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**Digital Enhanced Cordless Telecommunications (DECT);  
Common Interface (CI) Test Case Library (TCL);  
Part 2: Abstract Test Suite (ATS) for Medium Access Control  
(MAC) layer - Portable radio Termination (PT)**

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## Foreword

This final draft second edition European Telecommunication Standard (ETS) has been produced by the Digital Enhanced Cordless Telecommunications (DECT) Project of the European Telecommunications Standards Institute (ETSI), and is now submitted for the Voting phase of the ETSI standards approval procedure.

This ETS comprises nine parts, as follows:

- Part 1: "Test Suite Structure (TSS) and Test Purposes (TP) for Medium Access Control (MAC) layer";
- Part 2: "Abstract Test Suite (ATS) for Medium Access Control (MAC) layer - Portable radio Termination (PT)";**
- Part 3: "Abstract Test Suite (ATS) for Medium Access Control (MAC) layer - Fixed radio Termination (FT)";
- Part 4: "Test Suite Structure (TSS) and Test Purposes (TP) - Data Link Control (DLC) layer";
- Part 5: "Abstract Test Suite (ATS) - Data Link Control (DLC) layer";
- Part 6: "Test Suite Structure (TSS) and Test Purposes (TP) - Network (NWK) layer - Portable radio Termination (PT)";
- Part 7: "Abstract Test Suite (ATS) for Network (NWK) layer - Portable radio Termination (PT)";
- Part 8: "Test Suite Structure (TSS) and Test Purposes (TP) - Network (NWK) layer - Fixed radio Termination (FT)";
- Part 9: "Abstract Test Suite (ATS) for Network (NWK) layer - Fixed radio Termination (FT)".

| <b>Proposed transposition dates</b>   |                                 |
|---|---------------------------------|
| Date of latest announcement of this ETS (doa):  | 3 months after ETSI publication |
| Date of latest publication of new National Standard or endorsement of this ETS (dop/e): | 6 months after doa              |
| Date of withdrawal of any conflicting National Standard (dow):                          | 6 months after doa              |

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## 1 Scope

This European Telecommunication Standard (ETS) contains the Abstract Test Suite (ATS) to test the DECT Portable Part (PP) Medium Access Control (MAC) layer.

The objective of this test specification is to provide a basis for approval tests for DECT equipment giving a high probability of air interface inter-operability between different manufacturer's DECT equipment. This test specification contains the ATS specification for testing of the MAC layer at the Portable radio Termination (PT).

The ISO standard for the methodology of conformance testing (ISO/IEC 9646, parts 1 to 7 [13] to [19]) as well as the ETSI rules for conformance testing in ETS 300 406 [9] are used as the basis for the test methodology.

Test specifications for the Physical Layer (PHL) are provided in other DECT ETSs.

Annex A provides the Tree and Tabular Combined Notation (TTCN) part of this ATS.

Annex B provides the specification of the parallel test component LT\_MAC.

Annex C provides the Partial Protocol Implementation Extra Information for Testing (PIXIT) Proforma of this ATS.

Annex D provides the Protocol Conformance Test Report (PCTR) Proforma of this ATS.

## 2 Normative references

This ETS incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] ETS 300 175-1: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview".
- [2] ETS 300 175-2: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 2: Physical layer (PHL)".
- [3] ETS 300 175-3: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer".
- [4] ETS 300 175-4: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 4: Data Link Control (DLC) layer".
- [5] ETS 300 175-5: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 5: Network (NWK) layer".
- [6] ETS 300 175-6: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 6: Identities and addressing".
- [7] ETS 300 175-7: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 7: Security features".
- [8] ETS 300 175-8: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 8: Speech coding and transmission".
- [9] ETS 300 406: "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

- [10] ETS 300 474: "Digital Enhanced Cordless Telecommunications (DECT); Generic Access Profile (GAP); Profile requirement list and profile specific Implementation Conformance Statement (ICS) proforma".
- [11] ETS 300 497-1: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI) Test Case Library (TCL); Part 1: Test Suite Structure (TSS) and Test Purposes (TP) for Medium Access Control (MAC) layer".
- [12] ETS 300 497-5: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI) Test Case Library (TCL); Part 5: Abstract Test Suite (ATS) - Data Link Control (DLC) layer".
- [13] ISO/IEC 9646-1 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts". (See also CCITT Recommendation X.290 (1991)).
- [14] ISO/IEC 9646-2 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract test suite specification". (See also CCITT Recommendation X.291 (1991)).
- [15] ISO/IEC 9646-3 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 3: The tree and tabular combined notation". (See also CCITT Recommendation X.292 (1992)).
- [16] ISO/IEC 9646-4 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 4: Test realisation". (See also CCITT Recommendation X.292 (1992)).
- [17] ISO/IEC 9646-5 (1991): "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 CCITT Recommendation X.292 (1992)).
- [18] ISO/IEC 9646-6 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 6: Protocol profile test specification".
- [19] ISO/IEC 9646-7 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation conformance statement".
- [20] 91/263/EEC: "Council Directive of 29 April 1991 on the approximation of the laws of the Member States concerning telecommunications terminal equipment, including the mutual recognition of their conformity" (Terminal Directive).
- [21] TBR 6: "Digital Enhanced Cordless Telecommunications (DECT); General terminal attachment requirements".
- [22] TBR 10: "Digital Enhanced Cordless Telecommunications (DECT); General terminal attachment requirements; Telephony applications".
- [23] TBR 11 (1992): "Attachment requirements for terminal equipment for Digital European Cordless Telecommunications (DECT) Public Access Profile (PAP) applications".
- [24] TBR 22: "Attachment requirements for terminal equipment for Digital Enhanced Cordless Telecommunications (DECT) Generic Access Profile (GAP) applications".



