TECHNICAL BASIS for REGULATION

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Satellite Earth Stations and Systems (SES); Low data rate Land Mobile satellite Earth Stations (LMES) operating in the 1,5/1,6 GHz frequency bands

ETSI

European Telecommunications Standards Institute

ETSI Secretariat

Postal address: F-06921 Sophia Antipolis CEDEX - FRANCE
Office address: 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE
X.400: c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

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

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Foreword

This draft Technical Basis for Regulation (TBR) has been produced by the Satellite Earth Stations and Systems (SES) Technical Committee of the European Telecommunications Standards Institute (ETSI), and is now submitted for Public Enquiry.

Introduction

The Council Directive in respect of satellite earth station equipment (93/97/EEC) [1] which supplements the Council Directive on the approximation of the laws of the Member States concerning telecommunications terminal equipment, including the mutual recognition of their conformity (91/263/EEC) [2] concerns the harmonisation of conditions for the placing on the market of such equipment.

Two classes of standards are applicable to satellite earth station equipment. European Telecommunication Standards (ETSs) give the full technical specifications for this equipment, whereas Technical Bases for Regulation (TBRs) give the essential requirements under the Satellite Earth Station Directive (93/97/EEC) [1] and the Telecommunications Terminal Equipment Directive (91/263/EEC) [2] for placing such equipment on the market. Receive-only equipment not intended for terrestrial connection to the public telecommunications network may be put into use. Nothing in this TBR is construed to prevent the use of Community internal production control procedures as set out in the Annexes to the two Directives for such receive-only equipment. This TBR is based on ETS 300 254 (see annex B, Bibliography).

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1 Scope

This TBR specifies those technical requirements under articles 4.1 to 4.5 of Council Directive 93/97/EEC [1] that apply to satellite earth station equipment that is capable of operation in one or more of the following frequency ranges:

- 1 525,0 to 1 544,0 MHz and 1 555,0 to 1 559,0 MHz (Space - to - Earth);
- 1 626,5 to 1 645,5 MHz and 1 656,5 to 1 660,5 MHz (Earth - to - Space);

of the Mobile Satellite Service (MSS).

These requirements are taken from ETS 300 254 (see annex B, Bibliography).

This TBR does not contain the essential requirements under article 4.6 for interworking via the public telecommunications network in justified cases, and does not provide any guarantee of correct interworking between satellite earth station equipment.

This TBR specifies the requirements for satellite earth station equipment that:

- is capable of being used either for transmission only, or for transmission and reception (transmit-receive), or for reception only (receive-only), of radio-communications signals in any of the bands specified above;

- is not purpose built satellite earth station equipment intended for use as part of the public telecommunications network.

This TBR applies to all satellite equipment as described above, irrespective of whether the satellite earth station equipment provides additional interfaces, telecommunications services or functions. However additional TBRs may also apply.

2 Normative references

This TBR incorporates by dated or undated reference, provisions from other publications. These 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 into it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] Council Directive 93/97/EEC (1993) supplementing Directive 91/263/EEC in respect of satellite earth station equipment.

[2] Council Directive 91/263/EEC (1991) on the approximation of the laws of Member States concerning telecommunications terminal equipment, including the mutual recognition of their conformity.

[3] prETS 300 339 (1996): "Radio Equipment and Systems (RES); General ElectroMagnetic Compatibility (EMC) standard for Radio-communications equipment".

[4] Council Directive 89/336/EEC (1989) on the approximation of the laws of Member States relating to electromagnetic compatibility.

NOTE: This TBR also contains a number of informative references which have been included to indicate the sources from which various material has been derived, hence they do not have an associated normative reference number. Details of these publications are given in annex B (Bibliography).

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this TBR the following definitions apply:

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

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

manufacturer: The legal entity responsible under the terms of the Council Directive 93/97/EEC [1] for placing the product on the market in a Member State.

nominated bandwidth: The bandwidth of the LMES radio frequency transmission is nominated by the manufacturer. The nominated bandwidth is wide enough to encompass all close-in 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 LMSS transmit frequency band within which the LMES operates.

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

3.2 Abbreviations

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
LMSS	Land Mobile Satellite Service
NCF	Network Control Facility
PE	Portable Equipment
STE	Special Test Equipment
TBR	Technical Basis for Regulation

4 Requirements

4.1 Unwanted emissions outside the bands

4.1.1 Justification

Protection of terrestrial and satellite services from emissions caused by LMESs outside the bands 1 626,5 to 1 645,5 MHz and 1 656,5 to 1 660,5 MHz.

