



SLOVENSKI STANDARD SIST ETS 300 407 E1:2003

01-december-2003

Prenos in multipleksiranje (TM) – Digitalni radiorelejni sistemi (DRRS) – Parametri DRRS za prenos digitalnih signalov in analognih video signalov, ki delujejo na okrog 55 GHz

Transmission and Multiplexing (TM); Digital Radio Relay Systems (DRRS); Parameters for DRRS for the transmission of digital signals and analogue video signals operating around 55 GHz

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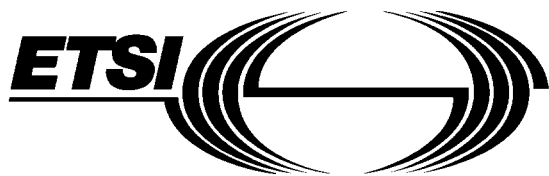
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**Transmission and Multiplexing (TM);
Parameters for Digital Radio Relay Systems (DRRS)
for the transmission of digital signals and analogue
video signals operating around 55 GHz**

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Transmission and Multiplexing (TM) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This ETS specifies the minimum performance parameters for radio equipment operating at frequencies around 55 GHz, as specified in the scope. Other standards cover radiocommunications equipment not listed in clause 1.

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Date of adoption:	21 February 1997
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Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	31 December 1997
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1 Scope

This ETS covers the minimum performance requirements for terrestrial fixed services radiocommunications equipment, as given below, at frequencies around 55 GHz.

This ETS specifies the performance criteria for the different equipment groups. The equipment groups are:

- digital signals;
- analogue video signals.

2 Normative references

This ETS incorporates by dated and undated reference, 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] ETS 300 132-1: "Equipment Engineering (EE); Power supply interface at the input to telecommunications equipment; Part 1: Operated by alternating current (ac) derived from direct current (dc) sources".
- [2] ETS 300 132-2: "Equipment Engineering (EE); Power supply interface at the input to telecommunications equipment; Part 2: Operated by direct current (dc)".
- [3] ETS 300.019: "Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment".
- [4] CCITT Recommendation G.703: "Physical/electrical characteristics of hierarchical digital interfaces".
- [5] ITU-T Recommendation G.707: "Synchronous digital hierarchy bit rates".
- [6] ITU-T Recommendation G.708: "Network node interface for the synchronous digital hierarchy".
- [7] ITU-T Recommendation G.709: "Synchronous multiplexing structure".
- [8] CCITT Recommendation G.781: "Structure of Recommendations on multiplexing equipment for the synchronous digital hierarchy (SDH)".
- [9] CCITT Recommendation G.782: "Types and general characteristics of synchronous digital hierarchy (SDH) multiplexing equipment".
- [10] CCITT Recommendation G.783: "Characteristics of synchronous digital hierarchy (SDH) multiplexing equipment functional blocks".
- [11] CCITT Recommendation G.784: "Synchronous digital hierarchy (SDH) management".
- [12] ITU-R Recommendation 403: "Intermediate-frequency characteristics for the interconnection of analogue radio-relay systems".
- [13] ETS 300 385: "Radio Equipment and Systems (RES); ElectroMagnetic Compatibility (EMC) standard for digital fixed radio links and ancillary equipment with data rates at around 2 Mbit/s and above".
- [14] ITU-T Recommendation G.773: "Protocol suites for Q-interfaces for management of transmission systems".

- [15] ITU-R Recommendation F.696-1: "Error performance and availability objectives for hypothetical reference digital sections utilizing digital radio-relay systems forming part or all of the medium-grade portion of an ISDN connection".
- [16] ITU-R Recommendation F.697-1: "Error performance and availability objectives for the local-grade portion at each end of an ISDN connection utilizing digital radio-relay systems".
- [17] CCIR Report 338: "Propagation data and prediction methods required for terrestrial line-of-sight systems".
- [18] CCIR Report 563: "Radiometeorological data".
- [19] CCIR Report 721: "Attenuation by hydrometers, in particular precipitation, and other atmospheric particles".
- [20] CCIR Report 1053: "Error performance and availability objectives for digital radio-relay systems used in the local-grade portion of an ISDN connection".

3 Abbreviations

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

ac	alternating current
BER	Bit Error Ratio
C/I	Carrier/Interference
dc	direct current
IF	Intermediate Frequency
FM	Frequency Modulation
ppm	parts per million
PAL	Phase Alternation Line
RF	Radio Frequency
RSL	Receiver Signal Level
SDH	Synchronous Digital Hierarchy
SRL	Spectrum Reference Level

4 General characteristics

4.1 Frequency bands and channel arrangements

4.1.1 Frequency band

The frequency band is 54,25 GHz to 57,2 GHz.

NOTE: The frequency band values considered are provisional.

The channel plan is constructed on a basic raster of 14 MHz.

