SLOVENSKI STANDARD
SIST ETS 300 638 E1:2003

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Prenos in multipleksiranje (TM) ï Digitalni radiorelejni sistemi (DRRS) ï Fiksna oprema toļ ka-toļ ka DRRS za prenos digitalnih signalov in analognega video signala, ki deluje v frekvenļ nih pasovih 10 GHz in 14 GHz izmenoma z 20 MHz-nim razmikom kanalov

Transmission and Multiplexing (TM); Digital Radio Relay Systems (DRRS); Fixed point-to-point radio link equipment for the transmission of digital signals and analogue video signal operating in the frequency bands 10 GHz and 14 GHz with 20 MHz alternate channel spacing

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Transmission and Multiplexing (TM); Digital Radio Relay Systems (DRRS); Fixed point-to-point radio link equipment for the transmission of digital signals and analogue video signal operating in the frequency bands 10 GHz and 14 GHz with 20 MHz alternate channel spacing

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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 contains the minimum technical requirements to ensure compatibility of products and conformance with radio regulations across ETSI member states. Radio terminals from different manufacturers are not required to interwork at radio frequency (i.e. no common air interface). However, terminals may be combined with other manufacturers equipment on a Radio Frequency (RF) branching network for operation on different polarizations.

This ETS defines the requirements of radio terminal and radio relay equipment and associated interfaces. The requirements for multiplex, network management and antenna/feeder equipment may be addressed elsewhere.

Transposition dates	
Date of adoption of this ETS:	25 October 1996
Date of latest announcement of this ETS (doa):	28 February 1997
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	31 August 1997
Date of withdrawal of any conflicting National Standard (dow):	31 August 1997

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1 Scope

This European Telecommunication Standard (ETS) covers the minimum performance requirements for terrestrial fixed services radio communications equipment, as given below, in bands in the frequency ranges 10 GHz and 14 GHz using 20 MHz channel spacing.

This ETS is applicable in those countries where the frequency plan in these bands is based on a 20 MHz spacing; it does not prevent the development of future ETSs for equipment operated in these bands using a different channel plan.

This ETS does not cover aspects related to test procedures and test conditions which are in the scope of another ETS under study in TM4.

The parameters specified fall into two categories:

a) those required to provide compatibility between channels from different sources of equipment on the same route, connected either to separate antennas, or to separate polarizations of the same antenna. This category also includes parameters providing compatibility with the existing radio-relay network;

b) parameters defining the transmission quality of the proposed systems.

The standardization includes the following specifications:

- transmitter and receiver characteristics;
- baseband and RF interface characteristics;
- diversity system characteristics.

As regards Synchronous Digital Hierarchy (SDH) systems, the Section Overhead (SOH) processing is covered in CCIR Recommendation 750 [8].

Safety aspects are outside the mandate of ETSI and they will not be considered in this ETS.

2 Normative references

This ETS incorporates by dated or 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 300 019 (1994): "Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment".

[2] ETS 300 132: "Equipment Engineering (EE); Power supply interface at the input to telecommunications equipment".

[3] ETS 300 385 (1995): "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".

[4] CCIR Recommendation 401-2: "Frequencies and deviations of continuity pilots for frequency modulation radio-relay systems for television and telephony".

[5] CCIR Recommendation 403-3: "Intermediate frequency characteristics for the interconnection of analogue radio-relay systems".

[6] CCIR Recommendation 405-1: "Pre-emphasis characteristics for frequency modulation radio-relay systems for television".

[7] CCIR Recommendation 746: "Radio - Frequency channel arrangements for radio-relay systems - Annex 7: Description of the radio-frequency channel arrangement in the frequency band 14,25-14,5 GHz using a 20 MHz channel spacing".

[8] CCIR Recommendation 750: "Architectures and functional aspects of radio-relay systems for SDH-based networks".

[9] CCIR Recommendation 751: "Transmission characteristics and performance requirements of radio-relay systems for SDH-based networks".

[10] ITU-T Recommendation J.61: "Transmission performance of television circuits designed for use in international connections".

[11] ITU-T Recommendation J.21: "Performance characteristics of 15 kHz-type sound-programme circuits - Circuits for high quality monophonic and stereophonic transmissions".

[12] CCITT Recommendation G.703: "Physical/electrical characteristics of hierarchical digital interfaces".

[13] ITU-T Recommendation G.707: "Network node interface for the Synchronous Digital Hierarchy".

[14] ITU-T Recommendation G.773: "Protocol suites for Q-interfaces for management of transmission systems".

[15] ITU-T Recommendation G.784: "Synchronous Digital Hierarchy (SDH) management".

3 Abbreviations and symbols

3.1 Abbreviations

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

ATPC	Automatic Transmitter Power Control
BB	BaseBand
BER	Bit Error Rate
C/I	Carrier to Interference Ratio
CW	Continuous Wave
DRRS	Digital Radio-Relay System
EMC	ElectroMagnetic Compatibility
IF	Intermediate Frequency
IF/RF	Intermediate Frequency/Radio Frequency
LO	Local Oscillator
PDH	Plesiochronous Digital Hierarchy
PRBS	Pseudo-Random Binary Sequence
RF	Radio Frequency
RSL	Received Signal Level
RX	Receive (Receiver)
SDH	Synchronous Digital Hierarchy
S/I	Signal to Interference Ratio
SRL	Spectrum Reference Level
STM-1	Synchronous Transport Module-level 1
TMN	Telecommunications Management Network
TX	Transmit (Transmitter)

3.2 Symbols

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

dB	decibel
dBm	decibel relative to 1 mW
GHz	Gigahertz
km	kilometre
Mbit/s	Mega-bit per second
MHz	Megahertz
m/s	metres per second
ppm	parts per million
ns	nanosecond
W/m²	Watts per square metre

4 General characteristics (digital and analogue)

4.1 Frequency bands and channel arrangements

The systems shall be required to operate in the frequency bands 10 GHz or 14 GHz using a channel spacing of 20 MHz according to ITU-R Recommendation 746 [7].

NOTE: A typical application of ITU-R Recommendation 746 [7] is shown in annex B.

4.1.1 Alternate channel spacing

See subclause 4.2, a).

Table 1a: Digital systems

Minimum bit rate (Mbit/s)	2 x 34 (note)	2 x 45 (note)	2 x 51
Channel spacing (MHz)	20	20	20
NOTE: In order to achieve good efficiency a minimum gross bit rate of about 90 Mb/s is envisaged; therefore n x 2 Mbit/s way side traffic in Plesiochronous Digital Hierarchy (PDH) systems is considered.			

Table 1b: Analogue systems

Video baseband (MHz)	≤ 10
Channel spacing (MHz)	20

4.1.2 Transmit/receive minimum separation

The minimum separation between the centre frequencies of the closest go and return radio channels shall be 30 MHz.

4.1.3 Transmit/receive duplex frequency separation

The transmitter receiver duplex frequency separation should be approximately half of the allocated frequency band. An example of a national channel plan in use is given in annex B for information.

4.2 Compatibility requirements between systems

a) Systems operating on common hops will normally use the same double polarized antenna;

b) there should be no requirement to operate transmitting equipment from one manufacturer with receiving equipment from another;