



SPECIFICATION

SIGNALLING SYSTEM NO. 7 INTERCONNECT ISUP

ACIF G500:1998 (VERSION 1.0)
PUBLISHED: FEBRUARY 1998

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SPECIFICATION



0 GENERAL

This document is part of the suite of documents prepared for by the Network Interworking Industry Forum (NIIF) for the purpose of defining the interconnect services and signalling protocol to be available from interconnecting domestic Australian networks. The complete suite of documents together form the base interconnect signalling arrangements to apply in Australian telecommunications environment from 1st July 1997.

This document is now being maintained by the ACIF who has assumed responsibility for the self-regulation of the Australian telecommunication industry. Future versions are envisaged to be published as ACIF standards.

This suite of documents is based on specific ITU-T recommendations, which remain copyright to the ITU-T. Each document indicates a base ITU-T recommendation(s) which have been used.

0.1 Participants

The NIIF group that developed this document consisted of the following companies and representatives:

	Representative	Company
<i>Chairperson</i>	Les Graf	Ericsson Australia Pty Ltd
Full Time Members		
	Pietro Fu	AAP Telecommunications Pty Ltd
	Guy Ignatius	Vodafone Pty Ltd
<i>Document Editor</i>	Adrian Pizzica	Telstra
	Roger Nicoll/ Jeremy Ginger	Optus Communications Pty Ltd
	Thian Tan	Ericsson Australia Pty Ltd
	Paul Vella	Telstra
Part Time Members		
	Mark Altamore	Alcatel Australia Pty Ltd
	Paul Jancek	BT Australasia Pty Ltd
	Stan Podbreznik	Nortel Australia Pty Ltd

1 INTRODUCTION

Version 1 (and all sub-versions) of this specification is based on the CCITT, now ITU-T, Recommendation Q.767,1991.Subsequent changes to this document will,in general,be consistent with ITU-T Recommendations.The conventions indicated below show variations from this ITU-T Recommendation.

Used conventions

- sections which are not applicable are replaced with:
(This section is not applicable to the Interconnect ISUP specification international interface) OR
(This section is not applicable to the Interconnect ISUP specification)
- paragraphs or sentences in a section which are not applicable are :~~struck out~~
- added sections,paragraphs or sentences included in the ITU-T Q.767 Recommendation are : underlined
- added sections,paragraphs or sentences are : underlined
- ITU-T included changed text in the in the Q.767 Recommendation is :
IN SMALL ITALIC CAPITALS

National network ~~ISDN international~~ interconnections have to be realised between non homogeneous networks that differ in terms of services supported,network signalling systems and national access protocols.

In order to perform such National network ~~international~~ ~~ISDN~~ interconnections,it is required to specify unambiguously and without options:

- the service capabilities of the Interconnect ISUP ~~international~~ signalling system;
- the Interconnect ISUP ~~international~~ signalling interface,i.e.,the signalling information elements and messages sent and received on the Interconnect ISUP ~~international~~ signalling section and the related procedures;
- all additional information,which is not specifically signalling system related,but which is needed to absorb the potential differences between the national networks.

Section 2 of this Specification describes the list of services supported by the Interconnect ISUP ~~international~~ interface.

Section 3 contains the definition of the Interconnect ISUP ~~international~~ signalling specification,in terms of exceptions/clarifications to the text of the existing ITU-T Blue Book ISUP Recommendations.

Section 4 contains additional information to ease Interconnect ISUP ~~international~~ interconnections.This “Guidelines” section should be understood as a “user’s guide” for Interconnect ISUP ~~international~~ interconnection.One of the objectives is to highlight possible areas of difficulty and propose standard solutions,that should be applied as far as possible by national ~~international~~ operators.

The Annexes A to E contain the complete Specification ~~revised Blue Book~~ text.Sections 1 to 4 have precedence over the content of Annexes A to E.

Blue Book SDLs have not been revised and are therefore not applicable to Interconnect ISUP ~~Recommendation Q.767~~.

2 SERVICES SUPPORTED

The following services are supported by the ~~first version of the~~ Interconnect ISUP international interface. The services supported by the Interconnect ISUP international interface have not to be fully supported in a national network.

The relevant ITU-T/CCITT Recommendations are indicated per service, with the ~~possible~~ likely modifications/simplifications applied for Interconnect ISUP international operation of the service.

2.1 Bearer services

The following bearer services are supported by the Interconnect ISUP international interface:

- 64 kbit/s unrestricted as described by the Stage 1 Supplementary Description - 64 kbit/s Unrestricted Bearer Service Category : Version 1.0.
- Speech. as described by the Stage 1 Supplementary Description - Speech Audio Bearer Service Category : Version 1.0.
- 3.1 kHz audio. as described by the Stage 1 Supplementary Description - 3.1 kHz Audio Bearer Service Category : Version 1.0.

Semi permanent switched connections are considered as non ISUP controlled, and are therefore, outside the scope of this document.

2.2 Teleservices

The following teleservices are supported:

- Telephony (Recommendation I.241.1);
- Teletex (Recommendation I.241.2);
- Telefax Gr 4 (Recommendation I.241.3);
- Mixed mode (Recommendation I.241.4);
- Videotex (Recommendation I.241.5);
- Telefax Gr 2/3.

2.3 Supplementary services

The following supplementary services are supported:

- CLIP/CLIR as described by the Stage 1 Supplementary Description - Calling Line Presentation/Restriction : Version 1.0, and the Stage 3 Supplementary Description - Calling Line Presentation/Restriction : Version 1.0.
- ~~COLP/COLR~~ as described in Recommendation I.251.5/6;
- ~~CUA~~ as described in Recommendation I.255.1;
- UUS 1 implicit as described in Recommendation I.257.1; as described by the Stage 1 Supplementary Description - User to User Signalling : Version 1.0, and the Stage 3 Supplementary Description - User to User Signalling : Version 1.0

- Call Diversion as described by the Stage 1 Supplementary Description - Call Diversion Services :Version 1.0, and the Stage 3 Supplementary Description - Call Diversion Services: Version 1.0.

Line Hunting, Direct Dialling In and Multiple Subscriber Number are without significance to the Interconnect ISUP international interface.

Subaddressing, Malicious Call Trace and Terminal Portability (SUSPEND user initiated) is implicitly supported, as part of the basic Q.767 procedures.

2.4 Interworking between ISDN and PSTN/IDN

Interworking between ISDN and PSTN/IDN is supported for the following services:

- telephony;
- voice band data;
- ~~digital connectivity.~~

3 EXCEPTIONS AND CLARIFICATION TO THE ITU-T/CCITT BLUE BOOK ISUP RECOMMENDATIONS

3.1 General

The objective of this section is to specify the exceptions to ITU-T/CCITT Recommendations:

- Q.761 (Functional description of the ISDN User Part of CCITT Signalling System No.7);
- Q.762 (General functions of CCITT Signalling System No.7 ISDN User Part Messages and parameters);
- Q.763 (Formats and codes of CCITT Signalling System No.7 ISDN User Part Messages and parameters);
- Q.764 (Signalling procedures for CCITT Signalling System No.7 ISDN User Part);
- Q.730 (ISDN supplementary services),

with deletions, clarifications etc., for the Interconnect ISUP international application. The following information is presented as an exceptions document which should be read in conjunction with ITU-T/CCITT Recommendations Q.761 to Q.764 and Q.730. Annexes A to E contain the complete revised text.

Those parts of the ITU-T/CCITT Recommendation which have not been listed as exceptions and are not relevant to Interconnect ISUP international interconnection should only be used as additional information to aid understanding. Although this Specification Recommendation applies only to the national international signalling section, the specification of functions, formats and codes of messages and signals, and actions performed at originating and destination local exchanges is retained.

3.2 Exceptions and clarifications to Recommendation Q.761

Table 1/~~Q.767~~ contains three columns as follows:

- the first column marked "Section" identifies the relevant section of Recommendation Q.761;
- the second column marked "Title" identifies the relevant subject of Recommendation Q.761;
- the third column marked "Remarks" identifies the deviations from Recommendation Q.761 as appropriate for the Interconnect ISUP international signalling section.

~~No remark is made against national options. It is assumed that they will not occur on an international relation.~~

All subsections are the same as in Recommendation Q.761 unless indicated otherwise in Table 1/Q.767 below.

TABLE 1/Q.767

Q.761 Section	Title	Remarks
1	General	4th paragraph: SCCP is not used
2	Services supported by the ISDN User Part	The list of services and supplementary services is contained in Rec. Q.767, § 2 <u>this specification.</u>
3.2.4	Status	a) Delete in the 1st paragraph, 1st sentence: "or the ISDN User part at the destination is unavailable" b) The note to Table 1/Q.761 reads: "The cause parameter can assume one value: - signalling network congested."
4	End-to-end signalling	Not applicable

3.3 Exceptions and clarifications to Recommendation Q.762

Table 2/Q.767 contains three columns as follows:

- the first column marked "Section" identifies the relevant section of Q.762;
- the second column marked "Title" identifies the relevant subject of Q.762;
- the third column marked "Remarks" identifies the deviations from Q.762 as appropriate for the international signalling section.

All subsections are the same as in Recommendation Q.762 unless indicated otherwise in Table 2/Q.767 below.

The remark "Not used" in the table means that a message, parameter or indicator should not be generated at an outgoing or incoming gateway exchange towards a national interconnecting carriers ~~the international~~ signalling network and if such a message, parameter or indicator is received by a national intercarrier gateway exchange ~~an international exchange~~ the procedures defined in Recommendation Q.764, § 2.10.5 in combination with the remarks listed in the § 3.5 of ~~Recommendation Q.767~~ this specification against § 2.10.5 of Recommendation Q.764 are invoked.

The remark "Default value is used" in the table means that an indicator is seen on the Interconnect ISUP ~~international~~ interface, but only one value is allowed to be sent.

The remark "Default coding is used" in the table means that a parameter is seen on the Interconnect ISUP ~~international~~ interface, but only one coding is allowed to be sent.

~~No remark is made against messages and parameters marked "For national use". It is assumed that they will not appear on an international relation.~~

Paragraph 3.3.1 contains definitions for additional messages, parameters and indicators.

