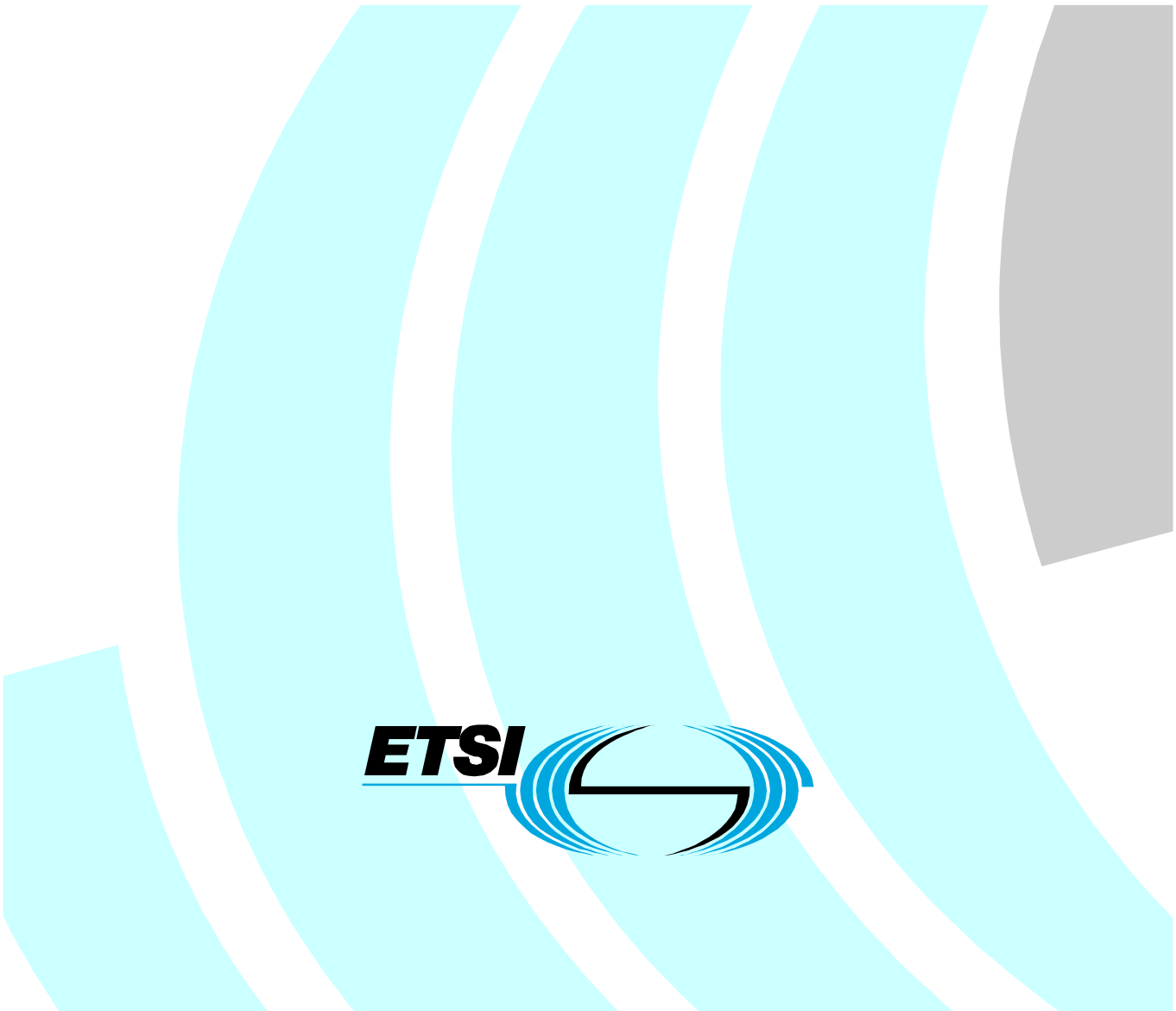
ETSI TS 101 950 V1.2.1 (2001-11)

Technical Specification

Digital Enhanced Cordless Telecommunications (DECT); DECT Packet Radio Service (DPRS); Interoperability Test Specification



Reference
RTS/DECT-040211

Keywords
application, data, DECT, DPRS, interoperability,
radio, TCL, testing

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Contents

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Foreword

This Technical Specification (TS) has been produced by ETSI Project Digital Enhanced Cordless Telecommunications (DECT).

1 Scope

The present document contains the test specification for interoperability of the DECT Packet Radio Service (DPRS).

The objective of the present document is to provide a basis to test DECT equipments giving a high probability of inter-operability between different manufacturer's DECT equipment.

The ISO standard for the methodology of conformance testing (ISO/IEC 9646-1 [5] and ISO/IEC 9646-2 [6]) as well as the ETSI rules for conformance testing (ETS 300 406 [4]) are used as a basis for the test methodology.

Annex A provides the Partial Protocol Implementation Extra Information for Testing (PIXIT) Proforma.

Annex B provides the Protocol Conformance Test Report (PCTR) Proforma.

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.

[1] ETSI EN 301 649: "Digital Enhanced Cordless Telecommunications (DECT); DECT Packet Radio Services (DPRS)".

[2] ETSI TS 101 869-1: "Digital Enhanced Cordless Telecommunications (DECT); DECT Packet Radio Services (DPRS); Profile requirement list and profile specific Implementation Conformance Statement (ICS) proforma; Part 1: Portable radio Termination (PT)".

[3] ETSI TS 101 869-2: "Digital Enhanced Cordless Telecommunications (DECT); DECT Packet Radio Services (DPRS); Profile requirement list and profile specific Implementation Conformance Statement (ICS) proforma; Part 2: Fixed radio Termination (FT)".

[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".

[6] ISO/IEC 9646-2 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract Test Suite specification".

[7] ISO/IEC 9646-3 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation (TTCN)".

[8] ISO/IEC 9646-6 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 6: Protocol profile test specification".

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

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms given in ISO/IEC 9646-7 [9] and the definitions given in EN 301 649 [1] apply.

3.2 Abbreviations

For the purposes of the present document, the abbreviations defined in ISO/IEC 9646-1 [5], ISO/IEC 9646-6 [8], ISO/IEC 9646-7 [9], EN 301 649 [1] and the following apply:

C	higher layer control Channel (see C_S and C_F)
C_F	higher layer signalling Channel (Fast)
C-plane	Control plane
C_S	higher layer signalling Channel (Slow)
DECT	Digital Enhanced Cordless Telecommunications
DLC	Data Link Control
FP	Fixed Part
FT	Fixed radio Termination
GAP	Generic Access Profile
HMSC	High level Message Sequence Chart
I	higher layer Information channel (see I_N and I_P)
I_N	higher layer Information channel (unprotected)
I_P	higher layer Information channel (protected)
IP	Internet Protocol
ISDN	Integrated Services Digital Network
IUT	Implementation Under Test
LAN	Local Area Network
MAC	Medium Access Control
ME	Management Entity
MSC	Message Sequence Chart
N	identities channel
NWK	NetWorK
PCTR	Protocol Conformance Test Report
PHL	PHysical Layer
PICS	Protocol Implementation Conformance Statement
PP	Portable Part
PT	Portable radio Termination
RFP	Radio Fixed Part
SAP	Service Access Point
SCS	System Conformance Statement
SCTR	System Conformance Test Report
SUT	System Under Test
U-plane	User-plane

4 Abstract Test Method (ATM)

This clause describes the ATM used to test the interoperability between two DECT equipments. Each equipment can be a FT part or a PP part depending on what feature is tested.

4.1 Test architecture

The general test architecture is shown in figure 1. A monitoring device shall observe and record the information exchange on the air interface between IUT_1 and IUT_2. It shall offer a level of presentation that permits to decode the MAC, DLC and the NWK layer for the C-plane and to analyse the U-plane exchange. The IUT_1 and the IUT_2 shall be situated in one or different rooms, possibly with obstacles at the line-of-site and at a distance of at least a few meters. If situated in different rooms, more than one operator will be needed. The monitoring device shall be situated where appropriate. All application devices and the external line (if any) shall be properly connected. The human operator shall initiate procedures at both terminals when required. The manufacturer of the IUT (IUT_1 and IUT_2) shall have described all manipulations for setting the IUT in the appropriate starting conditions of each test, in the relevant part of the PIXIT annex. By convention and when not contradicted by the test itself, IUT_1 is a PT and IUT_2 is a FT.

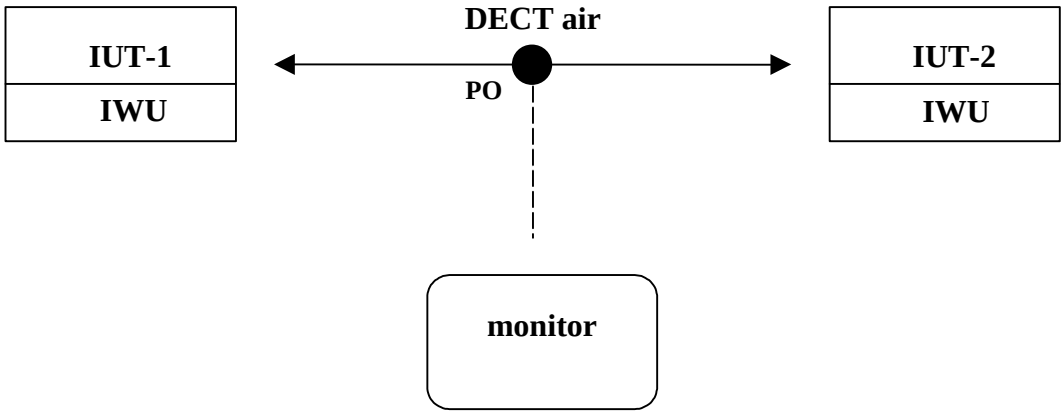

Figure 1: General test architecture

The test architecture for intercell handover tests is shown in figure 2. A second monitor device (Monitor 2) may be necessary. The monitor device 1 shall observe and record the exchanges between the RFP_1 and the PT. The monitor device 2 shall observe and record the exchanges between the RFP_2 and the PT.

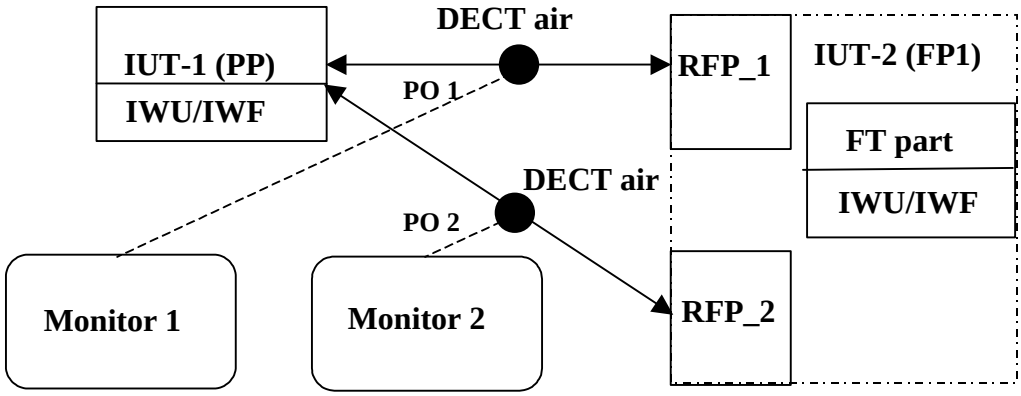

Figure 2: Test architecture for Intercell handover

The test architecture for parallel data connections tests is shown in figure 3. The monitor 1 shall be capable of monitoring the in-parallel connections.

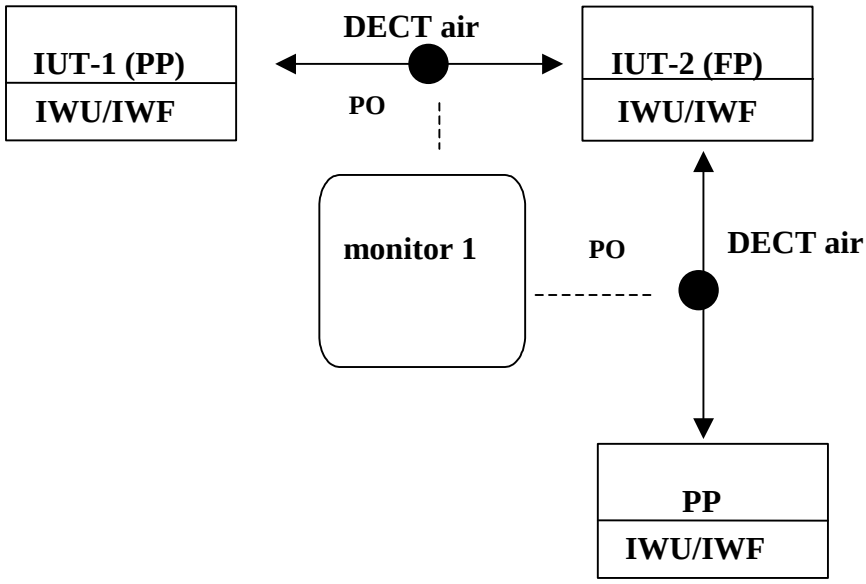

Figure 3: Test architecture for parallel data connections

4.2 Test configurations

The general test configuration is shown in figure 4. A DECT PP as IUT_1 is providing DECT interworking functions DPRS class 2 V.24 applications. An application device is connected to the PT (e.g. a PC). A DECT FT as IUT_2 is providing the same interworking functions. The FT is connected to an application device (e.g. a PC). In the case of connection handover testing there is a monitor for each of the RFPs of the IUT_2.

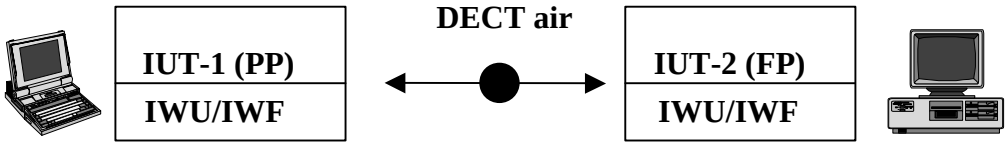

Figure 4: Test configuration 1 with 2 PCs as applications

The second test configuration is shown in figure 5. A DECT PP as IUT_1 is providing Ethernet interworking functions DPRS class 2. An application device is connected to the PT (e.g. a PC). A DECT FT as IUT_2 is providing the same interworking functions. The FT is connected to a fully operational connection to an external LAN.

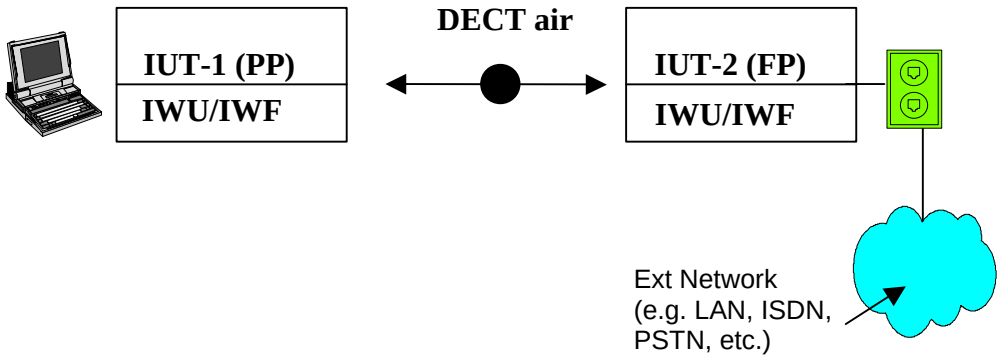

Figure 5: Test configuration 2 with 1 PC and the FP connected to an external Network

The third test configuration is shown in figure 6. A DECT PP as IUT_1 is providing DECT interworking functions DPRS class 2 V.24 applications. An application device is connected to the PT (e.g. a PC). A DECT FT as IUT_2 is providing the same interworking functions. A second DECT PP as IUT_2 is providing DECT interworking functions DPRS class 2 V.24 applications or DECT interworking functions Voice. This configuration shall be used in order to test speech and data connections, which are in parallel. Or this test configuration shall be used in order to test parallel data connections.

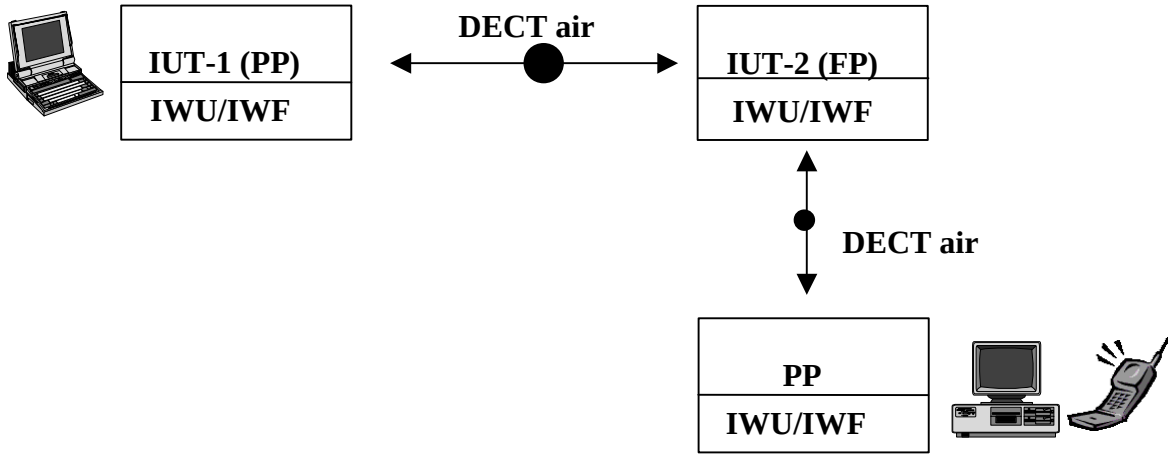

Figure 6: Test configuration 3 with PCs or a hand set as applications

4.3 Test mode

If not explicitly stated otherwise, the encryption has to be switch off in order to allow meaningful monitoring.

5 Abstract Test Description

In clause 7 all test cases as defined in the Test case list (clause 6) are described. Each test case is followed by a HSMC. In clause 8,9, 10, 11 and 12 all the procedures as defined in the test cases are described. If necessary the procedure description includes a HMSC or a MSC.

The clauses 5.1 to 5.5 explain the Abstract Test Description.

5.1 TC definition conventions

The TCs are defined following particular rules as shown in table 1.

Table 1: TC definition rules

<table>
<tr><th colspan="2">Test Case Name: Identification of the test case.</th></tr>
<tr><td>Feature Reference:</td><td>Identification of the NWK features, the DLC services and the MAC services to be tested. The PICS reference indicates the tables of the PICS documents TS 101 869-1 [2] (for PT) and TS 101 869-2 [3] (for FT) where the features and the services are listed with its status.
<table>
<tr><th>Feature</th><th>PICS Reference</th></tr>
<tr><td>First feature</td><td>B.2/9 [2]</td></tr>
<tr><td>...</td><td></td></tr>
<tr><td>Last feature</td><td>B.2/10 [2]</td></tr>
</table></td></tr>
<tr><td>Test Purpose:</td><td>Definition of the events that are expected from the IUTs.</td></tr>
</table>

<table>
<tr><th colspan="2">Test Case Name: Identification of the test case.</th></tr>
<tr><td>Test Setup:</td><td>Test architecture reference and test configuration reference.</td></tr>
<tr><td>Application Behaviour:</td><td>Description of the application, which has to be implemented on the IUT.</td></tr>
<tr><td>Test Procedure List:</td><td>Identification of the procedures to be tested. The procedures shall be performed if declared supported in the PICS documents. The PICS reference indicates the tables of the PICS documents TS 101 869-1 [2] (for PT) and TS 101 869-2 [3] (for FT) where the procedures are listed with its status.

<table>
<tr><th>Procedure</th><th>PICS Reference</th></tr>
<tr><td>First procedure</td><td>B.3/9 [2]</td></tr>
<tr><td>...</td><td></td></tr>
<tr><td>Fast procedure</td><td>B.3/10 [2]</td></tr>
</table>
There is a test procedure list for each tested layer.
The detailed order of events can be taken from the HMSCs and MSCs.</td></tr>
<tr><td>Pass Criteria:</td><td>Identification of the HMSCs and MSCs. The results, which are described with the HMSCs and MSCs, must be observed in order to get pass criteria. If not explicitly stated otherwise, the HMSCs and MSCs mandate the order of events and mandate the contents and values of the messages. Within the MSCs the documents TS 101 869-1 [2] for PT and TS 101 869-2 [3] for FT are referenced in order to describe the contents and values of the messages.</td></tr>
</table>

5.2 Description of the test execution with HMSCs

A HMSC is shown in figure 7. Each test case is followed by a HMSC. There is a HSMC for each layer. The HSMC is built out of MSCs. Each MSC within the HSMC is equal to a procedure. All MSCs are grouped in the clauses 8, 9, 10, 11 and 12.

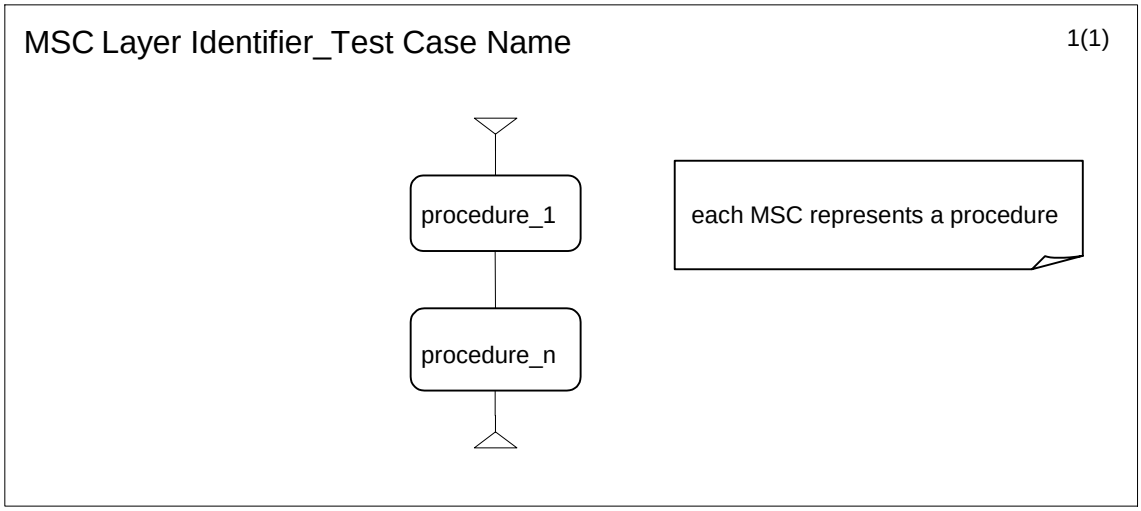

Figure 7: HMSC

5.3 Procedure definition conventions

The procedures are defined following particular rules as shown in table 2.

Table 2: Procedure definition rules

Procedure: Identification of the procedure.	
Preamble	Condition of stability before performing this procedure.
Stimulus	Reference to PIXIT items which explain how to start the procedure.

5.4 Description of the message flow with MSCs

A MSC is shown in figure 8. Each procedure is followed by a MSC. The MSC mandates the order of the messages, the contents and the values of the messages, which shall be observed.

Figure 8: MSC

5.5 Source of TC definitions

All TCs are specified according to EN 301 649 [1].

6 Test Case List

The test case list in table 3 identifies all possible test cases for interoperability testing. A status is assigned to each test case in order to indicate these test cases, which are mandatory to execute. The status of features, services or procedures within a test case is described in the documents TS 101 869-1 [2] for PT and TS 101 869-2 [3] for FT. In each test case a reference is given to the features, services or procedures.

Table 3: Test Case List

Nr.	Test Case Name	Status
01	Subscription	m
02	Outgoing call	o.301
03	Incoming call	o.301
04	Switch On	c301
05	Desubscribe	c302
06	Connection bandwidth control	c303
07	Suspend/Resume	m
08	Send/Receive U-plane data	m
09	Behaviour at the edge of range, in noisy environment and Interferer tests	m
10	Multicell behaviour	c304
11	Speech and Data in parallel or several Data connections in parallel	c305
12	V.24 procedures	o.302
13	Ethernet procedures	o.302
14	Encryption	m
15	Quality of service from applications point of view	o

Nr.	Test Case Name	Status
16	Quality of service from users point of view	o
c301: IF B.2/11 [3] THEN m ELSE i. c302: IF B.2/20 [3]) THEN m ELSE i. c303: IF (B.2/35 [2] AND B.2/35 [3]) THEN m ELSE i. c304: IF C.2/9 [3] THEN m ELSE i. c305: IF (F.3/5 [2] AND F.3/5 [3]) THEN m ELSE i. o.301: It is mandatory to support at least one of these options. o.302: It is mandatory to support at least one of these options.		

7 Test cases

7.1 Test Case: Subscription

Test Case Name: Subscription		
Feature Reference:	DPRS-N.9, Authentication of the PP	B.2/9 [2], B.2/9 [3]
	DPRS-N.11, Location registration	B.2/11 [2], B.2/11 [3]
	DPRS-N.12, On air key allocation	B.2/12 [2], B.2/12 [3]
	DPRS-N.18, Subscription registration user procedure on-air	B.2/18 [2], B.2/18 [3]
	DPRS-N.19, Link control	B.2/19 [2], B.2/19 [3]
	DPRS-N.33, Dynamic Parameters Allocation	B.2/33 [2], B.2/33 [3]
	DPRS-D.5, Data Link Service (LAPC + Lc) class A service	C.2/5 [2], C.2/5 [3]
	DPRS-D.7, Lc Frame delimiting and sequencing service	C.2/7 [2], C.2/7 [3]
	DPRS-M.3, Continuous broadcast	D.2/3 [2], D.2/3 [3]
	DPRS-M.5, Advanced connection	D.2/5 [2], D.2/5 [3]
Test Purpose:	To verify the subscription of the PT to the FT.	
Test Setup:	General test architecture, see clause 4.1, figure 1. Test configuration 1, see clause 4.2, figure 4.	
Application Behaviour:	Subscription registration user procedure on air shall be performed.	
NWK Test Procedure List:	Direct PT initiated link establishment	B.3/29 [2], B.3/29 [3]
	Obtain access rights	B.3/20 [2], B.3/20 [3]
	Terminal capability indication	B.3/17 [2], B.3/17 [3]
	Location Registration	B.3/15 [2], B.3/15 [3]
	Dynamic parameters allocation	B.3/42 [2], B.3/42 [3]
	Key Allocation	B.3/18 [2], B.3/18 [3]
	Authentication of PT	B.3/13 [2], B.3/13 [3]
	Link release	B.3/30 [2], B.3/30 [3]
DLC Test Procedure List:	Class A link establishment	C.3/5 [2], C.3/5 [3]
	Class A acknowledged information transfer	C.3/6 [2], C.3/6 [3]
	Class A link release	C.3/7 [2], C.3/7 [3]
	C_S-channel fragmentation and recombination	C.3/13 [2], C.3/13 [3]
	C_F-channel fragmentation and recombination	C.3/14 [2], C.3/14 [3]
	Selection of logical channels (C_S and C_F)	C.3/15 [2], C.3/15 [3]
MAC Test Procedure List:	Downlink broadcast	D.3/4 [2], D.3/4 [3]
	Logical connection setup	D.3/10 [2], D.3/10 [3]
	Single bearer Physical connection setup	D.3/13 [2], D.3/13 [3]
	Single duplex bearer setup	D.3/16 [2], D.3/16 [3]
	C_S/C_F Channel Data	D.3/24-25 [2], D.3/24-25 [3]
	Logical connection release	D.3/11 [2], D.3/11 [3]
	Physical Connection release	D.3/15 [2], D.3/15 [3]
	Unacknowledged bearer release	D.3/18 [2], D.3/18 [3]
Pass Criteria:	The following behaviour shall be observed: NWK layer: HMSC figure 9 and MSC figures 31, 32, 33, and 34. DLC layer: HMSC figure 10 and MSC figures 46 and 47. MAC layer: HMSC figure 11 and 53 and MSC figures 52, 54, 55, 56, 57, 58, 59, 61 and 73.	

7.1.1 High level MSC: NWK layer

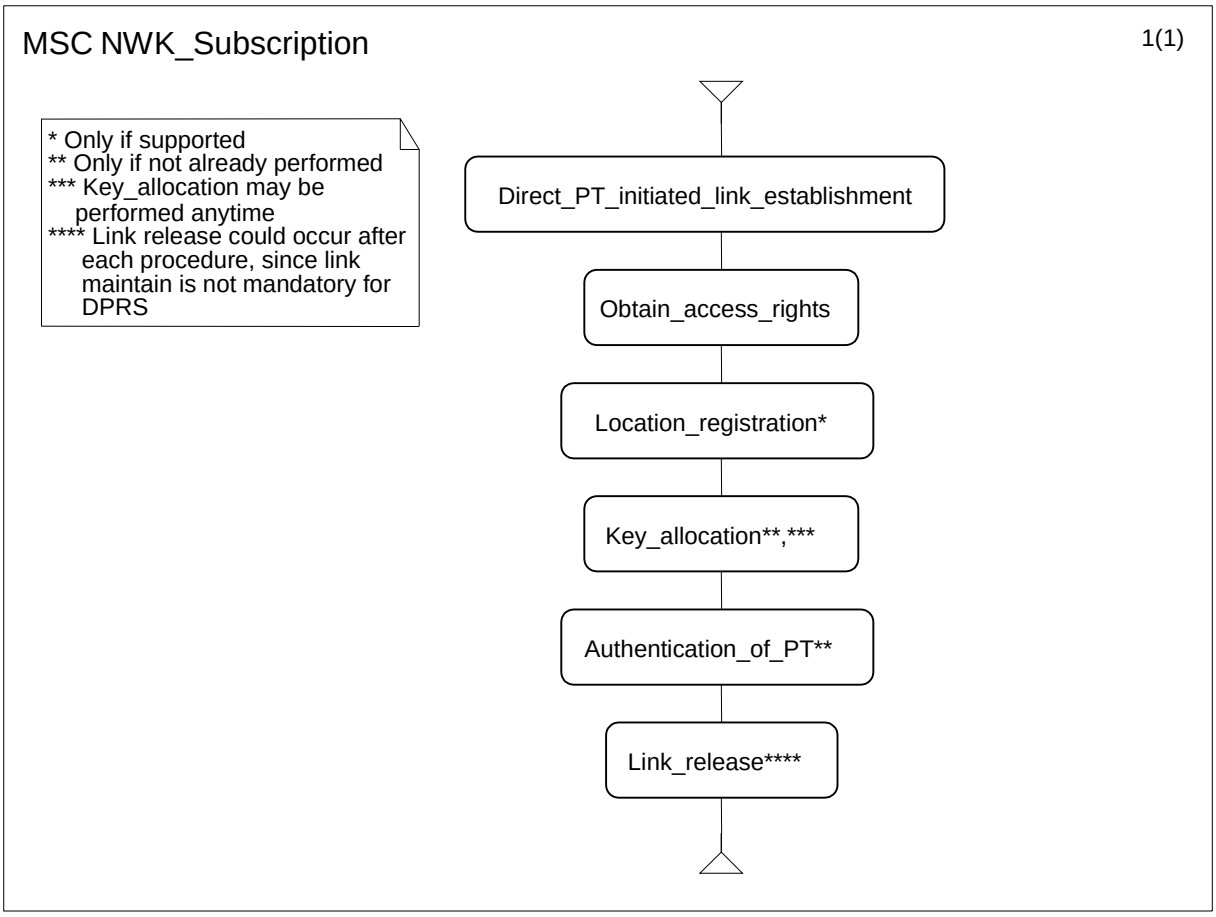

Figure 9: NWK Subscription

7.1.2 High level MSCs: DLC layer

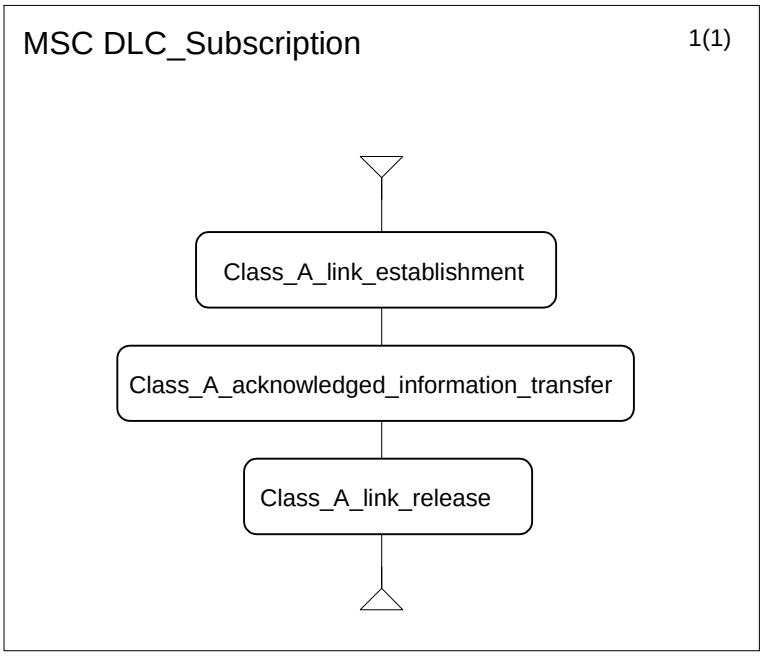

Figure 10: DLC Subscription

7.1.3 High level MSCs: MAC layer

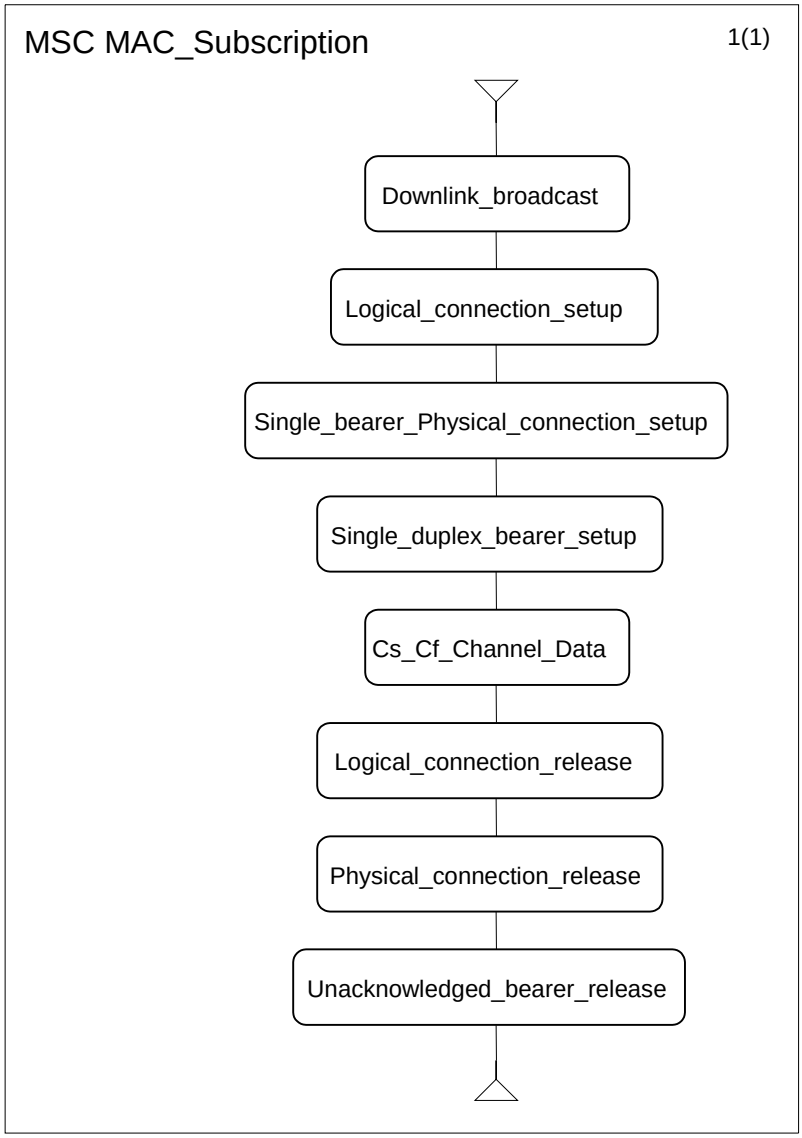

Figure 11: MAC Subscription

7.2 Test Case: Outgoing Call

Test Case Name: Outgoing Call		
Feature Reference:	DPRS-N.1, Outgoing Call	B.2/1 [2], B.2/1 [3]
	DPRS-N.3, On Hook	B.2/3 [2], B.2/3 [3]
	DPRS-N.34, Service Negotiation	B.2/34 [2], B.2/34 [3]
	DPRS-M.5, Advanced connection	D.2/5 [2], D.2/5 [3]
Test Purpose:	To verify the handling of an outgoing call.	
Test Setup:	General test architecture, see clause 4.1, figure 1. Test configuration 1, see clause 4.2, figure 4.	
Application Behaviour:	In order to verify that the PT and the FT connect the U-plane, an Application data transmission shall be performed.	
NWK Test Procedure List:	Call Resources/Parameters negotiation	B.3/43 [2], B.3/43 [3]
	Outgoing call request	B.3/1 [2], B.3/1 [3]
	Overlap sending	B.3/2 [2], B.3/2 [3]
	Outgoing call proceeding	B.3/3 [2], B.3/3 [3]
	Outgoing call confirmation	B.3/4 [2], B.3/4 [3]
	Outgoing call connection	B.3/5 [2], B.3/5 [3]
	Normal call release	B.3/8 [2], B.3/8 [3]
	Abnormal call release	B.3/9 [2], B.3/9 [3]
MAC Test Procedure List:	Logical connection setup	D.3/10 [2], D.3/10 [3]
	Single bearer Physical connection setup	D.3/13 [2], D.3/13 [3]
	Single duplex bearer setup	D.3/16 [2], D.3/16 [3]
	Connection Modification	D.3/12 [2], D.3/12 [3]
	MultiBearer Physical Connection Setup	D.3/14 [2], D.3/14 [3]
	Double Simplex Bearer Setup	D.3/17 [2], D.3/17 [3]
	C_S/C_F Channel Data	D.3/24-25 [2], D.3/24-25 [3]
	Logical connection release	D.3/11 [2], D.3/11 [3]
	Physical Connection release	D.3/15 [2], D.3/15 [3]
	Unacknowledged bearer release	D.3/18 [2], D.3/18 [3]
Pass Criteria:	The following behaviour shall be observed: NWK layer: HMSC figure 12 and MSC figures 37 and 44. MAC layer: HMSC figure 13 and 53 and MSC figures 54, 55, 56, 57, 58, 59, 61 and 73.	