### 3 Definitions and abbreviations

#### 3.1 Definitions

For the purposes of this part of this ETS, the definitions given in ISO/IEC 9646-1 [13] and ETS 300 175-1 [1] apply.

#### 3.2 Abbreviations

For the purpose of this part of this ETS, the following abbreviations apply:

|       |   |
|-------|---|
| ASP   | Abstract Service Primitive                            |
| ATM   | Abstract Test Method                                  |
| ATS   | Abstract Test Suite                                   |
| BI    | Invalid Behaviour                                     |
| BO    | Inopportune Behaviour                                 |
| BV    | Valid Behaviour                                       |
| CA    | Capability tests                                      |
| CM    | Co-ordination Message                                 |
| CP    | Co-ordination Point                                   |
| DECT  | Digital Enhanced Cordless Telecommunication           |
| DLC   | Data Link Control                                     |
| FT    | Fixed radio Termination                               |
| IUT   | Implementation Under Test                             |
| LT    | Lower Tester  |
| MAC   | Medium Access Control                                 |
| MTC   | Main Test Component                                   |
| PCO   | Point of Control and Observation                      |
| PDU   | Protocol Data Unit                                    |
| PHL   | Physical Layer  |
| PICS  | Protocol Implementation Conformance Statement         |
| PIXIT | Protocol Implementation Extra Information for Testing |
| PT    | Portable radio Termination                            |
| PTC   | Parallel Test Component                               |
| SAP   | Service Access Point                                  |
| SUT   | System Under Test                                     |
| TP    | Test Purposes   |
| TSS   | Test Suite Structure                                  |
| TTCN  | Tree and Tabular Combined Notation                    |
| UT    | Upper Tester  |

## 4 Abstract Test Method (ATM)

This clause describes the ATM used to test the DECT MAC layer protocol at the Portable radio Termination (PT).

