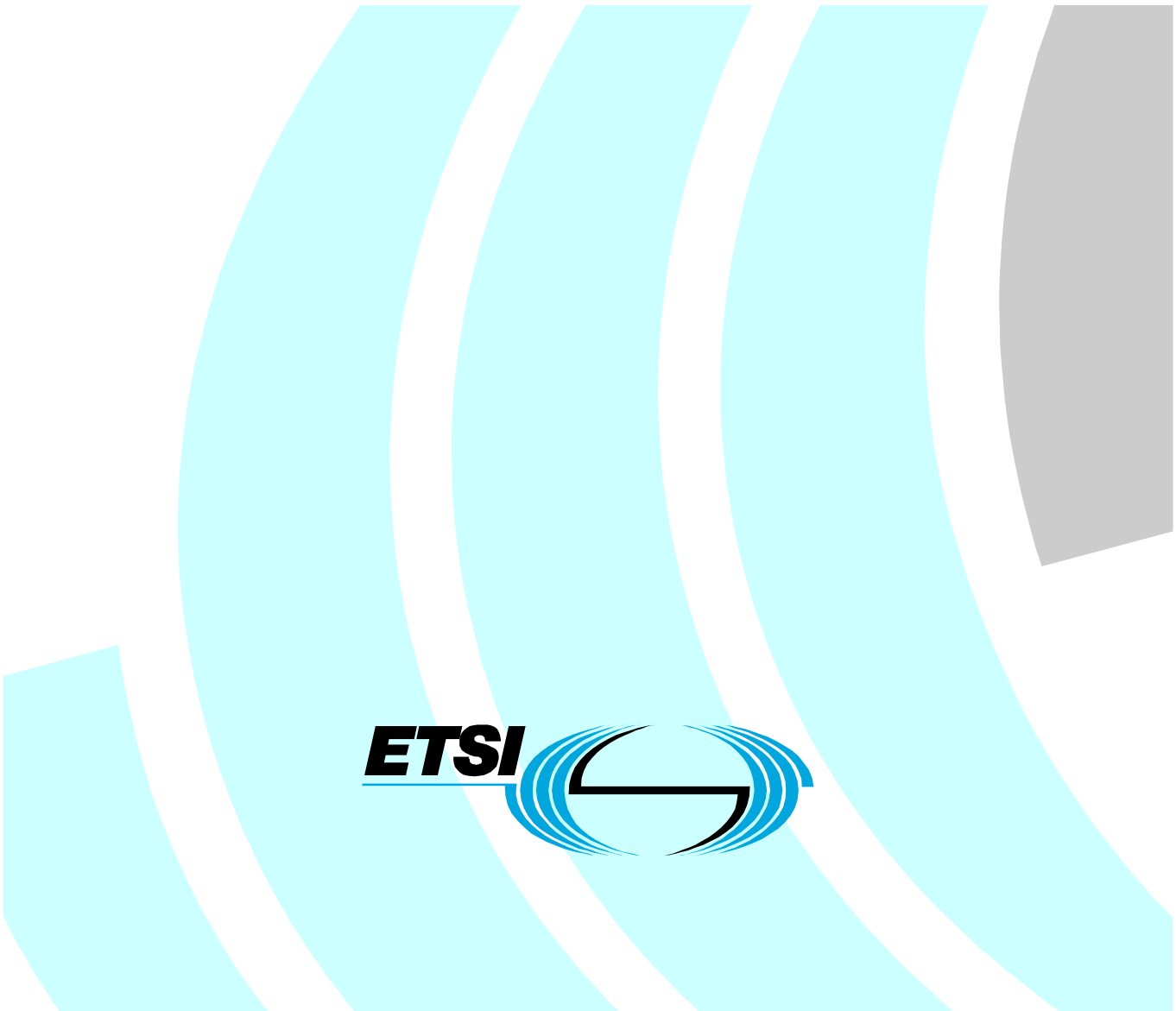
ETSI TS 102 362-2 V1.1.1 (2005-06)

Technical Specification

Electromagnetic compatibility and Radio spectrum Matters (ERM); Conformance testing for the Digital Mobile Radio (DMR); Part 2: Test Suite Structure and Test Purposes (TSS&TP) specification



Reference
DTS/ERM-TGDMR-053-2

Keywords
digital, PMR, radio, TSS&TP

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Sous-Préfecture de Grasse (06) N° 7803/88

Contents

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

The present document is part 2 of a multi-part deliverable covering the Electromagnetic compatibility and Radio spectrum Matters (ERM); Conformance testing for the Digital Mobile Radio (DMR), as identified below:

Part 1: "Protocol Implementation Conformance Statement (PICS) proforma";

Part 2: "Test Suite Structure and Test Purposes (TSS&TP) specification";

Part 3: "Abstract Test Suite (ATS) specification".

1 Scope

The present document contains the Test Suite Structure (TSS) and Test Purposes (TP) to test the ERM DMR Call Control Layer (CCL) and Data Link Layer (DLL).

The objective of the present document is to provide a basis for conformance tests for DMR equipment giving a high probability of air interface inter-operability between different manufacturers' DMR equipment.

The ISO standard for the methodology of conformance testing, ISO/IEC 9646-1 [5], the ETSI rules for conformance testing, ETS 300 406 [4], are used as a 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 and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

[1] ETSI TS 102 361-1 (V.1.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Technical Requirements for Digital Mobile Radio (DMR); Part 1: Air Interface (AI) protocol".

[2] ETSI TS 102 361-2 (V.1.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Technical Requirements for Digital Mobile Radio (DMR); Part 2: DMR voice and generic services and facilities".

[3] ETSI TS 102 362-1 (V1.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Conformance testing for the Digital Mobile Radio (DMR) air interface; Part 1: Protocol Conformance Implementation Statement (PICS) proforma".

[4] ETSI ETS 300 406: "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

[5] ISO/IEC 9646-1 (1991): "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 9646-7 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statement".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions defined in ISO/IEC 9646-7 [6], TS 102 361-1 [1] and TS 102 361-2 [2] apply.

3.2 Abbreviations

For the purposes of the present document, the abbreviations defined in ISO/IEC 9646-1 [5], ISO/IEC 9646-7 [6], TS 102 361-1 [1], TS 102 361-2 [2] and the following apply:

AC	All Call
BC	Broadcast Call
BDA	BS Downlink Activation
BS	Base Station

NOTE: A reference designating a fixed end device.

BV	Valid Behaviour
CA	Channel Access
CACH	Common Announcement CHannel
CC	Colour Code
CCL	Call Control Layer
CHT	Call HangTime
CR	CSBK Repeating
CRC	Cyclic Redundancy Checksum (for data error detection)
DLL	Data Link Layer
DM	Direct Mode
DMR	Digital Mobile Radio
EMB	EMBedded signalling
FEC	Forward Error Correction
FNS	Feature Not Supported
IC	Individual Call
IUT	Implementation Under Test
MS	Mobile Station

NOTE: A reference designating a mobile or portable radio.

OACSU	Off Air Call SetUp
OVCM	Open Voice Channel Mode
PDU	Protocol Data Unit
RM	Repeater Mode
ST	Slot Type
SYNC	SYNChronization
TACT	TDMA Access Channel Type
TI	TImer
TP	Test Purposes
TSS	Test Suite Structure
TT	Traffic Timing
UC	Unaddressed voice Call
VCR	Voice Call Repeating

4 Test Suite Structure (TSS)

4.1 TSS overview

Figure 1 shows the DMR Test Suite Structure (TSS) including its subgroups defined for the conformance testing.