7.2.1 High level MSCs: NWK layer

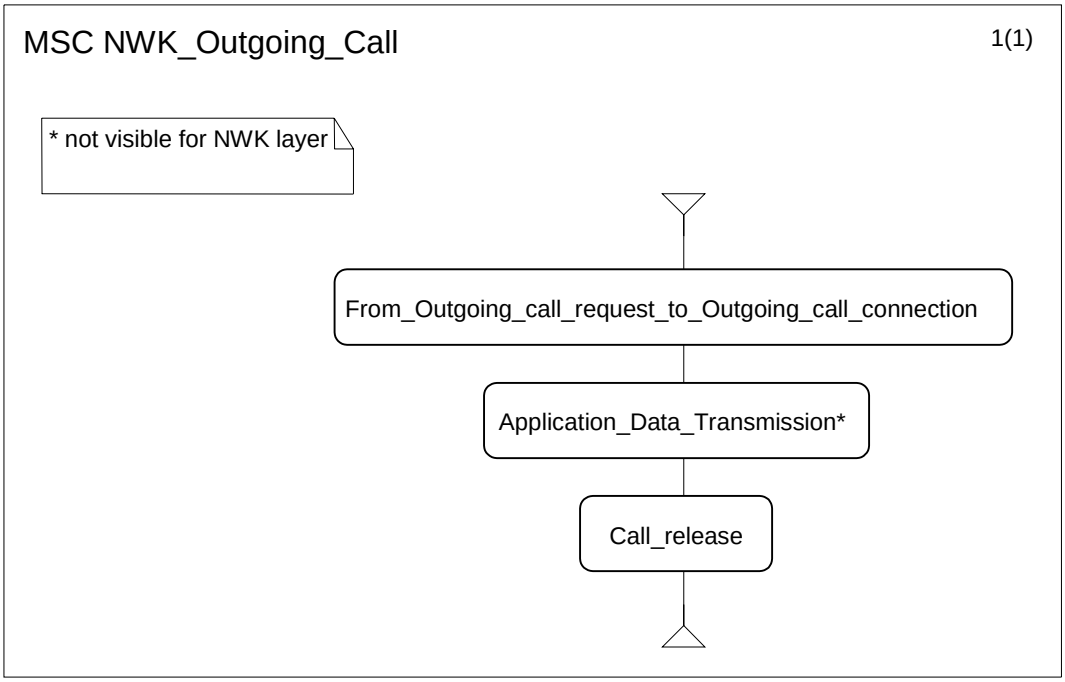

Figure 12: NWK Outgoing Call

7.2.2 High level MSCs: MAC layer

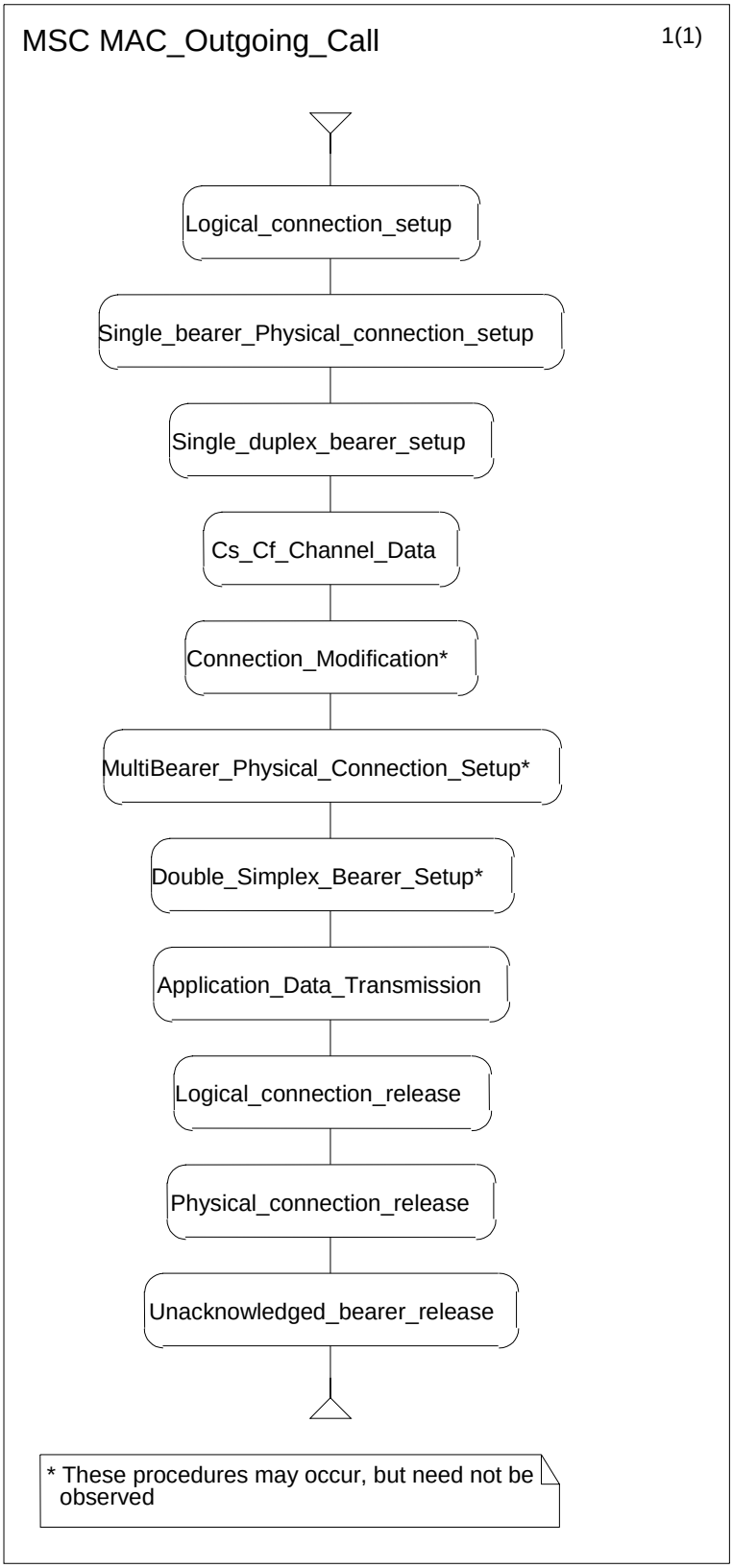

Figure 13: MAC Outgoing Call

7.3 Test Case: Incoming Call

Test Case Name: Incoming Call		
Feature Reference:	DPRS-N.8, Incoming Call	B.2/8 [2], B.2/8 [3]
	DPRS-N.3, On Hook	B.2/3 [2], B.2/3 [3]
	DPRS-N.15, Alerting	B.2/15 [2], B.2/15 [3]
	DPRS-N.19, Link control	B.2/19 [2], B.2/19 [3]
	DPRS-N.34, Service Negotiation	B.2/34 [2], B.2/34 [3]
	DPRS-M.4, Paging broadcast	D.2/4 [2], D.2/4 [3]
	DPRS-M.5, Advanced connection	D.2/5 [2], D.2/5 [3]
Test Purpose:	To verify the handling of an incoming call.	
Test Setup:	General test architecture, see clause 4.1, figure 1. Test configuration 1, see clause 4.2, figure 4.	
Application Behaviour:	In order to verify that the PT and the FT connect the U-plane, an Application data transmission shall be performed.	
NWK Test Procedure List:	Indirect FT initiated link establishment	B.3/25 [2], B.3/25 [3]
	Call Resources/Parameters negotiation	B.3/43 [2], B.3/43 [3]
	Incoming call request	B.3/10 [2], B.3/10 [3]
	Incoming call confirmation	B.3/11 [2], B.3/11 [3]
	Incoming call connection	B.3/7 [2], B.3/7 [3]
	PT alerting	B.3/12 [2], B.3/12 [3]
	Normal call release	B.3/8 [2], B.3/8 [3]
	Abnormal call release	B.3/9 [2], B.3/9 [3]
MAC Test Procedure List:	Normal paging	D.3/5 [2], D.3/5 [3]
	Low duty cycle paging	D.3/7 [2], D.3/7 [3]
	Logical connection setup	D.3/10 [2], D.3/10 [3]
	Single bearer Physical connection setup	D.3/13 [2], D.3/13 [3]
	Single duplex bearer setup	D.3/16 [2], D.3/16 [3]
	Connection Modification	D.3/12 [2], D.3/12 [3]
	MultiBearer Physical Connection Setup	D.3/14 [2], D.3/14 [3]
	Double Simplex Bearer Setup	D.3/17 [2], D.3/17 [3]
	C_S/C_F Channel Data	D.3/24-25 [2], D.3/24-25 [3]
	Logical connection release	D.3/11 [2], D.3/11 [3]
	Physical Connection release	D.3/15 [2], D.3/15 [3]
	Unacknowledged bearer release	D.3/18 [2], D.3/18 [3]
Pass Criteria:	The following behaviour shall be observed: NWK layer: HMSC figure 14 and MSC figures 30, 38 and 44. MAC layer: HMSC figure 15 and 53 and MSC figures 54, 55, 56, 57, 58, 59, 61, 65 and 73.	

7.3.1 High level MSCs: NWK layer

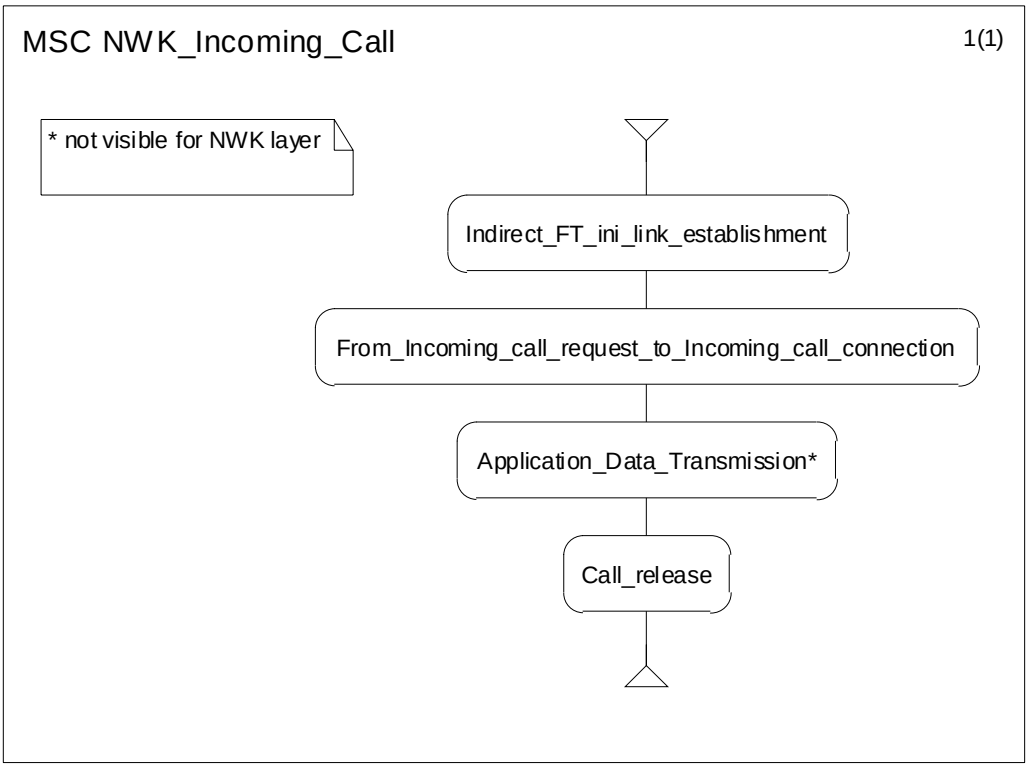

Figure 14: NWK Incoming Call

7.3.2 High level MSCs: MAC layer

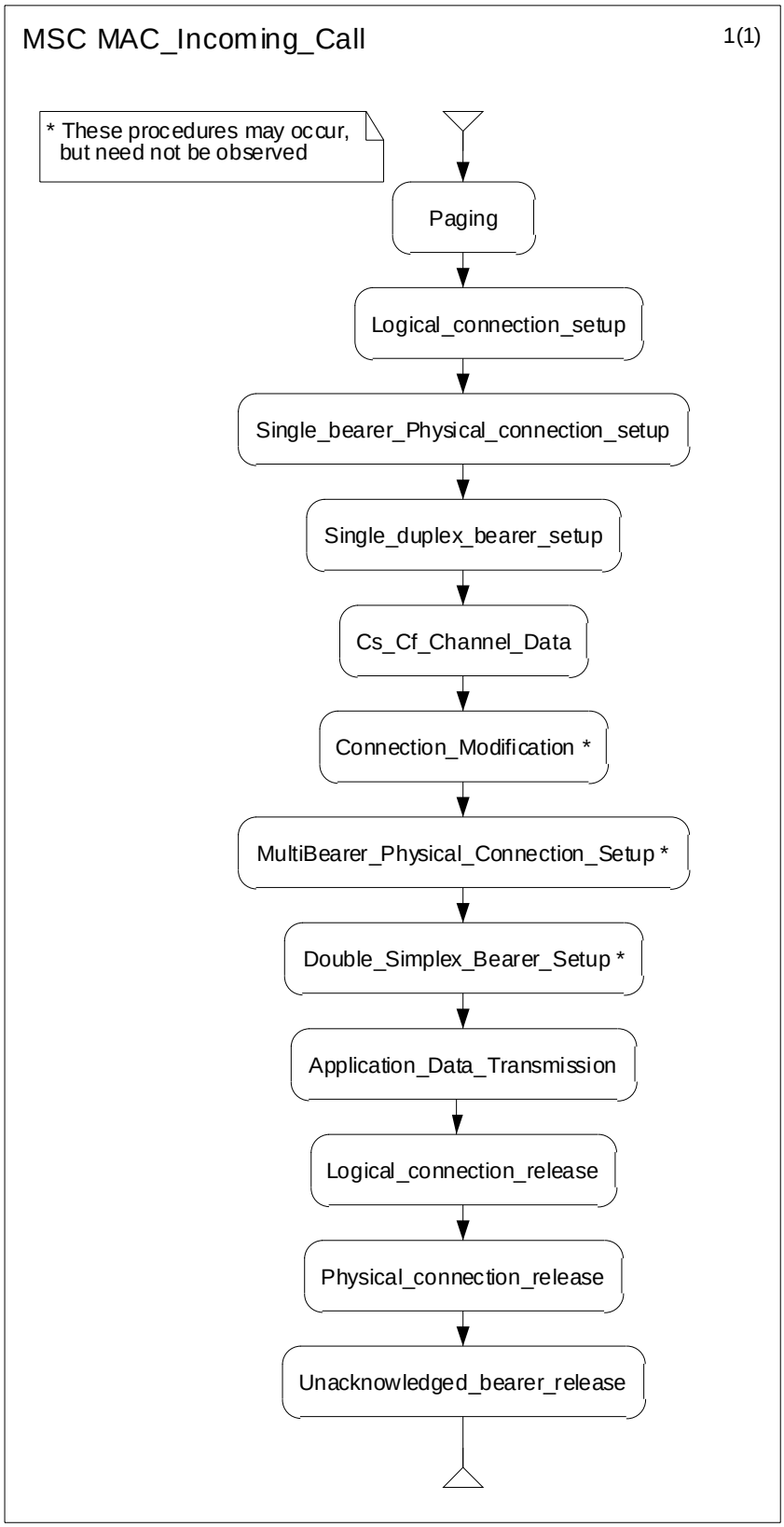

Figure 15: MAC Incoming Call

7.4 Test Case: Location Registration/Dynamic Parameters Allocation

Test Case Name: Switch on		
Feature Reference:	DPRS-N.11, Location registration	B.2/11 [2], B.2/11 [3]
	DPRS-N.33, Dynamic Parameters Allocation	B.2/33 [2], B.2/33 [3]
Test Purpose:	To verify the handling of Location Registration and Dynamic parameters allocation after the PT is switch on.	
Test Setup:	General test architecture, see clause 4.1, figure 1. Test configuration 1, see clause 4.2, figure 4.	
Application Behaviour:	-	
NWK Test Procedure List:	Terminal capability indication	B.3/17 [2], B.3/17 [3]
	Location Registration	B.3/15 [2], B.3/15 [3]
	Dynamic parameters allocation	B.3/42 [2], B.3/42 [3]
Pass Criteria:	The following behaviour shall be observed: NWK layer: HMSC figure 16 and MSC figure 33.	

7.4.1 High level MSCs: NWK layer

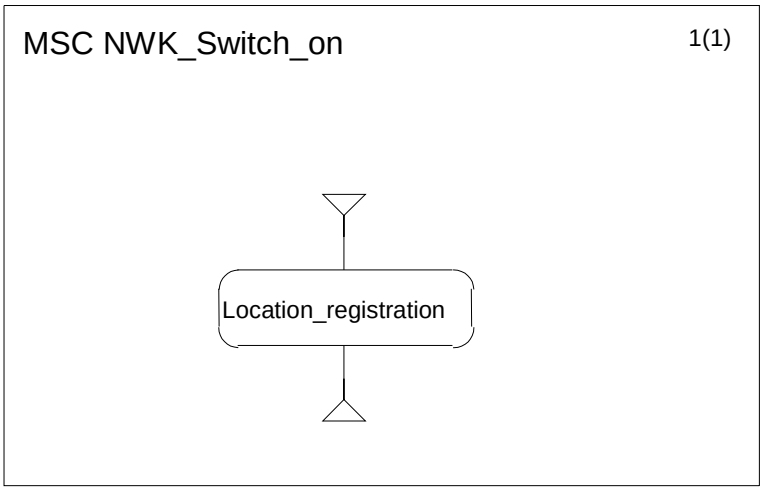

Figure 16: NWK Switch on

7.5 Test Case: Desubscribe

Test Case Name: Desubscribe		
Feature Reference:	DPRS-N.20, Terminate access rights FT initiated	B.2/20 [2], B.2/20 [3]
Test Purpose:	To verify that the PT can be desubscribed from the FT.	
Test Setup:	General test architecture, see clause 4.1, figure 1. Test configuration 1, see clause 4.2, figure 4.	
Application Behaviour:	Terminate access rights user procedure shall be performed.	
NWK Test Procedure List:	FT terminating access rights	B.3/34 [2], B.3/34 [3]
	Authentication of FT	B.3/22 [2], B.3/22 [3]
Pass Criteria:	The following behaviour shall be observed: NWK layer: HMSC figure 17 and MSC figure 36.	

7.5.1 High level MSCs: NWK layer

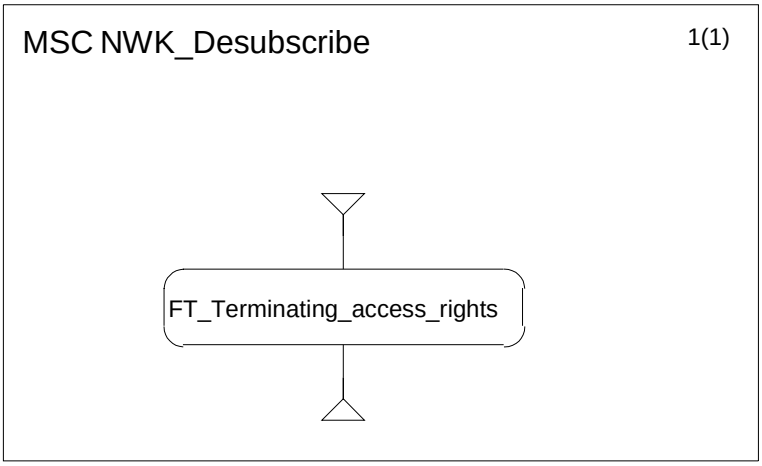

Figure 17: NWK Desubscribe

7.6 Test Case: Connection bandwidth control

Test Case Name: Connection bandwidth control		
Feature Reference:	DPRS-N.35, In call service change	B.2/35 [2], B.2/35 [3]
	DPRS-M.5, Advanced connection	D.2/5 [2], D.2/5 [3]
	DPRS-ME.2, Class 2 management	F.2/2 [2], F.2/2 [3]
Test Purpose:	To verify the handling of the bandwidth change.	
Test Setup:	General test architecture, see clause 4.1, figure 1. Test configuration 1, see clause 4.2, figure 4.	
Application Behaviour:	In order to force the IUT to change its bandwidth, at the Application layer an Application data transmission with a variable throughput shall be performed.	
NWK Test Procedure List:	Bandwidth change	B.3/44 [2], B.3/44 [3]
MAC Test Procedure List:	Logical connection setup	D.3/10 [2], D.3/10 [3]
	Single bearer Physical connection setup	D.3/13 [2], D.3/13 [3]
	Multi bearer Physical connection setup	D.3/14 [2], D.3/14 [3]
	Connection modification	D.3/12 [2], D.3/12 [3]
	Single duplex bearer setup	D.3/16 [2], D.3/16 [3]
	Double simplex bearer setup	D.3/17 [2], D.3/17 [3]
	Unacknowledged bearer release	D.3/18 [2], D.3/18 [3]
	Fast bearer release	D.3/20 [2], D.3/20 [3]
Management Entity Test Procedure List:	Dynamic Bandwidth management	F.3/5 [2], F.3/5 [3]
Pass Criteria:	The following behaviour shall be observed: NWK layer: HMSC figure 18 and MSC figure 40. MAC layer: HMSC figure 19 and MSC figure 64.	

7.6.1 High level MSCs: NWK layer

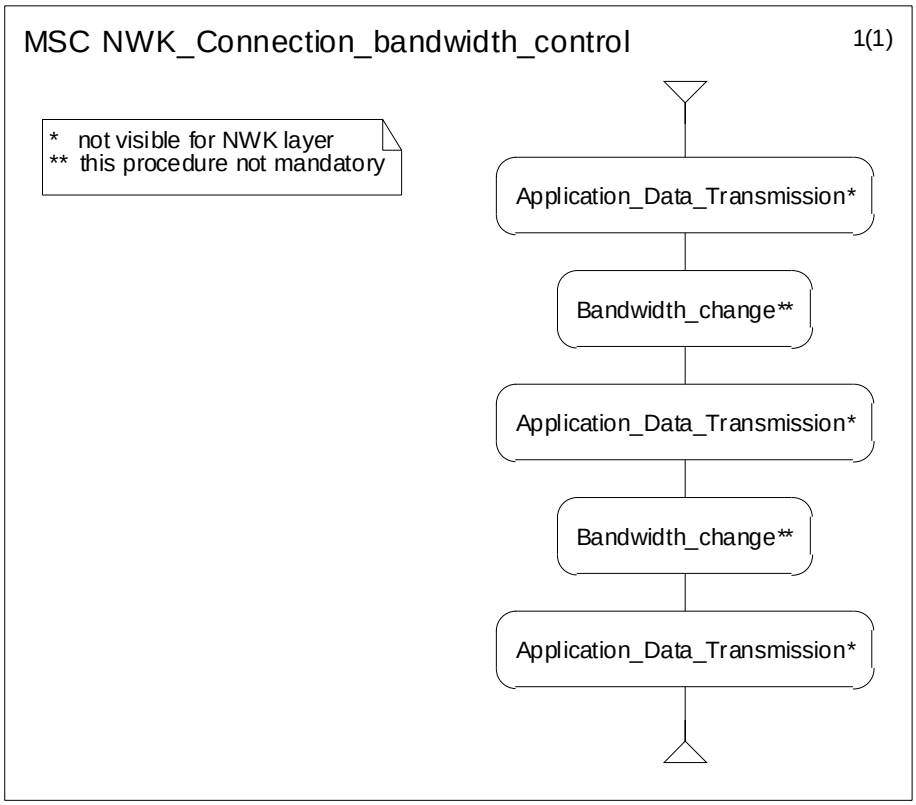

Figure 18: NWK Connection bandwidth control

7.6.2 High level MSCs: MAC layer

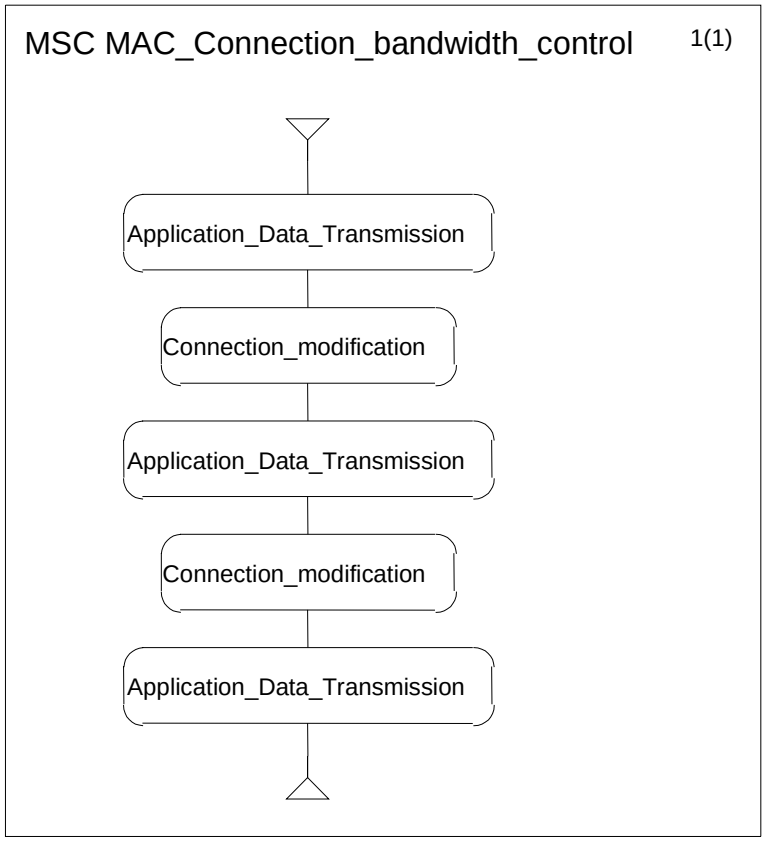

Figure 19: MAC Connection bandwidth control

7.7 Test Case: Stop/Start sending data

Test Case Name: Stop/Start sending data		
Feature Reference:	DPRS-N.33, Dynamic parameters allocation	B.2/33 [2], B.2/33 [3]
	DPRS-M.4, Paging broadcast	D.2/4 [2], D.2/4 [3]
	DPRS-M.5, Advanced connection	D.2/5 [2], D.2/5 [3]
	DPRS-ME.2, Class 2 management	F.2/2 [2], F.2/2 [3]
Test Purpose:	To verify the handling of suspend and resume management.	
Test Setup:	General test architecture, see clause 4.1, figure 1. Test configuration 1, see clause 4.2, figure 4.	
Application Behaviour:	In order to force the IUT to perform suspend and resume, at the Application layer an Application data transmission with big throughputs, small throughputs and delay between the throughputs shall be performed.	
NWK Test Procedure List:	Dynamic parameters allocation	B.3/42 [2], B.3/42 [3]
MAC Test Procedure List:	MAC paging	D.3/8 [2], D.3/8 [3]
	Connection modification	D.3/12 [2], D.3/12 [3]
	Single duplex bearer setup	D.3/16 [2], D.3/16 [3]
	Double simplex bearer setup	D.3/17 [2], D.3/17 [3]
	Unacknowledged bearer release	D.3/18 [2], D.3/18 [3]
	Fast bearer release	D.3/20 [2], D.3/20 [3]
Management Entity Procedure List:	Suspend management	F.3/2 [2], F.3/2 [3]
	Resume management	F.3/3 [2], F.3/3 [3]
	Stay Alive	F.3/4 [2], F.3/4 [3]
Pass Criteria:	The following behaviour shall be observed: Management Entity: HMSC figure 20 and MSC figures 76 and 77.	

7.7.1 High level MSCs: Management Entity

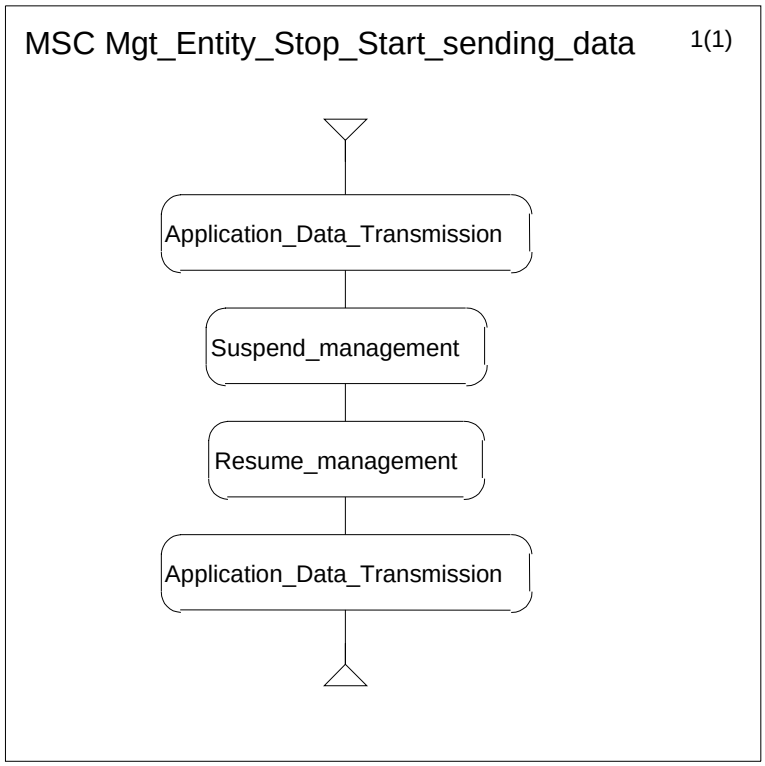

Figure 20: Management Entity Stop/Start sending data

7.8 Test Case: Send and receive U-plane data

Test Case Name: Send and receive U-plane data		
Feature Reference:	DPRS-N.34, Service negotiation	B.2/34 [2], B.2/34 [3]
	DPRS-D.1, LU10 EFREL	C.2/1 [2], C.2/1 [3]
	DPRS-D.2, FU10a	C.2/2 [2], C.2/2 [3]
	DPRS-D.3, FU10b	C.2/3 [2], C.2/3 [3]
	DPRS-D.4, FU10c	C.2/4 [2], C.2/4 [3]
	DPRS-M.5, Advanced connection	D.2/5 [2], D.2/5 [3]
	DPRS-ME.2, Class 2 management	F.2/2 [2], F.2/2 [3]
Test Purpose:	To verify the correct sending and receiving of U-plane data.	
Test Setup:	General test architecture, see clause 4.1, figure 1. Test configuration 1, see clause 4.2, figure 4.	
Application Behaviour:	At the Application layer an Application data transmission with big throughputs; small throughputs and delay between the throughputs shall be performed.	
NWK Test Procedure List:	Call Resources/Parameters negotiation	B.3/43 [2], B.3/43 [3]
DLC Test Procedure List:	U-plane transmission class 2	C.3/1 [2], C.3/1 [3]
	FU10a frame operation	C.3/2 [2], C.3/2 [3]
	FU10b frame operation	C.3/3 [2], C.3/3 [3]
	FU10c frame operation	C.3/4 [2], C.3/4 [3]
MAC Test Procedure List:	Connection modification	D.3/12 [2], D.3/12 [3]
	Single duplex bearer setup	D.3/16 [2], D.3/16 [3]
	Double simplex bearer setup	D.3/17 [2], D.3/17 [3]
	G_F Channel Data	D.3/39 [2], D.3/39 [3]
	Unacknowledged bearer release	D.3/18 [2], D.3/18 [3]
	Fast bearer release	D.3/20 [2], D.3/20 [3]
Management Entity Test Procedure List:	Dynamic Bandwidth management	F.3/5 [2], F.3/5 [3]
Pass Criteria:	The following behaviour shall be observed: DLC layer: HMSC figure 21 and MSC figure 45. MAC layer: HMSC figure 22 and MSC figure 75.	

