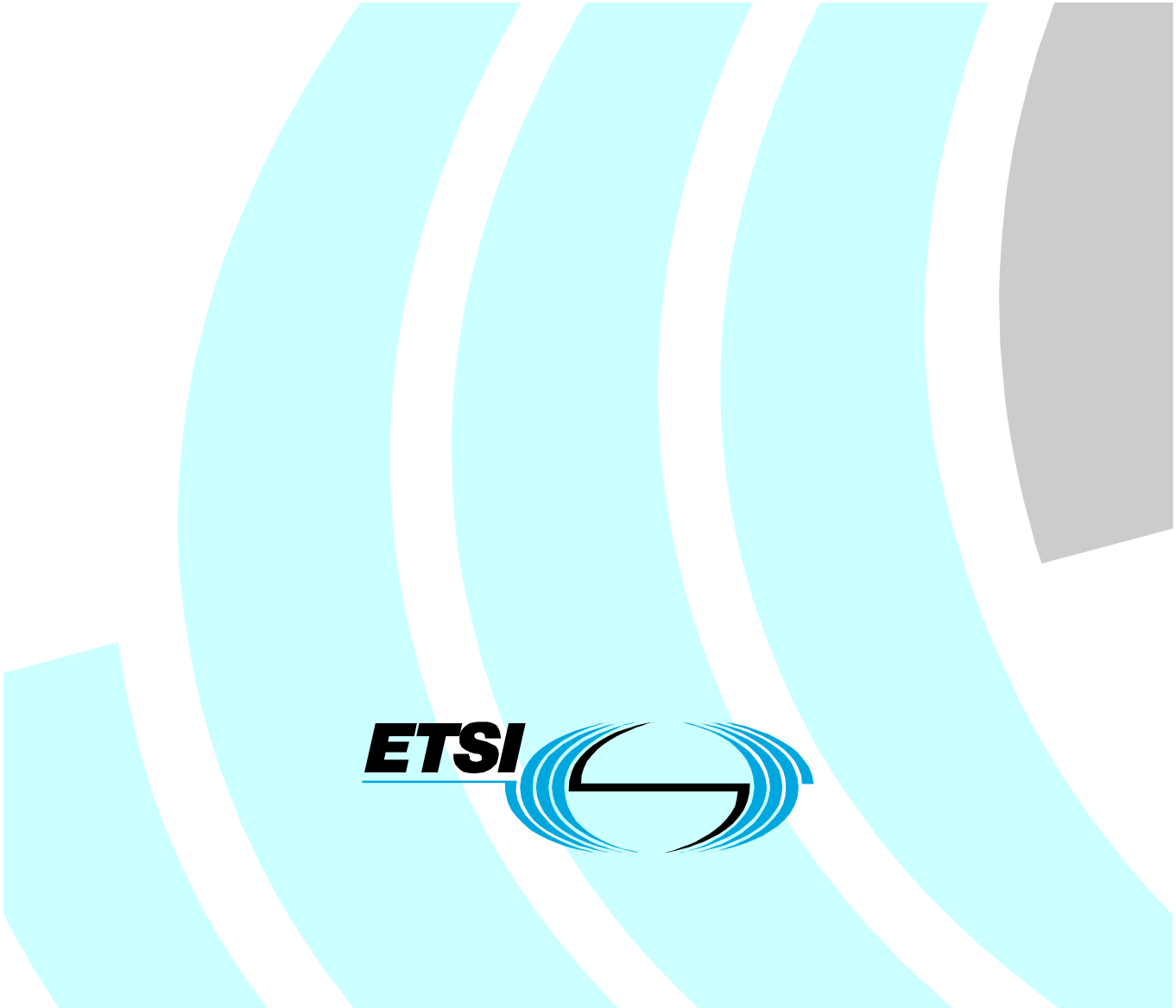
ETSI TR 102 021-1 V1.1.1 (2001-12)

Technical Report

Terrestrial Trunked Radio (TETRA);
User Requirement Specification TETRA Release 2;
Part 1: General Overview



Reference
DTR/TETRA-01074

Keywords
TETRA, User

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Contents

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://webapp.etsi.org/IPR/home.asp).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This Technical Report (TR) has been produced by ETSI Project Terrestrial Trunked Radio (TETRA).

