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## Foreword

This Harmonized European Standard (EN) has been produced by ETSI Technical Committee Satellite Earth Stations and Systems (SES).

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Directive 98/34/EC [i.1] as amended by Directive 98/48/EC [i.2].

The title and reference to the present document are intended to be included in the publication in the Official Journal of the European Union of titles and references of Harmonized Standard under the Directive 1999/5/EC [1].

See article 5.1 of Directive 1999/5/EC [1] for information on presumption of conformity and Harmonised Standards or parts thereof the references of which have been published in the Official Journal of the European Union.

The requirements relevant to Directive 1999/5/EC [1] are summarised in annex A.

National transposition dates	
Date of latest announcement of this EN (doa):	30 September 2013
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 March 2014
Date of withdrawal of any conflicting National Standard (dow):	30 September 2016

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## Introduction

The requirements defined in the present document have been selected to ensure an adequate level of compatibility with other radio services. The levels, however, do not cover extreme cases, which may occur in any location but with a low probability of occurrence.

The present document may not cover those cases where a potential source of interference which is producing individually repeated transient phenomena or a continuous phenomenon is present, e.g. a radar or broadcast site in the near vicinity. In such a case it may be necessary to use special protection applied to either the source of interference, or the interfered part or both.

The present document does not contain any requirement, recommendation or information about the installation of the LMES.

The previous version [6] of this harmonized standard contained two sets of limits to provide a transition from TBR 044 [4]. One set of limits (table 2a) was applicable up to 1 June 2002 and a more stringent set (table 2b) was applicable after this date. The first set of limits (table 2a) has been removed in the present document since it is no longer required. The second set of limits (table 2b) is retained for existing and legacy LMES and may continue to be used for LMES that only operate in the original L-band allocation (sub-band 1 as defined in table 1a).

The determination of the parameters of the user earth stations using a given geo-stationary satellite for the protection of the spectrum allocated to that satellite, is considered to be under the responsibility of the satellite operator or the satellite network operators. *Applicants for LMESs operating in satellite networks which provide radio navigation service and/or other safety services* should note that such satellite network operators may require testing in addition to the present document to prove correct interworking in order to avoid the LMES causing harmful interference which endangers the functioning of these services. References to these requirements will be listed in the Bibliography of the present document as they become known.

The present document specifies a new set of emission requirements for LMESs that are capable of transmitting in the frequency band from 1 668,0 MHz to 1 675,0 MHz. Following the WRC-03 decision to allocate to MSS the bands 1 518 MHz to 1 525 MHz (space to Earth) and 1 668 MHz to 1 675 MHz (Earth to space) and the conclusions of WRC-07, the present document specifies the necessary requirements to harmonise the use of these extended frequency bands by LMESs.

The present document treats the two parts of the L-band frequency allocation (as extended) as two sub-bands which may be used separately or in any combination. The original L-band allocation is referenced in the present document as "sub-band 1" and the extended L-band is referenced as "sub-band 2".

A new table 2c is added to the present document for LMESs that are capable of transmitting in any combination of either or both of these sub-bands. The new table 2c is recommended for all new LMESs including LMES that can only operate in sub-band 1.

The applicant may choose between tables 2b and 2c for new LMESs that are capable of transmitting in only the sub-band 1. The applicant has to declare which alternative is used.

**Figure 1: Void**

# 1 Scope

The present document applies to Land Mobile Earth Stations (LMESs) radio equipment with an EIRP less than or equal to 33 dBW and which have the following characteristics:

- the LMES could be either vehicle mounted or portable equipment;
- these LMESs are controlled and monitored by a Network Control Facility (NCF). The NCF is outside the scope of the present document;
- the LMES operate through geostationary satellites as part of a network providing voice and/or data communications;
- the LMES is capable of operating in any combination of all or any part of the frequency ranges sub-band 1 and sub-band 2 defined in table 1a.

**Table 1a: Land Mobile Satellite Service frequency bands**

Sub-Band	Direction of transmission	LMSS frequency bands
1	Transmit 1 (Earth to space)	1 626,5 MHz to 1 660,5 MHz
	Receive 1 (space to Earth)	1 525,0 MHz to 1 559,0 MHz
2	Transmit 2 (Earth to space)	1 668,0 MHz to 1 675,0 MHz
	Receive 2 (space to Earth)	1 518,0 MHz to 1 525,0 MHz

The present document is intended to cover the provisions of Directive 1999/5/EC [1] (R&TTE Directive) Article 3.2 which states that "... radio equipment shall be so constructed that it effectively uses the spectrum allocated to terrestrial/space radio communications and orbital resources so as to avoid harmful interference".

In addition to the present document, other ENs that specify technical requirements in respect of essential requirements under other parts of Article 3 of the R&TTE Directive [1] may apply to equipment within the scope of the present document.

NOTE: A list of such ENs is included on the web site <http://www.newapproach.org>.

## 2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

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

NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

### 2.1 Normative references

The following referenced documents are necessary for the application of the present document.

- [1] Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications equipment and the mutual recognition of their conformity (R&TTE Directive).
- [2] CISPR 16-1-4 (2010-04-27): "Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-4: Radio disturbance and immunity measuring apparatus- Antennas and test sites for radiated disturbance measurements".
- [3] Void.

- [4] ETSI TBR 044 (edition 1) (May 1998): "Satellite Earth Stations and Systems (SES); Land Mobile Earth Stations (LMES) operating in the 1,5 GHz and 1,6 GHz bands providing voice and/or data communications".
- [5] Void.
- [6] ETSI EN 301 444 (V1.1.1) (May 2000): "Satellite Earth Stations and Systems (SES); Harmonized EN for Land Mobile Earth Stations (LMES) operating in the 1,5 GHz and 1,6 GHz bands providing voice and/or data communications covering essential requirements under Article 3.2 of the R&TTE directive".

