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SERIES Q: SWITCHING AND SIGNALLING

Specifications of Signalling System No. 7 –
Test Specification

MTP LEVEL 2 TEST SPECIFICATION

Reedition of CCITT Recommendation Q.781 published
in the Blue Book, Fascicle VI.9 (1988)

NOTES

1 CCITT Recommendation Q.781 was published in Fascicle VI.9 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

2 In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Recommendation Q.781

MTP LEVEL 2 TEST SPECIFICATION

1 Introduction

This Recommendation contains a set of detailed tests of signalling system No. 7 MTP level 2 protocol. These tests intend to validate the protocol specified in Recommendation Q.703.

This Recommendation conforms to Recommendation Q.780 which describes the basic rules of the Test Specification. In addition the conditions which are specific to level 2 tests are described in the following sections.

2 General principles of level 2 tests

2.1 *Presentation of test descriptions*

The level 2 tests aim at testing the level 2 protocol conformance in a given implementation.

Each test description indicates in the "type of test" column; "Validation" (VAT) or "Validation" (VAT) and "compatibility" (CPT).

Although signal units are transmitted and received continuously on level 2, only the signal units which cause and/or indicate the changes of level 2 status are shown in the EXPECTED SIGNAL UNIT SEQUENCE column of each test description.

2.2 *Presentation of the test list*

These tests as a whole, aim at a complete validation of the level 2 protocol without redundancies. Each test is described as simply as possible to check precisely each elementary function of the protocol, which is referred in the columns "reference", "title" and "sub-title" of each test description.

This list is presented in the form of a succession of tests. The presentation order is essentially functional. However, the operator performing these tests may change this order, taking into account some other practical criteria such as: use pre-test conditions to order the list, the end of a given test may be the pre-test condition of another test.

3 Test configuration

A single link will be used for level 2 tests. Figure 1/Q.781 shows a single link between SP A and SP B. Test specifications are written to test the level 2 of the SP A.

4 Test environment

See Recommendation Q.780, § 6.2.

5 Test list

Note – Compatibility test items are indicated in this list by an asterisk (*).

– The abbreviations *PO*, *LPO*, *RPO*, *EM* and *EDA* are used for processor outage, local processor outage, remote processor outage, emergency and expected delay of acknowledgement respectively.

1 *Link State Control-Expected signal units/orders* (Figures 8/Q.703 and 9/Q.703)

* 1.1 Initialisation (Power-up)

* 1.2 Timer T2

1.3 Timer T3

1.4 Timer T1 and T4 (Normal)

* 1.5 Normal alignment-correct procedure (FISU)

1.6 Normal alignment-correct procedure (MSU)

1.7 SIO received during normal proving period

1.8 Normal alignment with PO set (FISU)

1.9 Normal alignment with PO set (MSU)

1.10 Normal alignment with PO set and clear

1.11 Set RPO when “Aligned not ready”

1.12 SIOS received when “Aligned not ready”

1.13 SIO received when “Aligned not ready”

1.14 Set and clear LPO when “Initial alignment”

1.15 Set and clear LPO when “Aligned ready”

1.16 Timer T1 in ““Aligned not ready” state

1.17 No SIO sent during normal proving period

1.18 Set and cease emergency prior to “start alignment”

* 1.19 Set emergency while in “not aligned state”

1.20 Set emergency when “aligned”

1.21 Both ends set emergency

1.22 Individual end sets emergency

1.23 Set emergency during normal proving

1.24 No SIO sent during emergency alignment

* 1.25 Deactivation during initial alignment

1.26 Deactivation during aligned state

1.27 Deactivation during aligned not ready

1.28 SIO received during link in service

* 1.29 Deactivation during link in service

1.30 Deactivation during LPO

1.31 Deactivation during RPO

* 1.32 Deactivation during the proving period

1.33 SIO received instead of FISUs

1.34 SIOS received instead of FISUs

1.35 SIPO received instead of FISUs

2 *Link State Control-Unexpected signal units/orders* (Figure 8/Q.703)

2.1 Unexpected signal units/orders in “Out of service” state

2.2 Unexpected signal units/orders in “Not aligned” state

2.3 Unexpected signal units/orders in “Aligned” state

2.4 Unexpected signal units/orders in “Proving” state

2.5 Unexpected signal units/orders in “Aligned ready” state

2.6 Unexpected signal units/orders in “Aligned not ready” state

2.7 Unexpected signal units/orders in “In service” state

2.8 Unexpected signal units/orders in “Processor outage” state

3 *Transmission failure* (Figure 8/Q.703)

3.1 Link aligned ready (Break Tx path)

3.2 Link aligned ready (Corrupt FIBs)

3.3 Link aligned not ready (Break Tx path)

3.4 Link aligned not ready (Corrupt FIBs)

* 3.5 Link in service (Break Tx path)

3.6 Link in service (Corrupt FIBs)

3.7 Link in processor outage (Break Tx path)

3.8 Link in processor outage (Corrupt FIBs)

4 *Processor Outage Control* (Figure 10/Q.703)

4.1 Set and clear LPO while link in service

4.2 RPO during LPO

4.3 Clear LPO when “Both processor outage”

5 *SU Delimitation, Alignment, Error Detection and Correction* (Figures 11/Q.703 and 12/Q.703)

5.1 More than seven “1”s between MSU opening and closing flags

5.2 Greater than maximum signal unit length

5.3 Below minimum signal unit length

5.4 Reception of single and multiple flags between FISUs

5.5 Reception of single and multiple flags between MSUs

6 *SUERM Check* (Figure 18/Q.703)

6.1 Error rate of 1 in 256-Link remains in service

6.2 Error rate of 1 in 254-Link into out of service

6.3 Consecutive corrupted SUs

6.4 Time controlled break of the link

7 *AERM check* (Figure 17/Q.703)

7.1 Error rate below the normal threshold

7.2 Error rate at the normal threshold

7.3 Error rate above the normal threshold

7.4 Error rate at the emergency threshold

8 *Transmission and reception control (Basic)* (Figures 13/Q.703 and 14/Q.703)

8.1 MSU transmission and reception

8.2 Negative acknowledgement of MSU

8.3 Check RTB full

8.4 Single MSU with erroneous FIB

8.5 Duplicated FSN

8.6 Erroneous retransmission-Single MSU

8.7 Erroneous retransmission-Multiple FISUs

8.8 Single FISU with corrupt FIB

8.9 Single FISU prior to RPO being set

8.10 Abnormal BSN-Single MSU

8.11 Abnormal BSN-Two consecutive FISUs

8.12 Excessive delay of acknowledgement

8.13 Level 3 Stop Command

9 *Transmission and reception control (PCR)* (Figures 15/Q.703 and 16/Q.703)

* 9.1 MSU transmission and reception

9.2 Priority control

9.3 Forced retransmission with the value N1

9.4 Forced retransmission with the value N2

9.5 Forced retransmission cancel

9.6 Repetition of forced retransmission

9.7 MSU transmission while RPO set

9.8 Abnormal BSN-Single MSU

9.9 Abnormal BSN-Two MSUs

9.10 Unexpected FSN

9.11 Excessive delay of acknowledgement

9.12 FISU with FSN expected for MSU

9.13 Level 3 Stop Command

10 *Congestion Control* (Figure 19/Q.703)

10.1 Congestion abatement

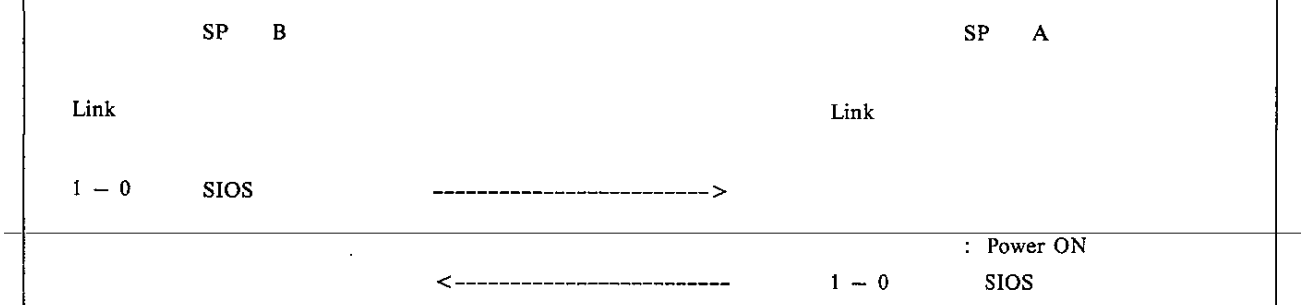
10.2 Timer T7

10.3 Timer T6

6 Test descriptions

TEST NUMBER: 1.1	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 8; Fig. 12; Fig. 13	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Initialization (Power-up)	
PURPOSE: To check that the No. 7 terminal equipment enters the correct state on power-up	
PRE-TEST CONDITIONS: Line equipment – ON; No. 7 equipment – OFF	
CONFIGURATION: 1	TYPE OF TEST: VAT, CPT

EXPECTED SIGNAL UNIT SEQUENCE:

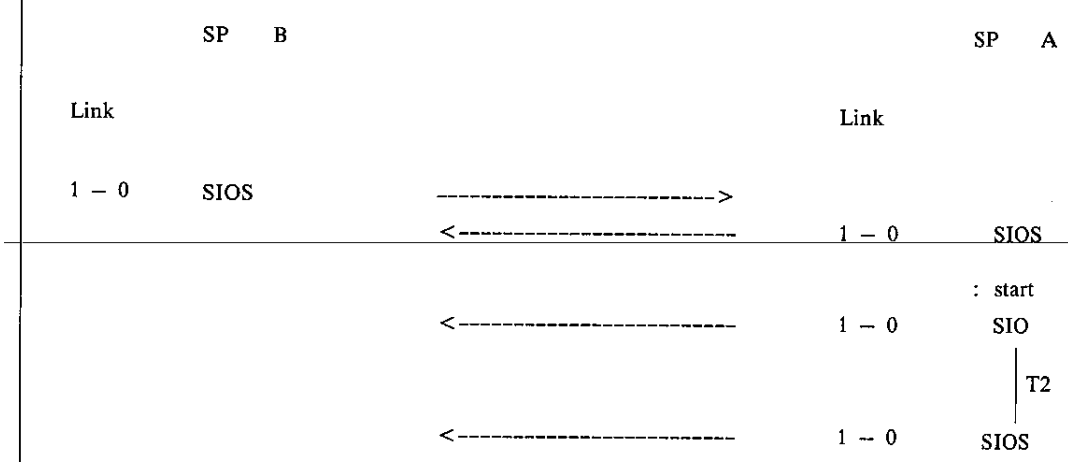


TEST DESCRIPTION

1.	Check link enters correct state.
2.	At "Power – On" or Initialization the FIB, BIB, FSN, and BSN shall be as follows: FIB = BIB = 1 : FSN = BSN = 127 (HEX 7F).
3.	Repeat test in reverse direction.

TEST NUMBER: 1.2	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 8; Fig. 9, Fig. 11, Fig. 13; Fig. 14	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Timer T2	
PURPOSE: To check "Not Aligned" Timer T2	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT, CPT

EXPECTED SIGNAL UNIT SEQUENCE:

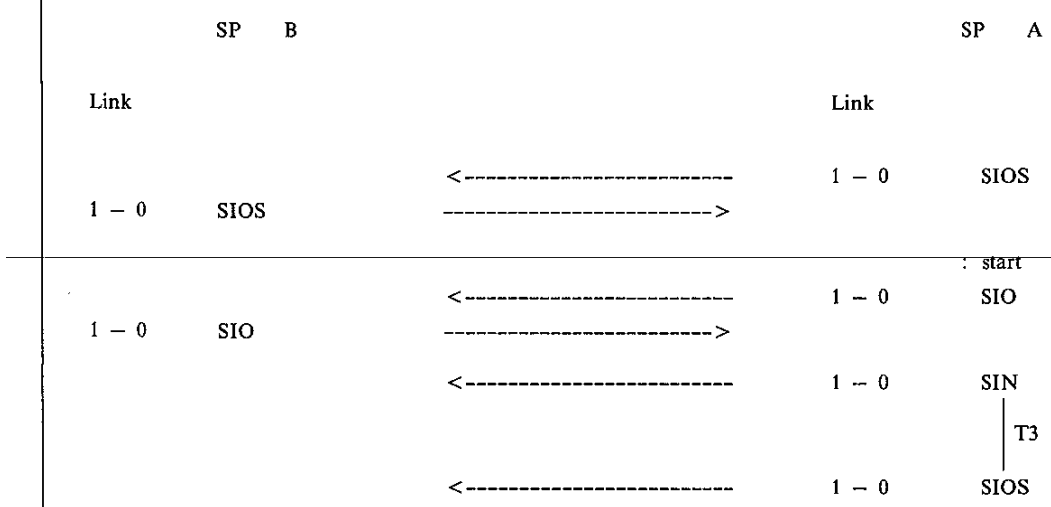


TEST DESCRIPTION

1.	Timer T2 shall be in the range 5 secs to 150 secs.

TEST NUMBER: 1.3	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 9; Fig. 14	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Timer T3	
PURPOSE: To check "Aligned" Timer T3	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

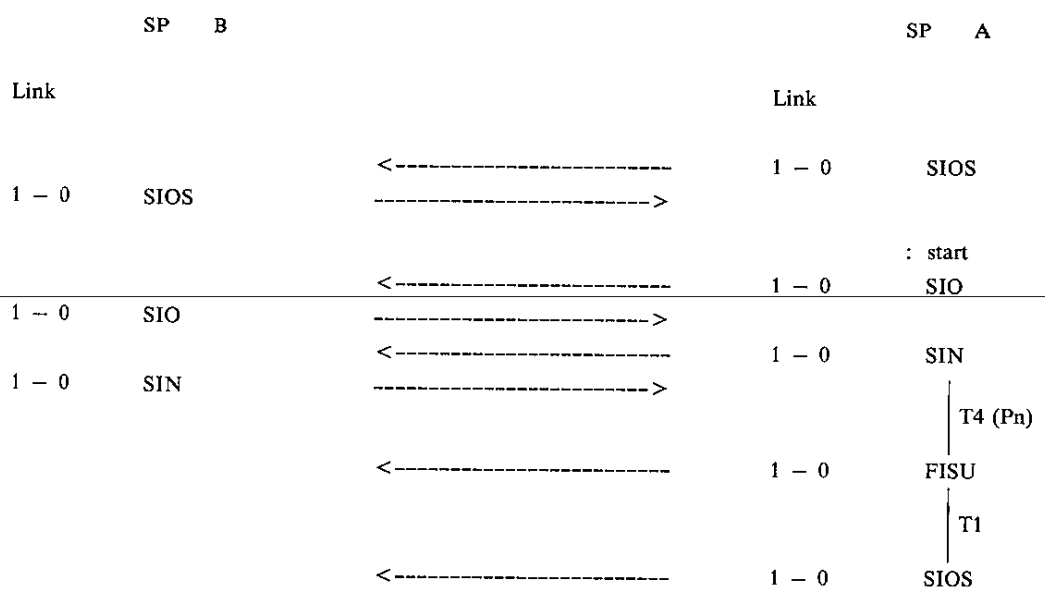
EXPECTED SIGNAL UNIT SEQUENCE:



TEST DESCRIPTION	
1.	Timer T3 shall be in the range 1 sec to 1.5 secs.

TEST NUMBER: 1.4	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 8; Fig. 9	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Timer T1 & Timer T4 (Normal)	
PURPOSE: To check "Aligned ready" Timer T1 and "Proving period" Timer T4 (Normal)	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:



TEST DESCRIPTION

1. At 64 kbit/s Timer T4 shall be in the range 7.5 secs to 9.5 secs (nominally 8.2 secs) and Timer T1 shall be in the range 40 secs to 50 secs.

2. At 4.8 kbit/s Timer T4 shall be in the range 100 secs to 120 secs (nominally 110 secs) and Timer T1 shall be in the in the range 500 secs to 600 secs.

TEST NUMBER: 1.5	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 8; Fig. 9	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Normal alignment – correct procedure (FISU)	
PURPOSE: To check normal alignment procedure	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT, CPT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
1 – 0	SIN	---------->		
		<----------	1 – 0	FISU
1 – 0	FISU	---------->		

TEST DESCRIPTION

1. Start normal alignment procedure.
2. Check link aligns and enters "In service" state.
3. Check that "In service" state is maintained.

TEST NUMBER: 1.6	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 8; Fig. 9	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Normal alignment – correct procedure (MSU)	
PURPOSE: To check normal alignment procedure	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

	SP B			SP A
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
1 – 0	SIN	---------->		
		<----------	1 – 0	FISU
1 – 0	MSU	---------->		

TEST DESCRIPTION

1. Start normal alignment procedure.
2. Check link aligns and enters "In service" state.
3. Check that "In service" state is maintained.