The present document is part 1 of a multi-part deliverable covering the User Requirement Specifications (URSs) for TETRA Release 2, as identified below:

Part 1: "General Overview";

Part 2: "High Speed Data";

Part 3: "Codec";

Part 4: "Air Interface Enhancements";

Part 5: "Interworking and Roaming";

Part 6: "Subscriber Identity Module (SIM)";

Part 7: "Security".

Introduction

The TETRA Release 2 suite of standards was mandated in the new Terms of Reference (ToR) for ETSI Project TETRA approved at ETSI Board meeting number 28 (Board 28) on 6th September 2000 [7][8]. Its aim was to enhance the services and facilities of TETRA in order to meet the emerging user requirements, utilize new technologies and, by maintaining the competitiveness with other wireless technologies, increase the futureproofness of TETRA as the standard for PMR and PAMR worldwide.

The approved programme for TETRA Release 2 covers five work areas, namely:

- high speed data;
- speech coding;
- air interface enhancements;
- interworking and roaming;
- SIM

and the User Requirement Specification for each of these work areas is covered by its own document. In addition, though not listed as a separate area of activity in the approved work programme, any significant market requirement for enhancement to TETRA Security will also be taken on board and is covered by a separate URS.

The present document provides the General Overview of the User Requirement Specification required by EPT for TETRA Release 2 as described in all of these URSs.

1 Scope

The present document outlines the process employed by EPT Working Group 1 in generating user requirements in general, and the methodology used for creating URSs for Release 2 in particular. It also covers the process of identifying interdependencies, which is considered important for ensuring that various stand-alone URSs fit together into an integrated and coherent URS for TETRA Release 2 as a whole.

The present document is applicable to the specification of TETRA Release 2 equipment.

Each of the work areas of the TETRA Release 2 programme is covered by its own stand-alone URS. The URSs were produced by the membership of WG1, who are responsible for capturing and defining user requirements for TETRA. TETRA Advanced Packet Service (TAPS) has already been approved by EPT and is therefore not covered by these URSs.

2 References

For the purposes of this Technical Report (TR) the following references apply:

[1] ETSI TR 102 021-2: "Terrestrial Trunked Radio (TETRA); User Requirement Specification TETRA Release 2; Part 2: High Speed Data".

[2] ETSI TR 102 021-3: "Terrestrial Trunked Radio (TETRA); User Requirement Specification TETRA Release 2; Part 3: Codec".

[3] ETSI TR 102 021-4: "Terrestrial Trunked Radio (TETRA); User Requirement Specification TETRA Release 2; Part 4: Air Interface Enhancements".

[4] ETSI TR 102 021-5: "Terrestrial Trunked Radio (TETRA); User Requirement Specification TETRA Release 2; Part 5: Interworking and Roaming".

[5] ETSI TR 102 021-6: "Terrestrial Trunked Radio (TETRA); User Requirement Specification TETRA Release 2; Part 6: Subscriber Identity Module (SIM)".

[6] ETSI TR 102 021-7: "Terrestrial Trunked Radio (TETRA); User Requirement Specification TETRA Release 2; Part 7: Security".

[7] B28 (00)12: "Extension of EPT Terms of Reference to Enable TETRA 'Release 2'".

[8] B28 (00)24 Rev 2: "Summary minutes, decisions and actions from 28th ETSI Board Meeting, Sophia Antipolis, 5-6 September 2000".

3 Definitions and abbreviations

3.1 Definitions

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

TETRA Release 2: Work Programme with new terms of reference within ETSI Project TETRA to enhance the services and facilities of TETRA in order to meet new user requirements, utilize new technology and increase the longevity of TETRA within the traditional market domains of PMR and PAMR

High Speed Data (HSD): net data rates in excess of 28,8 kbps which is the current capability of TETRA Release 1

roaming: utilization of a mobile terminal in a network other than the one where the mobile is subscribed but on which the mobile can still be located and operated by agreement between the respective network operators

NOTE: This definition is used in the present document. This may be different from the definition of roaming used in other TETRA documents.