4.1.2 Specification

The unwanted emissions in the measurement bandwidth and in all directions from the LMES outside the bands 1 626,5 to 1 645,5 MHz and 1 656,5 to 1 660,5 MHz, within which the LMES is designed to operate, shall be below the following limits.

1) The unwanted emissions over the frequency range 30 MHz to 960 MHz shall not exceed the limits in table 1.

Table 1: Limits of unwanted emissions below 960 MHz at a measuring distance of 10 m

Frequency (MHz)	Quasi-peak limits (dBµV/m)
30 to 230	30
230 to 960	37

The lower limit shall apply at the transition frequency.

2) The unwanted emissions EIRP above 960 MHz, in the measurement bandwidth and in all directions shall not exceed the limits given in table 2.

Table 2: Limits of unwanted emissions above 960 MHz and outside the bands 1 626,5 to 1 645,5 MHz and 1 656,6 to 1 660,5 MHz

Frequency range (MHz)	Carrier-on		Carrier-off	
	EIRP limit (dBpW)	Measurement bandwidth (kHz)	EIRP limit (dBpW)	Measurement bandwidth (kHz)
960 - 1 525	49	100	48	100
1 525 - 1 559	49	100	17	3
1 559 - 1 600	49	100	48	100
1 600 - 1 623,5	74	100	48	100
1 623,5 - 1 626	74	100	48	100
1 626 - 1 626,5	84	3	48	100
1 645,5 - 1 645,6	104	3	57	3
1 645,6 - 1 646,1	84	3	57	3
1 646,1 - 1 655,9	74	3	57	3
1 655,9 - 1 656,4	84	3	57	3
1 656,4 - 1 656,5	104	3	57	3
1 660,5 - 1 661	84	3	48	100
1 661 - 1 663,5	74	100	48	100
1 663,5 - 1 690	74	100	48	100
1 690 - 3 400	49 (note 2)	100	48	100
3 400 - 10 700	55 (note 3)	100	48	100
10 700 - 21 200	61	100	54	100
21 200 - 40 000	67	100	60	100

NOTE 1: The lower limits shall apply at the transition frequencies.
NOTE 2: In the band 3 253,0 to 3 321,0 MHz the maximum EIRP in one, and only one, 100 kHz measurement bandwidth shall not exceed 82 dBpW. Elsewhere in this band the power limit in this table shall be applied.
NOTE 3: In each of the bands 4 879,5 to 4 981,5 MHz, 6 506,0 to 6 642,0 MHz and 8 132,5 to 8 302,5 MHz the maximum EIRP in one, and only one, 100 kHz measurement bandwidth shall not exceed 72 dBpW. In the band 9 759,0 to 9 963,0 MHz the maximum power in one, and only one, 100 kHz measurement bandwidth shall not exceed 61 dBpW. Elsewhere in these bands the power limit in this table shall be applied.

4.1.3 Conformance tests

Conformance tests shall be carried out in accordance with subclause 5.1.

4.2 Maximum unwanted emission within the bands

4.2.1 Justification

Protection of satellite and terrestrial services operating in the 1 626,5 to 1 645,5 MHz and 1 656,5 to 1 660,5 MHz frequency bands.

4.2.2 Specification

When the LMES is in the carrier-on state, the EIRP spectral density of the unwanted emissions shall not exceed the limits in table 3.

Table 3: Limits of unwanted emission within the operating band with carrier-on

Offset from the edge of the band of the nominated bandwidth (kHz)	Maximum EIRP (dBpW)
0	117
100	104
200	84
greater than 700	74

When the LMES is in the carrier-off state, the EIRP spectral density of the unwanted emissions within the bands 1 626,5 to 1 645,5 and 1 656,5 to 1 660,5 MHz shall not exceed 57 dBpW in any 3 kHz band.

4.2.3 Conformance tests

Conformance tests shall be carried out in accordance with subclause 5.1.