7.8.1 High level MSCs: DLC layer

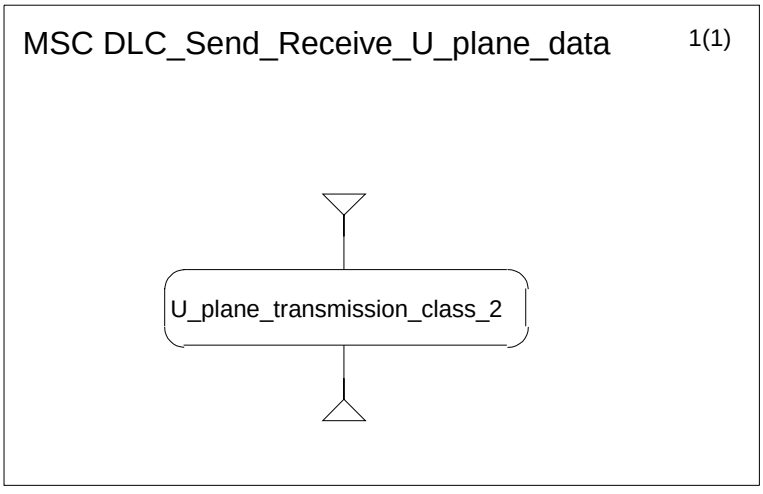

Figure 21: DLC Send and Receive U-plane data

7.8.2 High level MSCs: MAC layer

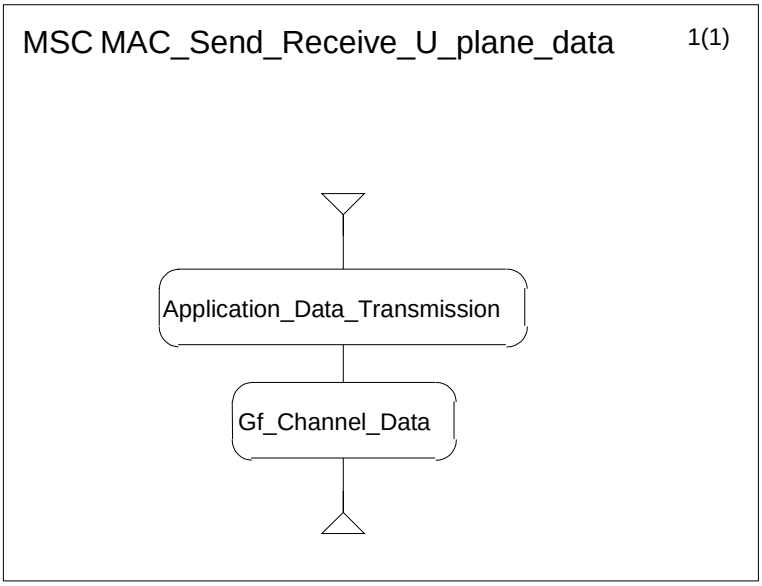

Figure 22: MAC Send and Receive U-plane data

7.9 Test Case: Behaviour at the edge of range, in noisy environment, Interferer tests

Test Case Name: Behaviour at the edge of range, in noisy environment, Interferer tests		
Feature Reference:	DPRS-D.1, LU10 EFREL	C.2/1 [2], C.2/1 [3]
	DPRS-D.2, FU10a	C.2/2 [2], C.2/2 [3]
	DPRS-D.3, FU10b	C.2/3 [2], C.2/3 [3]
	DPRS-D.4, FU10c	C.2/4 [2], C.2/4 [3]
	DPRS-M.5, Advanced connection	D.2/5 [2], D.2/5 [3]
	DPRS-M.16, Bearer replacement	D.2/16 [2], D.2/16 [3]
Test Purpose:	To verify the correct behaviour of the IUT in borderline cases.	
Test Setup:	General test architecture, see clause 4.1, figure 1. Test configuration 1, see clause 4.2, figure 4.	
Application Behaviour:	An Application data transmission shall be performed.	
DLC Test Procedure List:	U-plane transmission class 2	C.3/1 [2], C.3/1 [3]
	FU10a frame operation	C.3/2 [2], C.3/2 [3]
	FU10b frame operation	C.3/3 [2], C.3/3 [3]
	FU10c frame operation	C.3/4 [2], C.3/4 [3]
MAC Test Procedure List:	Bearer replacement	D.3/36 [2], D.3/36 [3]
	Unacknowledged bearer release	D.3/18 [2], D.3/18 [3]
Pass Criteria:	The following behaviour shall be observed: DLC layer: HMSC figure 23 and MSC figure 45. MAC layer: HMSC figure 24 and MSC figure 66.	

7.9.1 High level MSCs: DLC layer

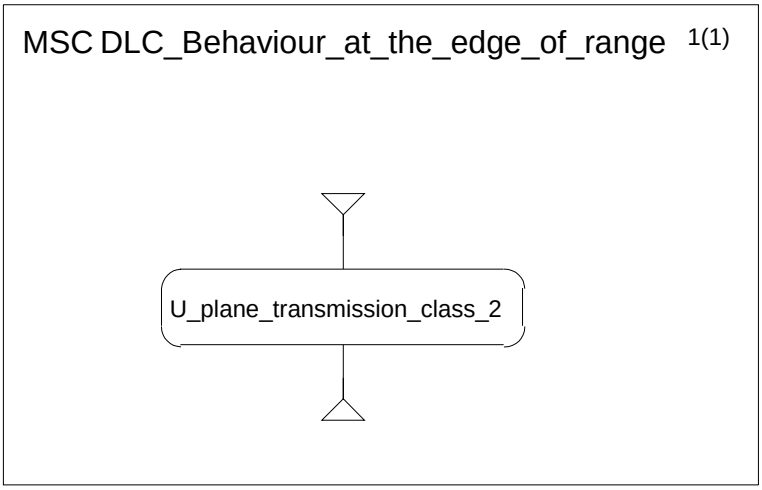

Figure 23: DLC Behaviour at the edge of range, in noisy environment, Interferer tests

7.9.2 High level MSCs: MAC layer

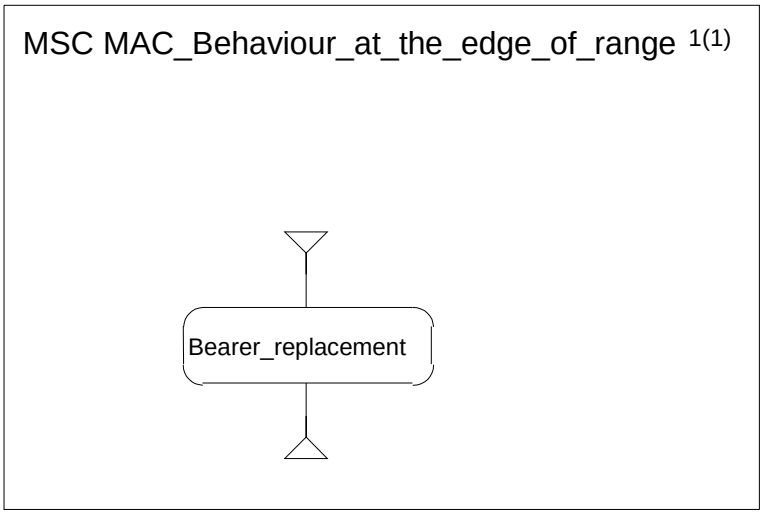

Figure 24: MAC Behaviour at the edge of range, in noisy environment, Interferer tests

7.10 Test Case: Multicell behaviour

Test Case Name: Multicell behaviour		
Feature Reference:	DPRS-D.9, Inter-cell voluntary connection handover	C.2/9 [2], C.2/9 [3]
Test Purpose:	To verify the correct handling of the connection handover procedure.	
Test Setup:	Test architecture for Intercell handover, see clause 4.1, figure 2. Test configuration 1, see clause 4.2, figure 4.	
Application Behaviour:	An Application data transmission shall be performed.	
DLC Test Procedure List:	Class A connection handover	C.3/18 [2], C.3/18 [3]
Pass Criteria:	The following behaviour shall be observed: DLC layer: HMSC figure 25.	

7.10.1 High level MSCs: DLC layer

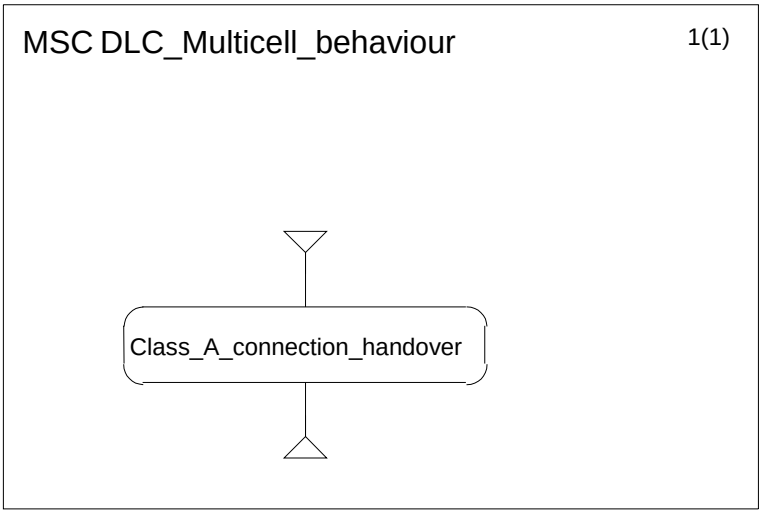

Figure 25: DLC Multicell behaviour

7.11 Test Case: Speech and Data in parallel or several Data connections in parallel

Test Case Name: Speech and Data in parallel or several Data connections in parallel		
Feature Reference:	DPRS-ME.2, Class 2 management	F.2/2 [2], F.2/2 [3]
Test Purpose:	To verify that it is possible to establish multiple connections.	
Test Setup:	Test architecture for parallel data connections, see clause 4.1, figure 3. Test configuration 3, see clause 4.2, figure 6.	
Application Behaviour:	In order to verify that all connections are working as expected, at least one of the following scenarios shall be performed: Scenario 1: Two Application data transmissions shall be performed in parallel. Scenario 2: An Application data transmission and a voice call shall be performed in parallel.	
Management Entity Test Procedure List:	Dynamic Bandwidth management	F.3/5 [2], F.3/5 [3]
Pass Criteria:	No errors shall occur during the Application data transmissions.	

7.12 Test Case: V.24 Operation

Test Case Name: V.24 Operation		
Feature Reference:	DPRS-N.34, Service negotiation	B.2/34 [2], B.2/34 [3]
Test Purpose:	To verify that an information transfer with the negotiated V.24 parameters is possible.	
Test Setup:	General test architecture, see clause 4.1, figure 1. Test configuration 2, see clause 4.2, figure 5.	
Application Behaviour:	An Application data transmission shall be performed in order to verify the correct use of possible Baudrates, Autobauding, Statuslines and Flowcontrol.	
NWK Test Procedure List:	Call Resources/Parameters negotiation	B.3/43 [2], B.3/43 [3]
Pass Criteria:	The following behaviour shall be observed: NWK layer: HMSC figure 26 and MSC figures 42 and 44.	

7.12.1 High level MSCs: NWK layer

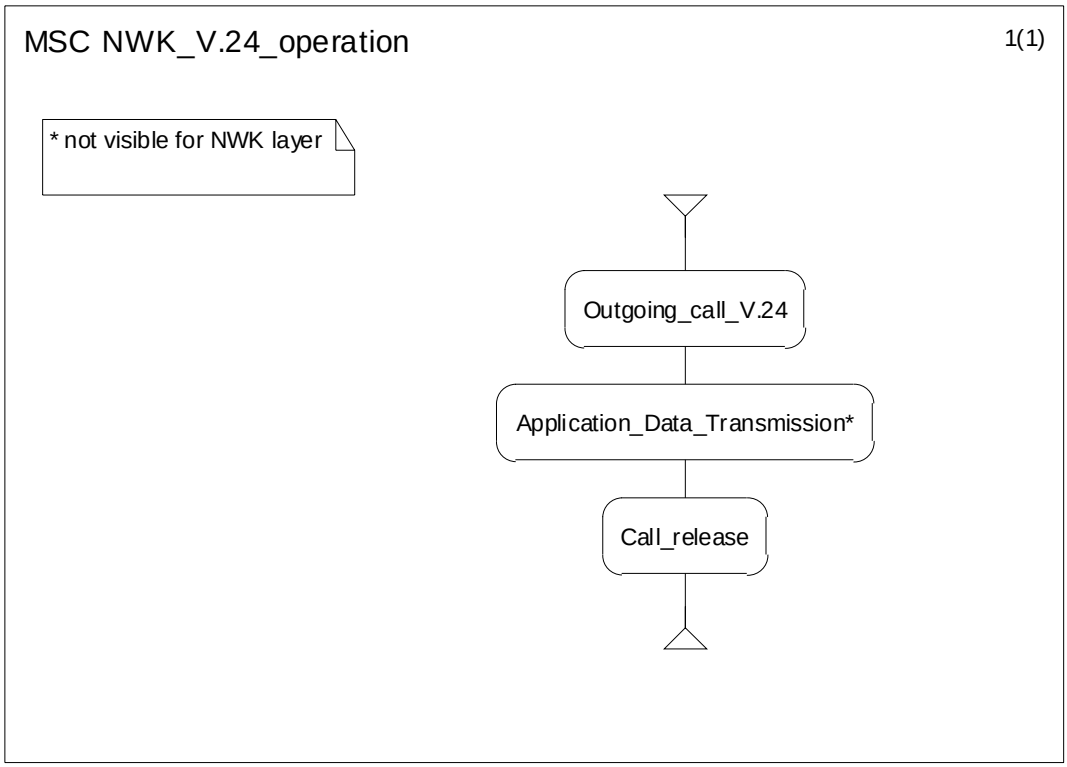

Figure 26: NWK V.24 operation

7.13 Test Case: Ethernet Operation

Test Case Name: Ethernet Operation		
Feature Reference:	DPRS-N.34, Service negotiation	B.2/34 [2], B.2/34 [3]
Test Purpose:	To verify that interworking with Ethernet is possible.	
Test Setup:	General test architecture, see clause 4.1, figure 1. Test configuration 2, see clause 4.2, figure 5.	
Application Behaviour:	An Application data transmission, which varies the packet size, shall be performed in order to verify that padding is handled correctly.	
NWK Test Procedure List:	Call Resources/Parameters negotiation	B.3/43 [2], B.3/43 [3]
Pass Criteria:	The following behaviour shall be observed: NWK layer: HMSC figure 27 and MSC figures 43 and 44.	

7.13.1 High level MSCs: NWK layer

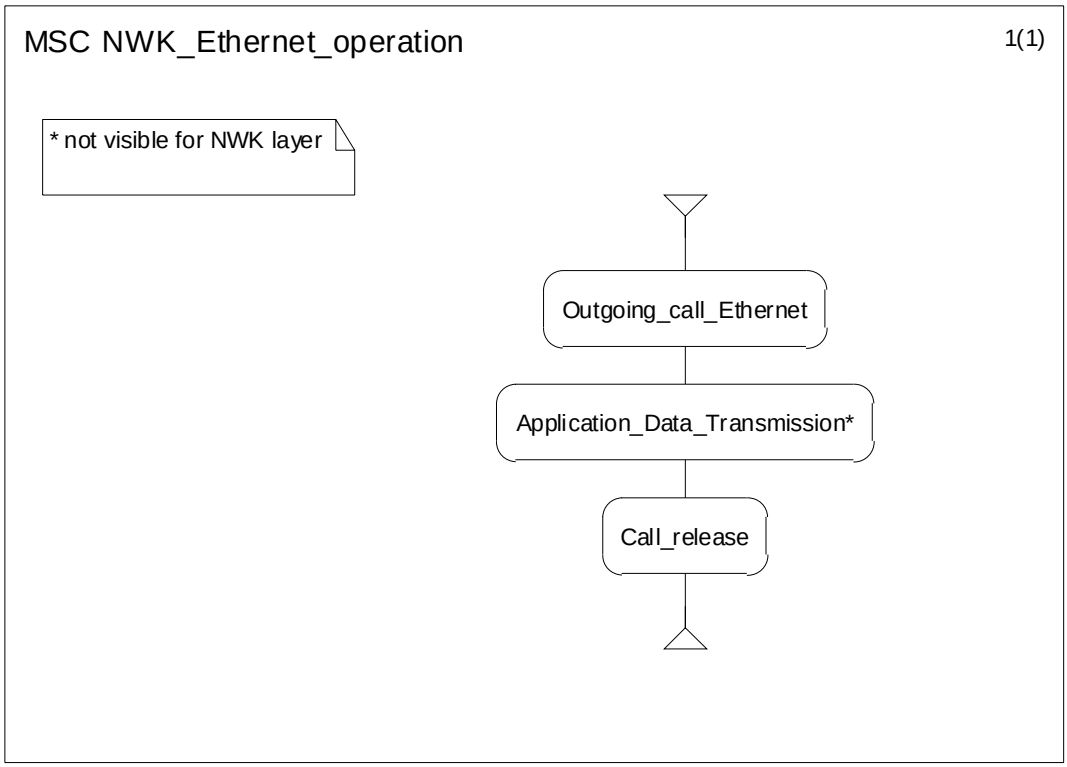

Figure 27: NWK Ethernet operation

7.14 Test Case: Encryption

Test mode: During the execution of this test encryption will be switch on. The message exchange has to be monitored until the encryption takes place.

Test Case Name: Encryption		
Feature Reference:	DPRS-N.17, Encryption activation FT initiated	B.2/17 [2], B.2/17 [3]
	DPRS-M.11, Encryption activation	D.2/11 [2], D.2/11 [3]
Test Purpose:	To verify the correct handling of Encryption activation.	
Test Setup:	General test architecture, see clause 4.1, figure 1. Test configuration 1, see clause 4.2, figure 4.	
Application Behaviour:	At the Application layer an Application data transmission shall be performed.	
NWK Test Procedure List:	Cipher-switching initiated by FT	B.3/23 [2], B.3/23 [3]
	Storing the Derived Cipher Key (DCK)	B.3/24 [2], B.3/24 [3]
MAC Test Procedure List:	Encryption process - initialization and synchronization	D.3/26 [2], D.3/26 [3]
	Encryption mode control	D.3/27 [2], D.3/27 [3]
Pass Criteria:	The following behaviour shall be observed: NWK layer: HMSC figure 28 and MSC figure 41. MAC layer: HMSC figures 29 and 68 and MSC figures 69, 70, 71 and 72.	

7.14.1 High level MSCs: NWK layer

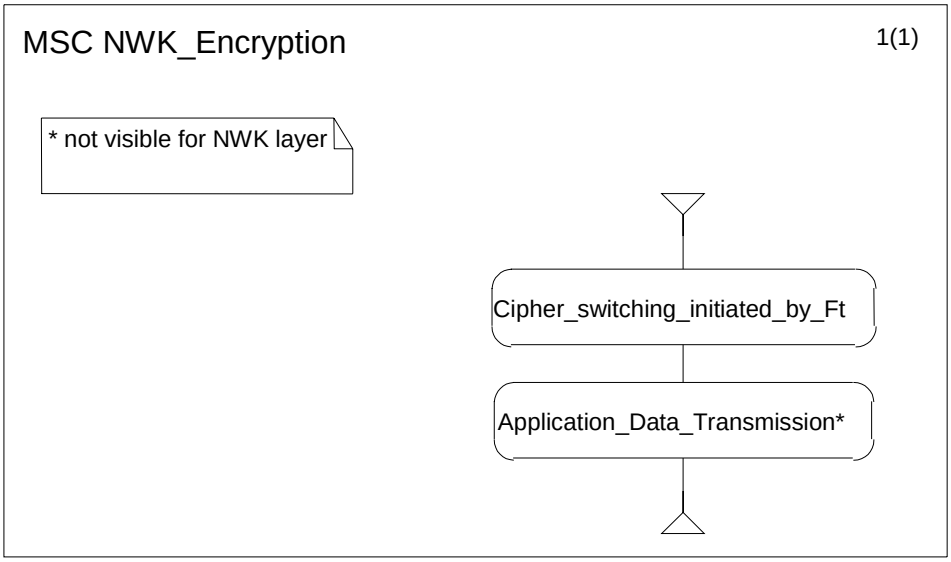

Figure 28: NWK Encryption

7.14.2 High level MSCs: MAC layer

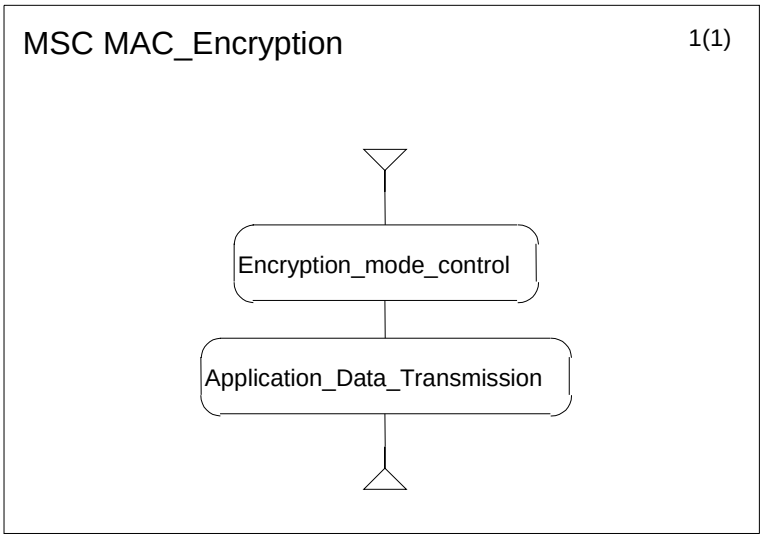

Figure 29: MAC Encryption

7.15 Test Case: Quality of service from applications point of view

Test Case Name: Quality of service from applications point of view	
Feature Reference:	-
Test Purpose:	To verify the quality claimed by the manufacturer.
Test Setup:	General test architecture, see clause 4.1, figure 1. Test configuration 1, see clause 4.2, figure 4.
Application Behaviour:	See PIXIT table A.7 item 41.
Test Procedure List:	-
Pass Criteria:	The application behaviour as indicated by the supplier in the PIXIT item A.7/41 shall be observed.

7.16 Test Case: Quality of service from users point of view

Test Case Name: Quality of service from users point of view	
Feature Reference:	-
Test Purpose:	To verify the quality claimed by the manufacturer.
Test Setup:	General test architecture, see clause 4.1, figure 1. Test configuration 1, see clause 4.2, figure 4.
Application Behaviour:	See PIXIT table A.7 item 42.
Test Procedure List:	-
Pass Criteria:	The application behaviour as indicated by the supplier in the PIXIT item A.7/42 shall be observed.

8 Application behaviour

8.1 Application data transmission

8.1.1 Procedure

Procedure: Application data transmission	
Preamble	The FT shall be in call state F-10. The PT shall be in call state T-10.
Stimulus	The test operator shall trigger the Application data transmission as described in the application behaviour of each test case. At MAC Layer, expect to see Protected I-Channel Error Detect Mode operation. At DLC Layer, expect to see LU10 Class 2 operation. No specific behaviour is visible at NWK Layer At Application level, the data transmission shall occur with no errors.

9 NWK layer procedures

9.1 Direct PT initiated link establishment

9.1.1 Procedure

Procedure: Direct PT initiated link establishment	
Preamble	The FT shall be in state Active_Idle. The PT shall be in state Idle_Locked.
Stimulus	The test operator shall trigger the Direct PT initiated link establishment procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 1.

9.2 Indirect FT initiated link establishment

9.2.1 Procedure

Procedure: Indirect FT initiated link establishment	
Preamble	The FT shall be in state Active_Idle. The PT shall be in state Idle_Locked.
Stimulus	The test operator shall trigger the Indirect FT initiated link establishment procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 26.

9.2.2 MSC

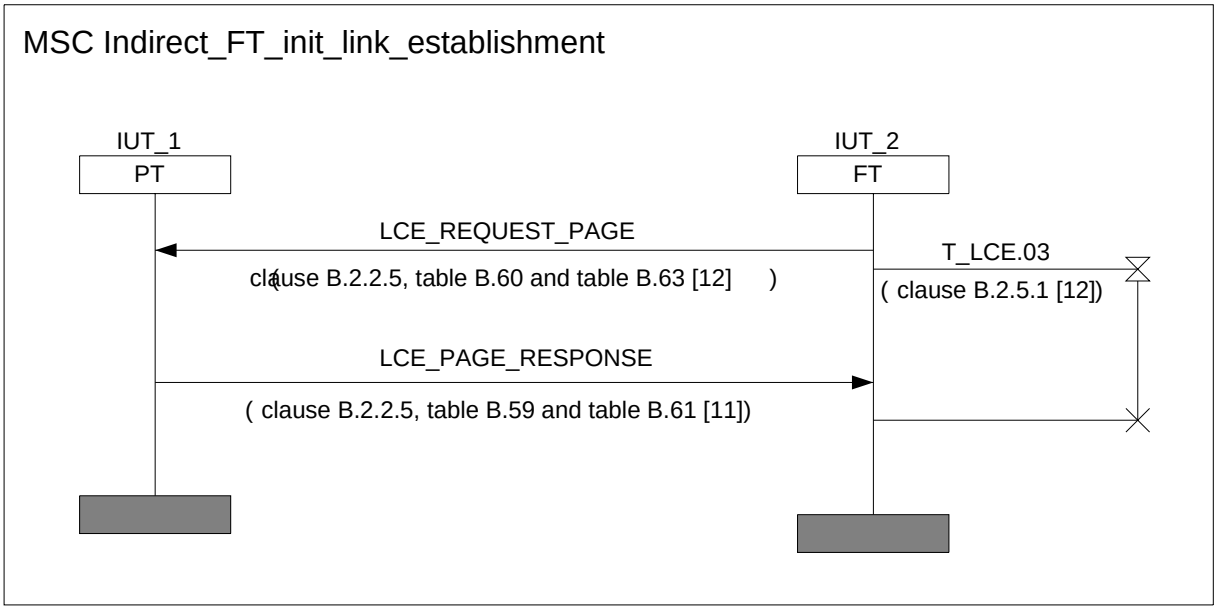

Figure 30: Indirect FT initiated link establishment

9.3 Obtain access rights

9.3.1 Procedure

Procedure: Obtain access rights	
Preamble	Higher layer capabilities bit a44 is set to 1. Direct PT initiated link establishment.
Stimulus	The test operator shall trigger the Obtain access rights procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 21 and item 22.

9.3.2 MSC

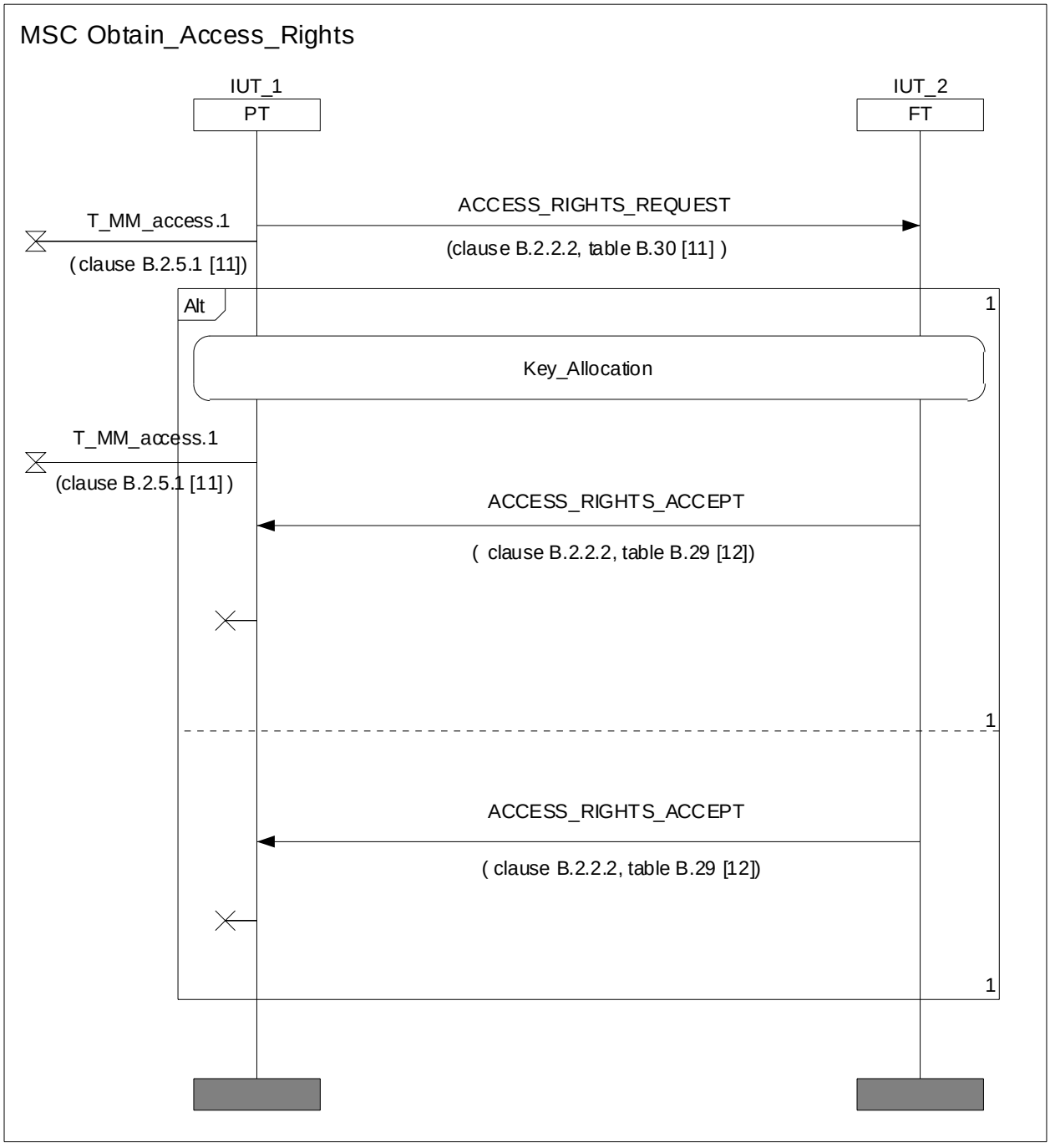

Figure 31: Obtain access rights

9.4 Key allocation

9.4.1 Procedure

Procedure: Key allocation	
Preamble	Direct PT initiated link establishment.
Stimulus	The test operator shall trigger the Key allocation procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 24.

9.4.2 MSC

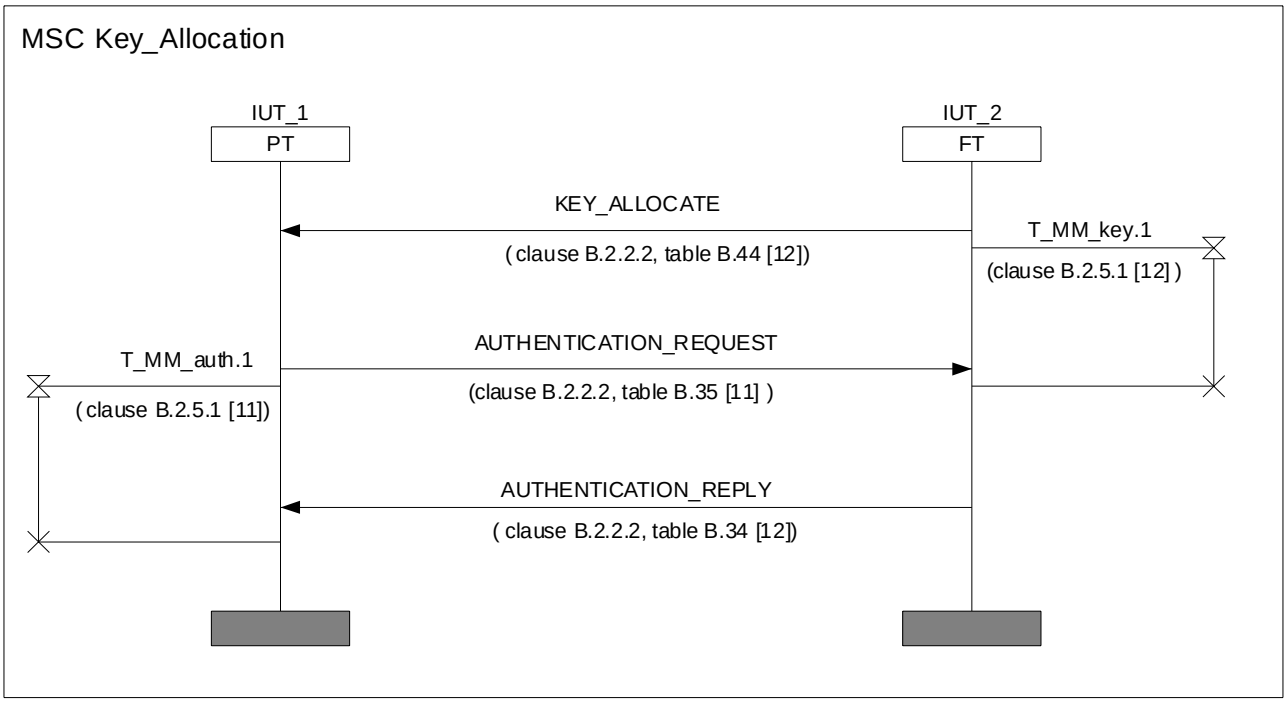

Figure 32: Key allocation

9.5 Location registration

9.5.1 Procedure

Procedure: Location registration	
Preamble	Higher layer capabilities bit a38 is set to 1. Direct PT initiated link establishment. If the PT is not yet subscribed to the FT, then Obtain access rights.
Stimulus	The test operator shall trigger the Location registration procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 19 and item 20.

