



SLOVENSKI STANDARD SIST ETS 300 639 E1:2003

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Transmission and Multiplexing (TM); Digital Radio Relay Systems (DRRS); Sub-STM-1 DRRS operating in the 13 GHz, 15 GHz and 18 GHz frequency bands with about 28 MHz co-polar and 14 MHz cross-polar channel spacing

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33.060.30	Radiorelejni in fiksni satelitski komunikacijski sistemi	Radio relay and fixed satellite communications systems

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**Transmission and Multiplexing (TM);
Sub-STM1 Digital Radio Relay Systems (DRRS) operating
in the 13 GHz, 15 GHz and 18 GHz frequency bands
with about 28 MHz co-polar
and 14 MHz cross-polar channel spacing**

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Foreword

This European Telecommunication Standard (ETS) has been prepared by the Transmission and Multiplexing (TM) Technical Committee of the European Telecommunications Standard Institute (ETSI) and is now submitted for the Voting phase of the ETSI standards approval procedure.

This ETS contains the minimum technical requirements to ensure compatibility of products and conformance with radio regulations across the European states of interest to ETSI Member. Radio terminals from different manufacturers are not required to interwork at radio frequency (i.e. no common air interface).

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:	4 October 1996
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1 Scope

This European Telecommunication Standard (ETS) specifies the minimum performance parameters for terrestrial fixed services radio communications equipment, as given below, for operation in the 13 GHz, 15 GHz and 18 GHz frequency bands (i.e. 12,75 to 13,25 GHz, 14,50 to 15,35 GHz and 17,70 to 19,70 GHz).

The equipments covered by this ETS are intended for operation with about 28 MHz basic channel spacing with frequency re-use either in 14 MHz interleaved mode or in co-channel mode (definitions are in ITU-R Recommendation F.746 [27]).

This ETS covers equipment for the transmission of sub-Synchronous Transport Module level-1 (STM-1) digital signals with a Virtual Container-3 (VC-3) payload capacity. The standardization of sub-STM-1 radio systems for 13 GHz, 15 GHz and 18 GHz bands has been prepared to ensure the compatibility with the existing plesiochronous and the new synchronous systems concerning frequency plans and performance. The architecture and functional aspects should be in accordance with ITU-R Recommendation F.750 [7] and transmission characteristics and performance requirements in accordance with ITU-R Recommendation F.751 [8].

This ETS do not cover aspects related to test procedures and test conditions which are currently under study in TM4.

The application of these Digital Radio Relay Systems (DRRS) is anticipated to be for point-to-point links in local, regional and national networks, mobile base station connections and customer access links. Consideration has to be given to special requirements of the local network (e.g. simple towers with less space for antenna, different network structures with high density nodes).

The systems considered in this ETS are intended to operate on average hop lengths about 15 km for 18 GHz band, 20 km for 15 GHz band and 30 km for 13 GHz band.

Equipment should be designed in order to meet network performance and availability requirements defined by ITU-T Recommendations G.821 [18] and G.826 [19], following the criteria defined in ITU-R Recommendations F.634 [3], F.695 [32], F.696 [5], F.697 [6], F.1092 [30] and F.1189 [31], for high or medium or local grade or the international or the national portion of the digital connection.

The parameters to be specified fall into two categories:

- a) those that are required to provide compatibility between Radio Frequency (RF) channels occupied by different sources of equipment on the same route connected either:
 - to separate antennas; or
 - to separate polarization of the same antenna;
- b) parameters defining the transmission quality of the proposed system.

The standardization deals with Intermediate Frequency (IF), RF and baseband characteristics relevant to sub-STM-1 Synchronous Digital Hierarchy (SDH) transmission. Spurious emissions and ElectroMagnetic Compatibility (EMC) requirements are also included in this ETS.