4.3 ElectroMagnetic Compatibility (EMC)

There are no specific EMC requirements under this TBR however ETS 300 339 [3] contains general EMC specifications. Once this ETS becomes a harmonised EMC standard, and until a product specific harmonised EMC standard is published, compliance to the general harmonised EMC standard will give presumption of compliance with the EMC Directive, Council Directive 83/336/EEC [4]. Upon publication of the product specific harmonised EMC standard compliance with that standard will give presumption of compliance with the EMC Directive, Council Directive 83/336/EEC [4].

4.4 LMES Control and Monitoring Functions (CMF)

The following minimum set of control and monitoring functions shall be implemented in LMESs in order to minimise the probability that they originate unwanted transmissions that may give rise to harmful interference to other systems.

Under any fault condition when the LMES transmissions are being suppressed the EIRP density shall not exceed 57 dBpW in any 3 kHz band.

4.4.1 Processor monitoring

4.4.1.1 Justification

To ensure that the LMES can suppress transmissions in the event of a processor sub-system failure.

4.4.1.2 Specification

An LMES shall incorporate a processor monitoring function for each of its processors involved in the manipulation of traffic and in Control and Monitoring Functions (CMF).

The processor monitoring function shall detect any failure of the processor hardware and software.

No later than one second after any fault condition occurs, the transmissions shall be suppressed until the processor monitoring function has determined that the fault condition has been cleared.

4.4.1.3 Conformance tests

Conformance tests shall be carried out in accordance with subclause 5.2.

4.4.2 Transmit subsystem monitoring

4.4.2.1 Justification

To verify the correct operation of the transmit frequency generation sub-system and to inhibit transmissions should the sub-system fail.

4.4.2.2 Specification

An LMES shall monitor the operation of its transmit frequency generation sub-system.

The failure of the transmit frequency generation sub-system for a period longer than 5 seconds shall result in transmissions being suppressed until the fault condition has been cleared.

4.4.2.3 Conformance tests

Conformance tests shall be carried out in accordance with subclause 5.2.

4.4.3 Power-on/Reset

4.4.3.1 Justification

To demonstrate that the LMES shall achieves a controlled non-transmitting state following the powering of the unit, or the occurrence of a reset made by a local operator when this function is implemented.

4.4.3.2 Specification

Following "power-on" the LMES shall enter a controlled, non-transmitting state.

4.4.3.3 Conformance tests

Conformance tests shall be carried out in accordance with subclause 5.2.

4.4.4 Network control authorisation

4.4.4.1 Justification

To ensure that the LMES cannot transmit unless it receives an appropriate enable signal from the NCF.

4.4.4.2 Specification

a) Without reception of an appropriate enable signal to the LMES via an authorised control channel it shall not be possible to initiate message transmission.

b) Transmissions shall not continue for longer than 30 seconds unless further enable signals are received. For half-duplex transmission systems in operation before 1 January 1994 this period of time shall be 15 minutes.

4.4.4.3 Conformance tests

Conformance tests shall be carried out in accordance with subclause 5.2.

4.4.5 Network control reception

4.4.5.1 Justification

These requirements ensure that the LMES is capable of:

a) receiving and implementing commands from the NCF through its correct reception of the appropriate control channel(s);

b) retaining a unique identification in the network and transmitting it upon reception of an appropriate request.

4.4.5.2 Specification

The LMES shall hold, in non-volatile memory, the unique identification code of the terminal itself.

The LMES shall be enabled or disabled through control channels.

A failure to receive an appropriate control channel (either a command or a signal) for a period longer than 30 seconds shall result in message transmission being inhibited. For half-duplex systems in operation before 1 January 1994, this period of time shall be 15 minutes.

The LMES shall be capable of receiving and acting upon the control messages that are addressed to it which contain transmitter enabling and disabling information. The LMES shall be capable of transmitting its identification code upon reception of an appropriate control message addressed to the LMES.

4.4.5.3 Conformance test

Conformance tests shall be carried out in accordance with subclause 5.2.

4.5 Initial burst rate transmission

4.5.1 Justification

To limit disturbance to other services.

4.5.2 Specification

For systems which do not inhibit initial burst transmission from the LMES after reset or power-on:

a) the transmission of the initial burst shall not exceed 1 % of the time;

b) each burst shall not last more than one second.

4.5.3 Conformance tests

Conformance tests shall be carried out in accordance with subclause 5.3.

5 Test Methods

The values of measurement uncertainty associated with each measurement parameter apply to all of the test cases described in this TBR. The measurement uncertainties shall not exceed the values shown in table 4.

