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# ETSI EN 301 427 V1.2.1 (2001-11)

*Candidate Harmonized European Standard (Telecommunications series)*

**Satellite Earth Stations and Systems (SES);  
Harmonized EN for Low data rate  
Mobile satellite Earth Stations (MESS)  
except aeronautical mobile satellite earth stations,  
operating in the 11/12/14 GHz frequency bands  
covering essential requirements  
under article 3.2 of the R&TTE directive**

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satellite**ETSI**

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## Foreword

This Candidate Harmonized European Standard (Telecommunications series) 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 Council Directive 98/34/EC (as amended) laying down a procedure for the provision of information in the field of technical standards and regulations.

The present document is intended to become a Harmonized Standard, the reference of which will be published in the Official Journal of the European Communities referencing the Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity ("the R&TTE Directive") [1].

Technical specifications relevant to Directive 1999/5/EC [1] are given in annex A.

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**National transposition dates**

Date of adoption of this EN:	2 November 2001
Date of latest announcement of this EN (doa):	28 February 2002
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 August 2002
Date of withdrawal of any conflicting National Standard (dow):	31 August 2003



## Introduction

The present document is part of a set of standards designed to fit in a modular structure to cover all radio and telecommunications terminal equipment under the R&TTE Directive [1]. Each standard is a module in the structure. The modular structure is shown in figure 1.

