



SLOVENSKI STANDARD
SIST EN 300 394-4-5 V1.1.1:2003
01-december-2003

Prizemni snopovni radio (TETRA) - Specifikacija za preskušanje skladnosti - 4. del: Specifikacija za preskušanje protokola za neposredno obratovanje (DMO) -- 5. poddel: Abstraktni preskušalni niz (ATS) za ponavljalnik (repetitor) mobilne postaje tipa 1

Terrestrial Trunked Radio (TETRA); Conformance testing specification; Part 4: Protocol testing specification for Direct Mode Operation (DMO); Sub-part 5: Abstract Test Suite (ATS) for Mobile Station (MS) Repeater type 1

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 300 394-4-5 V1.1.1:2003](https://standards.iteh.ai/catalog/standards/sist/a5a3d830-f551-4a8d-91d3-d53daeb92ca7/sist-en-300-394-4-5-v1-1-1-2003)
<https://standards.iteh.ai/catalog/standards/sist/a5a3d830-f551-4a8d-91d3-d53daeb92ca7/sist-en-300-394-4-5-v1-1-1-2003>

Ta slovenski standard je istoveten z: EN 300 394-4-5 Version 1.1.1

ICS:

33.070.10	Prizemni snopovni radio (TETRA)	Terrestrial Trunked Radio (TETRA)
-----------	---------------------------------	-----------------------------------

SIST EN 300 394-4-5 V1.1.1:2003 **en**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 300 394-4-5 V1.1.1:2003

<https://standards.iteh.ai/catalog/standards/sist/a5a3d830-f551-4a8d-91d3-d53daeb92ca7/sist-en-300-394-4-5-v1-1-1-2003>

ETSI EN 300 394-4-5 V1.1.1 (2001-01)

European Standard (Telecommunications series)

**Terrestrial Trunked Radio (TETRA);
Conformance testing specification;
Part 4: Protocol testing specification for
Direct Mode Operation (DMO);
Sub-part 5: Abstract Test Suite (ATS) for
Mobile Station (MS) Repeater type 1**

**iTeh STANDARD PREVIEW
(standards.iteh.ai)**

[SIST EN 300 394-4-5 V1.1.1:2003](https://standards.iteh.ai/catalog/standards/sist/a5a3d830-f551-4a8d-91d3-d53daeb92ca7/sist-en-300-394-4-5-v1-1-1-2003)

<https://standards.iteh.ai/catalog/standards/sist/a5a3d830-f551-4a8d-91d3-d53daeb92ca7/sist-en-300-394-4-5-v1-1-1-2003>



Reference

DEN/TETRA-02009-4-5

KeywordsTETRA, DMO, protocol, testing, TTCN, ATS,
PIXIT, radio**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

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 300 394-4-5 V1.1.1:2003](https://standards.iteh.ai/catalog/standards/sist/a5a3d830-f551-4a8d-91d3-d53daeb92ca7/sist-en-300-394-4-5-v1-1-1-2003)<https://standards.iteh.ai/catalog/standards/sist/a5a3d830-f551-4a8d-91d3-d53daeb92ca7/sist-en-300-394-4-5-v1-1-1-2003>

Important notice

Individual copies of the present document can be downloaded from:

<http://www.etsi.org>

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at <http://www.etsi.org/tb/status/>

If you find errors in the present document, send your comment to:
editor@etsi.fr

Copyright Notification

No part may be reproduced except as authorized by written permission.
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2001.
All rights reserved.