interworking: where TETRA users on one system can communicate with mobile users on another system (which could be TETRA or different), as long as they operate within their home TETRA network, i.e. they cannot roam into another system

interoperability: another name for roaming, where TETRA users can obtain a communication service (the same or reduced) outside their home systems. Interoperability between two different types of systems, e.g. TETRA and GSM, can be achieved by the use of multi-mode TETRA-GSM terminals or by swapping multi-application SIM card (if available) between the two terminals

3.2 Abbreviations

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

API	Application Programming Interface
DMO	Direct Mode Operation
EPT	ETSI Project TETRA
GPRS	General Packet Radio Service
GSM	Global System for Mobile communications
HSD	High Speed Data
IP	Internet Protocol
MoU	Memorandum of Understanding
PAMR	Public Access Mobile Radio
PMR	Private Mobile Radio
RF	Radio Frequency
SIM	Subscriber Identity Module
TETRA	TErrestrial Trunked RAdio
TR	Technical Report
UMTS	Universal Mobile Telecommunications System
URS	User Requirement Specification
URS	User Requirement Specification
USIM	User Services Identity Module
V+D	Voice plus Data
WG	EPT Working Group

4 User Requirement Specification

4.1 The Process

Within EPT, WG1 has been given the responsibility for capturing the requirements of the "TETRA Market" from a variety of user entities and for producing User Requirement Specifications. These are then used as a basis for all the other EPT working groups, each of which is responsible for development of a particular aspect of the Release 2 standard, e.g. air interface, network aspects, data, codec, etc.

WG1 membership consists of the representatives from end-users of TETRA systems and equipments, Network Operators, Regulators, Manufacturers and Administrations and its task is to collate often conflicting requirements from different user entities. The URS will comprise the list of services and facilities to be included in the new product/specification, the relative attractiveness of the market opportunity associated with each, and the indication by when should the product/specification be available in the market place. Since in reality, there are always some constraints governing budgets and resources, some prioritization of services and facilities should ideally be a part of the URS in order to assist the selection process in the technical working groups. If they were absent from the users they will be produced by WG1, in their role as the EPT voice of the market, in order to assist the detailed technical selection processes taking place in the WGs.

4.2 Methodology

In order to ensure that the most up-to-date information is used for the URSs, WG1 undertook to produce and send out a comprehensive Market Questionnaire (see bibliography), which was sent to the members of EPT and the TETRA MoU. Replies received from respondents to the Questionnaire were used as the main references for the Release 2 URSs. A series of WG1 membership meetings and conference calls took place to agree and approve the content of each URS.

It is important to note that the number of respondents to the TETRA Release 2 Questionnaire was relatively small reflecting only a small number of large Public Safety and PAMR TETRA user organizations, and/or potential TETRA user organizations in Western Europe. Although the investment in TETRA by these user organizations is estimated to represent over 70 % of the TETRA market in Western Europe, it is recognized that TETRA is being deployed in other regions of the world in a number of market segments outside Public Safety and PAMR. For this reason, a further review of user requirements may be necessary.

Following approval of the URSs WG1 will continue to provide, as required by Working Groups, clarifications and guidance during the standard development process, as well as the interpretation of the URSs in cases of ambiguity. In addition, WG1 is expected to continuously monitor the market in terms of new major technologies and the services and facilities they offer to the users and to assess their potential impact on the Release 2 and take the necessary steps to keep it up-to-date or to document the requirements for future release.

4.3 Interdependencies between URSs

As already mentioned, the Release 2 URS is divided into several separate documents, each covering only one of the sections of the Release 2 requirement. This method had the advantage of maximum flexibility when it came to the production and maintenance of each of the documents, since different parts of the Release 2 programme have different completion timescales. However, in order to ensure that all the URSs "fit together" into a coherent, integrated specification, allowing users to mix and match the Release 2 enhancements in various combinations and permutations, it is essential that all of the technical dependencies between different work areas are identified by the relevant working groups and that they are resolved as part of their work programme.

4.4 Individual URSs and their scope

The six URSs for TETRA Release 2, with a brief description of each, are listed in clauses 4.4.1 to 4.4.6.