TEST NUMBER: 1.7	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 7, 10.3 STD: Fig. 9; Fig. 17	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: SIO received during normal proving period	
PURPOSE: To test the response to the reception of an SIO during the normal proving period.	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
1 – 0	SIN	---------->		T4 Stopped
1 – 0	SIN (one only)	---------->		
1 – 0	SIN	---------->		
		<----------	1 – 0	SIN T4 (Pn)
		<----------	1 – 0	FISU

TEST DESCRIPTION

1.	Send an SIO at B during normal proving period.
2.	Check that new normal proving period is entered.

TEST NUMBER: 1.8 | PAGE: 1 OF 1

REFERENCE: Q.703 §§ 7, 8 STD: Fig. 8

TITLE: Link State Control – Expected signal units/orders

SUB TITLE: Normal alignment with PO set (FISU)

PURPOSE: To check the response following normal alignment when PO has been set

PRE-TEST CONDITIONS: Link out of service

CONFIGURATION: 1 | TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			Link	SP A
Link				
1 – 0	SIOS	<---------- ---------->	1 – 0	SIOS
				: set LPO
				: start
1 – 0	SIO	<---------- ---------->	1 – 0	SIO
1 – 0	SIN	<---------- ---------->	1 – 0	SIN
1 – 0	FISU	<---------- ---------->	1 – 0	SIPO
		<----------	1 – 0	SIPO

TEST DESCRIPTION

1. Check that normal alignment is carried out with PLO set at A.
2. Check that SIPO is returned when aligned, and that A stays in "processor outage" state.
3. Repeat test with LPO set at B.

TEST NUMBER: 1.9	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 7, 8 STD: Fig. 8	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Normal alignment with PO set (MSU)	
PURPOSE: To check the response following normal alignment when PO has been set	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

	SP B			SP A
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: set LPO
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
1 – 0	SIN	---------->		
		<----------	1 – 0	SIPO
1 – 0	MSU	---------->		
		<----------	1 – 0	SIPO

TEST DESCRIPTION

1.	Check that normal alignment is carried out with LPO set at A.
2.	Check that SIPO is returned when aligned, and that A stays in "processor outage" state.
3.	Repeat test with LPO set at B.

TEST NUMBER: 1.10 | PAGE: 1 OF 1

REFERENCE: Q.703 §§ 7, 8 STD: Fig. 8

TITLE: Link State Control – Expected signal units/orders

SUB TITLE: Normal alignment with PO set and clear

PURPOSE: To check the response following normal alignment when PO has been set and cleared

PRE-TEST CONDITIONS: Link out of service

CONFIGURATION: 1 | TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
1 – 0	SIOS	<---------- ---------->	1 – 0	SIOS
				: set LPO
				: clear LPO
				: start
1 – 0	SIO	<---------- ---------->	1 – 0	SIO
1 – 0	SIN	<---------- ---------->	1 – 0	SIN
1 – 0	FISU	<---------- ---------->	1 – 0	FISU

TEST DESCRIPTION

1. Check that normal alignment is carried out.
2. Check that link aligns and enters "In service" state.

TEST NUMBER: 1.11	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 7, 8 STD: Fig. 8	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Set RPO when "Aligned not ready"	
PURPOSE: To check the response following normal alignment when PO has been set	
PRE-TEST CONDITIONS: Link out of service; ability to set PO	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
	: set LPO			: set LPO
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
1 – 0	SIN	---------->		
		<----------	1 – 0	SIPO
1 – 0	SIPO	---------->		

TEST DESCRIPTION

1.	Set LPO at A and B.
2.	Start alignment.
3.	Check that both LPO and RPO after alignment completes.

TEST NUMBER: 1.13	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 7, 8 STD: Fig. 8	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: SIO received when "Aligned not ready"	
PURPOSE: To check the response following normal alignment when PO has been set	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			Link	SP A
Link				
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: set LPO
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
1 – 0	SIN	---------->		
		<----------	1 – 0	SIPO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1. Soon after alignment completes, A enters "Aligned not ready".
2. Before alignment completes at B, SIO is sent to A.
3. Check that, on reception of SIO, A enters "Out of service" state.
4. Repeat test with LPO set at B.

TEST NUMBER: 1.14	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 7, 8 STD: Fig. 8	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Set and clear LPO when "Initial alignment"	
PURPOSE: To check normal alignment with PO set and clear during "Initial alignment"	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
				: set LPO
1 – 0	SIN	---------->		
				: clear LPO
		<----------	1 – 0	FISU
1 – 0	FISU	---------->		
		<----------	1 – 0	FISU

TEST DESCRIPTION

1. Set LPO at A during "Initial alignment" state.
2. Check A remains in "Initial alignment" state.
3. Clear LPO before alignment completes at A.
4. Check A enters "In service" state after normal alignment.
5. Repeat the test at B.

TEST NUMBER: 1.15	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 7, 8 STD: Fig. 8	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Set and clear LPO when "aligned ready"	
PURPOSE: To test the response to LPO when "aligned ready" and to ensure that the aligned ready state resumes when LPO is cleared.	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
1 – 0	SIN	---------->		
		<----------	1 – 0	FISU
				: set LPO
		<----------	1 – 0	SIPO
				: wait 5 secs.
				: clear LPO
		<----------	1 – 0	FISU

TEST DESCRIPTION

1.	Start link at A.
2.	At "aligned ready" state set LPO at A. (Suppress return of FISUs at B to maintain "aligned ready" state).
3.	Clear LPO at A.
4.	Check A resumes "aligned ready" state.

TEST NUMBER: 1.16	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 7, 8 STD: Fig. 8	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Timer T1 in "aligned not ready" state	
PURPOSE: To test the operation of Timer T1 when in the "aligned not ready" state.	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

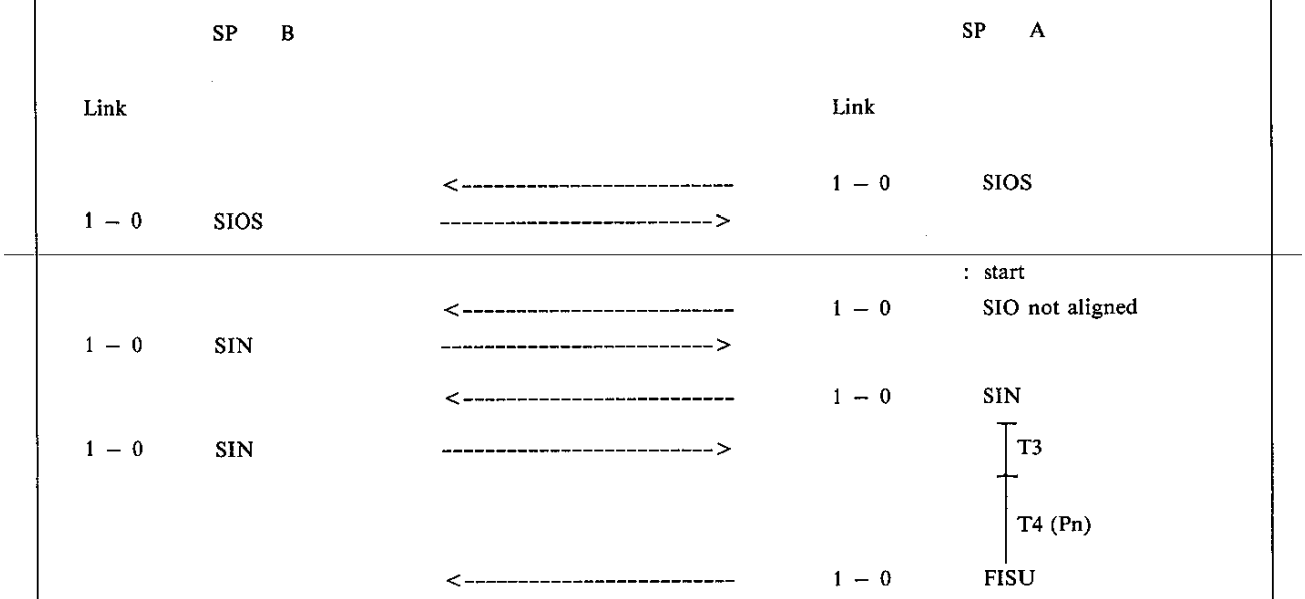
SP B			SP A	
Link			Link	
1 – 0	SIOS	<----------	1 – 0	SIOS
		---------->		
				: set LPO
				: start
1 – 0	SIO	<----------	1 – 0	SIO
		---------->		
1 – 0	SIN	<----------	1 – 0	SIN
		---------->		
		<----------	1 – 0	SIPO
				| T1
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1.	Set LPO and start link at A.
2.	Check A enters the "aligned not ready" state.
3.	Check A takes the link out of service after time T1.
4.	Timer T1 shall be in the range 40 secs to 50 secs.

TEST NUMBER: 1.17	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 9	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: No SIO sent during normal proving period	
PURPOSE: To ensure that normal alignment still occurs when SIO is omitted	
PRE-TEST CONDITIONS: Link out of Service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:



TEST DESCRIPTION

1.	Check normal alignment occurs with no SIO sent from SP B.

TEST NUMBER: 1.18 | PAGE: 1 OF 1

REFERENCE: Q.703 § 7 STD: Fig. 8

TITLE: Link State Control – Expected signal units/orders

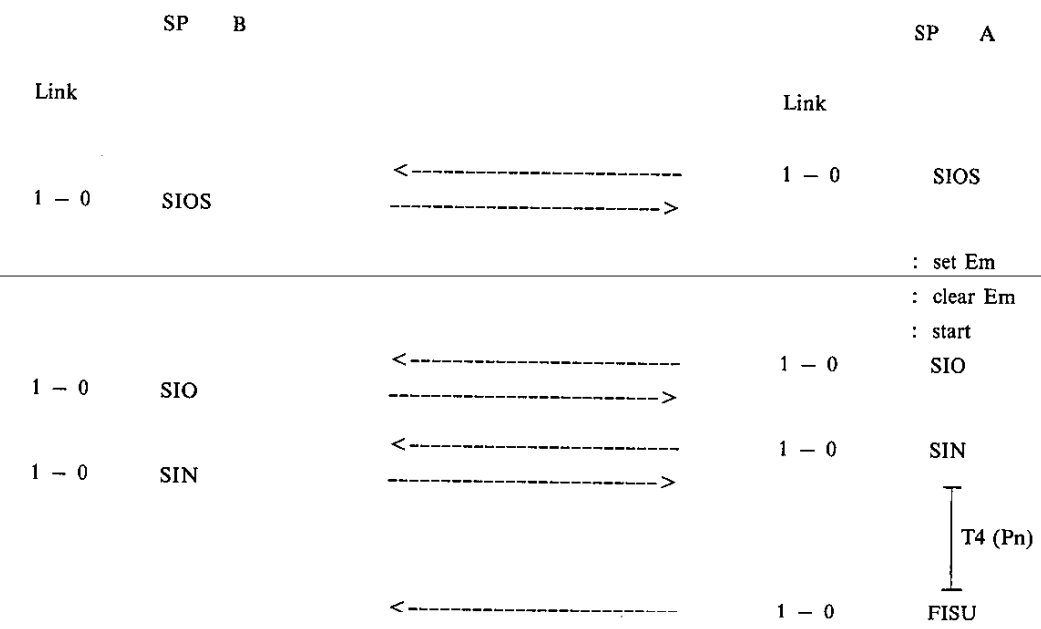
SUB TITLE: Set and cease emergency prior to "start alignment"

PURPOSE: To test the normal proving period is employed having "emergency" set and cleared

PRE-TEST CONDITIONS: Link out of service

CONFIGURATION: 1 | TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

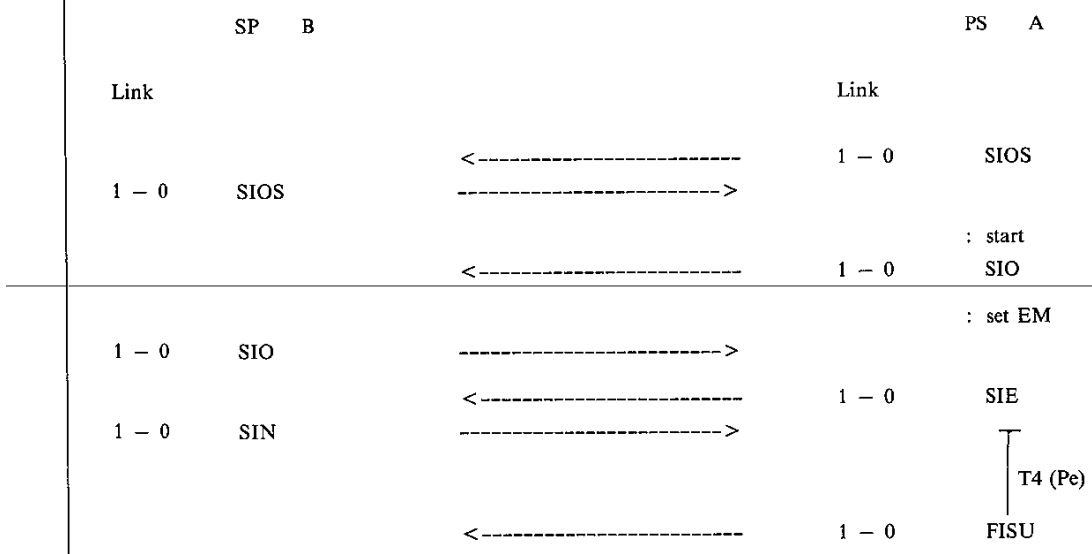


TEST DESCRIPTION

1. Check emergency set and cleared prior to start of alignment.
2. Check normal proving period is carried out.

TEST NUMBER: 1.19	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 8; Fig. 9	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Set emergency while in "not aligned state"	
PURPOSE: To test that emergency proving can be set during normal initial alignment.	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT, CPT

EXPECTED SIGNAL UNIT SEQUENCE:



TEST DESCRIPTION

1. Check that emergency proving period is used after set EM during normal initial alignment.
2. The timing of this test is critical, emergency must be set once the start command has been given and before SIO is received. (i.e. during Timer T2 operation).
3. At 64 kbit/s Timer T4 shall be in the range 0,4 sec to 0,6 sec (nominally 0,5 sec).
4. At 4,8 kbit/s, Timer T4 shall be in the range 6 secs to 8 secs (nominally 7 secs).

TEST NUMBER: 1.20	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 9	
TITLE: Link State Control -- Expected signal units/orders	
SUB TITLE: Set emergency when "aligned"	
PRE-TEST CONDITIONS: To test that emergency proving period is used when emergency set prior to receiving SIN	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
				: set EM
		<----------	1 – 0	SIE
1 – 0	SIN	---------->		| T4 (Pe)
		<----------	1 – 0	FISU

TEST DESCRIPTION

1. Check that emergency proving period is used after SIE sent during "aligned" state.
2. The timing of this test is critical. Emergency must be set once SIN has been sent but before Timer T3 expires.

TEST NUMBER: 1.21	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 8; Fig. 9	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Both ends set emergency	
PURPOSE: To check the emergency alignment procedure and Timer T4 (Pe)	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: set EM
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIE
1 – 0	SIE	---------->		
				| T4 (Pe)
		<----------	1 – 0	FISU

TEST DESCRIPTION

1.	Check correct emergency alignment procedure is performed.

TEST NUMBER: 1.22	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 9	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Individual end sets emergency	
PURPOSE: To check emergency alignment procedure, Emergency set at the other end	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

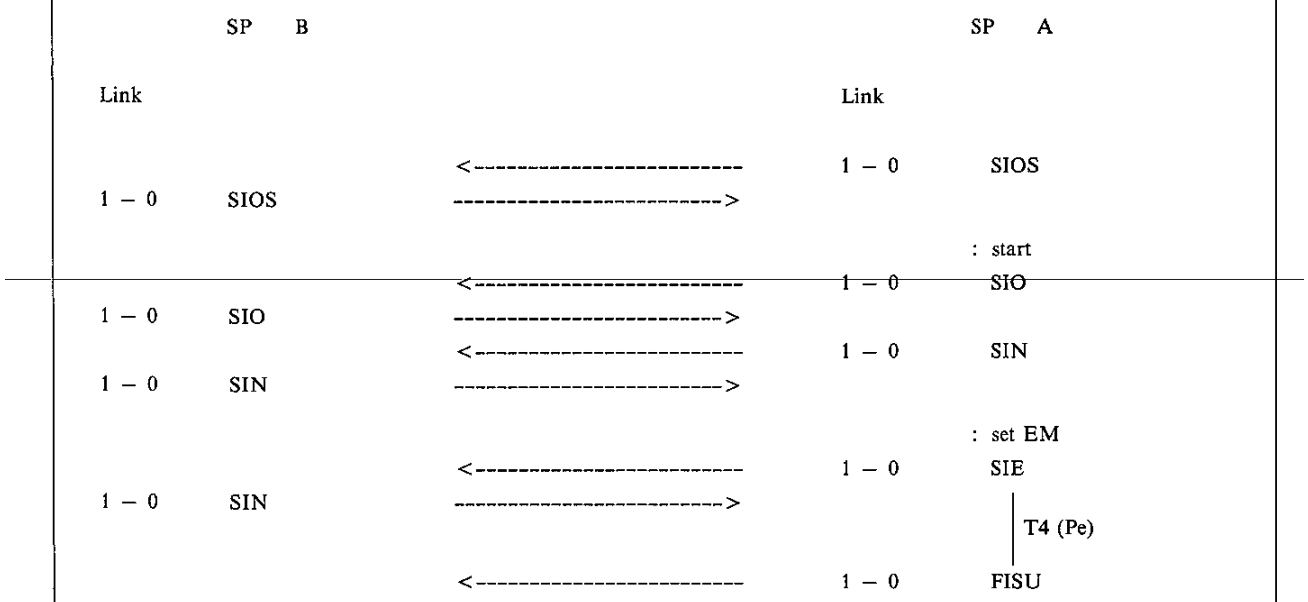
EXPECTED SIGNAL UNIT SEQUENCE:

TEST DESCRIPTION

1. Emergency alignment set at B.
2. Start alignment at A.
3. Check that alignment occurs with the emergency proving period.