Contents

Intellectual Property Rights	5
Foreword.....	5
1 Scope.....	6
2 References.....	6
3 Definitions and abbreviations.....	7
3.1 TETRA definitions.....	7
3.2 TETRA abbreviations.....	7
3.3 ISO 9646 definitions.....	7
3.4 ISO 9646 abbreviations	7
4 Abstract Test Method (ATM).....	8
4.1 ATM for the MS-REPI MAC ATS.....	8
4.1.1 Lower Tester (LT).....	8
4.1.2 Upper Tester (UT).....	8
4.1.3 Test Co-ordination Procedures (TCP).....	9
4.1.4 Point of Control and Observation (PCO).....	9
4.2 ATM for the MS-REPI DMCC ATS	9
4.2.1 Lower Tester (LT).....	10
4.2.2 Upper Tester (UT).....	10
4.2.3 Test Co-ordination Procedures (TCP).....	10
4.2.4 Point of Control and Observation (PCO).....	10
5 ATS conventions	10
5.1 Naming conventions.....	10
5.1.1 Declarations part.....	10
5.1.1.1 Test suite type and structured type definitions.....	10
5.1.1.2 Test suite operations definitions.....	10
5.1.1.3 Test suite parameter declarations.....	11
5.1.1.4 Test case selection expression definitions.....	11
5.1.1.5 Test suite constant declarations.....	11
5.1.1.6 Test suite variable declarations.....	11
5.1.1.7 Test case variable declarations	11
5.1.1.8 PCO declarations.....	11
5.1.1.9 Timer declarations	11
5.1.1.10 ASP type definitions.....	12
5.1.1.11 PDU type definitions	12
5.1.1.12 Alias definitions	12
5.1.2 Constraints part.....	12
5.1.3 Dynamic part.....	13
5.1.3.1 Test case identifier.....	13
5.1.3.2 Test step identifier	13
5.1.3.3 Default identifier	13
5.2 TC and TP naming	13
Annex A (normative): ATS for TETRA DMO MS-REPI.....	14
A.1 Abstract Test Suite (ATS) for TETRA DMO MS-REPI MAC protocol	14
A.1.1 The TTCN Graphical form (TTCN.GR).....	14
A.1.2 The TTCN Machine Processable form (TTCN.MP)	14
A.2 ATS for TETRA DMO MS-REPI DMCC protocol.....	14
A.2.1 The TTCN Graphical form (TTCN.GR).....	14
A.2.2 The TTCN Machine Processable form (TTCN.MP)	14

Annex B (normative):	Partial PIXIT proforma for TETRA DMO MS-REP1 protocol	15
B.1	Partial PIXIT proforma for TETRA DMO MS-REP1 MAC layer protocol.....	15
B.1.1	Identification summary.....	15
B.1.2	ATS summary.....	15
B.1.3	Test laboratory.....	15
B.1.4	Client identification.....	15
B.1.5	SUT.....	16
B.1.6	Protocol layer information.....	16
B.1.6.1	Protocol identification.....	16
B.1.6.2	IUT information.....	16
B.1.6.2.1	Implicit send events.....	16
B.1.6.2.2	Parameter values.....	17
B.2	Partial PIXIT proforma for TETRA DMO MS-REP1 DMCC protocol.....	18
B.2.1	Identification summary.....	18
B.2.2	ATS summary.....	18
B.2.3	Test laboratory.....	18
B.2.4	Client identification.....	18
B.2.5	SUT.....	19
B.2.6	Protocol layer information.....	19
B.2.6.1	Protocol identification.....	19
B.2.6.2	IUT information.....	19
B.2.6.2.1	Implicit send events.....	19
B.2.6.2.2	Parameter values.....	20
Annex C (normative):	Protocol Conformance Test Report (PCTR) proforma for TETRA	
	DMO MS-REP1 protocol.....	22
C.1	PCTR proforma for TETRA DMO MS-REP1 MAC layer protocol.....	22
C.1.1	Identification summary.....	22
C.1.1.1	Protocol conformance test report.....	22
C.1.1.2	IUT identification.....	22
C.1.1.3	Testing environment.....	23
C.1.1.4	Limits and reservation.....	23
C.1.1.5	Comments.....	23
C.1.2	IUT conformance status.....	23
C.1.3	Static conformance summary.....	23
C.1.4	Dynamic conformance summary.....	24
C.1.5	Static conformance review report.....	24
C.1.6	Test campaign report.....	25
C.1.7	Observations.....	25
C.2	PCTR proforma for TETRA DMO MS-REP1 DMCC layer protocol.....	26
C.2.1	Identification summary.....	26
C.2.1.1	Protocol conformance test report.....	26
C.2.1.2	IUT identification.....	26
C.2.1.3	Testing environment.....	26
C.2.1.4	Limits and reservation.....	26
C.2.1.5	Comments.....	27
C.2.2	IUT conformance status.....	27
C.2.3	Static conformance summary.....	27
C.2.4	Dynamic conformance summary.....	27
C.2.5	Static conformance review report.....	27
C.2.6	Test campaign report.....	28
C.2.7	Observations.....	29
History	30

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://www.etsi.org/ipr>).

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 Project Terrestrial Trunked Radio (TETRA).

The present document had been submitted to Public Enquiry as ETS 300 394-4-5. During the processing for Vote it was converted into an EN.