TABLE 2/Q.767 (SHEET 1 OF 5)

Q.762 section	Title	Remarks
1.5	Call modification completed message (CMC)	Not used
1.6	Call modification reject message (CMRJ)	Not used
1.7	Call modification request message (CMR)	Not used
1.8	<u>Call progress message (CPG)</u>	<u>1st paragraph changed. Indicating CPG in either direction and occurring after the ACM.</u>
1.9	<u>Charge information message (CRG)</u>	Not used
1.12	<u>Circuit group reset message (GRS)</u>	<u>Additional 2nd paragraph indicating message not used to unblock circuits.</u>
1.16	Circuit group query message (CQM)	Not used
1.17	Circuit group query response message (CQR)	Not used
1.18	Confusion message (CFN)	Not used <u>May be generated by a national ISUP application.</u>
1.20	<u>Continuity message (COT)</u>	Not used
1.21	<u>Continuity check request message (CCR)</u>	Not used
1.22	<u>Delayed release message (DRS)</u>	Not used
1.23	Facility accepted message (FAA)	Not used
1.24	Facility rejected message (FRJ)	Not used
1.25	Facility request message (FAR)	Not used
1.26	<u>Forward transfer message (FOT)</u>	Not used
1.27	Information message (INF)	Not used, <u>as CLI and CPC must be passed on every interconnecting call.</u>
1.28	Information request message (INR)	Not used, <u>as CLI and CPC must be passed on every interconnecting call.</u>
1.30	<u>Loop back acknowledgment message (LPA)</u>	Not used
1.31	<u>Overload message (OLM)</u>	Not used
1.32	Pass-along message (PAM)	Not used
1.33	Release message (REL)	Delete last sentence "In case the call..."

TABLE 2/Q.767 (SHEET 2 OF 5)

Q.762 section	Title	Remarks
1.35	<u>Reset circuit message (RSC)</u>	<u>Additional 2nd paragraph indicating not the normal message used to unblock circuits.</u>
1.41	<u>Unequipped circuit identification message (UCIC)</u>	<u>Not used</u>
1.42	User to user information message (USR)	Not used
2.2	Address presentation restricted indicator	Last sentence changed It is also used to indicate the non-availability of the address that the address cannot be ascertained.
2.3	<u>Address signal</u>	<u>1st sentence changed to include "and the overdecadic digits 10 to 15", "may be" and "by bilateral agreement"</u>
2.5	Call forwarding may occur indicator	Default value is used <u>Not used</u>
2.6	Call identity	Not used
2.7	Call reference	Not used
2.12	Calling party address request indicator	Not used
2.13	Calling party address response indicator	Not used
2.14	Calling party number incomplete indicator	Default value is used
2.15	<u>Calling party's category</u>	<u>Definition of valid CPC's included as well as national network use.</u>
2.16	Calling party's category request indicator	Not used
2.17	Calling party's category response indicator	Not used

TABLE 2/Q.767 (SHEET 3 OF 5)

Q.762 section	Title	Remarks
2.18 item a)	Cause value Normal class	<u>Cause 2 not used</u> <u>Cause 4 not used</u> <u>Cause 5 is added</u> <u>Additional definition for</u> <u>cause 17 and cause 19.</u> Cause 22: delete 2nd and 3rd sentences
item b)	Resource unavailable class	<u>Cause 43 defined</u> Additional definition for cause 44 (see § 3.3.1 of <u>this specification</u> Rec. Q.767)
item c)	Service or option not available class	Cause 50 not used <u>Cause 55 not used</u>
item d)	Service or option not implemented class	Causes 69 and 70 not used.
item e)	Invalid message (e.g. Parameter out of range) class	Cause 87 redefined (see § 3.3.1 of Rec. Q.767); <u>not used</u> cause 91 not used
item f)	Protocol error (e.g. unknown message) class	Cause <u>97, 99, 102 and 103</u> is added (see § 3.3.1 of <u>this</u> <u>specification Rec. Q.767</u>); Causes 97, 99, 103 not used. Cause 110 is added.
<u>2.20</u>	<u>Charge information request indicator</u>	<u>Not used</u>
<u>2.20.A</u>	<u>Message compatibility information</u> <u>parameter</u>	<u>See 3.3.1.6</u>
<u>2.21</u>	<u>Charge information response</u> <u>indicator</u>	<u>Not used</u>
2.24	Circuit state indicator	Not used
<u>2.25</u>	<u>Closed user group call indicator</u>	Default value is used <u>Not used</u>
<u>2.26</u>	<u>Closed user group interlock code</u>	<u>Note Used</u>
<u>2.26.A</u>	<u>Parameter compatibility information</u>	<u>See 3.3.1.7</u>
2.27	Coding standard	Default value is used
<u>2.28</u>	<u>Connected number</u>	<u>Default value is used</u>
2.29	Connection request	Not used
<u>2.30</u>	<u>Continuity check indicator</u>	<u>Not used</u>
<u>2.31</u>	<u>Continuity indicator</u>	<u>Not used</u>
2.32	Credit	Not used

TABLE 2/Q.767 (SHEET 4 OF 5)

Q.762 section	Title	Remarks
2.33	Diagnostic	Not used Used as defined within this specification.
2.35	End-to-end information indicator	Default value is used
2.36	End-to-end method indicator	Default value is used
2.38	Event presentation restriction indicator	Default value is used
2.40	Facility indicator	Not used
<u>2.41</u>	<u>Holding indicator</u>	<u>Not used</u>
<u>2.42</u>	<u>Hold provided indicator</u>	<u>Not used</u>
2.49	Local reference	Not used
<u>2.51</u>	<u>Malicious call identification request indicator</u>	<u>Not used</u>
2.52	Modification indicator	Not used
2.55	Numbering plan indicator	Default value is used Agreed value(s) is used
2.57	Original called number	Not used Used.
2.58	Original redirection reason	Not used
2.59	Point code	Not used
2.60	Protocol class	Not used
2.61	Protocol control indicator	Whether a bit or a bit combination contained in the PCI has history or control characteristic is specified in the definitions of the individual bits or bit combinations.
2.63	Recommendation indicator	Not used
2.64	Redirecting indicator	Not used Used.
2.65	Redirecting number	Not used Used.
2.66	Redirecting reason	Not used Used.
2.67	Redirecting counter	Not used Used.
2.68	Redirection number	Not used
2.71	SCCP method indicator	Default value is used Not used
<u>2.73</u>	<u>Signalling point code</u>	<u>Not used</u>
2.74	Solicited information indicator	Not used
<u>2.77</u>	<u>Temporary trunk blocking after release</u>	<u>Not used</u>
<u>2.78</u>	<u>Transit network selection</u>	<u>Not used</u>

TABLE 2/~~Q.767~~ (SHEET 5 OF 5)

Q.762 section	Title	Remarks
2.81	User to user indicators	Default value is used. <u>Last paragraph deleted - other values can be used.</u>
2.AA	Connected line identity request indicator	See § 3.3.1 of Rec. Q.767- <u>not used</u>
2.BB	Network discard indicator	See § 3.3.1 of Rec. Q.767- <u>not used</u>
Table 1/Q.762		Table 1/Q.762 is replaced by the following Table 3/Q.767. The following remarks apply: <ul style="list-style-type: none"> - Messages and parameters not used are not included. - Subfields included in used parameters and optional parameters included in used messages that are marked as "default value is used" are marked with bold type characters. - Subfields included in used parameters and optional parameters included in used messages that are marked as "default coding is used" are marked with underlined bold type characters.
<u>Table 2/Q.762</u>		<u>CCR - Continuity check request deleted.</u> <u>CFN - Confusion included.</u> <u>COT - Continuity deleted.</u> <u>FOT - Forward Transfer deleted.</u>

TABLE 3/Q.767 SHEET 1 OF 6)

Mandatory or optional parameters in the ISDN user part messages

Message	Group	Forward set-up		Gen-sup.	Backward set-up		Call Supervision			Circuit Supervision									
		IAM	SAM		COI	ACM	CON	CPG	ANM	FOI	REL	RLC	GCR RSC	BLO UBL	BLA UBA	SUS RES	CGB CGU	CGB A-C GUA	GRS GRA
Parameter field	Type Q.763 Annex C	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Message type	2.1	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Access transport	3.2	O			O	O	O												
Automatic congestion level	3.3																		
Backward call indicators	Charge indicator Called party's status indic. Called party's category ind. End to end method ind. Interworking ind. End to end information ind. ISDN user part ind. Holding-indicator ISDN access indicator Echo control device ind. SCCP-method ind.																		
Called party number	3.7	M																	

Bold characters means "default value is used". M = Mandatory O = Optional

TABLE 3 / Q.767 SHEET 3 OF 6)

Mandatory or optional parameters in the ISDN user part messages

Message	Parameter field	Subfield	Group	Forward set-up		Gen-sup.	Backward set-up		Call Supervision			Circuit Supervision							
				IAM	SAM		ACM	CON	CPG	ANM	FOF	REL	RLC	GCR RSC	BLO UBL	BLA UBA	SUS RES	CGB CGU	CGB A-C GUA
Connected-Number		Odd-even indicator Nature of address Numbering plan ind. Address pres. restricted ind. Screening ind. Address signals	3-14																
Continuity-indicators		Continuity indicators	3-16			AA													
Even indicators		Event indicator Event pres. restricted ind.	3.18						M										
Forward call ind.		National/international ind. End to end method ind. Interworking ind. End to end information ind. ISDN user part ind. ISDN user part preference ind. ISDN access ind. SCCP method ind.	3.20		M														

Bold characters means "default value is used".

TABLE 3/Q.767 SHEET 4 OF 6)

Mandatory or optional parameters in the ISDN user part messages

Message	Group	Forward set-up		Gen-sup.	Backward set-up			Call Supervision		Circuit Supervision																
		IAM	SAM		COI	ACM	CON	CPG	ANM	FOI	REL	RIC	RSC	GGR	BLO	BLA	SUS	CGB	CGU	CGB	GRS	GRA	GUA			
Parameter field	Type <u>Q.763</u> Annex C																									
Subfield	<u>3.20.A</u>																									
<u>Message information</u> Compatibility parameter field, instruction indicator subfield.																										
Nature of connection ind.	3.23	M																								
Optional backward call ind.	3.24																									
Optional forwarded cell ind.	3.25																									
Original Called Number	<u>3.26</u>																									
Parameter compatibility information.	<u>3.26.A</u>																									

Underlined, bold characters means "default coding is used".

3.3.1 Additional definitions

3.3.1.1 ~~connected line identity request indicator~~

~~Information sent in the forward direction indicating a request for the connected party number to be returned.~~

3.3.1.2 network discard indicator

This indicator indicates that user to user information included in the call control message has been discarded by the network.

