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Radijska oprema in sistemi (RES) - Izboljġani sistem za radijsko sporoḷ anje (ERMES) - Zahteve za sprejemnik

Radio Equipment and Systems (RES); European Radio MEssaging Service (ERMES); Receiver requirements

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Foreword

This Technical Basis for Regulation (TBR) has been produced by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This TBR covers the requirements for terminal (mobile) equipment for use within the European Radio Message System (ERMES).

This TBR contains the procedures and requirements for the approval testing of ERMES terminal (mobile) equipment which are mainly intended to be body worn.

The ERMES equipment to be approved is not intended to be physically attached to the public network.

This TBR is based on ETS 300 133-4 [2] and ETS 300 133-5 [3].

This TBR also includes a vocabulary of terms and a list of abbreviations and acronyms.

Annexes A, B and C are normative and therefore integral parts of this TBR.

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1 Scope

This TBR specifies the technical characteristics to be provided by European Radio Message System (ERMES) terminal equipment, which are mainly intended to be body worn and are capable of the reception and decoding of signals transmitted according to the ERMES standard, as described in ETS 300 133-4 [2].

The objective of this TBR is to ensure that ERMES terminal equipment meets the essential requirements as laid down in terms of the Directive 91/263/EEC [6], Articles 4d to 4g.

There are no specific EMC requirements included in this TBR for Article 4c of Directive 91/263/EEC [6]. The general EMC requirements for ERMES are included in ETS 300 340 [10].

2 Normative references

This TBR incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this TBR only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] ETS 300 133-2 (1992): "Paging Systems (PS) - European Radio Message System (ERMES) Part 2: Service aspects".

[2] ETS 300 133-4 (1992): "Paging Systems (PS) - European Radio Message System (ERMES) Part 4: Air interface specification".

[3] ETS 300 133-5 (1992): "Paging Systems (PS) - European Radio Message System (ERMES) Part 5: Receiver conformance specification".

[4] ISO Standard 1073 parts 1 & 2: "Alphanumeric character sets for optical recognition".

[5] CTR Scope (5/3/92): "European Radio Message System (ERMES) - Approval requirements for paging receivers" (NTRAC).

[6] Official Journal of the European Communities Volume 34, 23 May 1991: "Council Directive 91/263 /EEC of 29 April 1991 on the approximation of the laws of the Member States concerning telecommunications terminal equipment, including the mutual recognition of their conformity".

[7] Handbook on CTRs, Draft Issue 2 for presentation to TRAC on 16/17 February 1993.

[8] ETS 300 133-6 (1992): "Paging Systems (PS) - European Radio Message System (ERMES) Part 6: Base station conformance specification".

[9] ETR 028: "Radio Equipment and Systems (RES) - Uncertainties in the measurement of mobile radio equipment characteristics".

[10] ETS 300 340: "Radio Equipment and Systems (RES); Electro-Magnetic Compatibility (EMC) for European Radio Message System (ERMES) paging receivers".

3 Definitions and abbreviations

3.1 Introduction

The terms, definitions and abbreviations used within this TBR are given in this clause. A definition or a reference to a definition given in this clause is valid for all clauses of this TBR.

An explanation of all the abbreviations and acronyms used in this TBR is given in alphabetical order in subclause 3.3.

The definitions are presented in six groups. Within each group the definitions are given in a conceptual order rather than alphabetical order.

3.2 Vocabulary

3.2.1 Administrative terms

user: A person or machine initiating an access to the operator network or receiving a message through the operator network. User includes mobile subscribers, fixed subscribers and non-registered customers.

network operator: The administration/company which is responsible for the technical and commercial operation of the operator network.

home operator: The network operator to which a specific user has subscribed.

3.2.2 Identity related terms

basic Radio Identity Code (RIC): The prime identity of the paging receiver allocated by the network operator when service is initiated. It shall not be changeable without safeguards against unauthorised changes.