Group	Protocol Layer	Service and Facilities	Sub-Function
BS			
	CCL		
		BS Downlink Activation	MS Initiating
		Voice Call Repeating	MS Initiating
		Voice Call Hangtime	MS Initiating
		CSBK Repeating	MS Initiating
		BS Downlink Deactivation	MS Initiating
		All Call Voice	MS Initiating
		Broadcast Call Voice	MS Initiating
	DLL		
		Synchronization	
		TDMA Access Channel Type	
		Slot Type	
		Traffic Timing	
		Cyclic Redundancy Checksum	
MS			
	CCL		
		Generic BS Service	MS Initiating
		Feature Not Supported	MS Terminating
		Group Call	
			MS Initiating
			MS Terminating
		Individual Call	
			MS Initiating
			MS Terminating
		Unaddressed Voice Call	MS Initiating
		All Call Voice	MS Initiating
		Broadcast Call Voice	MS Initiating
		Open Voice Channel Mode	
			MS Initiating
			MS Terminating
		Transmit timeout	MS Initiating
	DLL		
		Synchronization	
		Slot Type	
		Embedded Signalling	
		Channel Access	
			Direct Mode
			Repeater Mode
		Cyclic Redundancy Checksum	

Figure 1: TSS for Digital Mobile Radio

The test suite is structured as a tree with the root defined as DMR-BS or DMR-MS, representing the two protocol test groups "DMR for BS" or "DMR for MS".

4.2 Test groups

The test groups are organized in four levels. The first level defines two entity groups, one for BS and one for MS. The second level defines two protocol groups, one for CCL and one for DLL. In the third and fourth layer, the test groups are created differently based on the second layer respectively (refer to clauses 5.1.2 and 5.1.3).

4.2.1 Protocol groups

4.2.1.1 Call Control Layer (CCL)

The Call Control layer provides the following services and facilities:

- generic BS services;
- feature not supported signalling;
- individual call;
- group call;
- unaddressed voice call service;
- all call service;
- broadcast voice call service;
- open voice channel call service;
- transmit timeout.

4.2.1.2 Data Link Layer (DLL)

Data Link layer provides the following main functions:

- channel coding (FEC, CRC);
- interleaving, de-interleaving and bit ordering;
- acknowledgement and retry mechanism;
- media access control and channel management;
- framing, superframe building and synchronization;
- burst and parameter definition;
- link addressing (source and/or destination);
- interfacing of voice applications (vocoder data) with the physical layer;
- data bearer services;
- exchanging signalling and/or user data with the CCL.

The present document focuses on the DLL layer signalling and the related PDUs. Framing, interleaving, and corresponding lower level DLL functions are not tested.

4.2.2 Main test types

4.2.2.1 Valid Behaviour (BV) tests

This test group shall verify that the IUT reacts in conformity with the base specifications after receipt or exchange of valid Protocol Data Units (PDUs). Valid PDUs means that the exchange of messages and the content of the exchanged messages are considered as valid.

4.2.2.2 Timer (TI) tests

This test group shall verify that the IUT reacts in conformity with the present document after expiry of a defined timer or exceeding of a defined time constraint.

4.2.2.3 Cyclic Redundancy Checksum (CRC) tests

This test group shall verify that the IUT applies the required CRC specified for the different PDUs in the present document.

5 CCL Test Purposes (TP)

5.1 Introduction

There are a total of 81 test purposes.

5.1.1 TP definition conventions

The TPs are defined by the rules shown in table 1.

Table 1: TP definition rules

TP definition item	Item description
TP Id	The TP Id is a unique identifier formed according to the TP naming conventions defined in the clause below.
Reference	A pointer to the base specification requirement from which the TP is derived (specification reference, clause, and paragraph).
Condition	The IUT's state to which the TP is applied.
Test purpose	The events that provoke the expected behaviour given the initial condition and the events that are expected from the IUT pursuant to the base specification.

5.1.2 CCL TP naming conventions

The identifier of the TP is built according to table 2.

Table 2: TP naming convention for CCL

Identifier:	**TP/<st>/<sl>/<sg>/<fm >/<x>-<nnn>**		
	<st> = side type	BS	Base Station
		MS	Mobile Station
	<sl> = stack layer	CCL	Call Control Layer
		DLL	Data Link Layer
	<sg> = service group	BA	BS Downlink Activation
		VCR	Voice Call Repeating
		CHT	Voice Call Hangtime
		CR	CSBK Repeating
		BDA	BS Downlink Deactivation
		FNS	Feature Not Supported
		IC	Individual Call
		GC	Group Call
		UC	Unaddressed Voice Call
		AC	All Call Voice
		BC	Broadcast Call Voice
		OVCM	Open Voice Channel Mode
	<fm> = functional module	MS_INI	MS Initiating
		MS_TER	MS Terminating
	x = type of testing	BV	Valid Behaviour Tests
		TI	Timer and Constraints Tests
		CRC	Checksum calculation Tests
	<nnn> = sequential number	(000...)	

EXAMPLE: TP/BS/CCL/BA/MS_INI/BV-000 is the first test purpose for the valid behaviour testing of the MS_INItiated BS activation procedure of the Call Control layer at the BS side.

5.1.3 DLL TP naming conventions

The identifier of the TP is built according to table 3.

Table 3: TP naming convention for DLL

Identifier:	**TP/<st>/<sl>/<sg>/<fm>/<x>-<nnn>**		
	<st> = side type	BS	Base Station
		MS	Mobile Station
	<sl> = stack layer	CCL	Call Control Layer
		DLL	Data Link Layer
	<sg> = service group	CA	Channel Access
		SYNC	Synchronization
		ST	Slot Type
		EMB	Embedded Signalling
		TACT	TDMA Access Channel Type
		TT	Traffic Timing
	<fm> = functional module	DM	Direct Mode(Peer to Peer Mode)
		RM	Repeater Mode
	x = type of testing	BV	Valid Behaviour Tests
		TI	Timer Tests
		CRC	Checksum calculation Tests
	<nnn> = sequential number	(000...)	

EXAMPLE: TP/MS/DLL/CA/DM/BV-001 is the second test purpose for the valid behaviour testing of the channel accessing procedure in direct mode of the Data Link layer at the MS side.

5.1.4 TP selection criteria name convention

The mapping relationship between selection criteria of the TP and answer items of PICS is listed in table 4.

Table 4: TP Selection Criteria name convention

Identifier:	Selection Criteria in TP	Answer Items in PICS (see note)	Criteria
1	PIC_BA_BS	A.31/1 [3]	BS Downlink Activation of BS
2	PIC_BA_MS	A.7/1 [3]	BS Downlink Activation from MS
3	PIC_BDA_BS	A.31/2 [3]	BS Downlink Deactivation
4	PIC_FNS	A.7/5 [3]	MS Feature Not Supported
5	PIC_LT	A.7/2 [3]	MS Late Entry
6	PIC_IC	A.7/6 [3]	Individual Call
7	PIC_GC	A.7/7 [3]	Group Call
8	PIC_UC	A.7/8 [3]	Unaddressed Voice Call
9	PIC_AC_BS	A.31/6 [3]	All Call of BS
10	PIC_AC_MS	A.7/9 [3]	All Call of MS
11	PIC_BC_BS	A.31/7 [3]	Broadcast Call of BS
12	PIC_BC_MS	A.7/10 [3]	Broadcast Call of MS
13	PIC_OVCM	A.7/11 [3]	OVCM
14	PIC_PRE_CK	A.12/2 [3]	Presence Check (OACSU)
15	PIC_2FRQ	A.30/2 [3]	Two frequency BS
16	PIC_RM_BS	A.29/1 [3]	Repeater mode of BS
17	PIC_RM_MS	A.5/2 [3]	Repeater mode of MS
18	PIC_DM	A.4/1 [3] OR A.5/1 [3]	Direct mode
19	PIC_POLITE	A.20/1 [3] OR A.20/2 [3]	Channel access policy
20	PIC_POLITE_TO_ALL	A.20/1 [3]	Channel access policy - Polite to all
21	PIC_POLITE_TO_CC	A.20/2 [3]	Channel access policy - Polite to own Colour Code
22	PIC_IMPOLITE	A.20/3 [3]	Channel access policy - Impolite
23	PIC_TT	A.7/12 [3]	MS Transmit timeout
24	PIC_VCR_BS	A.31/3 [3]	Voice call repeating of BS
25	PIC_VHT_BS	A.31/4 [3]	Voice call hangtime of BS
26	PIC_CSBK_BS	A.31/5 [3]	CSBK repeating of BS
NOTE: An example of the notation used: A.5/4 [3] is a reference to the answer of item 4 in table A.5, in TS 102 362-1 [3].			