3.3.1.3 cause 44 "Requested circuit/channel not available"

This cause is returned when the circuit or channel indicated by the requesting entity cannot be provided by the other side of the interface.

3.3.1.4 cause 87 "Called user not member of CUG"

~~This cause indicates that the called user for the incoming CUG call is not member of the specified CUG or that the calling user is an ordinary subscriber calling a CUG subscriber, respectively.~~

3.3.1.5 cause 102 "Recovery on timer expiry"

This cause indicates that a procedure has been initiated by the expiry of a timer in association with error handling procedures.

3.3.1.6 Message compatibility Information

Information sent in either direction indicating how an exchange should react in case this message is unrecognised.

3.3.1.7 Parameter compatibility Information

Parameter compatibility information parameter. Information sent in either direction indicating how an exchange should react in case the parameter is unrecognised.

3.4 Exceptions and clarifications to Recommendation Q.763

Table 4/~~Q.767~~ contains three columns as follows:

- the first column marked "Section" identifies the relevant section of Recommendation Q.763;
- the second column marked "Title" identifies the relevant subject of Recommendation Q.763;
- the third column marked "Remarks" identifies the deviations from Recommendation Q.763 as appropriate for the international signalling section.
- All subsections are the same as in Recommendation Q.763 unless indicated otherwise in Table 4/~~Q.767~~ below.

The remark "Not used" in the table means that a message, parameter or indicator should not be generated at an outgoing or incoming gateway exchange towards the National ~~international~~ signalling network and if such a message, parameter or indicator is received by an national exchange the procedures defined in Recommendation Q.764 § 2.10.5 in combination with the remarks listed in § 3.5 of ~~Recommendation Q.767~~ this specification against § 2.10.5 of ~~Recommendation Q.767~~ this specification are invoked.

All spare bits are reserved and not used. All code values marked "Reserved" or "Spare" are reserved and not used. All codings allocated by CCITT to messages, parameters and indicators which are marked as "Not used" in the table below may only be reintroduced for the CCITT specified purpose.

~~No remark is made against messages, parameters and parameter values marked "For national use". It is assumed that they will not appear on an international relation.~~

TABLE 4/Q.767 (SHEET 1 OF 7)

Q.763 section	Title	Remarks
1	General	The Note is not applicable
1.2	Circuit identification code	See § 4.1.11 of <u>this specification</u> Rec. Q.767
1.4	Formatting principles	Additional sentence: Between parameters there should be no unused (i.e. dummy) octets.
1.6	Mandatory variable part	2nd paragraph, 3rd sentence is replaced by : If the message type indicates that an optional part is possible (reflected by the presence of an "end of optional parameter octet" in Tables 5/Q.767 through 28/Q.767), but there is no optional part included in this particular message than a pointer field containing all zeros will be used. Add the following paragraphs at the end of § 1.6: If there are no mandatory variable parameters, but optional parameters are possible, the start of optional parameters pointer (coded all '0's if no optional parameter is present and coded '000001' if any optional parameter is present) will be included. <u>Note that the pointer to the start of the optional part shall be included if the message type indicates that an optional part is allowed irrespective of whether mandatory variable parameters are included. If there are no optional parameters present the Start Of Pointer (SOP) should be set to all zeros or should point to the End Of Pointer (EOP) if the EOP is present.</u>

TABLE 4/Q.767 (SHEET 2 OF 7)

Q.763 section	Title	Remarks
1.8	End of optional parameters octet	Additional sentence : If no optional parameter is present an "end of optional parameter" octet is not transmitted.
1.10	<u>Coding of spare bits</u>	<u>Additional paragraph :</u> <u>Reserved bits shall also be set to zero and where parameters are defined as not to be provided but must be included to maintain bit pattern structure, they shall be set to zero.</u>
1.11	National message types and parameters	Not used.
2.1	Message type codes Table 3/Q.763	The following message types are not used: <ul style="list-style-type: none"> • Call modification completed • Call modification reject • Call modification request • Circuit group query • Circuit group query response • Confusion • <u>Charge Information</u> • <u>Continuity</u> • <u>Continuity check request</u> • <u>Delayed release</u> • Facility accepted • Facility request • Facility reject • <u>Forward Transfer</u> • Information • Information request • <u>Loop back acknowledgment</u> • <u>Overload</u> • Pass along • <u>Unequipped CIC</u> • User to user information
3.1	Parameter names Table 4/Q.763	The following parameters are not used: <ul style="list-style-type: none"> • Call modification indicators • Call reference • Circuit state indicator • <u>Closed user interlock code</u> • <u>Connected number</u> • Connection request • <u>Continuity indicator</u> • Facility indicator • Information indicators • Information request indicators • Original called number • Redirecting number • Redirection information • Redirection number • <u>Signalling point code</u> • <u>Transit network selection</u>

TABLE 4/Q.767 (SHEET 3 OF 7)

Q.763 section	Title	Remarks
3.2	Access transport	For the contents and the length of the Access Transport Parameter, see § 4.3.2 of Rec. Q.767. <u>this specification.</u>
3.4	Backward call indicators	BA: is used <i>Note</i> – The interpretation of these bits depends only on the originating exchange. DC = 10: not used HG = 00: is used only J = 1: is not used L = 1: is not used PO = 00: is used only
3.5	Call modification indicators	Not used
3.6	Call reference	Not used
3.7		
item b)	Nature of address indicator	Only 000 0011 and 000 0100 are <u>000 0010</u> is used
item e)	<u>Address signal</u>	<u>1010, 1101 and 1110</u> included
item d)	Numbering plan indicator	001 is used only
3.8	Figure 10/Q.763	Delete note
item b)	Nature of address indicator	000 0100 <u>000 0011</u> is used only
item c)	Calling party number incomplete indicator (NI)	1 is not used
item d)	Numbering plan indicator	001 is used only
item e)	Address presentation restricted indicator	10 is not used for calling party number Delete note
item f)	Screening indicator	Only 01 and 11 are used Delete note
item g)	<u>Address signal</u>	<u>1010, 1101, 1110 and 1111</u> included
3.9	Calling party's category	00000000 not used <u>As defined in this specification.</u>
3.10	Cause indicators	Only octets 1 and 2 will be supported Coding standard: only 00 is used; delete note Location: 0001 and 0010 are <u>0011</u> is not used Recommendation: not used Cause value: 2, 4, 5, 50, 55, 69, 70, 87, 91, 97, 99, 103 are not used Diagnostic: not used <u>is added.</u> Cause 87 is redefined Cause 102 "Recovery on timer expiry" is used in addition <u>Cause 110 "Message with unrecognised parameter discarded" is used in addition.</u>

TABLE 4/Q.767 (SHEET 4 OF 7)

Q.763 section	Title	Remarks
3.12	Circuit state indicator	not used
3.13	Closed user group interlock code	Add sentence: "Only international interlock codes shall be used" <u>not used</u>
3.14	Connected number	<u>Not used</u>
item b)	Nature of address indicator	Only 0000000 and 0000100 are used <u>not used</u>
item c)	Numbering plan indicator	Only 000 and 001 are used <u>not used</u>
item e)	Screening indicator	00 and 10
3.15	Connection request	Not used
3.16	<u>Continuity indicators</u>	<u>Not used</u>
3.18	Event information	0000100-0000110 not used Event presentation restricted indicator is always set to 0
3.19	Facility indicator	Not used
3.20	Forward call indicators	CB = 00: is used only E = 1: is not used KJ = 00: is used only
3.21	Information indicators	Not used
3.22	Information request indicators	Not used
3.24	Optional backward call indicators	B = 0 and <u>B=1 are</u> is used only
3.25	Optional forward call indicators	<u>Not used</u>
	Additional indicator:	Bit H: H = 0: not requested H = 1: requested
	Connected line identity request indicator	
3.26	Original called number	Not used As defined in this specification.
3.27	Range and status	a) Range: Range code 0: is not used b) Status: The minimum number of status bits in the status subfield is 2 Query messages are not used
3.28	Redirecting number	Not used As defined in this specification.
3.29	Redirection information	Not used As defined in this specification.
3.30	Redirection number	Not used
3.31	<u>Signalling Point Code</u>	<u>Not used</u>

TABLE 4 / ~~Q.767~~ (SHEET 5 OF 7)

Q.763 section	Title	Remarks
3.34	Transit network selection	Not used
3.35	Transmission medium requirements	0000 0000, 0000 0010, 0000 0011 are used only
3.36	User service information	<u>The following 2 paragraphs are inserted: The following codes are provided as an indication of what can be supported in the user service information parameter. The utilisation of the codes is subject to each National networks implementation and therefore is subject to bilateral agreements. The inclusion of all the codes in this specification, in no way defines or determines the requirements of a National network, nor requires a National network to implement or support the transit of all or any of the codes.</u> for further information see § 4.3 of Rec. Q.767 this specification.
3.37	User-to-user indicators	A = 1: is used only CB = 00, ED = 00, GF = 00 are used only
	Additional indicator:	Bit H:
	Network discard indicator	H = 0: no information H = 1: UUI discarded by the network H = 1 is used only
Table 5	Message type : Address complete	a) The following parameters are not used: • Call reference • Connected number b) length of cause indicators is 4 c) length of User to User information is 3-131; delete reference and note a)
Table 6	Message type : Answer	a) The following parameters are not used: • Optional backward call indicator • Call reference • User to User indicators b) length of User to User information is 3-131; delete reference and note a)
Table 7	Message type: Call progress	a) The following parameters are not used: • Call reference • Cause indicators • Redirection number • User to user indicators b) length of User to User information is 3-131; delete reference and note a)

TABLE 4/Q.767 (SHEET 6 OF 7)

Q.763 section	Title	Remarks
Table 8	Message type: Circuit group query response	Not used
Table 10	Message type: Confusion	Not used , Message added.
Table 11	Message type: Connect	a) The following parameters are not used: <ul style="list-style-type: none"> • Optional backward call indicator • Call reference b) length of User to User information is 3-131; delete reference and note a)
Table 12	Message type: Continuity	Not used
Table 13	Message type: Facility reject	Not used
Table 14	Message type: Information	Not used
Table 15	Message type: Information request	Not used
Table 16	Message type: Initial address	a) The following parameters are not used: <ul style="list-style-type: none"> • <u>Transit network selection</u> • Call reference • Connection request • Redirecting number • Redirection information • User to User indicators • <u>Closed user group interlock code</u> b) Note c) is not applicable c) length of User to User information is 3-131; delete reference and note b)
Table 17	Message type: Release	a) The following parameters are not used: <ul style="list-style-type: none"> • Access transport • Redirection information • Redirection number • <u>Signalling Point Code</u> b) length of User to User information is 3-131; delete reference and note b) e) length of cause indicators is 3
Table 18	Message type: Release complete	cause indicators: not used <u>length of cause indicator 5-6</u>
Table 20	Message type : User to user information	Not used
Table 21	Message type : Forward transfer	Call reference is not used <u>Not used</u>
Table 22	Message type : Suspend Resume	Call reference is not used

TABLE 4/Q.767 (SHEET 7 OF 7)

Q.763 section	Title	Remarks
Table 23	<u>Message type :</u> <u>Blocking</u> <u>Blocking acknowledgment</u> <u>Continuity check request,</u> <u>Loop back acknowledgment</u> <u>Overload,</u> <u>Reset circuit</u> <u>Unblocking</u> <u>Unblocking acknowledgment</u> <u>Unequipped circuit identification</u> <u>code (national use), not used</u>	<u>Continuity check request, not used</u> <u>Loop back acknowledgment, not used</u> <u>Overload, not used</u> <u>Unequipped circuit identification</u> <u>(national use), not used</u>
Table 24	Message type : Call modification completed Call modification request Call modification reject	Not used
Table 26	Message type : Circuit group reset Circuit group query	Circuit group query: not used
Table 27	Message type : Facility accepted Facility request	Not used
Table 28	Message type : Pass-along	Not used
Annex A		For action on spare codes refer to § 4.1.1 of Rec. Q.767 this specification.