9.5.2 MSC

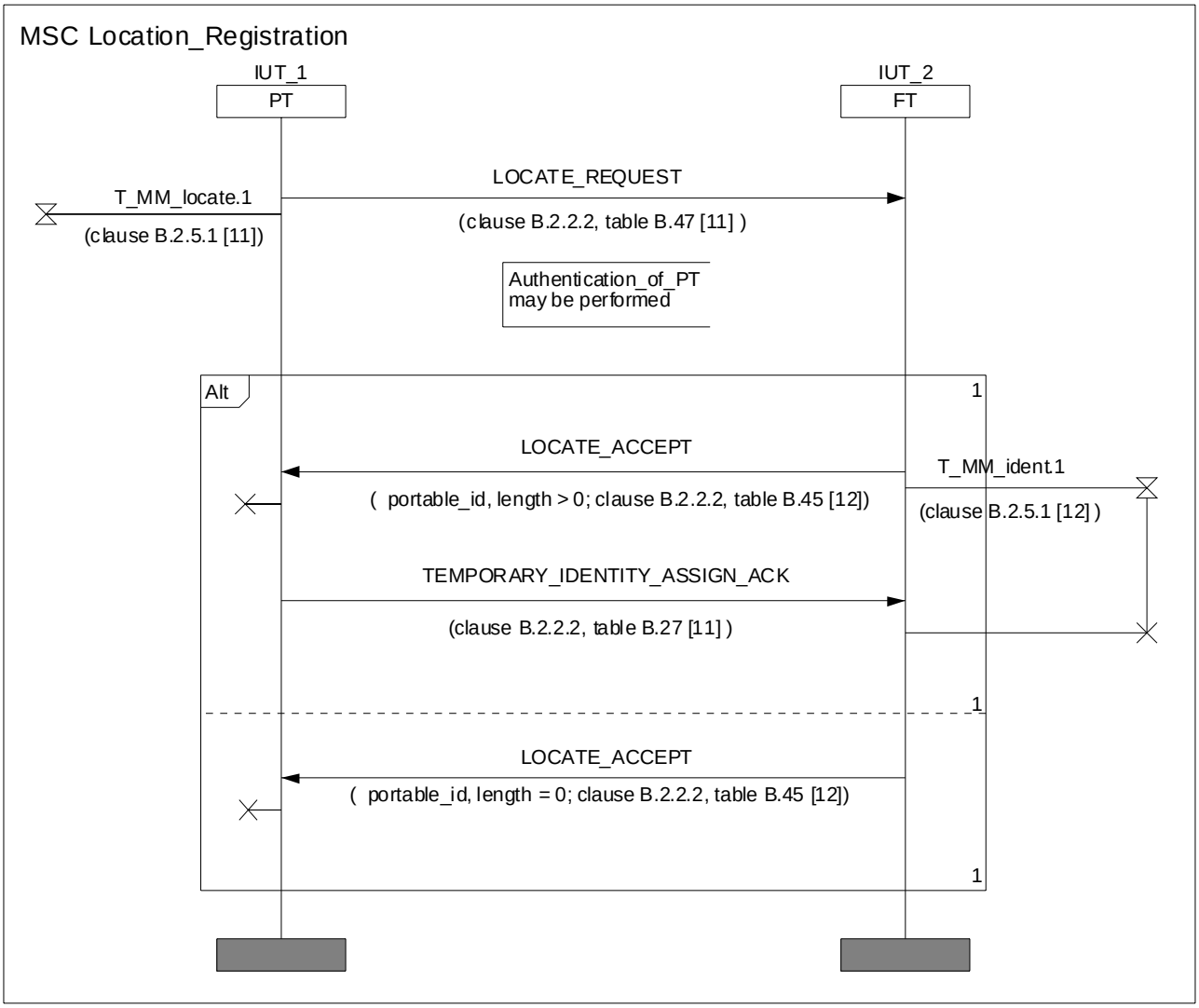

Figure 33: Location Registration

9.6 Authentication of PT

9.6.1 Procedure

Procedure: Authentication of PT	
Preamble	Link establishment.
Stimulus	The test operator shall trigger the Authentication of PT procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 17.

9.6.2 MSC

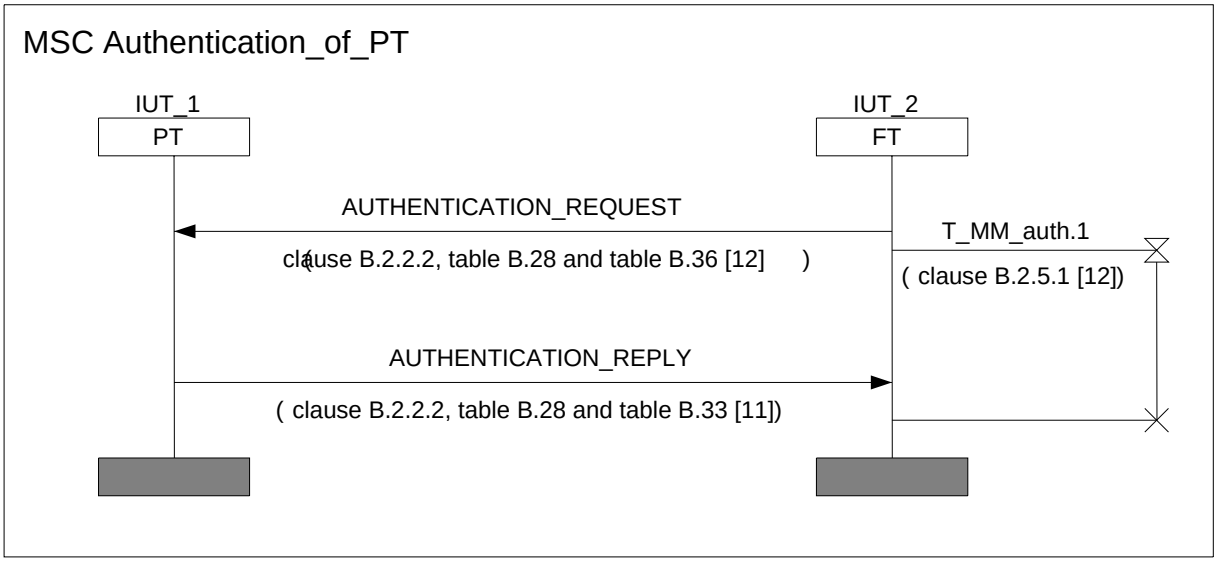

Figure 34: Authentication of PT

9.7 Authentication of FT

9.7.1 Procedure

Procedure: Authentication of FT	
Preamble	Link establishment.
Stimulus	The test operator shall trigger the Authentication of FT procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 18.

9.7.2 MSC

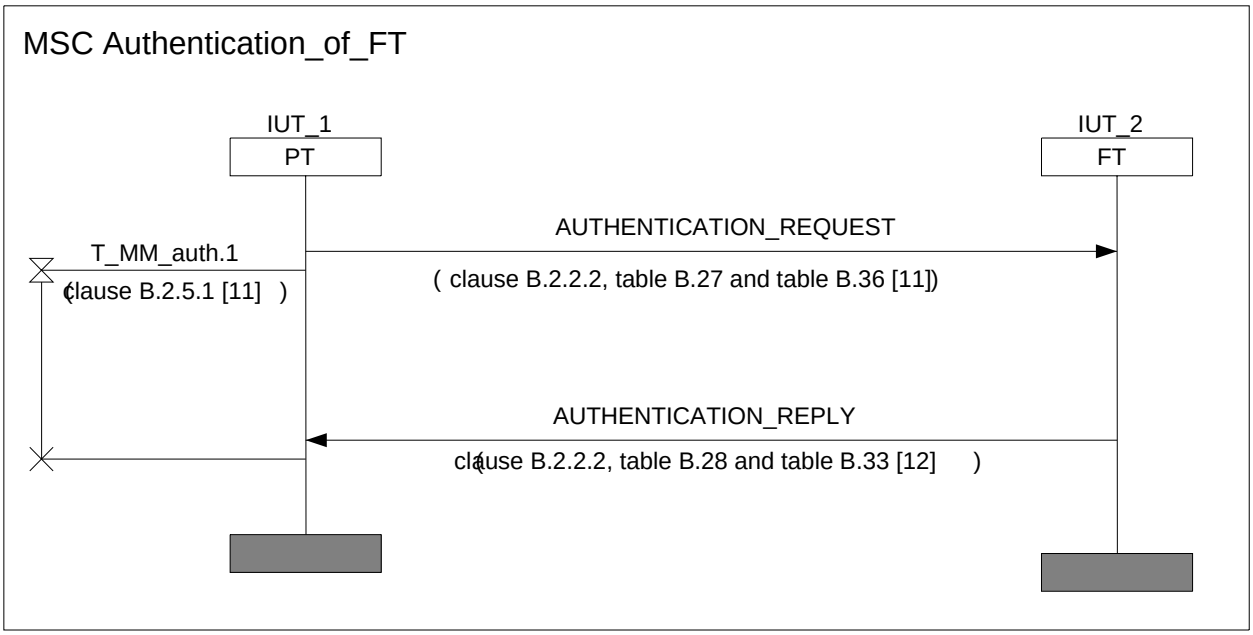

Figure 35: Authentication of FT

9.8 Terminal capability indication

9.8.1 Procedure

Procedure: Terminal capability indication	
Preamble	Terminal capability indication is performed during the Obtain access rights procedure and the Location Registration procedure.
Stimulus	-

9.9 Dynamic parameters allocation

9.9.1 Procedure

Procedure: Dynamic parameters allocation	
Preamble	Dynamic parameters allocation is performed during the Obtain access rights procedure and the Location Registration procedure.
Stimulus	-

9.10 Call Resources/Parameters negotiation

9.10.1 Procedure

Procedure: Call Resources/Parameters negotiation	
Preamble	Call Resources/Parameters negotiation is performed during the Outgoing call or the Incoming call.
Stimulus	-

9.11 FT terminating access rights

9.11.1 Procedure

Procedure: FT terminating access rights	
Preamble	The PT shall be subscribed to the FT. Link establishment.
Stimulus	The test operator shall trigger the FT terminating access rights procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 23.

9.11.2 MSC

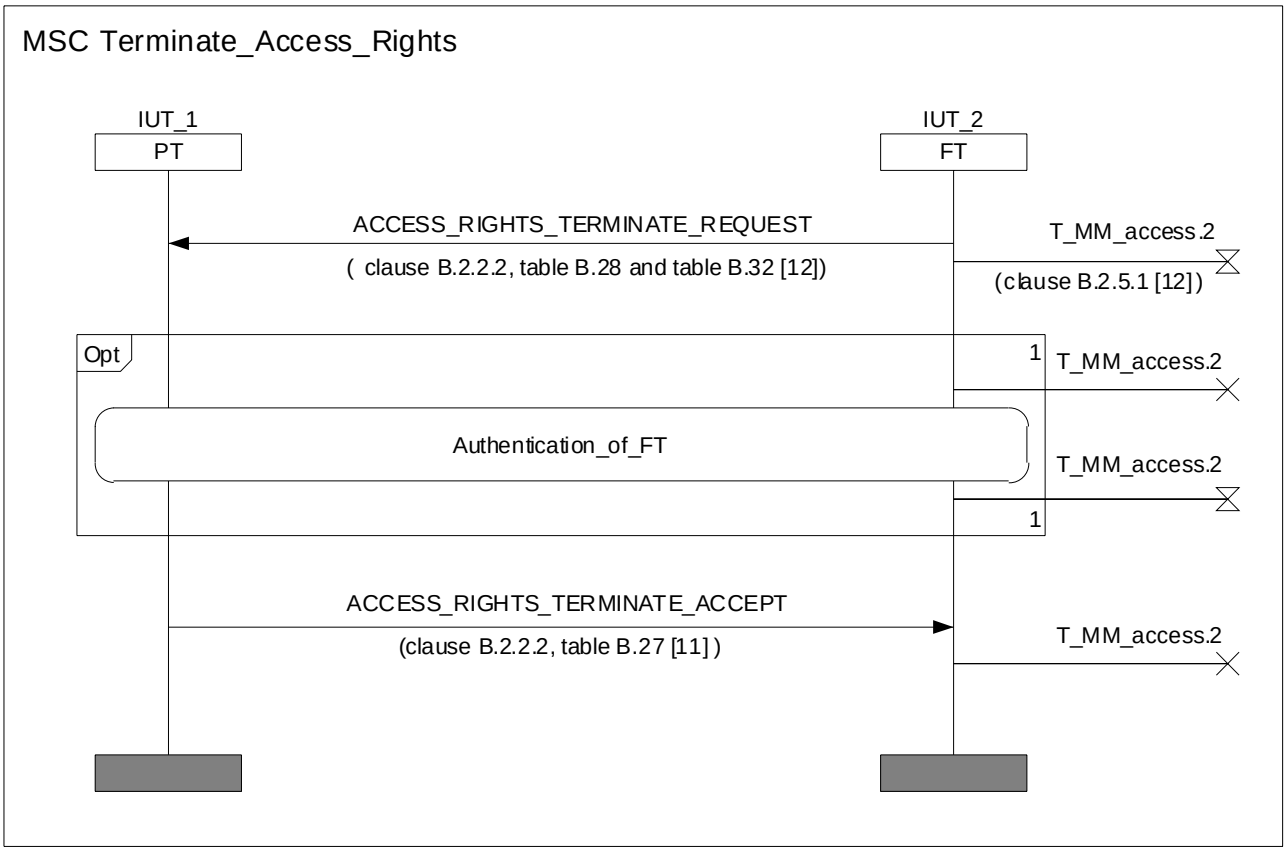

Figure 36: FT terminating access rights

9.12 From Outgoing call request to Outgoing call connection

9.12.1 Procedure

Procedure: From Outgoing call request to Outgoing call connection	
Preamble	The PT shall be subscribed to the FT. Direct PT initiated link establishment.
Stimulus	The test operator shall trigger the Outgoing call request procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 1.

9.12.2 MSC

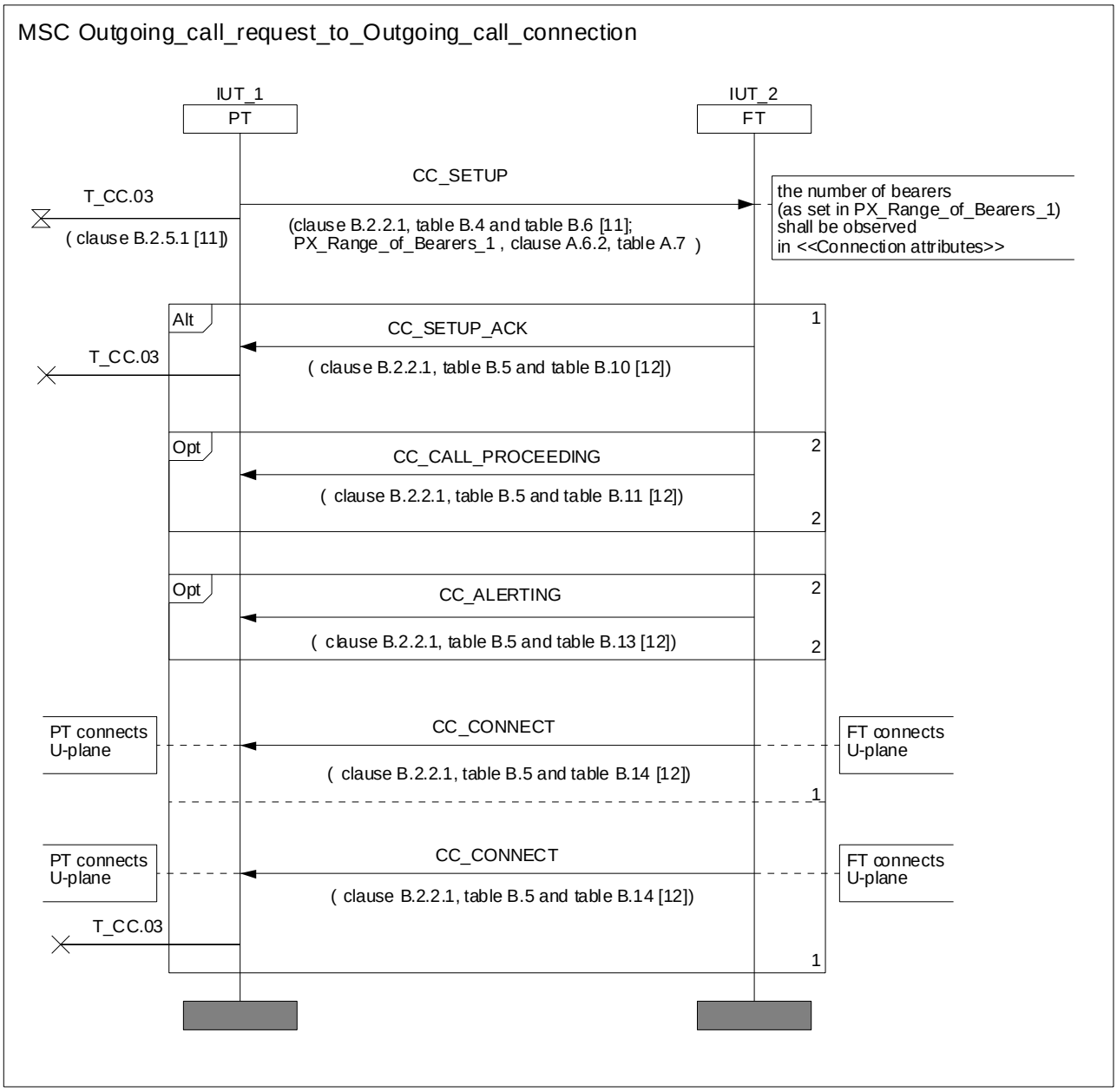

Figure 37: From Outgoing call request to Outgoing call connection

9.13 From Incoming call request to Incoming call connection

9.13.1 Procedure

Procedure: From Incoming call request to Incoming call connection	
Preamble	The PT shall be subscribed to the FT. Indirect FT initiated link establishment.
Stimulus	The test operator shall trigger the Incoming call request procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 26.

9.13.2 MSC

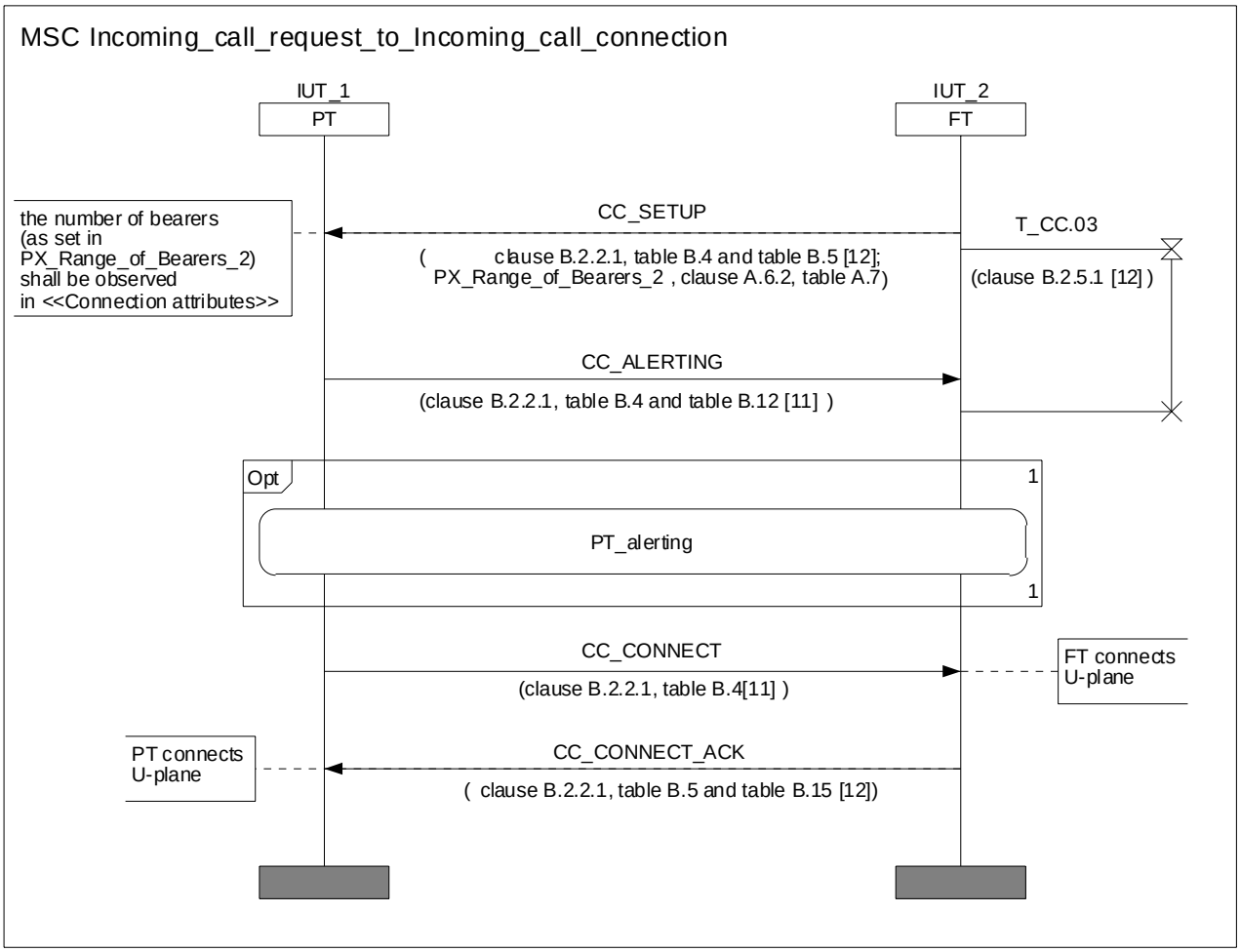

Figure 38: From Incoming call request to Incoming call connection

9.14 PT alerting

9.14.1 Procedure

Procedure: PT alerting	
Preamble	The FT shall be in call state F-07. The PT shall be in call state T-07.
Stimulus	The test operator shall trigger the Incoming call request procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 49.

9.14.2 MSC

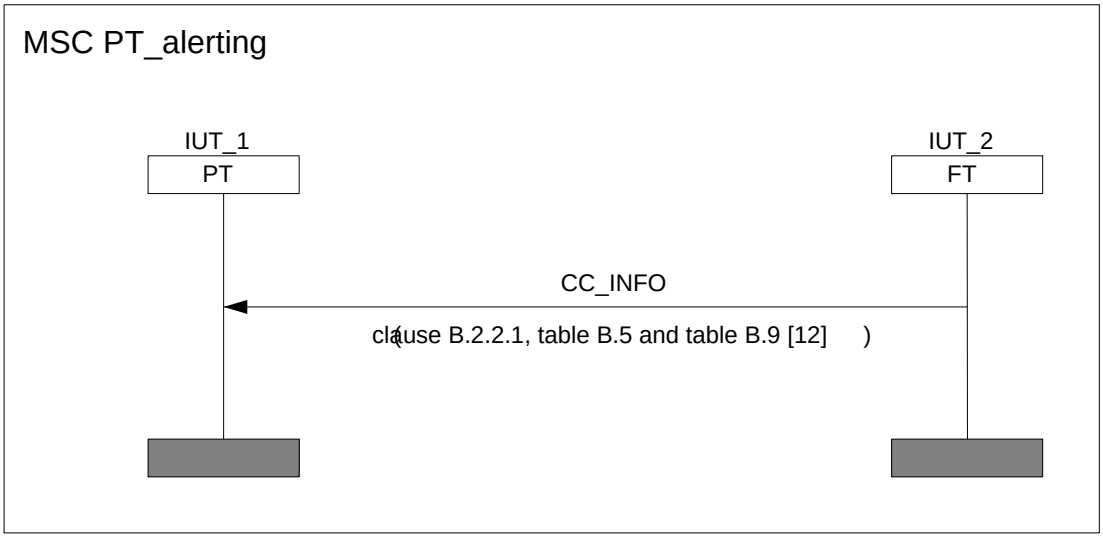

Figure 39: PT alerting

9.15 Bandwidth change

9.15.1 Procedure

Procedure: Bandwidth change	
Preamble	The FT shall be in call state F-10. The PT shall be in call state T-10.
Stimulus	The test operator shall trigger the Bandwidth change procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 31 or item 32.

9.15.2 MSC

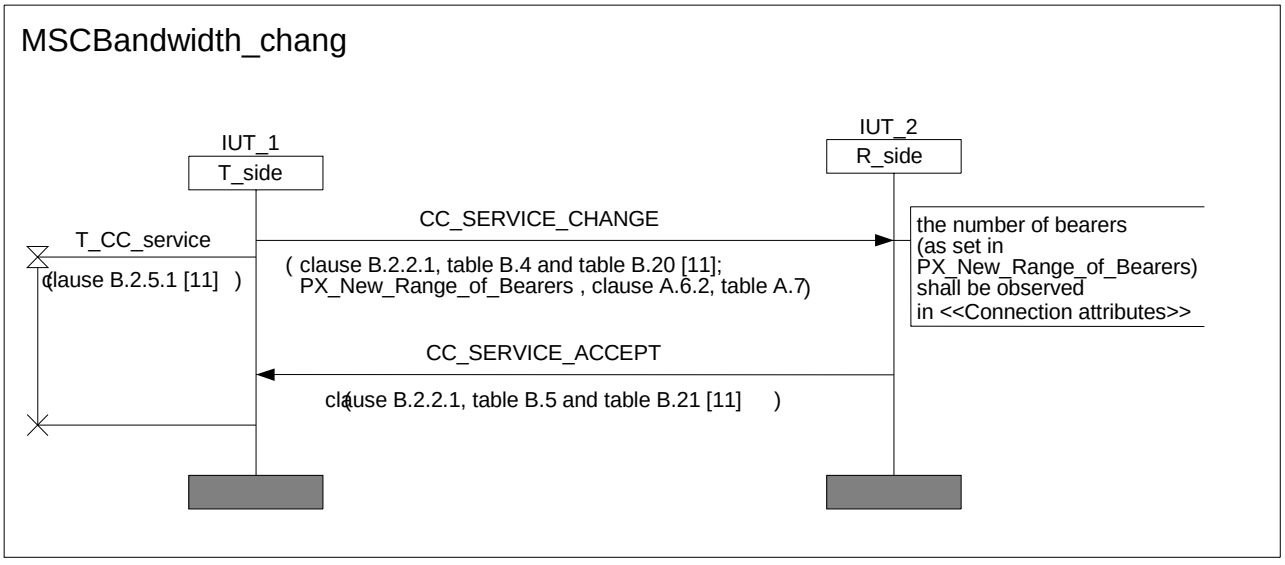

Figure 40: Bandwidth change

9.16 Cipher-switching initiated by FT

9.16.1 Procedure

Procedure: Cipher-switching initiated by FT	
Preamble	Link establishment. Storing the DCK during the Authentication of PT: {AUTHENTICATION_REQUEST} shall contain <<Auth-type>> with <UPC>='1'B and <Cipher key number>='1000'B.
Stimulus	The test operator shall trigger the Cipher-switching initiated by FT procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 10.

9.16.2 MSC

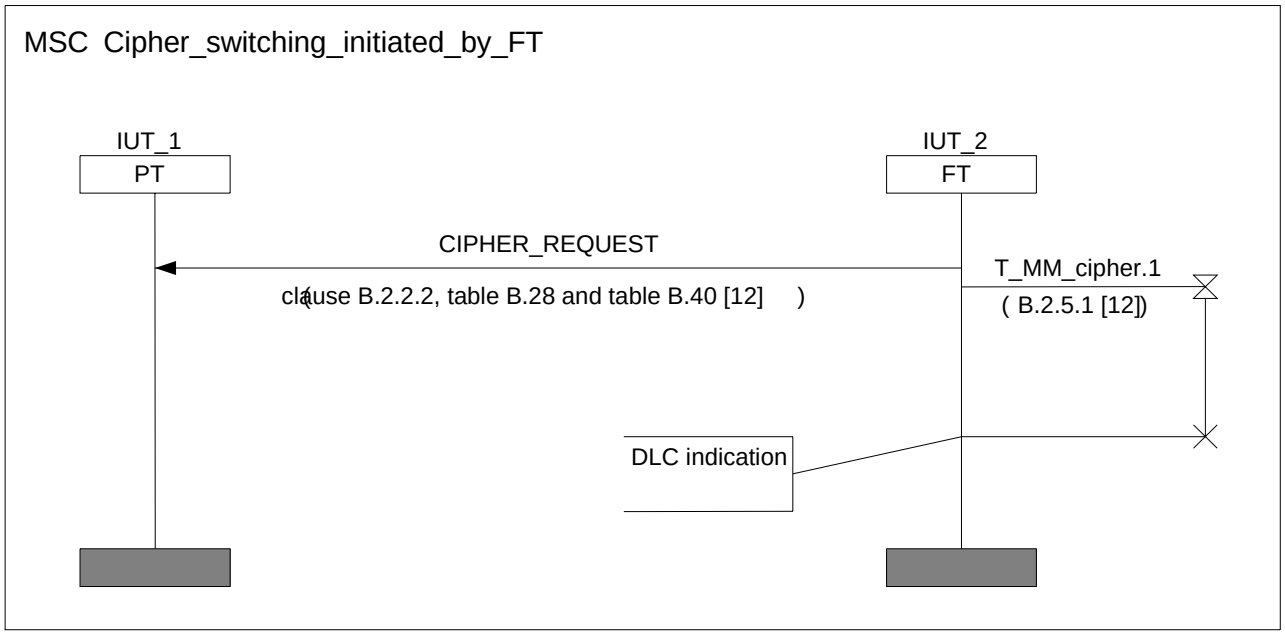

Figure 41: Cipher switching initiated by FT

9.17 Outgoing call V.24

9.17.1 Procedure

Procedure: Outgoing call V.24	
Preamble	The PT shall be subscribed to the FT. Direct PT initiated link establishment.
Stimulus	The test operator shall trigger the Outgoing call request procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 1.

9.17.2 MSC

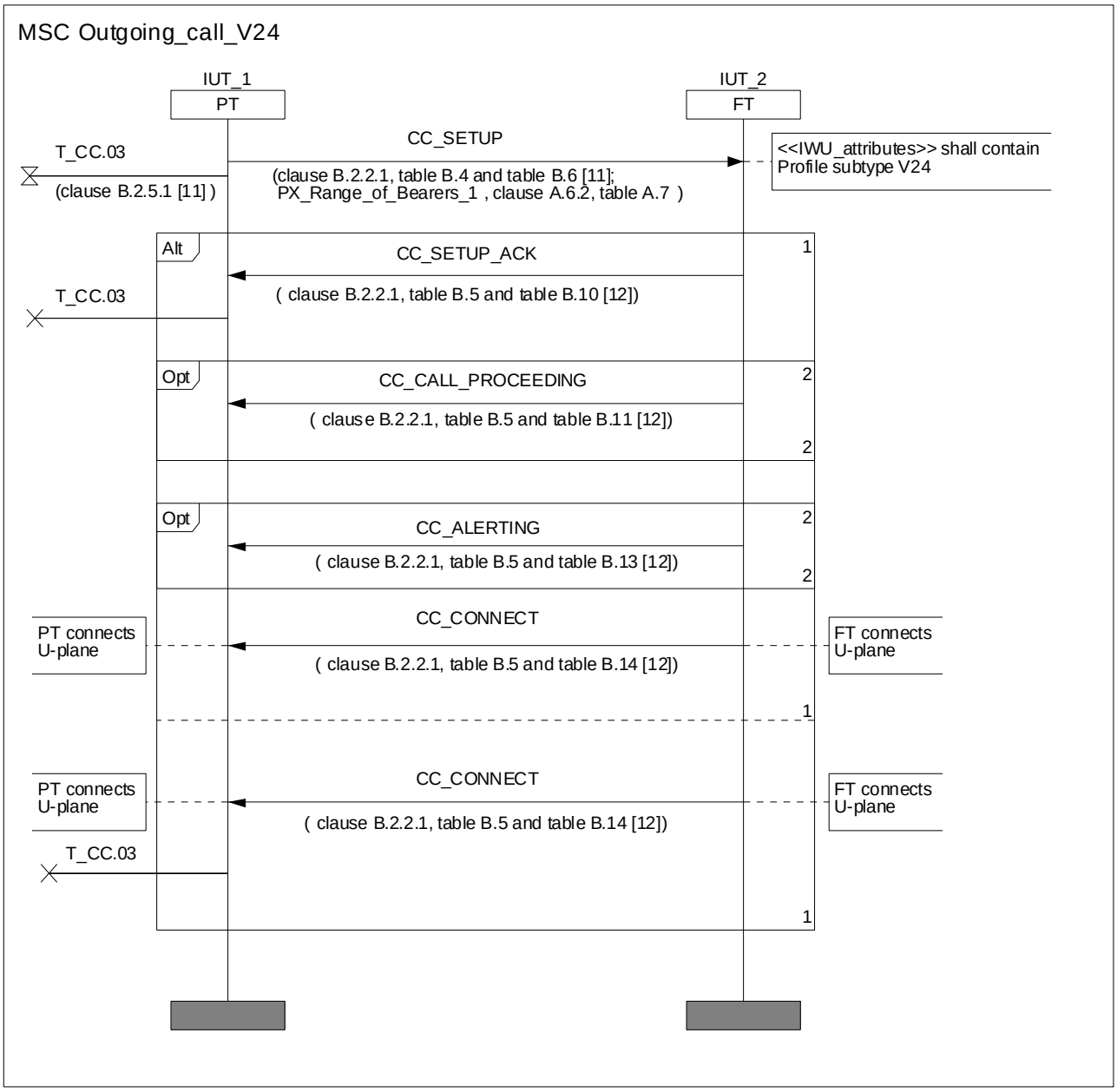

Figure 42: Outgoing call V.24

9.18 Outgoing call Ethernet

9.18.1 Procedure

Procedure: Outgoing call Ethernet	
Preamble	The PT shall be subscribed to the FT. Direct PT initiated link establishment.
Stimulus	The test operator shall trigger the Outgoing call request procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 1.

9.18.2 MSC

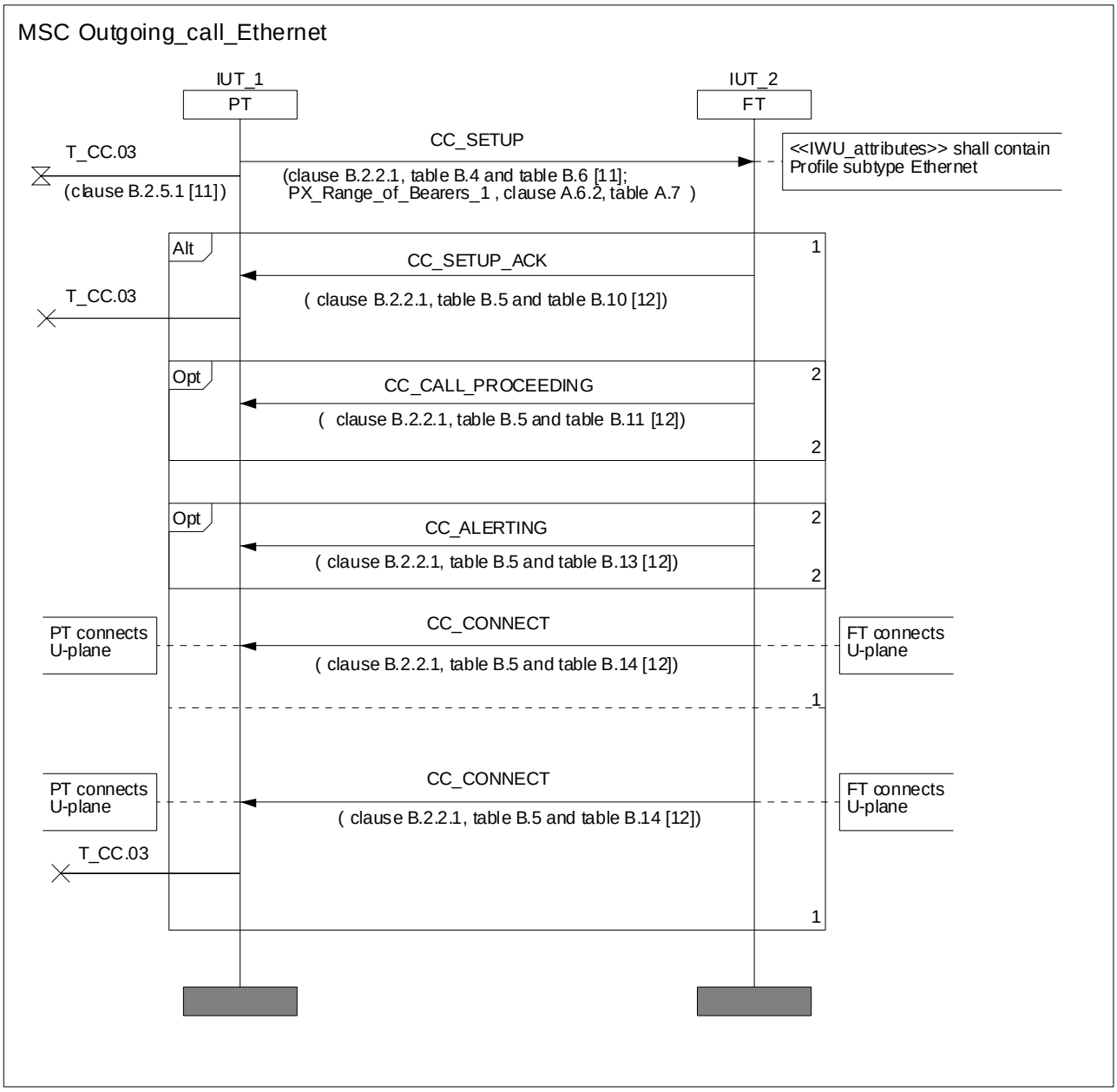

Figure 43: Outgoing call Ethernet

9.19 Call release

9.19.1 Procedure

Procedure: Call release	
Preamble	The PT shall be in call state T-10. The FT shall be in call state F-10.
Stimulus	The test operator shall trigger the Call release procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 2 or item 25.