Table 4: Measurement uncertainty

Measurement parameter	Uncertainty
RF frequency	± 10 kHz
RF power	± 0,75 dB
Conducted spurious	± 4 dB
Radiated spurious	± 4 dB
Antenna gain	± 2 dB

To enable the performance tests to be carried out the use of Special Test Equipment (STE), made available by the manufacturer may be necessary. Since this test equipment will be specific to the particular system, it is not possible to provide detailed specifications in this TBR. However, the following baseline is provided:

- if the LMES requires to receive a modulated carrier from the satellite in order to transmit, then special test arrangements are required to simulate the satellite signal, thus enabling the LMES to transmit allowing measurement of transmission parameters;

- any characteristic of these special test arrangements which may have direct or indirect effects on the parameters to be measured shall be clearly stated by the manufacturer.

All tests in the carrier-on state shall be undertaken with the transmitter operating at the maximum power setting and with the maximum transmit burst rate where applicable.

All technical characteristics and operational conditions declared by the manufacturer shall be entered in the test report.

5.1 Measurement of unwanted emissions

5.1.1 General

For purpose of the test, the EUT comprises:

a) for IE:

- the EME;
- the IME;
- interconnecting cables between IME and EME units as supplied by the manufacturer;
- the necessary power supply cables and any other cable ensuring a proper functioning of the terminal.

b) for PE:

- for a single module PE, the module itself with any deployable parts in their normal operating configuration;

- for a multiple module PE, all such modules with all necessary interconnecting cables of lengths as normally supplied by the manufacturer; again any deployable parts should be in their normal operating configuration.

For measurements below 960 MHz the distance between the EUT and the measuring antenna shall be 10 m. For measurements above 960 MHz the distance between the EUT or the substitution antenna and the measuring antenna shall be such that the radiating near-field of each antenna shall not overlap with that of the other. The larger radiating near-field of the EUT and substitution antenna shall be used to determine the minimum distance between the EUT and measuring antenna in the first instance.

The upper and lower extremes of the tuning range shall be stated by the manufacturer.

5.1.2 Test site

The test shall be performed either in an open area test site, a semi-anechoic chamber or an anechoic chamber. Ambient noise levels shall be at least 6 dB below the applicable unwanted emissions limit.

The test site shall be flat, free of overhead wires and nearby reflecting structures, sufficiently large to permit aerial placement at the specified measuring distance and provide adequate separation between aerial, test unit and reflecting structures.

A metal ground plane shall be inserted on the natural ground plane and it shall extend at least 1 m beyond the perimeter of the EUT at one end and at least 1 m beyond the measurement antenna at the other end.

5.1.3 Test method

For IE, the EUT shall be installed with a separation of about 0,5 m between the IME and the EME, the maximum length connection cable specified by the manufacturer shall be installed. The height of the cable shall be between 0,5 and 1 m. The cable shall be maintained in that position by non-metallic means. The EME shall be set, in its normal operating configuration on a non-metallic table at a height between 0,5 and 1 m. The IME shall be set on a non-metallic table at a height of 0,8 m for tests below 960 MHz and between 0,5 and 1 m for tests above 960 MHz. Any associated equipment, e.g. portable computer or data terminal if required for operation of the LMES, shall be placed next to, and at the same height as, the IME.

For PE, the equipment shall be arranged in its normal operating configuration as recommended by the manufacturer on a non-metallic table at a height between 0,5 and 1 m.

The EUT shall be terminated with matched impedances at the terrestrial ports if there is no associated equipment connected to such port.

For frequencies between 80 MHz and 960 MHz the measuring antenna shall be a balanced dipole which shall be resonant in length. For frequencies below 80 MHz it shall have a length equal to the 80 MHz resonant length and shall be tuned and matched to the feeder by a suitable transforming device. For frequencies above 960 MHz the antenna shall be a horn radiator of known gain/frequency characteristics. When used for reception the antenna and any associated amplification system shall have an amplitude/frequency response within ± 2 dB of the combined calibration curves across the measurement frequency range considered for the antenna. The antenna is mounted on a support capable of allowing the antenna to be used in either horizontal or vertical polarisation and at the specified height.

For tests below 960 MHz the receive test equipment shall be a measuring receiver. For tests above 960 MHz the receive test equipment shall be a spectrum analyser.