3.4.1 Additional formats and codes

3.4.1.1 Connected line identity request indicator

See § 3.25 in Table 4/Q.767.

3.4.1.2 Network discard indicator

See § 3.37 in Table 4/Q.767.

3.4.1.3 Cause 102 "Recovery on timer expiry"

See § 3.10 in Table 4/Q.767.

3.4.1.4 Message Compatibility Information

See § C.3.20A.

3.4.1.5 Parameter Compatibility Information

See § C.2.26A

3.5 Exceptions and clarifications to Recommendation Q.764

Table 5/Q.767 contains three columns as follows:

- the first column marked “Section” identifies the relevant section of Recommendation Q.764;
- the second column marked “Title” identifies the relevant subject of Recommendation Q.764;
- the third column marked “Remarks” identifies the deviations from Recommendation Q.764 as appropriate for the international signalling section.

All subsections are the same as in Recommendation Q.764 unless indicated otherwise in Table 5/Q.767 below.

The remark “Not applicable” in the table means that a procedure described in Recommendation Q.764 is not available in the international signalling network and is therefore not used on the international signalling links.

~~No remark is made against procedures marked “For national use”. It is assumed that they will not be invoked on an international relation.~~

TABLE 5/Q.767 SHEET 1 OF 8)

Q.764 section	Title	Remarks
1.2	Numbering	1st paragraph replaced with : “The Australian Numbering plan will be used. Where possible alignment to Recommendations E.163 and E.164 should be attempted however bilateral agreements may be required.”
1.3	Address signalling	Note – The use of en-bloc or overlap signalling is based on bilateral agreements.
1.5	Signalling methods	1st paragraph, replace first sentence with: “One signalling method is used in this Recommendation” Delete 2nd hyphenated item 2nd paragraph, delete last sentence
1.6	Layout of Recommendation. Q.764 Annex D	Delete 2nd and last sentence
2.	Basic call control and signalling procedures	Additional paragraph : “Note that the routing of calls is determined by the dialled digits, the subscriber’s category and service activated. If the originating exchange is an SSP, routing may also be determined by IN trigger points.

TABLE 5/Q.767 SHEET 2 OF 8)

Q.764 section	Title	Remarks
2.1.1.1	Actions required at the originating exchange	
item a)	Circuit selection	<ul style="list-style-type: none"> a) $n * 64$ kbit/s connections are not supported b) Connection types "alternate speech/64 kbit/s unrestricted" and "alternate 64 kbit/s unrestricted/speech" are not supported c) The sentence "the first value of bearer information received will be used to set the initial mode of the connection." is not applicable d) <u>The paragraph : "If the ISDN User Part preference indicator indicates "required" and no ISDN User Part route is available, the call will be released." is added.</u>
2.1.1.1 (cont)	Actions required at the originating exchange	
item b)	<u>Address information sending sequence</u>	a) <u>Section replaced with : "The sequence and coding of the address signals for National interconnection will be determined on a bilateral basis for each interconnected service."</u>
item c)	Initial address message	<ul style="list-style-type: none"> a) <u>3rd paragraph item i) reads: "The only type of end to end method..." and delete "§ 3" and item iv) are not applicable.</u> b) <u>Delete at the end of the paragraph starting with "The ISDN UP preference indicator..." the last sentence starting with "In addition..."</u> c) <u>At the end of the section items (i) and (iii) are not applicable</u>
item d)	Transfer of information not included in the initial address message	Not applicable
item e)	<u>Completion of transmission path</u>	<u>Clarification included.</u>
2.1.1.2	Actions required at an intermediate exchange	
item a)	Circuit selection	<ul style="list-style-type: none"> 1st paragraph, delete sentences starting with: "Within a network..." to "...connection type" <u>2nd paragraph, last sentence deleted.</u>
item b)	Parameters in the initial address message	<ul style="list-style-type: none"> a) <u>Delete in 2nd sentence: "end to end method indicator"</u> b) <u>Delete 3rd sentence: " A change..."</u>

TABLE 5 / Q.767 SHEET 3 OF 8)

Q.764 section	Title	Remarks
2.1.1.3	Actions required at the destination exchange	2nd paragraph is not applicable
2.1.2.1	Actions required at the originating exchange	
item a)	Circuit selection	<ul style="list-style-type: none"> a) $n * 64$ kbit/s connections are not supported b) Connection types "alternate speech/64 kbit/s unrestricted" and "alternate 64 kbit/s unrestricted/speech" are not supported c) The sentence "the first value of bearer information received will be used to set the initial mode of the connection." is not applicable
2.1.2.1 (cont)	Actions required at the originating exchange	
item b)	<u>Address information sending sequence</u>	a) <u>Paragraph included : "The sequence and coding of the address signals for National interconnection will be determined on a bilateral basis for each interconnected service."</u>
item c)	Content of initial and subsequent address Messages	2nd sentence in the 1st paragraph reads "The contents of the initial address message is the same as described in § 2.1.1.1 c) taking into account the remarks against § 2.1.1.1 c) given in this <u>recommendation specification.</u> " <u>4th and 5th paragraph deleted.</u>
item d)	Transfer of information not included in the Initial Address Message	Not applicable
item e)	<u>Completion of transmission path</u>	<u>Clarification included.</u>
2.1.2.2	Actions required at an intermediate exchange	
item a)	Circuit selection	Delete 2nd, <u>4th and 5th</u> paragraphs
item b)	Parameters in the initial address message	<ul style="list-style-type: none"> a) Delete in 2nd sentence: "end to end method indicator" b) Delete 3rd sentence: " A change..."
2.1.2.3	Actions required at the destination exchange	2nd paragraph is not applicable, <u>additional paragraph : "Also, if the called part has an analogue access, the connection is only allowed when the transmission medium requirement indicates "speech" or "3.1kHz audio".</u>
2.1.3	Calling party number	The only method is to send this information within the IAM

TABLE 5/Q.767 SHEET 4 OF 8)

Q.764 section	Title	Remarks
<u>2.1.4.1</u>	<u>Return of address complete message from destination exchange</u>	<u>1st paragraph, 1st sentence changed, last sentence deleted. Section 2) item a) deleted.</u>
<u>2.1.4.4</u>	<u>Receipt of address complete message or the connect message at the originating exchange</u>	<u>Item e) added.</u>
<u>2.1.4.8</u>	<u>Return of address complete message in interworking situations</u>	<u>Section deleted. Additional paragraph, "An address complete message shall always be sent."</u>
<u>2.1.4.9</u>	<u>Return of subaddress information in ACM, CON or CPG</u>	<u>Not applicable for ACM and CPG; subaddress information can only be returned in ANM or CON; for the detailed procedure see Recommendation-Q.767, § 4 of this specification.</u>
<u>2.1.4.10</u>	<u>Receipt of conflicting backward call indicators</u>	<u>New section added.</u>
<u>2.1.5</u>	<u>Call progress</u>	<u>CPG can only be sent after ACM</u>
<u>2.1.6</u>	<u>Information messages</u>	<u>Not applicable</u>
<u>2.1.7</u>	<u>Answer message</u>	<u>See Rec. Q.767, § 4 of this specification for the handling of subaddress</u>
<u>2.1.8</u>	<u>Continuity-check</u>	<u>Not applicable</u>
<u>2.1.9</u>	<u>Special procedures at an interworking point</u>	<u>Not applicable</u>
<u>2.1.10</u>	<u>Cross-Office check</u>	<u>Not applicable</u>
<u>2.1.11.2</u>	<u>Network charging messages</u>	<u>Not applicable</u>
<u>2.1.12</u>	<u>Forward transfer message</u>	<u>Procedures are not supported by all-network operators, Not applicable</u>
<u>2.1.13</u>	<u>Transit network selection</u>	<u>Not applicable</u>
<u>2.2.1</u>	<u>Unsuccessful call set-up Actions at exchange initiating a release message</u>	<u>Replace second sentence with: "The exchange sends a release message to the preceding exchange and timers T1 and T5 are started to ensure that a release complete message is received from the preceding exchange (expiration of timers T1 and T5 is covered in § 2.10.6)."</u>
<u>2.2.2</u>	<u>Action at intermediate exchange</u>	<u>Replace 2nd sentence with: "Timers T1 and T5 are started to ensure that a release complete message is received from the preceding exchange (expiration of timers T1 and T5 is covered in § 2.10.6)."</u>
<u>2.2.4</u>	<u>Tones and announcements</u>	<u>Additional definitions and procedures included.</u>

TABLE 5 / Q.767 (SHEET 5 OF 8)