### 4.1 Description of ATM

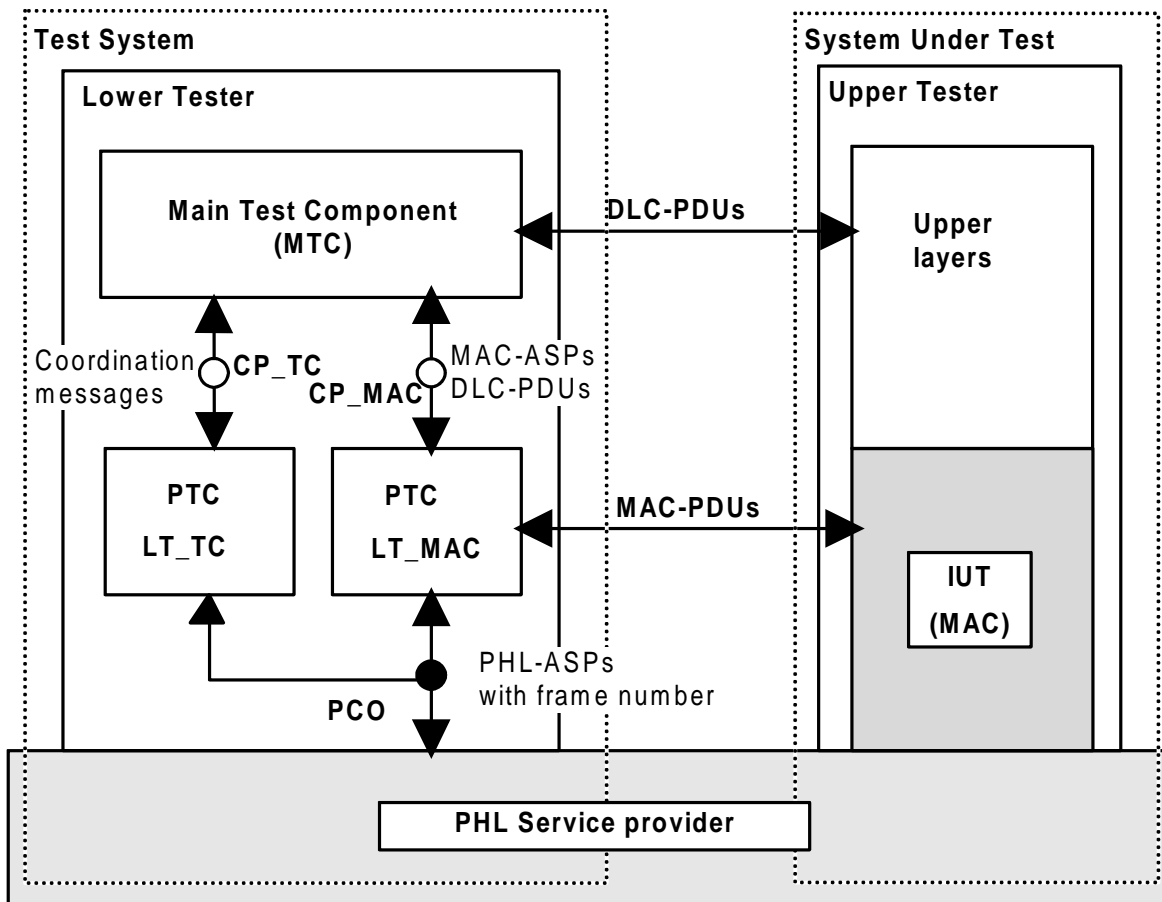


Figure 1: Remote test method, embedded variant

A single-party testing concept is used, which consists of the following abstract testing functions:

- PCO:** the Point of Control and Observation (PCO) for MAC Layer testing is located at the D-Service Access Point (D-SAP) between the MAC layer and the Physical layer. All test events at the PCO are specified in terms of Physical Layer - Abstract Service Primitives (PHL-ASPs) (frame number parameter added);
- CP\_TC:** Co-ordination Point Test Case (CP\_TC) is located between the Main Test Component (MTC) and Parallel Test Component (PTC) LT\_TC in the test system. It is used for passing co-ordination messages between these two testing functions;
- CP\_MAC:** Co-ordination Point MAC (CP\_MAC) is located between the MTC and PTC LT\_MAC in the test system. It is equivalent to the PCO used for Data Link Control (DLC) layer testing in part 6 of this ETS. All co-ordination messages at this CP are specified in terms of MAC-ASPs and DLC Protocol Data Units (DLC-PDUs);

**PTC LT\_TC:** the Lower Tester Parallel Test Component LT\_TC (PTC LT\_TC) is located in the test system. It makes restricted use of the PCO by only observing the test events in both directions. It assigns preliminary verdicts (the MTC assigns the final verdict);

**NOTE:** This restricted use of the PCO is a non-ISO/IEC 9646-2 [14] application of the PCO.

**PTC LT\_MAC:** The Lower Tester Parallel Test Component LT\_MAC (PTC LT\_MAC) is located in the test system. It provides indirect control and observation of the Implementation Under Test (IUT) during test execution, via the underlying service-provider. It does not assign any verdicts;

**MTC:** The Main Test Component (MTC) is located in the test system. It is responsible for creating and terminating the PTCs, managing the co-ordination points CP\_TC and CP\_MAC, and computation of the final test case verdict;

**Upper layers:** No explicit Upper Tester (UT) exists in the test system. However, the System Under Test (SUT) (upper layers) needs to carry out some UT functions to achieve some effects of test co-ordination procedures.

The primitives used at the PCO (physical SAP) are defined according to ETS 300 175-2 [2] clause 7 and associated subclauses.

The co-ordination messages used at CP\_MAC co-ordination point are abstract primitives including protocol data units and frames. The abstract primitives (MAC ASPs) are defined according to ETS 300 175-3 [3] clause 8 and associated subclauses. Two abstract primitives for starting and stopping the synchronization between the main test component and the parallel test component LT\_MAC are added for the needs of the tester. The protocol data units (DLC C-plane PDUs) are defined according to ETS 300 175-4 [4] clause 7 and associated subclauses. The frames (DLC U-plane frames) are defined according to ETS 300 175-4 [4] clause 12 and associated subclauses.

## 4.2 Test strategy

The ATM defined in subclause 4.1 requires the use of concurrent TTCN, which is specified in Amendment 1 of ISO/IEC 9646-3 [15]. The parallel test components PTC\_TC and PTC\_MAC are, however, seen as two independent entities. This means that there is no communication or synchronization between the two PTCs during the test.

PTC\_TC is specified in TTCN (see annex A). Since PTC\_TC is only observing at the PCO, this ATS does not contain any send statements. Once the Test Purposes (TP) are fulfilled, the PTC\_TC terminates, i.e. there are no post ambles, unless required by the TP. No explicit co-ordination messages is exchanged at CP\_TC. To simplify the TTCN test cases, the underlying service provider has been assigned the task of frame numbering. Consequently, a frame parameter has been added to some of the PHL-ASPs.

The requirements for PTC\_MAC (see annex B) are specified using ETS 300 474 [10].

The Main Test Component (MTC) creates the two PTCs (using CREATE operation), stimulates the PTC\_MAC (using MAC ASPs at CP\_MAC) and then waits for the two PTCs to terminate (using the DONE event). The final verdict is computed as follows:

- a PASS is assigned if PTC\_TC returns a PASS verdict and the expected event is received from PTC\_MAC at CP\_MAC;
- a FAIL verdict is assigned if PTC\_TC returns a FAIL verdict independently of what is received from PTC\_MAC at CP\_MAC;
- an INCONC verdict is assigned if: PTC\_TC returns an INCONC verdict and the expected event is received from PTC\_MAC at CP\_MAC, or returns a PASS verdict and an unexpected event is received from PTC\_MAC at CP\_MAC.

## 5 Untestable Test Purposes (TP)

This clause gives a list of TP which are not implemented in the ATS for PTC LT\_TC (see annex A) due to the chosen ATM or other restrictions.