TEST NUMBER: 1.23	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 9	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Set emergency during normal proving	
PURPOSE: To test that setting emergency during normal proving stops normal proving and starts the emergency proving	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

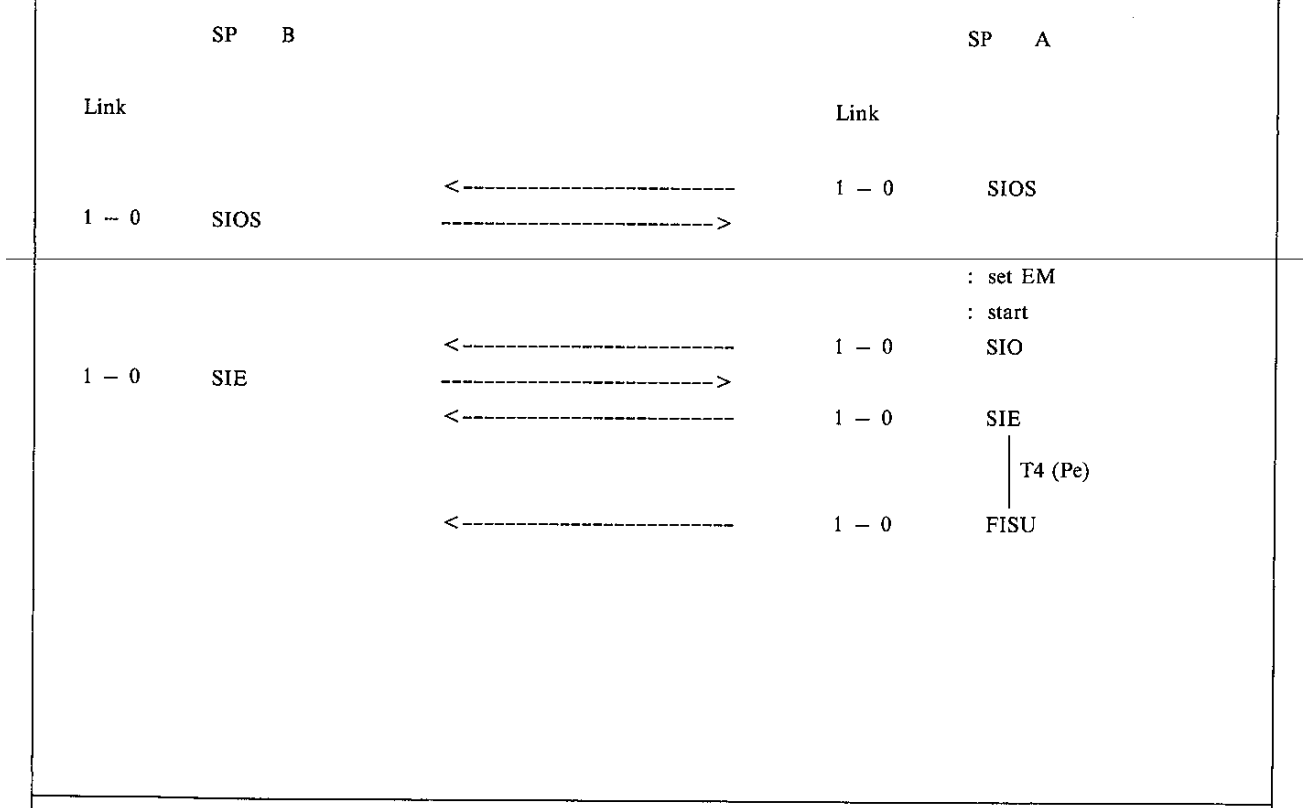


TEST DESCRIPTION

1. Set emergency during normal proving period at A.
2. Check A sends SIE.
3. Repeat test in reverse direction.

TEST NUMBER: 1.24	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 9	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: No SIO sent during emergency alignment	
PURPOSE: To ensure that emergency alignment still occurs when SIE is received following SIOS	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:



TEST DESCRIPTION

1. Set emergency and start link at A.
2. A receives SIE after sending SIO.
3. Check that link aligns OK after emergency proving.

TEST NUMBER: 1.25	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 8; Fig. 9	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Deactivation during initial alignment	
PURPOSE: To test the response to the receipt of the stop command while in the initial alignment state (initial alignment is Not Aligned State)	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT, CPT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: start
		<----------	1 – 0	SIO
				: wait 5 secs.
				: stop
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1. Check that alignment ceases after Stop command given.
2. The stop command must be issued before timer T2 expires.
3. Timer T2 shall be in the range 5 secs to 150 secs.

TEST NUMBER: 1.26	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 8; Fig. 9	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Deactivation during aligned state	
PURPOSE: To test the response to the receipt of the stop command while in the initial alignment state (initial alignment is aligned state).	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
				: stop
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1. Check that alignment ceases after STOP command given.
2. The stop command must be issued before timer T3 expires.
3. Timer T3 shall be in the range 1 sec to 1.5 secs.

TEST NUMBER: 1.27	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 7, 8 STD: Fig. 8	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Deactivation during aligned not ready	
PURPOSE: To check the response following normal alignment when PO has been set	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: set LPO
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
1 – 0	SIN	---------->		
		<----------	1 – 0	SIPO
				: stop
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1. Soon after alignment completes, A enters "Aligned not ready".
2. Before alignment completes at B, stop command is given at A.
3. Check that A enters "Out of service" state.
4. Repeat test with LPO set at B.

TEST NUMBER: 1.28	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 8; Fig. 14	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: SIO received during link in service	
PURPOSE: To check the deactivation of a signalling link from the "In Service" state.	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
1 – 0	FISU	---------->		
		<----------	1 – 0	FISU
1 – 0	SIO	---------->		
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1. SIO is sent to A during link in service.
2. Check that an "in service" link can be taken out of service at A.

TEST NUMBER: 1.29	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 8; Fig. 14	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Deactivation during link in service	
PURPOSE: To check the deactivation of a signalling link from the "In service" state	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT, CPT

EXPECTED SIGNAL UNIT SEQUENCE:

	SP B			SP A
Link			Link	
1 – 0	FISU	---------->		
		<----------	1 – 0	FISU
	: stop			
1 – 0	SIOS	---------->		
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1.	Check that an "In service" link can be taken out of service by command at B.
2.	Repeat test, command given at A.

TEST NUMBER: 1.30	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 7, 8 STD: Fig. 10	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Deactivation during LPO	
PURPOSE: To check the response to the stop command during LPO	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	FISU
1 – 0	FISU	---------->		
				: set LPO
		<----------	1 – 0	SIPO
1 – 0	FISU	---------->		
				: stop
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1. SIPO sent from A, stop command given at A, check link enters out of service state.
2. Repeat test, SIPO sent from B, stop command at B, check link enters out of service state.

TEST NUMBER: 1.31	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 7, 8 STD: Fig. 10	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Deactivation during RPO	
PURPOSE: To test the response to the stop command during RPO	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

	SP B			SP A
Link			Link	
1 – 0	FISU	---------->		
		<----------	1 – 0	FISU
1 – 0	SIPO	---------->		
				: stop
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1. SIPO received at A, stop command given at A, check link enters out of service state.
2. Repeat test, SIPO received at B, stop command given at B, check link enters out of service state.

TEST NUMBER: 1.32	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 7, 10.3 STD: Fig. 8; Fig. 9	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Deactivation during the proving period	
PURPOSE: To test the response to the receipt of SIOS during the proving period	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT, CPT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
1 – 0	SIN	---------->		
	: stop			
1 – 0	SIOS	---------->		
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1. Check link enters out of service state when SIOS is received at A during the proving period.
2. Repeat test, SIOS received at B during proving period.

TEST NUMBER: 1.33	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 8	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: SIO received instead of FISUs	
PURPOSE: To check the response to the receipt of SIO instead of FISUs in the aligned ready state	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
1 – 0	SIN	---------->		
		<----------	1 – 0	FISU
1 – 0	SIO	---------->		
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1.	Check link enters out of service state when SIO is received at A instead of FISUs in the aligned ready state.

TEST NUMBER: 1.34	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 8	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: SIOS received instead of FISUs	
PURPOSE: To check the response to the receipt of SIOS instead of FISUs in the aligned ready state	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
1 – 0	SIN	---------->		
		<----------	1 – 0	FISU
	: stop			
1 – 0	SIOS	---------->		
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1.	Check link enters out of service state when SIOS is received at A instead of FISUs in the aligned ready state.

TEST NUMBER: 1.35	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 7, 8 STD: Fig. 8	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: SIPO received instead of FISUs	
PURPOSE: To check the response to the receipt of SIPO instead of FISUs in the aligned ready state	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
1 – 0	SIN	---------->		
		<----------	1 – 0	FISU
	: set LPO			
1 – 0	SIPO	---------->		
		<----------	1 – 0	FISU

TEST DESCRIPTION

1.	Check link enters processor outage state when SIPO received at A instead of FISUs in the aligned ready state.

TEST NUMBER: 2.1	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 7, 11 STD: Fig. 8	
TITLE: Link State Control – Unexpected signal units/orders	
SUB TITLE: Unexpected signal units/orders in "Out of service" state	
PURPOSE: To check that the unexpected signal units/orders are ignored	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

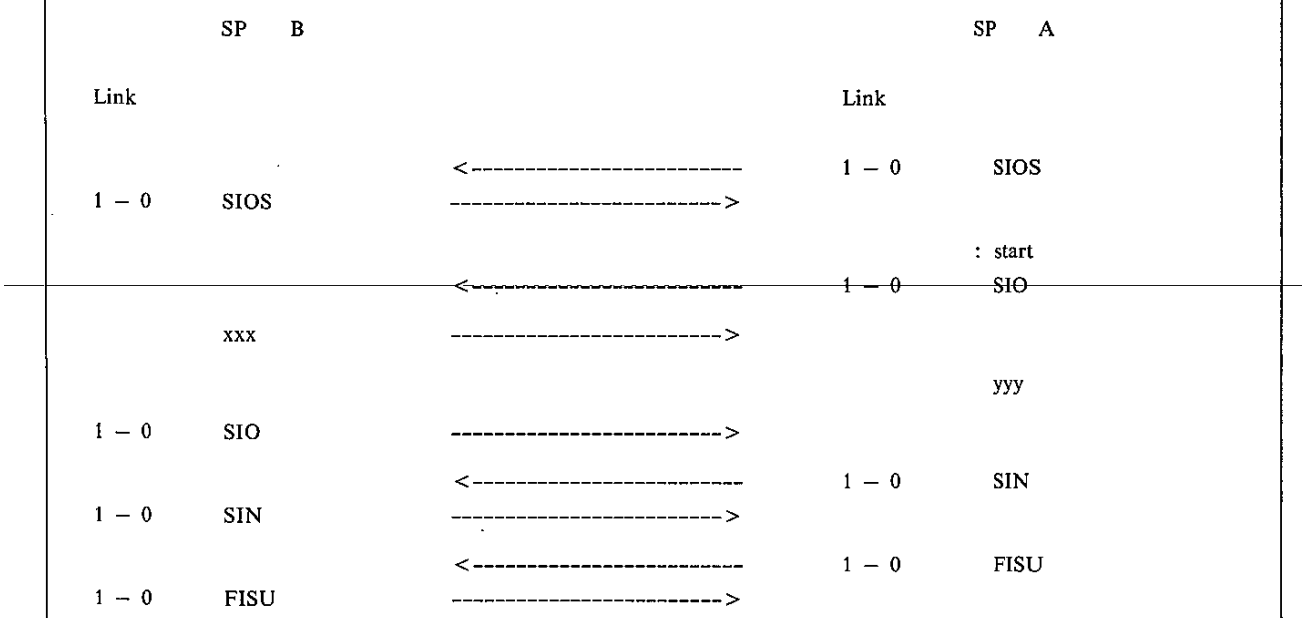
	SP B			SP A
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
	xxx	---------->		
				yyy
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
1 – 0	SIN	---------->		
		<----------	1 – 0	FISU
1 – 0	FISU	---------->		

TEST DESCRIPTION

1.	Check that the unexpected signal units xxx received from B are ignored without impact on the system. xxx are successively SIO, SIN, SIE, SIPO, SIB, aberrant LSSU (non-existing status, one and two octects), FISU and MSU.
2.	Check that the unexpected orders yyy = Stop from level 3 are ignored without impact on system (if applicable).

TEST NUMBER: 2.2	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 7, 11 STD: Fig. 9	
TITLE: Link State Control – Unexpected signal units/orders	
SUB TITLE: Unexpected signal units/orders in "Not aligned" state	
PURPOSE: To check that unexpected signal units/orders are ignored	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:



TEST DESCRIPTION

1. Check that the unexpected signal unit xxx received from B are ignored without impact on the system. xxx are successively SIOS, SIPO, SIB, aberrant LSSU, FISU and MSU.

2. Check that the unexpected orders yyy received from Level 3 are ignored without impact on the system. yyy are successively clear EM and start (if applicable).

TEST NUMBER: 2.3	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 7, 11 STD: Fig. 9	
TITLE: Link State Control – Expected signal units/orders	
SUB TITLE: Unexpected signal units/orders in "Aligned" state	
PURPOSE: To check that unexpected signal units/orders are ignored	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

	SP B			SP A
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
	xxx	---------->		
				yyy
1 – 0	SIN	---------->		
		<----------	1 – 0	FISU
1 – 0	FISU	---------->		

TEST DESCRIPTION

1.	Check that the unexpected signal units xxx received from B are ignored without impact on the system. xxx are successively SIO, SIPO, SIB, aberrant LSSU, FISU and MSU.
2.	Check that the unexpected orders yyy received from Level 3 are ignored without impact on the system. yyy are successively clear EM and start (if applicable).

TEST NUMBER: 2.4	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 7, 11 STD: Fig. 9	
TITLE: Link State Control – Unexpected signal units/orders	
SUB TITLE: Unexpected signal units/orders in "Proving" state	
PURPOSE: To check that unexpected signal units/orders are ignored	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
1 – 0	SIN	---------->		
	xxx	---------->		
				yyy
		<----------	1 – 0	FISU
1 – 0	FISU	---------->		

TEST DESCRIPTION

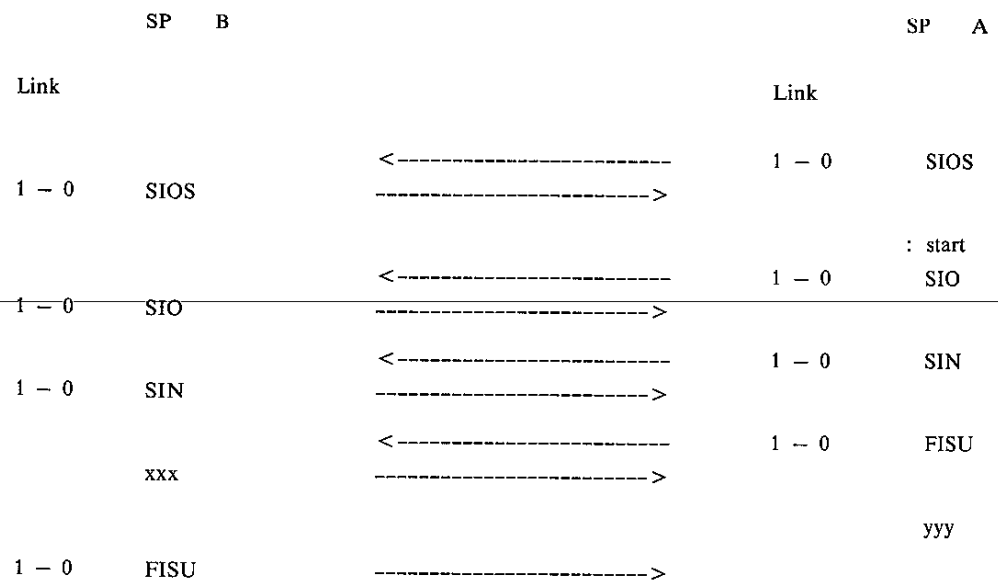
1. Check that the unexpected signal units xxx received from B are ignored without impact on the system. xxx are successively SIPO, SIB, aberrant LSSU, FISU and MSU.

2. Check that the unexpected orders yyy received from Level 3 are ignored without impact on the system. yyy are successively clear EM and start (if applicable).

Note – The reception of SIB in "Initial alignment" state may possibly cause link failure after transferring to "In service" state because of the T6 expiration.