9.19.2 MSC

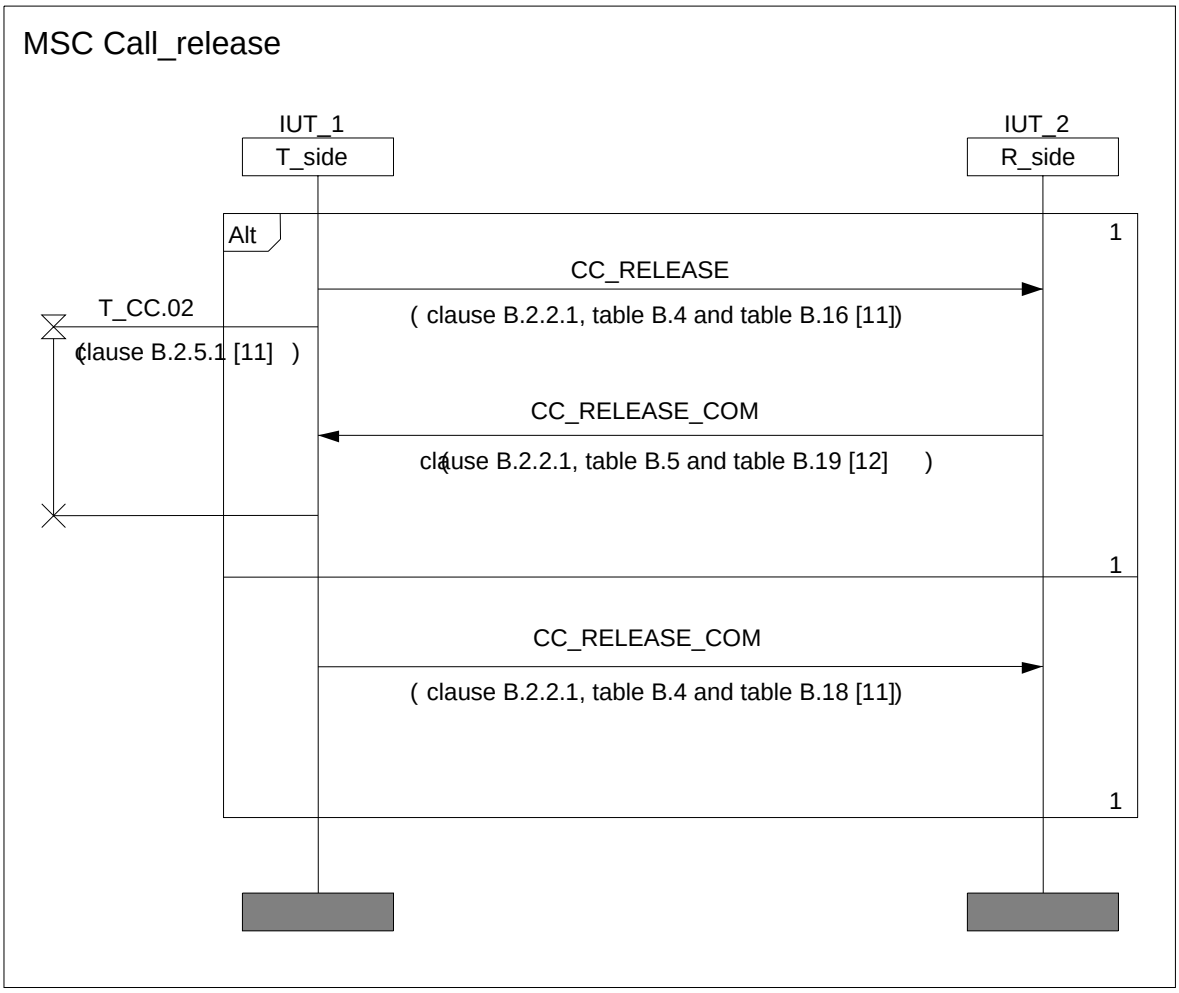

Figure 44: Call release

9.20 Link release

9.20.1 Procedure

Procedure: Link release	
Preamble	Link establishment.
Stimulus	The test operator shall trigger the Link release procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 33 or item 34.

10 DLC layer procedures

10.1 U-plane transmission class 2

10.1.1 Procedure

Procedure: U-plane transmission class 2	
Preamble	Logical connection setup.
Stimulus	The test operator shall trigger the U-plane transmission class 2 procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 46 or 47.

10.1.2 MSC

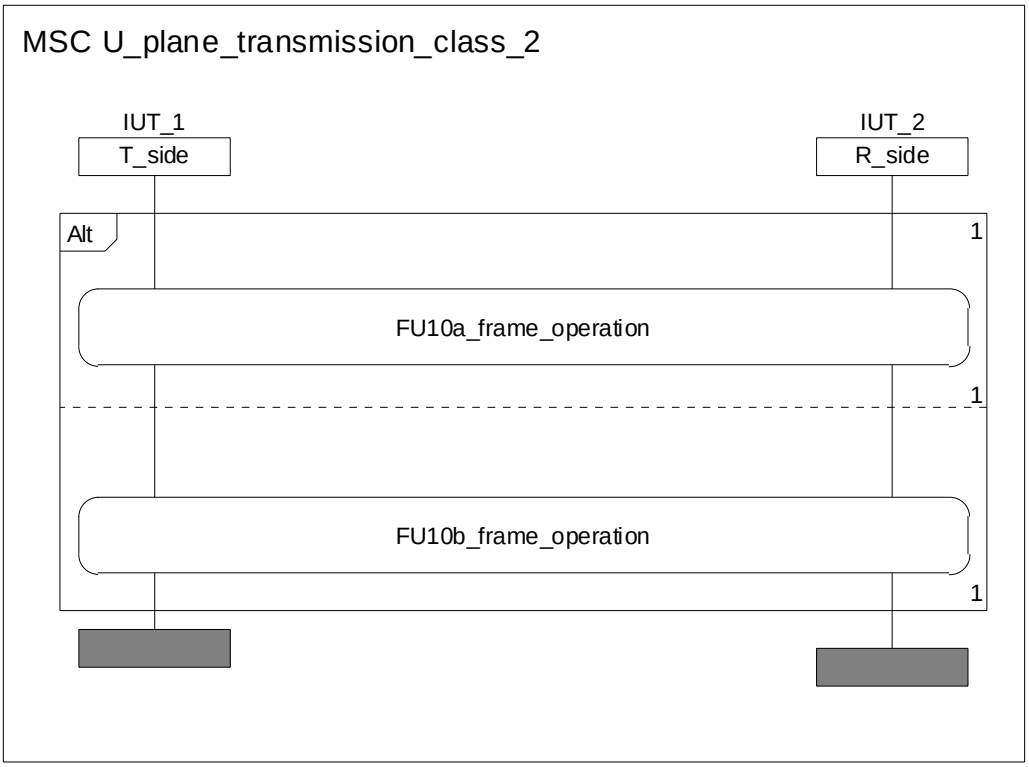

Figure 45: U-plane transmission class 2

10.2 Class A link establishment

10.2.1 Procedure

Procedure: Class A link establishment	
Preamble	Logical connection setup.
Stimulus	The test operator shall trigger the Class A link establishment procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 43 or item 50.

10.2.2 MSC

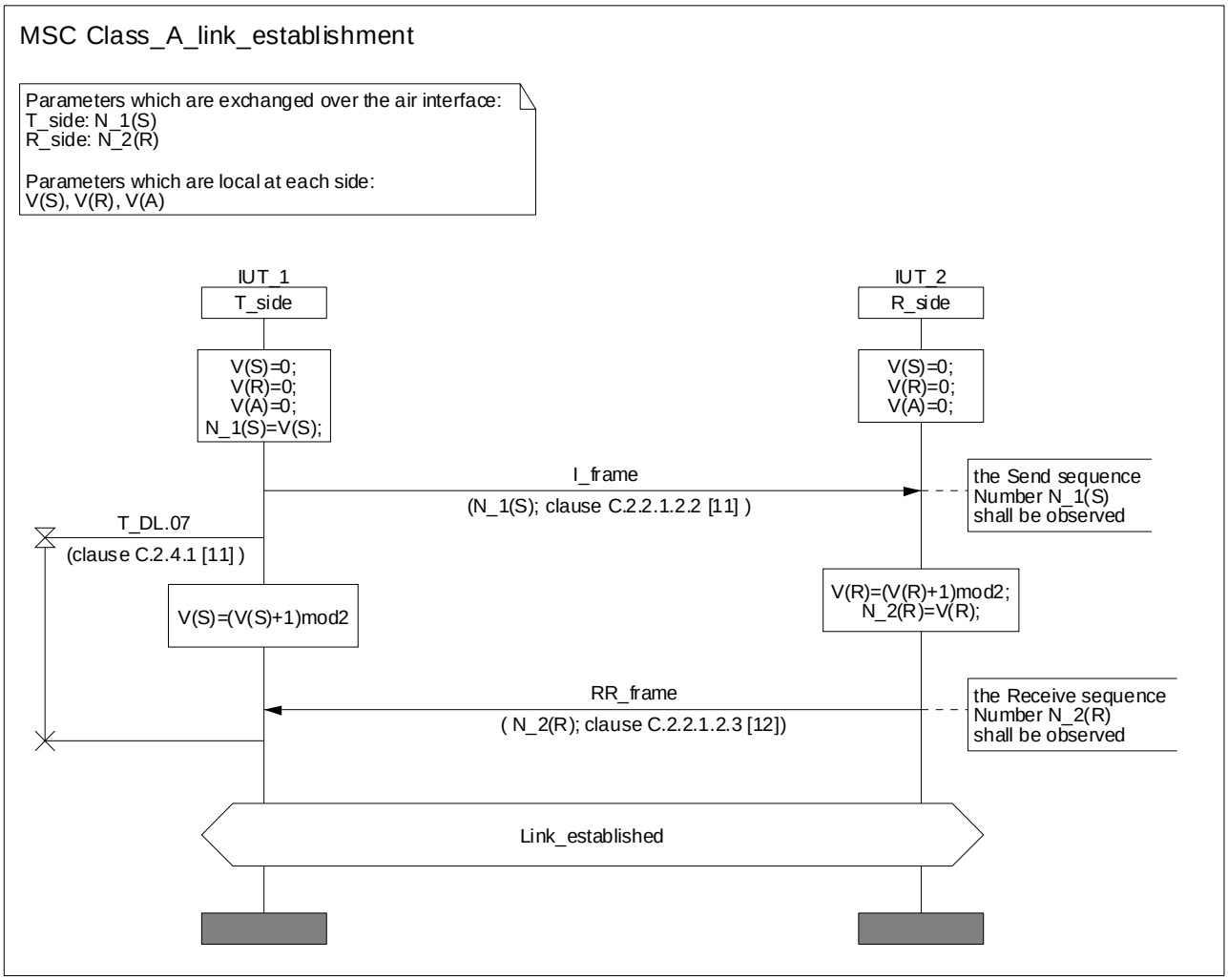

Figure 46: Class A link establishment

10.3 Class A acknowledged information transfer

10.3.1 Procedure

Procedure: Class A acknowledged information transfer	
Preamble	Class A link establishment
Stimulus	The test operator shall trigger the Class A acknowledged information transfer procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 44 or item 51.

10.3.2 MSC

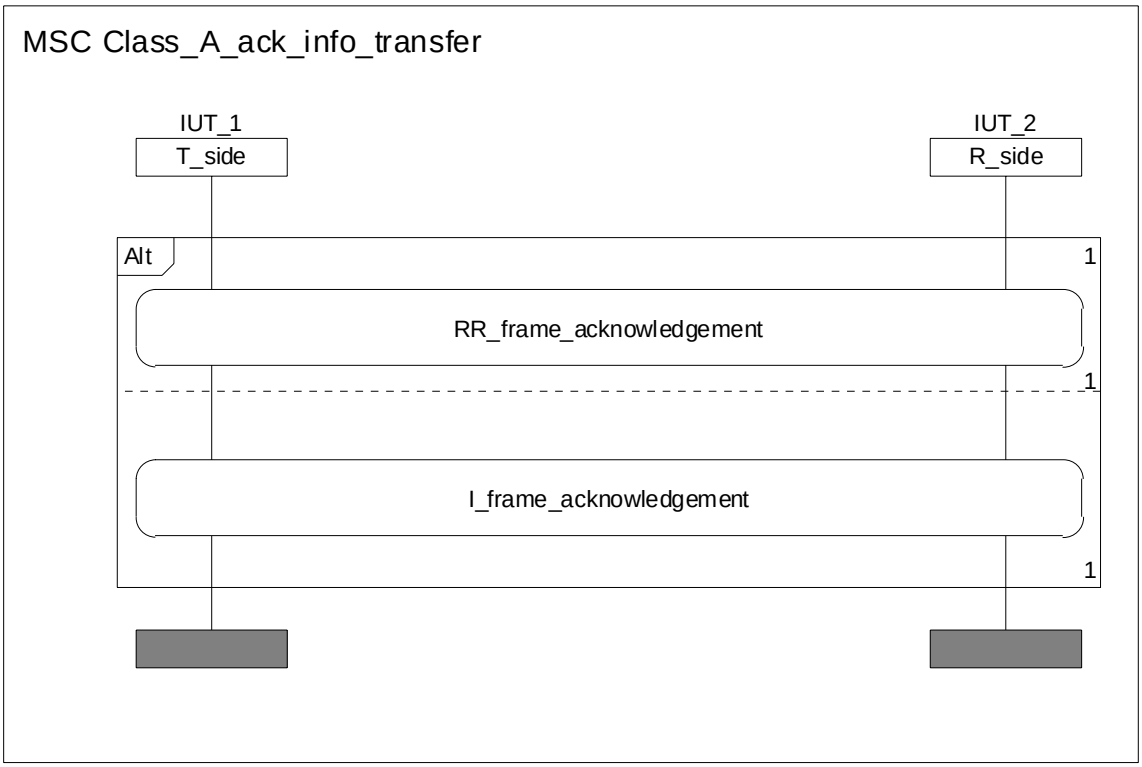

Figure 47: Class A acknowledged information transfer

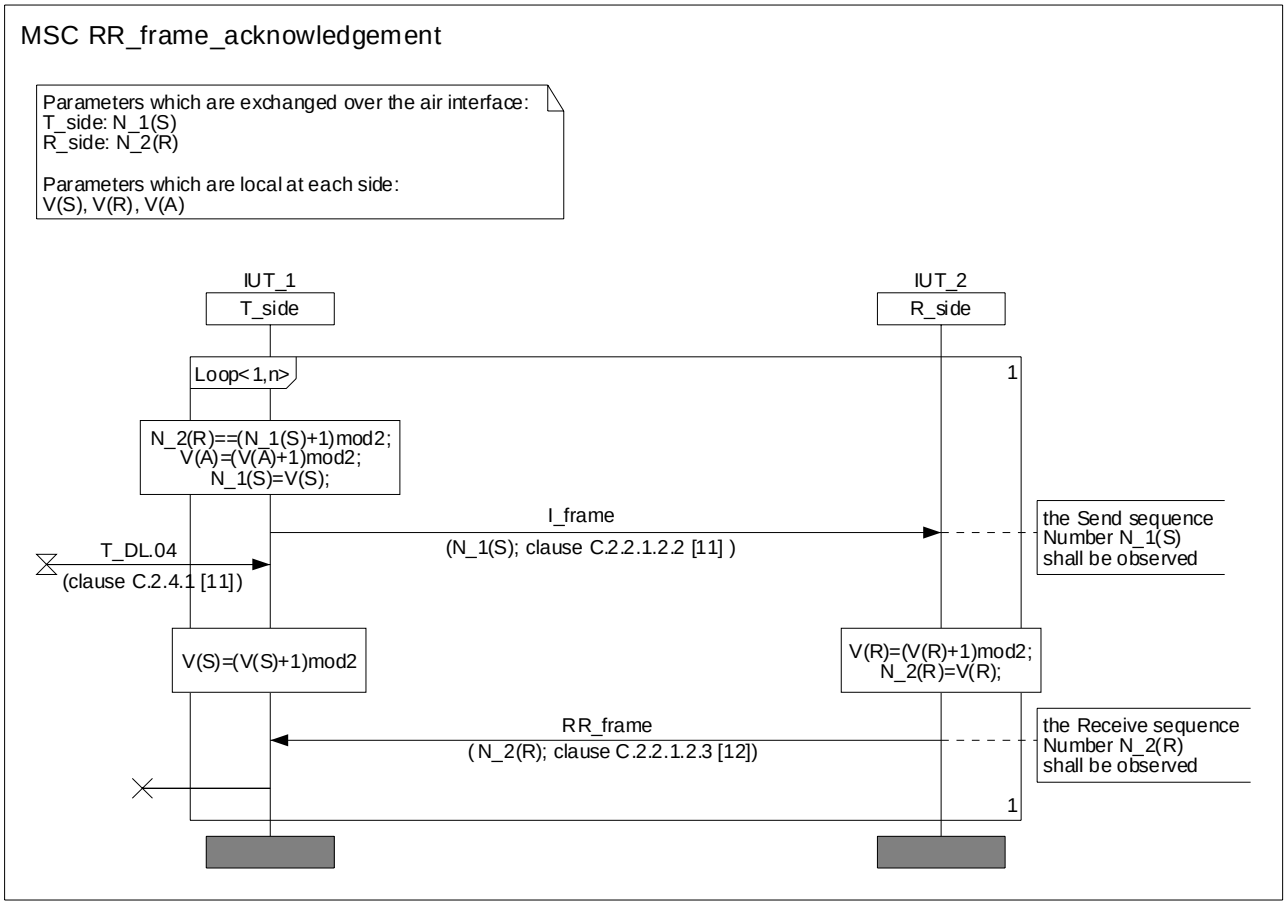

Figure 48: RR frame acknowledgment

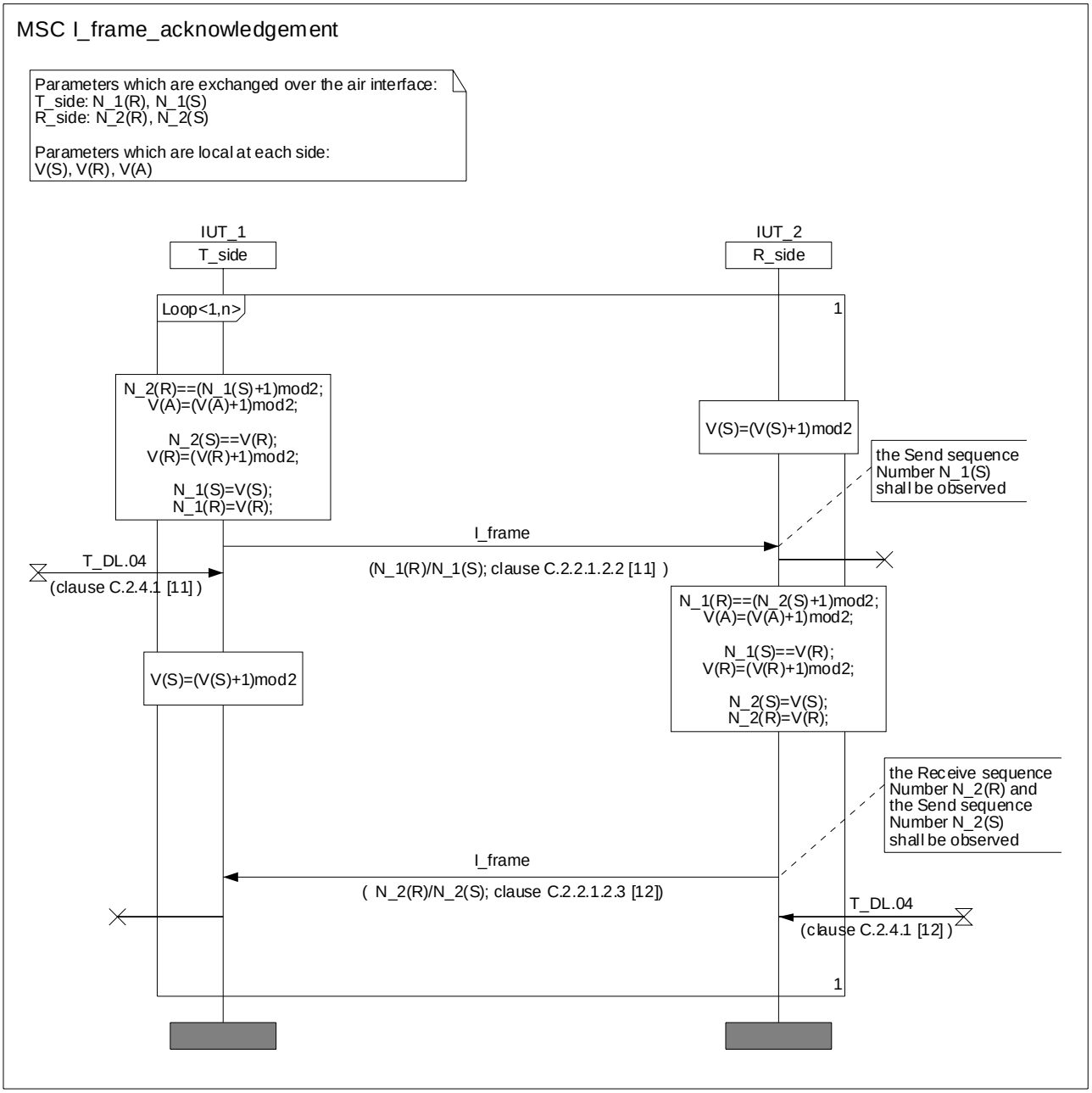

Figure 49: I frame acknowledgment

10.4 FU10a frame operation

10.4.1 Procedure

Procedure: FU10a frame operation	
Preamble	U-plane transmission class 2.
Stimulus	FU10a frame operation is performed during the U-plane transmission class 2 procedure.

10.4.2 MSC

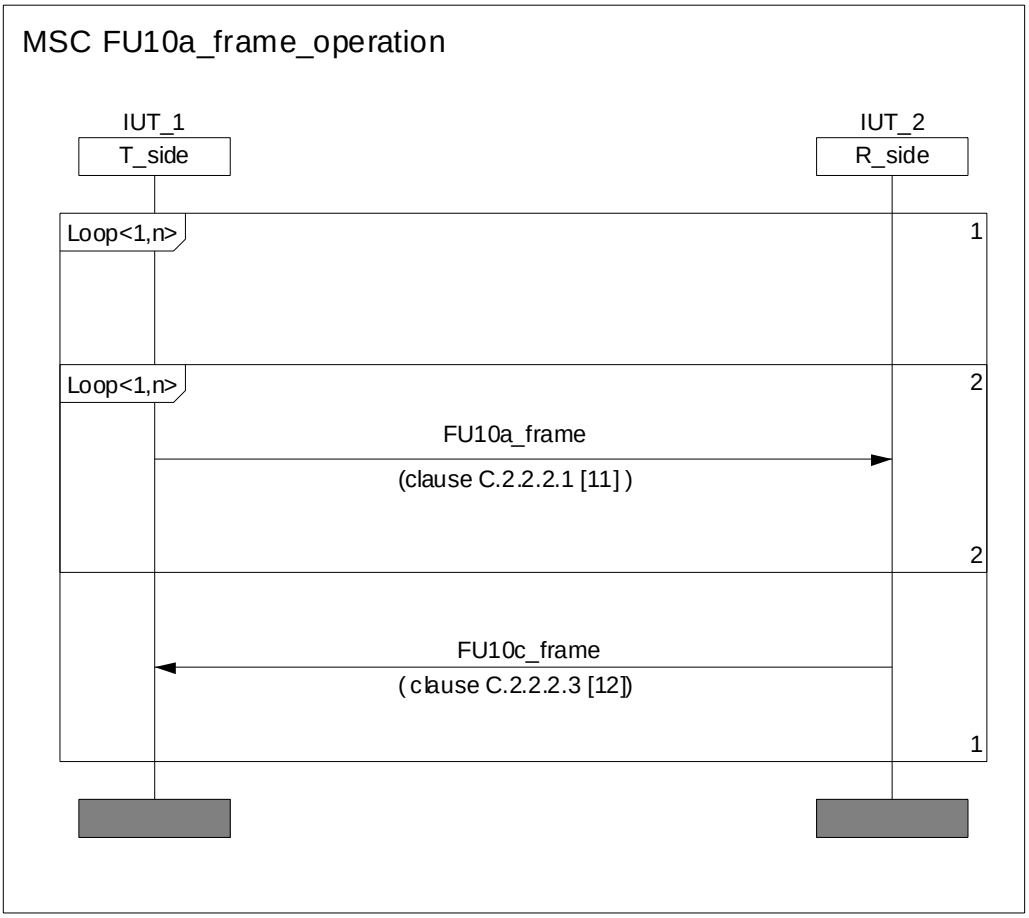

Figure 50: FU10a frame operation

10.5 FU10b frame operation

10.5.1 Procedure

Procedure: FU10b frame operation	
Preamble	U-plane transmission class 2.
Stimulus	FU10b frame operation is performed during the U-plane transmission class 2 procedure.

10.5.2 MSC

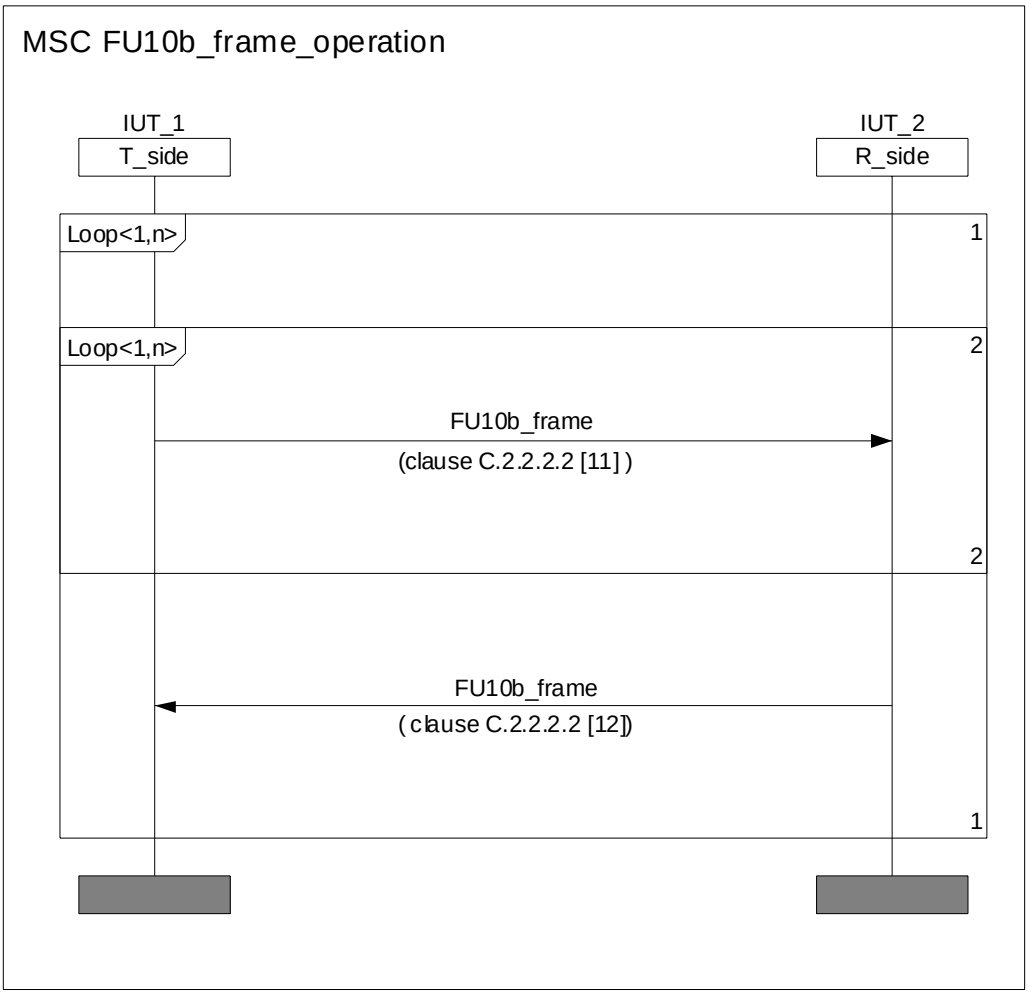

Figure 51: FU10b frame operation

10.6 FU10c frame operation

10.6.1 Procedure

Procedure: FU10c frame operation	
Preamble	U-plane transmission class 2.
Stimulus	FU10c frame operation is performed together with the FU10a frame operation.

10.7 Class A connection handover

10.7.1 Procedure

Procedure: Class A connection handover	
Preamble	U-plane transmission class 2.
Stimulus	The test operator shall trigger the Class A connection handover procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 16.

10.8 C_S-channel fragmentation and recombination

10.8.1 Procedure

Procedure: C_S-channel fragmentation and recombination	
Preamble	Class A link establishment.
Stimulus	C_S-channel fragmentation and recombination is performed during the Class A acknowledged information transfer procedure.

10.9 C_F-channel fragmentation and recombination

10.9.1 Procedure

Procedure: C_F-channel fragmentation and recombination	
Preamble	Class A link establishment.
Stimulus	C_F-channel fragmentation and recombination is performed during the Class A acknowledged information transfer procedure.

10.10 Selection of logical channels (C_S and C_F)

10.10.1 Procedure

Procedure: Selection of logical channels (C_S and C_F)	
Preamble	Class A link establishment.
Stimulus	Selection of logical channels (C_S and C_F) is performed during the Class A acknowledged information transfer procedure.

10.11 Class A link release

10.11.1 Procedure

Procedure: Class A link release	
Preamble	Class A link establishment.
Stimulus	The test operator shall trigger the Class A link release procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 45 or item 52.

11 MAC layer procedures

11.1 Downlink broadcast

11.1.1 Procedure

Procedure: Downlink broadcast	
Preamble	The FT shall be in state Active_Idle. The PT shall be in state Idle_Locked.
Stimulus	The test operator shall trigger the Downlink broadcast procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 37.

11.1.2 MSC

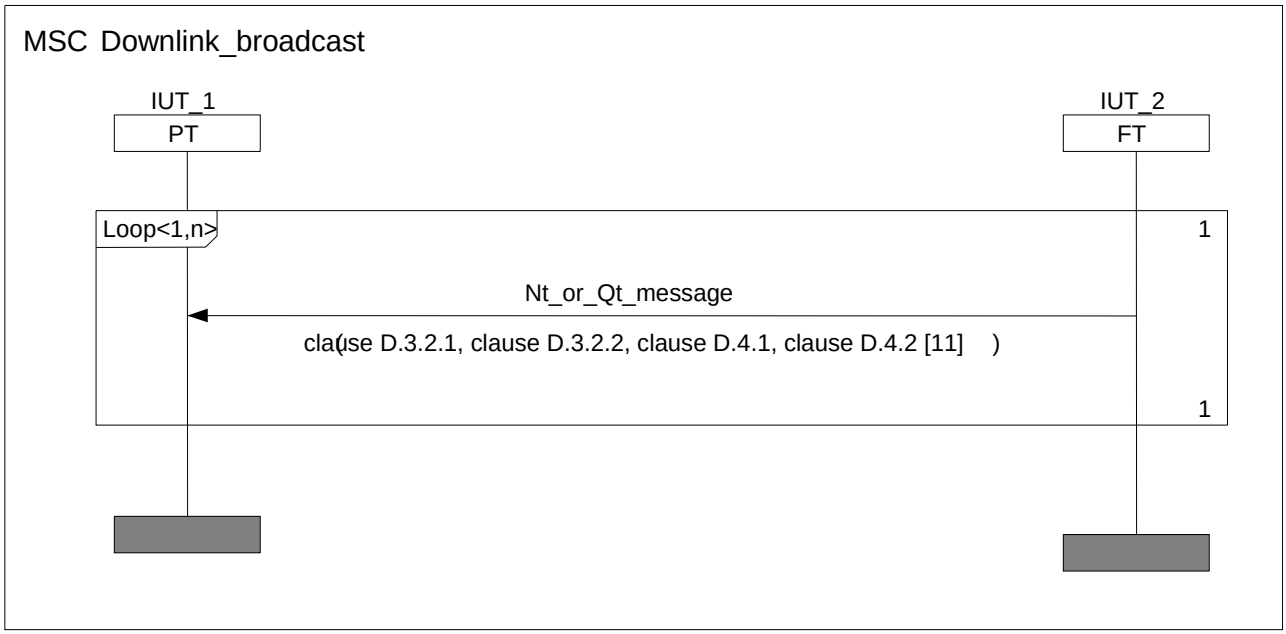

Figure 52: Downlink broadcast

11.2 Logical connection setup

11.2.1 Procedure

Procedure: Logical connection setup	
Preamble	The FT shall be in state Active_Idle. The PT shall be in state Idle_Locked.
Stimulus	The test operator shall trigger the Logical connection setup procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 3 or item 4 or item 5 or item 6.

11.3 Single bearer Physical connection setup

11.3.1 Procedure

Procedure: Single bearer Physical connection setup	
Preamble	The FT shall be in state Active_Idle. The PT shall be in state Idle_Locked.
Stimulus	The test operator shall trigger the Single bearer Physical connection setup procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 3 or item 4.