5.2 Test purposes for Base Station (BS)

5.2.1 Call Control Layer (CCL)

5.2.1.1 BS Downlink Activation (BDA)

5.2.1.1.1 MS Initiating (MS_INI)

TP ID	TP/BS/CCL/BA/MS_INI/BV-000
Reference	Clause 5.1.1.1.3 of TS 102 361-2 [2]
Selection criteria	PIC_BA_BS and PIC_RM_BS
Initial condition	The IUT is in BS_Hibernating state
Test purpose	Check, that after receiving a BS_Dwn_Act PDU, the IUT starts to send Idle messages.

5.2.1.2 Voice Call Repeating (VCR)

5.2.1.2.1 MS Initiating (MS_INI)

TP ID	TP/BS/CCL/VCR/MS_INI/BV-000
Reference	Clause 5.1.1.2 of TS 102 361-2 [2]
Selection criteria	PIC_RM_BS and PIC_VCR_BS
Initial condition	The IUT is in Channel_Hangtime state
Test purpose	Check, that after receiving a Grp_V_Ch_Usr PDU, the IUT repeats this PDU.

TP ID	TP/BS/CCL/VCR/MS_INI/BV-001
Reference	Clause 5.1.1.2 of TS 102 361-2 [2]
Selection criteria	PIC_RM_BS and PIC_VCR_BS
Initial condition	The IUT is in Channel_Hangtime state
Test purpose	Check, that after receiving a UU_V_Ch_Usr PDU, the IUT repeats this PDU.

5.2.1.3 Voice Call Hangtime (CHT)

5.2.1.3.1 MS Initiating (MS_INI)

TP ID	TP/BS/CCL/CHT/MS_INI/TI-000
Reference	Clauses 5.1.1.3 of TS 102 361-2 [2], 5.2.1.4 and F.1 of TS 102 361-1 [1]
Selection criteria	PIC_RM_BS and PIC_VHT_BS
Initial condition	The IUT is in Repeating_Slot_1 state and timer T_CallHt is not equal 0
Test purpose	Check, that after receiving Grp_V_Ch_Usr PDU(Voice_Terminator_with_LC), the IUT keeps repeating Grp_V_Ch_Usr(Voice_Terminator_with_LC) PDU until T_CallHt expires.

TP ID	TP/BS/CCL/CHT/MS_INI/TI-001
Reference	Clauses 5.1.1.3 of TS 102 361-2 [2], 5.2.1.4 and F.1 of TS 102 361-1 [1]
Selection criteria	PIC_RM_BS and PIC_VHT_BS
Initial condition	The IUT is in Repeating_Slot_1 state, timer T_CallHt is not equal 0 and timer T_MSInactiv > T_CallHt, and T_CallHt starts
Test purpose	Check, that after expiry of T_CallHt, IUT starts to send idle messages.

TP ID	TP/BS/CCL/CHT/MS_INI/TI-002
Reference	Clauses 5.1.1.3 of TS 102 361-2 [2], 5.2.1.4and F.1 of TS 102 361-1 [1]
Selection criteria	PIC_RM_BS and PIC_VHT_BS
Initial condition	The IUT is in Repeating_Slot_1 state, timer T_CallHt is not equal 0 and timer T_MSInactiv > T_CallHt, and T_CallHt starts
Test purpose	Check, that after expiry of T_CallHt, IUT keeps sending idle messages until T_MSInactiv expires.

TP ID	TP/BS/CCL/CHT/MS_INI/TI-003
Reference	Clauses 5.1.1.3 of TS 102 361-2 [2] and 5.2.1.4 of TS 102 361-1 [1]
Selection criteria	PIC_RM_BS and PIC_VHT_BS
Initial condition	The IUT is in Repeating_Slot_1 state and timer T_CallHt is not equal 0
Test purpose	Check, that after receiving UU_V_Ch_Usr PDU(Voice_Terminator_with_LC), the IUT keeps repeating UU_V_Ch_Usr PDU(Voice_Terminator_with_LC) until T_CallHt expires.

TP ID	TP/BS/CCL/CHT/MS_INI/TI-004
Reference	Clauses 5.1.1.3 of TS 102 361-2 [2] and 5.2.1.4 of TS 102 361-1 [1]
Selection criteria	PIC_RM_BS and PIC_VHT_BS
Initial condition	The IUT is in Repeating_Slot_1 state, timer T_CallHt is not equal 0 and timer T_MSInactiv > T_CallHt, and T_CallHt starts.
Test purpose	Check, that after expiry of T_CallHt, IUT starts to send idle messages.

TP ID	TP/BS/CCL/CHT/MS_INI/TI-005
Reference	Clauses 5.1.1.3 of TS 102 361-2 [2] and 5.2.1.4 of TS 102 361-1 [1]
Selection criteria	PIC_RM_BS and PIC_VHT_BS
Initial condition	The IUT is in Repeating_Slot_1 state, timer T_CallHt is not equal 0 and timer T_MSInactiv > T_CallHt, and T_CallHt starts.
Test purpose	Check, that after expiry of T_CallHt, IUT keeps sending idle messages until T_MSInactiv expires.

5.2.1.4 CSBK Repeating (CR)

5.2.1.4.1 MS Initiating (MS_INI)

TP ID	TP/BS/CCL/CR/MS_INI/BV-000
Reference	Clause 5.1.1.4 of TS 102 361-2 [2]
Selection criteria	PIC_RM_BS and PIC_CSBK_BS
Initial condition	The IUT is in Channel_Hangtime state
Test purpose	Check, that after receiving a UU_V_Req PDU, the IUT repeats this PDU.

TP ID	TP/BS/CCL/CR/MS_INI/BV-001
Reference	Clause 5.1.1.4 of TS 102 361-2 [2]
Selection criteria	PIC_RM_BS and PIC_CSBK_BS
Initial condition	The IUT is in Channel_Hangtime state
Test purpose	Check, that after receiving a UU_Ans_Rsp PDU, the IUT repeats this PDU.

TP ID	TP/BS/CCL/CR/MS_INI/BV-002
Reference	Clause 5.1.1.4 of TS 102 361-2 [2]
Selection criteria	PIC_RM_BS and PIC_CSBK_BS
Initial condition	The IUT is in Channel_Hangtime state
Test purpose	Check, that after receiving a NACK_Rsp PDU, the IUT repeats this PDU.

5.2.1.5 BS Downlink Deactivation (BDA)

5.2.1.5.1 MS Initiating (MS_INI)

TP ID	TP/BS/CCL/BDA/MS_INI/TI-000
Reference	Clause 5.1.1.5 of TS 102 361-2 [2]
Selection criteria	PIC_BDA_BS and PIC_RM_BS
Initial condition	The IUT is in BS_Hibernating state
Test purpose	Check, that upon receiving a BS_Dwn_Act PDU, BS keeps sending the idle messages until T_MSInactiv expires.

TP ID	TP/BS/CCL/BDA/MS_INI/TI-001
Reference	Clause 5.1.1.5 of TS 102 361-2 [2]
Selection criteria	PIC_BDA_BS and PIC_RM_BS
Initial condition	The IUT is in BS_Hibernating state
Test purpose	Check, that upon receiving a BS_Dwn_Act PDU, BS keeps sending the idle messages until T_MSInactiv expires, then BS stops sending any burst.

5.2.1.6 All Call Voice (AC)

5.2.1.6.1 MS Initiating (MS_INI)

TP ID	TP/BS/CCL/AC/MS_INI/BV-000
Reference	Clause 5.3.2.3.1 of TS 102 361-2 [2]
Selection criteria	PIC_RM_BS and PIC_AC_BS
Initial condition	The IUT is in Repeating_Slot_1 state and timer T_CallHt is not equal 0
Test purpose	Check, that after receiving Grp_V_Ch_Usr PDU(Voice_Terminator_with_LC) of an All Call Voice call, the IUT repeats this PDU once and then starts to send idle messages.

5.2.1.7 Broadcast Call Voice (BC)

5.2.1.7.1 MS Initiating (MS_INI)

TP ID	TP/BS/CCL/BC/MS_INI/BV-000
Reference	Clause 5.3.3.3.2 of TS 102 361-2 [2]
Selection criteria	PIC_RM_BS and PIC_BC_BS
Initial condition	The IUT is in Repeating_Slot_1 state and timer T_CallHt is not equal 0
Test purpose	Check, that after receiving Grp_V_Ch_Usr PDU(Voice_Terminator_with_LC) of a Broadcast Call Voice call, the IUT repeats this PDU once and then starts to send idle messages.

