

ANNEX B
(to Recommendation Q.764)
State transition diagrams

Note – Should any conflict arise between the text and the SDL definition, the textual description is taken as definitive.

B.1 *General*

This Annex contains the description of the signalling procedures described in this Recommendation in the form of state transition diagrams according to the CCITT Specification and Description Language (SDL). In order to facilitate functional description, the ISDN User Part (ISDN-UP) signalling procedure is divided into main functional blocks, as shown in Figure B-1/Q.764. These blocks are as follows:

- 1) *Signalling procedure control (SPRC)*
SPRC provides procedures for sending ISDN-UP messages to Level 3 (SCCP or MTP) and distributing received messages to the other ISDN-UP functional blocks.
- 2) *Call processing control (CPC)*
CPC provides call control procedures for realizing basic circuit switched service according to user's request.
- 3) *Circuit supervision control (CSC)*
CSC provides procedures for circuit supervision control for maintenance purpose and for recovery from abnormal situation.

B.2 *Drafting convention*

- a) External inputs and outputs are used for interactions with a remote exchange and interaction between SPRC and the other functional blocks. Internal inputs and outputs are used for interactions within each functional block, e.g., to indicate control of time-out. For these interactions, input and output symbols are used as shown in Figure B-2/Q.764.
- b) Inputs and outputs symbols contain as part of their name acronyms of their source and destination functional block names with an arrow in between, e.g., Blocking BLS -> CPC.
- c) A simple example of SDL diagram according to the above conventions is shown in Figure B-3/Q.764.

B.3 *Abbreviations, timers and primitives*

B.3.1 *Abbreviations*

- 1) Table B-1/Q.764:
 Signalling procedure control.
- 2) Table B-2/Q.764:
 Call processing control.
- 3) Table B-3/Q.764:
 Circuit supervision control.

B.3.2 *Timers*

Timers used in the ISDN-UP SDL diagrams are shown in Table B-4/Q.764.

B.3.3 *Primitives*

Primitives used over the interface between call control and ISDN-UP are shown in Table B-5/Q.764.

B.4 *State transition diagrams and SDL diagrams*

Each ISDN-UP main functional block is further subdivided into the functional blocks. Functional diagrams and simple state transition diagrams for each main functional block are shown below:

- 1) Signalling procedure control (SPRC)
 —
 —
- 2) Call processing control (CPC)
 —
 —
- 3) Circuit supervision control (CSC)
 —
 —

The ISDN-UP SDL diagrams are described based on the three-blocks approach. In this approach, call control, which provides signalling-independent functions such as connect-through, circuit selection and digits analysis, is outside the ISDN-UP. These functions are described only in §§ 1-3. The ISDN-UP diagrams are provided for the above subdivided functional blocks, as shown below:

1) Signalling procedure control (SPRC)

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2) Call processing control (CPC)

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3) Circuit supervision control (CSC)

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(HGBS):

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(HGBR)

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Figure B–1/Q.764 - T1116960-88

Figure B–2/Q.764 - T6970-88

Figure B–3/Q.764 - T1116980-88

TABLE B–1/Q.764

Signalling procedure control acronym

Acronym

Description

BLR

Blocking/Unblocking Message Reception

BLS

Blocking/Unblocking Message Sending

CCO

Continuity Check Outgoing

CCI

Continuity Check Incoming

CGRS

Circuit Group Reset Sending

CGRR

Circuit Group Reset Reception

CPC

Call Processing Control

CRR

Circuit Reset Reception

CRS

Circuit Reset Sending

Functional

CSC

Circuit Supervision Control

block name

SPRC

Signalling Procedure Control

MGBR

Maintenance Oriented Circuit Group Blocking/Unblocking Reception

HGBR

Hardware Failure Oriented Circuit Group Blocking/Unblocking Reception

MGBS

Maintenance Oriented Circuit Group Blocking/Unblocking Sending

HGBS

Hardware Failure Oriented Circuit Group Blocking/Unblocking Sending

CRCR

Continuity Recheck Control Reception

CRCS

Continuity Recheck Control Sending

CQR

Circuit Group Query Reception

CQS

Circuit Group Query Sending

MSDC

Message Sending Control

MDSC

Message Distributing Control

BLA

Blocking Acknowledgement

BLO
Blocking

GRA
Group Reset Acknowledgement

GRS
Group Reset

CQR
Circuit Group Query Response

CQM
Circuit Group Query

UBA
Unblocking Acknowledgement

Message type

UBL
Unblocking

CCR
Continuity Check Request

CGB
Circuit Group Blocking

CGBA
Circuit Group Blocking Acknowledgement

CGU
Circuit Group Unblocking

CGUA
Circuit Group Unblocking Acknowledgement

RSC
Reset Circuit

CFN
Confusion

TABLE B-2/Q.764

Call processing control acronym

Acronym

Description

OGC

Outgoing Trunk Circuit

General

ICC

Incoming Trunk Circuit

CCH

Continuity Check Indicator

CC

Call control

SPRC

Signalling Procedure Control

CPC

Call Processing Control

BLR
Blocking/Unblocking Message Reception

BLS
Blocking/Unblocking Message Sending

CCO
Continuity Check Outgoing

CCI
Continuity Check Incoming

CGRR
Circuit Group Reset Reception

Functional

CRR
Circuit Reset Reception

block name

CRS
Circuit Reset Sending

CPCI
Call Processing Control Incoming

CPCO
Call Processing Control Outgoing

MGBR
Maintenance Oriented Circuit Group Unblocking/Blocking Reception

HGBR

Hardware Failure Oriented Circuit Group Blocking/Unblocking Reception

MGBS

Maintenance Oriented Circuit Group Unblocking/Blocking Sending

HGBS

Hardware Failure Oriented Circuit Group Blocking/Unblocking Sending

CRCR

Continuity Recheck Reception

CRCS

Continuity Recheck Sending

ACM

Address Complete

ANM

Answer

COT

Continuity

CPG

Call Progress

IAM
Initial Address

Message type

SUS
Suspend (network–or user–initiated)