5.1.3.1 Receive test equipment

5.1.3.1.1 Measuring receiver

Measuring receivers shall conform to the following characteristics:

- the response to a constant amplitude sine wave signal shall remain within ± 1 dB across the frequency range of interest;

- quasi-peak detection shall be used in a - 6 dB bandwidth of 120 kHz;

- the receiver shall be operated at more than 1 dB below the compression point during tests/measurements.

5.1.3.1.2 Spectrum analyser

The spectrum analyser resolution bandwidth shall be set to the specified measuring bandwidth or as close as possible. If the resolution bandwidth is different from the specified measuring bandwidth, bandwidth correction shall be performed for noise-like wideband signals. The measuring system shall be capable of detecting signals at least 6 dB below the applicable unwanted emissions limit.

5.1.4 Procedure

5.1.4.1 Test arrangements

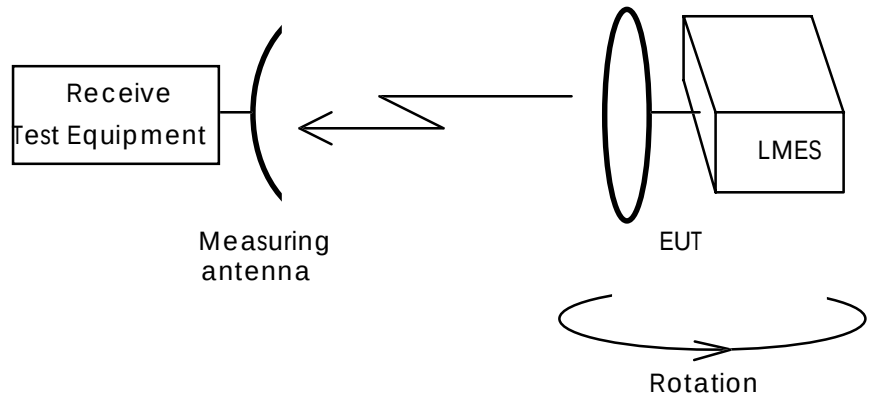

Figure 1: Test arrangement - Unwanted emissions measurement, first axis

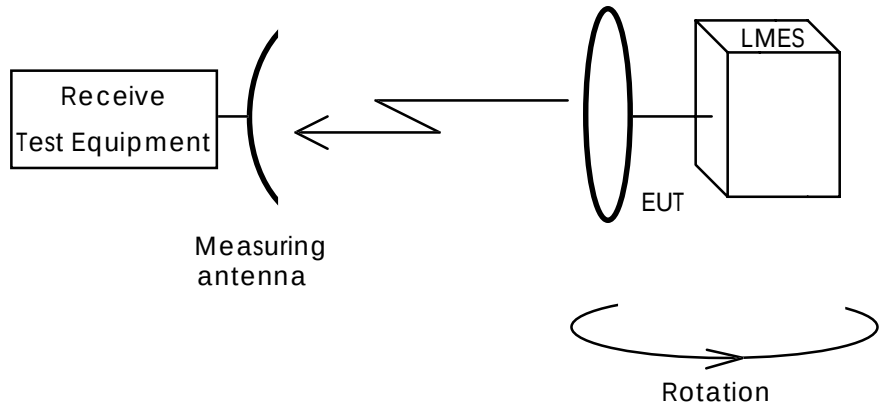

Figure 2: Test arrangement - Unwanted emissions measurement, second axis

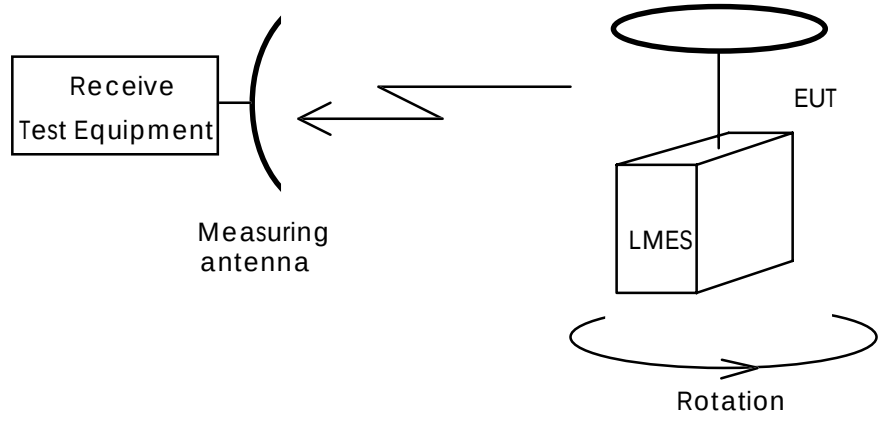

Figure 3: Test arrangement - Unwanted emissions measurement, third axis

5.1.4.2 Below 960 MHz

a) The test arrangement shall be as shown in figure 1 with the measuring receiver installed. EUTs with adjustable antennas shall have the antenna boresight axis in the plane of rotation. The measuring antenna boresight axis shall coincide with the plane of rotation of the boresite of the EUT.

b) The EUT shall be in the carrier-on state with the carrier at the lowest possible centre frequency.

c) The EUT shall be rotated through 360 degrees whilst unwanted emissions are measured in frequency and amplitude, over the frequency range 30 MHz to 960 MHz. The frequency and amplitude of each signal shall be noted.

d) The measurements shall be repeated with the measuring antenna in the opposite polarisation and the signal levels similarly noted.

e) The tests in c) and d) above shall be repeated with the EUT carrier at the highest possible centre frequency.

f) The tests in c) and d) above shall be repeated with the carrier-off.

g) The tests in b) to f) above shall be repeated with the EUT turned so that its axis of rotation is orthogonal to that of the first case, as shown in figure 2. The EUT antenna boresight axis shall remain in the plane of rotation.

