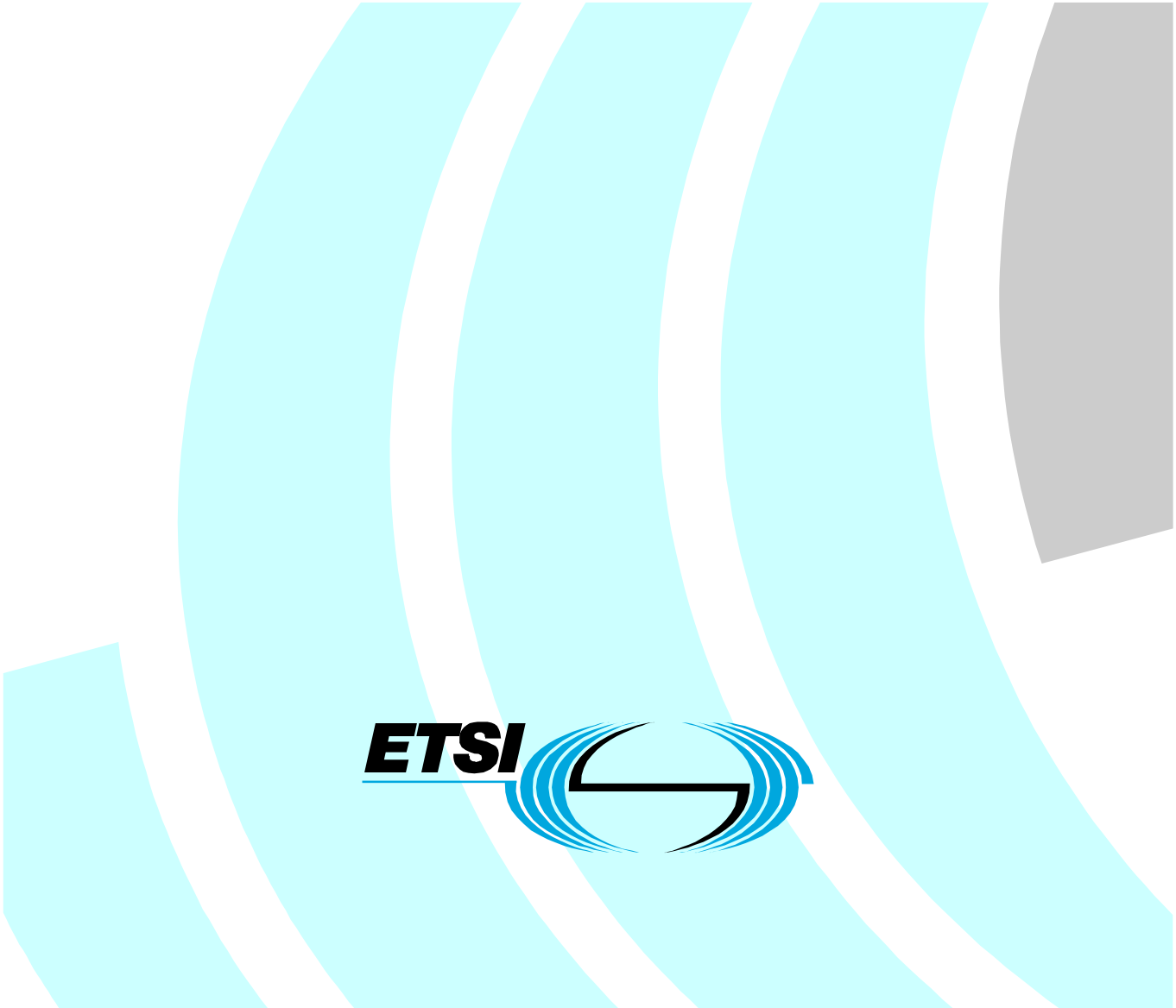
# ETSI EN 301 461 V1.3.1 (2002-11)

*European Standard (Telecommunications series)*

**Fixed Radio Systems;**
**Point-to-point equipment;**
**High capacity fixed radio systems carrying SDH signals (2 x STM-1) in frequency bands with 40 MHz channel spacing and using Co-Channel Dual Polarized (CCDP) operation**



Reference
REN/TM-04140

Keywords
DRRS, point-to-point, radio, SDH, STM,
transmission, DFRS

***ETSI***

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

# Contents

# Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://webapp.etsi.org/IPR/home.asp).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

# Foreword

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

The present document introduces new classes and grades of equipments focused on applications with single or few channels per links, with or without the XPIC option, suitable for co-polar adjacent channel operation; typical for mobile networks infrastructures.

| **National transposition dates** | |
|---|---|
| Date of adoption of this EN: | 1 November 2002 |
| Date of latest announcement of this EN (doa): | 28 February 2003 |
| Date of latest publication of new National Standard or endorsement of this EN (dop/e): | 31 August 2003 |
| Date of withdrawal of any conflicting National Standard (dow): | 31 August 2003 |

# 1 Scope

The present document specifies the minimum performance parameters for a high capacity digital radio-relay system operating in frequency bands with 40 MHz channel spacing in the 4 GHz, 5 GHz, U6 GHz and 11 GHz bands. The channel capacity is 1 x STM 1 on each polarization that allows to transmit up to 2 × STM 1 signals in the same RF channel by using both polarizations in co-channel dual polarized (CCDP) mode of operation with cross-polar interference canceller techniques (XPIC).

The present document is also applicable to 1 x STM-1 ACCP systems operating with co-polar arrangement of 40 MHz for which the CCDP operation with XPIC is considered a non applicable option; for those systems the clauses relevant to XPIC operation (i.e. co-channel "internal" interference) are not applicable. These systems are intended for local high capacity links (e.g. mobile infrastructure connections) where few channels may be used by different operators) and the crowded environment may require co-polar operation on adjacent channels.

Recognizing the benefits from the industrial point of view, two different grades of system have been defined.

- Grade A: based on 30 MHz-like system technology (i.e. based on 128 states modulation) with reduced receiver BER threshold capability.
- Grade B: based on 40 MHz system technology (i.e. based on 64 states modulation) with improved receiver BER threshold capability.

It has to be noted that STM-1 systems can be grouped in order to offer an SDH interface higher than STM-1.

The area of application of these digital radio-relay systems is foreseen to be in trunk and access networks forming part of an SDH-network including optical rings.

Systems considered in the present document shall be able to respect ITU-R and ITU-T performance objectives.

The systems considered should operate in these networks having regard for existing hop length, which are considered to be normally up to about 30 km to 40 km for access and about 60 km for trunk networks, respectively. Hop lengths greater than this latter length are used in special applications.

The systems considered in the present document are intended to allow operation with respect to existing PDH systems using 16 QAM modulation and transmitting 140 Mbit/s applying a channel spacing of 40 MHz.

The parameters specified fall into two categories:

a) parameters that are required to provide compatibility between channels connected to the same antenna via a multichannel branching system, or channels on the same route connected to separate antennas;

NOTE: Due to the internal functionality of the XPIC, equipment operating on both polarization of the same channel is considered to form a single CCDP system.

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

The standardization deals with baseband, IF and RF characteristics relevant to SDH. Antenna/feeder system requirements are also considered for information to the reader, however antenna characteristics are generally covered in EN 300 833 [34].

Baseband interfaces have to be considered for STM-1 signals in accordance with ITU-T Recommendations G.707 [1] and G.957 [2]. PDH interfaces according to ITU-T Recommendation G.703 [3] for signals mapped into STM-1 signals according to ITU-T Recommendation G.707 [1] could be used.

Safety aspects will not be considered in the present document.