11.4 Multi bearer Physical connection setup

11.4.1 Procedure

Procedure: Multi bearer Physical connection setup	
Preamble	The FT shall be in state Active_Idle. The PT shall be in state Idle_Locked.
Stimulus	The test operator shall trigger the Multi bearer Physical connection setup procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 5 or item 6.

11.5 Single duplex bearer setup

11.5.1 Procedure

Procedure: Single duplex bearer setup	
Preamble	The FT shall be in state Active_Idle. The PT shall be in state Idle_Locked.
Stimulus	The test operator shall trigger the Single duplex bearer setup procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 3 or item 4.

11.5.2 HMSC

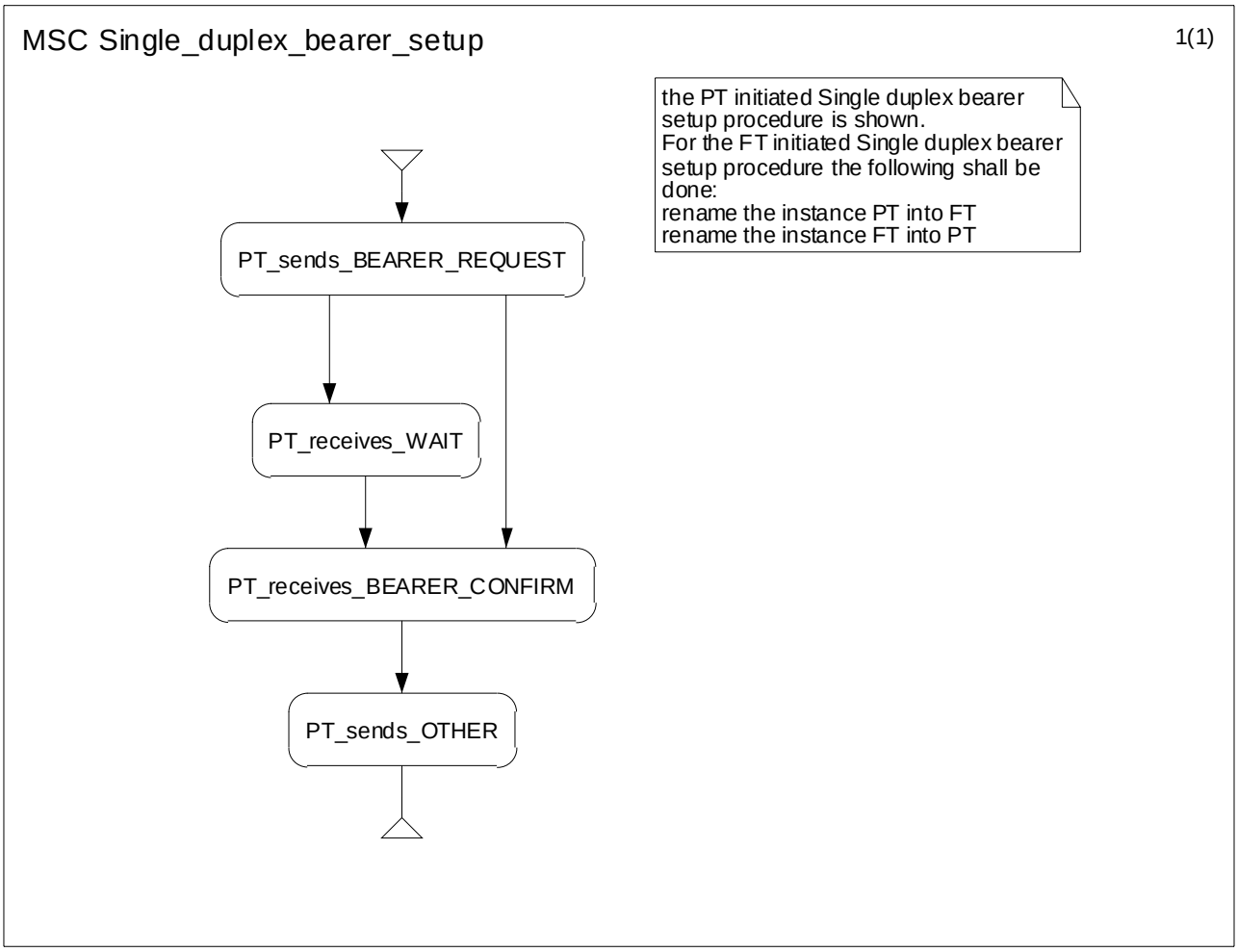

Figure 53: Single duplex bearer setup

11.5.3 MSC

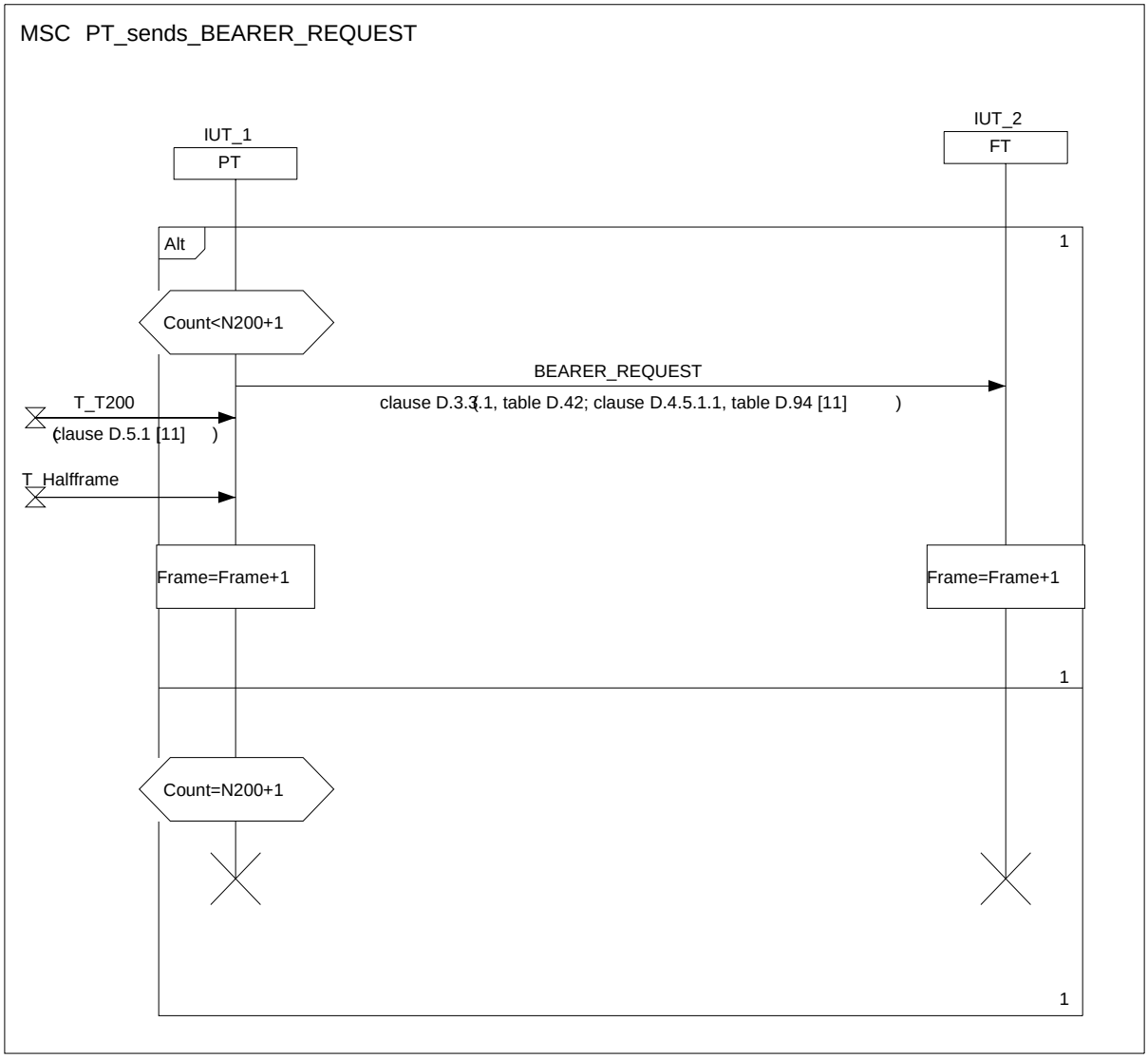

Figure 54: PT sends BEARER REQUEST

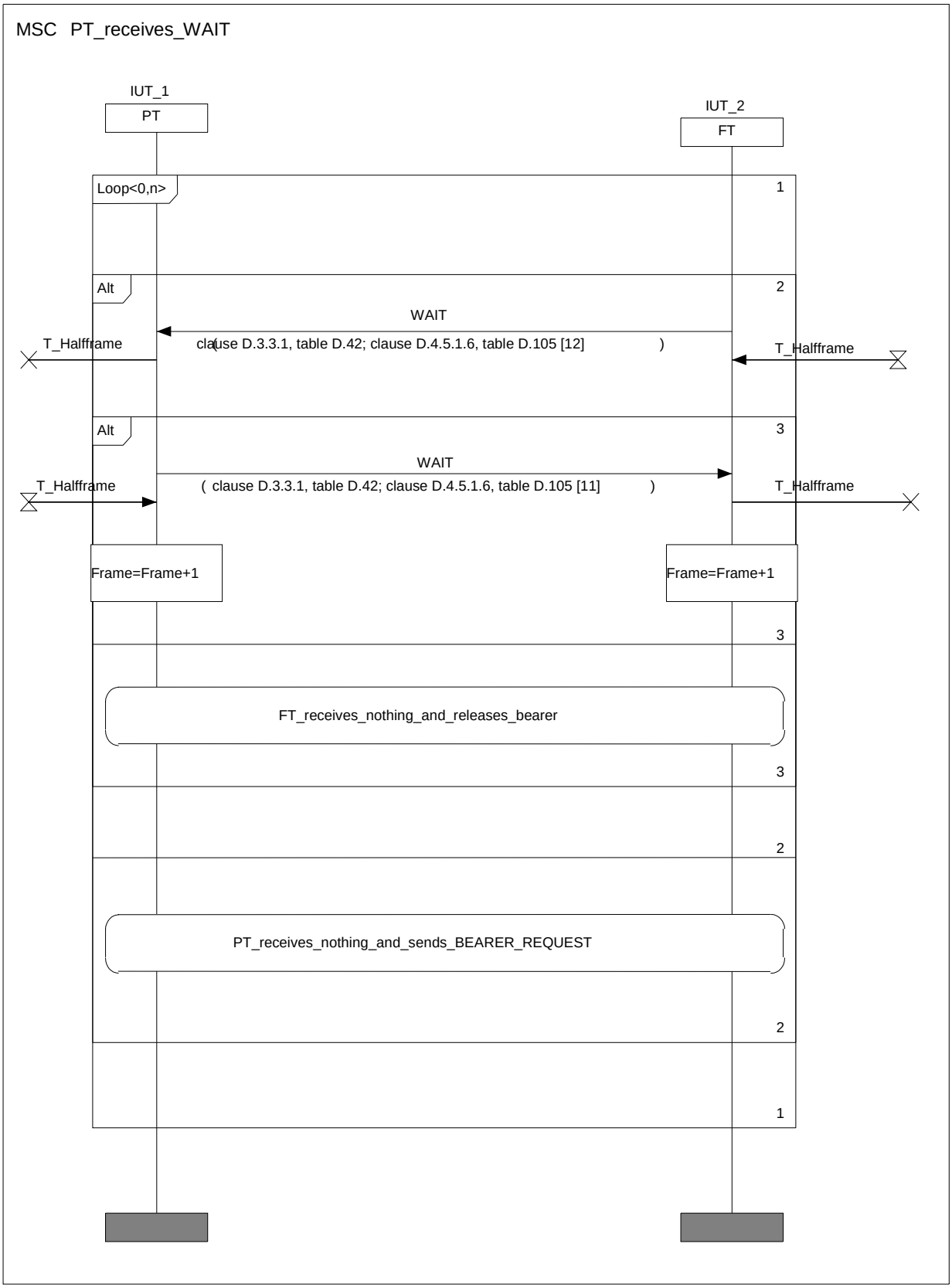

Figure 55: PT receives WAIT

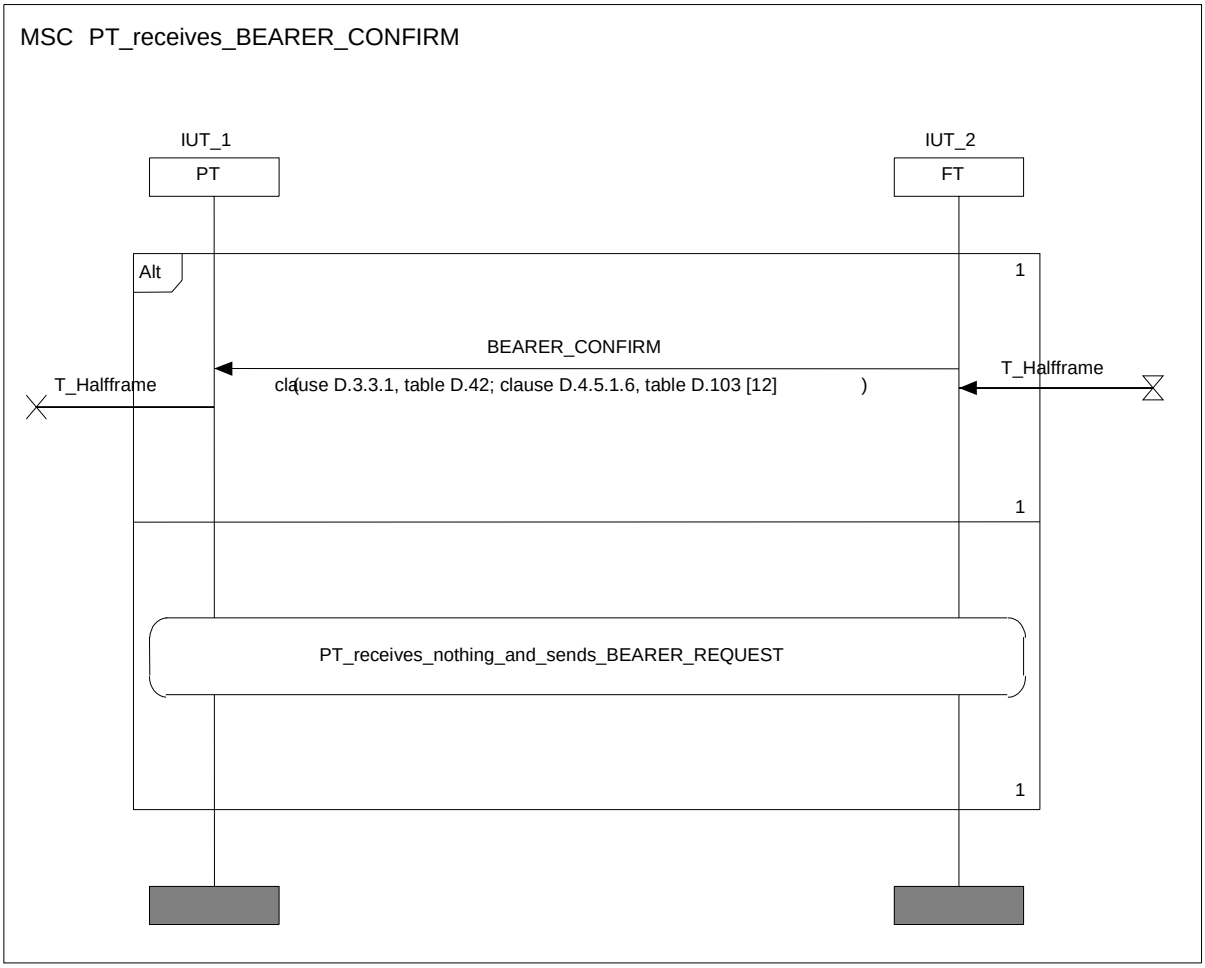

Figure 56: PT receives BEARER CONFIRM

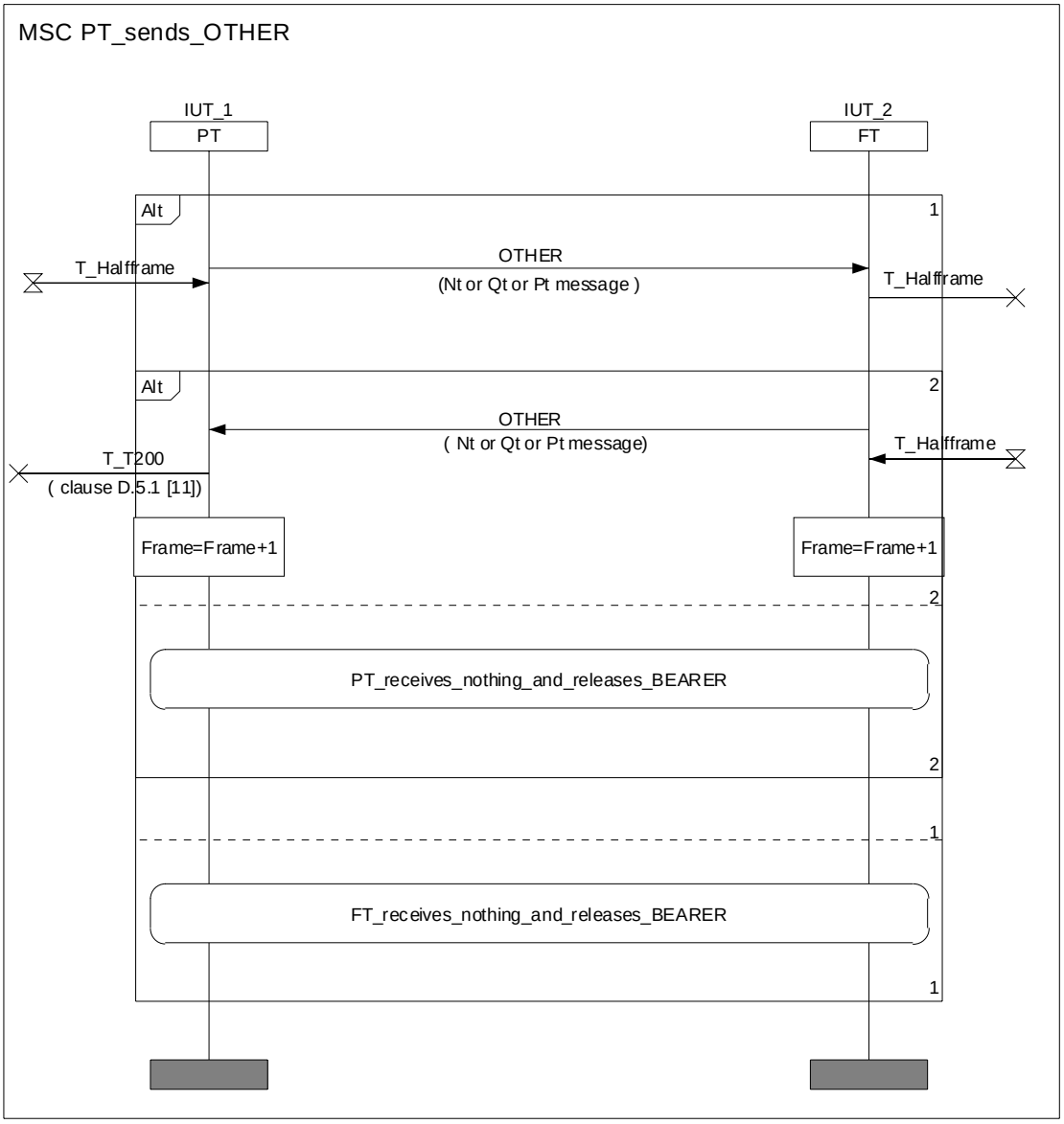

Figure 57: PT sends OTHER

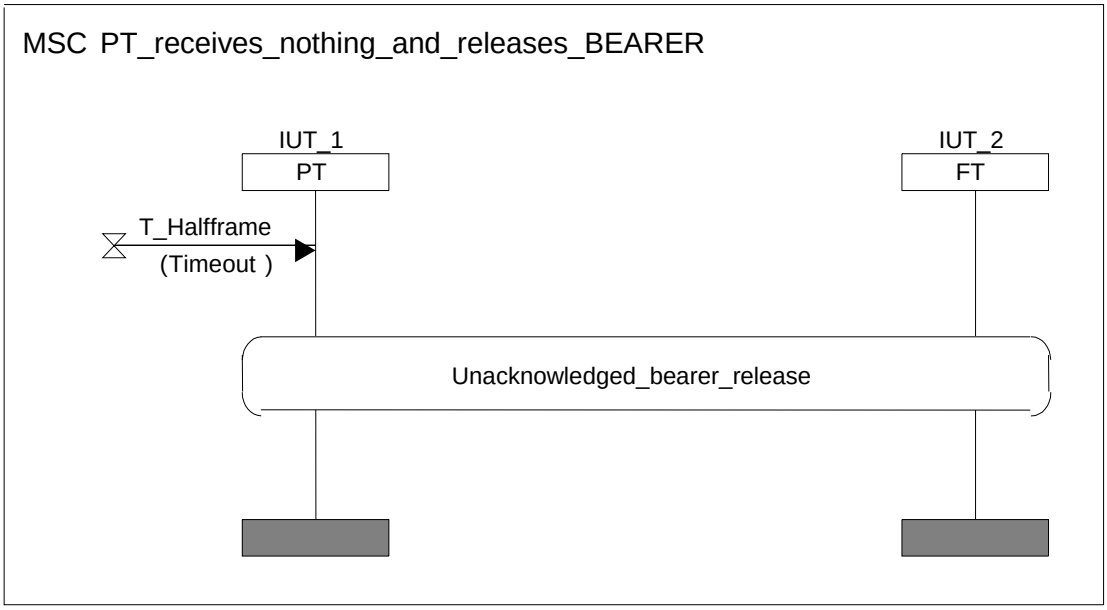

Figure 58: PT receives nothing and releases bearer

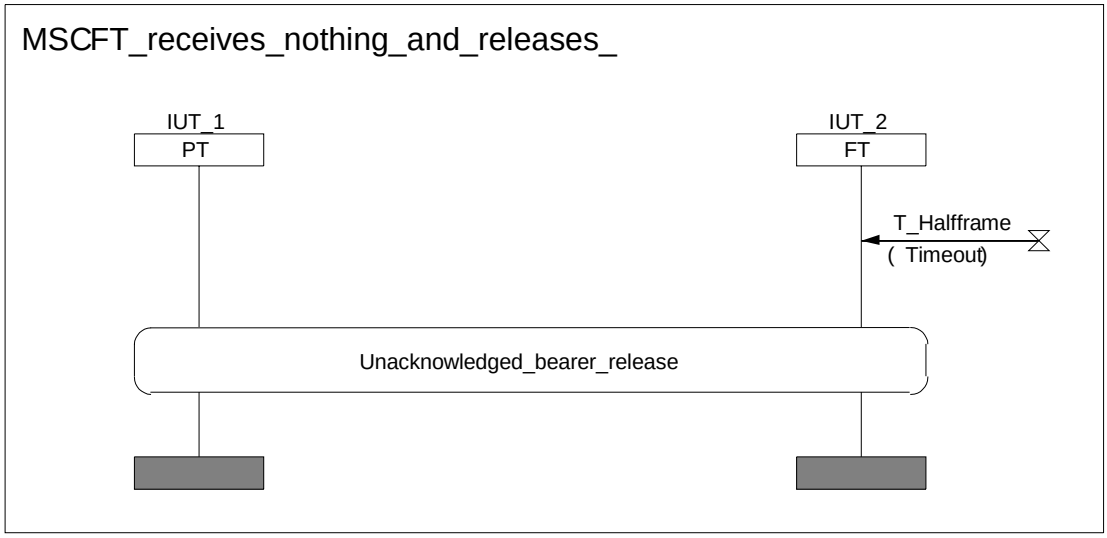

Figure 59: FT receives nothing and releases bearer

11.6 Double simplex bearer setup

11.6.1 Procedure

Procedure: Double simplex bearer setup	
Preamble	The FT shall be in state Active_Idle. The PT shall be in state Idle_Locked.
Stimulus	The test operator shall trigger the Double simplex bearer setup procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 7.

11.6.2 MSC

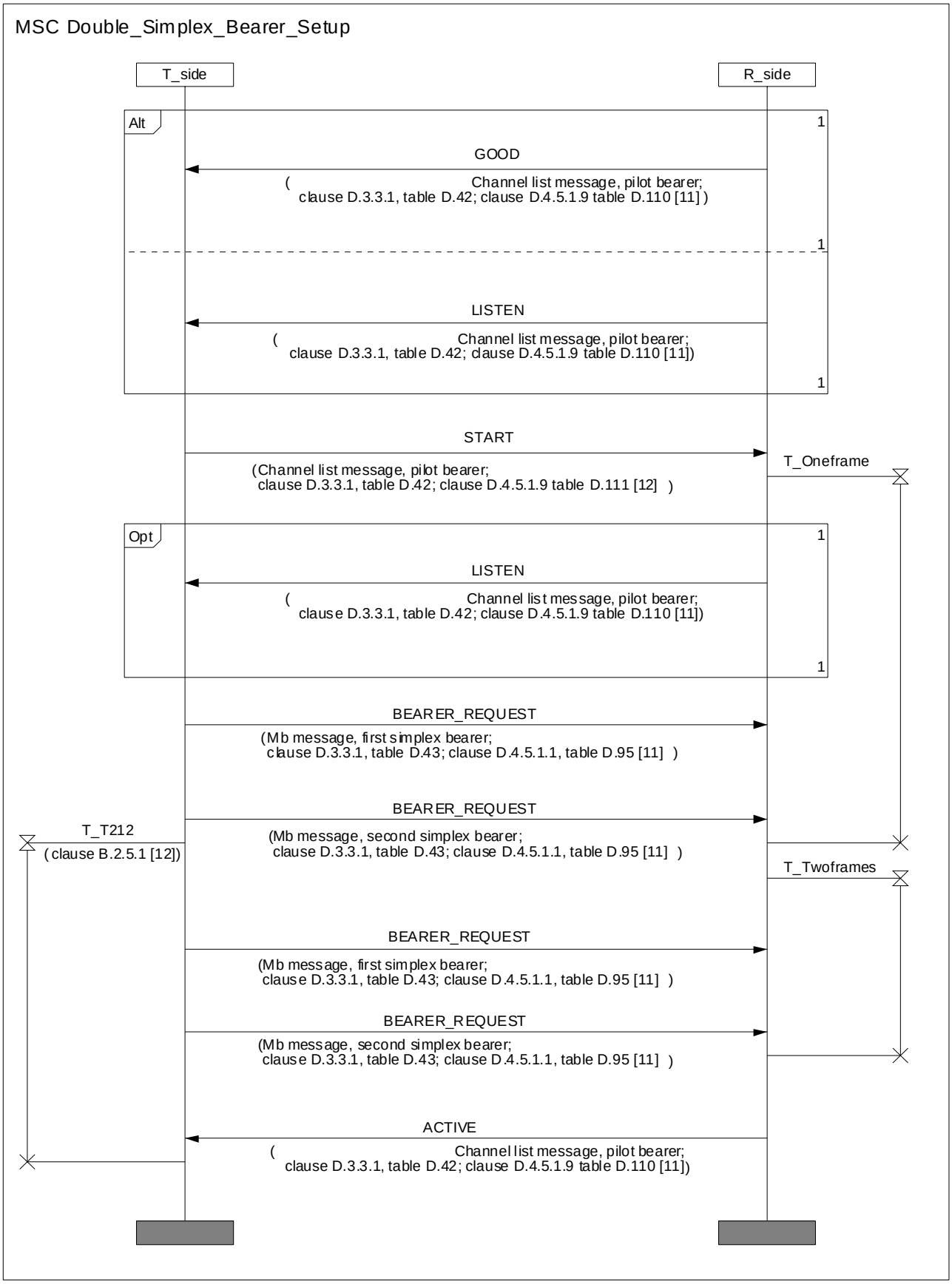

Figure 60: Double simplex bearer setup

11.7 C_S/C_F Channel Data

11.7.1 Procedure

Procedure: C_S/C_F Channel Data	
Preamble	Signalling activities at upper layers.
Stimulus	-

11.7.2 MSCs

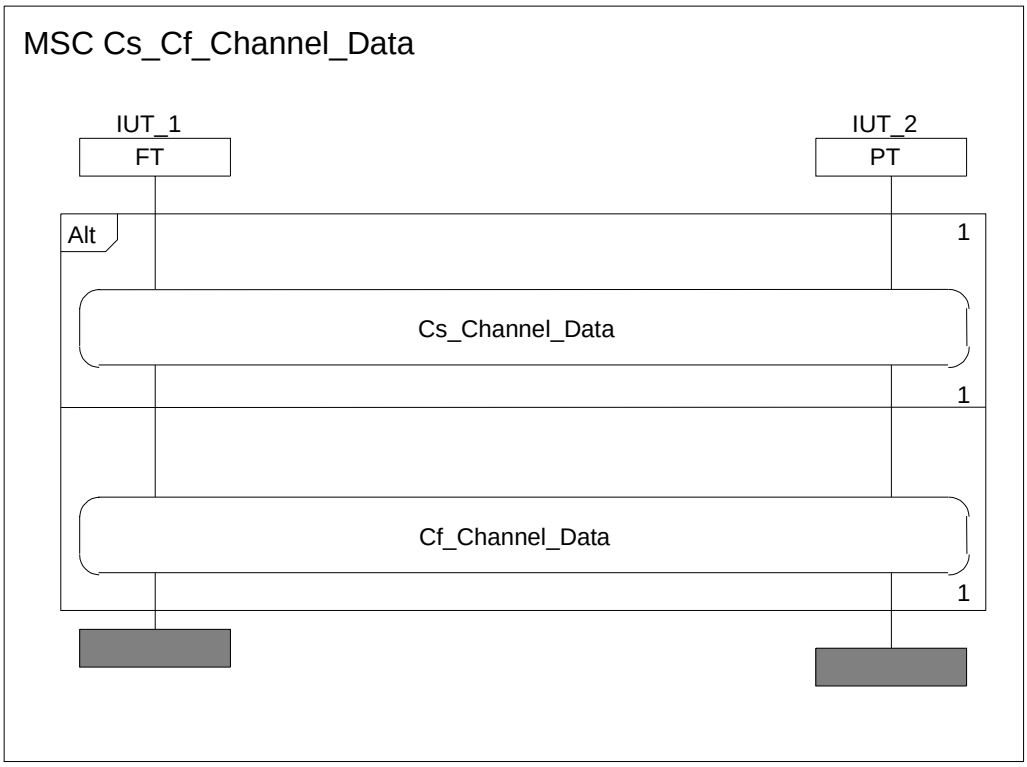

Figure 61: C_S/C_F Channel Data

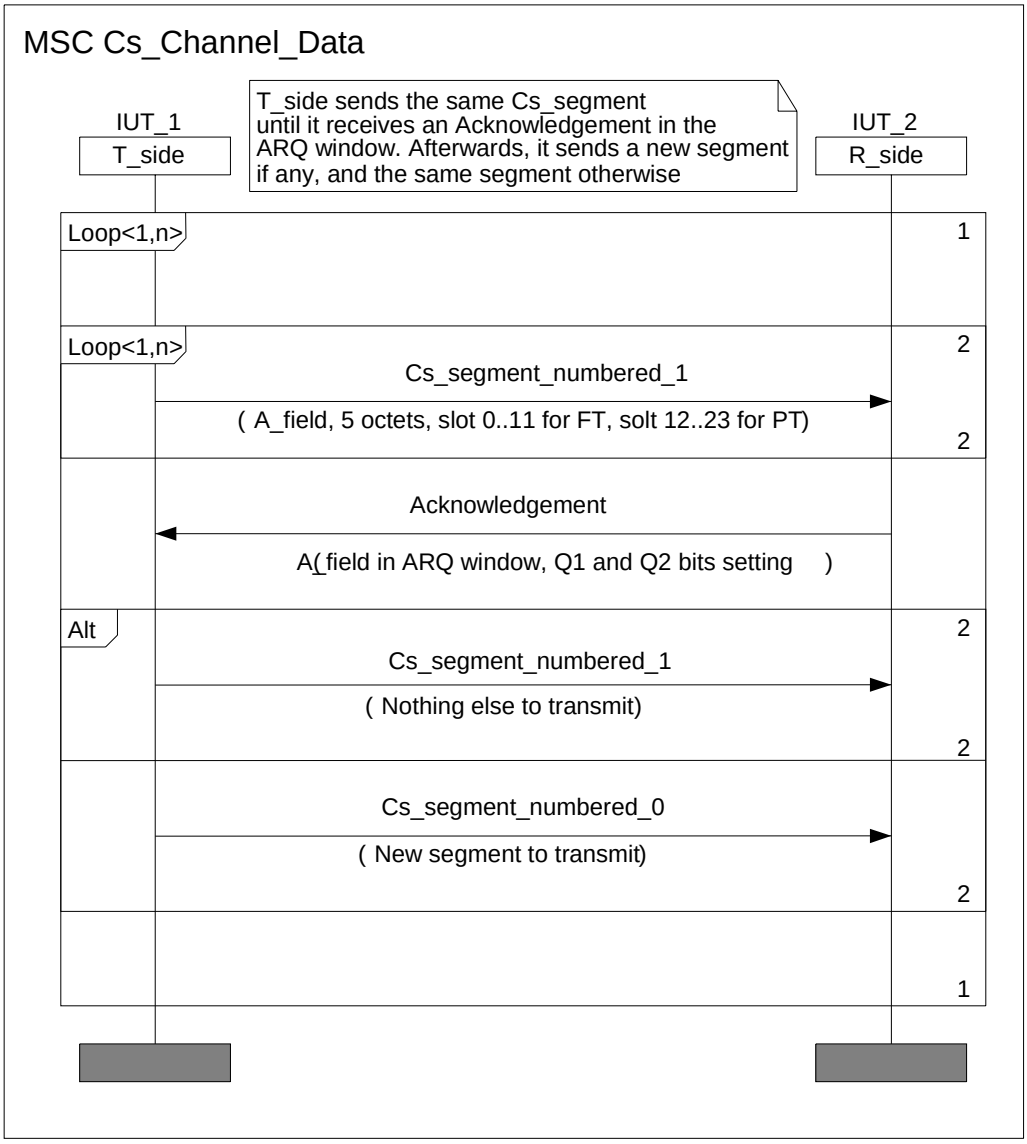

Figure 62: C_S Channel Data

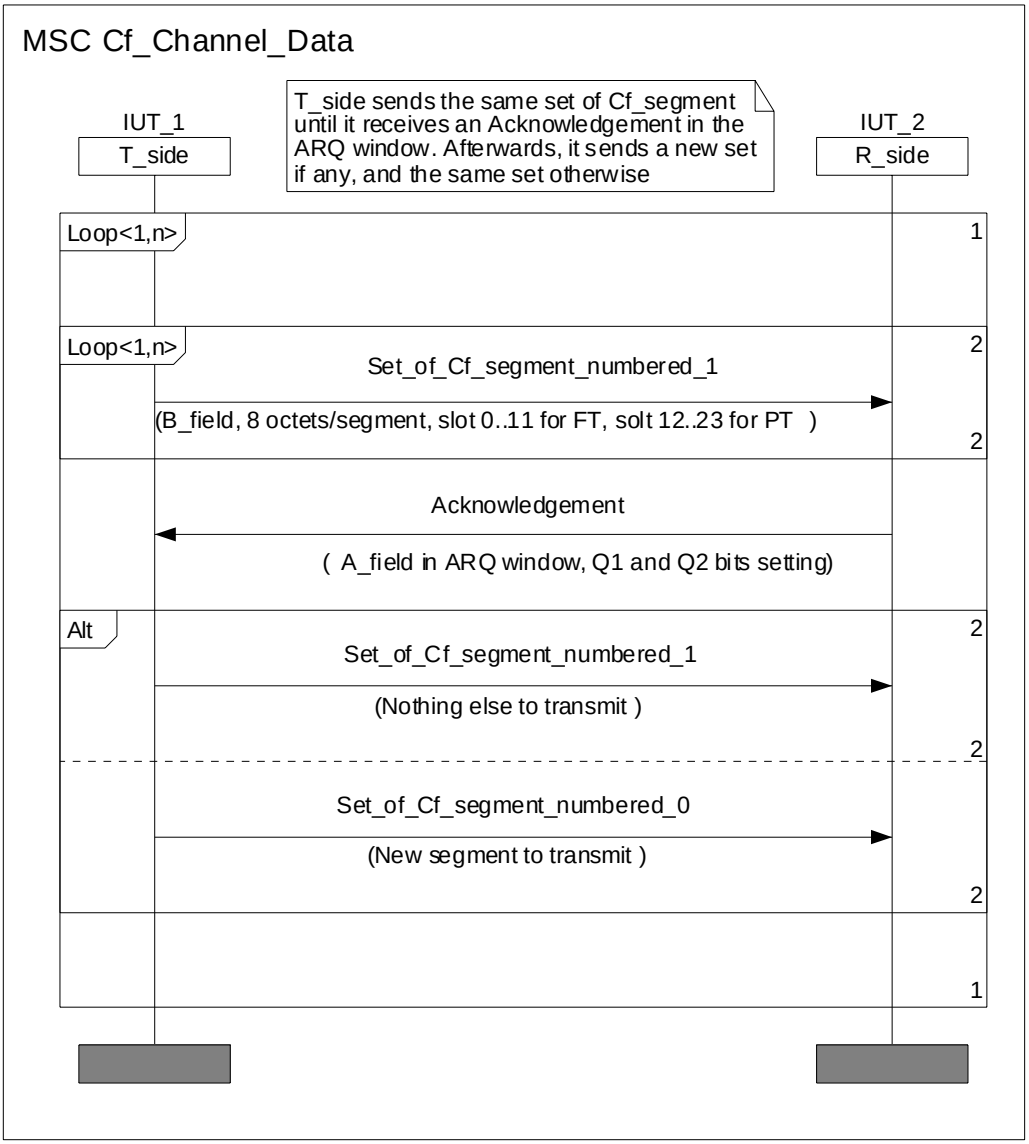

Figure 63: C_F Channel Data

11.8 Connection modification

11.8.1 Procedure

Procedure: Connection modification	
Preamble	Link establishment.
Stimulus	The test operator shall trigger the Connection modification procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 27 or item 28 or item 29 or item 30.

