air interface, where each part is separately encoded as a binary string. Mobiles, however, are normally designed to be capable of displaying the identity in decimal form for the human user.

The subsequent text of the present document refers to the decimal form as read by a human.

The structure an ITSI in decimal form is quite similar to that of the ITU-T Recommendation E.212 [4] IMSI, used by public land mobile networks e.g. the GSM family of networks, but it is a separate numbering scheme.

The IMSI structure and format are as shown in figure 2.

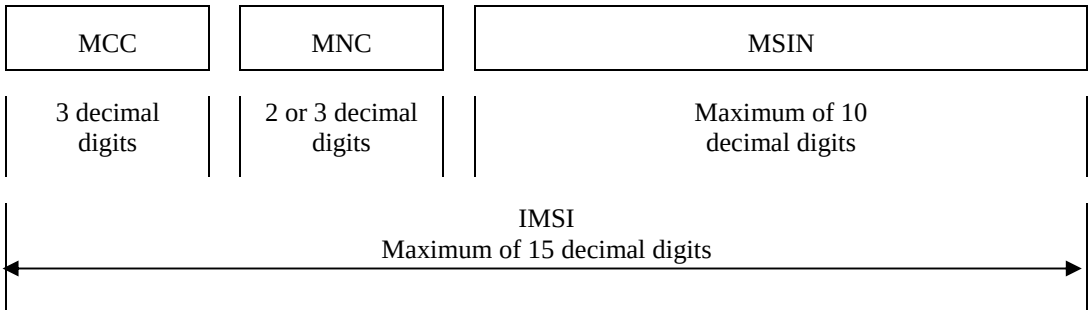

Figure 2: Structure and Format of IMSI

5 Allocation and administration of TETRA Mobile Country Codes ((T)MCC))

TETRA Mobile Country Codes ((T)MCC) are currently administered by the TETRA Memorandum of Understanding (MoU) Group, which is an industry organisation.

EN 300 392-1 [1] specified initially that the (T)MCC values should copy the values allocated in ITU-T Recommendation X.121 [5], but, because ITU-T Recommendation X.121 [5] relates to an older and different technology, the MoU is currently copying the values allocated under ITU-T Recommendation E.212 [4] for the IMSI. No values other than those allocated under ITU-T Recommendation E.212 [4] have been allocated by the MoU.

NOTE: The current intention is to update the TETRA standards to say that assigned E.212 MCCs will be the basis when (T)MCCs will be assigned and administered in the future by the ITU-TSB.

Because the TETRA MoU is not an intergovernmental body, its allocations are not necessarily recognised by all National Regulatory Authorities (NRA). Discussions are under way to transfer the administration of (T)MCC resources to the ITU-TSB to put the scheme fully under the control of national regulatory authorities and to give international recognition to the TETRA numbering arrangements.

6 Allocation and administration of TETRA Mobile Network Codes((T)MNC))

The administration of TETRA Mobile Network Codes is a national matter. In practice they may be administered by the National Numbering Plan Administrator, under the NRA, or by the National TETRA Numbering Administrator if other than the National Numbering Plan Administrator. The administrator is called in the present document the National TETRA Numbering Administrator.

Where the administrator is not the NRA the NTNA may wish to obtain guidance from the national numbering plan administrator on best practice for the administration of the codes.

NOTE: ITU-T Recommendation E.190 [3] includes some general principles that may be followed.

7 Guidance on allocating TETRA MNCs for dual mode operation with systems that use ITU-T Recommendation E.212 MNCs

7.1 Background

(T)MNCs are in principle independent of other identity schemes and so may be allocated in whatever manner the NTNA decides. However there is a possibility that operators may wish to run dual mode systems with technology that uses ITU-T Recommendation E.212 [4] IMSIs (e.g. GSM and UMTS/IMT-2000), and this clause gives guidance on how the numbering systems relate to each other in dual mode operation.

In dual mode operation, a dual mode terminal will appear to a TETRA network (home or visited) as a normal TETRA terminal, but will appear to a visited GSM network as a normal GSM terminal. It is assumed that no modifications will be made to the GSM networks to facilitate dual mode operation with TETRA. The home TETRA networks that supports dual mode will have to appear to visited GSM networks as a GSM network or at least a mobile virtual network. This involves operating a GSM style Home Location Register (HLR) and supporting GSM authentication and charging arrangements.

There are two options for the numbering of the mobile terminal:

- To have an IMSI value for use with GSM different from the ITSI value for use with TETRA, which would require the TETRA operator to translate from one to the other.
- To use a common decimal value of IMSI and ITSI for use with both systems, which requires a common value of E.212 MNC and (T)MNC and is known as alignment.

The choice of the options is unlikely to affect the design of the mobile terminals and their SIMs since manufacturers would be likely to design terminals to accommodate separate values. However there is a possibility that the use of a common value could provide some cost savings for the home TETRA operator who is supporting dual mode. In order to assist the NTNA decision whether or not such savings exist, and therefore whether the aligned approach can be justified, evidence shall be provided by the operators concerned.