Q.764 section	Title	Remarks
2.2.5	Address incomplete	Add the following text as a new § 2.2.5: "The determination that proper number of digits has not been received can be made at once if the end of pulsing signal is received. When overlap working is used, and the end of pulsing signal has not been received, the release message with cause 28 (address incomplete) will be sent 15-20 seconds (T35) after receipt of the latest digit and before receipt of the minimum or fixed number of digits for forward routing of the call."
2.3.1	Release initiated by a calling party	
item a)	Actions at the originating exchange	Replace 2nd sentence with: "A release message is sent to the succeeding exchange and timers T1 and T5 are started to ensure that a release complete message is received from the succeeding exchange (expiration of timers T1 and T5 is covered in § 2.10.6)."
2.3.1 (cont)	Release initiated by a calling party	
item b)	Actions at an intermediate exchange	Replace 2nd sentence of item (ii) with: "Timers T1 and T5 are started to ensure that a release complete message is received from the succeeding exchange (expiration of timers T1 and T5 is covered in § 2.10.6)."
item d)	Charging	<u>National matter. Bilateral agreement necessary for each interconnecting service.</u>
2.5.1.1	Suspend initiated by a calling party	The suspend request controlling exchange is within the network of the suspend initiating user
item a)	Actions at originating exchange	add "or notification" after "suspend request"
2.5.1.2	Suspend initiated by a called party	The suspend request controlling exchange is within the network of the suspend initiating user
2.5.3	Expiration of timer T2 or timer T6	Cause value # 102 is used in the release message
2.7	In-call modification	Not applicable

TABLE 5/Q.767 SHEET 6 OF 8)

Q.764 section	Title	Remarks
2.8.3.1	Echo control procedure Actions at the destination exchange	a) Remove "or call progress" from the second hyphenated item b) Replace "nature of connection indicators field not being set" with "backward call indicators parameter field" in the last paragraph
2.8.3.2	Echo control procedure Actions at an intermediate exchange	a) Remove "or call progress" from the first sentence
<u>2.9.1</u>	<u>Automatic repeat attempt</u>	<u>item iv) deleted</u>
<u>2.9.2</u>	<u>Blocking and unblocking of circuits and circuit groups</u>	<u>Additional explanatory paragraph added.</u>
<u>2.9.2.2</u>	<u>Circuit group blocking and unblocking of messages</u>	<u>5th paragraph deleted.</u>
2.9.2.3	Abnormal blocking and circuit group blocking procedures	a) In item iv) replace the end of the 1st sentence with: "...group blocking message, then the maintenance system should be notified for the circuits concerned." b) In item (v) and (vii) replace "a circuit group unblocking message will be sent" with "the maintenance system should be notified". c) Editorial, renumber 2nd item iv) with vi) d) In item (vi) and (viii) replace "a circuit group blocking message will be sent" with "the maintenance system should be notified". e) In item (ix) replace "may" with "shall" in the last line f) In item (xii) replace "an unblocking message will be sent" with "the maintenance system should be notified". g) In item (xiii) replace "a blocking message will be sent" with "the maintenance system should be notified".
2.9.3	Circuit group query	Not applicable
<u>2.10.1.3</u>	<u>Preventive action</u>	<u>Only method 2 supported</u>
2.10.1.4	Actions to be taken on detection of dual seizure	Last sentence is not applicable

TABLE 5 / Q.767 (SHEET 7 OF 8)

Q.764 section	Title	Remarks
2.10.3.1	Reset circuit message	a) The 4-15 <u>15-60</u> s timer is T16 b) The + <u>5-15</u> min timer is T17 c) Replace in item f) 2nd sentence with: The circuit shall be made available for service after receipt of the appropriate acknowledgment message
2.10.3.2	Circuit group reset message	
	a)	The 4-15 <u>15-60</u> s timer is T22
	b)	The + <u>5-15</u> min timer is T23
2.10.4	Failure in the blocking/ unblocking sequence	a) The 4-15 <u>15-60</u> s timer is T12 for blocking message, T14 for unblocking message, T18 for circuit group blocking message, T20 for circuit group unblocking message. b) The + <u>5-15</u> min timer is T13 for blocking message, T15 for unblocking message, T19 for circuit group blocking message, T21 for circuit group unblocking message
2.10.5.1	Handling of unexpected messages	a) In item c) the last sentence is not applicable b) Item e) is not applicable
2.10.5.2	General requirements on receipt of unrecognised signalling information messages and parameters	Not applicable For further information, see Rec. Q.767, § 4.1.1
Table 1	Minimum messages recognised and parameters	Not applicable For further information, see Rec. Q.767, § 4.1.1
2.10.5.3	Procedures for handling of the unrecognised messages or parameters	Not applicable For further information, see Rec. Q.767, § 4.1.1
2.10.6	Failure to receive a "release complete" message	Replace "retransmitting" with "transmitting" in the 1st sentence of 2nd paragraph.
2.10.7	Failure to receive a response to an INR	Not applicable
2.10.8.2	Call-failure	Replace 1st sentence with: The call failure indication (cause #31) is sent in a release message whenever a call attempt fails and other specific cause value do not apply

TABLE 5/~~Q.767~~ SHEET 8 OF 8)

Q.764 section	Title	Remarks
2.10.8.3	Abnormal release conditions	a) Replace "T6" by "T9" b) Add the following item to b) and c) : "– on failure to receive an address message before 15-20 seconds (T35) after receipt of the latest address message and before the minimum or fixed number of digits have been received."
2.10.8.4	Message loss during end-to-end transfer	Not applicable
2.10.8.5	SCCP supervision timer	Not applicable
2.10.10	Temporary trunk blocking before release of call	Not applicable
2.12	Automatic congestion control	a) The parameter should be recognised. b) If this procedure is not implemented the ACC parameter is not acted upon and discarded as normal
3	End-to-end signalling	Neither the pass-along method nor the SCCP method is applicable, only the link-by-link method is supported
Table A	Timers in Recommendation Q.764	See the following Table 6/ Q.767 in this specification

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TABLE 6/Q.767 SHEET 1 OF 4)

Timers in Recommendation Q.764

Symbol	Time-out value	Significance	Cause for initiation	Normal termination	At expiry	Section
T1	4-15- <u>15-60</u> seconds	Local	When release message is sent	At the receipt of release complete message	Re-transmit release message and start timer T1	2.2 - 2.3.1 2.10.6
T2	3 min	Dual	When suspend request controlling exchange receives suspend (user) message	At the receipt of resume (user) message at controlling exchange	Initiate release procedure	2.5.1.1 2.5.2.1 2.5.3
T3			Not used on the international interface			2.6
T4			Not used on the international interface			2.7.1 2.7.2
T5	1-5-15 mins	Local	When initial release message is sent	At receipt of release complete message	Send reset circuit message, alert maintenance personnel and remove the circuit from service, stop T1 start T17. Procedure continues until maintenance intervention occurs	2.2 2.3.1 2.10.6
T6	Covered in Rec. Q.118	Dual	When controlling exchange receives suspend (network)	At the receipt of resume (network) message	Initiate release procedure	2.5.1.3 2.5.2.3 - 2.5.3
T7	20-30 s	Dual	When the latest address message is sent	When the condition for normal release of address and routing information is met (receipt of ACM, CON messages)	Release all equipment and connection (send release message)	2.1.1.1 2.1.4.4 2.1.4.8 2.1.2.1 f) 2.10.8.3
T8	10-15 s	Local	When transit or incoming international exchange receives initial address message requiring continuity check on this circuit, or indicates that continuity check has been performed on a previous circuit	At receipt of continuity message	Release all equipment and connection into international network (send release message)	2.1.8 2.10.8.3
T9	Interval specified in Rec. Q.118	Dual	When national controlling or outgoing international National exchange receives ACM	At the receipt of answer	Release connection and send back release message	2.1.4.4 2.1.7.2 2.1.7.3 2.10.8.3

TABLE 6/Q.767 SHEET 2 OF 4)

Timers in Recommendation Q.764

Symbol	Time-out value	Significance	Cause for initiation	Normal termination	At expiry	Section
T10	4-6 s	Dual	When last digit is received in interworking situations	At the receipt of fresh information	Send address complete message	2.1.2.1 e) 2.1.4.8
T11	15-20 s	Dual	When latest address message is received in interworking situations	When ACM is sent complete message	Send address	2.1.4.8
T12	4-15 <u>15-60</u> seconds	Local	When blocking message is sent	At receipt of blocking acknowledgment	Re-transmit blocking message and start T12	2.10.4
T13	1-5-15 mins	Local	When initial blocking message is sent	At receipt of blocking acknowledgment	Transmit blocking message, alert maintenance personnel and start T13; stop T12. Procedure continues until maintenance intervention occurs	2.10.4
T14	4-15 <u>15-60</u> seconds	Local	When unblocking message is sent	At receipt of unblocking acknowledgment	Re-transmit unblocking message and start T14	2.10.4
T15	1-5-15 mins	Local	When initial unblocking message is sent	At receipt of unblocking acknowledgment	Re-transmit unblocking message and alert maintenance personnel, start T15, and stop T14. Procedure continues until maintenance intervention occurs	2.10.4
T16	4-15 <u>15-60</u> seconds	Local	When reset circuit message is sent not due to the expiry of Timer T5	At the receipt of the acknowledgment (RLC message)	Re-transmit reset circuit message start T16	2.10.3.1
T17	1-5-15 mins	Local	When initial reset circuit message is sent	At the receipt of the acknowledgment	Alert maintenance personnel, retransmit reset circuit message, start T17 and stop T16. Procedure continues until maintenance intervention occurs	2.10.3.1
T18	4-15 <u>15-60</u> seconds	Local	When group blocking message is sent	At receipt of group blocking acknowledgment	Re-transmit group blocking message and start T18	2.10.4

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TABLE 6 / Q.767 (SHEET 3 OF 4)

Timers in Recommendation Q.764

Symbol	Time-out value	Significance	Cause for initiation	Normal termination	At expiry	Section
T19	1-5-15 mins	Local	When initial group blocking message is sent	At receipt of group blocking acknowledgment	Re-transmit group blocking message, alert maintenance personnel, start T19 and stop T18. Procedure continues until maintenance intervention occurs	2.10.4
T20	4-15-15-60 seconds	Local	When group unblocking message is sent	At receipt of group unblocking acknowledgment	Re-transmit group unblocking message and start T20	2.10.4
T21	1-5-15 mins	Local	When initial group unblocking message is sent	At the receipt of group unblocking acknowledgment	Re-transmit group unblocking message, alert maintenance personnel, start T21 and stop T20. Procedure continues until maintenance intervention occurs	2.10.4
T22	4-15-15-60 seconds	Local	When circuit group reset message is sent	At the receipt of the acknowledgment	Re-transmit circuit group reset message, start T22	2.10.3.2
T23	1-5-15 mins	Local	When initial circuit group reset message is sent	At receipt of the acknowledgment	Alert maintenance personnel and start T23, re-transmit circuit group reset message, stop T22. Procedure continues until maintenance intervention occurs	2.10.3.2
T24	<2 s	Local	When check tone is sent	At the receipt of backward check tone	Send continuity message with failure indication and: a) start T25 if continuity check was asked in an IAM and make automatic repeat attempt, or b) start T26 if continuity check was asked in a CCR	Rec. Q.724, §7.4.1
T25	1-10 s	Local	When initial continuity check failure is detected		Send CCR message and repeat continuity check	Rec. Q.724, §7.3