**Table 1: Untestable TP**

| Test purpose | Reason   |
|--------------|--|
| TP/DB/BV-00  | It is not possible to distinguish, without confusion, if the PT is unlocked or crashed.  |
| TP/DB/BV-02  | It is no possible to distinguish, without confusion, if the PT is unlocked or crashed.   |
| TP/PG/BV-00  | No procedure can be defined to verify that the Fixed radio Termination (FT) manages correctly the paging Extended Flag when it transmit pages. |

## 6 ATS conventions (only applicable for PTC LT\_TC)

The ATS conventions are intended to give a better understanding of the ATS but they also describe the conventions made for the development of the ATS. These conventions shall be considered during any later maintenance or further development of the ATS.

The ATS conventions contain two clauses, the naming conventions and the implementation conventions. The naming conventions describe the structure of the naming of all ATS elements. The implementation conventions describe the functional structure of the ATS.

To define the ATS, the guidelines of the documents ETS 300 406 [9] and ETR 141 were considered.

### 6.1 Naming conventions

#### 6.1.1 Declarations part

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

##### 6.1.1.1 General

The following general rules apply for the name giving in the declarations part. All type definitions (simple type definitions, structured type definitions, ASP type definitions and PDU type definitions) shall be written in uppercase.

All element names (structured type definition), parameter names (ASP type definition) and field names (PDU type definition) shall be written in lowercase.

Predefined types (e.g. BITSTRING[8]) are never used in structured type definitions, ASP type definitions or PDU type definitions. Simple types are used instead.

All declarations in the test suite are listed in alphabetical order. A different order of listing should be used for only maintenance reasons.

##### 6.1.1.2 Test suite operations definition

The test suite operation identifiers are composed of substrings in lowercase letters, except for standard prefix "TSO\_". Each substring is separated by an underscore character ("\_").

EXAMPLE:                    TSO\_substring

### 6.1.1.3 Test suite parameter declarations

The test suite parameter identifiers are composed of substrings in lowercase letters, except for the standard prefix "TSP\_". Each substring is separated by an underscore character ("\_").

EXAMPLE 1: TSP\_t\_wait

If the test suite parameter references a Protocol Implementation Conformance Statement (PICS) item, the letter "C" is added to the standard prefix.

EXAMPLE 2: TSPC\_extended\_rf\_carriers

If the test suite parameter references a PIXIT item, the letter "X" is added to the standard prefix.

EXAMPLE 3: TSPX\_pmid

### 6.1.1.4 Test case selection expression definition

The test case selection expression identifiers are composed of substrings in lowercase letters, beginning with the prefix "TCS\_". Each substring is separated by an underscore character ("\_").

### 6.1.1.5 Test suite constant declarations

The test suite constant identifiers are composed of substrings in lowercase letters, except for the prefix "TSC\_". Each substring is separated by an underscore character ("\_").

If the test suite constant represents a system parameter, the complete name defined in the protocol ETS is used.

EXAMPLE: TSC\_n200

### 6.1.1.6 Test suite variable declarations

The test suite variable identifiers are composed of substrings in lowercase letters, except for the prefix "TSV\_". Each substring is separated by an underscore character ("\_").

Complete names as defined in the protocol ETS are used.

### 6.1.1.7 Test case variable declarations

The test case variable identifiers are composed of substrings in lowercase letters, except for the prefix "TCV\_". Each substring is separated by an underscore character ("\_").

Complete names as defined in the protocol ETS are used.

### 6.1.1.8 Timer declarations

Two types of timers can be identified:

- 1) standardised:
  - those defined in the protocol ETS, e.g. T201. They use exactly the same name as in the ETS.

As there is a tolerance margin accepted for these timers, three values are needed:

- the maximum value allowed, which will use the suffix "\_max";
- the minimum value allowed, which will use the suffix "\_min";
- the value actually implemented, with no suffix;

EXAMPLE 1: T201\_max, T201\_min, and T201.

2) not standardised:

- those not defined in the protocol ETS, i.e. for execution use, e.g. a timer waiting for a response. These timers begin with the prefix "T\_", followed by a string in lowercase letters.

EXAMPLE 2: T\_resp represents a timer for controlling the response time of the IUT.

#### **6.1.1.9 ASP type definitions**

The general conventions in subclause 6.1.1.1 applies.

The identifier of an ASP type uses the same name as the name defined in the protocol ETS.

EXAMPLE: PL\_TX\_REQ for an ASP containing a MAC layer PDU to the peer MAC layer (the IUT).

#### **6.1.1.10 PDU type definitions**

The general conventions in subclause 6.1.1.1 applies.

The PDU type identifier shall identify the related structure or type as defined in the protocol ETS.

EXAMPLE: A\_MT\_BASIC\_CONNECTION\_CONTROL

#### **6.1.1.11 Co-ordination Message (CM) type definitions**

The CM types are copied from the ASP types in ETS 300 497-5 [12] without modifications.

#### **6.1.1.12 Alias definitions**

Alias definitions are not used.

### **6.1.2 Constraints part**

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

#### **6.1.2.1 General**

Constraints shall be written with the first letter in uppercase, and the rest in lowercase.