h) The tests in b) to f) above shall be repeated with the EUT turned so that its axis of rotation is mutually orthogonal to those of the first two cases, as shown in figure 3. The EUT antenna boresight axis shall be perpendicular to the plane of rotation.

5.1.4.3 Above 960 MHz

a) The test arrangement shall be as shown in figure 1 with the spectrum analyser installed. EUTs with adjustable antennas shall have the antenna boresight axis in the plane of rotation. The measuring antenna boresight axis shall coincide with the plane of rotation of the boresite of the EUT.

b) The EUT shall be in the carrier-on state with the carrier at the lowest possible centre frequency.

c) The EUT shall be rotated through 360 degrees whilst unwanted emissions are measured in frequency and amplitude, over the frequency range 960 MHz to 40 GHz. The frequency and amplitude of each signal shall be noted.

d) The measurements shall be repeated with the measuring antenna in the opposite polarisation and the signal levels similarly noted.

e) The tests in c) and d) above shall be repeated with the EUT carrier at the highest possible centre frequency.

f) The tests in c) and d) above shall be repeated with the carrier-off.

g) The tests in b) to f) above shall be repeated with the EUT turned so that its axis of rotation is orthogonal to that of the first case, as shown in figure 2. The EUT antenna boresight axis shall remain in the plane of rotation.

h) The tests in b) to f) above shall be repeated with the EUT turned so that its axis of rotation is mutually orthogonal to those of the first two cases, as shown in figure 3. The EUT antenna boresight axis shall be perpendicular to the plane of rotation.

5.2 LMES Control and Monitoring Functions (CMF)

If the EUT is an LMES that has been modified by the manufacturer for these tests then full documentation of such modification(s) shall be provided to prove that the modification(s) will simulate the required test condition.

For the purpose of this test the EUT is defined as the IME and that part of the EME up to the antenna flange.

The measurement of the EIRP spectral density shall be limited within either the nominated bandwidth or to a 10 MHz bandwidth centred on the carrier frequency whichever is the greater.