5.2.2 Data Link Layer (DLL)

5.2.2.1 TDMA Access Channel Type (TACT)

TP ID	TP/BS/DLL/TACT/BV-000
Reference	Clauses 6.3 and 9.1.4 of TS 102 361-1 [1]
Selection criteria	PIC_RM_BS and PIC_2FRQ
Initial condition	The IUT is configured for 2:1 mode operation and in BS_Hibernating state
Test purpose	Check, that after receiving control burst with BS_Dwn_Act PDU, the IUT sends TACT PDUs in the CACH burst indicating that both inbound channels are idle.

TP ID	TP/BS/DLL/TACT/BV-001
Reference	Clauses 6.3 and 9.1.4 of TS 102 361-1 [1]
Selection criteria	PIC_RM_BS and PIC_2FRQ
Initial condition	The IUT is configured for 2:1 mode operation and in Hangtime state
Test purpose	Check, that after the tester starts traffic transmission in both slots, the IUT sends TACT PDUs in the CACH burst indicating that both inbound channels are busy.

TP ID	TP/BS/DLL/TACT/BV-002
Reference	Clauses 6.3 and 9.1.4 of TS 102 361-1 [1]
Selection criteria	PIC_RM_BS and PIC_2FRQ
Initial condition	The IUT is configured for 2:1 mode operation and in Hangtime state
Test purpose	Check, that after the tester starts traffic transmission on inbound slot 1, the IUT sends TACT PDUs in the CACH burst indicating that inbound channel 1 is busy and inbound channel 2 is idle.

TP ID	TP/BS/DLL/TACT/BV-003
Reference	Clauses 6.3 and 9.1.4 of TS 102 361-1 [1]
Selection criteria	PIC_RM_BS and PIC_2FRQ
Initial condition	The IUT is configured for 2:1 mode operation and in Hangtime state
Test purpose	Check, that after the tester starts traffic transmission on inbound slot 2, the IUT sends TACT PDUs in the CACH burst indicating that inbound channel 2 is busy and inbound channel 1 is idle.

5.2.2.2 Synchronization (SYNC)

TP ID	TP/BS/DLL/SYNC/BV-000
Reference	Clause 9.1.1 of TS 102 361-1 [1]
Selection criteria	PIC_RM_BS
Initial condition	The IUT is in Channel_Hangtime state
Test purpose	Check, that after receiving a burst with UU_V_Ch_Usr PDU, the IUT repeats this PDU using the SYNC PDU pattern - "BS sourced Data SYNC pattern".

TP ID	TP/BS/DLL/SYNC/BV-001
Reference	Clause 9.1.1 of TS 102 361-1 [1]
Selection criteria	PIC_RM_BS
Initial condition	The IUT is in Repeating_Slot_1 state
Test purpose	Check, that after receiving a voice burst in slot 1, the IUT repeats this voice burst with SYNC PDU pattern - "BS sourced voice SYNC pattern".

5.2.2.3 Slot Type (ST)

TP ID	TP/BS/DLL/ST/BV-000
Reference	Clauses 9.1.3 and 9.3.6 of TS 102 361-1 [1]
Selection criteria	PIC_RM_BS
Initial condition	The IUT is in BS_Hibernating state
Test purpose	Check, that after receiving control burst with BS_Dwn_Act PDU, the IUT sends Idle messages with SLOT Type PDU in which information element 'Data Type' = idle.

5.2.2.4 Traffic Timing (TT)

TP ID	TP/BS/DLL/TT/BV-000
Reference	Clause 5.1.1.1 of TS 102 361-1 [1]
Selection criteria	PIC_RM_BS and PIC_2FRQ
Initial condition	IUT configured for Aligned channel timing and IUT is in Hangtime state
Test purpose	Check, that after receiving voice bursts in inbound slot 2, the IUT repeats these voice bursts in outbound slot 1.

TP ID	TP/BS/DLL/TT/BV-001
Reference	Clause 5.1.1.2 of TS 102 361-1 [1]
Selection criteria	PIC_RM_BS and PIC_2FRQ
Initial condition	IUT configured for Offset channel timing and IUT is in Hangtime state
Test purpose	Check, that after receiving voice bursts in inbound slot 2, the IUT repeats these voice bursts in outbound slot 2.

5.2.2.5 Cyclic Redundancy Checksum (CRC)

TP ID	TP/BS/DLL/CRC/BV-000
Reference	Clauses 9.1.7, 7.1.4 and B.3.8 of TS 102 361-1 [1]
Selection criteria	PIC_RM_BS and PIC_2FRQ
Initial condition	IUT is repeating voice traffic in Slot 1
Test purpose	Check that for each 4 CACH bursts received a embedded Short LC PDU with an 8 bit checksum can be derived.

5.3 Test purposes for Mobile Station (MS)

5.3.1 Call Control Layer (CCL)

5.3.1.1 BS Downlink Activation (BDA)

5.3.1.1.1 MS Initiating (MS_INI)

TP ID	TP/MS/CCL/BA/MS_INI/BV-000
Reference	Clause 5.1.1.1.3 of TS 102 361-2 [2]
Selection criteria	PIC_BA_MS and PIC_RM_MS
Initial condition	The IUT is in Out_of_Sync state
Test purpose	Check, that when the IUT initiates a PTT_Request, the IUT initially sends a BS_Dwn_Act PDU.

TP ID	TP/MS/CCL/BA/MS_INI/TI-000
Reference	Clauses 5.1.1.1.3 of TS 102 361-2 [2], 5.2.2.2.4 and annex F of TS 102 361-1 [1]
Selection criteria	PIC_BA_MS and PIC_RM_MS
Initial condition	The IUT is in Out_of_Sync state and wakeup message threshold N_Wakeup > 0
Test purpose	Check, that when IUT initiates a PTT_Request, the IUT sends the first BS_Dwn_Act PDU, only after expiry of timer T_SyncWu without receiving idle message from the BS, the IUT sends another BS_Dwn_Act PDU.

TP ID	TP/MS/CCL/BA/MS_INI/TI-001
Reference	Clauses 5.1.1.1.3 of TS 102 361-2 [2], 5.2.2.2.4 and annex F of TS 102 361-1 [1]
Selection criteria	PIC_BA_MS and PIC_RM_MS
Initial condition	The IUT is in Out_of_Sync state and wakeup message threshold N_Wakeup> 1
Test purpose	Check, that when the IUT initiate a PTT_Request, the IUT sends N_Wakeup times BS_Dwn_Act PDUs without receiving idle message.

TP ID	TP/MS/CCL/BA/MS_INI/TI-002
Reference	Clauses 5.1.1.1.3 of TS 102 361-2 [2], 5.2.2.2.4 and annex F of TS 102 361-1 [1]
Selection criteria	PIC_BA_MS and PIC_RM_MS
Initial condition	The IUT is in Out_of_Sync state and wakeup message threshold N_Wakeup> 1
Test purpose	Check, that when the IUT initiates a PTT_Request and sends the BS_Dwn_Act PDU N_Wakeup times without receiving idle message, the IUT stops to send BS_Dwn_Act PDU.

5.3.1.2 Feature Not Supported (FNS)

5.3.1.2.1 MS Terminating (MS_TER)

TP ID	TP/MS/CCL/FNS/MS_TER/BV-000
Reference	Clauses 5.1.2.2 and 5.2.2.1 of TS 102 361-2 [2]
Selection criteria	PIC_FNS and PIC_IC and NOT (PIC_PRE_CK)
Initial condition	IUT is in inactive state and IUT does not support presence check (OACSU) for Individual Call feature
Test purpose	Check, that after receiving a UU_V_Req PDU, the IUT starts to send NACK_Rsp PDU.

5.3.1.3 Group Call (GC)

5.3.1.3.1 MS Initiating (MS_INI)

TP ID	TP/MS/CCL/GC/MS_INI/BV-000
Reference	Clauses 5.2.1.3.3.3 [2] and 5.2.1.3.1 of TS 102 361-2 [2]
Selection criteria	PIC_GC and PIC_IMPOLITE
Initial condition	Both channels of the tester are busy. IUT is in Inactive state.
Test purpose	Check, that when the IUT initiates a PTT_Request, the IUT sends a Grp_V_Ch_Usr PDU.