4.1.2 Co-polar channel spacing**Table 1: Digital systems**

Minimum system rate (Mbit/s)	Maximum channel spacing (MHz)
2	14
8	28
34	56
140/155	140

Table 2: Analogue systems

Video baseband (MHz)	< 3,5	< 6	< 10	< 14
Channel spacing (MHz)	42	70	70	70

4.1.3 Transmit/receive centre gap

The centre gap shall be taken as a multiple of the basic raster distance of 14 MHz, and shall not be greater than 70 MHz.

4.1.4 Transmit/receive duplex frequency separation

The transmitter receiver duplex frequency separation shall not be less than 500 MHz. (Typical separations will be around 1 000 MHz.)

4.2 Compatibility requirements between systems

In order to provide compatibility between systems there should be no requirement to operate transmitting equipment from one manufacturer with receiving equipment from another.

4.3 Types of installation

The equipment may comprise both radio relay units in weather protected locations, and outdoor units with the Radio Frequency (RF) assemblies located close to the antenna in order to minimize feeder losses.

4.3.1 Environmental conditions

The equipment shall be required to meet the environmental conditions set out in ETS 300 019 [3], which defines weather protected and outdoor environmental classes and test severities.

4.3.1.1 Equipment within weather protected locations

Equipment intended for operation within temperature controlled locations or partially temperature controlled locations shall meet the requirements of ETS 300 019 [3] classes 3.1 and 3.2 respectively.

Optionally, the more stringent requirements of ETS 300 019 [3] classes 3.3 (non-temperature controlled locations), 3.4 (sites with heat trap) and 3.5 (sheltered locations) may be applied.

4.3.1.2 Equipment for non-weather protected locations

Equipment intended for operation within non-weather protected locations shall meet the requirements of ETS 300 019 [3], class 4.1 or 4.1E

Class 4.1 applies to many European countries and class 4.1E applies to all European countries.

Weather protected equipment conforming to classes 3.3, 3.4 and 3.5, together with an enclosure or

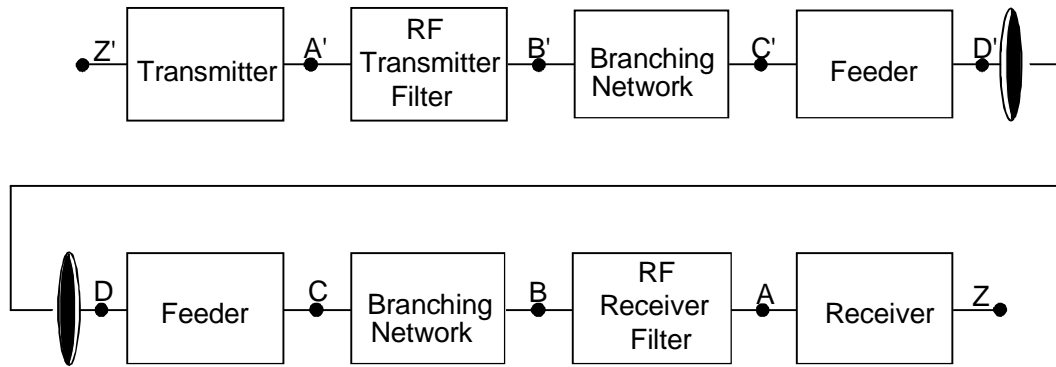
cabinet may fulfil the requirements of operating in a non-weather protected environment, but this is outside the scope of this ETS.

4.3.2 Electromagnetic compatibility

Equipment shall operate under the conditions specified in ETS 300 385 [13].

4.4 Block diagram

The RF block diagram is shown in figure 1.



NOTE 1: For the purpose of defining the measurement points, the branching network does not include a hybrid.

NOTE 2: Points B, C, D, and B', C', D' may coincide.

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 Figure 1: RF block diagram
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4.5 General characteristics

The following characteristics are desirable: [SIST ETS 300 407 E1:2003](https://standards.iteh.ai/catalog/standards/sist/14beff42-5cd0-4fa9-b0a7-52bfa865542b/sist-ets-300-407-e1-2003)
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- tuning facilities;
- flexibility for location of systems;
- wayside traffic facilities;
- transmitter identification;
- maintenance facilities;
- performance monitoring facilities.

4.6 Transmission Management Network (TMN) interface

Any TMN interface required should follow CCITT Recommendation G.784 [11] and ITU-T Recommendation G.773 [14]. This subject is also under study in ETSI TM 2 and TM 3.

4.7 Branching/feeder/antenna requirements

- a) the minimum recommended antenna radiation pattern envelope is shown in figure 2, element 2A. It may be necessary to use a higher performance antenna pattern as shown in figure 2, element 2B;
- b) antenna flange/equipment feeder flange. When flanges are required, IEC type R620 should be used.