TEST NUMBER: 2.5	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 7, 11 STD: Fig. 8	
TITLE: Link State Control – Unexpected signal units/orders	
SUB TITLE: Unexpected signal units/orders in "Aligned ready" state	
PURPOSE: To check that unexpected signal units/orders are ignored	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:



TEST DESCRIPTION

1. Check that the unexpected signal units xxx received from B are ignored without impact on the system. xxx are successively SIB and aberrant LSSU.

2. Check that the unexpected orders yyy received from level 3 are ignored without impact on the system. yyy are successively set EM, clear EM, clear LPO and Start (if applicable).

Note – The reception of SIB in "Aligned ready" state may possibly cause link failure after transferring to "In service" state because of the T6 expiration.

TEST NUMBER: 2.6	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 7, 11 STD: Fig. 8	
TITLE: Link State Control – Unexpected signal units/orders	
SUB TITLE: Unexpected signal units/orders in "Aligned not ready" state	
PURPOSE: To check that unexpected signal units/orders are ignored	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

	SP B			SP A
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: set LPO
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
1 – 0	SIN	---------->		
		<----------	1 – 0	SIPO
	xxx	---------->		
				yyy
1 – 0	FISU	---------->		
		<----------	1 – 0	SIPO

TEST DESCRIPTION

1. Check that the unexpected signal units xxx received from B are ignored without impact on the system. xxx are successively SIB and aberrant LSSU.
2. Check that the unexpected orders yyy received from level 3 are ignored without impact on the system. yyy are successively set EM, clear EM, clear LPO and Start (if applicable).

TEST NUMBER: 2.7	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 7, 11 STD: Fig. 8	
TITLE: Link State Control -- Unexpected signal units/orders	
SUB TITLE: Unexpected signal units/orders in "In service" state	
PURPOSE: To check unexpected signal units/orders are ignored	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

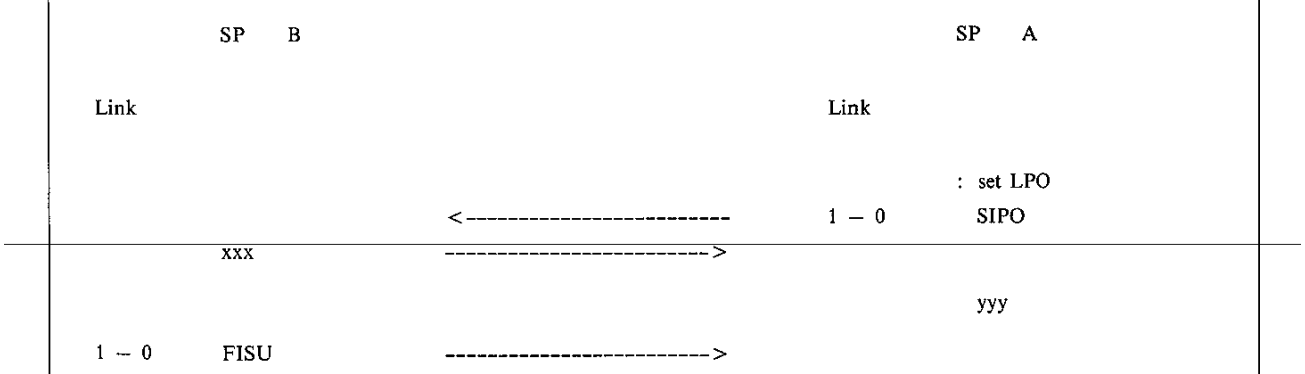
	SP B			SP A
Link			Link	
		<----------	1 – 0	FISU
1 – 0	FISU	---------->		
	aberrant LSSU	---------->		
				yyy
		<----------	1 – 0	FISU
1 – 0	FISU	---------->		

TEST DESCRIPTION

1. Check that an aberrant LSSU received from B is ignored without impact on the system.
2. Check that the unexpected orders yyy received from level 3 are ignored without impact on the system. yyy are successively set EM, clear EM, clear LPO and Start (if applicable).

TEST NUMBER: 2.8	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 7, 11 STD: Fig. 8	
TITLE: Link State Control – Unexpected signal units/orders	
SUB TITLE: Unexpected signal units/orders in "Processor outage" state	
PURPOSE: To check that the unexpected signal units/orders are ignored	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:



TEST DESCRIPTION

1.	Check that the unexpected signal units xxx received from A are ignored without impact on the system. xxx are successively SIB and aberrant LSSU.
2.	Check that the unexpected orders yyy received from level 3 are ignored without impact on the system. yyy are successively set EM, clear EM and Start (if applicable).

TEST NUMBER: 3.1	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 4, 10.2 STD: Fig. 8	
TITLE: Transmission failure	
SUB TITLE: Link aligned ready (Break Tx path)	
PURPOSE: To test the response to a transmission failure – detected by SUERM – when in "Aligned ready" state	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
1 – 0	SIN	---------->		
		<----------	1 – 0	FISU
	: break Tx			
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1.	Break Tx path at B when in "Aligned ready" state, check that the SUERM detects the failure and the link is taken out of service.
2.	Repeat test, break Tx at A.

TEST NUMBER: 3.2	PAGE: 1 OF 1
REFERENCE: Q.703 § 5.3 STD: Fig. 8	
TITLE: Transmission failure	
SUB TITLE: Link aligned ready (Corrupt FIBs – Basic)	
PURPOSE: To check the response to a link failure after corruption of two FIBs – detected by reception control – while in Aligned ready State.	
PRE-TEST CONDITIONS: Aligned ready	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	FISU
1 – 0	FISU corrupt FIB (FIB+FSN=7F)	---------->		
1 – 0	FISU corrupt FIB (FIB+FSN=7F)	---------->		
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1.	Check that receipt of two FISUs at A with corrupt FIB's at link aligned ready state causes the link to be taken out of service.

TEST NUMBER: 3.3	PAGE: 1 OF 1
REFERENCE: Q.703 §§ 8, 10.3 STD: Fig. 8	
TITLE: Transmission failure	
SUB TITLE: Link aligned not ready (Break Tx path)	
PURPOSE: To test the response to a break in the transmission path – detected by SUERM – in "Aligned not ready" state	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B				SP A
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: set LPO
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
1 – 0	SIN	---------->		
		<----------	1 – 0	SIPO
	: break Tx			
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1.	Set LPO at A.
2.	Start link alignment at A.
3.	In link aligned not ready state break Tx at B and check link is taken out of service.
4.	Repeat test for B with break in Tx at A, check link is taken out of service.
5.	The Tx path must be broken before Timer T1 expires.

TEST NUMBER: 3.4	PAGE: 1 OF 1
REFERENCE: Q.703 § 5.3, 8 STD: Fig. 8	
TITLE: Transmission failure	
SUB TITLE: Link aligned not ready (Corrupt FIBs – Basic)	
PURPOSE: To check the response to a link failure after corruption of two FIBs – detected by reception control – while in "Aligned not ready"	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

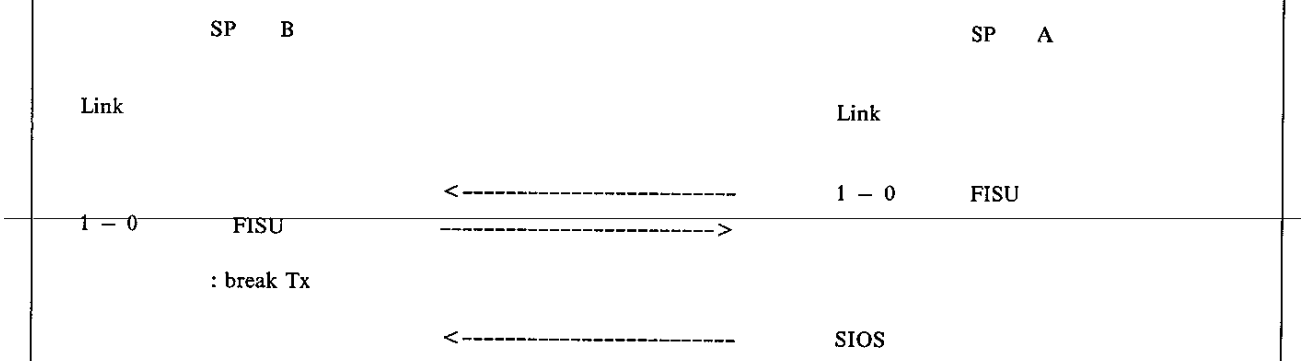
	SP B			SP A
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: set LPO
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
1 – 0	SIN	---------->		
		<----------	1 – 0	SIPO
1 – 0	FISU corrupt FIB (FIB+FSN=7F)	---------->		
1 – 0	FISU corrupt FIB (FIB+FSN=7F)	---------->		
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1. Set LPO at A.
2. Start link alignment at A.
3. Send two corrupt FISUs (corrupt FIBs) on link aligned not ready.
4. Check link is taken out of service at A.

TEST NUMBER: 3.5	PAGE: 1 OF 1
REFERENCE: Q.703 § 4, 10.2 STD: Fig. 8	
TITLE: Transmission failure	
SUB TITLE: Link in service (Break Tx path)	
PURPOSE: To test the response to a transmission failure when the link is "In service"	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT, CPT

EXPECTED SIGNAL UNIT SEQUENCE:



TEST DESCRIPTION

1.	Break Tx at B, check SIOS returned from A.
2.	Repeat test, break at A.

TEST NUMBER: 3.6	PAGE: 1 OF 1
REFERENCE: Q.703 § 5.3 STD: Fig. 8	
TITLE: Transmission failure	
SUB TITLE: Link in service (Corrupt FIBs – Basic)	
PURPOSE: To check the response to a link failure after corruption of two FIBS – detected by reception control – while "In service"	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

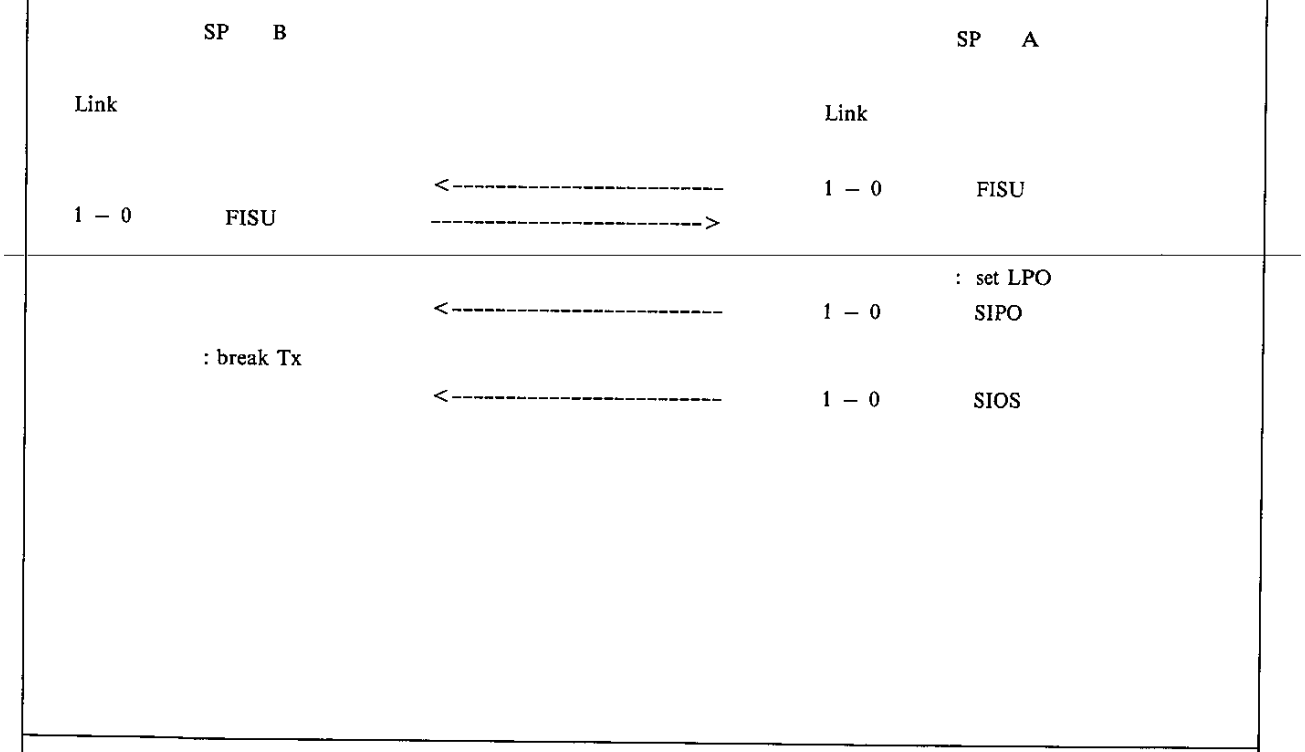
SP B			SP A	
Link			Link	
		<----------	1 – 0	FISU
1 – 0	FISU (FIB+FISN=FF)	---------->		
1 – 0	FISU corrupt FIB (FIB+FSN=7F)	---------->		
1 – 0	FISU corrupt FIB (FIB+FSN=7F)	---------->		
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1.	Check that receipt of two FISUs at A with corrupt FIBs at link in service state causes the link to be taken out of service.

TEST NUMBER: 3.7	PAGE: 1 OF 1
REFERENCE: Q.703 § 8, 10.2 STD: Fig. 8	
TITLE: Transmission failure	
SUB TITLE: Link in processor outage (Break Tx path)	
PURPOSE: To test the response to a transmission failure when the link is "Processor outage"	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:



TEST DESCRIPTION

1.	Break Tx path at B when in "Processor outage" state, check that the SUERM detects the failure and the link is taken out of service.
2.	Repeat test, break TX at A.

TEST NUMBER: 3.8	PAGE: 1 OF 1
REFERENCE: Q.703 § 5.3, 8 STD: Fig. 8	
TITLE: Transmission failure	
SUB TITLE: Link in processor outage (Corrupt FIBs – Basic)	
PURPOSE: To check the response to a link failure after corruption of two FIBs – detected by reception control – while in "Processor outage"	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

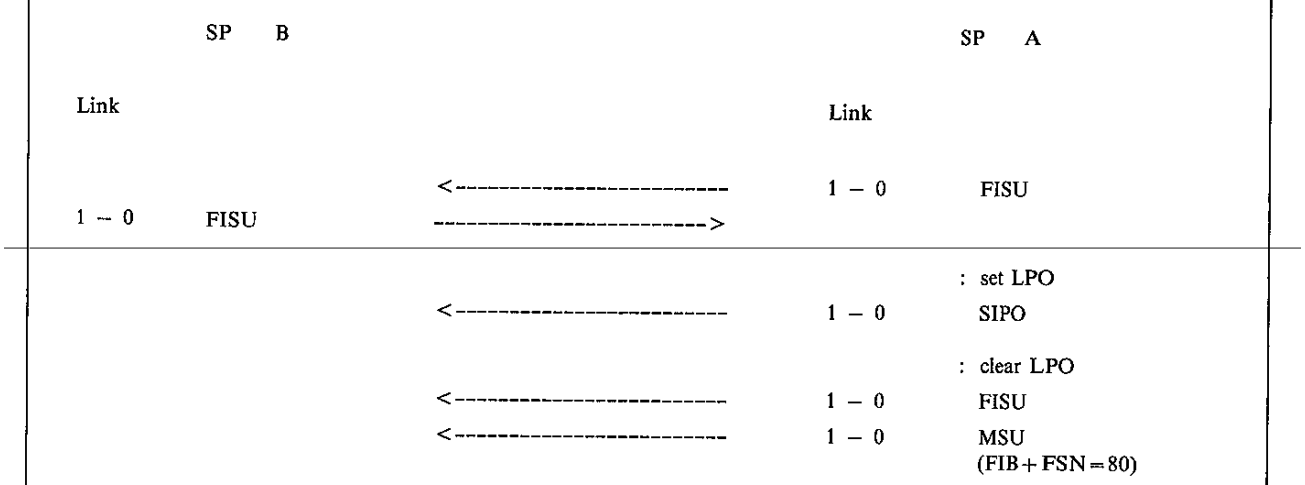
SP B			SP A	
Link			Link	
		<----------	1 – 0	FISU
1 – 0	FISU	---------->		
				: set LPO
		<----------	1 – 0	SIPO
1 – 0	FISU corrupt FIB (FIB+FSN=7F)	---------->		
1 – 0	FISU corrupt FIB (FIB+FSN=7F)	---------->		
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1.	Check that receipt of two FISUs at A with corrupt FIBs on processor outage state causes the link to be taken out of service.

