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ANNEX B
(to Recommendation Q.714)

Action tables for the signalling connection

control part of Signalling System No. 7

B.1 *Introduction*

This Annex contains the definitions for the symbols used and contains the full definition of actions, if any, to be taken on the receipt of messages by a signalling point (node).

Annex A contains the full definition of states of the signalling point X/Y interface and the transitions between states in the normal case.

B.2 *Symbol definition of the action tables*

The entries given in Table B-1/Q.714 and B-2/Q.714 indicate the action, if any, to be taken by a SP on receipt of any kind of message, and the state the SP enters, which is given in parentheses, following the action taken.

In any state it is possible to receive an Error message (ERR). The reaction, if any, depends on the contents (error cause and possible diagnostics) of the message and is specified in Q.714, § 3.10.3.

The reaction on messages received with procedure errors (e.g. too long, invalid P(R), not octet aligned, etc.) are normal actions and will be described in the text. So they are covered by the actions indicated as NORMAL.

B.3 *Table of contents*

Table B-1/Q.714 Actions taken by SP-Y on receipt of messages.

Table B-2/Q.714 Actions taken by SP-Y on receipt of messages with known message type and containing mismatch information.

Table B-3/Q.714 Actions taken by SP-Y on receipt of messages during connection establishment and release phases.

Table B-4/Q.714 Actions taken by SP-Y on receipt of messages during the data transfer phase in a given state: reset.

Table B-5/Q.714 Actions taken by SP-Y on receipt of messages during the data transfer phase in a given state: data expedited data, flow control.

H.T. [T1.714]

TABLE B-1/Q.714

Action taken by SP-Y on receipt of messages

{ State of the interface as perceived by node SP-Y Message received by node SP-Y }	Any state
{ Any message with unknown message type (see Note) }	DISCARD
{ Any message with known message type and: } See Table B-2/Q.714 a) unassigned destination local reference number, or b) Originating Point Code received not equal to the PC stored locally, or c) source local reference number received not equal to the remote local reference number stored locally }	{
Any other message	See Table B-3/Q.714

DISCARD: SP-Y discards the received message and takes no subsequent action.

Note — This notion of unknown message type depends upon the protocol class.

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H.T. [T2.714]

TABLE B-2/Q.714

Action taken by SP-Y on receipt of messages with known

message type and
containing mismatch information as in Table B-1/Q.714
in any state

{ Type of mismatch information Message received by node PS-Y }	{		
Unassigned destination local reference number }	{		
Source local reference number received not equal to the one stored locally }	{		
Originating Point Code received not equal to the PC stored locally (see Note 1) }			
CR (X)	N.A.	N.A.	N.A.
CC (Y, X)	Send ERR (X) (see Note 2)	N.A.	N.A.
CREF (Y)	DISCARD	N.A.	N.A.
RLSD (Y, X)	Send RLC (X, Y) (see Note 2)	Send ERR (X) (see Note 2)	Send ERR (X) (see
RLC (Y, X)	DISCARD	DISCARD	DISCARD
DT1 (Y)	DISCARD	N.A.	C.O.N.P.
DT2 (Y)	DISCARD	N.A.	C.O.N.P.
AK (Y)	DISCARD	N.A.	C.O.N.P.
ED (Y)	DISCARD	N.A.	C.O.N.P.
EA (Y)	DISCARD	N.A.	C.O.N.P.
RSR (Y, X)	Send ERR (X) (see Note 2)	Send ERR (X) (see Note 2)	Send ERR (X) (see
RSC (Y, X)	Send ERR (X) (see Note 2)	Send ERR (X) (see Note 2)	Send ERR (X) (see
ERR (Y)	For further study	For further study	For further st
IT (Y, X)	DISCARD	RELEASE	C.O.N.P

DISCARD: SP-Y discards the received message and takes no subsequent action.

C.O.N.P. Check Optionally Not Performed.

N.A. Not Applicable

NAME (d, s): NAME = abbreviation of message d = destination local reference number s = source local reference number.

Note 1 — Performing this check is a national option.

Note 2 — In this situation no action is taken locally on any existing connection section. Information in any message sent back is taken from the received message.