Radio Identity Code (RIC): The number used by the system on the radio path to identify the receiver(s) for which the paging signal is intended. RIC has a total length of 35 bits and consists of four parts: The zone code (3 bits) the country code (7 bits), the operator code (3 bits) and the local address (22 bits).

operator identity: The number used by the system on the radio path to identify the home operator of a receiver. It has a total length of 13 bits and consists of three parts, the zone code, the country code and the operator code.

zone code: Binary representation of the zone number defined in ETS 300 133-4 [2], annex A. The zone code consists of 3 bits.

country code: Binary representation of the country number defined in ETS 300 133-4 [2], annex A. The country code consists of 7 bits.

operator code: The number used by the system to identify an operator within a country. It consists of 3 bits.

initial address: The 18 most significant bits of the local address.

3.2.3 Services, facilities and receiver features

group call: A call intended for two or more mobile subscribers.

3.2.4 Network related terms

ERMES system: The totality of the operator networks.

home network: The operator network with which a mobile subscriber has signed a subscription.

3.2.5 Area concepts

paging area: The area controlled by a Paging Area Controller (PAC). It is the minimum area to which a mobile subscriber is permitted to subscribe in order to receive his paging messages.

3.2.6 Terms related to the radio subsystem

paging signal: The signal sent on the radio path to a paging receiver.

alert signal: The signal generated by the receiver as an indication of a received paging signal.

alert signal indicator: The information bits contained in the I1 message header that determines which alert signal should be generated at the receiver. It is related to the address code input by the calling party.

code-word: The standard information unit of 30 bits length (used on the air interface).

codeblock: The unit of nine interleaved code-words used in the message partition of the air interface.

batch number: The 4 bit number corresponding to a particular batch type. Batch type A shall correspond to batch number 0000. Batch type P shall correspond to batch number 1111.

batch type: The letter (A to P) which identifies one of the 16 batches within a sub-sequence.

End of Message (EOM) character: A specific character used to indicate the end of an alphanumeric message. It corresponds to DC1 as defined in ETS 300 133-2 [1], annex B, clause B.2.

3.3 Abbreviations and acronyms

BAI	Border Area Indicator
CTA	Common Temporary Address
CTAP	Common Temporary Address Pointer
EOM	End of Message
ERMES	European Radio Message System
EUT	Equipment Under Test
IA	Initial Address
LCD	Liquid Crystal Display
PAC	Paging Area Controller
p.d.	potential difference
RF	Radio Frequency
RIC	Radio Identity Code
RSVD	Reserved bits for future definition
rms	root mean square
SSI	Supplementary System Information
TBR-RT	Technical Basis for Regulation - Requirements Table

4 General

4.1 Introduction

This TBR is based on the CTR Scope statement [5] from NTRAC on CTR No. 7.

This TBR specifies the receiver conformance requirements and the considered relevance of the Articles from the directive 91/263/EEC [6] with regard to ERMES receivers. The CTR Scope statement suggests that this TBR should only consider Articles 4e, 4f, and 4g. Article 4a is dealt with under the Low Voltage Directive (73/23/EEC), while Articles 4b and 4d are considered not relevant for this TBR. In the TBR Requirements Table (TBR-RT) given in clause 6, the tests to be carried out on ERMES receivers and the relevant Articles in the CTR scope statement [5] are tabulated.

4.2 Choice of model for approval testing

The applicant shall provide one preliminary or production model of the equipment, as appropriate for approval testing.

If approval is given on the basis of tests on a preliminary model, then the corresponding production models shall be identical in all respects to the preliminary model tested.

4.3 Description of equipment

The applicant shall provide the following information to the test laboratory.