The first part of the constraint declaration identifier name is equivalent to the corresponding type identifier used in the declaration part. The second part of the name describes the content of this constraint.

EXAMPLE: Declaration part: HEADER\_FIELD  
Constraint part: Header\_field\_nt\_no\_b

All constraints shall be listed in alphabetical order. If a different order of listing is maintained, the reason for doing so shall be specified.

### **6.1.3 Dynamic part**

This subclause describes the naming conventions used for the elements of the ATS dynamic part.

#### **6.1.3.1 General**

All test cases shall be listed in the order in which they appear in the Test Suite Structure (TSS) and TP document.

### 6.1.3.2 Test Case (TC) identifier

The identifier of the test case is built in the same way as for the test purpose described in ETS 300 497-1 [11], subclause 5.1.1, with the exception that "TP" is replaced by "TC\_PT" ("PT" for Portable radio Termination). The identifier of a TC is built according to table 2.

**Table 2: TC naming convention**

| Identifier: | TC_PT_<fm>_<x>_<nn>      |         |                          |
|-------------|--------------------------|---------|--------------------------|
|             | <fm> = functional module | DB      | Down link Broadcast      |
|             |                          | PG      | Paging services          |
|             |                          | NB      | Non Continuous Broadcast |
|             |                          | DC      | Down link Connectionless |
|             |                          | UC      | Uplink Connectionless    |
|             |                          | BS      | Bearer setup             |
|             |                          | CM      | Connection modification  |
|             |                          | BH      | Bearer handover          |
|             |                          | BR      | Bearer release           |
|             |                          | DT      | Data transfer            |
|             |                          | LM      | Layer Management         |
|             |                          | TM      | Test Messages            |
|             | <x> = Type of testing    | CA      | Capability Tests         |
|             |                          | BV      | Valid Behaviour Tests    |
|             |                          | BI      | Invalid Behaviour Tests  |
|             | <nn> = sequential number | (00-99) | Test purpose Number      |

EXAMPLE: TP identifier: TP/BS/CA-00  
TC identifier: TC\_PT\_BS\_CA\_00

### 6.1.3.3 Test step identifier

The test step identifier is built of substrings in lowercase letters, preceded by a string of uppercase letters. The substrings are joined by underscore characters. The first substring indicates the main function of the test step; e.g. PR for preamble, PO for postamble, LTS for local tree and STP for general test step. The second substring indicates the purpose of the step.

EXAMPLE: PO\_release\_bearer

### 6.1.3.4 Default identifier

The default identifiers begin with the prefix "DF\_", followed by a string in lowercase letters.

### 6.1.3.5 Label identifier

The identifiers in the label column is built according to table 3:

**Table 3: Naming convention for verdict assignment identifier**

| Identifier: | <Table><nn>              |         |                       |
|-------------|--------------------------|---------|-----------------------|
|             | <Table> = type of table  | TB      | Test Body             |
|             |                          | CS      | Check State test step |
|             |                          | DF      | Default               |
|             |                          | PO      | Postamble             |
|             |                          | PR      | Preamble              |
|             |                          | TS      | Test Step             |
|             | <nn> = sequential number | (00-99) | Label number          |

### 6.1.3.6 ATS abbreviations

These abbreviations are used to shorten identifier names:

|      |                 |
|------|-----------------|
| addr | address         |
| ack  | acknowledgement |
| bear | bearer          |
| cap  | capability      |
| cfm  | confirm         |
| chn  | channel         |
| con  | connection      |
| ctrl | control         |
| est  | establish       |
| ext  | extension       |
| id   | identification  |
| ind  | indication      |
| info | information     |
| max  | maximum         |
| min  | minimum         |
| par  | parameter       |
| prop | proprietary     |
| rel  | release         |
| req  | request         |
| rsp  | response        |
| std  | standard        |
| sys  | system          |

## 6.2 Implementation conventions

### 6.2.1 Declaration part

The comment line of single element TTCN tables (e.g. test suite constants) is used to give a reference where the format and content of the element is described in the relevant protocol ETSs. Any particularity of the element format or content is described in the comment line.

The comment line in the header of multi element TTCN tables (e.g. ASPs) is used to reference to the protocol ETS.

The detailed comments are used to describe any peculiarity of the table.

In the ASP, PDU, and CM declarations, the comments column is used to identify if a parameter (in ASPs) or field (in PDUs) is mandatory or optional:

- M: mandatory
- O: optional

In the ASP and PDU declarations the comments column is further used to give information about the parameter/field value, in particular if the parameter/field contains a fixed spare value.

### 6.2.2 Constraint part

The ASPs and PDUs are defined in a way that all relevant parameters/fields are parametrized. That improves the transparency of the constraints in the dynamic part, as all values which are relevant for the test are always present.

Generally no modified constraints are used. This allows an easier reuse and adaptation of constraints if they are reused in other test specifications.

The comment line of a constraint always contains a reference to the relevant protocol ETS.

The detailed comments footer is used to describe any peculiarity of the table.



### 6.2.3 Dynamic part

All events which are defined as a conformance requirement by the TP, causes a preliminary verdict PASS if the requirement is met.

All invalid events are handled in the default tree. Only FAIL or INCONC verdicts are assigned in the default tree.

