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gcXcglc`d`g`ZY_j Yb b]a `g_U_Ub`Ya `fl <!8 A 5 L`E`8] []]U]b]fUX]cfYY`b]g]ghYa]
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Fixed Radio Systems; Point-to-multipoint equipment; Frequency Hopping Code Division Multiple Access (FH-CDMA); Point-to-multipoint Digital Radio Relay Systems (DRRS) in the bands within 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 former title of the present document was: "Transmission and Multiplexing (TM); Digital Radio Relay Systems (DRRS); Frequency Hopping Code Division Multiple Access (FH-CDMA); Point-to-multipoint DRRS in the bands within the range 1 GHz to 3 GHz".

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Date of adoption of this EN:	16 February 2001
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Introduction

The main field of application of Point-to-Multipoint (P-MP) systems is to provide access to both public and private networks (Public Switched Telephone Network (PSTN), Private Data Network (PDN), ...). By means of P-MP systems the network service area may be extended to cover both distant and scattered subscriber locations; and the systems may be applied to build new access networks covering both urban and rural areas.

Subscribers 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, new data services).

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

P-MP systems are generally configured as Pre-Assigned Multiple Access (PAMA) radio systems or as Demand Assigned Multiple Access (DAMA) radio systems.

The essential features of a typical P-MP DAMA radio system 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 topography. Moreover, a small number of sites is required for these installations, thus facilitating rapid implementation and minimizing maintenance requirements of the systems.

Concentration means that m subscribers can share n radio channels (m 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" means that every subscriber has access to every channel (instead of a fixed assignment as in most multiplex systems). When a call is initiated an available channel 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 subscriber equipment 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 typical P-MP applications, delivered directly or indirectly, or in any superimposed transport network layer:

- voice;
- fax;
- voiceband data;
- telex;
- data up to 64 kbit/s;
- ISDN;
- Internet Access.

1.2 Frequency bands and channel arrangements

The present document covers Fixed Service bands at 1,5 GHz, 2,2 GHz, 2,4 GHz and 2,6 GHz.

The frequency plans for the 1,5 GHz, 2,2 GHz and 2,6 GHz bands are given in CEPT T/R 13-01 [7] and ITU-R Recommendation F.1098-1 [20]. For the 2,4 GHz band, the ITU-R Recommendation F.701-2 [8] is applicable.

The present document may cover equipment which uses either Frequency Division Duplexing or Time Division Duplexing.

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NOTE: As with other point-to-multipoint standards, attention should be given to assigning spectrum so as to allow different systems to operate in adjacent assigned frequencies without unacceptable mutual interference. This is the responsibility of the regulatory authorities that are advised to note any guidelines produced by CEPT, particularly those with reference to spectrum where unlike duplex methods are to be used.

1.3 Access method

The present document covers Frequency Hopping - Code Division Multiple Access (FH-CDMA) systems.

NOTE: The method described in the present document applies slow frequency hopping TR 101 274 [26], with a hopping period up to 400 ms. During the dwell time, several different links in the same area may operate on different sub-channels in a manner which resembles the characteristics and properties of FDMA systems. The sub-channel supporting each link may be further subdivided using frequency division, time division or a combination of both techniques. (The terms "hopping period", "dwell time" and "sub-channel" are defined in clause 3.1).

1.4 Compatibility

The present document is not intended to ensure that a Central Station (CS) from one manufacturer will inter-operate with a Terminal Station (TS) or Repeater Station (RS) from another manufacturer.

2 References

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

- 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.

- [1] ETSI ETS 300 012: "Integrated Services Digital Network (ISDN); Basic user-network interface; Layer 1 specification and test principles".
- [2] ITU-T Recommendation Q.553 (1996): "Transmission characteristics at 4-wire analogue interfaces of digital exchanges".
- [3] ITU-T Recommendation Q.552 (1996): "Transmission characteristics at 2-wire analogue interfaces of digital exchanges".
- [4] ITU-T Recommendation G.821 (1996): "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".
- [5] ITU-T Recommendation R.20: "Telegraph modem for subscriber lines".
- [6] ITU-T Recommendations V-series: "Data communication over the telephone network".
- [7] CEPT T/R 13-01 (1993): "Preferred channel arrangements for fixed services in the range 1-3 GHz".
- [8] ITU-R Recommendation F.701-2 (1997): "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)".
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- [12] ETSI EN 300 385: "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for fixed radio links and ancillary equipment".
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- [24] IEC 60339-1: "General purpose rigid coaxial transmission lines and their associated flange connectors - Part 1: General requirements and measuring methods".
- [25] IEC 60339-2: "General purpose rigid coaxial transmission lines and their associated flange connectors - Part 2: Detail specifications"
- [26] ETSI TR 101 274: "Transmission and Multiplexing (TM); Digital Radio Relay Systems (DRRS); Point-to-multipoint DRRS in the access network: Overview of different access techniques".
- [27] ITU-R Recommendation F.1189-1 (1997): "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 or all of the national portion of a 27 500 km hypothetical reference path".
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