TP ID	TP/MS/CCL/GC/MS_INI/BV-001
Reference	Clauses 5.2.1.3.3.3 [2] and 5.2.1.3.1 of TS 102 361-2 [2]
Selection criteria	PIC_GC
Initial condition	Both channels of the tester are idle. IUT is in Inactive state.
Test purpose	Check, that when the IUT initiates a PTT_Request, the IUT sends a Grp_V_Ch_Usr PDU.

TP ID	TP/MS/CCL/GC/MS_INI/BV-002
Reference	Clause 5.2.1.3.3.6 of TS 102 361-2 [2]
Selection criteria	PIC_GC
Initial condition	IUT is in Transmit state.
Test purpose	Check, that when the IUT initiates a Dekey_Indication, the IUT sends a Grp_V_Ch_Usr PDU(Voice_Terminator_with_LC).

5.3.1.3.2 MS Terminating (MS_TER)

TP ID	TP/MS/CCL/GC/MS_TER/BV-000
Reference	Clause 5.2.1.3.3.4 of TS 102 361-2 [2]
Selection criteria	PIC_GC
Initial condition	IUT is in Not_In_Call state.
Test purpose	Check, that after receiving a Grp_V_Ch_Usr PDU with a group address to which the IUT belongs, the IUT joins the call.
Note	Requires an Upper Tester.

TP ID	TP/MS/CCL/GC/MS_TER/BV-001
Reference	Clauses 5.2.1.3.3.5 of TS 102 361-2 [2], 5.1.2.1 and 7.1.3.1 of TS 102 361-1 [1]
Selection criteria	PIC_GC and PIC_LT
Initial condition	A group call is established to a group address to which the IUT belongs.
Test purpose	Check, that after receiving a Grp_V_Ch_Usr PDU (Voice_Header_LC) from Embedded LCs of voice bursts without voice header, the IUT joins the call.
Note	Requires an Upper Tester.

TP ID	TP/MS/CCL/GC/MS_TER/BV-002
Reference	Clause 5.2.1.3.3.7 of TS 102 361-2 [2]
Selection criteria	PIC_GC
Initial condition	IUT is in My_Call state.
Test purpose	Check, that after receiving a Grp_V_Ch_Usr PDU (Terminate_with_LC) which indicates call termination, the IUT mutes the speaker.
Note	Requires an Upper Tester.

TP ID	TP/MS/CCL/GC/MS_TER/BV-003
Reference	Clause 5.2.1.3.3.8 of TS 102 361-2 [2]
Selection criteria	PIC_GC
Initial condition	IUT is in In_Session state.
Test purpose	Check, that after receiving the last Grp_V_Ch_Usr PDU (Terminator_with_LC), the IUT starts to send End_of_Call service primitive to User IO.
Note	Requires an Upper Tester.

TP ID	TP/MS/CCL/GC/MS_TER/BV-004
Reference	Clause 5.2.1.3.3.9 of TS 102 361-2 [2]
Selection criteria	PIC_GC
Initial condition	IUT is in In_Session state.
Test purpose	Check, that after receiving a Grp_V_Ch_Usr PDU(Voice_Header_LC) with Destination ID = Not_My_ID, the IUT sends message End_of_Call.
Note	Requires an Upper Tester.

5.3.1.4 Individual Call (IC)

5.3.1.4.1 MS Initiating (MS_INI)

TP ID	TP/MS/CCL/IC/MS_INI/BV-000
Reference	Clauses 5.2.2.4.2 and 5.2.2.4 of TS 102 361-2 [2]
Selection criteria	PIC_IC and PIC_PRE_CK
Initial condition	IUT is in Inactive state
Test purpose	Check, that when the IUT initiates a PTT_Request, the IUT initially sends a UU_V_Req PDU.
Note	Requires an Upper Tester

TP ID	TP/MS/CCL/IC/MS_INI/BV-001
Reference	Clause 5.2.2.4.2.2 of TS 102 361-2 [2]
Selection criteria	PIC_IC and PIC_PRE_CK
Initial condition	IUT is in inactive state
Test purpose	Check, that when the IUT initiates a PTT_Request with presence check and after receiving a UU_Ans_Rsp PDU that accepts the call, the IUT sends a UU_V_Ch_Usr PDU.

TP ID	TP/MS/CCL/IC/MS_INI/BV-002
Reference	Clause 5.2.2.4.2.2 of TS 102 361-2 [2]
Selection criteria	PIC_IC and PIC_PRE_CK
Initial condition	IUT is in inactive state
Test purpose	Check, that when the IUT initiates a PTT_Request with presence check and after receiving a UU_Ans_Rsp PDU that rejects the call, the IUT will not continue the call.

TP ID	TP/MS/CCL/IC/MS_INI/BV-003
Reference	Clauses 5.2.2.4.2.2 and 5.2.1.3.3.3 of TS 102 361-2 [2]
Selection criteria	PIC_IC and NOT (PIC_PRE_CK) and PIC_IMPOLITE
Initial condition	Both channels of the tester are busy. IUT is in Inactive state.
Test purpose	Check, that when the IUT initiates a PTT_Request, the IUT sends a UU_V_Ch_Usr PDU.

TP ID	TP/MS/CCL/IC/MS_INI/BV-004
Reference	Clauses 5.2.2.4.2.2 and 5.2.1.3.3.3 of TS 102 361-2 [2]
Selection criteria	PIC_IC and NOT (PIC_PRE_CK)
Initial condition	Both channels of the tester are idle. The IUT is in Inactive state.
Test purpose	Check, that when the IUT initiates a PTT_Request, the IUT sends a UU_V_Ch_Usr PDU.

TP ID	TP/MS/CCL/IC/MS_INI/BV-005
Reference	Clauses 5.2.2.4 and 5.2.1.3.3.6 of TS 102 361-2 [2]
Selection criteria	PIC_IC
Initial condition	IUT is in Transmit state.
Test purpose	Check, that when the IUT initiates a Dekey_Indication, the IUT sends a UU_V_Ch_Usr PDU(Terminator_with_LC).
Note	Requires an Upper Tester.

TP ID	TP/MS/CCL/IC/MS_INI/TI-000
Reference	Clauses 5.2.1.7 of TS 102 361-1 [1], 5.2.2.3.1, 5.2.2.4.2.1 and annex A of TS 102 361-2 [2]
Selection criteria	PIC_IC and PIC_PRE_CK
Initial condition	IUT is in Inactive state and CSBK_Retry_Limit N_CSBKRetry >= 1
Test purpose	Check, that when the IUT sends the first UU_V_Req PDU by initiating a PTT_Request, on no reply and after expiry of timer T_AckWait, the IUT sends the second UU_V_Req PDU.
Note	Requires an Upper Tester.

TP ID	TP/MS/CCL/IC/MS_INI/TI-001
Reference	Clauses 5.2.1.7 of TS 102 361-1 [1], 5.2.2.3.1, 5.2.2.4.2.1 and A.2 of TS 102 361-2 [2]
Selection criteria	PIC_IC and PIC_PRE_CK
Initial condition	IUT is in Inactive state and CSBK_Retry_Limit N_CSBKRetry defined
Test purpose	Check, after initiating a PTT_Request and on no reply, that the IUT sends the UU_V_Req PDU N_CSBKRetry + 1 times.
Note	Requires an Upper Tester.

TP ID	TP/MS/CCL/IC/MS_INI/TI-002
Reference	Clauses 5.2.1.7 of TS 102 361-1 [1], 5.2.2.3.1, 5.2.2.4.2.1 and annex A of TS 102 361-2 [2]
Selection criteria	PIC_IC and PIC_PRE_CK
Initial condition	IUT is in Inactive state and CSBK_Retry_Limit N_CSBKRetry defined
Test purpose	Check, after initiating a PTT_Request and on no reply, and having sent the UU_V_Req PDU N_CSBKRetry + 1 times, receiving no UU_Ans_Rsp PDU in return the IUT does not send any UU_V_Ch_Usr PDU.
Note	Requires an Upper Tester.