TABLE 6/Q.767 (SHEET 4 OF 4)

Timers in Recommendation Q.764

Symbol	Time-out value	Significance	Cause for initiation	Normal termination	At expiry	Section
T26	1-3 min	Local	When second or subsequent continuity check failure is detected		Send CCR message and repeat continuity check	Rec-Q.724, § 7.3
T27	4 min	Local	When continuity check failure indication is received	At receipt of continuity check request message	Send reset circuit message; start T16 and T17	2.1.8
T28			Not used on the international interface			2.9.3.2
T29	300 - 600 ms	Local	Congestion indication received when T29 not running		New congestion indication will be taken into account	2.11.2
T30	5-10 s	Local	Congestion indication received when T29 not running		Restore traffic by one step if not yet at full load and start T30	2.11.2
T31			Not used on the international interface			3.7.2 3.7.3 3.7.4
T32			Not used on the international interface			3.7.5
T33			Not used on the international interface			2.1.6.2 2.10.7
T34			Not used on the international interface			2.9.3.2
T35	15-20 s	Dual	At receipt of the latest digit (< > ST) and before the minimum or fixed number of digits have been received	At receipt of ST or when the minimum or fixed number of digits have been received <u>Depending on bilateral agreements</u>	Send release message (cause 28)	2.2.5 2.10.8.3
T36	10-15 s	Local	When transit or incoming international exchange receives continuity check request message	At receipt of continuity or release message	Release all equipment; sent reset circuit message; start T16 and T17	2.1.8

3.6 Exceptions and clarifications to Recommendation Q.730

(This section is not applicable to the Interconnect ISUP specification international interface)

4 GUIDELINES FOR INTERCONNECT ISUP

4.1 Clarifications to ISUP basic call control procedures

4.1.1 Handling of unrecognised signalling information

Refer Section D.2.10.5

4.1.1.1 In national interconnect ISUP transit situations

(This section is not applicable to the Interconnect ISUP specification)

4.1.1.2 In incoming/outgoing gateway or in interworking situations

(This section is not applicable to the Interconnect ISUP specification)

4.1.2.1 Usage of causes

Table 10/Q-767 indicates the usage of cause values for the Interconnect ISUP interface.

a) meaning of notes:

*location: see item b) "handling of location indicators"

b) used abbreviations:

U: user

LPN: private network serving the local user

PRNRPN: private network serving the remote user

TN: transit network

INT: international network

LN: public network serving the local user

RLN: public network serving the remote user

~~Setting causes 18 and 19, and using location "public or private network serving the remote user" or any other cause with location "user or private network serving the remote user" should imply that the call has reached the called party, i.e. end-to-end fields have been transmitted.~~

~~National networks should make sure, to avoid public network misuse, that the following locations are not generated on the access:~~

~~- public, international, transit network and beyond an interworking point.~~

~~The cause value sent is the one of the latest-occurred event (e.g. retransmitting of the release message).~~

TABLE 10/Q.767 (SHEET 1 OF 3)

Cause information element/parameter

Cause	Definition	Location	Reference	Notes
1	Unallocated (unassigned) number	RPN, LN	Q.931	
		RN, INTL	Q.931	No route by digit analysis
3	No route to destination	RPN, LN, RN	Q.931	
5	Misdialed trunk prefix	LN, RN		
16	Normal call clearing	U, RPN, LPN	Q.931	
17	User busy	U, RPN, LPN, RN	Q.931	Basic call and Call diversion services
18	No user responding	RN	Q.931	Call diversion services
19	No answer from user (user alerted)	RN	Q.931 Q.767 (D.2.1.4.4.) Q.767 (D.2.10.8.3)	
		RN, INT		Expiry of waiting ANMtimer (T9)
		RN		Call diversion services
21	Call rejected	U, RPN	Q.931	
		RN		Call diversion services
22	Number changed	U, RPN, LN, RN	Q.931	
27	Destination out of order	RN, RPN	Q.931	
28	Invalid number format (address incomplete)	U, RPN, RN, LN	Q.931	
		INT	Q.767 (D.2.1.1) Q.767 (D.2.1.2.1) Q.767 (D.2.10.8.3) Q.767 (D.2.2.5)	The called party number is not in a valid format or is not complete
		INT, RN, RPN		
29	Facility rejected	RN, U, RPN, LN		
		INT	Q.931	Inability to provide a requested signalling capability

TABLE 10/Q.767 (SHEET 2 OF 3)

Cause information element/parameter

Cause	Definition	Location	Reference	Notes
31	Normal, unspecified	RLN		
		INT, RLN	Q.931 Q.767 (D.2.1.1.1) Q.767 (D.2.1.2.1) Q.767 (D.2.9.1) Q.767 (D.2.9.2.1) Q.767 (D.2.9.2.2) Q.767 (D.2.10.3) Q.767 (2.10.6) Q.767 (D.2.10.8.2) Q.767 (2.10.8.3)	Call failure information indicating the failure of a call due to the lapse of a timeout or a fault not covered by specific causes (examples: expiry of timers Q.764 not covered by specific causes, release of interconnected circuit,...)
		RLN		Expiry of waiting INF timer (T33)
34	No circuit/channel available	U, RPN, RLN, LN	Q.931	
		INT		Circuit congestion encountered in an exchange
38	Network out of order	U, RPN	Q.931	
41	Temporary failure	U, RPN, RLN, LN	Q.931	
42	Switching equipment congestion	RLN, INT		
43	<u>Access information discarded</u>	U, RPN		
44	Requested circuit/channel not available	U, RPN, LN	Q.931	
47	Resource unavailable, unspecified	U, RPN	Q.931	
55	Incoming calls barred within CUG	RLN	Q.767 (E.3.2.3)	CUG
57	Bearer capability not authorised	LN		

TABLE 10/Q.767 (SHEET 3 OF 3)

Cause information element/parameter				
Cause	Definition	Location	Reference	Notes
58	Bearer capability not presently available	LN		
63	Service or option not available, unspecified	LN		
65	Bearer capability not implemented	LN INT		Inability to provide a requested TMR
79	Service or option not implemented, unspecified			
87	User not member of CUG	RLN		CUG
88	Incompatible destination	U, RPN	Q.031	
95	Invalid message, unspecified	LN		
97	<u>Message type non-existent or not implemented</u>	U, LN INT, RLN		
99	<u>Information element / parameter non-existent or not implemented</u>	U, LN INT, RLN		
102	<u>Recovery on timer expiry</u>	INT	Q.767 (D.2.5.1.1) Q.767 (D.2.5.1.2) Q.767 (D.2.5.3) Q.767 (2.5.5.1.3) Q.767(D.2.5.3)	<u>Expiry of waiting RES(network) timer (not generated by international transit exchange)</u>
103	<u>Parameter non-existent or not implemented, passed on</u>			
110	<u>Message with unrecognised parameter, discarded</u>			
111	Protocol error, unspecified	RLN RLN, INT RLN	Q.931	CUG
127	Interworking, unspecified			

4.1.2.2 Handling of location indicators

If the event causing the sending of the cause indicators parameter takes place in the international exchange (i.e. incoming or outgoing gateway exchange), the location will be set to "0111 International network".

If interworking is encountered in the international exchange and if a message containing the cause indicators parameter is sent because of the receipt of a message of the other signalling system, the location will be set "1010 Beyond an interworking point" (BI).

The location "public network serving the local user" or "private network serving the local user" should not be sent on the international section. The conversion from "public network serving the local user" to "public network serving the remote user" or "private network serving the local user" to "private network serving the remote user" shall take place in the national network generating the cause.

Location values have no significance across interconnect boundaries. No action should be based on these values as their meaning cannot be guaranteed.

~~In all other cases the national exchange will pass on the received location.~~

~~Using this solution, it is impossible to distinguish a national location "transit network" from a location "transit network beyond the international boundary".~~

The real location where the event was generated is lost when interworking: for example EGC and NNC in TUP are coded "34,BI". In spite of that, the limitations of this solution are accepted, because they are considered as acceptable for this Interconnect international ISUP version.

4.1.2.3 Interworking

(This section is not applicable to the Interconnect ISUP specification)

4.1.3 Charging

(This section is not applicable to the Interconnect ISUP specification)

4.1.4 Operator services

(This section is not applicable to the Interconnect ISUP specification)

4.1.5 Test Calls

The use of test calls and the commercial process for accounting Interconnect ISUP test calls will be by bilateral agreement.

4.1.6 Continuity Check

(This section is not applicable to the Interconnect ISUP specification)

4.1.7 Application of Recommendation Q.118 for suspend/resume (network)

The suspend (network) message in the ISDN UP can be generated by the network in response to a clearback indication from an interworking node or an on-hook condition from an analogue called party.

When an outgoing gateway receives the suspend (network) message, this gateway starts a timer (1-2 minutes) according to Recommendation Q.118, § 4.3.2. If this timer expires, the release procedure is initiated on both sides.

When an incoming gateway sends the suspend (network) message, this gateway starts a timer (2-3 minutes) according to Recommendation Q.118, § 4.3.3, unless this function is already provided in the national network. If this timer expires, the release procedure is initiated on both sides.

4.1.8 Terminal Portability

The Terminal Portability supplementary service allows a calling as well as a called user to move a terminal from one socket to another during the established state of a call. It is also possible to replace a terminal by another compatible terminal or to suspend and resume the call without changing the terminal or the socket.

The user initiated suspend and resume procedures as described in ~~Recommendation Q.764~~, § D.2.5, are applied. The suspend/resume indicator in the suspend and resume messages are set to "ISDN subscriber initiated".

If interworking with a network or a signalling system not supporting remote user notification of call suspension/resumption occurs, user initiated suspend/resume messages received will be discarded. If the clearback signal is not needed in the national network, it is recommended that no mapping, e.g. to clearback should be performed.

4.1.9 Subaddress

During call set-up, the called party subaddress provided by the calling party is transported from the originating to the destination exchange, in the IAM.

The calling party may also provide its own subaddress to complement the calling line identification, as provided in the CLI service. This subaddress is transported from the originating to destination exchange, in the IAM.