4.4.1 TR 102 021-2 "User Requirement Specification TETRA Release 2; Part 2: High Speed Data"

TR 102 021-2 provides the user requirement for High Speed Data (HSD). The main issues cover:

- HSD applications and net data rates to support non-voice applications;
- data rate capacity in addition to TETRA Release 1 V+D;
- RF coverage requirements for HSD;
- frequency spectrum efficiency requirements;
- integration of HSD with TETRA Release 1 V+D services;
- compatibility of HSD with TETRA Release 1 V+D services;
- HSD Call Types;
- Backward Compatibility with TETRA Release 1;
- migration from TETRA Release 1;
- availability of HSD;
- relative importance of HSD user requirement criteria.

4.4.2 TR 102 021-3 "User Requirement Specification TETRA Release 2; Part 3: Codec

TR 102 021-3 provides the user requirements for voice coding. The main issues cover:

- improved end-to-end delay performance;
- voice quality improvement over existing codec;
- equal or better immunity to background noise;
- interworking with GSM/UMTS (No double vocoding);
- interoperability with lower rate, standard codec.

4.4.3 TR 102 021-4 "User Requirement Specification TETRA Release 2; Part 4: Air Interface Enhancements"

TR 102 021-4 provides the user requirements for the air interface enhancements. The main issues cover:

- improved spectrum efficiency;
- increased network capacity;
- improved system performance;
- improved quality of service;
- reduction in size and weight of terminals;
- increased battery life;
- increased coverage;
- provisioning of location information.

4.4.4 TR 102 021-5 "User Requirement Specification TETRA Release 2; Part 5: Interworking and roaming"

TR 102 021-5 provides the user requirement for interworking and roaming. The main issues covers:

- improvements in interworking between TETRA and public mobile networks such as GSM, GPRS and UMTS;
- provision of inter-standard roaming;
- backward compatibility and integration of the new services with existing TETRA standards.

4.4.5 TR 102 021-5 "User Requirement Specification TETRA Release 2; Part 6: SIM"

TR 102 021-5 provides the user requirement for the Subscriber Identity Module (SIM). The main issues cover:

- evolution to USIM
- SIM Tool Kit
- testing of SIM
- other services on top of TETRA, e.g. WAP, API and IP
- DMO and Managed DMO
- multi-standard SIM relevant to Interworking and Roaming.

4.4.6 TR 102 021-6 "User Requirement Specification TETRA Release 2; Part 7: Security"

TR 102 021-6 provides the user requirement for security issues.

4.5 Relative Market importance of each area of Release 2

Based on the replies from the Market Questionnaire, the relative importance of each area of Release 2 is given in figure 1.

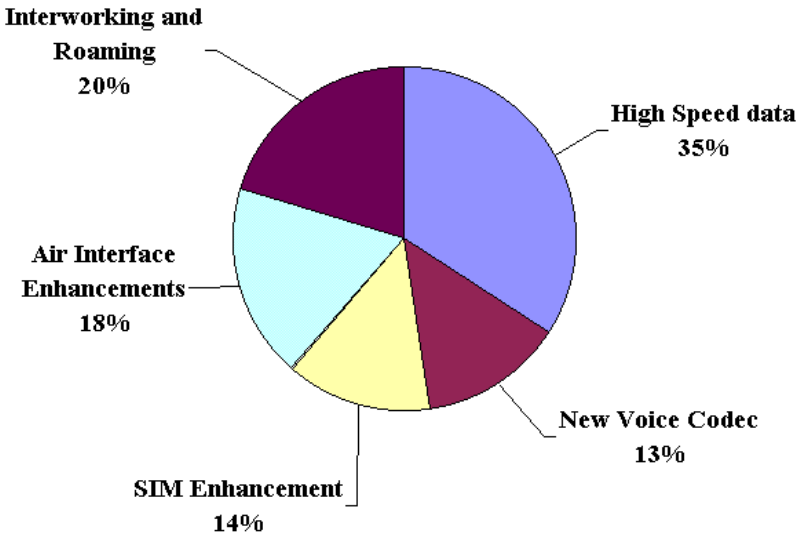


Figure 1: Overall importance

Annex A: Bibliography

EPT13(00)17r1 TETRA Release 2 Work Programme.

EPT/WG1(01)046v9 ETSI Project TETRA (EPT) TETRA Release 2 Questionnaire.

History

Document history		
V1.1.1	December 2001	Publication