11.8.2 MSC

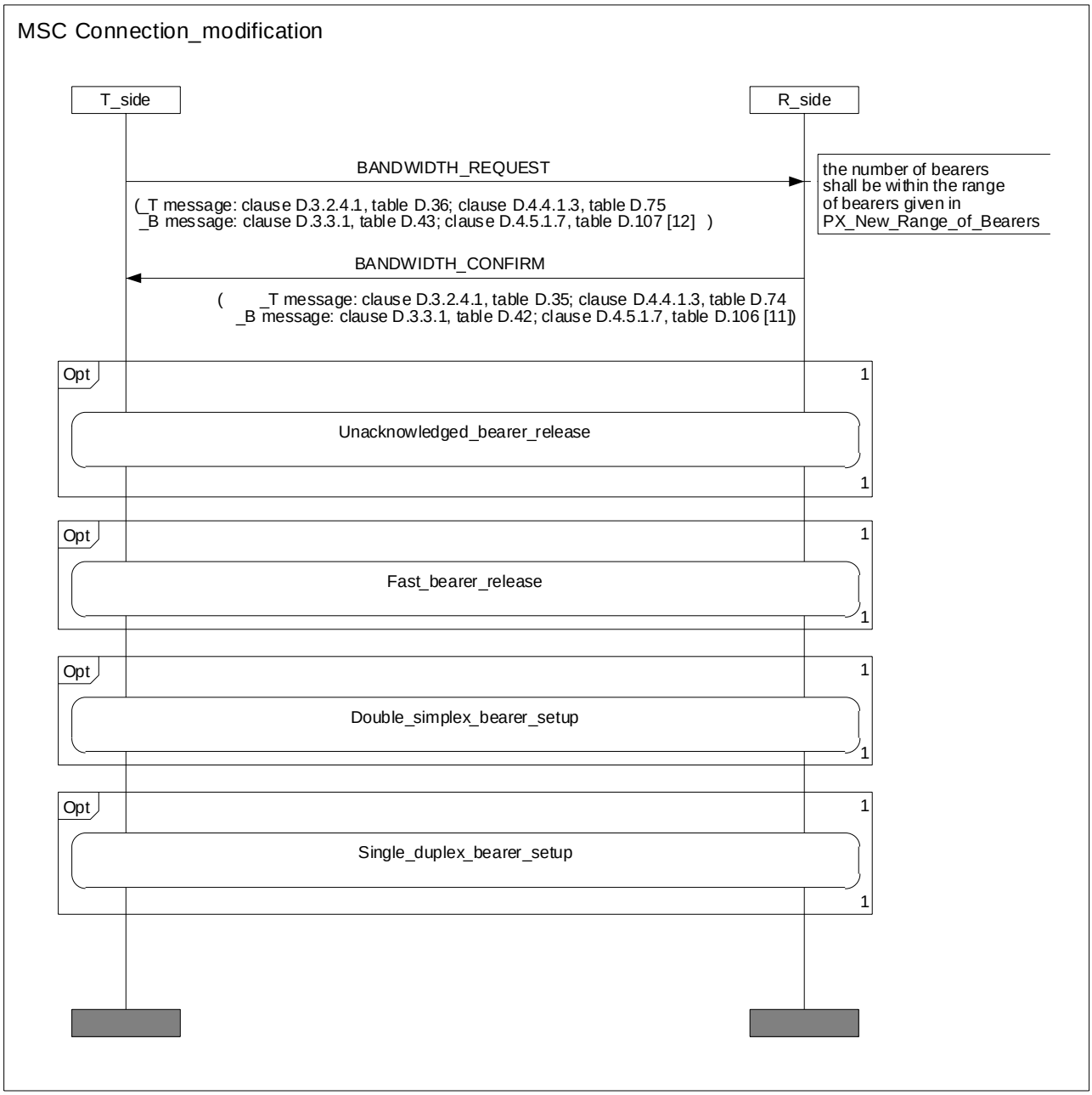

Figure 64: Connection modification

11.9 Paging

11.9.1 Procedure

Procedure: Paging	
Preamble	The FT shall be in state Active_Idle. The PT shall be in state Idle_Locked.
Stimulus	The test operator shall trigger the Normal paging procedure or the Low duty cycle paging procedure or the MAC paging procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 26.

11.9.2 MSC

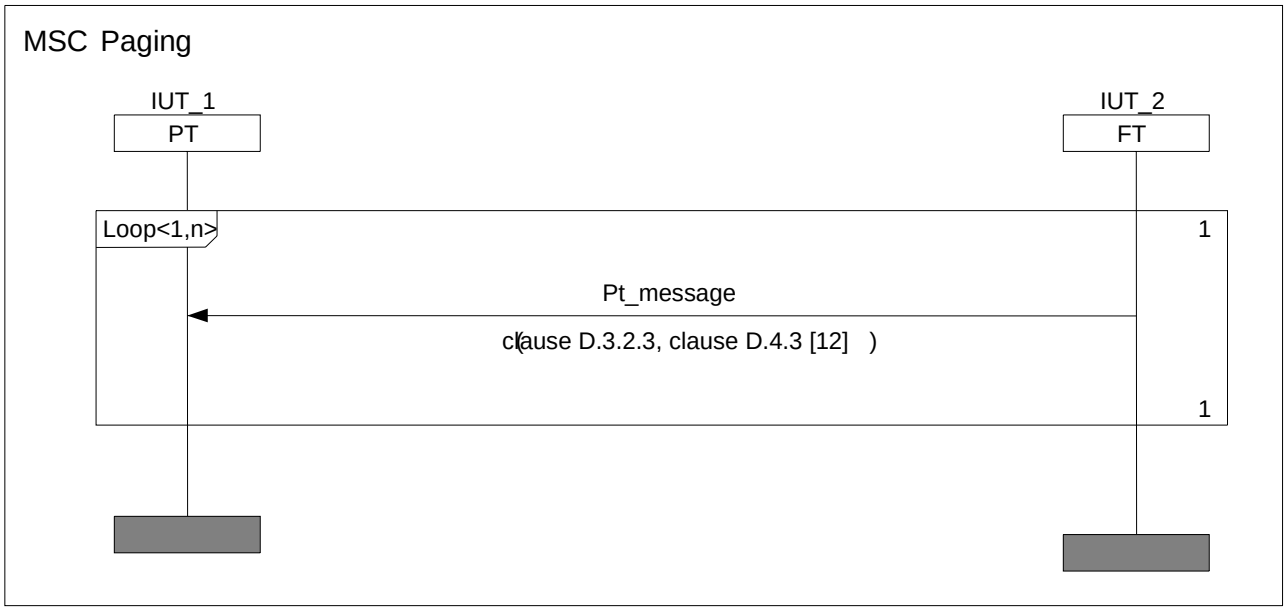

Figure 65: Paging

11.10 Bearer replacement

11.10.1 Procedure

Procedure: Bearer replacement	
Preamble	Link establishment.
Stimulus	The test operator shall trigger the Bearer replacement procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 15.

11.10.2 MSC

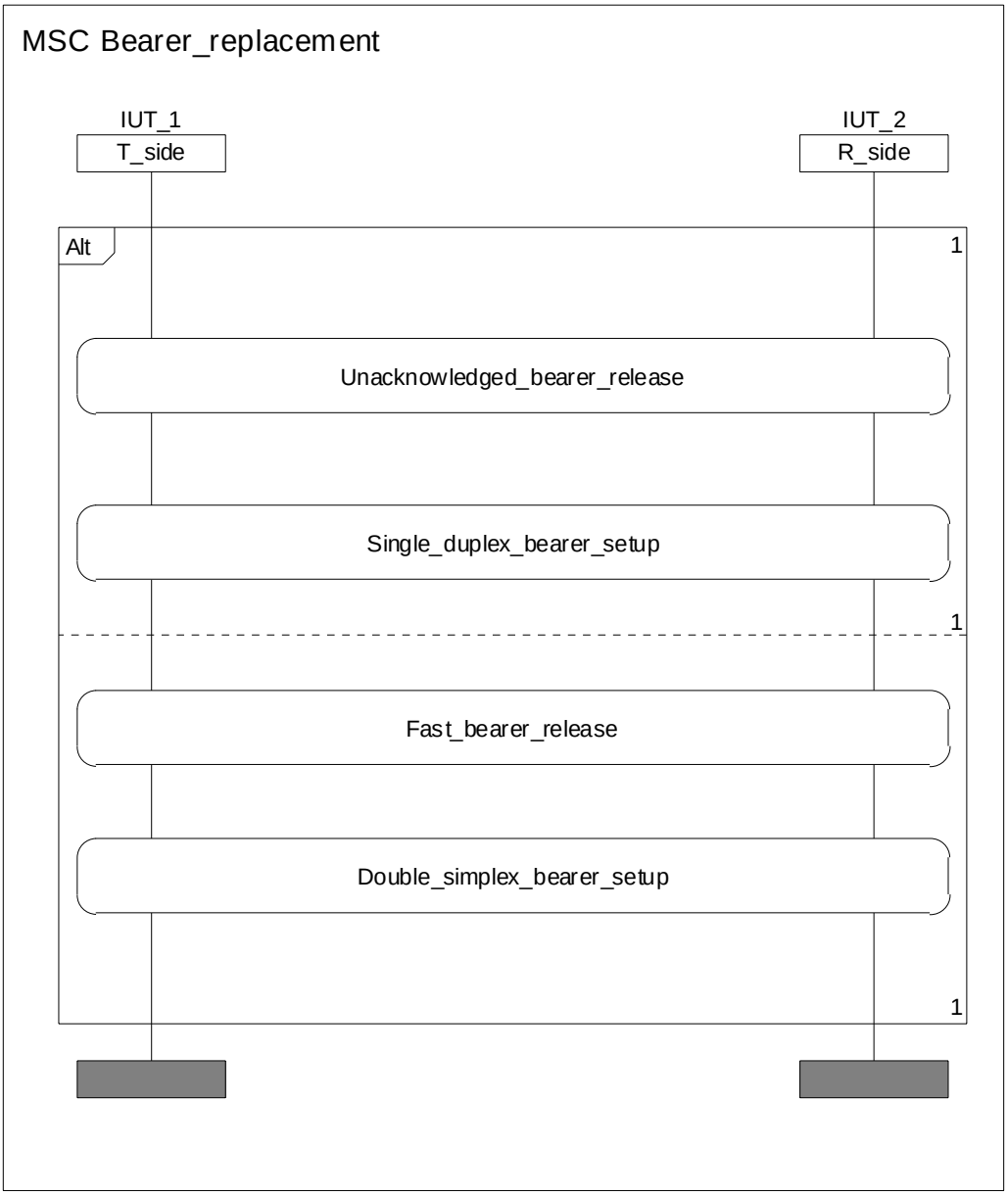

Figure 66: Bearer replacement

11.11 Encryption process - initialization and synchronization

11.11.1 Procedure

Procedure: Encryption process - initialization and synchronization	
Preamble	Link establishment.
Stimulus	The test operator shall trigger the Encryption process - initialization and synchronization procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 10.

11.11.2 MSC

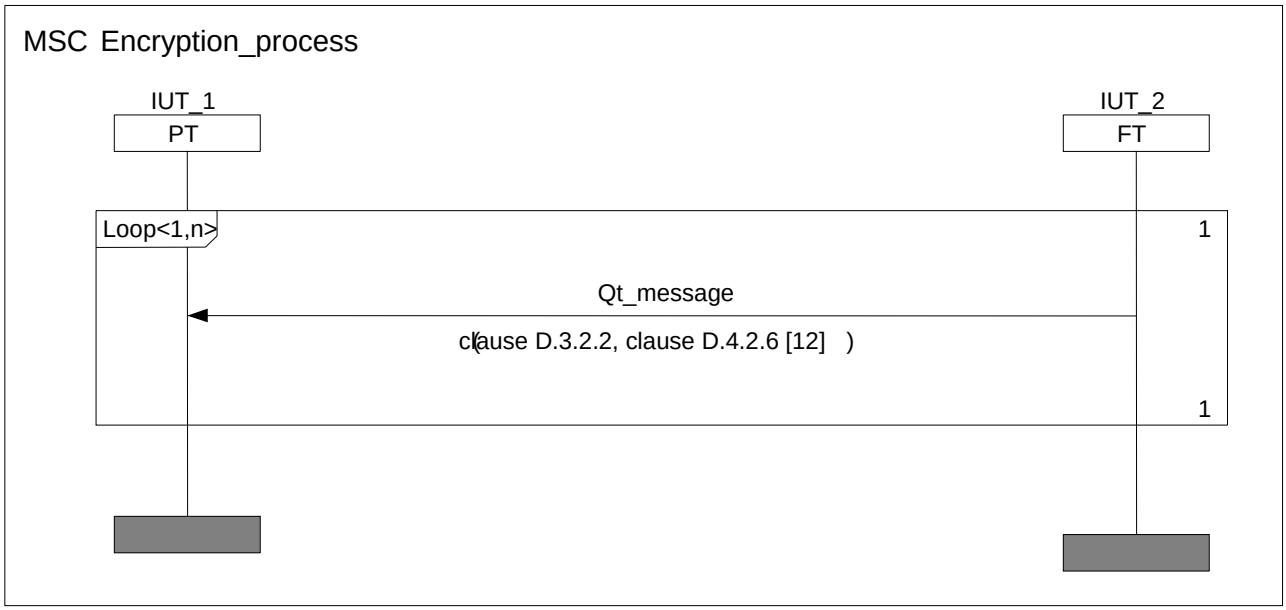

Figure 67: Encryption process - initialization and synchronization

11.12 Encryption mode control

11.12.1 Procedure

Procedure: Encryption mode control	
Preamble	Encryption process - initialization and synchronization.
Stimulus	The test operator shall trigger the Encryption mode control procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 10.

11.12.2 HMSC

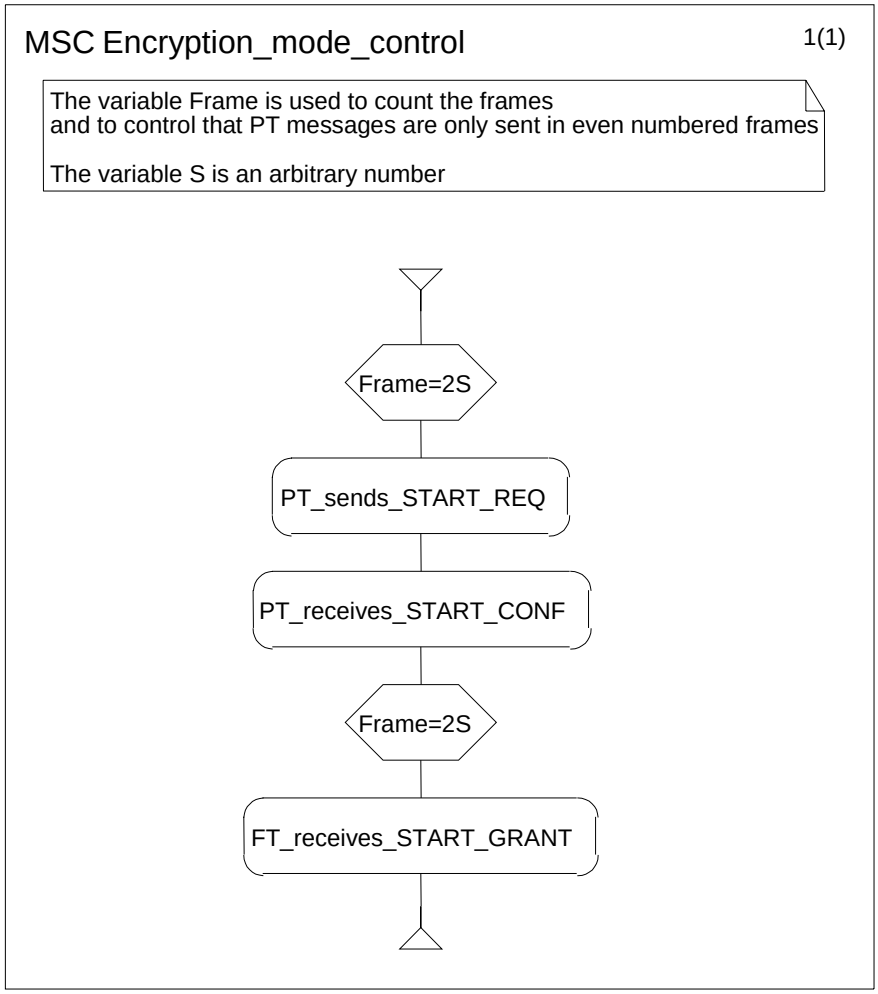

Figure 68: Encryption mode control

11.12.3 MSC

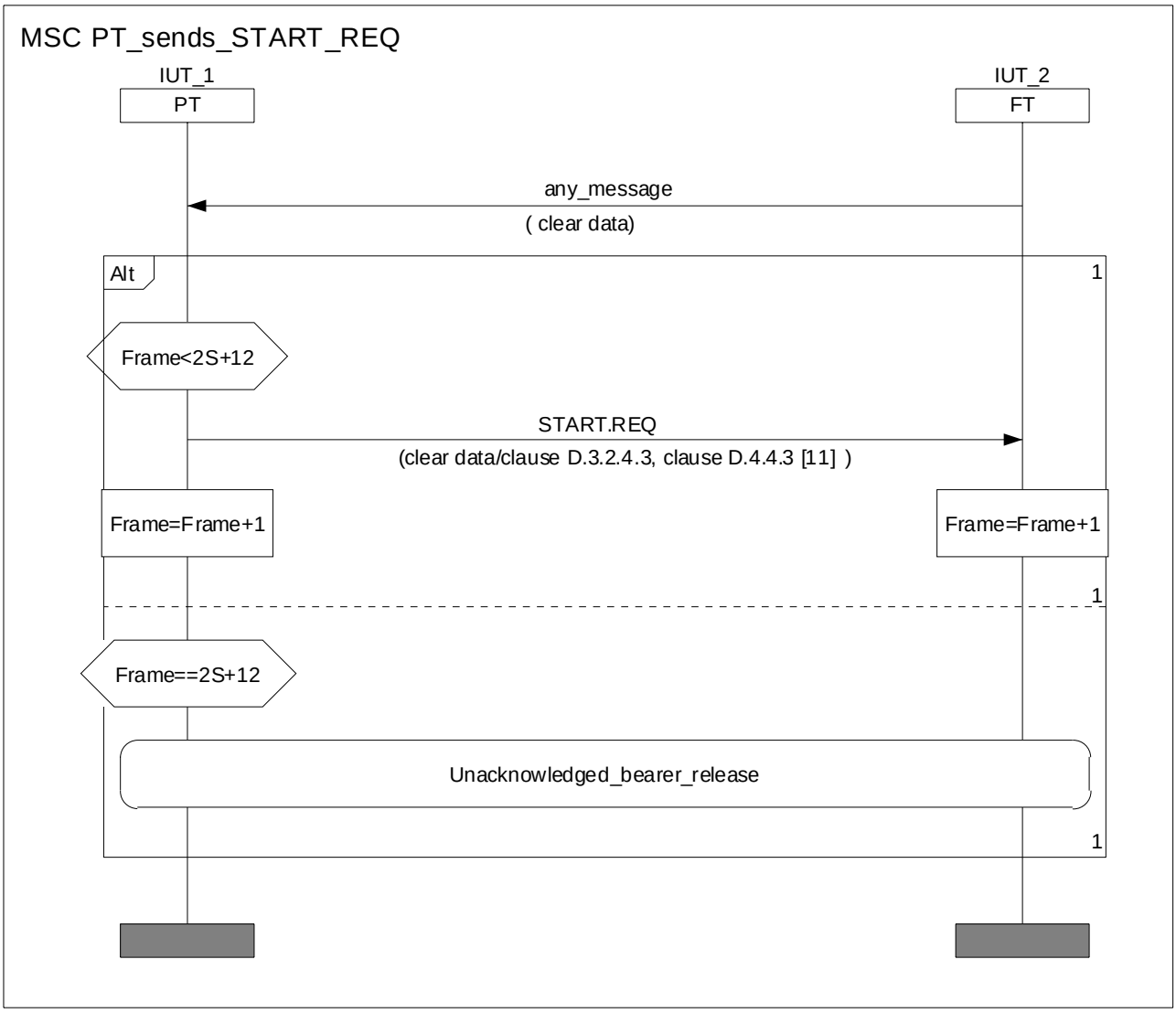

Figure 69: PT sends START.REQ

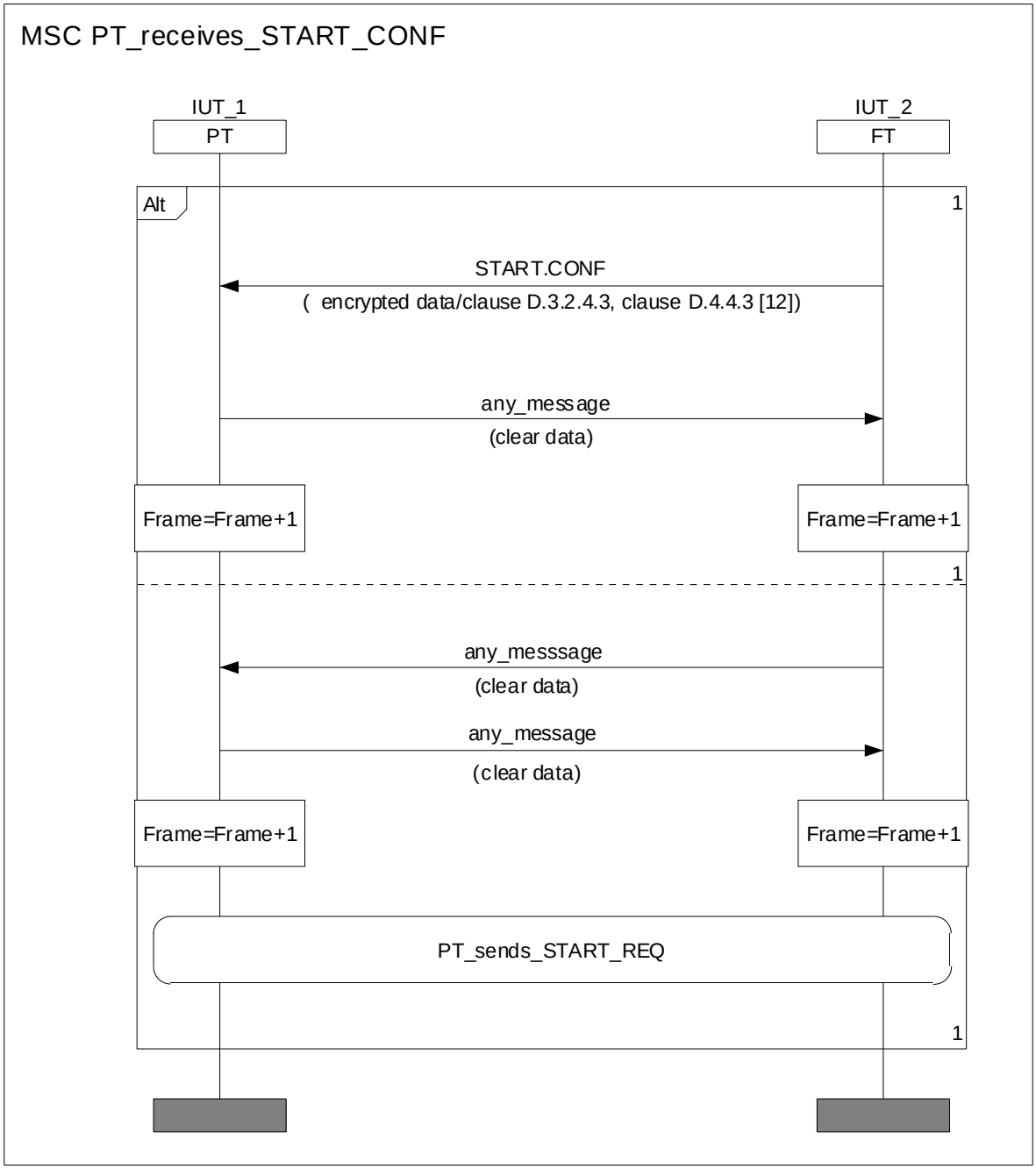

Figure 70: PT receives START.CONF

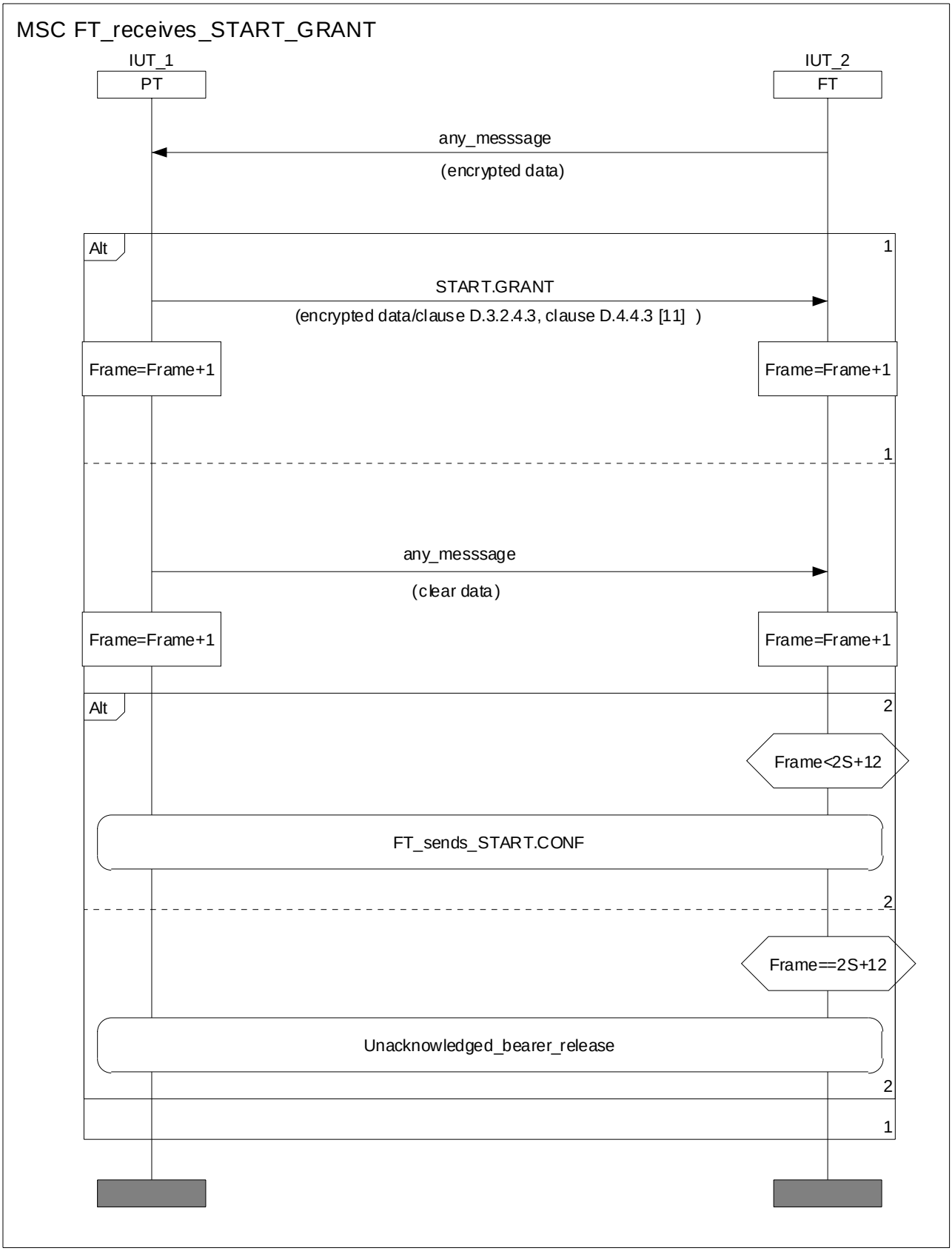

Figure 71: FT receives START.GRANT

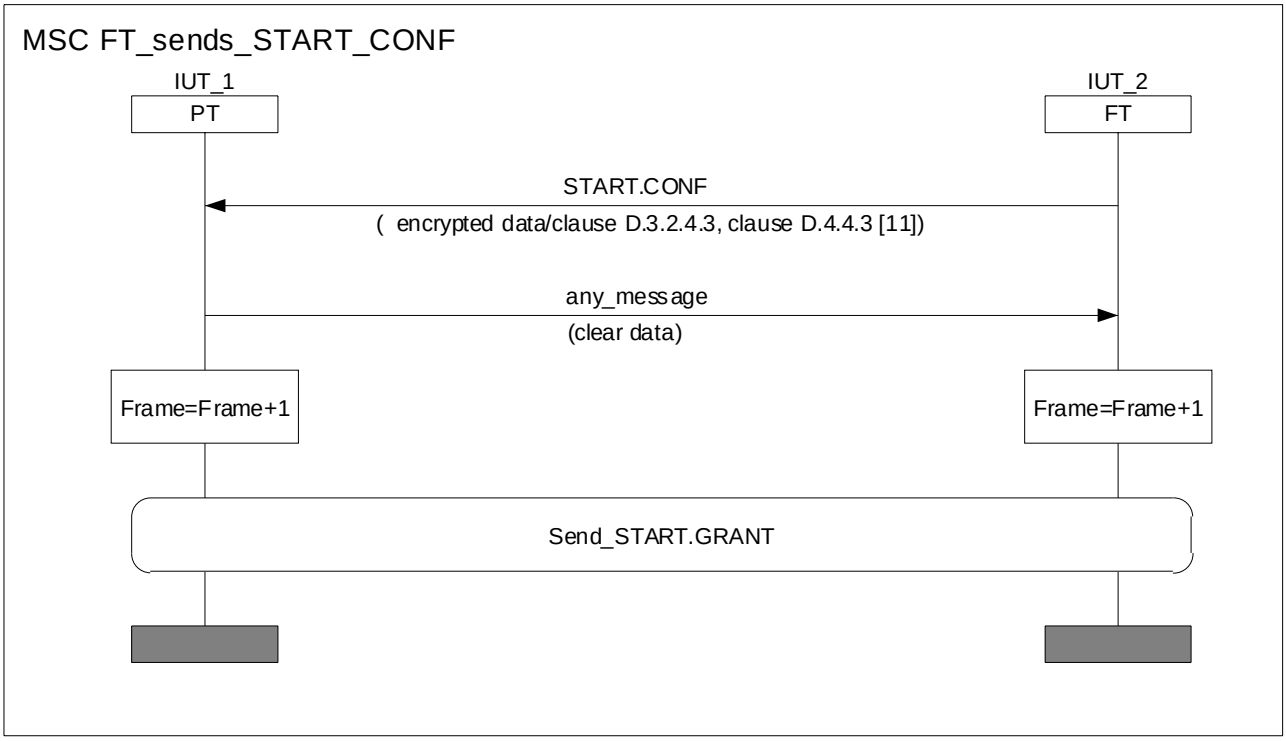

Figure 72: FT sends START.CONF

11.13 Logical connection release

11.13.1 Procedure

Procedure: Logical connection release	
Preamble	The FT shall be in state Active_Traffic. The PT shall be in state Active_Locked.
Stimulus	The test operator shall trigger the Logical connection release procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 35 or item 36.

11.14 Physical connection release

11.14.1 Procedure

Procedure: Physical connection release	
Preamble	The FT shall be in state Active_Traffic. The PT shall be in state Active_Locked.
Stimulus	The test operator shall trigger the Physical connection release procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 35 or item 36.

11.15 Unacknowledged bearer release

11.15.1 Procedure

Procedure: Unacknowledged bearer release	
Preamble	The FT shall be in state Active_Traffic. The PT shall be in state Active_Locked.
Stimulus	The test operator shall trigger the Unacknowledged bearer release procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 35 or item 36.