The called party may also provide its own subaddress ~~to complement the connected line identification as provided in the COL service~~. This subaddress is transported from the destination to originating exchange, in the ANM or CON.

Up to 20 octets of subaddress information can be conveyed. Calling and called party subaddress information is conveyed in the ATP parameter of the IAM. Connected line subaddress information is conveyed in the ATP parameter in the ANM or CON.

No notification of delivery or non delivery of subaddress information is sent to the subaddress sending user.

On interworking with a network or a signalling system which does not support the transfer of the received subaddress (due to a shorter length or no subaddress at all), the whole subaddress information element is discarded. No notification of non delivery is provided.

4.1.10 MTP pause/resume

On reception of a MTP pause primitive, ISUP takes the following action:

- If the affected destination is not a destination (SP) known by ISUP (not connected by circuits to the exchange), no action takes place.
- If the affected destination is a destination (SP) known by the ISUP, the circuits connected to the inaccessible SP will be prohibited for new outgoing calls. If no other circuits are available to route these calls, they are released with the appropriate cause (34 - no circuit available).

All other procedures (blocking, unblocking, reset ~~AND CONTINUITY CHECK~~) to be started on these circuits, and all procedures and calls already started before the MTP pause reception, are handled as usual. The local and remote ISUP will not receive answers to the messages sent; message repetition, reset procedures or normal call release procedures on time out will be initiated, depending on the duration of the SP inaccessibility.

On reception of a MTP resume primitive, ISUP takes the following action:

- If the affected destination is not a destination (SP) known by ISUP (not connected by circuits to the exchange), no action takes place.
- If the affected destination is a destination (SP) known by the ISUP, the circuits connected to the previously inaccessible SP can be used again for calls to that direction. The pending procedures that were running during the signalling relation unavailability, are completed as messages can be again exchanged between the two SPs. As a result of the time supervision mechanism for responses to the messages sent in each relevant procedure, the circuits affected by the signalling relation unavailability are restored to a normal state when the signalling relation becomes available.

4.1.11 CIC allocation

The following rules should apply for the allocation of CIC codes to circuits in the ~~international~~ Interconnect ISUP network:

- the CIC should be coded according to the traffic circuit number between two switching units; (refer Annex C, section C.1.2 and Figure C.-2.1 of this specification)
- ~~the basis for the traffic circuit numbering should be the recommendation M.140, Blue Book (switching unit related traffic circuit numbering);~~
- ~~the CIC will be the binary code of the traffic circuit number without the letter Z or B.~~

4.2 Clarifications to ISUP supplementary services

The following summarises the action taken by a national network not supporting a given supplementary service, and provides also consideration for international transit operation.

4.2.1 Gateway (incoming/outgoing) reactions for supplementary services not supported in the national network

As national networks may not fully support the basic services and supplementary services supported by this version of the ~~international~~ **Interconnect** ISUP signalling system, it is essential to standardise the gateways reaction when receiving signalling information on the ~~international~~ **national** section relevant to a service or supplementary service not provided or partially provided in the ~~international~~ **national** network. Bilateral agreements are necessary before opening between two networks, a service supported by the ~~international~~ **national** signalling system. ~~It may happen, that no service screening on a route basis is performed/feasible in the outgoing gateway; and therefore a service request for a national supplementary service not supported, may be received in an international gateway.~~

TABLE 12/Q.767

Supplementary service	Reaction in international national gateway	Remarks
UUS 1 implicit	Incoming gateway: Reject UUS information received in IAM using user to user indicator bit H = 1 "Network discard" in ACM or CON Incoming/Outgoing gateway: UUS information received in other messages is discarded without notification by the outgoing/incoming gateway	If no UUS information is sent in the IAM, the incoming (outgoing) national network should prevent the transmission of UUS in the backward (forward) direction
CLIP	Incoming gateway: Discard Calling Party Number- CLIR assumed	No notification is given
CLIR	Incoming gateway: Discard Calling Party Number- if unable to handle or convey- the restriction indication	No notification is given
CUG	See § 3.6 of Rec. Q.767- Incoming gateway: Discard CUG information- interpret as non-CUG call.	Non-CUG call.

TABLE 12/Q-767

Supplementary service	Reaction in international national gateway	Remarks
COLP	Outgoing gateway: Discard Connected Number Incoming gateway: Send Connected Number parameter with indication address not available in ANM or CON Discard Connected Number if unable to handle or convey the restriction indication	Connected number should be received only on request No notification is given
COLR	Outgoing gateway: Discard Connected Number if unable to handle or convey the restriction indication	No notification is given
Subaddressing	Discard subaddress	The national network shall discard the received subaddress No notification is given
Call forwarding	Refer to appropriate stage 1 and stage 3 documents	
Terminal portability	Discard suspend/resume (user initiated) messages	No notification is given

4.2.2 Transit considerations

(This section is not applicable to the Interconnect ISUP specification)

4.3 Handling of access information

4.3.1 General

The national ISDNs may not guarantee the support of all supplementary services and information elements contained in access protocol standards. It is, however, useful, in order to support national ISDN communication, that a minimum common profile for the various services supported (see § 2) is defined.

These profiles for bearer capability (BC), high layer compatibility (HLC), low layer compatibility (LLC) are given as typical examples to allow gateways to perform necessary mapping, if needed (e.g. national network does not support the fully transparent transfer or handling of HLC, BC, LLC).

There is no intention however to restrict the sending of any further codings on the international section (but the result is not guaranteed). Checks on the codings sent/received are not mandatory in a national gateway however, it is considered as a National administrations decision.

4.3.2 Content of Access Transport parameter (ATP)

The content of ATP may be considered. ~~No A National administration may consider checking check should be made on~~ the content of ATP, with reference to the table below. The maximum length should only be limited by the message length, as the content of ATP will probably evolve in the future. If maximum message length is exceeded, the user to user information (UUI) should be the first information discarded.

TABLE 13/Q.767

Message	Forward	Backward	Information element
ACM		X	Progress indicator
ANM		X	Progress indicator Connected party subaddress LLC
CPG		X	Progress indicator
CON		X	Progress indicator LLC Connected party subaddress
IAM	X Calling party subaddress		Progress indicator Called party subaddress LLC HLC

Note - Two progress indicators may be sent in a message.

~~It is not recommended to perform any check in the~~ The National gateway may check, unless required, on the presence and validity (coding/ max length) of the information elements received in the ATP, in particular subaddress.

4.3.3 Coding of USI (BC), HLC, LLC

4.3.3.1 General

This section identifies the ISUP parameters and Q.931 information elements (Blue Book) that may be present with various services. It also proposes specific codings for the User Service Information (USI) parameter, high layer compatibility (HLC) information element and low layer compatibility (LLC) information element, which may be present at the international interface. The HLC, LLC information elements are included in the Access Transport parameter.

4.3.3.2 Relationship between services and signalling information

Table 14/Q.767 below identifies the relationship between services and the presence of USI(BC), HLC and LLC signalling information in the ISUP IAM.

Note - these should be considered as examples only.

TABLE 14/Q.767

		Services		Parameter/info elements		
		Teleservice (Note 1)	Bearer Service	USI	HLC	LLC
Originating Network	ISDN	Telephony, Facsimile, G2/G3, Facsimile G4, Mixed mode, Teletex, Videotex,	64 kbit/s unrestricted	Yes	Yes	Note 2
				Yes	Yes	Note 2
				Yes	Yes	Note 2
				Yes	Yes	Note 2
				Yes	Yes	Note 2
				Yes	Yes	Note 2
	Note 3		3.1 kHz audio	Yes	No	Note 2
			Speech	Yes	No	Note 2
	PSTN	Telephony/Voice band data		No	No	No
		Digital connectivity		No	No	No

Note 1 - All teleservices operate at 64 kbits/s as specified in Recommendation I.241.

Note 2 - LLC will be included if provided by the user. Guidelines for the application of LLC can be found in Annex L of Recommendation Q.931.

Note 3 - Analogue subscriber connected to an ISDN local exchange are treated as analogue subscribers in the PSTN, i.e. no USI, HLC or LLC, respectively is contained in the ISUP IAM.

Any USI parameter received not conforming to this section might result in the call being failed.

Transport of codings specified should at least be guaranteed across the international interface.

4.3.3.2.1 Teleservices

Key:

x possibly examined at certain gateway and may be coded 0 or 1

. it has no significance to the ~~international~~ national network (e.g. coded according to network/user specific rules)

a) Telephony
User Service Information parameter

1 0 0 0 0 0 0	Octet 1	Coding standard and information transfer capability (speech)
1 0 0 1 0 0 0	2	Transfer mode and information transfer rate (64 kbit/s)
1 0 1 0 0 0 1 <u>1</u> *	3	Layer identification and user information layer 1 (Rec. G.711 A/ μ -law)

High layer compatibility information element

0 1 1 1 1 1 0 1	Octet 1	HLC information element identifier
0 0 0 0 0 0 1 0	2	Length (2 octets)
1 0 0 1 0 0 0 1	3	Coding standard, interpretation and presentation method of protocol profile
1 0 0 0 0 0 0 1	4	High layer characteristics identification (telephony)

b) Facsimile G2/G3 User Service Information parameter

1 0 0 1 0 0 0 0	Octet 1	Coding standard and information transfer capability (3.1 kHz audio)
1 0 0 1 0 0 0 0	2	Transfer mode and information transfer rate (64 kbit/s)
1 0 1 0 0 0 1 1	3	Layer identification and user information layer 1 (Rec. G.711 A/ µ -law)

High layer compatibility information element

0 1 1 1 1 1 0 1	Octet 1	HLC information element identifier
0 0 0 0 0 0 1 0	2	Length (2 octets)
1 0 0 1 0 0 0 1	3	Coding standard interpretation and presentation method of protocol profile
1 0 0 0 0 1 0 0	4	High layer characteristics identification (fax G2/G3)

c) Facsimile Group 4 User Service Information parameter

1 0 0 0 1 0 0 0	Octet 1	Coding standard and information transfer capability (64 kbit/s)
1 0 0 1 0 0 0 0	2	Transfer mode and information transfer rate (64 kbit/s)
0 0 1 0 0 0 0 1	3	Layer identification and user information layer 1 protocol (V.110 rate adaptation)
1 0 0 0 1 1 1 1	3a	Synchronous; 56 kbit/s

Note - Octet 3 and 3a are used only when rate adaptation is applied.