TEST NUMBER: 4.1	PAGE: 1 OF 1
REFERENCE: Q.703 § 8 STD: Fig. 10	
TITLE: Processor outage control	
SUB TITLE: Set and clear LPO while link in service	
PURPOSE: To check the ability to perform correctly when LPO is set and recovered	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

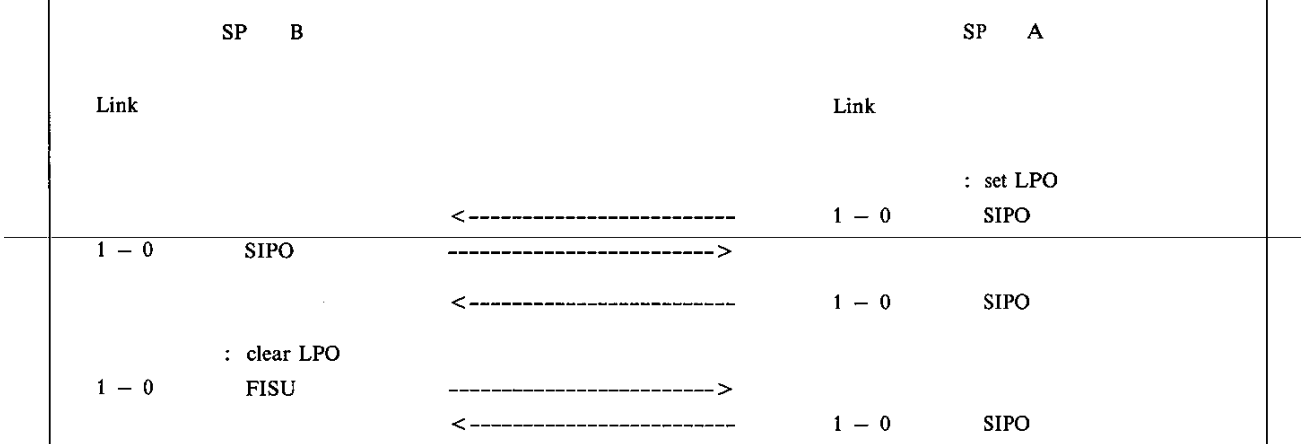


TEST DESCRIPTION

1.	Set LPO at A while link in service.
2.	Check message is discarded.
3.	Clear LPO at A.
4.	Check MSU is sent correctly.

TEST NUMBER: 4.2	PAGE: 1 OF 1
REFERENCE: Q.703 § 8 STD: Fig. 10	
TITLE: Processor outage control	
SUB TITLE: RPO during LPO	
PURPOSE: To test the response to RPO is set and cleared when "LPO"	
PRE-TEST CONDITIONS: Link in service. PO set at B	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:



TEST DESCRIPTION

1. Set LPO at A.
2. Clear LPO at B.
3. Check is SIPO sent from A.

TEST NUMBER: 4.3	PAGE: 1 OF 1
REFERENCE: Q.703 § 8 STD: Fig. 10	
TITLE: Processor outage control	
SUB TITLE: Clear LPO when "Both processor outage"	
PURPOSE: To test the response to LPO, RPO recovered when "Both processor outage"	
PRE-TEST CONDITIONS: PO set at A and B	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	SIPO
1 – 0	SIPO	---------->		
				: clear LPO
		<----------	1 – 0	FISU
	: clear LPO			
1 – 0	FISU	---------->		
		<----------	1 – 0	FISU

TEST DESCRIPTION

1. Clear LPO at A.
2. Clear LPO at B.
3. Check is FISU sent from A.

TEST NUMBER: 5.1	PAGE: 1 OF 1
REFERENCE: Q.703 § 4.1 STD: Fig. 11	
TITLE: SU delimitation, alignment, error detection and correction	
SUB TITLE: More than seven '1's between MSU opening and closing flags	
PURPOSE: To test the signal unit delimitation, alignment, and error detection action on receipt of an MSU containing seven or more consecutive '1's	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

	SP B			SP A
Link			Link	
		<----------	1 – 0	FISU
1 – 0	FISU	---------->		
1 – 0	corrupt MSU (FIB+FSN=80) (containing seven consecutive '1's)	---------->		
		<----------	1 – 0	FISU (BSN unchanged)
1 – 0	FISU	---------->		

TEST DESCRIPTION

1. Send a corrupt MSU at B containing seven consecutive '1's.
2. Check that A discards the signal unit, and goes into octet counting mode.
3. On reception of a correct FISU, check that A leaves the octet counting mode and remains in the "in service" state.

TEST NUMBER: 5.2	PAGE: 1 OF 1
REFERENCE: Q.703 § 4.1 STD: Fig. 11	
TITLE: SU delimitation, alignment, error detection and correction	
SUB TITLE: Greater than maximum signal unit length	
PURPOSE: To test the signal unit delimitation, alignment, error detection action on receipt of signal unit greater than the maximum length	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

	SP B			SP A
Link			Link	
		<----------	1 – 0	FISU
1 – 0	FISU	---------->		
1 – 0	corrupt MSU (FIB + FSN = 80) (signal unit length > max. allowed)	---------->		
		<----------	1 – 0	FISU (BSN unchanged)
1 – 0	FISU	---------->		

TEST DESCRIPTION

1. Send corrupt MSU at B with maximum length plus extra bits and good sumcheck.
2. Check A discards the signal unit, and goes into octet counting mode.
3. On reception of a correct FISU, check that A leaves the octet counting mode and remains in the "in service" state.

TEST NUMBER: 5.3	PAGE: 1 OF 1
REFERENCE: Q.703 § 4.1 STD: Fig. 11	
TITLE: SU delimitation, alignment, error detection and correction	
SUB TITLE: Below minimum signal unit length	
PURPOSE: To test the signal unit delimitation, alignment and error detection action on receipt of signal unit less than the minimum length	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

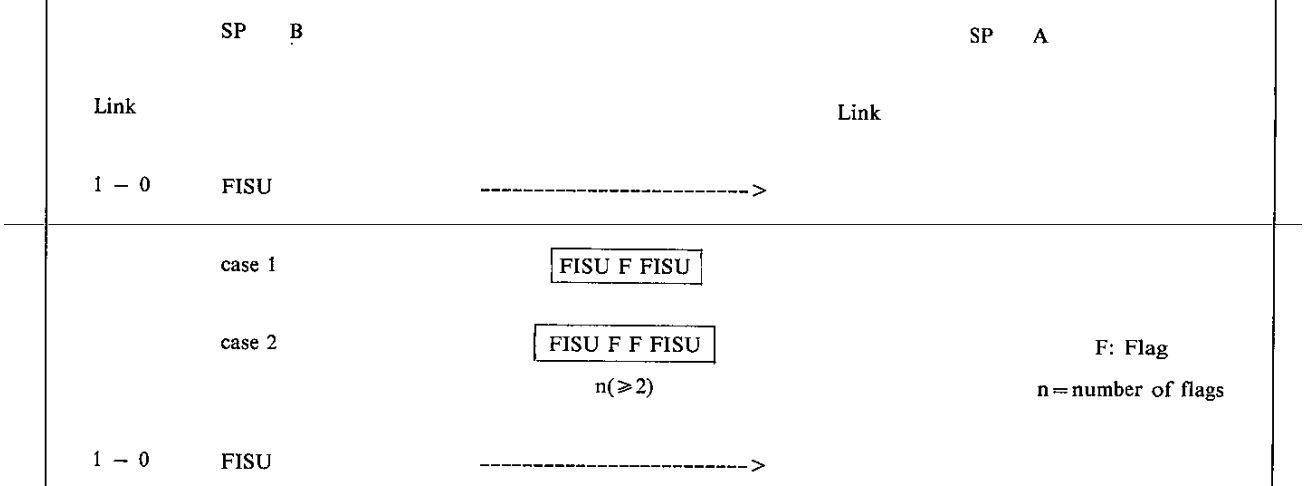
	SP B			SP A
Link			Link	
		<----------	1 – 0	FISU (BIB+BSN=FF)
1 – 0	FISU	---------->		
1 – 0	corrupt MSU (FIB+FSN=80) (signal unit less than 6 octets)	---------->		
		<----------	1 – 0	FISU (BSN unchanged)
1 – 0	FISU	---------->		

TEST DESCRIPTION

1. Generate a corrupt MSU at B of less than 6 octets (i.e. less than 5 octets between flags).
2. Check A discards the signal unit, and goes into octet counting mode.
3. On reception of a correct FISU, check that A leaves the octet counting mode and remains in the "in service" state.

TEST NUMBER: 5.4	PAGE: 1 OF 1
REFERENCE: Q.703 § 2 STD: Fig. 11	
TITLE: SU delimitation, alignment, error detection and correction	
SUB TITLE: Reception of single and multiple flags between FISUs	
PURPOSE: To check that single and multiple flags between FISUs can be received	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

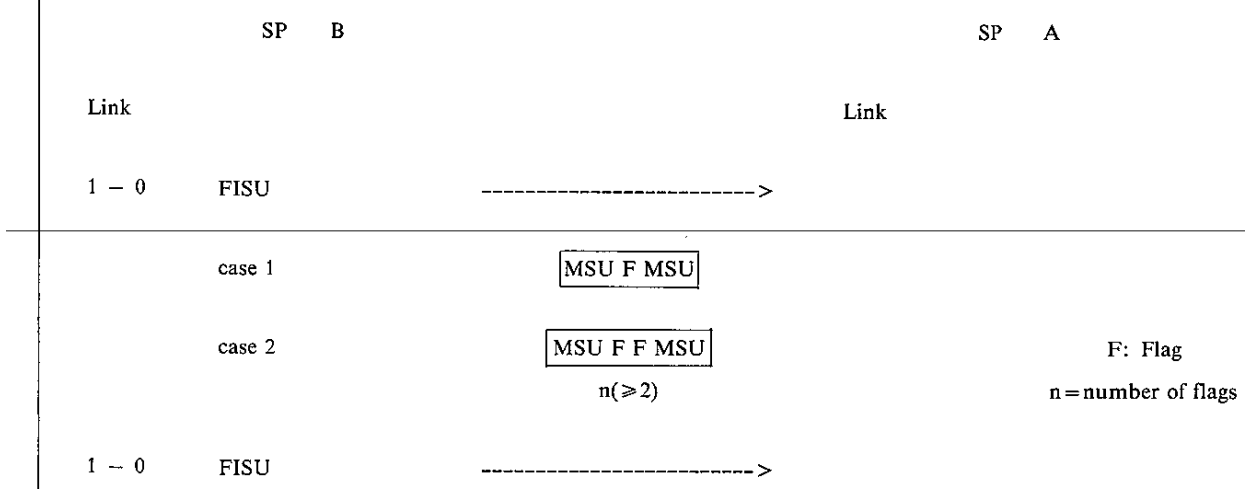
EXPECTED SIGNAL UNIT SEQUENCE:



TEST DESCRIPTION	
1.	Check that single and n flags, case 1 and case 2 respectively, can be received.

TEST NUMBER: 5.5	PAGE: 1 OF 1
REFERENCE: Q.703 § 2 STD: Fig. 11	
TITLE: SU delimitation, alignment, error detection and correction	
SUB TITLE: Reception of single and multiple flags between MSUs	
PURPOSE: To check that single and multiple flags between MSUs can be received	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

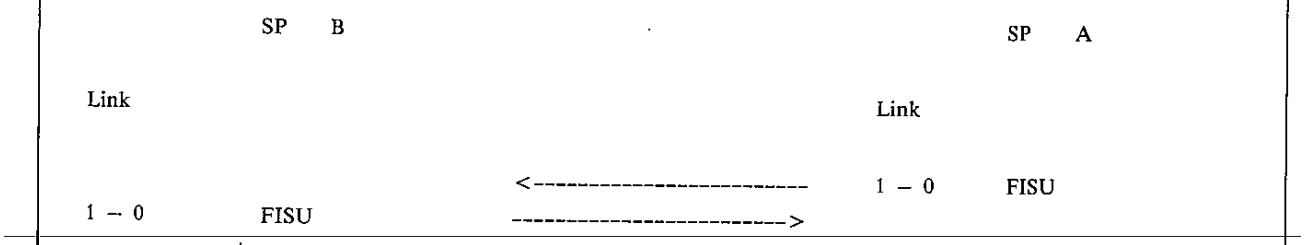


TEST DESCRIPTION

1.	Check that single and n flags, case 1 and case 2 respectively, can be received.

TEST NUMBER: 6.1	PAGE: 1 OF 1
REFERENCE: Q.703 § 10.2 STD: Fig. 11, Fig. 18, Fig. 8	
TITLE: SUERM check	
SUB TITLE: Error rate of 1 in 256 – Link remains in service	
PURPOSE: To check the SUERM at a link error rate of 1 in 256 units	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:



TEST DESCRIPTION

1. Check that "In service" state is maintained. The test should run for several minutes.

2. Ct = the count of corrupted FISUs.

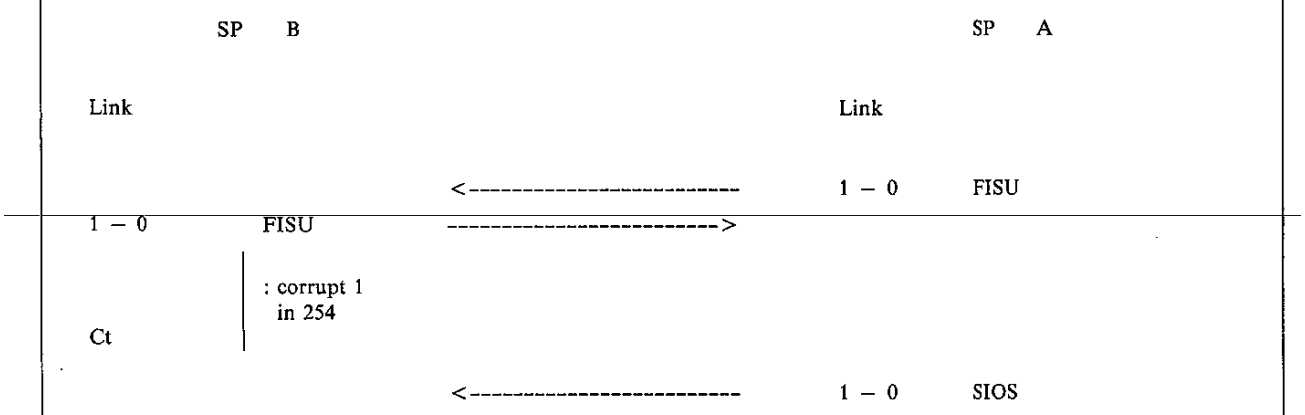
Note – 1)The number *(x)* of corrupt signal units before an SIOS returned is calculated according to the following formula (a = number of correct signal units):

$$x = \frac{1}{1 + a}\left(\frac{256 \times 64}{\frac{256}{1 + a} - 1}\right) \text{ for } a < 256$$

2)In this case as $a = 255$, so $x =$ infinity.

TEST NUMBER: 6.2	PAGE: 1 OF 1
REFERENCE: Q.703 § 10.2 STD: Fig. 11, Fig. 18, Fig. 8	
TITLE: SUERM check	
SUB TITLE: Error rate of 1 in 254 – Link out of service	
PURPOSE: To check the SUERM at a link error rate of 1 in 254 units	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

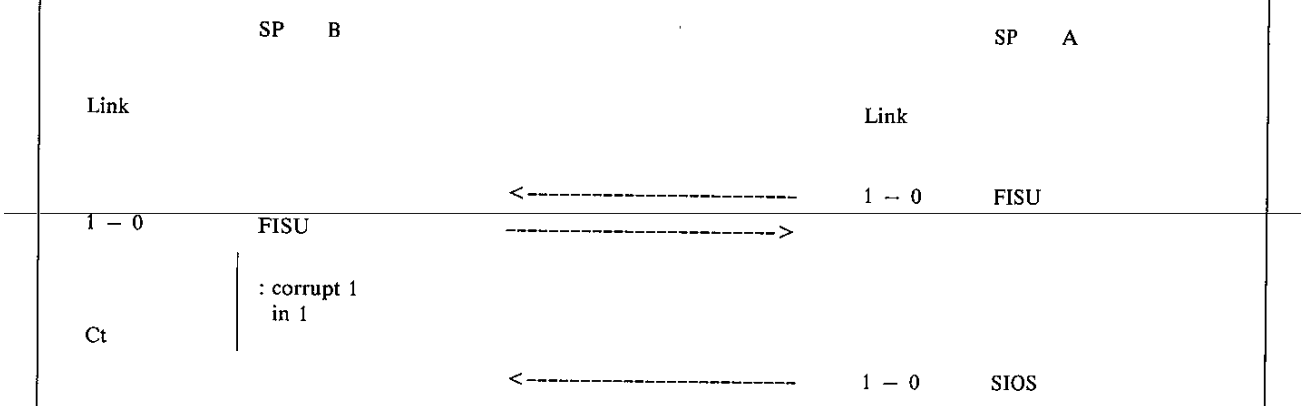


TEST DESCRIPTION

1. SIOS should be returned after approx. 8192 corrupt FISUs (eg. CRC error).
2. Ct = the count of corrupted FISUs.

TEST NUMBER: 6.3	PAGE: 1 OF 1
REFERENCE: Q.703 § 10.2 STD: Fig. 11, Fig. 18, Fig. 8	
TITLE: SUERM check	
SUB TITLE: Consecutive corrupted SUs	
PURPOSE: To test the SUERM on consecutive corrupted signal units	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:



TEST DESCRIPTION

1. SIOS should be returned after approx. 64 corrupt FISUs (eg. CRC error).
2. Ct = the count of corrupted FISUs.

TEST NUMBER: 6.4	PAGE: 1 OF 1
REFERENCE: Q.703 § 10.2 STD: Fig. 11, Fig. 18	
TITLE: SUERM check	
SUB TITLE: Time controlled break of the link	
PURPOSE: To check response to a range of time controlled breaks of Tx or Rx	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

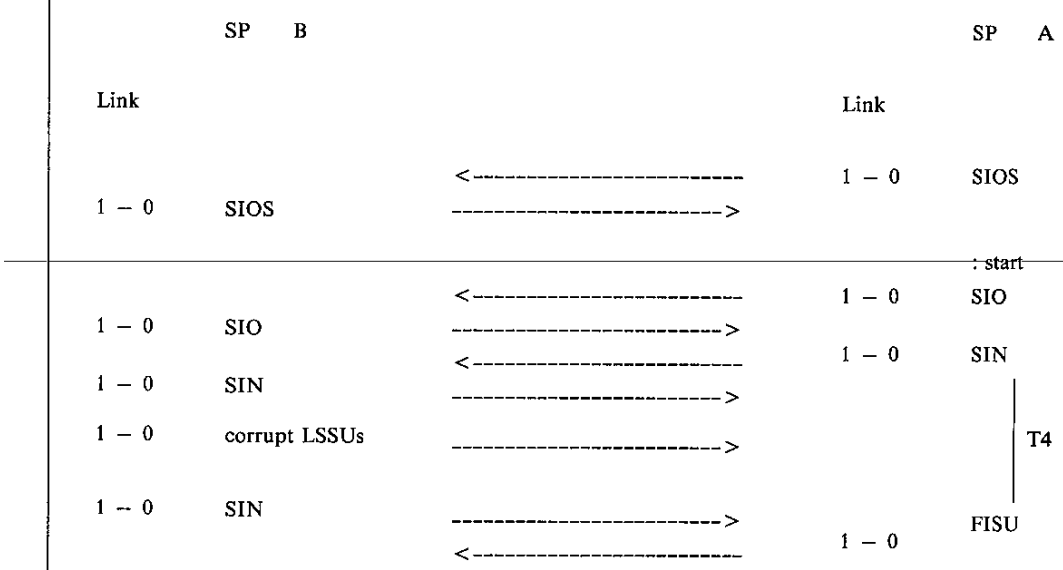
SP B			SP A
Link			Link
	<----------	1 – 0	FISU
1 – 0 FISU	---------->		
: break Tx			
: restore Tx			
FISU	---------->		
	<----------	1 – 0	FISU

TEST DESCRIPTION

1.	Break the transmission link, and restore before level 2 goes out of service. (Break time is less than approx. 128ms for 64 kbit/s).
2.	Check that A enters and leaves the octet counting mode on reception of an FISU.

TEST NUMBER: 7.1	PAGE: 1 OF 1
REFERENCE: Q.703 § 10.3 STD: Fig. 9, Fig. 11, Fig. 17	
TITLE: AERM check	
SUB TITLE: Error rate below the normal threshold	
PURPOSE: To test the AERM on error rates below the normal threshold	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

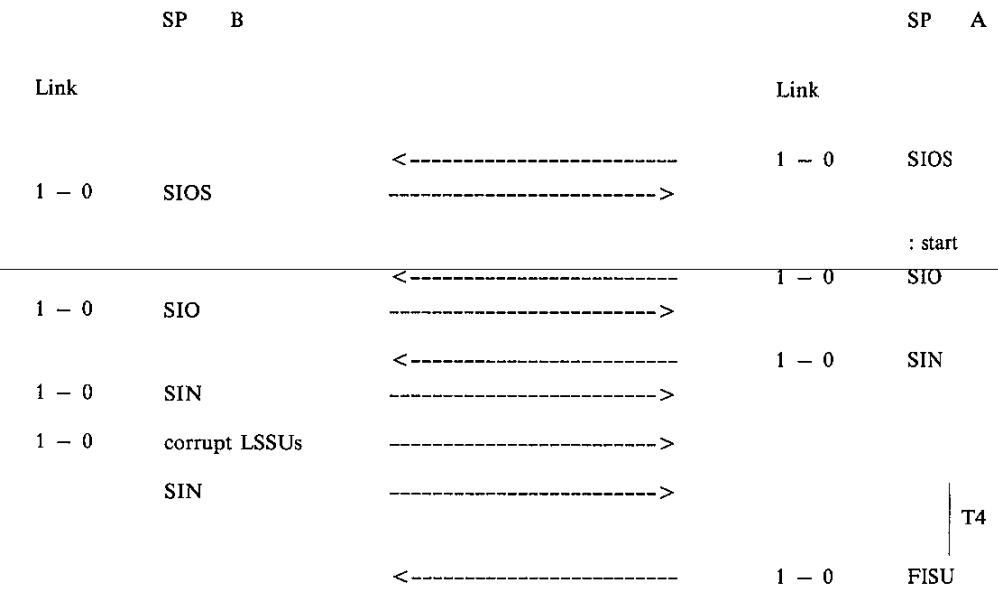


TEST DESCRIPTION

1. Start link at A.
2. Generate x number of corrupt LSSUs (e.g. CRC error) at B.($x < Tin$).
3. Check that the proving period continues and the link aligns successfully.

TEST NUMBER: 7.2	PAGE: 1 OF 1
REFERENCE: Q.703 § 10.3 STD: Fig. 9, Fig. 11, Fig. 17	
TITLE: AERM check	
SUB TITLE: Error rate at the normal threshold	
PURPOSE: To test the AERM at an error rate equal to the normal threshold	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:



TEST DESCRIPTION

1. Start link at A.
2. Generate x number of corrupt LSSUs (e.g. CRC error) at B.($x \geqslant$ Tin).
3. Check that the proving period is aborted, then restarted and link aligns successfully.

TEST NUMBER: 7.3	PAGE: 1 OF 1

REFERENCE: Q.703 § 10.3 STD: Fig. 9, Fig. 11, Fig. 17

TITLE: AERM check

SUB TITLE: Error rate above the normal threshold

PURPOSE: To test the AERM at an error rate above the threshold over five proving periods

PRE-TEST CONDITIONS: Link out of service

CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

Link	SP B		Link	SP A
		<------------------------	1 – 0	SIOS
1 – 0	SIOS	------------------------>		
				: start
		<------------------------	1 – 0	SIO
1 – 0	SIO	------------------------>		
		<------------------------	1 – 0	SIN
1 – 0	SIN	------------------------>		
1 – 0	corrupt LSSUs	------------------------>		
		<------------------------	1 – 0	SIN
1 – 0	SIN	------------------------>		
1 – 0	corrupt LSSUs	------------------------>		
		<------------------------	1 – 0	SIN
1 – 0	SIN	------------------------>		
1 – 0	corrupt LSSUs	------------------------>		
		<------------------------	1 – 0	SIN
1 – 0	SIN	------------------------>		
1 – 0	corrupt LSSUs	------------------------>		
		<------------------------	1 – 0	SIN
1 – 0	SIN	------------------------>		
1 – 0	corrupt LSSUs	------------------------>		
		<------------------------	1 – 0	SIOS

TEST DESCRIPTION

1.	Start link at A.
2.	Generate x number of corrupt LSSUs (e.g. CRC error) at B.(x ⩾ Tin).
3.	Observe that 5 proving period attempts are made before link out of service state.

TEST NUMBER: 7.4	PAGE: 1 OF 1
REFERENCE: Q.703 § 10.3 STD: Fig. 9, Fig. 11, Fig. 17	
TITLE: AERM check	
SUB TITLE: Error rate at the emergency threshold	
PURPOSE: To test the AERM at the emergency threshold	
PRE-TEST CONDITIONS: Link out of service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

	SP B			SP A
Link			Link	
		<----------	1 – 0	SIOS
1 – 0	SIOS	---------->		
				: start
		<----------	1 – 0	SIO
1 – 0	SIO	---------->		
		<----------	1 – 0	SIN
1 – 0	SIE	---------->		
1 – 0	corrupt LSSU	---------->		
1 – 0	SIE	---------->		
T4 (Pe)		<----------	1 – 0	SIN
		<----------	1 – 0	FISU

TEST DESCRIPTION

1. Start link at A, check emergency proving started from B.
2. Generate x number of corrupt LSSUs (e.g. CRC error) at B. ($5 > x \geqslant Tie$).
3. Check that link aligns successfully.

TEST NUMBER: 8.1	PAGE: 1 OF 1
REFERENCE: Q.703 § 5.2 STD: Fig. 13, Fig. 14	
TITLE: Transmission and reception control (Basic)	
SUB TITLE: MSU transmission and reception	
PURPOSE: To check basic MSU transmission and reception	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT, CPT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	FISU
1 – 0	FISU	---------->		
1 – 0	MSU (FIB + FSN = 80) (BIB + BSN = FF)	---------->		
		<----------	1 – 0	FISU (FIB + FSN = FF) (BIB + BSN = 80)
1 – 0	FISU (FIB + FSN = 80) (BIB + BSN = FF)	---------->		
		<----------	1 – 0	MSU (FIB + FSN = 80) (BIB + BSN = 80)
1 – 0	FISU (FIB + FSN = 80) (BIB + BSN = 80)	---------->		
		<----------	1 – 0	FISU (FIB + FSN = 80) (BIB + BSN = 80)

TEST DESCRIPTION

1. Generate an MSU at B.
2. Check that A receives the MSU correctly, and returns a positive acknowledgement.
3. Generate an MSU at A.
4. Check that B receives the MSU correctly, and returns a positive acknowledgement.

TEST NUMBER: 8.2	PAGE: 1 OF 1
REFERENCE: Q.703 § 5.3 STD: Fig. 13	
TITLE: Transmission and reception control (Basic)	
SUB TITLE: Negative acknowledgement of an MSU	
PURPOSE: To test the response to a negatively acknowledged MSU	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	FISU
1 – 0	FISU	---------->		
		<----------	1 – 0	MSU (FIB+FSN=80)
		<----------	1 – 0	MSU (FIB+FSN=81)
1 – 0	FISU (BIB+BSN=7F)	---------->		
		<----------	1 – 0	MSU (FIB+FSN=00)
		<----------	1 – 0	MSU (FIB+FSN=01)

TEST DESCRIPTION

1. Send MSU from A.
2. Reply with negative acknowledgement from B.
3. Check that A retransmits the MSU.

TEST NUMBER: 8.3 | PAGE: 1 OF 1

REFERENCE: Q.703 § 5.3 STD: Fig. 13

TITLE: Transmission and reception control (Basic)

SUB TITLE: Check RTB full

PURPOSE: To check that MSUs are buffered when no acknowledgements are received

PRE-TEST CONDITIONS: Link in service

CONFIGURATION: 1 | TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A
Link		Link	
	<----------	1 – 0	FISU
1 – 0	FISU (BIB + BSN = FF) ---------->		
	<----------	1 – 0	MSU (FIB + FSN = 80)
			●
			●
	<----------	1 – 0	MSU (FIB + FSN = FE)
	<----------	1 – 0	FISU (FIB + FSN = FE)
1 – 0	FISU (BIB + BSN = 7F) ---------->		
	<----------	1 – 0	MSU (FIB + FSN = 00)
			●
			●
	<----------	1 – 0	MSU (FIB + FSN = 7E)

TEST DESCRIPTION

1. Generate MSUs at A, at a rate of 100 per second, in order to fill the RTB before the EDA timer T7 expires.
2. No acknowledgements are sent from B until the last message is received, then send negative acknowledgement to the first message received.
3. Check that the complete contents of the RTB are retransmitted.

TEST NUMBER: 8.4	PAGE: 1 OF 1
REFERENCE: Q.703 § 5.2 STD: Fig. 14	
TITLE: Transmission and reception control (Basic)	
SUB TITLE: Single MSU with erroneous FIB	
PURPOSE: To ensure correct performance when an MSU with erroneous FIB is received	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B Link			Link	SP A
		<----------	1 – 0	FISU (BIB+BSN=7F)
1 – 0	FISU (FIB+FSN=7F)	---------->		
1 – 0	MSU (FIB+FSN=80)	---------->		
		<----------	1 – 0	FISU (BIB+BSN=7F)
1 – 0	FISU (FIB+FSN=00)	---------->		
1 – 0	FISU (FIB+FSN=00)	---------->		
		<----------	1 – 0	FISU (BIB+BSN=FF)
1 – 0	MSU (FIB+FSN=80)	---------->		
		<----------	1 – 0	FISU (BIB+BSN=80)

TEST DESCRIPTION

1. Generate an MSU at B with FIB inverted.
2. Check A discards the MSU.
3. Generate 2 FISUs at B with correct FIB.
4. Check A discards the FISU and negative acknowledgement returned.
5. Check that B retransmits the MSU correctly, and positive acknowledgement returned.

TEST NUMBER: 8.5	PAGE: 1 OF 1
REFERENCE: Q.703 § 5.2 STD: Fig. 14	
TITLE: Transmission and reception control (Basic)	
SUB TITLE: Duplicated FSN	
PURPOSE: To test the reception control response to duplicated FSNs	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

	SP B			SP A
Link			Link	
		<----------	1 – 0	FISU
1 – 0	FISU	---------->		
1 – 0	MSU (FIB+FSN=80)	---------->		
		<----------	1 – 0	FISU (BIB+BSN=80)
1 – 0	MSU (FIB+FSN=80)	---------->		
1 – 0	FISU (FIB+FSN=81)	---------->		
		<----------	1 – 0	FISU (BIB+BSN=00)
1 – 0	MSU (FIB+FSN=01)	---------->		
		<----------	1 – 0	FISU (BIB+BSN=01)

TEST DESCRIPTION

1. Generate an MSU at B, check A receives the MSU correctly and returns a positive acknowledgement.
2. Duplicate the FSN at B, check that A responds with a negative acknowledgement.
3. Retransmit the MSU with correct FSN, check that A replies with a positive acknowledgement.

TEST NUMBER: 8.6	PAGE: 1 OF 1
REFERENCE: Q.703 § 5.2 STD: Fig. 14	
TITLE: Transmission and reception control (Basic)	
SUB TITLE: Erroneous retransmission – Single MSU	
PURPOSE: To test the reception control response to retransmission of a single MSU	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

	SP B			SP A
Link			Link	
		<----------	1 – 0	FISU (BIB+BSN=FF)
1 – 0	FISU (FIB+FSN=FF)	---------->		
1 – 0	MSU (FIB+FSN=00)	---------->		
1 – 0	FISU (FIB+FSN=80)	---------->		
1 – 0	FISU (FIB+FSN=80)	---------->		
		<----------	1 – 0	FISU (BIB+BSN=7F)
1 – 0	MSU (FIB+FSN=00)	---------->		
		<----------	1 – 0	FISU (BIB+BSN=00)

TEST DESCRIPTION

1. A single MSU with FIB inverted in error is sent to A, followed by FISUs with correct FIBs.
2. Check that A returns a negative acknowledgement for the MSU.
3. Retransmit the MSU correctly.
4. Check that A receives the MSU correctly and returns a positive acknowledgement.

TEST NUMBER: 8.7	PAGE: 1 OF 1
REFERENCE: Q.703 § 5.3 STD: Fig. 14	
TITLE: Transmission and reception control (Basic)	
SUB TITLE: Erroneous retransmission – Multiple FISUs	
PURPOSE: To test reception control response to retransmissions of multiple FISUs	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

	SP B			SP A
Link			Link	
		<----------	1 – 0	FISU
1 – 0	FISU (FIB+FSN=FF)	---------->		
1 – 0	FISU (FIB+FSN=7F)	---------->		
1 – 0	FISU (FIB+FSN=FF)	---------->		
1 – 0	FISU (FIB+FSN=7F)	---------->		
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1. Generate FISUs with the FIB inverted at B.
2. Check that A responds with link out of service.

TEST NUMBER: 8.8	PAGE: 1 OF 1
REFERENCE: Q.703 § 5.3 STD: Fig. 14	
TITLE: Transmission and reception control (Basic)	
SUB TITLE: Single FISU with corrupt FIB	
PURPOSE: To test the response to receive an FISU with a corrupt FIB	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

	SP B			SP A
Link			Link	
		<----------	1 – 0	FISU
1 – 0	FISU (FIB+FSN=FF)	---------->		
1 – 0	FISU (FIB+FSN=7F)	---------->		
		<----------	1 – 0	FISU
1 – 0	FISU (FIB+FSN=FF)	---------->		
		<----------	1 – 0	FISU

TEST DESCRIPTION

1.	Generate one FISU with a corrupt FIB at B, and check that the link status remains in service.

TEST NUMBER: 8.9	PAGE: 1 OF 1
REFERENCE: Q.703 § 5.2 STD: Fig. 10, Fig. 14	
TITLE: Transmission and reception control (Basic)	
SUB TITLE: Single FISU prior to RPO being set	
PURPOSE: To test the response to RPO while in the abnormal FIB state	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	FISU
1 – 0	FISU	---------->		
1 – 0	FISU (one only) (FIB + FSN = 7F)	---------->		
1 – 0	SIPO	---------->		
1 – 0	MSU (FIB + FSN = 80)	---------->		
1 – 0	FISU (FIB + FSN = 80)	----------> [a]		
1 – 0	FISU (FIB + FSN = 80)	---------->		
		<----------	1 – 0	FISU (BIB + BSN = 7F)
1 – 0	MSU (FIB + FSN = 00)	---------->		
		<----------	1 – 0	FISU (BIB + BSN = 00)

[a] RPO at A has recovered, but this FISU is discarded.