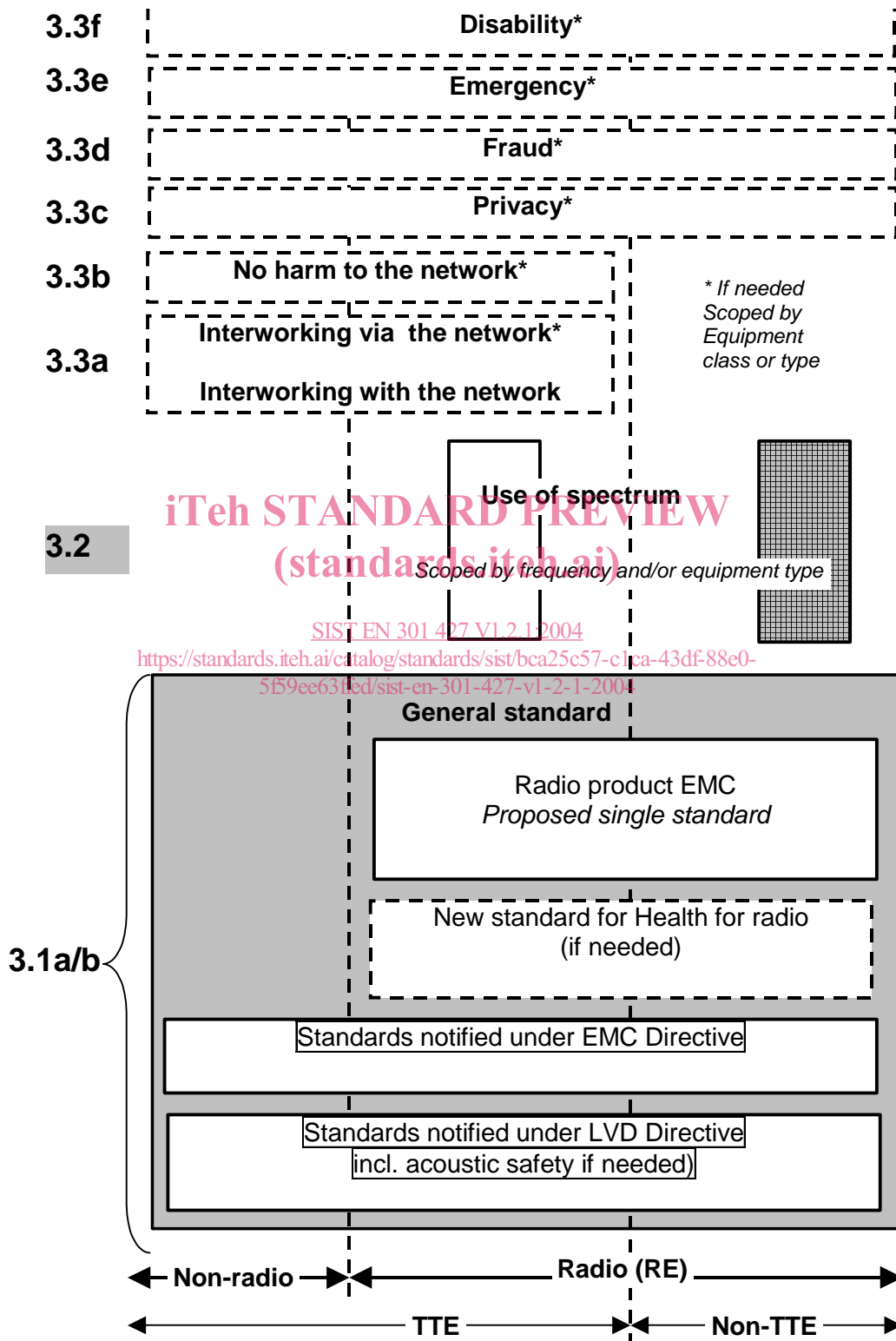


Figure 1: Modular structure for the various standards used under the R&TTE Directive

The left hand edge of the figure 1 shows the different clauses of article 3 of the R&TTE Directive [1].

For article 3.3 various horizontal boxes are shown. Dotted lines indicate that at the time of publication of the present document essential requirements in these areas have to be adopted by the Commission. If such essential requirements are adopted, and as far and as long as they are applicable, they will justify individual standards whose scope is likely to be specified by function or interface type.

The vertical boxes show the standards under article 3.2 for the use of the radio spectrum by radio equipment. The scopes of these standards are specified either by frequency (normally in the case where frequency bands are harmonized) or by radio equipment type.

For article 3.1b figure 1 shows the new single multi-part product EMC standard for radio, and the existing collection of generic and product standards currently used under the EMC Directive. The existing separate product EMC standards can be used until their dates of cessation of presumption of conformity published in the O.J.E.C. For article 3.1a figure 1 shows the existing safety standards currently used under the LV Directive and new standards covering human exposure to electromagnetic fields. New standards covering acoustic safety may also be required.

The bottom of the figure shows the relationship of the standards to radio equipment and telecommunications terminal equipment. A particular equipment may be radio equipment, telecommunications terminal equipment or both. A radio spectrum standard will apply if it is radio equipment. An article 3.3 standard will apply as well only if the relevant essential requirement under the R&TTE Directive [1] is adopted by the Commission and if the equipment in question is covered by the scope of the corresponding standard. Thus, depending on the nature of the equipment, the essential requirements under the R&TTE Directive [1] may be covered in a set of standards.

The modularity principle has been taken because:

- it minimizes the number of standards needed. Because equipment may, in fact, have multiple interfaces and functions it is not practicable to produce a single standard for each possible combination of functions that may occur in an equipment;
- it provides scope for standards to be added:
  - under article 3.2 when new frequency bands are agreed; or
  - under article 3.3 should the Commission take the necessary decisions;
 without requiring alteration of standards that are already published;
- it clarifies, simplifies and promotes the usage of Harmonized Standards as the relevant means of conformity assessment.

The present document is based on TBR 027 (see Bibliography).

The requirements 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 MES.

The determination of the parameters of the user earth stations using a given geostationary 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.

# 1 Scope

The present document applies to Mobile Earth Stations (MESs), except aeronautical mobile earth stations, which have the following characteristics:

- The MES are operating in one or more frequency ranges of the Fixed Satellite Service (FSS):
  - 10,70 GHz to 11,70 GHz (space to earth);
  - 12,50 GHz to 12,75 GHz (space to earth);
  - 14,00 GHz to 14,25 GHz (earth to space).

