



SLOVENSKI STANDARD
SIST ETS 300 721 E1:2005
01-februar-2005

Satelitske zemeljske postaje in sistemi (SES) - Mobilne zemeljske postaje (MES), ki zagotavljajo podatkovne komunikacije z nizkimi bitnimi hitrostmi (LBRDC), uporabljajo satelite na nizki zemeljski orbiti (LEO) in obratujejo pod 1 GHz

Satellite Earth Stations and Systems (SES); Mobile Earth Stations (MES) providing Low Bit Rate Data Communications (LBRDC) using LEO satellites operating below 1 GHz

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MES providing Low Bit Rate Data Communications (LBRDC)
using LEO satellites operating below 1 GHz

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Satellite Earth Stations and Systems (SES) Technical Committee of the European Telecommunications Standards Institute (ETSI).

Transposition dates	
Date of adoption:	20 June 1997
Date of latest announcement of this ETS (doa):	30 September 1997
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	31 March 1998
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1 Scope

This European Telecommunication Standard (ETS) provides specifications for the standardization of the characteristics of Mobile Earth Stations (MESs) with both transmit and receive capabilities in order to limit interference to radiocommunications services.

The Low Earth Orbiting (LEO) satellite networks referred to in this ETS operate under the Mobile Satellite Service (MSS). The MESs operate as part of a LEO satellite network providing Low Bit Rate Data Communications (LBRDC).

The frequency bands under which the MESs operate should be within the following bands:

MES Transmit frequencies and Service allocations		MES Receive frequencies and Service allocations	
148 MHz to 149,9 MHz	Mobile-Satellite Service	137 MHz to 137,025 MHz	Mobile-Satellite Service
149,9 MHz to 150,05 MHz	Land Mobile-Satellite Service	137,025 MHz to 137,175 MHz	Mobile-Satellite Service
235 MHz to 322 MHz	Mobile-Satellite Service	137,175 MHz to 137,825 MHz	Mobile-Satellite Service
335,4 MHz to 399,9 MHz	Mobile-Satellite Service	137,825 MHz to 138 MHz	Mobile-Satellite Service
399,9 MHz to 400,05 MHz	Land Mobile-Satellite Service	235 MHz to 322 MHz	Mobile-Satellite Service
		335,4 MHz to 399,9 MHz	Mobile-Satellite Service
		400,15 MHz to 401 MHz	Mobile-Satellite Service

Some LEO satellite networks provide Low Bit Rate Data Communications (LBRDC) using short burst, low duty cycle MES transmissions in order to reduce interference with existing users. The interference levels can also be decreased by modulation techniques; Direct Sequence - Spread Spectrum Multiple Access (DS-SSMA) or Frequency Division Multiple Access (FDMA) using Dynamic Channel Activity Assignment (DCAA) as described in ITU-R Recommendations M 1039 and M 1087.

These MESs generally have the following characteristics:

- the MESs could be either a Based MES (BMES), a Vehicle mounted MES (VMES) or a Portable MES (PMES);
- the MES could consist of a number of modules including suitable interfaces to the user.

The main specifications are contained in two categories related to:

- **unwanted emissions limitation:** to protect terrestrial and space radiocommunications services, and the radio astronomy services from harmful interference;
- **MES control and monitoring functions:** to specify a minimum set of Control and Monitoring Functions (CMFs) to be implemented on each MES in order to minimize the probability that they originate unwanted transmissions that may give rise to harmful interference to other systems.

2 Normative references

This ETS incorporates, by dated or undated references, 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 ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] ITU Radio Regulations.

- [2] ETS 300 722: "Satellite Earth Stations and Systems (SES); Network Control Facilities for MES providing Low Bit Rate Data Communications (LBRDC) using LEO satellites operating below 1 GHz".
- [3] CISPR Publication No 16 (1993): "Specification for radio disturbance and immunity measuring apparatus and methods".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this ETS, the following definitions apply:

BMES: A MES intended to be installed in a fixed location, and which is powered either by dc or ac mains.

carrier-off state: A MES is in this state when it is not transmitting a signal, i.e. not in the carrier-on state.

carrier-on state: A MES is in this state when it is transmitting a signal in a continuous or non-continuous mode.

control channel: A Control Channel may be either a command to a particular MES or a signal from the satellite containing control information to appropriately enable or disable transmissions from a MES.

Internally Mounted Equipment (IME) and Externally Mounted Equipment (EME): The EMEs are the modules to be externally mounted as stated by the manufacturer or indicated in the user documentation, the IMEs are the remaining modules intended to be internally mounted. Where different specifications apply to IME and EME, this is noted in the relevant text.

nominated bandwidth: The bandwidth of the MES radio frequency transmission is nominated by the terminal 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 MSS transmit frequency band within which the MES operates.

PMES: A MES intended to be portable, and which is powered by a stand alone battery, and generally intended to be self-contained and free standing. A PMES would normally consist of a single module, but may consist of several interconnected modules. In some cases different specifications apply to PMES and this is noted in the relevant text.

unwanted emissions: Unwanted emissions are those falling outside the nominated bandwidth.

VMES: A MES intended to be installed on a vehicle. A VMES may consist of one or several interconnected modules as follows:

NOTE: For FDMA / DCAA systems the Nominated Bandwidth does not exceed 25 kHz.

3.2 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

BMES	Based MES
CMF	Control and Monitoring Function
DCAA	Dynamic Channel Activity Assignment
DS-SSMA	Direct Sequence Spread Spectrum Multiple Access
EIRP	Equivalent Isotropically Radiated Power
EME	Externally Mounted Equipment
EUT	Equipment Under Test
FDMA	Frequency Division Multiple Access
IME	Internally Mounted Equipment
MES	Mobile Earth Station
MSS	Mobile Satellite Service
NCF	Network Control Facilities

PMES	Portable MES
RF	Radio Frequency
rms	root mean square
STE	Special Test Equipment
VMES	Vehicle mounted MES

4 Test Report

The test report shall contain:

- the value of the nominated bandwidth, declared by the manufacturer;
- the antenna gain pattern;
- the results of the tests;
- all parameters and operational conditions.

5 Radio Frequency (RF)

Whenever a change of limit between adjacent frequency bands occurs in this subclause, the lower of the two limits shall apply at the transition frequency.

5.1 Unwanted emission outside the bands 148 to 150,05 MHz, 235 to 322 MHz, 335,4 to 399,9 MHz and 399,9 to 400,05 MHz

Purpose:

Protection of other terrestrial services, space radiocommunications services and the radio astronomy services from emissions caused by MESs outside the bands 148 to 150,05 MHz, 235 to 322 MHz, 335,4 to 399,9 MHz and 399,9 to 400,05 MHz.

Specification:

With carrier off the MES unwanted emission shall not exceed 33 dBpW in any 100 kHz.

The unwanted emissions from the MES outside the uplink bands 148 - 150,05 MHz, 235 to 322 MHz, 335,4 to 399,9 MHz and 399,9 to 400,05 MHz, within which the MES is designed to operate, shall not exceed the limits shown in the following tables.

Table 1: Unwanted emissions outside the operational band 148 to 150,05 MHz

Frequency (MHz)	Maximum EIRP density (dBpW)		Measurement bandwidth
	DS-SSMA	FDMA	
0,1 to 146	54	54	100 kHz
146 to 147,5	70	54	100 kHz
147,5 to 148	70 - 105 (note)	54	100 kHz
150,05 to 151,15	70	54	100 kHz
151,15 to 1 000	54	54	100 kHz
1 000 to 12 750	60	60	1 MHz

NOTE: Linearly interpolated in dBpW vs. frequency