The present document consists of the following parts:

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

SIST EN 300 394-4-5 V1.1.1:2003
<https://standards.iteh.ai/catalog/standards/sist/a5a3d830-f551-4a8d-91d3-d53daeb92ca7/sist-en-300-394-4-5-v1-1-1-2003>
National transposition dates

Date of adoption of this EN:	5 January 2001
Date of latest announcement of this EN (doa):	30 April 2001
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 October 2001
Date of withdrawal of any conflicting National Standard (dow):	31 October 2001

1 Scope

The present document contains the Abstract Test Suites (ATS) to test the TETRA Direct Mode Operation (DMO) Mobile Station Repeater Type 1 (MS-REP1) protocol at layer 3, called Direct Mode Call Control (DMCC) and the MS-Repeater type 1 protocol at layer 2, the Medium Access Control (MAC) protocol. The DMCC and MAC protocols are specified in ETS 300 396-3 [1] and in EN 300 396-4 [2]. The Test Suite Structure (TSS) and Test Purposes (TPs) for the two ATSS are defined in EN 300 394-4-3 [4].

The objective of the test specifications are to provide a basis for approval tests for TETRA DMO MS equipment supporting the Repeater Type 1 protocols, giving a high probability of air interface inter-operability between different manufacturer's TETRA equipment.

The ISO standard for the methodology of conformance testing, ISO/IEC 9646-1 [5], ISO/IEC 9646-2 [6], ISO/IEC 9646-3 [7] and ISO/IEC 9646-5 [8], as well as the ETSI rules for conformance testing, ETS 300 406 [9] and ETR 141 [10] are used as a basis for the test methodology.

Annex A provides the Tree and Tabular Combined Notation (TTCN) part of these two ATSS.

Annex B provides the Partial Protocol Implementation eXtra Information for Testing (PIXIT) Proforma of these two ATSS.

Annex C provides the Protocol Conformance Test Report (PCTR) Proforma of these ATSS.

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. <https://standards.iteh.ai/catalog/standards/sist/a5a3d830-f551-4a8d-91d3-d53daeb92ca7/sist-en-300-394-4-5-v1-1-1-2003>
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

- [1] ETSI ETS 300 396-3: "Terrestrial Trunked Radio (TETRA); Technical requirements for Direct Mode Operation (DMO); Part 3: Mobile Station to Mobile Station (MS-MS) Air Interface (AI) protocol".
- [2] ETSI EN 300 396-4: "Terrestrial Trunked Radio (TETRA); Technical requirements for Direct Mode Operation (DMO); Part 4: Type 1 repeater air interface".
- [3] ETSI EN 300 396-8-2: "Terrestrial Trunked Radio (TETRA); Direct Mode Operation (DMO); Part 8: Protocol Implementation Conformance Statement (PICS) proforma specification; Sub-part 2: Type 1 repeater Air Interface (AI)".
- [4] ETSI EN 300 394-4-3: "Terrestrial Trunked Radio (TETRA); Conformance testing specification; Part 4: Protocol testing specification for Direct Mode Operation (DMO); Sub-part 3: Test Suite Structure and Test Purposes (TSS&TP) for Mobile Station (MS) Repeater type 1".
- [5] 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 (1991)).
- [6] ISO/IEC 9646-2 (1994): "Information technology - Open Systems Interconnection - Conformance Testing Methodology and Framework - Part 2: Abstract Test Suite Specification". (See also ITU-T Recommendation X.291 (1991)).
- [7] ISO/IEC 9646-3 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 3: The tree and tabular combined notation". (See also ITU-T Recommendation X.292 (1992)).

- [8] ISO/IEC 9646-5 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 5: Requirements on test laboratories and clients for the conformance assessment process". (See also ITU-T Recommendation X.292 (1992)).
- [9] ETSI ETS 300 406: "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".
- [10] ETSI ETR 141: "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; The Tree and Tabular Combined Notation (TTCN) style guide".

3 Definitions and abbreviations

3.1 TETRA definitions

For the purposes of the present document, the terms and definitions given in EN 300 396-4 [2] apply.

3.2 TETRA abbreviations

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

DMCC	Direct Mode Call Control
DMO	Direct Mode Operation
MAC	Medium Access Control
MS	Mobile Station
MS-REP1	Mobile Station Repeater Type 1
SDS	Short Data Service
SDU	Service Data Unit

3.3 ISO 9646 definitions

For the purposes of the present document the following ISO/IEC 9646 definitions apply:

TTCN.GR	
TTCN.MP	
Protocol Conformance Test Report (PCTR)	
PCTR proforma	

3.4 ISO 9646 abbreviations

For the purposes of the present document the following ISO/IEC 9646-1 [5] abbreviations apply:

ASP	Abstract Service Primitive
ATM	Abstract Test Method
ATS	Abstract Test Suite
ICS	Implementation Conformance Statement
IUT	Implementation Under Test
IXIT	Implementation eXtra Information for Testing
LT	Lower Tester
MTC	Main Test Component
PCO	Point of Control and Observation
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statements
PIXIT	Protocol Implementation eXtra Information for Testing
PTC	Parallel Test Component
SAP	Service Access Point
SPyT	Single Party Testing
SUT	System Under Test

TC	Test Case
TP	Test Purpose
TSS	Test Suite Structure
TTCN	Tree and Tabular Combined Notation
UT	Upper Tester

For the purposes of the present document the following ISO/IEC 9646-5 [8] abbreviations apply:

PCTR	Protocol Conformance Test Report
------	----------------------------------

4 Abstract Test Method (ATM)

4.1 ATM for the MS-REP1 MAC ATS

This subclause describes the ATM used for testing the MS-REP1 MAC layer protocol of a Mobile Station Repeater Type 1 (MS-REP1). It is the embedded variant of the remote test method used in Single Party Testing (SPyT) context, as defined in ISO/IEC 9646-2 [6], clause 11. This test method has been selected, because:

- this test method implies no specific requirements from the Implementation Under Test (IUT);
- the upper Service Access Point (SAP) of the IUT cannot be directly observed;
- the variety of the possible TETRA implementations is a serious technical obstacle for the adoption of a different ATM;
- this test method places minimum limitations in the realization of conformance testing.

The selected test method is illustrated in figure .

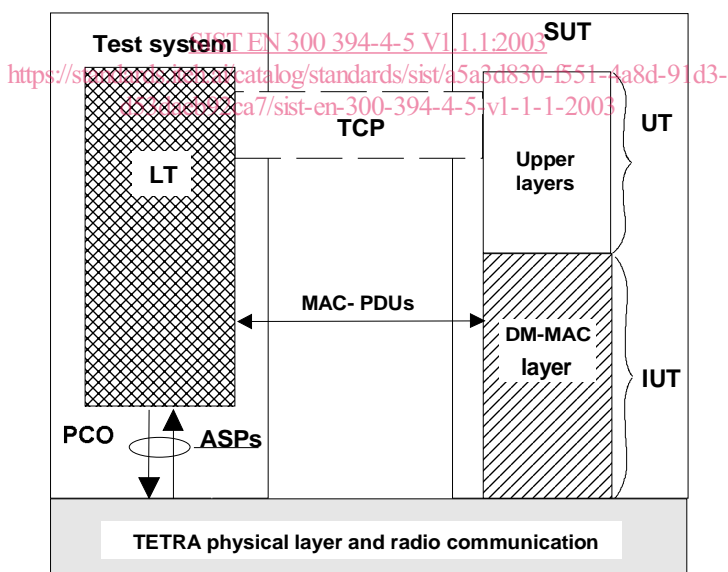


Figure 1: Remote SPyT test method for TETRA DMO MS-REP1 MAC layer

4.1.1 Lower Tester (LT)

A LT is located in a remote TETRA test system. It controls and observes the behaviour of the IUT.

4.1.2 Upper Tester (UT)

There is no explicit UT in the remote test method, but the layers above inside the System Under Test (SUT) are used implicitly for testing the DM-MAC layer.

4.1.3 Test Co-ordination Procedures (TCP)

The implicit send events defined by the provider of an implementation in annex B serve the purpose of the TCP. They are used as an input to the IUT communicating with the UT to initiate test events at the MS-REP1 MAC layer.

4.1.4 Point of Control and Observation (PCO)

All test events at the PCO carrying service user data are specified in terms of MAC layer PDUs. Only few Abstract Service Primitives (ASPs) are defined for control or observation purposes. The mapping of the MAC PDUs into the physical layer frame structure is left to the test implementation.

4.2 ATM for the MS-REP1 DMCC ATS

This clause describes the ATM used for testing the DMCC protocol of a MS-REP1. The selected method is the embedded variant of the remote test method used in Single Party Testing (SPyT) context, as defined in ISO/IEC 9646-2 [6], clause 11. This test method has been selected, because:

- this test method implies no specific requirements from the Implementation Under Test (IUT);
- the upper Service Access Point (SAP) of the IUT cannot be directly observed;
- the variety of the possible TETRA implementations is a serious technical obstacle for the adoption of a different ATM;
- this test method places minimum limitations in the realization of conformance testing.

The selected test method is illustrated in figure 2.

