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Terrestrial Trunked Radio (TETRA); Conformance testing specification; Part 4: Protocol testing specification for Direct Mode Operation (DMO); Sub-part 12: Test Suite Structure and Test Purposes (TSS&TP) for Repeater type 2

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**Terrestrial Trunked Radio (TETRA);
Conformance testing specification;
Part 4: Protocol testing specification for
Direct Mode Operation (DMO);
Sub-part 12: Test Suite Structure
and Test Purposes (TSS&TP)
for Repeater type 2**

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TTCN**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
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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Project Terrestrial Trunked Radio (TETRA).

The present document had been submitted to Public Enquiry as ETS 300 394-4-12. During the processing for Vote it was converted into an EN.

The present document is part 4 of a multi-part deliverable covering Terrestrial Trunked Radio (TETRA); Conformance testing specification, as identified below:

- Part 1: "Radio";
- Part 2: "Protocol testing specification for Voice plus Data (V+D)";
- Part 3: "Protocol testing specification for Packet Data Optimized (PDO)";
- Part 4: "Protocol testing specification for Direct Mode Operation (DMO)";**
- Part 5: "Security".

National transposition dates

Date of adoption of this EN:	29 December 2000
Date of latest announcement of this EN (doa):	31 March 2001
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 September 2001
Date of withdrawal of any conflicting National Standard (dow):	30 September 2001

1 Scope

The present document contains the Test Suite Structure (TSS) and Test Purposes (TPs) to test the TETRA Direct Mode Operation (DMO) protocols. The present document is divided into several parts, each one dealing with a different set of layer 3 and layer 2 DMO protocols. This present part 4, sub-part 12 deals with TSS&TP for Direct Mode Repeater type 2 (DM-REP2) Air Interface protocol, data link layer 2 only, while part 4, sub-part 1 deals with TSS&TP for DM MS to MS protocol and part 4, sub-part 11 deals with DM-MS operating through Repeater type 2 (MS-REP2) Air Interface protocol.

Testing of security features is outside the scope of the present document.

The objective of this test specification is to provide a basis for approval tests for TETRA equipment giving a high probability of air interface inter-operability between different manufacturer's TETRA equipment.

The ISO/IEC standard for the methodology of conformance testing, ISO/IEC 9646-1 [3] and ISO/IEC 9646-2 [4], as well as the ETSI methodology for conformance testing, ETS 300 406 [5], are used as the basis for the test methodology.

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 EN 300 396-7: "Terrestrial Trunked Radio (TETRA); Technical requirements for Direct Mode Operation (DMO); Part 7: Type 2 repeater air interface".
<https://standards.iteh.ai/catalog/standards/sist/328531259f1845e499c25d67e1b697d5/sist-en-300-394-4-12-v1-1-1-2003>
- [2] ETSI EN 300 396-8-4: "Terrestrial Trunked Radio (TETRA); Technical requirements for Direct Mode Operation (DMO); Part 8: Protocol Implementation Conformance Statement (PICS) proforma specification; Sub-part 4: Type 2 repeater Air Interface (AI)".
- [3] ISO/IEC 9646-1 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".
(See also ITU-T Recommendation X.290).
- [4] ISO/IEC 9646-2 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract Test Suite specification".
(See also CCITT Recommendation X.291).
- [5] ETSI ETS 300 406 (1995): "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".
- [6] ETSI EN 300 396-8-2: "Terrestrial Trunked Radio (TETRA); Technical requirements for Direct Mode Operation (DMO); Part 8: Protocol Implementation Conformance Statement (PICS) proforma specification; Sub-part 2: Type 1 repeater Air Interface (AI)".

3 Definitions and abbreviations

3.1 TETRA definitions

For the purposes of the present document, the terms and definitions given in EN 300 396-7 [1] apply.

3.2 ISO/IEC 9646 abbreviations

For the purposes of the present document, the following ISO/IEC 9646-1 [3] abbreviations apply:

ICS	Implementation Conformance Statement
IUT	Implementation Under Test
IXIT	Implementation eXtra Information for Testing
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
TP	Test Purpose
TSS	Test Suite Structure

3.3 TETRA abbreviations

For the purposes of the present document, the following TETRA abbreviations apply:

CM	Circuit Mode
DMO	Direct Mode of Operation
MAC	Medium Access Control
MS	Mobile Station
RX	Receiver
SDS	Short Data Services
SDU	Service Data Unit

4 Test Suite Structure (TSS)

4.1 MAC layer test groups

The first level of the MAC test groups separates the MAC test suite in functional test groups: CA, BV, BI and TI.

The following list defines the MAC layer test group names and identifiers:

- DM-REP2 MAC layer (DMO_DMREP2_MAC)
 - Capability tests (CA)
 - Valid behaviour tests (BV)
 - Invalid behaviour tests (BI)
 - Timer tests (TI)

4.2 Test group description

Capability (CA) tests provide limited testing that the observable capabilities of the IUT are in accordance with the conformance requirements and the additional capabilities claimed in the PICS/PIXIT.

The Valid Behaviour (BV) group tests an IUT in response to valid behaviour of the test system. "Valid" means that a test event is syntactically and contextually correct. All test cases in the valid behaviour group are intended to verify as thoroughly as possible the various functions of the protocol.

Different timers are defined to supervise the various state transitions. The Timer (TI) test group is intended to verify that the IUT is reacting properly to an expiry of one of the timers or to a counter mismatch.

5 Introduction to Test Purposes (TPs)

The test purposes are defined in clause 6 of the present document for MAC layer.

5.1 Test purpose definition conventions

Each TP is described using text presented in a table.

Table 1 contains the following information.

Table 1

TP-Name	The TP name is a unique identifier, specified according to the TP naming conventions defined in the clause below. (it is also the name of the corresponding test case)	Requirement ref: reference to the clause number of specification EN 300 396-7 [1] stating this conformance requirement. For example: EN 300 396-7 [1], 6.2.5.1
Purpose	purpose of the test itself, indicating for example the test performed against a requirement of the protocol, described by this test purpose. Example: test of changeover initiated from RX reservation state	
Selection cond	expression based on EN 300 396-8-4 [2] PICS statements, used to select or deselect the corresponding test case according to the options of the implementation.	
Test description	body of the test	
Pass criteria	visible action to be observed at PCO to declare that the IUT passes the test and conforms to the specifications	
Preamble	"None" or name of the preamble procedure bringing the IUT from idle state to the state required to run the test.	
Postamble	"None" or name of the postamble to bring the IUT back to idle state.	

5.2 Test purpose naming conventions

The identifier of a test purpose is built according to table 2.

Table 2: Test purpose naming convention

DMO/	<ts>/<tt>/<nn>		
<ts>	= test suite type	DMREP2	DM Repeater type 2
<tt>	= Type of testing	CA	Capability Tests
		BV	Valid Behaviour Tests
		BI	Invalid Behaviour Tests
		TI	Timer expiry and counter mismatch tests
<nn>	= sequential number	01-99	Test Purpose Number