The preamble, the test body and the postamble have different defaults, which allows a specific verdict handling, e.g. only INCONC verdicts are assigned in the preamble.

Except for local trees, test steps do not contain a default. Then there is no restrictions regarding the error handling.

All verdict assignments are labelled. According to ISO/IEC 9646-3 [15], annex E, clause E.2, labels should be written to the conformance log. This allows, for example, to identify where the test failed. To allow an exact identification of the table in which the verdict was assigned, the convention described in subclause 6.1.3.5 is applied.

To avoid deadlocks, the Parallel Test Components (PTC) LT\_TC and LT\_MAC shall always terminate.

TP which are listed in the untestable TP list in clause 5 are not considered in the ATS, thus these TC identifiers are missing in the ATS and the numbering of the TCs is not always continuous.

## **Annex A (normative):      Abstract Test Suite (ATS), PTC LT\_TC**

The ATS is written in TTCN according to ISO/IEC 9646-3 [15].

As the ATS was developed on a separate TTCN software tool and therefore the TTCN tables are not completely referenced in the contents table. The ATS itself contains a Test Suite Overview (TSO) part which provides additional information and references about the ATS.

NOTE:      According to ISO/IEC 9646-3 [15], in case of a conflict in interpretation of the operational semantics of TTCN.GR and TTCN.MP, the operational semantics of the TTCN.GR representation takes precedence.

### **A.1    The machine processable ATS (TTCN.MP)**

The electronic form of the machine processable file (TTCN MP format) corresponding to this ATS is contained in an ASCII text file (4972\_ev.MP (note)) associated with this ETS.

NOTE:      This file is located in a compressed archive file named 4972\_ev.LZH. Other file formats are available on request.

### **A.2    The graphical ATS (TTCN.GR)**

The electronic form of the graphical ATS (TTCN GR format) corresponding to this ATS is contained in an ASCII Postscript file (4972\_ev.PS (note)) associated with this ETS.

NOTE:      This file is located in a compressed archive file named 4972\_ev.LZH. Other file formats are available on request.

## Annex B (normative): Specification of PTC LT\_MAC

### B.1 General requirements

The PTC LT\_MAC (MAC emulation) shall, as a minimum, fulfil all requirements with profile status M in the profile Requirement List (profile RL) in ETS 300 474 [10], clause 7.

### B.2 Additional requirements

A number of commands have been defined to control the behaviour of PTC LT\_MAC (the MAC emulation). In annex A, these are implemented as a co-ordination message with a parameter to specify the required action. The test system shall support the actions specified in table B.1.

**Table B.1: Actions to be supported by the test system**

| Action       | Ref. to ETS 300 175-3 [3] | Requirement   |
|--------------|---------------------------|---|
| TSC_action2  | 6.2.5.1                   | Generate A field CRC error in NT messages.  |
| TSC_action4  | 11.5.1                    | Generate an incorrect message for RFPI handshake. Change the RFPI transmitted by the Lower Tester on all bearers to the IUT by inverting bits a16 to a23.   |
| TSC_action5  | 10.8.1.1                  | Acknowledge received Cs segment only after three receipt.   |
| TSC_action6  | 10.6.1                    | Allow bearer handover, broadcast an appropriate bearer handover information, wait 640 ms to let the IUT to recognise this and jam the currently occupied channel, {RF-carrier; slot} (to force an intracell bearer handover)  |
| TSC_action7  | 10.6.1                    | Power down the signal strength of the currently used RFP stepwise by TSPX_decay_rate dB/sec to force handover to a different RFP (intercell bearer handover).   |
| TSC_action8  | 10.5.1                    | Ignore any received "access_request" messages in basic bearer setup   |
| TSC_action9  | 10.5.1.1                  | When receiving an ACCESS_REQUEST message, send a WAIT message and then repeat doing this when receiving a WAIT message.   |
| TSC_action10 | 11.3.3                    | Transmit forever incorrect A-field CRC in frame 0 (Timer T207 testing).   |
| TSC_action11 | 7.2.4.3                   | Transmit blind slot information in a zero length page with only one slot available. This one available slot shall have a minimum distance of two slots to the dummy bearer of the LT.   |
| TSC_action12 | 7.2.4.3                   | Transmit "other bearer" or "dummy or C/L bearer position" twice to tell a new bearer position, which is a minimum distance of two slots from the old position, to the PP and release the old dummy bearer afterwards. In the moment of transmission of the new position there has to be a new active dummy bearer at the LT at the new position. Repeat this three times. |
|              |                           | (continued)   |

Table B.1 (concluded): Actions to be supported by the test system

| Action       | Ref. to ETS 300 175-3 [3] | Requirement   |
|--------------|---------------------------|---|
| TSC_action13 | 7.2.3.3                   | Transmit the extended RF carrier information QT message.  |
| TSC_action19 | 10.5.1                    | Ignore any received "bearer_handover_request" messages in bearer setup for handover.  |
| TSC_action20 | 10.5.1.1                  | Don't use wait for bearer setup.  |
| TSC_action21 | 10.5.1.1                  | Configure MAC layer to use one wait cycle during bearer setup.  |
| TSC_action22 | 10.5.1                    | Establish a dummy bearer using a free cell and an unused RPN.   |
| TSC_action23 | 7.2.4.3                   | Tranmit blind slot information for the position of the dummy bearers and the slots on either side of the dummy bearers on both cells. |
| TSC_action24 | 10.6                      | Ignore all intracell handover request received.   |
| TSC_start    | 11.3.2                    | Start test case synchronization.  |
| TSC_stop     | 11.5.1                    | Stop testcase synchronization.  |

NOTE: These actions are defined as test suite constants in the ATS (see annex A).