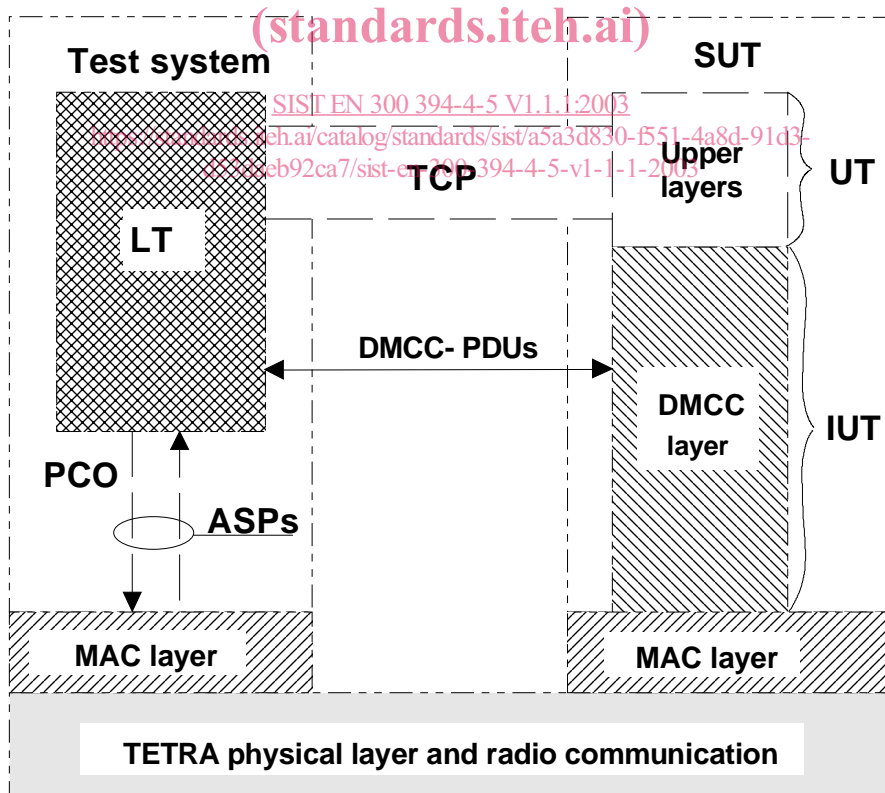


Figure 2: Remote single party test method for TETRA MS-REP1 DMCC protocol

4.2.1 Lower Tester (LT)

A LT is located in a remote TETRA test system. It controls and observes the behaviour of the IUT.

4.2.2 Upper Tester (UT)

There is no explicit UT in the remote test method, but the TETRA MS-REPI DMCC and the layers above inside the System Under Test (SUT) are used implicitly for testing the DMCC layer.

4.2.3 Test Co-ordination Procedures (TCP)

The implicit send events defined by the provider of an implementation in annex B serve the purpose of the TCP. They are used as an input to the IUT communicating with the UT to initiate test events at the DMCC protocol layer.

4.2.4 Point of Control and Observation (PCO)

The PCO is located inside the protocol.

All test events at the PCO carrying service user data is specified in terms of PDUs. The mapping of the PDUs to possible Medium Access Control (MAC) layer service primitives is left to the test implementation.

5 ATS conventions

This clause describes the conventions applied to define the two ATSS and gives the naming conventions chosen for the different elements of the ATSS.

The ATS conventions are intended to give a better understanding of the ATS but they describe also the conventions made for the development of the ATS, thus for any later maintenance purposes or further development of the ATS, the conventions described in this clause shall be considered.

<https://standards.iteh.ai/catalog/standards/sist/a5a3d830-f551-4a8d-91d3-d53daeb92ca7/sist-en-300-394-4-5-v1-1-1-2003>

5.1 Naming conventions

5.1.1 Declarations part

This subclause describes the naming conventions chosen for the elements of the ATS declarations part.

5.1.1.1 Test suite type and structured type definitions

The test suite type and test suite structured type identifiers describe the information elements, and each whole word included in the name is written in lowercase starting by an uppercase letter:

EXAMPLE: Priority_Level_Type simple type;
 SSI_Type simple type;
 ITSI_Type structured type.

In the case an abbreviation is included in the declaration name, there is an underscore ("_") before and/or after it, separating it from the rest of the identifier. This rule with abbreviations apply to all the naming conventions in the whole test suite.

5.1.1.2 Test suite operations definitions

The test suite operation identifiers are composed of strings in uppercase letters starting by the uppercase string "TSO_". The different strings in the definition are separated with underscores.

EXAMPLE: TSO_ACTIVE_IND_CALL_OCCUPATION_REPI_MS.