11.15.2 MSC

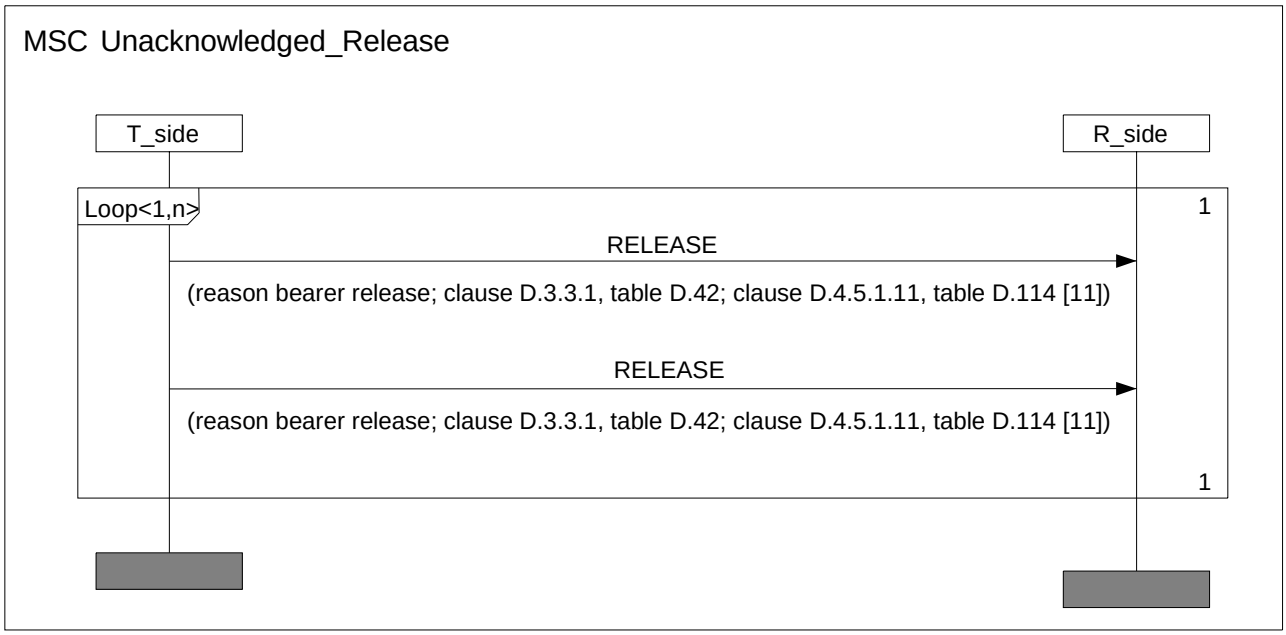

Figure 73: Unacknowledged bearer release

11.16 Fast bearer release

11.16.1 Procedure

Procedure: Fast bearer release	
Preamble	Double simplex bearer establishment.
Stimulus	The test operator shall trigger the Fast bearer release procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 8 or item 9.

11.16.2 MSC

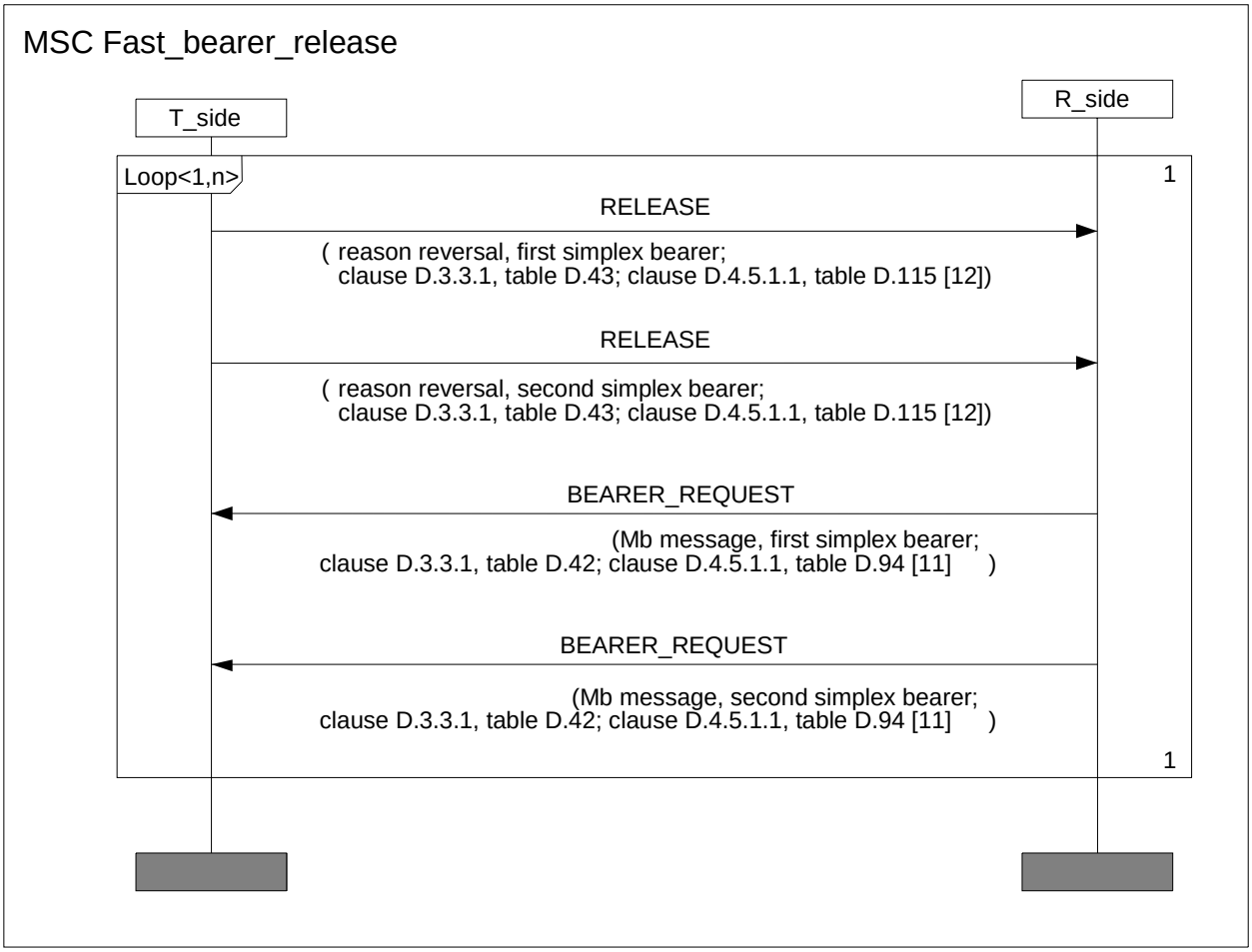

Figure 74: Fast bearer release

11.17 G_F Channel Data

11.17.1 Procedure

Procedure: G_F Channel Data	
Preamble	U-plane exchange (DLC FU10a + FU10c).
Stimulus	-

11.17.2 MSC

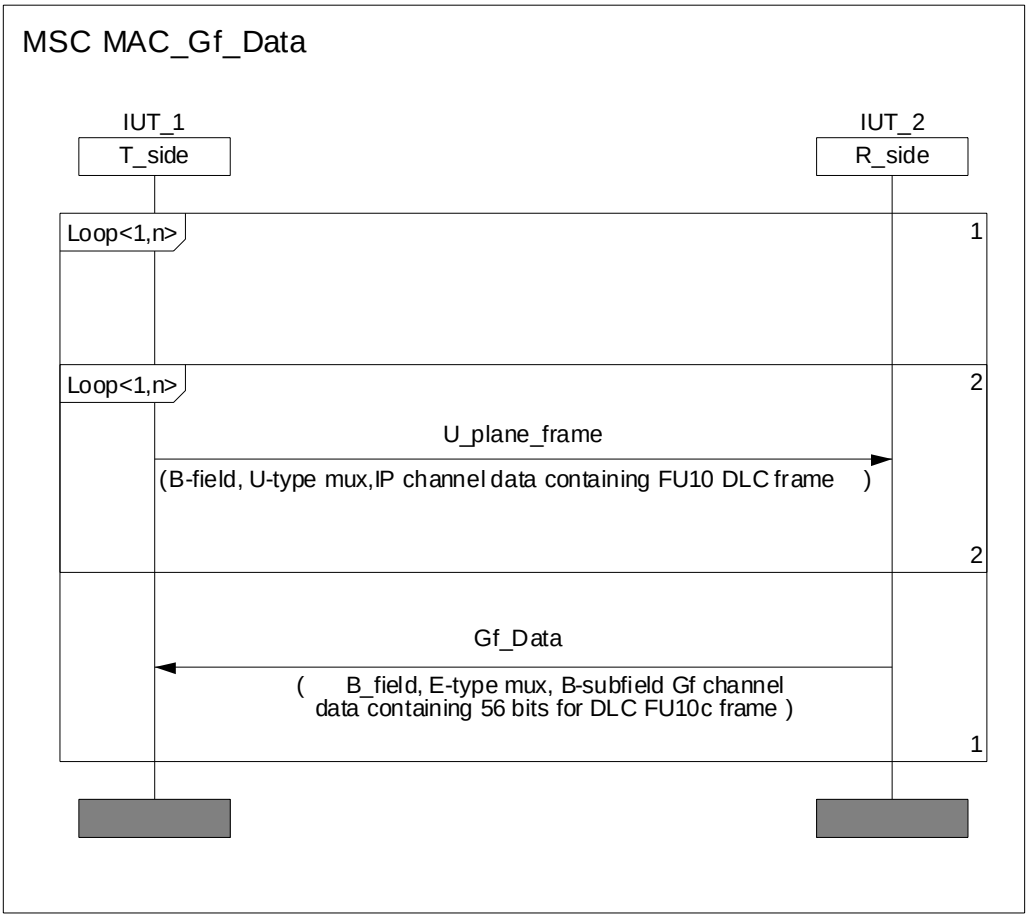

Figure 75: G_F Channel Data

12 Management entity procedures

12.1 Dynamic bandwidth management

12.1.1 Procedure

Procedure: Dynamic bandwidth management	
Preamble	Condition of stability before performing this procedure.
Stimulus	The test operator shall trigger the Dynamic bandwidth management procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 27 or item 28 or item 29 or item 30.

12.2 Suspend management

12.2.1 Procedure

Procedure: Suspend management	
Preamble	The FT shall be in call state F-10. The PT shall be in call state T-10.
Stimulus	The test operator shall trigger the Suspend management procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 11 or item 12.

12.2.2 MSC

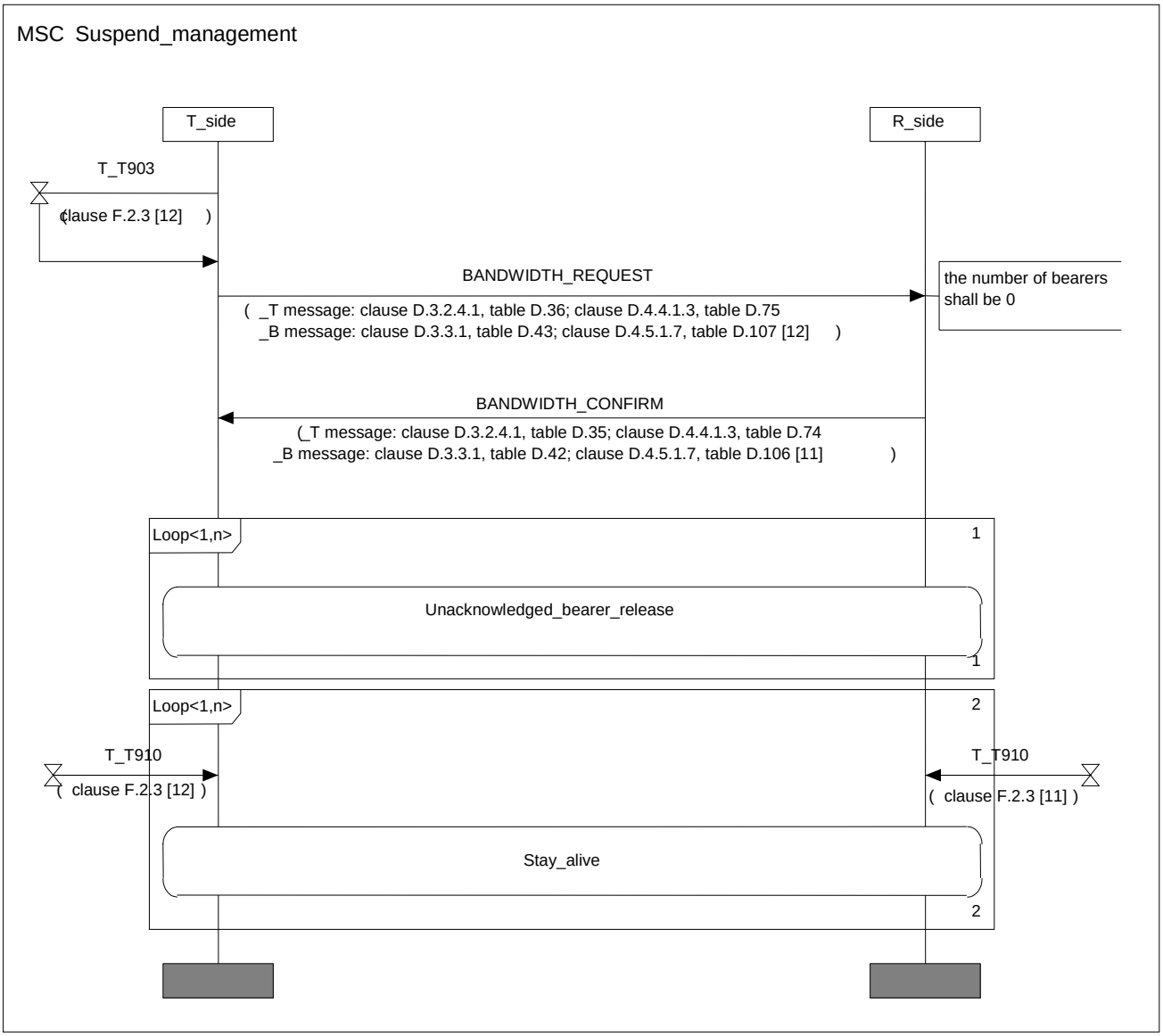

Figure 76: Suspend management

12.3 Resume management

12.3.1 Procedure

Procedure: Resume management	
Preamble	Suspend management.
Stimulus	The test operator shall trigger the Resume management procedure by using suitable actions indicated by the supplier in the PIXIT table A.7 item 13 or item 14.

12.3.2 MSC

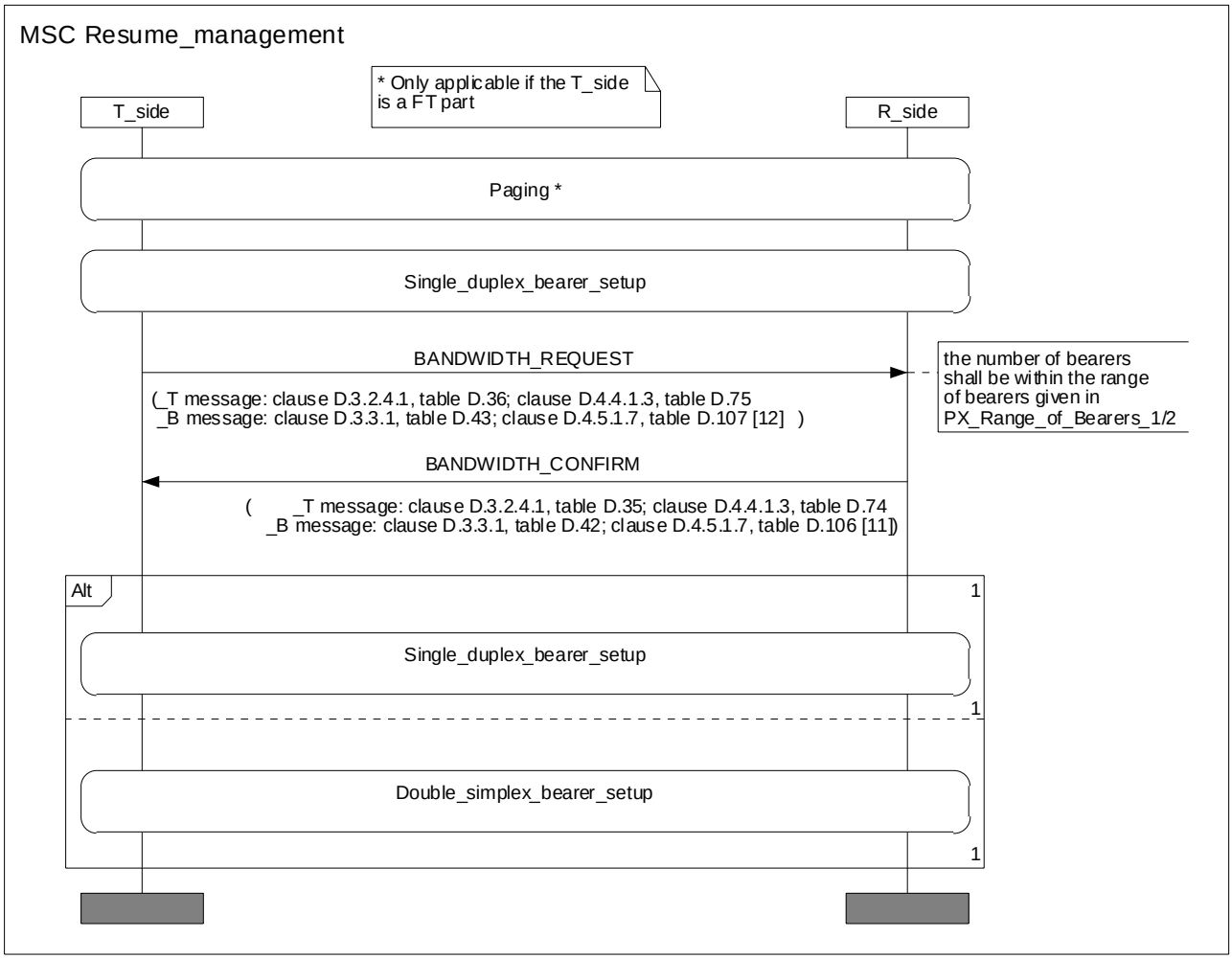

Figure 77: Resume management

12.4 Stay Alive

12.4.1 Procedure

Procedure: Identification of the procedure	
Preamble	Link suspended.
Stimulus	Stay alive is performed during the Suspend management.

12.4.2 MSC

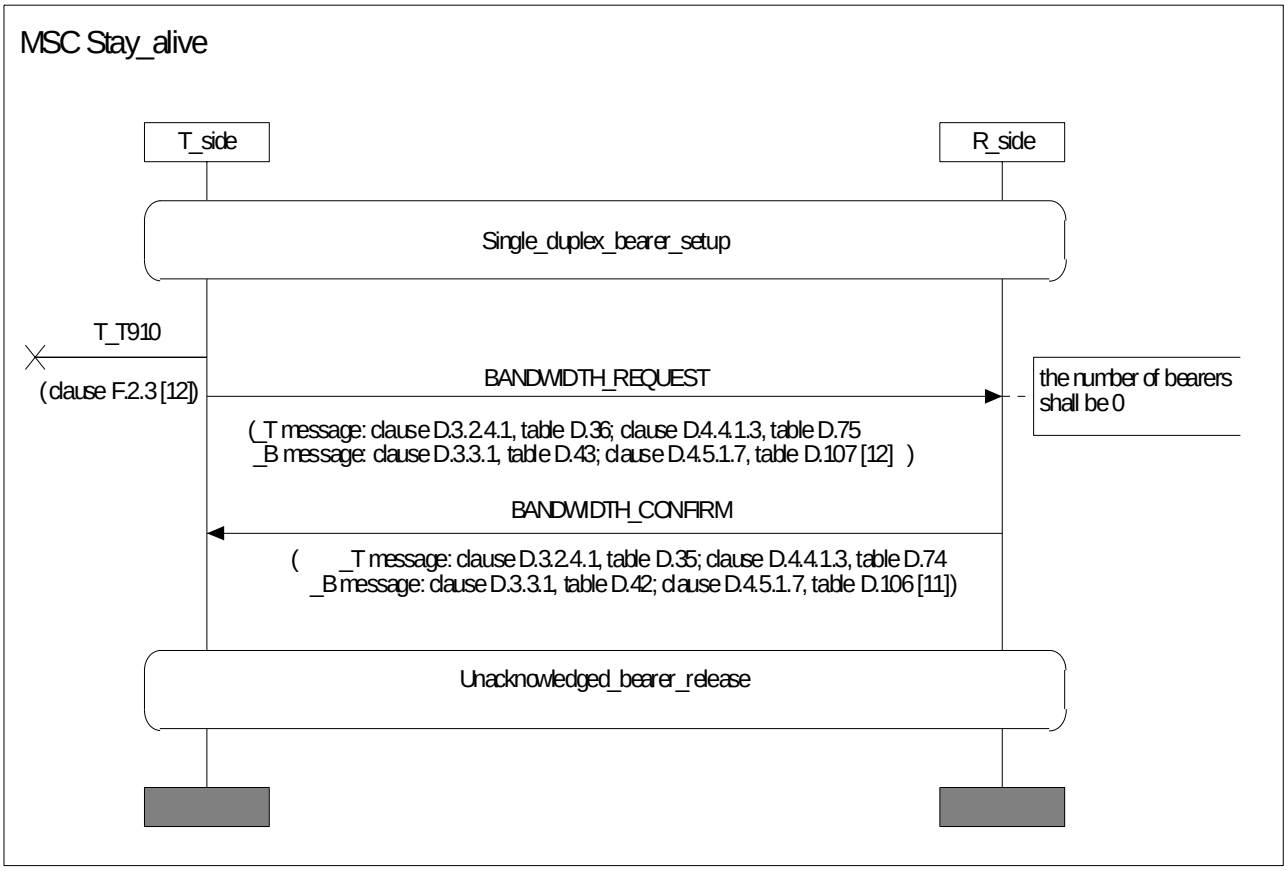

Figure 78: Stay alive

Annex A (normative): Partial PIXIT proforma

The PIXIT Proforma is based on ISO/IEC 9646-6 [8]. Any needed additional information can be found in this international standard document.

A.1 Identification summary

Table A.1

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

A.2 Test summary

Table A.2

Protocol Specification:	
Protocol to be tested:	
Test Specification:	
Abstract Test Method:	

A.3 Test laboratory

Table A.3

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

A.4 Client identification

Table A.4

Client Identification:	
Client Test manager:	
Test Facilities required:	

A.5 SUT

Table A.5

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

A.6 Protocol layer information

A.6.1 Protocol identification

Table A.6

Name:	
Version:	
PICS References:	

A.6.2 IUT information

Table A.7

Item	Question	Explanation	Answer
1	How could the IUT_1 (PT) be forced to invoke an outgoing call?	Indicates the steps that have to be followed to force IUT_1 (PT) to start outgoing call.	
2	How could the IUT_1 (PT) be forced to release a call?	Indicates the steps that have to be followed to release a call.	
3	How could the IUT_1 (PT) be forced to initiate the following procedures: Logical connection setup, Single bearer Physical connection setup, and Single duplex bearer setup?	Indicates the steps that have to be followed to initiate the following procedures: Logical connection setup, Single bearer Physical connection setup, and Single duplex bearer setup.	
4	How could the IUT_2 (FT) be forced to initiate the following procedures: Logical connection setup, Single bearer Physical connection setup, and Single duplex bearer setup?	Indicates the steps that have to be followed to initiate the following procedures: Logical connection setup, Single bearer Physical connection setup, and Single duplex bearer setup.	
5	How could the IUT_1 (PT) or IUT_2 (FT) be forced to initiate the following procedures: Logical connection setup, Multi bearer Physical connection setup, and Symmetric connection?	Indicates the steps that have to be followed to initiate the following procedures: Logical connection setup, Multi bearer Physical connection setup, and Symmetric connection.	
6	How could the IUT_1 (PT) or IUT_2 (FT) be forced to initiate the following procedures: Logical connection setup, Multi bearer Physical connection setup, and Asymmetric connection?	Indicates the steps that have to be followed to initiate the following procedures: Logical connection setup, Multi bearer Physical connection setup, and Asymmetric connection?	
7	How could the IUT_1 (PT) be forced to initiate a Double simplex bearer setup procedure?	Indicates the steps that have to be followed to initiate a Double simplex bearer setup procedure.	
8	How could the IUT_1 (PT) be forced to reverse the direction of the bearers used in an asymmetric multibearer connection?	Indicates the steps that have to be followed to reverse the direction of the bearers used in an asymmetric multibearer connection.	
9	How could the IUT_2 (FT) be forced to reverse the direction of the bearers used in an asymmetric multibearer connection?	Indicates the steps that have to be followed to reverse the direction of the bearers used in an asymmetric multibearer connection.	
10	How could the IUT_2 (FT) be forced to switch a connection from clear mode to encrypt mode?	Indicates the steps that have to be followed to initiate a FT initiated cipher-switching procedure.	
11	How could the IUT_1 (PT) be forced to initiate a MAC suspend?	Indicates the steps that have to be followed to initiate a MAC suspend procedures.	
12	How could the IUT_2 (FT) be forced to initiate a MAC suspend?	Indicates the steps that have to be followed to initiate a MAC suspend procedures.	
13	How could the IUT_1 (PT) be forced to initiate a MAC resume?	Indicates the steps that have to be followed to initiate a MAC resume procedures.	
14	How could the IUT_2 (FT) be forced to initiate a MAC resume?	Indicates the steps that have to be followed to initiate a MAC resume procedures.	
15	How could the IUT_1 (PT) be forced to initiate a bearer replacement procedure?	Indicates the steps that have to be followed to initiate a bearer replacement procedure.	
16	How could the IUT_1 (PT) be forced to initiate a Class A connection handover procedure?	Indicates the steps that have to be followed to initiate a Class A connection handover procedure.	

Item	Question	Explanation	Answer
17	How could the IUT_2 (FT) be forced to initiate an authentication of PT procedure?	Indicates the steps that have to be followed to initiate an authentication of PT procedure.	
18	How could the IUT_1 (PT) be forced to initiate an authentication of FT procedure?	Indicates the steps that have to be followed to initiate an authentication of FT procedure.	
19	How could the IUT_2 (FT) be forced to set bit38 in the broadcast FT "higher layer capabilities" to '1'?	Indicates the steps that have to be followed to set bit38 in the broadcast FT "higher layer capabilities" to '1'.	
20	How could the IUT_1 (PT) be forced to initiate a Location registration procedure?	Indicates the steps that have to be followed to initiate a Location registration procedure.	
21	How could the IUT_2 (FT) be forced to set bit44 in the broadcast FT "higher layer capabilities" to '1'?	Indicates the steps that have to be followed to set bit44 in the broadcast FT "higher layer capabilities" to '1'.	
22	How could the IUT_1 (PT) be forced to initiate an Obtain access rights procedure?	Indicates the steps that have to be followed to initiate an Obtain access rights procedure.	
23	How could the IUT_2 (FT) be forced to initiate a terminate access rights procedure?	Indicates the steps that have to be followed to initiate a terminate access rights procedure.	
24	How could the IUT_2 (FT) be forced to initiate the Key allocation procedure?	Indicates the steps that have to be followed to initiate the Key allocation procedure.	
25	How could the IUT_2 (FT) be forced to release a call?	Indicates the steps that have to be followed to release a call.	
26	How could the IUT_2 (FT) be forced to invoke an incoming call?	Indicates the steps that have to be followed to force IUT_2 (FT) to start incoming call.	
27	How could the IUT_1 (PT) be forced to increase the number of bearers?	Indicates the steps that have to be followed to force IUT_1 (PT) to increase the number of bearers.	
28	How could the IUT_1 (PT) be forced to decrease the number of bearers?	Indicates the steps that have to be followed to force IUT_1 (PT) to decrease the number of bearers.	
29	How could the IUT_2 (FT) be forced to increase the number of bearers?	Indicates the steps that have to be followed to force IUT_2 (FT) to increase the number of bearers.	
30	How could the IUT_2 (FT) be forced to decrease the number of bearers?	Indicates the steps that have to be followed to force IUT_2 (FT) to decrease the number of bearers.	
31	How could the IUT_1 (PT) be forced to request Service change changing the range of bearers (PT Master)?	Indicates the steps that have to be followed to force IUT_1 (PT) to request Service change changing the range of bearers (PT Master).	
32	How could the IUT_2 (FT) be forced to request Service change changing the range of bearers (FT Master)?	Indicates the steps that have to be followed to force IUT_2 (FT) to request Service change changing the range of bearers (FT Master).	
33	How could the IUT_1 (PT) be forced to initiate the Link release procedure?	Indicates the steps that have to be followed to initiate the Link release procedure.	
34	How could the IUT_2 (FT) be forced to initiate the Link release procedure?	Indicates the steps that have to be followed to initiate the Link release procedure.	
35	How could the IUT_1 (PT) be forced to initiate the following procedures: Logical connection release, Physical connection release, and Unacknowledged bearer release?	Indicates the steps that have to be followed to initiate the following procedures: Logical connection release, Physical connection release, and Unacknowledged bearer release.	

Item	Question	Explanation	Answer
36	How could the IUT_2 (FT) be forced to initiate the following procedures: Logical connection release, Physical connection release, and Unacknowledged bearer release?	Indicates the steps that have to be followed to initiate the following procedures: Logical connection release, Physical connection release, and Unacknowledged bearer release.	
37	How could the IUT_2 (FT) be forced to initiate the Downlink broadcast procedure?	Indicates the steps that have to be followed to initiate the Downlink broadcast procedure.	
38	How many bearers can be established during the Outgoing call?	PX_Range_of_Bearers_1 indicates the range of bearers which can be established during the Outgoing call.	
39	How many bearers can be established during the Incoming call?	PX_Range_of_Bearers_2 indicates the range of bearers which can be established during the Incoming call.	
40	What shall be the new bandwidth for the Active call?	PX_New_Range_of_Bearers indicates the new range of bearers for the Active call.	
41	What feature shall be observed at the Application side?	PX_QoS_Application indicates the claims of an application at the Application side (e.g. throughput/delay/no transmission errors).	
42	What feature shall be observed at the User side?	PX_QoS_User indicates the claims of an application at the User side (e.g. web browsing/file transfer/no dropped connections).	
43	How could the IUT_1 (PT) be forced to initiate the Class A link establishment procedure?	Indicates the steps that have to be followed to force IUT_1 (PT) to initiate the Class A link establishment procedure.	
44	How could the IUT_1 (PT) be forced to initiate the Class A acknowledged information transfer procedure?	Indicates the steps that have to be followed to force IUT_1 (PT) to initiate the Class A acknowledged information transfer procedure.	
45	How could the IUT_1 (PT) be forced to initiate the Class A link release procedure?	Indicates the steps that have to be followed to force IUT_1 (PT) to initiate the Class A link release procedure.	
46	How could the IUT_1 (PT) be forced to initiate the U-plane transmission class 2 procedure?	Indicates the steps that have to be followed to force IUT_1 (PT) to initiate the U-plane transmission class 2 procedure.	
47	How could the IUT_2 (FT) be forced to initiate the U-plane transmission class 2 procedure?	Indicates the steps that have to be followed to force IUT_2 (FT) to initiate the U-plane transmission class 2 procedure.	
48	What kind of User data transmissions shall be executed?	Specifies the possible User data transmissions.	
49	How could the IUT_2 (FT) be forced to initiate the PT alerting procedure?	Indicates the steps that have to be followed to force IUT_2 (FT) to initiate the PT alerting procedure.	
50	How could the IUT_2 (FT) be forced to initiate the Class A link establishment procedure?	Indicates the steps that have to be followed to force IUT_2 (FT) to initiate the Class A link establishment procedure.	
51	How could the IUT_2 (FT) be forced to initiate the Class A acknowledged information transfer procedure?	Indicates the steps that have to be followed to force IUT_2 (FT) to initiate the Class A acknowledged information transfer procedure.	
52	How could the IUT_2 (FT) be forced to initiate the Class A link release procedure?	Indicates the steps that have to be followed to force IUT_2 (FT) to initiate the Class A link release procedure.	

Annex B (normative): PCTR Proforma

The PCTR proforma is based on ISO/IEC 9646-6 [8]. Any needed additional information can be found in this document.

B.1 Identification summary

B.1.1 Protocol conformance test report

Table B.1

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

B.1.2 IUT identification

Table B.2

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

B.1.3 Testing environment

Table B.3

PIXIT Number:	
Test Specification:	
Test Method:	
Means of Testing identification:	
Date of testing:	
Conformance Log reference(s):	
Retention Date for Log reference(s):	

B.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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B.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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B.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 B.3 of the present document) and there are no "FAIL" verdicts to be recorded (in clause B.6 of the present document) strike the words "has or", otherwise strike the words "or has not".

B.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.

B.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 the present document) strike the words "did or" otherwise strike the words "or did not".

Summary of the results of groups of test:

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B.5 Static conformance review report

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

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B.6 Test campaign report

Table B.4

Test Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in clause 7)
Subscription	Yes/No	Yes/No		
Outgoing call	Yes/No	Yes/No		
Incoming call	Yes/No	Yes/No		
Switch On	Yes/No	Yes/No		
Desubscribe	Yes/No	Yes/No		
Connection bandwidth control	Yes/No	Yes/No		
Stop/Start sending data	Yes/No	Yes/No		
Send/Receive U-plane data	Yes/No	Yes/No		
Behaviour at the edge of range, in noisy environment and Interferer tests	Yes/No	Yes/No		
Multicell behaviour	Yes/No	Yes/No		
Speech and Data in parallel or several Data connections in parallel	Yes/No	Yes/No		
Ethernet procedures	Yes/No	Yes/No		
V.24 procedures	Yes/No	Yes/No		
Encryption	Yes/No	Yes/No		
Quality of service from applications point of view	Yes/No	Yes/No		
Quality of service from users point of view	Yes/No	Yes/No		

B.7 Observations

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

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Annex C (normative): HMSCs and MSCs

The test execution is described with HMSCs and MSCs. All the MSCs are listed in MSC.PR format (.mpr files) contained in 040200_MSC.ZIP and 040200_HMCS.ZIP, both contained in archive ts_101950v010201p0.ZIP which accompanies the present document.

Annex D (informative): Bibliography

- ETSI EN 300 175-1: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview".
- ETSI EN 300 175-2: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 2: Physical Layer (PHL)".
- ETSI EN 300 175-3: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer".
- ETSI EN 300 175-4: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 4: Data Link Control (DLC) layer".
- ETSI EN 300 175-5: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 5: Network (NWK) layer".
- ETSI EN 300 175-6: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 6: Identities and addressing".
- ETSI EN 300 175-7: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 7: Security features".
- ETSI EN 300 175-8: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 8: Speech coding and transmission".
- ETSI EN 300 444: "Digital Enhanced Cordless Telecommunications (DECT); Generic Access Profile (GAP)".
- ITU-T Recommendation X.290 (1991): "OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications - General concepts".
- ITU-T Recommendation X.291 (1991): "OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications - Abstract test suite specification".
- ITU-T Recommendation X.292 (1992): "OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications - The Tree and Tabular Combined Notation (TTCN)".

History

Document history		
V1.1.1	May 2001	Publication
V1.2.1	November 2001	Publication