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**Satellite Earth Stations and Systems (SES);
TeleVision Receive-Only (TVRO) satellite earth stations
operating in the 11/12 GHz frequency bands**

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Foreword

This final 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 the Voting phase of the ETSI standards approval procedure.

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 harmonization 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 300 158, ETS 300 249 and ETS 300 457 (see annex B, Bibliography).

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1 Scope

This Technical Basis for Regulation (TBR) specifies the technical requirements that apply to TeleVision Receive-Only (TVRO) Satellite Earth Stations for compliance with Article 4.1 of Council Directive 93/97/EEC [1].

These TVROs have the following characteristics:

- The TVROs are operating in one or more of the following frequency ranges:
 - the Fixed Satellite Service (FSS) frequency bands of 10,70 GHz to 11,70 GHz and 12,50 GHz to 12,75 GHz;
 - the Broadcast Satellite Service (BSS) frequency bands of 11,70 GHz to 12,50 GHz.
- The TVROs are capable of being used for reception only (receive-only) of television audio-visual signals in either of the bands specified above, and are not capable of transmission.

This TBR applies to the TVRO with its ancillary equipment and its various terrestrial ports, and operated under the conditions which are within the ranges of humidity, temperature and supply voltage declared by the manufacturer.

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.

This TBR 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.

This TBR does not contain any requirement, recommendation or information about the installation of the TVROs.

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] EN 50083-2 (1995): "Cabled distribution system for television and sound signals. Part 2: Electromagnetic compatibility for equipment".
- [4] EN 55013 (1990)/A12 (1994): "Limits and measurement of radio disturbance characteristics of broadcast receivers and associated equipment".

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:

outdoor unit: The part of the TVRO intended to be installed outdoor, as declared by the manufacturer, or as indicated in the user documentation.

The outdoor unit usually comprises two main parts:

- a) the antenna sub-system which converts the incident radiation field into a guided wave;
- b) the Low Noise Block (LNB), which is a device that amplifies, with very low internal noise, the received signals in the Radio Frequency (RF) band and converts them to intermediate frequencies (often called the 1st Intermediate Frequency (IF));

NOTE: The installation equipment (means of attachment) is outside the scope of this TBR. However, the antenna structures and other components directly mounted on the antenna and forming an integral part of it, are subject to the specifications of this TBR.

unwanted radiation: Any radiation radiated by the outdoor unit.

3.2 Abbreviations

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

BSS	Broadcast Satellite Service
EIRP	Equivalent Isotropically Radiated Power
FSS	Fixed Satellite Service
IF	Intermediate Frequency
LNB	Low Noise Block
LO	Local Oscillator
RF	Radio Frequency
TVRO	TeleVision Receive-Only

4 Requirements

4.1 Unwanted radiation

4.1.1 General

The power of the Local Oscillator (LO) leakage and other unwanted radiation, after passing through the band-pass filter, the RF waveguides and the polarizer, is radiated by the TVRO antenna.

The unwanted radiation at the LO frequency could possibly interfere with nearby TVROs receiving signals in different frequency ranges, as well as line of site radio-relay receivers.

The unwanted radiation at the second harmonic of the LO could interfere with line-of-site radio-relay receivers working in the region of the 20 GHz frequency band.

4.1.2 Justification

To limit the unwanted radiation level from the outdoor unit in order to protect the radio spectrum.

4.1.3 Specification

The unwanted radiation power measured at the antenna flange (including the polarizer, ortho-mode transducer, band-pass filter, RF waveguides) shall not exceed the following limits:

- a) -60 dBm in a 120 kHz bandwidth at the LO fundamental frequency;
- b) -50 dBm in a 120 kHz bandwidth at the frequency of the second harmonic of the LO;
- c) -60 dBm in any other 120 kHz bandwidth.

This TBR applies to the frequency range from 2,5 GHz to 25 GHz.

4.1.4 Conformance tests

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

5 Test methods

5.1 Unwanted radiation

The value of the power of the unwanted radiation shall be measured in one of the two following ways:

- a) Direct method:

Measurement of the power of the unwanted radiation at the antenna flange or at a similar interface between the antenna and the LNB e.g. the input to the LNB. Due allowance shall be made for the feed losses between the available interface and the antenna flange.

- b) Indirect method:

In case of unavailability of a suitable interface between the LNB and the antenna the level of the unwanted radiation power at the antenna flange shall be obtained by measurement of the on-axis EIRP of the unwanted radiation through the antenna and the knowledge of the antenna gain. The value of the antenna gain at the operational frequencies shall be provided by the manufacturer. The power of the unwanted radiation shall be measured as indicated in either EN 50083-2 [3], subclause 4.2.2.3 or EN 55013 [4], subclause 5.5.

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

Notwithstanding the provisions of the copyright clause related to the text of this TBR, ETSI grants that users of this TBR may freely reproduce the TBR-RT pro forma in this annex so that it can be used for its intended purposes and may further publish the completed TBR-RT.

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

TBR Reference			TBR 029		
No	Category	Reference	TBR-R	Status	Support
1	4.1	4.1	Unwanted radiation	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 300 158 (1992): "Satellite Earth Stations (SES); Television Receive-Only (TVRO-FSS) Satellite Earth Stations operating in the 11/12 GHz FSS bands".
- ETS 300 249 (1993): "Satellite Earth Stations (SES); Television Receive-Only (TVRO) equipment used in the Broadcasting Satellite Service (BSS)".
- prETS 300 784 (1996): "Satellite Earth Stations and Systems (SES); TeleVision Receive-Only (TVRO) satellite earth stations operating in the Fixed Satellite Service (FSS) and Broadcasting Satellite Service (BSS) 11/12 GHz frequency bands".
- ETS 300 457 (1995): "Satellite Earth Stations and Systems (SES); Test methods for TeleVision Receive-Only (TVRO) operating in the 11/12 GHz frequency bands".
- ETR 169 (1995): "Satellite Earth Stations and Systems (SES); Common Technical Regulations (CTRs) in the satellite earth station equipment field".
- Council Directive 89/336/EEC (1989) on the approximation of the laws of Member States relating to electromagnetic compatibility.

History

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