RES
Resume (network–or user–initiated)

REL
Release

RLC
Release Complete

FOT
Forward Transfer

SAM
Subsequent Address

CON
Connect

TABLE B-3/Q.764

Circuit supervision control acronym

	Acronym	Description
	BLR	Blocking/Unblocking Reception
	BLS	Blocking/Unblocking Sending
	CRS	Circuit Reset Sending
	CRR	Circuit Reset Reception
	CGRS	Circuit Group Reset Sending
	CGRR	Circuit Group Reset Reception
	MGBR	

Maintenance Oriented Circuit Group Blocking/Unblocking Reception

Functional

HGBR

Hardware Failure Oriented Circuit Group Blocking/Unblocking Reception

block name

MGBS

Maintenance Oriented Circuit Group Blocking/Unblocking Sending

HGBS

Hardware Failure Oriented Circuit Group Blocking/Unblocking Sending

CRCR

Continuity Recheck Reception

CRCS

Continuity Recheck Sending

CQR

Circuit Group Query Reception

CQS

Circuit Group Query Sending

HRB

Hardware Failure Oriented Remotely Blocking

HLB

Hardware Failure Oriented Locally Blocking State

BLA

Blocking Acknowledgement

BLO

Blocking

COT

Continuity

CQR

Circuit Group Query Response

CQM

Circuit Group Query

GRA

Group Reset Acknowledgement

GRS

Group Reset

RLC

Release Complete

Message type

RSC

Reset Circuit

UBA

Unblocking Acknowledgement

UBL

Unblocking

CGB

Circuit Group Blocking

CGBA

Circuit Group Blocking Acknowledgement

CCR

Continuity Check Request

CGU

Circuit Group Unblocking

CGUA

Circuit Group Unblocking Acknowledgement

REL

Release

TABLE B-4/Q.764

Timer

	Timer	Symbol	Time-out value
First RLC timer	T1		4–15 s
Second RLC timer	T5		1 min
RES timer (network)	T6		Covered in Q.118
ACM timer	T7		20–30 s
COT timer			

T8

10–15 s

ANM timer

T9

Interval specified in Q.118

First BLA timer

T12

4–15 s

Second BLA timer

T13

1 min

First UBA timer

T14

4–15 s

Second UBA timer

T15

1 min

First RSC response timer

T16

4–5 s

Second RSC response timer

T17

1 min

First CGBA timer

T18

4–15 s

Second CGBA timer

T19

1 min

First CGUA timer

T20

4–15 s

Second CGUA timer

T21

1 min

First GRA timer

T22
4–15 s

Second GRA Timer

T23
1 min

Continuity tone timer

T24
2 s

CCR timing timer

T25
1–10 s

CCR response timer

T26
1–3 min

CCR receive timer

T27

4 min

CQR timer

T28

10 s

TABLE B-5/Q.764

Primitives

Primitive

ISDN-UP message

Interface

SETUP

REQUEST

IAM

Interface between

INDICATION

ANM, CON

CC and CPC

RESPONSE

RELEASE

CONFIRMATION

REL, RLC

RESET

INDICATION

RSC, RLC

RESPONSE

GRS, GRA

FORWARD TRANSFER

REQUEST

FOT

INDICATION

PROC

ACM (Other)

ALERT

CPG, ACM (Subscriber free)

INFO

SAM

PROG a)

CPG, ACM (Interworking, Q.931 progress indicator)

IBI b)

CPG (In-band information)

ACM (In-band information)

SUSPENDED

SUS

RESUMED

RES

BLOCKING

REQUEST

BLO, BLA

Interface between

INDICATION

CGB, CGBA

CC and CSC

RESPONSE

CONFIRMATION

UNBLOCKING

UBL, UBA

CGU, CGUA

CCT GROUP QUERY

CQM, CQR

STOP c)

REQUEST

–

CONFIRMATION

CONTINUITY RECHECK

CCR

RESET

GRS, GRA

RSC, RLC

TABLE B-5/Q.764 (cont.)

Primitive

ISDN-UP message

Interface

CALL FAILURE c)

INDICATION

—

Interface between
CC and CPC

REATTEMPT c)

CONTINUITY REPORT

REQUEST

COT

INDICATION

MAINTENANCE SYSTEM c)

INDICATION

–

Interface between
CC and CSC

START RESET c)

CC and CPC

- a Prog (network): Interworking
 Prog (access): Q.931 progress indicator
- b) IBI: In-band information available
- c) Locale primitive

Figure B-4/Q.764 - T1116990-88