## Annex C (normative): Partial PIXIT proforma for DECT MAC

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the PIXIT proforma in this annex so that it can be used for its intended purposes and may further publish the completed PIXIT.

The PIXIT Proforma is based on ISO/IEC 9646-6. Any additional information needed can be found in this international standard document.

### C.1 Identification summary

Table C.1

|                       |  |
|-----------------------|--|
| PIXIT Number:         |  |
| Test Laboratory Name: |  |
| Date of Issue:        |  |
| Issued to:            |  |

### C.2 ATS summary

Table C.2

|                         |                        |
|-------------------------|------------------------|
| Protocol Specification: | ETS 300 175-3          |
| Protocol to be tested:  |                        |
| ATS Specification:      | ETS 300 497-2          |
| Abstract Test Method:   | ETS 300 497-2 clause 4 |

### C.3 Test laboratory

Table C.3

|                                 |  |
|---------------------------------|--|
| Test Laboratory Identification: |  |
| Test Laboratory Manager:        |  |
| Means of Testing:               |  |
| SAP Address:                    |  |

## C.4 Client identification

Table C.4

|                           |  |
|---------------------------|--|
| Client Identification:    |  |
| Client Test manager:      |  |
| Test Facilities required: |  |

## C.5 SUT

Table C.5

|                                  |  |
|----------------------------------|--|
| Name:                            |  |
| Version:                         |  |
| SCS Number:                      |  |
| Machine configuration:           |  |
| Operating System Identification: |  |
| IUT Identification:              |  |
| PICS Reference for IUT:          |  |
| Limitations of the SUT:          |  |
| Environmental Conditions:        |  |

## C.6 Protocol layer information

### C.6.1 Protocol identification

Table C.6

|                  |                                |
|------------------|--------------------------------|
| Name:            | DECT - MAC layer ETS 300 175-3 |
| Version:         |                                |
| PICS References: |                                |

## C.6.2 IUT information

Table C.7: Addresses

| Item | Parameter         | Parameter Type         | Explanation  | Value |
|------|-------------------|------------------------|--|-------|
| 1    | TSPX_ipui         | Bitstring              | International Portable User Identity (ETS 300 175-6 [6])                                   |       |
| 2    | TSPX_rfp1         | B_40 - (Bitstring[40]) | RFPI for RFP number 1 (ETS 300 175-6 [6])  |       |
| 3    | TSPX_rfp1_invalid | B_40 - (Bitstring[40]) | derived from item 2 RFPI for RFP number 1 with bit a16 to a23 inverted (ETS 300 175-6 [6]) |       |
| 4    | TSPX_rfp2         | B_40 - (Bitstring[40]) | RFPI for RFP number 2 (ETS 300 175-6 [6])  |       |

Table C.8: Parameter values

| Item | Parameter                  | Parameter Type | Explanation  | Value |
|------|----------------------------|----------------|--|-------|
| 1    | TSPX_dummy_bearer_duration | INTEGER        | Value of wait timer used to delay the test case after setting up a second dummy bearer in case of intercell handover testing                 |       |
| 2    | TSPX_intracell_behaviour   | INTEGER        | Value 0,1 for handling intracell bearer handover<br>0 = Normal tester behaviour<br>1 = force tester to ignore all intracell handover request |       |
| 3    | TSPX_decay_rate            | INTEGER        | Ramp gradient for power down the RFP power. Used for TSC_action7. Shall be between 0 and 10 dB/s   |       |

**Annex D (normative): Protocol Conformance Test Report (PCTR) proforma for DECT MAC**

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the PCTR proforma in this annex so that it can be used for its intended purposes and may further publish the completed PCTR.

The PCTR proforma is based on ISO/IEC 9646-6 [18]. Any additional information needed can be found in this document.

**D.1 Identification summary**

**D.1.1 Protocol conformance test report**

**Table D.1**

|                                 |  |
|---------------------------------|--|
| PCTR Number:                    |  |
| PCTR Date:                      |  |
| Corresponding SCTR Number:      |  |
| Corresponding SCTR Date:        |  |
| Test Laboratory Identification: |  |
| Test Laboratory Manager:        |  |
| Signature:                      |  |

**D.1.2 IUT identification**

**Table D.2**

|                         |  |
|-------------------------|--|
| Name:                   |  |
| Version:                |  |
| Protocol specification: |  |
| PICS:                   |  |
| Previous PCTR if any:   |  |



**D.1.3 Testing environment**

**Table D.3**

|                                      |   |
|--------------------------------------|---|
| PIXIT Number:                        |   |
| ATS Specification:                   |   |
| Abstract Test Method:                | Remote test method, Embedded variant with no UT |
| Means of Testing identification:     |   |
| Date of testing:                     |   |
| Conformance Log reference(s):        |   |
| Retention Date for Log reference(s): |   |

**D.1.4 Limits and reservation**

Additional information relevant to the technical contents or further use of the test report, or the rights and obligations of the test laboratory and the client, may be given here. Such information may include restriction on the publication of the report.