5.3.1.4.2 MS Terminating (MS_TER)

TP ID	TP/MS/CCL/IC/MS_TER/BV-000
Reference	Clause 5.2.2.4.2.2 of TS 102 361-2 [2]
Selection criteria	PIC_IC and PIC_PRE_CK
Initial condition	IUT is in Inactive state
Test purpose	Check, that after receiving a UU_V_Req PDU and if the channel is idle, the IUT responds with UU_Ans_Rsp PDU.

TP ID	TP/MS/CCL/IC/MS_TER/BV-001
Reference	Clause 5.2.2.3.2 of TS 102 361-2 [2]
Selection criteria	PIC_IC and PIC_PRE_CK
Initial condition	IUT is in Inactive state
Test purpose	Check, that after receiving a UU_V_Req PDU and if the channel is busy, the IUT does not respond to this request.

TP ID	TP/MS/CCL/IC/MS_TER/BV-002
Reference	Clauses 5.2.2.4 and 5.2.1.3.3.4 of TS 102 361-2 [2]
Selection criteria	PIC_IC
Initial condition	IUT is in Inactive state.
Test purpose	Check, that after receiving a UU_V_Ch_Usr PDU, the IUT joins the call.
Note	Requires an Upper Tester.

TP ID	TP/MS/CCL/IC/MS_TER/BV-003
Reference	Clauses 5.2.2.4 and 5.2.1.3.3.5 of TS 102 361-2 [2], 5.1.2.1 and 7.1.3.1 of TS 102 361-1 [1]
Selection criteria	PIC_IC and PIC_LT
Initial condition	An individual call is established.
Test purpose	Check, that after receiving a UU_V_Ch_Usr PDU(Voice_Header_LC) from Embedded LCs of voice bursts without voice header, the IUT joins the call.
Note	Requires an Upper Tester.

TP ID	TP/MS/CCL/IC/MS_TER/BV-004
Reference	Clauses 5.2.2.4 and 5.2.1.3.3.7 of TS 102 361-2 [2]
Selection criteria	PIC_IC
Initial condition	IUT is in My_Call state.
Test purpose	Check, that after receiving a UU_V_Ch_Usr PDU(Terminator_with_LC), the IUT mutes speaker.
Note	Requires an Upper Tester.

TP ID	TP/MS/CCL/IC/MS_TER/BV-005
Reference	Clauses 5.2.2.4 and 5.2.1.3.3.8 of TS 102 361-2 [2]
Selection criteria	PIC_IC
Initial condition	IUT is in In_Session state.
Test purpose	Check, that after receiving the last UU_V_Ch_Usr PDU(Terminator_with_LC), the IUT starts to send End_of_Call service primitive to User IO.
Note	Requires an Upper Tester.

TP ID	TP/MS/CCL/IC/MS_TER/BV-006
Reference	Clauses 5.2.2.4 and 5.2.1.3.3.9 of TS 102 361-2 [2]
Selection criteria	PIC_IC
Initial condition	IUT is in In_Session state.
Test purpose	Check, that after receiving a UU_V_Ch_Usr PDU with Destination ID = Not_My_ID, the IUT sends message End_of_Call.
Note	Requires an Upper Tester.

5.3.1.5 Unaddressed Voice Call (UC)

5.3.1.5.1 MS Initiating (MS_INI)

TP ID	TP/MS/CCL/UC/MS_INI/BV-000
Reference	Clause 5.3.1 of TS 102 361-2 [2] and annex A of TS 102 361-1 [1]
Selection criteria	PIC_GC and PIC_UC
Initial condition	IUT is in My_System state
Test purpose	Check, that after IUT initiates an Unaddressed Voice Call by pressing PTT, an Grp_V_Ch_Usr is sent using a valid unaddressed group address.

5.3.1.6 All Call Voice (AC)

5.3.1.6.1 MS Initiating (MS_INI)

TP ID	TP/MS/CCL/AC/MS_INI/BV-000
Reference	Clause 5.3.2 of TS 102 361-2 [2] and annex A of TS 102 361-1 [1]
Selection criteria	PIC_GC and PIC_AC_MS
Initial condition	IUT is in My_System state
Test purpose	Check, that after IUT initiates an All Call Voice call by pressing PTT, a Grp_V_Ch_Usr is sent using a valid All-talk group address and with the broadcast field bit set.

5.3.1.7 Broadcast Call Voice (BC)

5.3.1.7.1 MS Initiating (MS_INI)

TP ID	TP/MS/CCL/BC/MS_INI/BV-000
Reference	Clause 5.3.3 of TS 102 361-2 [2]
Selection criteria	PIC_GC and PIC_BC_MS
Initial condition	IUT is in My_System state
Test purpose	Check, that after IUT initiates a Broadcast Call Voice call by pressing PTT, an Grp_V_Ch_Usr is sent with the broadcast field bit set.

5.3.1.8 Open Voice Channel Mode (OVCM)

5.3.1.8.1 MS Initiating (MS_INI)

TP ID	TP/MS/CCL/OVCM/MS_INI/BV-000
Reference	Clause 5.3.4 of TS 102 361-2 [2]
Selection criteria	PIC_OVCM and PIC_GC
Initial condition	IUT is in My_System state
Test purpose	Check, that after IUT initiates an Open Voice Channel Mode group call by pressing PTT, an Grp_V_Ch_Usr is sent with the OVCM bit set.

TP ID	TP/MS/CCL/OVCM/MS_INI/BV-001
Reference	Clause 5.3.4 of TS 102 361-2 [2]
Selection criteria	PIC_OVCM and PIC_IC
Initial condition	IUT is in My_System state
Test purpose	Check, that after IUT initiates an Open Voice Channel Mode individual call by pressing PTT, an UU_V_Ch_Usr is sent with the OVCM bit set.

5.3.1.8.2 MS Terminating (MS_TER)

TP ID	TP/MS/CCL/OVCM/MS_TER/BV-000
Reference	Clause 5.3.4 of TS 102 361-2 [2]
Selection criteria	PIC_OVCM and PIC_GC
Initial condition	IUT is in My_System state
Test purpose	Check, that after receiving an Grp_V_Ch_Usr PDU with Destination ID = Not_My_ID and OVCM bit set, the IUT joins the call.

TP ID	TP/MS/CCL/OVCM/MS_TER/BV-001
Reference	Clause 5.3.4 of TS 102 361-2 [2]
Selection criteria	PIC_OVCM and PIC_IC
Initial condition	IUT is in My_System state
Test purpose	Check, that after receiving an UU_V_Ch_Usr PDU with Destination ID = Not_My_ID and OVCM bit set, the IUT joins the call.

5.3.1.9 Transmit timeout

5.3.1.9.1 MS Initiating (MS_INI)

TP ID	TP/MS/CCL/TI/MS_INI/BV-000
Reference	Clause 6.1 of TS 102 361-2 [2]
Selection criteria	PIC_GC or PIC_IC and PIC_TT
Initial condition	IUT is in My_System state
Test purpose	Check, that after IUT initiates a call by pressing PTT and after time T_TO has passed, the IUT stops transmitting even if PTT is still pressed.

5.3.2 Data Link Layer (DLL)

5.3.2.1 Synchronization (SYNC)

TP ID	TP/MS/DLL/SYNC/BV-000
Reference	Clause 9.1.1 of TS 102 361-1 [1]
Selection criteria	PIC_RM_MS
Initial condition	The IUT is in Out_of_Sync state
Test purpose	Check, that when the IUT initiates a PTT_Request, the IUT initially sends a wake up message with SYNC pattern matching MS sourced data SYNC pattern.
Note	Requires an Upper Tester.

TP ID	TP/MS/DLL/SYNC/BV-001
Reference	Clause 9.1.1 of TS 102 361-1 [1]
Selection criteria	PIC_IC or PIC_GC
Initial condition	IUT is in In_Session state
Test purpose	Check, that when the IUT initiates a PTT_Request, the IUT sends voice bursts with SYNC pattern matching MS sourced voice SYNC pattern following the LC header.
Note	Requires an Upper Tester.

TP ID	TP/MS/DLL/SYNC/BV-002
Reference	Clause 9.1.1 of TS 102 361-1 [1]
Selection criteria	PIC_DM
Initial condition	The IUT is in Out_of_Sync state
Test purpose	Check, that when the IUT receives a UU_V_Req request from the tester for individual call presence check, the IUT either responds with a UU_Ans_Rsp or a NACK_Rsp PDU in a CSBK burst with SYNC PDU in which the SYNC pattern matches the MS sourced data SYNC pattern.