5.2.1 Test arrangement

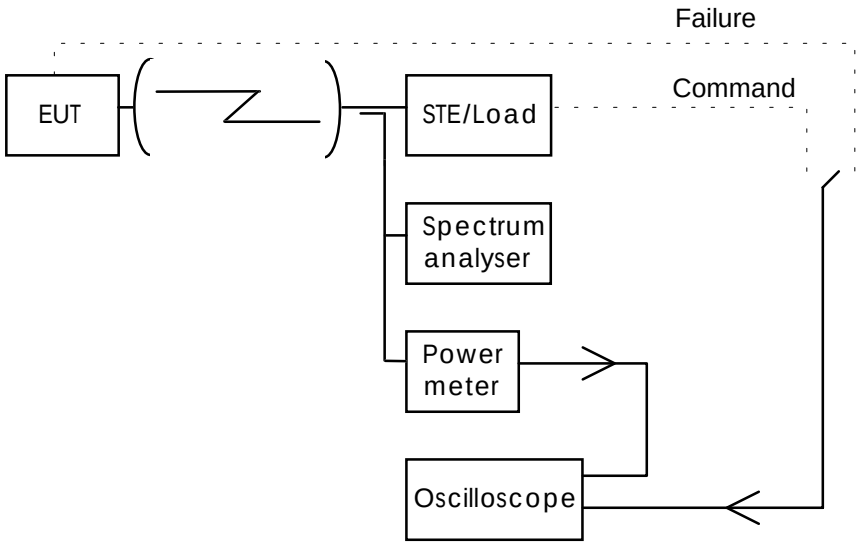

Figure 4: General test arrangement for control and monitoring tests for radiated measurements

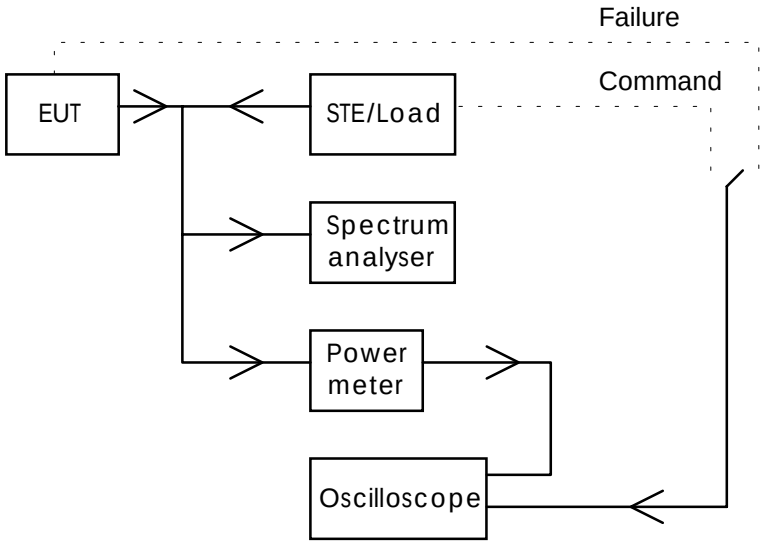

Figure 5: General test arrangement for control and monitoring tests for conducted measurements

The test arrangement shall be as shown in figure 4 or 5. The EUT shall be authorised to transmit and shall be in the carrier-on state at the commencement of each test, unless otherwise stated. The oscilloscope shall monitor by measuring the time difference between the command, or failure, and the occurrence of the expected event (e.g. the transmission suppression). The spectrum analyser and the power meter shall monitor the EUT output level.

5.2.2 Processor monitoring

5.2.2.1 Test method

a) Each of the processors within the EUT shall, in turn, be caused to fail.

b) Within 1 second of such failure the EUT shall cease to transmit as measured by the oscilloscope.

c) The power meter and spectrum analyser shall be observed to ascertain that the transmissions have been suppressed.

d) The failed processor shall be restored to normal working condition and the EUT shall restore automatically to normal working before the next processor shall be induced to fail.

5.2.3 Transmit subsystem monitoring

5.2.3.1 Test method

a) The frequency lock subsystem within the EUT shall be caused to fail.

b) Within 6 seconds of such failure the EUT shall cease to transmit as measured by the oscilloscope.

c) The power meter and spectrum analyser shall be observed to ascertain that the transmissions have been suppressed.

d) The failed elements shall be restored to normal working state and the EUT shall be restored to normal working.

e) The frequency generation subsystem within the EUT shall be caused to fail.

f) Within 6 seconds of such failure the EUT shall cease to transmit as measured by the oscilloscope.

g) The power meter and spectrum analyser shall be observed to ascertain that the transmissions have been suppressed.

h) The failed elements shall be restored to normal working state and the EUT shall be restored to normal working.

5.2.4 Power-on/Reset

5.2.4.1 Test method

a) Remove the power supply from the EUT.

b) Restore the power supply to the EUT.

c) The EUT shall not transmit during or after power-on.

d) The power meter and spectrum analyser shall be observed to ascertain that the transmissions are suppressed.

e) The EUT shall be restored to the carrier-on state.

f) Operate the reset control of the EUT.

g) The EUT shall cease to transmit.

h) The power meter and spectrum analyser shall be observed to ascertain that the transmissions have been suppressed.