TEST DESCRIPTION

1. Generate one FISU at B with abnormal FIB.
2. Send SIPO from B, followed by an MSU.
3. Check A responds correctly with negative acknowledgement and a retransmission is received corrrectly.

TEST NUMBER: 8.10	PAGE: 1 OF 1
REFERENCE: Q.703 § 5.3 STD: Fig. 14	
TITLE: Transmission and reception control (Basic)	
SUB TITLE: Abnormal BSN – single MSU	
PURPOSE: To test the response to an abnormal BSN	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

	SP B			SP A
Link			Link	
		<----------	1 – 0	FISU
1 – 0	FISU (FIB+FSN=FF) (BIB+BSN=FF)	---------->		
1 – 0	MSU (FIB+FSN=80) (BIB+BSN=BF)	---------->		
1 – 0	FISU (FIB+FSN=80) (BIB+BSN=FF)	----------> [a]		
1 – 0	FISU (FIB+FSN=80) (BIB+BSN=FF)	---------->		
		<----------	1 – 0	FISU (BIB+BSN=7F)
1 – 0	MSU (FIB+FSN=00) (BIB+BSN=FF)	---------->		
		<----------	1 – 0	FISU (BIB+BSN=00)

[a] Though UNB: = 1, abnormal BSNR is not canceled.

TEST DESCRIPTION

1.	Generate a single MSU with abnormal BSN at B, followed by FISUs with correct BSN.
2.	Check that A responds with a negative acknowledgement.
3.	Retransmit the MSU correctly at B.
4.	Check that the MSU is received correctly and positive acknowledgement is given.

TEST NUMBER: 8.11 | PAGE: 1 OF 1

REFERENCE: Q.703 § 5.3 STD: Fig. 14

TITLE: Transmission and reception control (Basic)

SUB TITLE: Abnormal BSN – two consecutive FISUs

PURPOSE: To test the response to abnormal BSNs in two consecutive FISUs

PRE-TEST CONDITIONS: Link in service

CONFIGURATION: 1 | TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

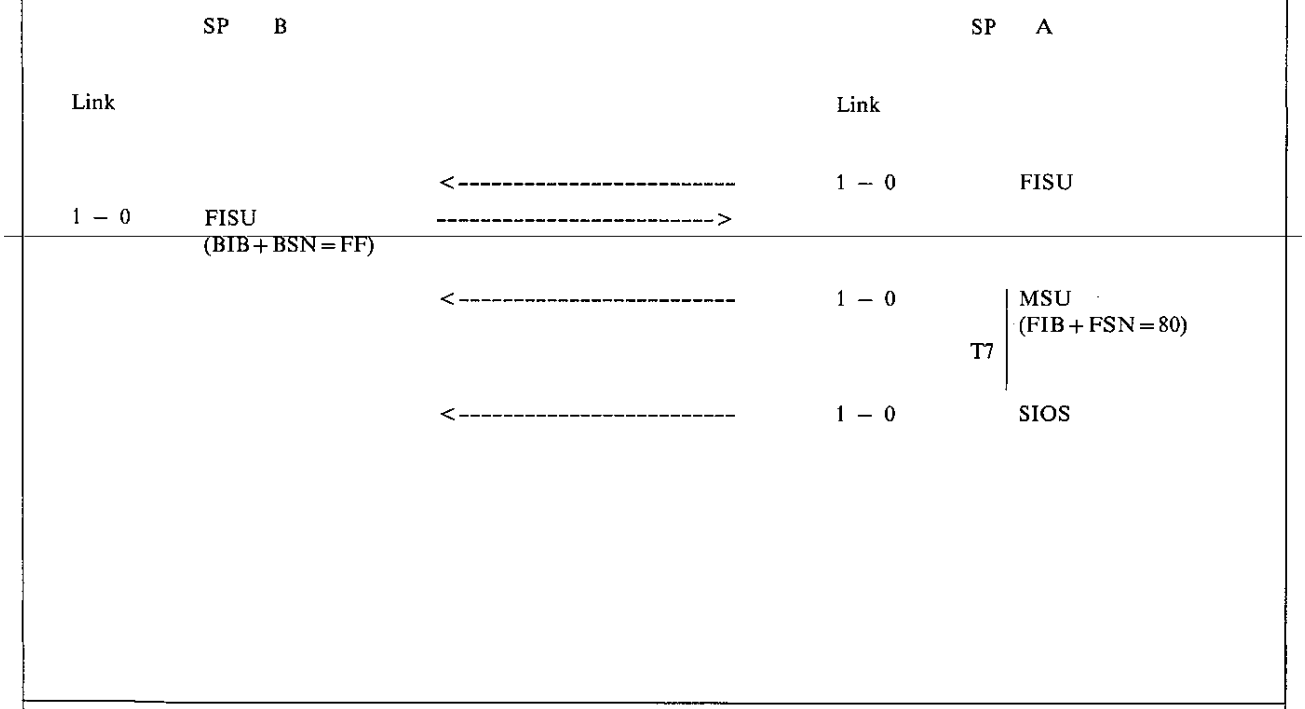
	SP B			SP A
Link			Link	
		<----------	1 – 0	FISU
1 – 0	FISU (BIB+BSN=FF)	---------->		
1 – 0	FISU (BIB+BSN=BF)	---------->		
1 – 0	FISU (BIB+BSN=BF)	---------->		
1 – 0	FISU (BIB+BSN=FF)	---------->		
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1. Generate two consecutive FISUs at B with abnormal BSNs.
2. Check that A responds by taking the link out of service.

TEST NUMBER: 8.12	PAGE: 1 OF 1
REFERENCE: Q.703 § 5.3 STD: Fig. 14	
TITLE: Transmission and reception control (Basic)	
SUB TITLE: Excesssive delay of acknowledgement	
PURPOSE: To test the transmission control response to the expiration of EDA timer T7	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:



TEST DESCRIPTION

1. Generate an MSU at A.
2. Discard the received MSU at B and send no acknowledgement to A for more than T7 period.
3. Check that the link is taken out of service by SIOS generated at A after T7 has expired.
4. Timer T7 shall be in the range 0.5 secs to 2.0 secs.

TEST NUMBER: 8.13	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 14	
TITLE: Transmission and reception control (Basic)	
SUB TITLE: Level 3 Stop command	
PURPOSE: To test the response to a Stop command	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

	SP B			SP A
Link			Link	
		<----------	1 – 0	FISU
1 – 0	FISU	---------->		
				: stop
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1. Give Stop command at A.
2. Check that A responds with link out of service.

TEST NUMBER: 9.1	PAGE: 1 OF 1
REFERENCE: Q.703 § 6.2 STD: Fig. 15, Fig. 16	
TITLE: Transmission and reception control (PCR)	
SUB TITLE: MSU transmission and reception	
PURPOSE: To check basic MSU transmission and reception	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT, CPT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	FISU (FSN=7F, BSN=7F)
1 – 0	FISU (FSN=7F, BSN=7F)	---------->		
		<----------	1 – 0	MSU (FSN=0, BSN=7F)
		<----------	1 – 0	MSU (FSN=0, BSN=7F)
				● ●
1 – 0	FISU (FSN=7F, BSN=0)	---------->		
		<----------	1 – 0	FISU (FSN=0, BSN=7F)
1 – 0	MSU (FSN=0, BSN=0)	---------->		
		<----------	1 – 0	FISU (FSN=0, BSN=0)

TEST DESCRIPTION

1.	Generate an MSU at A.
2.	Check that B receives the MSU correctly.
3.	Check that A sends FISUs after receiving an FISU with a positive acknowledgement.
4.	Generate an MSU at B.
5.	Check that A receives the MSU correctly and returns a positive acknowledgement.

TEST NUMBER: 9.2	PAGE: 1 OF 1
REFERENCE: Q.703 § 6.3 STD: Fig. 15, Fig. 16	
TITLE: Transmission and reception control (PCR)	
SUB TITLE: Priority control	
PURPOSE: To check the preventive retransmission procedure	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			Link	SP A
Link				
		<----------	1 – 0	FISU (FSN=7F, BSN=7F)
1 – 0	FISU (FSN=7F, BSN=7F)	---------->		
		<----------	1 – 0	MSU (FSN=0, BSN=7F)
		<----------	1 – 0	MSU (FSN=1, BSN=7F)
				●
				●
		<----------	1 – 0	MSU (FSN=2, BSN=7F)
				●
				●
		<----------	1 – 0	MSU (FSN=0, BSN=7F)
		<----------	1 – 0	MSU (FSN=1, BSN=7F)
		<----------	1 – 0	MSU (FSN=2, BSN=7F)
				●
				●
1 – 0	FISU (FSN=7F, BSN=0)	---------->		
1 – 0	FISU (FSN=7F, BSN=1)	---------->		
1 – 0	FISU (FSN=7F, BSN=2)	---------->		
		<----------	1 – 0	FISU (FSN=2, BSN=7F)

TEST DESCRIPTION

1. Generate two MSUs at A.
2. No positive acknowledgement is sent from B.
3. Check that MSUs are retransmitted at A.
4. Generate another MSU at A.
5. Check that B receives MSUs correctly.
6. Reply with positive acknowledgements at B.
7. Check that A stops retransmission after receiving the positive acknowledgement for the last MSU in RTB and sends FISU.

TEST NUMBER: 9.3	PAGE: 1 OF 1
REFERENCE: Q.703 § 6.4 STD: Fig. 15	
TITLE: Transmission and reception control (PCR)	
SUB TITLE: Forced retransmission with the value N_1	
PURPOSE: To check that "RTB full" is detected by N_1 and forced retransmission occurs	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	FISU (FSN=7F, BSN=7F)
1 – 0	FISU (FSN=7F, BSN=7F)	---------->		
		<----------	1 – 0	MSU (FSN=0, BSN=7F)
				●
				●
		<----------	1 – 0	MSU (FSN=7E, BSN=7F)
		<----------	1 – 0	MSU (FSN=0, BSN=7F)
				●
				●
		<----------	1 – 0	MSU (FSN=X, BSN=7F)
1 – 0	FISU (FSN=7F, BSN=0)	---------->		
		<----------	1 – 0	MSU (FSN=X+1, BSN=7F)
				●
				●
		<----------	1 – 0	MSU (FSN=7F, BSN=7F)

TEST DESCRIPTION

1. Generate 128 MSUs at A, at a rate of 100 per second, in order to fill the RTB before the EDA timer T7 expires.
2. No positive acknowledgement is sent from B until a forced retransmission starts at A.
3. Reply with a positive acknowledgement with BSN=0 before T7 expires at A.
4. Check that the forced retransmission is canceled after the transmission of the last MSU in RTB.

Note – N_1 is the maximum number of MSUs which are available for retransmission.
(The value of N_1 is normally 127).

TEST NUMBER: 9.4 | PAGE: 1 OF 1

REFERENCE: Q.703 § 6.4 STD: Fig. 15

TITLE: Transmission and reception control (PCR)

SUB TITLE: Forced retransmission with the value N_2

PURPOSE: To check that "RTB full" is detected by N_2 and forced retransmission starts

PRE-TEST CONDITIONS: Link in service

CONFIGURATION: 1 | TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B Link			Link	SP A
		<----------	1 – 0	FISU (FSN=7F, BSN=7F)
1 – 0	FISU (FSN=7F, BSN=7F)	---------->		
		<----------	1 – 0	MSU (FSN=0, BSN=7F)
				● ●
		<----------	1 – 0	MSU (FSN=N–1, BSN=7F)
		<----------	1 – 0	MSU (FSN=0, BSN=7F)
				● ●
		<----------	1 – 0	MSU (FSN=X, BSN=7F)
1 – 0	FISU (FSN=7F, BSN=a–1)	---------->		
		<----------	1 – 0	MSU (FSN=a, BSN=7F)
		<----------	1 – 0	MSU (FSN=N, BSN=7F) (a > X)

TEST DESCRIPTION

1. Generate N+1 MSUs at A, (the octet count of N MSUs is larger than N_2).
2. Send no positive acknowledgement at B until a forced retransmission starts at A.
3. Check that B receives the MSUs with FSN=0 up to FSN=N–1 but does not receive the MSU with FSN=N.
4. Reply with a positive acknowledgement with BSN=a–1 at B.
5. Check that the retransmission restarts from the next value of FSN which is acknowledged by B when the retransmission is interrupted.
6. Check that B receives the MSU with FSN=N.

Note – N_2 is the maximum number of octets which are available for retransmission.

TEST NUMBER: 9.5	PAGE: 1 OF 1
REFERENCE: Q.703 § 6.4 STD: Fig. 15	
TITLE: Transmission and reception control (PCR)	
SUB TITLE: Forced retransmission cancel	
PURPOSE: To check that the forced retransmission is canceled when BSN equal to FSNL is received	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A	
Link			Link	
		<----------	1 – 0	FISU (FSN=7F, BSN=7F)
1 – 0	FISU (FSN=7F, BSN=7F)	---------->		
		<----------	1 – 0	MSU (FSN=0, BSN=7F)
				●
				●
		<----------	1 – 0	MSU (FSN=7E, BSN=7F)
		<----------	1 – 0	MSU (FSN=0, BSN=7F)
				●
				●
		<----------	1 – 0	MSU (FSN=X, BSN=7F)
1 – 0	FISU (FSN=7F, BSN=7E)	---------->		
		<----------	1 – 0	MSU (FSN=7F, BSN=7F)

TEST DESCRIPTION

1. Generate N_1+1 MSUs at A, (e.g. 128).
2. Send no positive acknowledgement at B until a retransmission occurs at A.
3. Reply with a positive acknowledgement with BSN=7E at B.
4. Check that a forced retransmission is canceled and the MSU with FSN=7F is sent at A.

Note 1 – FSNL is the FSN of the last MSU in RTB.

Note 2 – Alternatively, the number of octets threshold (N_2), instead of the number of MSUs threshold (N_1), could be used to start forced retransmission.

TEST NUMBER: 9.6	PAGE: 1 OF 1
REFERENCE: Q.703 § 6.4 STD: Fig. 15	
TITLE: Transmission and reception control (PCR)	
SUB TITLE: Repetition of forced retransmission	
PURPOSE: To check that the forced retransmission repeats when "RTB full" is still detected after finishing a forced retransmission	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			Link	SP A
Link				
		<----------	1 – 0	FISU (FSN=7F, BSN=7F)
1 – 0	FISU (FSN=7F, BSN=7F)	---------->		
		<----------	1 – 0	MSU (FSN=0, BSN=7F)
				●
				●
		<----------	1 – 0	MSU (FSN=7E, BSN=7F)
		<----------	1 – 0	MSU (FSN=0, BSN=7F)
				●
				●
		<----------	1 – 0	MSU (FSN=7E, BSN=7F)
		<----------	1 – 0	MSU (FSN=0, BSN=7F)
				●

TEST DESCRIPTION

1.	Generate MSUs at A at a rate of N per second, in order to make A repeat a forced retransmission. ($N \geq 127 \div T$, where T = lower limit of T7)
2.	No acknowledgement is sent from B.
3.	Check that A repeats a forced retransmission.

TEST NUMBER: 9.7	PAGE: 1 OF 1
REFERENCE: Q.703 § 6.2 STD: Fig. 15	
TITLE: Transmission and reception control (PCR)	
SUB TITLE: MSU transmission while RPO set	
PURPOSE: To ensure correct performance while RPO is set	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A
Link		Link	
	<----------	1 – 0	FISU (FSN=7F, BSN=7F)
1 – 0 FISU (FSN=7F, BSN=7F)	---------->		
	<----------	1 – 0	MSU (FSN=0, BSN=7F)
			● ●
: set LPO			
1 – 0 SIPO (FSN=7F, BSN=7F)	---------->		
	<----------	1 – 0	FISU (FSN=0, BSN=7F)
			● ●
: clear LPO			
1 – 0 MSU (FSN=0, BSN=7F)	---------->		
	<----------	1 – 0	MSU (FSN=0, BSN=7F)
1 – 0 MSU (FSN=0, BSN=0)	---------->		
	<----------	1 – 0	FISU (FSN=0, BSN=0)

TEST DESCRIPTION

1.	Generate an MSU at A.
2.	Instead of sending positive acknowledgement, set and keep PO at B.
3.	Check A stops a retransmission of the MSU and sends FISUs, and not detect link failure by the expiration of T7.
4.	Cease PO and send an MSU with no positive acknowledgement at B.
5.	Check A starts a retransmission of the MSU.
6.	Generate an MSU with a positive acknowledgement at B.
7.	Check A receives the MSU and responds correctly.