5.3.2.2 Slot Type (ST)

TP ID	TP/MS/DLL/ST/BV-000
Reference	Clauses 5.1.2.2, 5.2.2.2.8 and 9.1.3 of TS 102 361-1 [1]
Selection criteria	PIC_IC or PIC_GC
Initial condition	IUT is in In_Session state
Test purpose	Check, that when the IUT initiates a PTT request, the IUT sends a Full Link Control burst with a Slot Type PDU in which the data type field = Voice_LC_Header.
Note	Requires an Upper Tester.

TP ID	TP/MS/DLL/ST/BV-001
Reference	Clauses 5.1.2.3, 9.1.3and G.1.2 of TS 102 361-1 [1]
Selection criteria	PIC_IC or PIC_GC
Initial condition	IUT is in Transmit state
Test purpose	Check, that when the IUT initiates a Dekey_Indication, the IUT sends a Full Link Control burst with a Slot Type PDU in which the data type field = Terminator with LC
Note	Requires an Upper Tester.

TP ID	TP/MS/DLL/ST/BV-002
Reference	Clauses 9.3.6, 9.1.3, 5.2.2.2.1 of TS 102 361-1 [1] and 5.1.1.1 of TS 102 361-2 [2]
Selection criteria	PIC_RM_MS
Initial condition	The IUT is in Out_of_Sync state
Test purpose	Check, that when the IUT initiates a PTT_Request, the IUT sends a CSBK burst with a Slot Type PDU in which the data type field = CSBK.
Note	Requires an Upper Tester.

5.3.2.3 Embedded signalling (EMB)

TP ID	TP/MS/DLL/EMB/DM/BV-000
Reference	Clauses 7.1.3.2, 9.1.2 and 9.3.3 of TS 102 361-1 [1]
Selection criteria	(PIC_IC or PIC_GC) and PIC_DM
Initial condition	IUT is in In_Session state
Test purpose	Check, that when the IUT initiates a PTT request, the IUT sends a voice superframe with 4 continuous embedded signalling PDUs in which the information element Link Control Start/Stop (LCSS) is filled correctly.
Note	Requires an Upper Tester.

TP ID	TP/MS/DLL/EMB/RM/BV-000
Reference	Clauses 7.1.3.2, 9.1.2 and 9.3.3 of TS 102 361-1 [1]
Selection criteria	(PIC_IC or PIC_GC) and PIC_RM
Initial condition	IUT is In_Session state
Test purpose	Check, that when the IUT initiates a PTT request, the IUT sends a voice superframe with 4 continuous embedded signalling PDUs in which the information element Link Control Start/Stop (LCSS) is filled correctly.
Note	Requires an Upper Tester.

5.3.2.4 Channel Access (CA)

5.3.2.4.1 Direct Mode (DM)

TP ID	TP/MS/DLL/CA/DM/BV-000
Reference	Clause 5.2.2.1.1 of TS 102 361-1 [1]
Selection criteria	PIC_POLITE_TO_ALL and PIC_DM
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that when the IUT transitions to In_Sync state by detecting SYNC PDUs on the channel, the IUT does not initiate transmission.

TP ID	TP/MS/DLL/CA/DM/BV-001
Reference	Clause 5.2.2.1.1 of TS 102 361-1 [1]
Selection criteria	PIC_POLITE_TO_CC and PIC_DM
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that when IUT transitions to In_Sync state by detecting SYNC PDU, after IUT receives a control burst with Slot Type PDU in which the Colour Code does not match that of the IUT, the IUT start to transmit.

TP ID	TP/MS/DLL/CA/DM/BV-002
Reference	Clause 5.2.2.1.1 of TS 102 361-1 [1]
Selection criteria	PIC_POLITE_TO_CC and PIC_DM
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that when the IUT comes to In_Sync state by detecting SYNC, after IUT receives a voice burst with Embedded Signalling PDU in which Colour Code does not match that of the IUT, the IUT starts to transmit.

TP ID	TP/MS/DLL/CA/DM/BV-003
Reference	Clause 5.2.2.1.1 of TS 102 361-1 [1]
Selection criteria	PIC_POLITE_TO_CC and PIC_DM
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that when IUT comes to In_Sync state by detecting SYNC and after IUT receives a control burst with Slot Type PDU in which Colour Code matches that of the IUT, the IUT does not initiate transmission.

TP ID	TP/MS/DLL/CA/DM/BV-004
Reference	Clause 5.2.2.1.1 of TS 102 361-1 [1]
Selection criteria	PIC_POLITE_TO_CC and PIC_DM
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that when IUT comes to In_Sync state by detecting SYNC and after IUT receives a voice burst with Embedded Signalling PDU in which Colour Code matches that of the IUT, the IUT does not initiate transmission.

TP ID	TP/MS/DLL/CA/DM/BV-005
Reference	Clauses 5.2.2.1.1 and 5.2.1.6 of TS 102 361-1 [1]
Selection criteria	PIC_IMPOLITE and PIC_DM
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that the IUT initiates transmission, even if the channel is busy with non-DMR activity with RF level greater than the N_RssiLo value for impolite channel access.

TP ID	TP/MS/DLL/CA/DM/BV-006
Reference	Clauses 5.2.2.1.1 and 5.2.1.6 of TS 102 361-1 [1]
Selection criteria	PIC_IMPOLITE and PIC_DM
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that the IUT initiates transmission, even if the channel is busy with DMR traffic with colour code different from that of the IUT.

TP ID	TP/MS/DLL/CA/DM/BV-007
Reference	Clauses 5.2.2.1.1 and 5.2.1.6 of TS 102 361-1 [1]
Selection criteria	PIC_IMPOLITE and PIC_DM
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that the IUT initiates transmission, even if the channel is busy with DMR traffic with the same colour code as that of the IUT.

TP ID	TP/MS/DLL/CA/DM/TI-000
Reference	Clause 5.2.1.1 of TS 102 361-1 [1]
Selection criteria	PIC_POLITE and PIC_DM
Initial condition	IUT changes to new channel and the tester does not transmit anything on this channel.
Test purpose	Check, when the IUT initiates PTT, then only after expiry of timer T_ChMonTo, the IUT transmits.

TP ID	TP/MS/DLL/CA/DM/TI-001
Reference	Clause 5.2.1.1 of TS 102 361-1 [1]
Selection criteria	PIC_POLITE and PIC_DM
Initial condition	IUT changes to new channel and try to synchronize the received signal. The tester keeps transmitting voice bursts on this channel with unknown SYNC pattern.
Test purpose	Check, when the IUT initiates PTT, then only after expiry of T_ChSyncTo, the IUT transmits.

TP ID	TP/MS/DLL/CA/DM/TI-002
Reference	Clause 5.2.2.1.1 of TS 102 361-1 [1]
Selection criteria	PIC_POLITE_TO_CC and PIC_DM
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that when IUT transitions to In_Sync state by detecting SYNC and after expiry of T_TxCC without receiving any burst with Embedded Signalling PDU or Slot Type PDU which contains a matching Colour Code, the IUT initiates transmission.

5.3.2.4.2 Repeater Mode (RM)

TP ID	TP/MS/DLL/CA/RM/BV-000
Reference	Clause 5.2.2.2.3 of TS 102 361-1 [1]
Selection criteria	PIC_IMPOLITE and PIC_RM_MS
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that when the IUT transitions to In_Sync state by detecting SYNC and after IUT receives an idle burst with Slot Type PDU in which Colour Code does not match that of the IUT, the IUT sends a CSBK PDU with a BS wake up message.

TP ID	TP/MS/DLL/CA/RM/BV-001
Reference	Clause 5.2.2.2.3 of TS 102 361-1 [1]
Selection criteria	PIC_IMPOLITE and PIC_RM_MS
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that when the IUT transitions to In_Sync state by detecting SYNC and after IUT receives a voice burst with Embedded Signalling PDU in which Colour Code does not match that of the IUT, the IUT sends a CSBK PDU with a BS wake up message.