Because the transmissions from the MES to the Satellite in the 14,00 GHz to 14,25 GHz band fall under a secondary allocation, the transmissions should not cause harmful interference to primary services (e.g. the Fixed Satellite Service (FSS)) and at the same time cannot claim protection from harmful interference from those services.

- The MES may be either:
  - a Land Mobile Earth Station (LMES) radio equipment; and/or
  - a Maritime Mobile Earth Station (MMES) radio equipment not providing those distress and safety functions required by the International Maritime Organization (IMO).
- These LMESs could be either vehicle mounted or portable equipment.
- These MMESs are installable equipment on ships.
- The MES could consist of a number of modules including a keyboard interface to the user.
- The MES use linear polarization.
- The MES operate through a geostationary satellite at least 3° away from any other geostationary satellite operating in the same frequency band and covering the same area.
- The antenna of the MES may be omnidirectional or directional with a means of tracking the satellite.
- The MES are operating as part of a satellite network used for the distribution and/or exchange of information between users.
- The MES are controlled and monitored by a Network Control Facility (NCF). The NCF is outside the scope of the present document.

The present document applies to the MES with its ancillary equipment and its various terrestrial ports, and when operated within the boundary limits of the operational environmental profile declared by the manufacturer.

The present document is intended to cover the provisions of Directive 1999/5/EC (R&TTE Directive) [1] 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 ETSI web site.

## 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.

- [1] Directive 1999/5/EC: "of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity".
- [2] CISPR 16-1: "Specification for radio disturbance and immunity measuring apparatus and methods; Part 1: Radio disturbance and immunity measuring apparatus".

## 3 Definitions and abbreviations

### 3.1 Definitions

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

**carrier-off state:** MES 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:** MES 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 MES receive control information from the NCF of 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 Installable Equipment (IE) which are intended to be mounted externally to the vehicle as stated by the manufacturer

**Installable Equipment (IE):** equipment which is intended to be fitted to a vehicle

NOTE: 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 manufacturer as EME are defined as IME

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

**nominated bandwidth:** the bandwidth of the MES radio frequency transmission is nominated by the manufacturer. The nominated bandwidth is wide enough to encompass all spectral elements of the transmission which have a level greater than the specified unwanted emissions limits. The nominated bandwidth is wide enough to take account of the transmit carrier frequency stability. The nominated bandwidth is within the transmit frequency band within which the MES operates

**Portable Equipment (PE):** is generally intended to be self-contained, free standing and portable. Normally, a PE would consist of a single module, but may consist of several interconnected modules

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

## 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
EME	Externally Mounted Equipment
EUT	Equipment Under Test
IE	Installable Equipment
IME	Internally Mounted Equipment
LMES	Land Mobile Earth Station
MES	Mobile Earth Station
MMES	Maritime Mobile Earth Station
NCF	Network Control Facility
PE	Portable Equipment
RF	Radio Frequency
rms	root mean square
R&TTE	Radio and Telecommunications Terminal Equipment
STE	Special Test Equipment

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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 manufacturer. 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

#### 4.2.1 Unwanted emissions outside the band

##### 4.2.1.1 Justification

Protection of terrestrial and satellite services from emissions caused by MES outside the band 14,00 GHz to 14,25 GHz.

##### 4.2.1.2 Specification

The unwanted emissions in the measurement bandwidth and in all directions from the MES outside the band 14,00 GHz to 14,25 GHz, within which the MES is designed to operate, shall be below the following limits:

- 1) The unwanted emissions over the frequency range 30 MHz to 1 000 MHz shall not exceed the limits in table 1a for LMESs and table 1b for MMESs.

**Table 1a: Limits of LMESs unwanted emissions up to 1 000 MHz at a measuring distance of 10 m in a 120 kHz bandwidth**

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