TEST NUMBER: 9.8 | PAGE: 1 OF 1

REFERENCE: Q.703 § 6.3 STD: Fig. 16

TITLE: Transmission and reception control (PCR)

SUB TITLE: Abnormal BSN – Single MSU

PURPOSE: To test the response to an abnormal BSN

PRE-TEST CONDITIONS: Link in service

CONFIGURATION: 1 | TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B				SP A
Link			Link	
		<----------	1 – 0	FISU (FSN=7F, BSN=7F)
1 – 0	FISU (FSN=7F, BSN=7F)	---------->		
1 – 0	MSU (FSN=0, BSN=0)	---------->		
1 – 0	MSU (FSN=0, BSN=7F)	---------->		
1 – 0	MSU (FSN=0, BSN=7F)	---------->		
		<----------	1 – 0	FISU (FSN=7F, BSN=0)

TEST DESCRIPTION

1. Generate a single MSU at B with abnormal BSN followed by retransmission of that MSU with normal BSN.
2. Check that A responds with a positive acknowledgement and not detect link failure.

TEST NUMBER: 9.9	PAGE: 1 OF 1
REFERENCE: Q.703 § 6.3 STD: Fig. 16	
TITLE: Transmission and reception control (PCR)	
SUB TITLE: Abnormal BSN – Two MSUs	
PURPOSE: To test the response to two consecutive MSUs with an MSU having normal BSN between them	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B				SP A
Link			Link	
		<----------	1 – 0	FISU (FSN=7F, BSN=7F)
1 – 0	FISU (FSN=7F, BSN=7F)	---------->		
1 – 0	MSU (FSN=0, BSN=7E)	---------->		
1 – 0	MSU (FSN=0, BSN=7F)	---------->		
1 – 0	MSU (FSN=0, BSN=7E)	---------->		
		<----------	1 – 0	SIOS (FSN=7F, BSN=7F)

TEST DESCRIPTION

1. Generate two consecutive MSUs at B with abnormal BSN with an MSU having normal BSN between them.
2. Check that all MSUs are discarded at A.
3. Check that A responds by taking the link out of service.

TEST NUMBER: 9.10	PAGE: 1 OF 1
REFERENCE: Q.703 § 6.2 STD: Fig. 16	
TITLE: Transmission and reception control (PCR)	
SUB TITLE: Unexpected FSN	
PURPOSE: To check the reception control response to an MSU with unexpected FSN	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

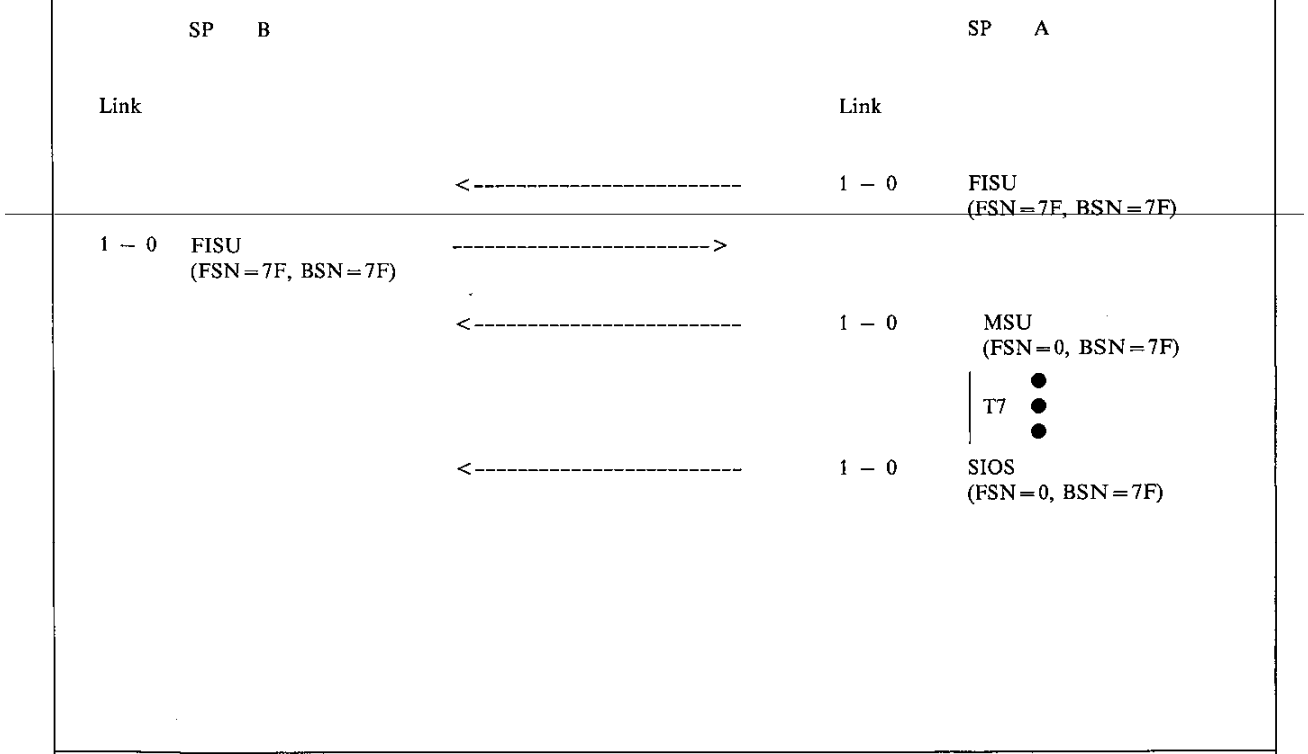
SP B				SP A
Link			Link	
		<----------	1 – 0	FISU (FSN=7F, BSN=7F)
1 – 0	FISU (FSN=7F, BSN=7F)	---------->		
1 – 0	MSU (FSN=0, BSN=7F)	---------->		
1 – 0	MSU (FSN=2, BSN=7F)	---------->		
		<----------	1 – 0	FISU (FSN=7F, BSN=0)

TEST DESCRIPTION

1.	Generate an MSU with unexpected FSN at B.
2.	Check A discards the MSU with unexpected FSN and not sends acknowledgement for that MSU.

TEST NUMBER: 9.11	PAGE: 1 OF 1
REFERENCE: Q.703 § 6.3 STD: Fig. 15	
TITLE: Transmission and reception control (PCR)	
SUB TITLE: Excessive delay of acknowledgement	
PURPOSE: To test the transmission control response to the expiration of EDA timer T7	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:



TEST DESCRIPTION

1. Generate an MSU at A.
2. Suspend sending positive acknowledgement at B for more than T7 period.
3. Check that A sends SIOSs instead of retransmission of MSU after T7 expires.
4. Timer T7 shall be in the range 0.5 secs to 2.0 secs.

TEST NUMBER: 9.12	PAGE: 1 OF 1
REFERENCE: Q.703 § 6.2 STD: Fig. 16	
TITLE: Transmission and reception control (PCR)	
SUB TITLE: FISU with FSN expected for MSU	
PURPOSE: To check that the received FISU having FSN expected for MSU is discarded	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

SP B			SP A
Link		Link	
1 – 0	FISU (FSN=7F, BSN=7F) ---------->		
	<----------	1 – 0	FISU (FSN=7F, BSN=7F)
1 – 0	FISU (FSN=0, BSN=7F) ---------->		
	<----------	1 – 0	FISU (FSN=7F, BSN=7F)

TEST DESCRIPTION

1. Generate an FISU with FSN expected for MSU at B.
2. Check that A discards the FISU and responds with an FISU with correct BSN.

TEST NUMBER: 9.13	PAGE: 1 OF 1
REFERENCE: Q.703 § 7 STD: Fig. 16	
TITLE: Transmission and reception control (PCR)	
SUB TITLE: Level 3 Stop command	
PURPOSE: To test the response to a Stop command	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

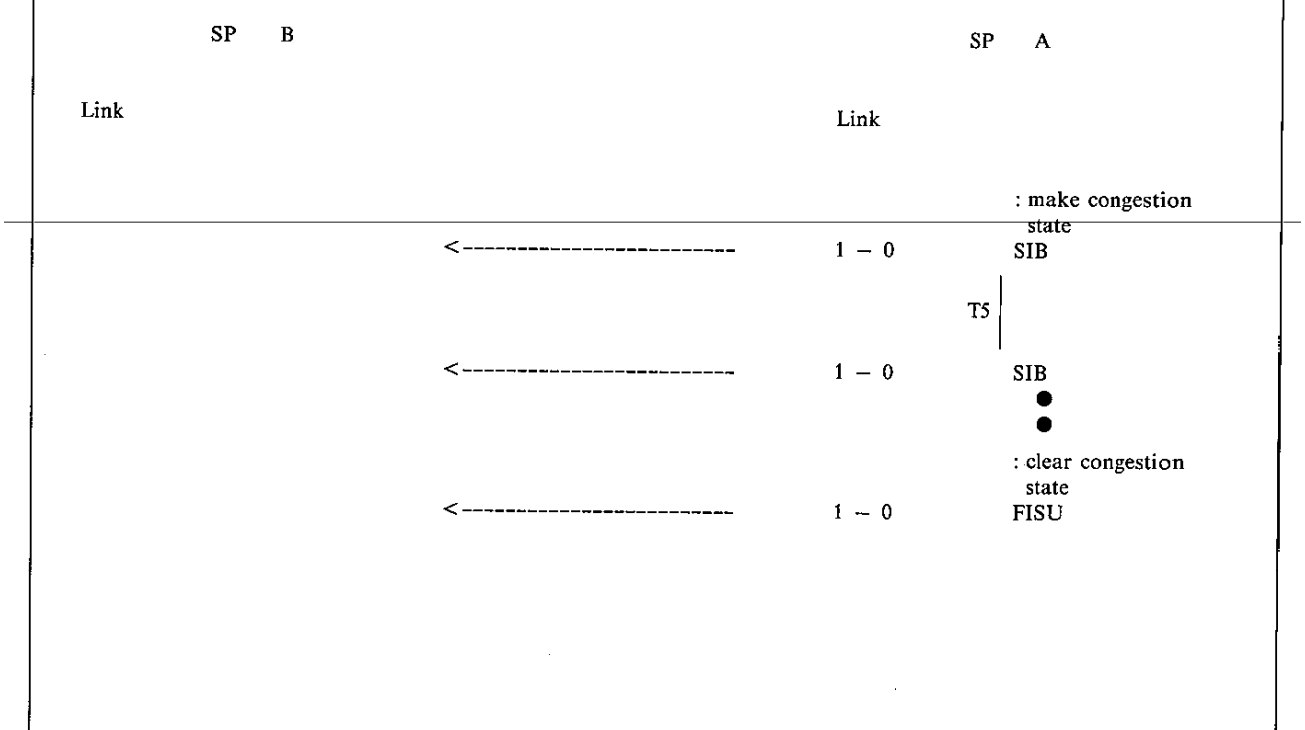
	SP B			SP A
Link			Link	
		<----------	1 – 0	FISU
1 – 0	FISU	---------->		
				: stop
		<----------	1 – 0	SIOS

TEST DESCRIPTION

1. Give Stop command at A.
2. Check that A responds with link out of service.

TEST NUMBER: 10.1	PAGE: 1 OF 1
REFERENCE: Q.703 § 9 STD: Fig. 19	
TITLE: Congestion Control	
SUB TITLE: Congestion abatement	
PURPOSE: To check the congestion abatement procedure	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

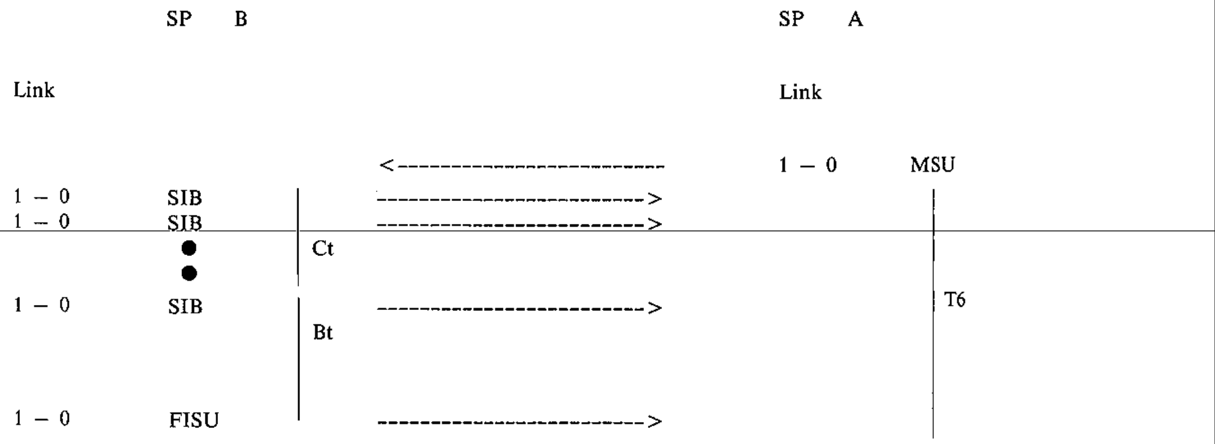


TEST DESCRIPTION

1.	Make congestion state at A and check A sends SIB. (Implementation of congestion control is not specified.)
2.	Check B receives SIBs at the interval of T5.
3.	Clear congestion state at A and check A stops sending SIBs.
4.	Timer T5 shall be in the range 80 ms to 120 ms.

TEST NUMBER: 10.2	PAGE: 1 OF 1
REFERENCE: Q.703 § 9.2 STD: Fig. 19	
TITLE: Congestion Control	
SUB TITLE: Timer T7	
PURPOSE: To check timer T7 is restarted at the reception of SIB (without expiring of T6)	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:

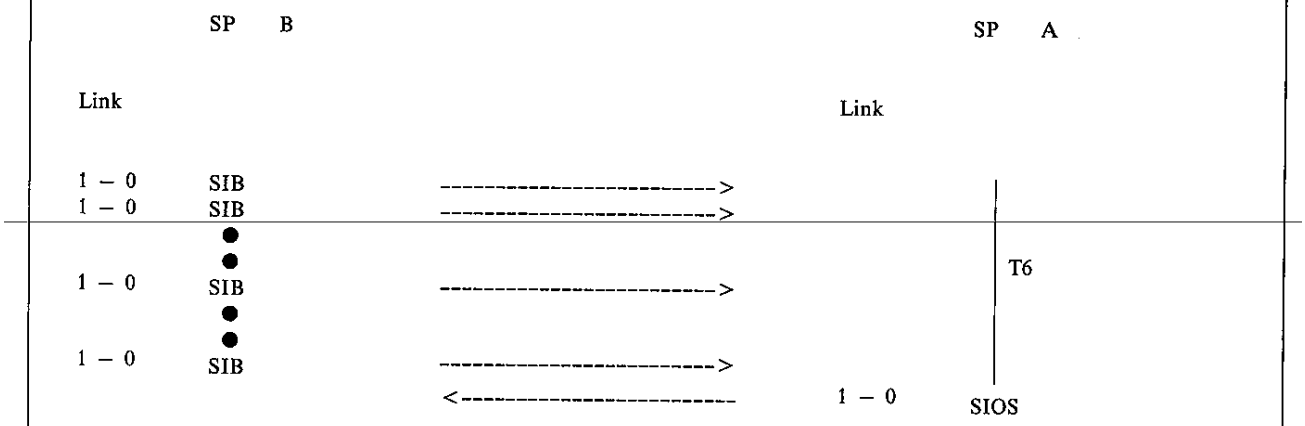


TEST DESCRIPTION

1. Generate an MSU at A.
2. Generate SIBs at B with the time intervals of T5 for Ct, instead of positive acknowledgement.
3. Check that link remains in service during Ct.
4. Send FISU with positive acknowledgement from B after Bt expires.
5. Check that link remains in service.
6. Ct = more than T7 and less than T6.
7. Bt = less than T7.
8. (Ct + Bt) is less than T6.

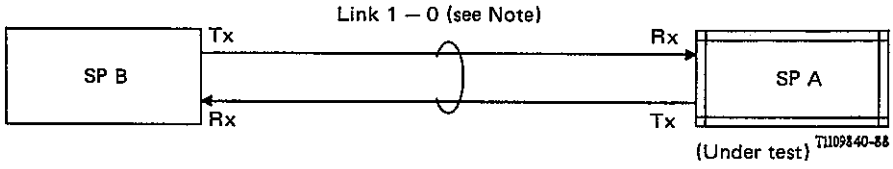
TEST NUMBER: 10.3	PAGE: 1 OF 1
REFERENCE: Q.703 § 9.3 STD: Fig. 19	
TITLE: Congestion Control	
SUB TITLE: Timer T6	
PURPOSE: To check "Remote Congestion" Timer T6	
PRE-TEST CONDITIONS: Link in service	
CONFIGURATION: 1	TYPE OF TEST: VAT

EXPECTED SIGNAL UNIT SEQUENCE:



TEST DESCRIPTION

1.	Generate SIB at B until Timer T6 expires.
2.	Check link becomes out of service.
3.	Timer T6 shall be in the range 3 secs to 6 secs (8 to 12 secs for 4.8 kbit/s).



Note — First digit: linkset number.
Second digit: link number.

FIGURE 1/Q.781

Test configuration of MTP level 2 test
Configuration 1

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