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**D.1.5 Comments**

Additional comments may be given by either the client or the test laboratory on any of the contents of the PCTR, for example, to note disagreement between the two parties.

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**D.2 IUT Conformance status**

This IUT has or has not been shown by conformance assessment to be non conforming to the specified protocol specification.

Strike the appropriate words in this sentence. If the PICS for this IUT is consistent with the static conformance requirements (as specified in clause D.3 in this report) and there are no "FAIL" verdicts to be recorded (in clause D.6 in this report) strike the words "has or", otherwise strike the words "or has not".

**D.3 Static conformance summary**

The PICS for this IUT is or is not consistent with the static conformance requirements in the specified protocol.

Strike the appropriate words in this sentence.

**D.4 Dynamic conformance summary**

The test campaign did or did not reveal errors in the IUT.

Strike the appropriate words in this sentence. If there are no "FAIL" verdicts to be recorded (in clause D.6 of this report) strike the words "did or" otherwise strike the words "or did not".

Summary of the results of groups of test:

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**D.5 Static conformance review report**

If clause D.3 indicates non-conformance, this subclause itemises the mismatches between the PICS and the static conformance requirements of the specified protocol specification.

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**D.6 Test campaign report**

Table D.4

| ATS Reference  | Selected? | Run?   | Verdict | Observations<br>(Reference to any observations made in clause 7) |
|----------------|-----------|--------|---------|--|
| TC_PT_BH_CA_00 | Yes/No    | Yes/No |         |  |
| TC_PT_BH_CA_01 | Yes/No    | Yes/No |         |  |
| TC_PT_BR_CA_00 | Yes/No    | Yes/No |         |  |
| TC_PT_BS_BV_00 | Yes/No    | Yes/No |         |  |
| TC_PT_BS_CA_00 | Yes/No    | Yes/No |         |  |
| TC_PT_BS_CA_01 | Yes/No    | Yes/No |         |  |
| TC_PT_DB_BV_01 | Yes/No    | Yes/No |         |  |

(continued)

Table D.4 (concluded)

| ATS Reference  | Selected? | Run?   | Verdict | Observations<br>(Reference to any observations<br>made in clause 7) |
|----------------|-----------|--------|---------|---|
| TC_PT_DT_BI_00 | Yes/No    | Yes/No |         |   |
| TC_PT_DT_CA_00 | Yes/No    | Yes/No |         |   |
| TC_PT_DT_CA_01 | Yes/No    | Yes/No |         |   |
| TC_PT_DT_CA_02 | Yes/No    | Yes/No |         |   |
| TC_PT_LM_CA_00 | Yes/No    | Yes/No |         |   |
| TC_PT_LM_CA_01 | Yes/No    | Yes/No |         |   |
| TC_PT_LM_CA_02 | Yes/No    | Yes/No |         |   |
| TC_PT_LM_CA_03 | Yes/No    | Yes/No |         |   |
| TC_PT_LM_CA_04 | Yes/No    | Yes/No |         |   |
| TC_PT_PG_BV_02 | Yes/No    | Yes/No |         |   |
| TC_PT_PG_BV_03 | Yes/No    | Yes/No |         |   |
| TC_PT_PG_CA_00 | Yes/No    | Yes/No |         |   |
| TC_PT_PG_CA_01 | Yes/No    | Yes/No |         |   |

**D.7 Observations**

Additional information relevant to the technical content of the PCTR is given here.

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## **Annex E (informative): Bibliography**

The following references are provided for information.

- 1) EWOS/ETSI Project Team No 5: "Project Report and Technical Report. OSI Conformance Testing Methodology and Procedures in Europe".
- 2) ETR 022: "Advanced Testing Methods (ATM); Vocabulary of terms used in communications protocols conformance testing".
- 3) ETR 141: "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; The Tree and Tabular Combined Notation (TTCN) style guide".
- 4) CEPT Recommendation T/SGT SF2 (89) 6/0: "Draft Recommendation T/SF Services and Facilities of Digital Enhanced Cordless Telecommunications".
- 5) ETR 015: "Digital Enhanced Cordless Telecommunications (DECT); Reference document".
- 6) ETR 041: "Transmission and Multiplexing (TM); Digital Enhanced Cordless Telecommunications (DECT); Transmission aspects 3,1 kHz telephony Interworking with other networks".
- 7) ETR 042: "Digital European Cordless Telecommunications (DECT); A Guide to DECT features that influence the traffic capacity and the maintenance of high radio link transmission quality, including the results of simulations".
- 8) ETR 043: "Digital European Cordless Telecommunications (DECT); Common interface; Services and facilities requirements specification".
- 9) ETR 056: "Digital European Cordless Telecommunications (DECT); System description document".

## History

| Document history |  |
|------------------|--|
| August 1996      | First Edition                                    |
| February 1997    | Public Enquiry PE 9724: 1997-02-14 to 1997-06-13 |
| November 1997    | Vote V 9803: 1997-11-18 to 1998-01-16            |
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|                  |  |