7.2 Allocations of (T)MNC in relation to E.212 MNC

The National TETRA Numbering Administrator may wish to facilitate the use of dual mode operation with a common value of IMSI and ITSI. Since the values of the E.212 MCCs and the (T)MCCs have the same numerical value, and since the subscriber number is an internal matter for the operator, the issue focuses on achieving a common value of the network code. If the National TETRA Numbering Administrator does not make these arrangements, the TETRA operators will have to translate numbers if they provide dual mode operation.

The following applies only where the National TETRA Numbering Administrator wishes to facilitate dual mode operation with a common value of IMSI and ITSI. Where a common value is not intended, the schemes are totally separate and any (T)MNC value may be allocated without regard to the assigned E.212 MNC value.

Figure 3 shows the ITU-T Recommendation E.212 [4] and TETRA network code numbering spaces aligned with each other.

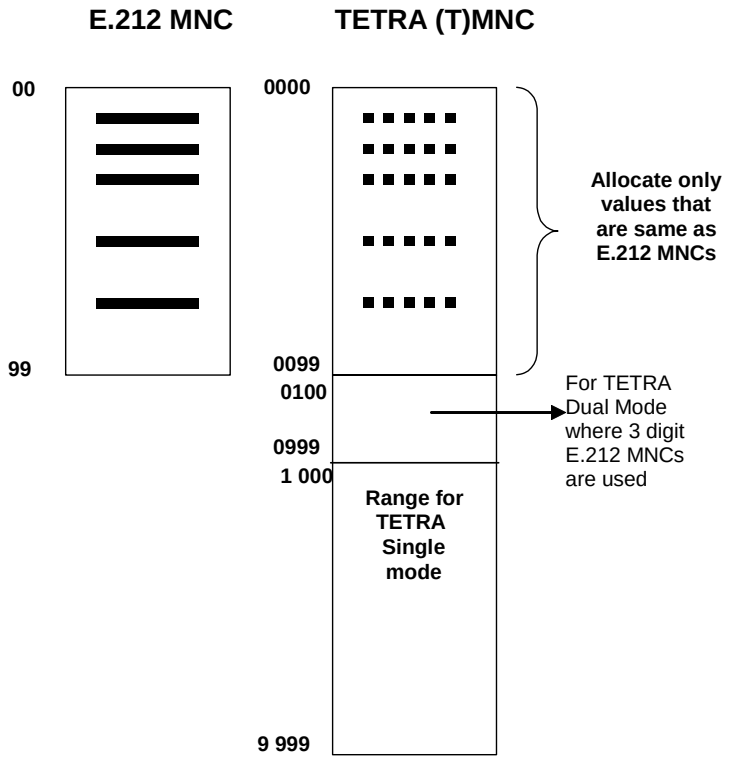

Figure 3: ITU-T Recommendation E.212 [4] and TETRA MNC values where administrators support alignment

NOTE: To ensure consistency with those countries that use 3 digit E.212 MNCs, the TETRA range 0100 to 0999 should not be used. ITU-T Recommendation E.212 [4] values have a range from 00 to 99, whereas (T)MNC values have a range from 0000 to 9999. Since the ranges overlap only for the values 00 to 99, TETRA allocations for single mode operation should be limited to the range 1 000 to 9 999. This approach takes into account the possible use of TETRA MNCs in the range 0100 to 0999 in those countries that have 3 digit E.212 MNCs where the NTNA has chosen the aligned approach.

Where an operators wishes to introduce dual mode operation, the operators should first obtain an ITU-T Recommendation E.212 [4] MNC from National Numbering Plan Administrator and then the National TETRA Numbering Administrator (if other than the National Numbering Plan Administrator) should allocate the same value in the TETRA (T)MNC space.

TETRA (T)MNC values equivalent to ITU-T Recommendation E.212 [4] values that have already been allocated to GSM in the range 00 to 99 would be used only if GSM operators add TETRA technology to their networks.

If an operator starts with a TETRA-only service and a (T)MNC in the range 1 000 to 9 999 and subsequently decides to introduce dual mode with a common value, then that operator will either have to:

- re-number their TETRA network code to a new (aligned) common value in the range 00 to 99, or
- support two separate (T)MNC values, a dual mode code aligned in the range 00 to 99 and the existing value in the range 1 000 to 9 999.

Annex A (informative): Bibliography

ITU-T Recommendation E.164: "The international public telecommunication numbering plan".

ITU Recommendation E.214: "Structure of the land mobile global title for the signalling connection control part (SCCP)".

TETRA WORKSHOP, Copenhagen, 16 September 1998 Report.

ETSI ETS 300 392-4-1: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 4: Gateways basic operation; Sub-part 1: Public Switched Telephone Network (PSTN)".

ETSI ETS 300 392-4-2: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 4: Gateways basic operation; Sub-part 2: Integrated Services Digital Network (ISDN) gateway".

History

Document history		
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