H.T. [T3.714]

TABLE B-3/Q.714

Action taken by SP-Y on receipt of messages during connection establishment and release phases

{	{ Ready c1 { { Data transfer c4 { {					
Connexion request (CR)	NORMAL (c2)	See Note				
Connection confirm (CC)		DISCARD (c2)	NORMAL (c4)	DISCARD (c4)	ERROR 1 (c6)	DISCARD (c
Connection refused (CREF)		DISCARD (c2)	NORMAL (c1)	DISCARD (c4)	ERROR 1 (c6)	DISCARD (c
Released (RLSD)	See Table B-2/Q.714	DISCARD (c2)	ERROR 2 (c3)	NORMAL (c5)	DISCARD (c5)	NORMAL (c
Released complete (RLC)		DISCARD (c2)	ERROR 3 (c1)	DISCARD (c4)	ERROR 1 (c6)	NORMAL (c
Other messages		DISCARD (c2)	ERROR 3 (c1)	See Table B-4/Q.714	ERROR 1 (c6)	DISCARD

(c6) NORMAL: The action taken by SP-Y follows the normal procedures as defined in the appropriate sections of the procedure text.

DISCARD: SP-Y discards the received message and takes no subsequent action.

ERROR 1: SP-Y discards the received message and initiates a connection release by sending a RLSD message with proper invalid type cause.

ERROR 2: SP-Y returns a Released complete message using information contained in the message and takes no subsequent action.

ERROR 3: SP-Y discards the received message and releases locally.

Note — Reception of CR in these states is note possible because CR does not contain a destination local reference number (no search is performed).

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H.T. [T4.714]

TABLE B-4/Q.714

Action taken by node SP-Y as receipt of messages during the data transfer state

{	Data transfer: c4 Data control ready (d1)	SP-X reset request (d2)	SP-Y reset request (d3)

{
Reset request (RSR)
(see Note 2)
}
	NORMAL (d2)	DISCARD (d2)	NORMAL (d1)

{
Reset confirmation (RSC)
(see Note 2)
}
	ERROR (d3)	ERROR (d3)	NORMAL (d1)

Other messages	See Table B-5/Q.714	ERROR (d3) (see Note 1)	DISCARD

(d3) NORMAL: The action taken by SP-Y follows the normal procedures as defined in the appropriate sections of the procedure text.

DISCARD: Signalling point Y discards the received message and takes no subsequent action.

ERROR: Signalling point Y discards the received message and initiates a reset by transmitting a reset request message with the appropriate cause indication.

Note 1 — If signalling point Y issues a reset by transmitting a reset request message as a result of an error condition in state d2, it should eventually consider the interface to be in the Data control ready state (d1).

Note 2 — Reception of these messages for a class 2 connection section may trigger the sending of an ERR message back if these message types are known by the receiving SCCP.

TABLEAU B-4/Q.714 [T4.714], p. 4

H.T. [T5.714]

TABLE B-5/Q.714

Action taken by SP-Y on receipt of messages during the data control ready state

{	Data control ready: d1 Normal data flow e1	SP-X expedited data e2	SP-Y expedited data e3	
Expedited data (ED)	NORMAL (d2)	ERROR (d3)	NORMAL (d4)	ERR

{
Expedited data (EA) acknowledgement
}
	DISCARD (e1)	DISCARD (e2)	NORMAL (e1)	NOR

{
Data (DT), data acknowledgement (AK) and Inactivity Test (IT)
}
	NORMAL (e1)	NORMAL (e2)	NORMAL (e3)	NO

(e4) NORMAL: The action taken by signalling point Y follows the normal procedures as defined in the appropriate sections of the procedure text.

DISCARD: Signalling point Y discards the received message and takes no subsequent action as direct result of receiving that message.

ERROR: Signalling point Y discards the received message packet and indicates a reset by transmitting a reset request message with the appropriate cause indication (e.g. procedure error).

Note — Reception of an ED, EA, DT 2 or AK message for a class 2 connection section will cause the receiving SCCP to DISCARD any of these messages. A DT 1 message received for a class 3 connection section will also be discarded.

ANNEX C
(to Recommendation Q.714)

State transition diagrams (STD)

for the signalling connection control part of Signalling System No. 7

C.1 *General*

This annex contains the description of the main SCCP functions (except SCCP management (SCMG) which is contained in annex D to Recommendation Q.714) according to the CCITT Specification and Description Language (SDL).

For the SCCP as a whole, Figure 1/Q.714 illustrates a subdivision into functional blocks, showing their functional interactions as well as the functional interactions with the other major functions of signalling system No. 7 (e.g. MTP).

The functional breakdown shown in this diagram is intended to illustrate a reference model, and to assist interpretation of the text of the SCCP procedures. The state transition diagrams are intended to show precisely the behaviour of the signalling system under normal and abnormal conditions as viewed from a remote location. It must be emphasized that the functional partitioning shown in the following diagrams is used only to facilitate understanding of the system behaviour, and is not intended to specify the functional partitioning to be adopted in a practical implementation of the signalling system.