NOTE: This is a specific reference to the previous version of the present document.

## 2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations and of rules on Information Society services.
- [i.2] Directive 98/48/EC of the European Parliament and of the Council of 20 July 1998 amending Directive 98/34/EC laying down a procedure for the provision of information in the field of technical standards and regulations.

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## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in the R&TTE Directive [1] and the following apply:

**applicant:** manufacturer or his authorized representative within the European Community or the person responsible for placing the apparatus on the market

**antenna transmit gain:** ratio, expressed in decibels, of the power that would have to be supplied to an isotropic radiator to the power supplied to the antenna being considered, so that they produce the same field strength at the same distance in the same direction

**carrier-off state:** LMES is in this state when either it is authorized by the Network Control Facility (NCF) to transmit but when it does not transmit any signal, or when it is not authorized by the NCF to transmit.

**carrier-on state:** LMES is in this state when it is authorized by the NCF to transmit and when it transmits a signal.

**Control Channel (CC):** channel or channels by which LMES receive control information from the NCF for their network

**environmental profile:** range of environmental conditions under which equipment within the scope of the present document is required to comply with the provisions of the present document

**Externally Mounted Equipment (EME):** EME consists of those of the modules of the IE which are intended to be mounted externally to the vehicle as stated by the applicant.

**Installable Equipment (IE):** equipment which is intended to be fitted to a vehicle. An IE may consist of one or several interconnected modules

**Internally Mounted Equipment (IME):** those of the modules of the IE which are not declared by the applicant as EME are defined as Internally Mounted Equipment (IME)



**nominated bandwidth:** bandwidth of the LMES radio frequency transmission nominated by the applicant and that is wide enough to encompass all spectral elements of the transmission necessary for communication and which have a level greater than the specified unwanted emissions limits and is within the LMSS transmit frequency band within which the LMES operates

NOTE: The nominated bandwidth is wide enough to take account of the transmit carrier frequency stability.

**Portable Equipment (PE):** portable equipment is generally intended to be self-contained, free standing and portable

NOTE: A PE would normally consist of a single module, but may consist of several interconnected modules.

**unwanted emissions:** unwanted emissions are those falling outside the nominated bandwidth

**sub-band:** contiguous portion of the operating band

NOTE: Two sub-bands are defined (see table 1a).

## 3.2 Abbreviations

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

CC	Control Channel
CMF	Control and Monitoring Functions
EIRP	Equivalent Isotropically Radiated Power
EMC	ElectroMagnetic Compatibility
EME	Externally Mounted Equipment
ETS	European Telecommunication Standard
EUT	Equipment Under Test
IE	Installable Equipment
IME	Internally Mounted Equipment
LMES	Land Mobile Earth Station
MES	Mobile Earth Station
MSS	Mobile Satellite Service
NCF	Network Control Facility
PE	Portable Equipment
RA	Radio Astronomy
R&TTE	Radio and Telecommunications Terminal Equipment
RF	Radio Frequency
STE	Special Test Equipment
TBR	Technical Basis for Regulation

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## 4 Technical requirement specifications

### 4.1 Environmental profile

The technical requirements of the present document apply under the environmental profile for operation of the equipment, which shall be declared by the applicant. The equipment shall comply with all the technical requirements of the present document at all times when operating within the boundary limits of the declared operational environmental profile. The environmental profile for operation of the equipment shall include the ranges of humidity, temperature and supply voltage.

## 4.2 Conformance requirements

### 4.2.0 Maximum EIRP

#### 4.2.0.1 Justification

Not needed.

#### 4.2.0.2 Specification

The maximum eirp of the LMES shall not exceed 33 dBW.

#### 4.2.0.3 Conformance test

Declaration of maximum eirp by the applicant.

NOTE: No conformance test is defined for this requirement.

### 4.2.1 Unwanted emissions outside the band 1 625,8 MHz to 1 661,2 MHz and outside the band 1 667,3 MHz to 1 675,7 MHz

#### 4.2.1.1 Justification

The technical requirements presented in this clause shall apply to all LMESs that are capable of transmitting either in sub-band 1 or sub-band 2, or in both sub-bands as defined in table 1a for the purpose of:

- protection of terrestrial and satellite services from emissions caused by LMES outside the band 1 625,8 MHz to 1 661,2 MHz; and
- protection of terrestrial and satellite services from emissions caused by LMES outside the band 1 667,3 MHz to 1 675,7 MHz.

#### 4.2.1.2 Specification

Unwanted emissions from Land Mobile Earth Stations (LMESs) outside the band 1 625,8 MHz to 1 661,2 MHz and outside the band 1 667,3 MHz to 1 675,7 MHz shall be below the following limits.

Unless otherwise stated the specification in this clause shall apply to all types of LMESs notwithstanding their transmitting capabilities within the frequency bands as defined in table 1a.

- 1) The unwanted emissions over the frequency range 30 MHz to 1 000 MHz shall not exceed the limits in table 1.

**Table 1: Limits of unwanted emissions up to 1 000 MHz at a measuring distance of 10 m**

Frequency (MHz)	Quasi-peak limits (dB(µV/m))
30 to 230	30
230 to 1 000	37

The lower limit shall apply at the transition frequency.

- 2) For LMES that are capable of transmitting within only the sub-band 1 frequency band as defined in table 1a, the unwanted emissions Equivalent Isotropically Radiated Power (EIRP) above 1 000 MHz in the measurement bandwidth and in all directions shall not exceed limits of either tables 2b or 2c. The applicant shall declare which alternative shall be used.