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Fixed Radio Systems; Point-to-multipoint equipment; Time Division Multiple Access (TDMA); Point-to-multipoint digital radio systems in frequency bands in the range 1 GHz to 3 GHz

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European Standard (Telecommunications series)

**Fixed Radio Systems;
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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Transmission and Multiplexing (TM).

The present document is a revision of ETS 300 636. Clause 2, subclauses 5.3.3, 5.4.2 and 7.3 have been modified and approved as amendment under ETS 300 636/A1, under ETSI Standards One-step Approval Procedure 9956. The complete document is published as EN 300 636 V1.2.1.

The former title of the present document was: "Transmission and Multiplexing (TM); Time Division Multiple Access (TDMA) point-to-multipoint digital radio systems in the frequency range 1 to 3 GHz".

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National transposition dates

Date of adoption of this EN:	31 December 1999
Date of latest announcement of this EN (doa):	31 March 2000
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 September 2000
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Introduction

The main field of application of Point-to-Multipoint (P-MP) systems is to provide access to both the Public Switched Telephone Network (PSTN) and private networks (Private Digital Network (PDN)), particularly for remote subscribers. By means of P-MP systems the network service area may be extended to cover both distant and scattered subscriber locations.

These remote subscribers, in a similar manner to the city subscriber, are offered the full range of services by the particular public or private network. Subscribers have access to these services by means of the various standardized user network interfaces (2-wire loop, data, ...).

P-MP applications in the metropolitan and urban environment are mainly for the provision of new data services for business subscribers and for the extension of Integrated Services Digital Network (ISDN) services to local subscribers.

The frequency bands below 3 GHz are particularly suitable for the extension of telecommunications services to distant rural and suburban subscribers.

P-MP systems provide standard network interfaces and transparently connect subscribers to the appropriate network node (local switch, ...). These systems allow a service to be connected to a number of subscribers ranging from a few users to several hundred and over a wide range of distances.

P-MP systems are generally, but not necessarily, configured as pre-assigned systems or as Demand Assigned Multiple Access (DAMA) radio systems.

The essential features of a typical P-MP DAMA radio systems are:

- efficient use of the radio spectrum;
- concentration;
- transparency.

Radio is often the ideal way of obtaining communications at low cost and almost independent of distance and difficult topology. Moreover, only a small number of sites are required for these installations, thus facilitating rapid implementation and minimizing maintenance requirements of the systems.

Concentration means that N subscribers can share n channels (N being larger than n), allowing better use to be made of the available frequency spectrum and at a lower equipment cost. The term "multi-access" is derived from the fact that every subscriber has access to every channel (instead of a fixed assignment as in most multiplex systems). When a call is initiated one of the available channels is allocated to it. When the call is terminated, the channel is released for another call.

Concentration requires the use of distributed intelligent control which in turn allows many other operation and maintenance functions to be added.

Transparency means that the exchange and the telephone communicate with each other without being aware of the radio link.

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1 Scope

1.1 Applications

The scope of the present document covers the following Point-to-Multipoint (P-MP) applications:

- voice;
- telex;
- low speed data (up to 64 kbit/s);
- Integrated Services Digital Network (ISDN) (basic rate access).

1.2 Frequencies

The present document covers fixed P-MP services operating in the 1,5 GHz, 2,2 GHz, 2,4 GHz and 2,6 GHz bands and having the frequency plans as given in CEPT Recommendation T/R 13-01 [1] for 1,5 GHz, 2,2 GHz and 2,6 GHz bands. For the 2,4 GHz band, the ITU-R Recommendation F.701-2 [2] is applicable.

1.3 Access method

The present document covers Time Division Multiple Access (TDMA) systems.

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2 References **(standards.iteh.ai)**

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

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- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

- [1] CEPT Recommendation T/R 13-01: "Preferred channel arrangements for fixed services in the range 1 to 3 GHz".
- [2] ITU-R Recommendation F.701-2 (1990): "Radio-frequency channel arrangements for analogue and digital point-to-multipoint radio systems operating in frequency bands in the range 1.350 to 2.690 GHz (1.5, 1.8, 2.0, 2.2, 2.4 and 2.6 GHz)".
- [3] ITU-T Recommendation G.821 (1990): "Error performance of an international digital connection operating at a bit rate below the primary rate and forming part of an integrated services digital network".
- [4] ITU-T Recommendation G.773 (1990): "Protocol suites for Q interfaces for management of transmission systems".
- [5] ETSI EN 300 631: "Fixed Radio Systems; Point-to-Point Antennas; Antennas for Point-to-Point fixed radio systems in the 1 GHz to 3 GHz band".
- [6] ITU-T Recommendation G.712 (1993): "Transmission performance characteristics of pulse code modulation channels".

- [7] CCITT Recommendation R.20 (1988): "Telegraph modem for subscriber lines".
- [8] ITU-T Recommendation G.703 (1991): "Physical/electrical characteristics of hierarchical digital interfaces".
- [9] ETSI ETS 300 012: "Integrated Services Digital Network (ISDN); Basic user-network interface; Layer 1 specification and test principles".
- [10] ETSI ETS 300 324 Parts 1 to 5 and Part 7: "Signalling Protocols and Switching (SPS); V interfaces at the digital Local Exchange (LE) V5.1 interface for the support of Access Network (AN)".
- [11] ETSI EN 300 347 Parts 1 and 2: "V interfaces at the digital Local Exchange (LE); V5.2 interface for the support of Access Network (AN)".
- [12] ETSI ETS 300 132 Parts 1 and 2: "Equipment Engineering (EE); Power supply interface at the input to telecommunications equipment".
- [13] ETSI ETS 300 019 Parts 1 and 2: "Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Parts 1-0 to 1-7: Classification of environmental conditions; Parts 2-0 to 2-7: Specification of environmental tests".
- [14] ETSI EN 300 385 (V1.2.): "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for fixed radio links and ancillary equipment".
- [15] CEPT/ERC Recommendation 74-01: "Spurious emissions".

3 Symbols and abbreviations

3.1 Symbols

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For the purposes of the present document the following symbols apply:

dB	decibel
dBm	decibel relative to 1 milliwatt
GHz	GigaHertz
Hz	Hertz
kbit/s	kilobits per second
kHz	kiloHertz
Mbit/s	Megabits per second
MHz	MegaHertz
ms	millisecond