5.2.5 Network control authorisation

5.2.5.1 Test method

a) The EUT shall be authorised to transmit and shall be in the carrier-off state at the commencement of the test.

b) The STE shall remove transmit authorisation for the EUT. A call shall then be initiated by the EUT, and this event displayed on the oscilloscope.

c) Within 30 seconds (15 minutes for systems in operation before 1st of January 1994) the EUT shall cease to transmit as measured by the oscilloscope.

5.2.6 Network control reception

5.2.6.1 Test method

a) The connection between the STE and EUT shall be removed from the STE.

b) Within 31 seconds of this event the EUT shall cease to transmit as measured by the oscilloscope.

c) The power meter and spectrum analyser shall be observed to ascertain that the transmissions have been suppressed.

d) The connection shall be restored and the EUT shall be authorised to transmit.

e) The STE shall cease to transmit the unique identification code for the EUT.

f) Within 31 seconds of this command event the EUT shall cease to transmit as measured by the oscilloscope.

g) The power meter and spectrum analyser shall be observed to ascertain that the transmissions have been suppressed.

h) The STE shall transmit the unique identification code and the EUT shall be authorised to transmit.

j) The EUT shall be in receipt of an enable command and a control message from the NCF requesting the EUT's identification code.

k) The EUT shall transmit an identification message to the NCF.

l) A transmitter disable message shall be received from the NCF by the EUT.

m) Within 30 seconds of receipt of this message the EUT shall cease to transmit as measured by the oscilloscope.

n) The power meter and spectrum analyser shall be observed to ascertain that the transmissions have been suppressed.

p) A transmitter enable message shall be received from the NCF by the EUT.

q) Reception of this message shall authorise the EUT to start transmission.

5.3 Initial burst rate transmission

5.3.1 Test method

a) The test arrangement shall be as shown in figure 4 or 5. The EUT shall be switched off at the commencement of the test. The oscilloscope shall monitor the periods of transmissions from the EUT.

b) The EUT shall be switched on and transmitted power monitored. The monitoring shall be performed for a period of one minute.

c) The oscilloscope shall be observed to ensure that the permitted initial burst rate of transmission is not exceeded.

Annex A (normative): The TBR Requirements Table (TBR-RT)

Table A.1: TBR Requirements Table (TBR-RT)

TBR Reference			TBR 026		
No	**Category**	**Reference**	**TBR-R**	**Status**	**Support**
1	4.3	4.1	Unwanted emissions outside the 1 626,5 to 1 645,5 MHz and 1 656,5 to 1 660,5 MHz bands	M	
2	4.3	4.2	Maximum unwanted emission within the 1 626,5 to 1 645,5 MHz and 1 656,5 to 1 660,5 MHz bands	M	
3	4.3	4.4.1	Processor monitoring	M	
4	4.3	4.4.2	Transmit subsystem monitoring	M	
5	4.3	4.4.3	Power-on/Reset	M	
6	4.3	4.4.4	Network control authorisation	M	
7	4.3	4.4.5	Network control reception	M	
8	4.3	4.5	Initial burst rate transmission	M	

Key to columns:

No TBR-RT entry number;

Category Category of essential requirement as per Article 4 of the Satellite Equipment Directive [1];

Reference Clause reference within this TBR of the supporting text for the entry;

TBR-R Title of entry within this TBR-RT;

Status Status of the entry (M = Mandatory, shall be implemented under all circumstances);

Support Does the equipment support the essential requirement of this entry; Y/N.

Annex B (informative): Bibliography

- ETS 300 254 (1994): "Satellite Earth Stations and Systems (SES); Land Mobile Earth Stations (LMESs) operating in the 1,5/1,6 GHz bands providing Low Bit Data Communications (LBRDCs)".

- Council Directive 89/336/EEC (1989) on the approximation of the laws of Member States relating to electromagnetic compatibility.

- EN 55022 (1994): "Limits and methods of measurement of radio disturbance characteristics of information technology equipment".

- ETR 169 (1995): "Satellite Earth Stations and Systems (SES); Common Technical Regulations (CTRs) in the satellite earth station equipment field".

History

Document history			
August 1996	Public Enquiry	PE 111:	1996-08-05 to 1996-11-29