4.3.1 Manufacturer's declaration

A declaration by the manufacturers or applicant shall be supplied detailing the following parameters:

a) the normal and extreme test voltages, see ETS 300 133-5 [3], subclauses 5.2 and 5.3;

b) any combination of the control characters ESC, LF and CR and any other character which should not be used for test in subclause 4.6.24.3, see ETS 300 133-5 [3], subclause 8.3;

c) a statement demonstrating that no combination of the RSVD bits affects the performance of the receiver with respect to this TBR, subclause 4.6.29;

d) the method to simulate insufficient quality of reception (BER, code-word error rate, erroneous system information) and the time constraints to be used in test 8.11, see ETS 300 133-5 [3] subclause 8.2.5;

e) a statement demonstrating that any features in the receiver that are additional to the requirements of this TBR do not affect the performance of the receiver with respect to this TBR, see subclause 4.6.30;

f) there will be a certain minimum time after a receiver is switched on before it is capable of receiving messages as described in the tests in clause 6. It is required that this time is stated, see ETS 300 133-5 [3] subclause 8.12.1;

g) the category of receiver shall be declared (see subclause 4.5);

h) the alerts associated with all the alert signal indicator bit sequences shall be declared. In addition the means whereby these alerts maybe tested shall be explained. If any additional equipment is required to test these alerts, then this shall be supplied by the manufacturer, see ETS 300 133-5 [3] subclause 7.3.1;

j) the message presentation technique shall be declared by the manufacturer. This is required to enable the test laboratory to test the message function;

k) the receiver shall have a basic RIC. The manufacturer shall declare that this RIC meets the requirements of ETS 300 133-4 [2], clause 3;

l) the reference orientation that shall be close to the orientation in normal use;

m) for the calculations of spurious response measurement the manufacturer shall state the frequency of the oscillator signal applied to the first mixer of the receiver, the intermediate frequencies of the receiver and the switching range.

4.4 Mechanical and electrical design

Any control or adjustment which, if maladjusted, could affect the conformance of the product to this TBR shall not be readily accessible to the user.

4.5 Categories of receivers

There are four categories of receivers, according to the different paging services they are designed to provide. Table 1 describes each of the four categories.

Table 1: Categories of receivers

Category	Description
1	A receiver providing this function shall respond to at least one combination of the alert signal indicator bits. Responses to the remaining seven alert indicator bits shall (if implemented) be clearly distinguishable.
2	A receiver including this function shall provide for the reception of a 20 digit numeric message. The numeric character set is included in annex C. Receivers having this function shall also have the tone-only function.
3	A receiver including this function shall provide for the reception of a 400 character text message. The alphanumeric character set is included in annex C. Receivers having this function shall also have the numeric and the tone-only functions.
4	A receiver including this function shall provide for the reception of an arbitrary data message.

4.6 The requirements and justifications

4.6.1 Average usable sensitivity (normal)

The receiver under test shall meet the specifications as defined in subclause 7.1 a).

The receiver is required to meet the above specification in order to provide sufficient call success rate under static field conditions when the transmitted field strength is at the defined level. This level has been chosen as a suitable limit level when economic, technical and regulatory considerations are taken into account. It is therefore required that receivers shall meet the specification as defined in subclause 7.1 a) and measured as defined in subclause 7.2 a).

Reference:

ETS 300 133-5 [3], subclause 6.1 i).

4.6.2 Degradation in required sensitivity under channel switching

The receiver under test shall meet the specifications as defined in subclause 7.1 b).

One of the essential features of the ERMES system is that the paging messages are distributed in a multiple frequency environment. It is therefore required that the receivers maintain their sensitivity to paging messages while they are scanning through the frequencies used in the system as defined in subclause 7.1 b) and measured as defined in subclause 7.2 l).

Reference:

ETS 300 133-5 [3], subclause 6.1 iii).

4.6.3 Degradation in required sensitivity in extremes and offset

The receiver under test shall meet the specifications as defined in subclause 7.1 c).

The operating temperature range for the receiver is -10° C to + 55° C. This range should cover the range of temperatures normally experienced in Europe by a body worn product. The receiver under test is primarily intended to be portable and therefore its power is derived from a battery. During the life of this battery, its terminal voltage may change, and to ensure that the performance of the receiver is not