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 place 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-R Recommendation F.497: "Radio frequency channel arrangements for radio relay systems operating in the 13 GHz frequency band".
- [2] ITU-R Recommendation F.595: "Radio-frequency channel arrangements for radio-relay systems operating in the 18 GHz frequency band".
- [3] ITU-R Recommendation F.634: "Error performance objectives for real digital radio-relay links forming part of a high grade circuit within an integrated services digital network".
- [4] ITU-R Recommendation F.636: "Radio-frequency channel arrangements for radio-relay systems operating in the 15 GHz band".
- [5] ITU-R Recommendation F.696: "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".
- [6] ITU-R Recommendation F.697: "Error performance and availability objectives for the local grade portion at each end of an ISDN connection utilizing digital radio-relay systems".
- [7] ITU-R Recommendation F.750: "Architectures and functional aspects of radio-relay systems for SDH-based networks".
- [8] ITU-R Recommendation F.751: "Transmission characteristics and performance requirements of radio-relay systems for SDH-based networks".
- [9] ITU-T Recommendation G.703: "Physical/electrical characteristics of hierarchical digital interfaces".
- [10] ITU-T Recommendation G.707: "Synchronous digital hierarchy bit rates".
- [11] ITU-T Recommendation G.708: "Network node interface for the synchronous digital hierarchy".
- [12] ITU-T Recommendation G.709: "Synchronous multiplexing structure".
- [13] ITU-T Recommendation G.773: "Protocol suites for Q interfaces for management of transmission systems".
- [14] ITU-T Recommendation G.781: "Structure of Recommendations on equipment for the synchronous digital hierarchy (SDH)".
- [15] ITU-T Recommendation G.782: "Types and general characteristics of synchronous digital hierarchy (SDH) equipment".
- [16] ITU-T Recommendation G.783: "Characteristics of synchronous digital hierarchy (SDH) equipment functional blocks".
- [17] ITU-T Recommendation G.784: "Synchronous digital hierarchy (SDH) management".
- [18] ITU-T Recommendation G.821: "Error performance of an international digital connection forming part of an integrated services digital network".

- [19] ITU-T Recommendation G.826: "Error performance parameters and objectives for international, constant bit-rate digital paths at or above the primary rate".
- [20] ITU-T Recommendation G.957: "Optical interfaces for equipments and systems relating to the synchronous digital hierarchy".
- [21] ETS 300 019: "Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment".
- [22] 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".
- [23] ETS 300 132: "Equipment Engineering (EE); Power supply interface at the input to telecommunications equipment".
- [24] ETS 300 174 (1992): "Network Aspects (NA); Digital coding of component television signals for contribution quality applications in the range 34-45 Mbit/s".
- [25] IEC 835 (1993): "Methods of measurement for equipment used in digital microwave radio transmission systems - Part 2: Measurements on terrestrial radio relay systems - Section 4: Transmitter/Receiver including modulator/demodulator".
- [26] IEC 835 (1993): "Methods of measurement for equipment used in digital microwave radio transmission systems - Part 2: Measurements on terrestrial radio relay systems - Section 8: Adaptive equalizer".
- [27] ITU-R Recommendation F.746: "Radio-frequency channel arrangements for radio-relay systems".
- [28] ITU-R Recommendation F.1191: "Bandwidths and unwanted emissions of DRRS". [SIST ETS 300 639 E1:2003](https://standards.iteh.ai/catalog/standards/sist/696ed27e-d0d7-425e-9446-11191ff6-7816e1202011)
- [29] ETS 300 119: "Equipment Engineering (EE); European telecommunication standard for equipment practice".
- [30] ITU-R Recommendation F.1092: "Error performance objectives for constant bit rate digital paths at or above the primary rate carried by digital radio-relay systems which may form part of the international portion of a 27 500 km hypothetical reference path".
- [31] ITU-R Recommendation F.1189: "Error performance objectives for constant bit rate digital paths at or above the primary rate carried by digital radio-relay systems which may form part of the national portion of a 27 500 km hypothetical reference path".
- [32] ITU-R Recommendation F.695: "Availability objectives for real digital radio-relay links forming part of a high-grade circuit within an integrated services digital network".