TP ID	TP/MS/DLL/CA/RM/BV-002
Reference	Clause 5.2.2.2.3 of TS 102 361-1 [1]
Selection criteria	PIC_POLITE_TO_CC and PIC_RM_MS
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that when the IUT transitions to In_Sync state by detecting SYNC and after IUT receives an idle burst with Slot Type PDU in which Colour Code PDU does not match IUT's, the IUT sends a CSBK PDU with a BS wake up message.

TP ID	TP/MS/DLL/CA/RM/BV-003
Reference	Clause 5.2.2.2.3 of TS 102 361-1 [1]
Selection criteria	PIC_POLITE_TO_CC and PIC_RM_MS
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that when the IUT transitions to In_Sync state by detecting SYNC and after IUT receives a voice with Embedded Signalling PDU in which Colour Code PDU does not match that of the IUT, the IUT sends a CSBK PDU with a BS up message.

TP ID	TP/MS/DLL/CA/RM/BV-004
Reference	Clause 5.2.2.2.3 of TS 102 361-1 [1]
Selection criteria	PIC_POLITE_TO_ALL and PIC_RM_MS
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that when the IUT transitions to In_Sync state by detecting SYNC and after IUT receives an idle burst with Slot Type PDU in which Colour Code PDU does not match that of the IUT, the IUT does not initiate transmission.

TP ID	TP/MS/DLL/CA/RM/BV-005
Reference	Clause 5.2.2.2.3 of TS 102 361-1 [1]
Selection criteria	PIC_POLITE_TO_ALL and PIC_RM_MS
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that when the IUT transitions to In_Sync state by detecting SYNC and after IUT receives a voice burst with Embedded Signalling PDU in which Colour Code does not match that of the IUT, the IUT does not initiate transmission.

TP ID	TP/MS/DLL/CA/RM/BV-006
Reference	Clause 5.2.2.2.5 of TS 102 361-1 [1]
Selection criteria	PIC_POLITE and PIC_RM_MS
Initial condition	The IUT is in state Not_In_Call and initiates PTT_Request
Test purpose	Check, after IUT receives CACH bursts with a TACT PDU indicating channel idle, the IUT transmits.

TP ID	TP/MS/DLL/CA/RM/BV-007
Reference	Clause 5.2.2.2.5 of TS 102 361-1 [1]
Selection criteria	PIC_POLITE and PIC_RM_MS
Initial condition	The IUT is in Not_In_Call and initiates PTT_Request
Test purpose	Check, after IUT receives CACH bursts with a TACT PDU indicating channel busy, the IUT does not initiate transmission.

TP ID	TP/MS/DLL/CA/RM/BV-008
Reference	Clauses 5.2.2.2.1 and 5.2.2.1.1 of TS 102 361-1 [1]
Selection criteria	PIC_IMPOLITE and PIC_RM_MS
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that the IUT sends a CSBK PDU with a BS wake up message even if the channel is busy with non-DMR activity with RF level greater than the N_RssiLo value for impolite channel access.

TP ID	TP/MS/DLL/CA/RM/BV-009
Reference	Clauses 5.2.2.2.1 and 5.2.2.1.1 of TS 102 361-1 [1]
Selection criteria	PIC_POLITE_TO_CC and PIC_RM_MS
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that the IUT sends a CSBK PDU with a BS wake up message, even if the channel is busy with non-DMR activity with RF level greater than the N_RssiLo value for polite to own Colour Code channel access.

TP ID	TP/MS/DLL/CA/RM/BV-010
Reference	Clauses 5.2.2.2.1 and 5.2.2.1.1 of TS 102 361-1 [1]
Selection criteria	PIC_POLITE_TO_ALL and PIC_RM_MS
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that when the channel is busy with non-DMR activity with RF level greater than the N_RssiLo value for polite to all channel access, the IUT does not start transmission.

TP ID	TP/MS/DLL/CA/RM/TI-000
Reference	Clause 5.2.2.2.3 of TS 102 361-1 [1]
Selection criteria	(PIC_POLITE_TO_CC or PIC_IMPOLITE) and PIC_RM_MS
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that when the IUT transitions to In_Sync_unknown_System state by detecting SYNC and after expiry of timer T_TxCCSlot receiving only voice bursts with (Embedded Signalling PDU or Slot Type PDU) which does not contain a matching Colour Code, the IUT sends a CSBK PDU with a wake up message.

TP ID	TP/MS/DLL/CA/RM/TI-001
Reference	Clause 5.2.2.2.3 of TS 102 361-1 [1]
Selection criteria	PIC_POLITE_TO_ALL and PIC_RM_MS
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that when the IUT transitions to In_Sync_unknown_System state by detecting SYNC and after expiry of timer T_TxCCSlot receiving only voice bursts with Embedded Signalling PDU or Slot Type PDU which does not contain a matching Colour Code, the IUT does not initiate transmission.

TP ID	TP/MS/DLL/CA/RM/TI-002
Reference	Clause 5.2.2.2.5 of TS 102 361-1 [1]
Selection criteria	PIC_POLITE and PIC_RM_MS
Initial condition	The IUT changes to new channel and initiates PTT_Request
Test purpose	Check, that when the IUT transitions to Not_In_Call state when receiving the first idle message and after expiry of T_IdleSrch without finding an idle inbound channel from the TACT PDU, the IUT does not initiate transmission.

5.3.2.5 Cyclic Redundancy Checksum (CRC)

TP ID	TP/MS/DLL/CRC/BV-000
Reference	Clauses 9.1.6, 7.1.1 and B.3.7 of TS 102 361-1 [1]
Selection criteria	PIC_IC or PIC_GC
Initial condition	IUT is in In_Session state
Test purpose	Check, that when the IUT initiates a PTT request, the IUT sends a Full Link Control burst with a voice header burst (Voice_LC_Header) and a 24-bit checksum calculated using a Reed-Solomon (12,9) FEC.
Note	Requires an Upper Tester.

TP ID	TP/MS/DLL/CRC/BV-001
Reference	Clauses 9.1.6, 7.1.2 and B.3.7 of TS 102 361-1 [1]
Selection criteria	PIC_IC or PIC_GC
Initial condition	IUT is in Transmit state
Test purpose	Check, that when the IUT initiates a Dekey_Indication, the IUT sends a Full Link Control burst with a voice terminator burst (Terminator_With_LC) and a 24-bit checksum calculated using a Reed-Solomon (12,9) FEC.
Note	Requires an Upper Tester.

TP ID	TP/MS/DLL/CRC/BV-002
Reference	Clauses 9.1.6, 7.1.3.2 and B.3.12 of TS 102 361-1 [1]
Selection criteria	PIC_IC or PIC_GC
Initial condition	IUT is in In_Session state
Test purpose	Check, that when the IUT initiates a PTT request, the IUT sends a voice superframe with 4 continuous embedded signalling PDUs making up a Full LC PDU with a 5 bit checksum.
Note	Requires an Upper Tester.

TP ID	TP/MS/DLL/CRC/BV-003
Reference	Clauses 9.1.8, 7.2.1 and B.3.9 of TS 102 361-1 [1]
Selection criteria	(PIC_IC or PIC_GC) and PIC_RM_MS
Initial condition	IUT is in Out_of_Sync state
Test purpose	Check, that when the IUT initiates a PTT_Request, the IUT initially sends a wake up message in a CSBK PDU with a 16 bit checksum calculated using a CRC-CCITT algorithm.
Note	Requires an Upper Tester.

TP ID	TP/MS/DLL/CRC/BV-004
Reference	Clauses 9.1.8, 7.2.1 and B.3.9 of TS 102 361-1 [1]
Selection criteria	(PIC_IC or PIC_GC) and PIC_DM
Initial condition	IUT is in Out_of_Sync state
Test purpose	Check, that when the IUT receives a UU_V_Req request from the tester for individual call presence check, the IUT either responds with a UU_Ans_Rsp or a NACK_Rsp PDU in a CSBK PDU with a 16 bit checksum calculated using a CRC-CCITT algorithm.

Annex A (informative): Bibliography

- ISO/IEC 9646-2 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract Test Suite specification". (See also ITU-T Recommendation X.291 (1991).
- ISO/IEC 9646-6 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 6: Protocol profile test specification".
- ETSI ETR 266: "Methods for Testing and Specification (MTS); Test Purpose style guide".

History

Document history		
V1.1.1	June 2005	Publication