C.2 *Drafting conventions*

Each major function is designated by its acronym (e.g. SCOC = SCCP connection-oriented control).

External inputs and outputs are used for interactions between different functional blocks. Included within each input and output symbol in the state transition diagrams are acronyms which identify the functional blocks which are the source and the destination of the message, e.g.:

SCRC SCOC indicates that the message is sent from SCCP routing control to SSCP connection-oriented control

Internal inputs and outputs are only used to indicate control of timers.

C.3 *Figures*

The list of figures is as follows:

Figure C-1/Q.714 SCCP routing control procedures (SCRC).

Figure C-2/Q.714 Connection establishment and release procedures at originating node for SCCP connection-oriented control (SCOC). (Sheets 1 to 3: connection establishment, and sheets 4 to 6: connection release procedures)

Figure C-3/Q.714 Connection establishment and release procedures at destination node for SCCP connection-oriented control (SCOC). (Sheets 1 to 2: connection establishment, and sheets 3 to 5: connection release procedures)

Figure C-4/Q.714 Data transfer procedures at originating and destination nodes for SCCP connection-oriented control (SCOC).

Figure C-5/Q.714 Expedited data transfer procedures at originating and destination nodes for SCCP connection-oriented control (SCOC).

Figure C-6/Q.714 Reset procedures at originating and destination nodes for SCCP connection-oriented control (SCOC).

Figure C-7/Q.714 Connection establishment and release procedures at intermediate node for SCCP connection-oriented control (SCOC). (Sheets 1 to 4: connection establishment, and sheets 5 to 9: connection release procedures)

Figure C-8/Q.714 Data transfer procedures at intermediate node for SCCP connection-oriented control (SCOC).

Figure C-9/Q.714 Expedited data transfer procedures at intermediate node for SCCP connection-oriented control (SCOC).

Figure C-10/Q.714 Reset procedures at intermediate node for SCCP connection-oriented control (SCOC).

Figure C-11/Q.714 Restart procedure for SCCP connection-oriented control (SCOC).

Figure C-12/Q.714 SCCP connectionless control (SCLC).

C.4 *Abbreviations and timers*

Abbreviations and timers used in Figures C-1/Q.714 to C-11/Q.714 are listed below.

Abbreviations

CR Connection Request

DPC Destination Point Code

GT Global Title

IT Inactivity Test

MSG Message

MTP Message Transfer Part

NPDU Network Protocol Data Unit

NSDU Network Service Data Unit

PC Point Code

SCCP Signalling Connection Control Part

SCLC SCCP Connectionless Control

SCMG SCCP Management

SCOC SCCP Connection-Oriented Control

SCRC SCCP Routing Control

SLS Signalling Link Selection

SS Sub-System

SSN Sub-System Number

SSPC Sub-System Prohibited Control

Timers

T(conn est) Waiting for connection confirm message.

T(ias) Delay to send a message on a connection section.

T(iar) Waiting to receive a message on a connection section.

T(rel) Waiting for release complete message.

T(int) Waiting to report abnormal release to maintenance function.

T(guard)	Waiting to resume normal procedures for temporary connection sections during the restart procedure

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Figure C-1/Q.714 (feuillet 1 sur 3), (N), p. 6

Figure C-1/Q.714 (feuillet 2 sur 3), (N), p. 7

Figure C-1/Q.714 (feuillet 3 sur 3), (N), p. 8

Figure C-2/Q.714 (feuillet 1 sur 6), (N), p. 9

Figure C-2/Q.714 (feuillet 2 sur 6), (N), p. 10

Figure C-2/Q.714 (feuillet 3 sur 6), (N), p. 11

Figure C-2/Q.714 (feuillet 4 sur 6), (N), p. 12

Figure C-2/Q.714 (feuillet 5 sur 6), (N), p. 13

Figure C-2/Q.714 (feuillet 6 sur 6), (N), p. 14

Figure C-3/Q.714 (feuillet 1 sur 5), (N), p. 15

Figure C-3/Q.714 (feuillet 2 sur 5), (N), p. 16

Figure C-3/Q.714 (feuillet 3 sur 5), (N), p. 17

Figure C-3/Q.714 (feuillet 4 sur 5), (N), p. 18

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Figure C-4/Q.714 (feuillet 1 sur 4), (N), p. 20

Figure C-4/Q.714 (feuillet 2 sur 4), (N), p. 21

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Figure C-7/Q.714 (feuillet 8 sur 9), (N), p. 36

Figure C-7/Q.714 (feuillet 9 sur 9), (N), p. 37