High layer compatibility information element

0 1 1 1 1 1 0 1	Octet 1	HLC information element identifier
0 0 0 0 0 0 1 0	2	Length (2 octets)
1 0 0 1 0 0 0 1	3	Coding standard, interpretation and presentation method of protocol profile
1 0 1 0 0 0 0 1	4	High layer characteristics identification (fax group 4)

d) Mixed mode
User Service Information parameter

1 0 0 0 1 0 0 0	Octet 1	Coding standard and information transfer capability (64 kbit/s)
1 0 0 1 0 0 0 0	2	Transfer mode and information transfer rate (64 kbit/s)
0 0 1 0 0 0 0 1	3	Layer identification and user information layer 1 protocol (V.110 rate adaptation)
1 0 0 0 1 1 1 1	3a	Synchronous;56 kbit/s

Note - Octet 3 and 3a are used only when rate adaptation is applied.

High layer compatibility information element

0 1 1 1 1 1 0 1	Octet 1	HLC information element identifier
0 0 0 0 0 0 1 0	2	Length (2 octets)
1 0 0 1 0 0 0 1	3	Coding standard,interpretation and presentation method of protocol profile
1 0 1 0 0 1 0 0	4	High layer characteristics identification (mixed mode)

e) Teletex
User Service Information parameter

1 0 0 0 1 0 0 0	Octet 1	Coding standard and information transfer capability (64 kbit/s)
1 0 0 1 0 0 0 0	2	Transfer mode and information transfer rate (64 kbit/s)
0 0 1 0 0 0 0 1	3	Layer identification and user information layer 1 protocol (V.110 rate adaptation)
1 0 0 0 1 1 1 1)	3a	Synchronous;56 kbit/s

Note - Octet 3 and 3a are used only when rate adaptation is applied.

High layer compatibility information element

0 1 1 1 1 1 0 1	Octet 1	HLC information element identifier
0 0 0 0 0 0 1 0	2	Length (2 octets)
1 0 0 1 0 0 0 1	3	Coding standard,interpretation and presentation method of protocol profile
1 0 1 1 0 0 0 1	4	High layer characteristics identification (teletex)

f) Videotex
User Service Information parameter

1 0 0 0 1 0 0 0	Octet 1	Coding standard and information transfer capability (64 kbit/s)
1 0 0 1 0 0 0 0	2	Transfer mode and information transfer rate (64 kbit/s)
0 0 1 0 0 0 0 1	3	Layer identification and user information layer 1 protocol (V.110 rate adaptation)
1 0 0 0 1 1 1 1	3a	Synchronous;56 kbit/s

Note - Octet 3 and 3a are used only when rate adaptation is applied.

High layer compatibility information element

0 1 1 1 1 1 0 1	Octet 1	HLC information element identifier
0 0 0 0 0 0 1 0	2	Length (2 octets)
1 0 0 1 0 0 0 1	3	Coding standard,interpretation and presentation method of protocol profile
1 0 1 1 0 0 1 0	4	High layer characteristics identification (videotex)

4.3.3.2.2 Bearer services

a) 64 kbit/s unrestricted
i) Synchronous 64 kbit/s working
User Service Information parameter

1 0 0 0 1 0 0 0	Octet 1	Coding standard and information transfer capability (64 kbit/s)
1 0 0 1 0 0 0 0	2	Transfer mode and information transfer rate (64 kbit/s)

ii) Synchronous 56 kbit/s working with V.110/X.30 rate adaptation and no NIC
User Service Information parameter

1 0 0 0 1 0 0 0	Octet 1	Coding standard and information transfer capability (64 kbit/s)
1 0 0 1 0 0 0 0	2	Transfer mode and information transfer rate (64 kbit/s)
0 0 1 0 0 0 0 1	3	Layer identification and user information layer 1 protocol (V.110 rate adaptation)
1 0 0 0 1 1 1 1	3a	Synchronous;56 kbit/s

iii) Synchronous rates less than 56 kbit/s with V.110/X.30 rate adaptation
User Service Information parameter

1 0 0 0 1 0 0 0	Octet 1	Coding standard and information transfer capability (64 kbit/s)
1 0 0 1 0 0 0 0	2	Transfer mode and information transfer rate (64 kbits/s)
Low layer compatibility information element		
0 1 1 1 1 1 0 0	Octet 1	LLC information element identifier
0 0 0 0 0 1 0 1	2	Length (5 octets)
1 0 0 0 1 0 0 0	3	Coding standard and information transfer capability (64 kbit/s)
1 0 0 1 0 0 0 0	4	Transfer mode and information transfer rate (64 kbit/s)
0 0 1 0 0 0 0 1	5	Layer identification and user information layer 1 protocol (V.110 rate adaptation)
0 0 0 user rate	5a	Synchronous;user rate
1 0 0 x x 0 0 0	5b	Intermediate rate,with/without NIC and no flow control on Tx & Rx

iv) Synchronous 64 kbit/s working with X.25 protocol
User Service Information parameter

1 0 0 0 1 0 0 0	Octet 1	Coding standard and information transfer capability (64 kbit/s)
1 0 0 1 0 0 0 0	2	Transfer mode and information transfer rate (64 kbit/s)
Low layer compatibility information element		
0 1 1 1 1 1 0 0	Octet 1	LLC information element identifier
0 0 0 0 0 1 0 0	2	Length (4 octets)
1 0 0 0 1 0 0 0	3	Coding standard and information transfer capability (64 kbit/s)
1 0 0 1 0 0 0 0	4	Transfer mode and information transfer rate (64 kbit/s)
1 1 0 0 0 1 1 0	6	Layer 2 identification and user information layer 2 protocol (X.25 link level)
1 1 1 0 0 1 1 0	7	Layer 3 identification and user information layer 3 protocol (CCITT X.25 packet layer)

Note 1 - Octet 5 is omitted when working at 64 kbit/s.The presence of the layer 2 and 3 information in octet 6 and 7 is identified by bits 7 and 6 of those octets being coded “10” and “11”respectively.

Note 2 - Octets 6 and 7 could also be coded as:11001101 and 11100111,signifying X.75 SLP Layer 2 protocol and ISO 8208 Layer 3 protocol, respectively.

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v) Synchronous 56 kbit/s with V.110/X.30 rate adaptation and X.25 protocol
User Service Information parameter

1 0 0 0 1 0 0 0	Octet 1	Coding standard and information transfer capability (64 kbit/s)
1 0 0 1 0 0 0 0	2	Transfer mode and information transfer rate (64 kbit/s)
0 0 1 0 0 0 0 1	3	Layer identification and user information layer 1 protocol (V.110 rate adaptation)
1 0 0 0 1 1 1 1	3a	Synchronous;56 kbit/s

Low layer compatibility information element

0 1 1 1 1 1 0 0	Octet 1	LLC information element identifier
0 0 0 0 0 1 1 0	2	Length (6 octets)
1 0 0 0 1 0 0 0	3	Coding standard and information transfer capability (64 kbit/s)
1 0 0 1 0 0 0 0	4	Transfer mode and information transfer rate (64 kbit/s)
0 0 1 0 0 0 0 1	5	Layer identification and user information layer 1 protocol (V.110 rate adaptation)
1 0 0 0 1 1 1 1	5a	Synchronous;56 kbit/s
1 1 0 0 0 1 1 0	6	Layer 2 identification and user information layer 2 protocol (CCITT X.25 link level)
1 1 1 0 0 1 1 0	7	Layer 3 identification and user information layer 3 protocol (X.25 packet layer)

Note - Octets 6 and 7 could also be coded as:11001101 and 11100111,signifying X.75 SLP Layer 2 protocol and ISO 8208 Layer 3 protocol, respectively.

vi) Synchronous rates less than 56 kbit/s with V.110/X.30 rate adaptation and X.25 protocol
User Service Information parameter

1 0 0 0 1 0 0 0	Octet 1	Coding standard and information transfer capability (64 kbit/s)
1 0 0 1 0 0 0 0	2	Transfer mode and information transfer rate (64 kbit/s)

Low layer compatibility information element

0 1 1 1 1 1 0 0	Octet 1	LLC information element identifier
0 0 0 0 0 1 1 1	2	Length (7 octets)
1 0 0 0 1 0 0 0	3	Coding standard and information transfer capability (64 kbit/s)
1 0 0 1 0 0 0 0	4	Transfer mode and information transfer rate (64 kbit/s)
0 0 1 0 0 0 0 1	5	Layer identification and user information layer 1 protocol (V.110 rate adaptation)
0 0 0 user rate	5a	Synchronous;user rate
1 0 0 x x 0 0 0	5b	Intermediate rate,with/without NIC and no flow control on Tx & Rx
1 1 0 0 0 1 1 0	6	Layer 2 identification and user information layer 2 protocol (X.25 link level)
1 1 1 0 0 1 1 0	7	Layer 3 identification and user information layer 3 protocol (X.25 packet layer)

Note - Octets 6 and 7 could also be coded as:11001101 and 11100111,signifying X.75 SLP Layer 2 protocol and ISO 8208 Layer 3 protocol, respectively.

vii)Asynchronous rates with V.110 rate adaptation
User Service Information parameter

1 0 0 0 1 0 0 0	Octet 1	Coding standard and information transfer capability (64 kbit/s)
1 0 0 1 0 0 0 0	2	Transfer mode and information transfer rate (64 kbit/s)

Low layer compatibility information element

0 1 1 1 1 1 0 0	Octet 1	LLC information element identifier
0 0 0 0 0 1 1 1	2	Length (7 octets)
1 0 0 0 1 0 0 0	3	Coding standard and information transfer capability (64 kbit/s)
1 0 0 1 0 0 0 0	4	Transfer mode and information transfer rate (64 kbit/s)
0 0 1 0 0 0 0 1	5	Layer identification and user information layer 1 protocol (V.110 rate adaptation)
0 1 0 user rate	5a	Asynchronous;user rate (user rates up to 19.2 kbit/s possible)
0 0 0 0 0 x x 0	5b	Intermediate rate,without NIC and with/without flow control on Tx & Rx
0 x x x x x x x	5c	Number of stop bits, number of data bits,parity
1 x	5d	Half/Full duplex,modem type

SPECIFICATION

- b) 3.1 kHz audio
 i) 3.1 kHz audio with A law
 User Service Information parameter

1 0 0 1 0 0 0 0	Octet 1	Coding standard and information transfer capability (3.1 kHz audio)
1 0 0 1 0 0 0 0	2	Transfer mode and information transfer rate (64 kbit/s)
1 0 1 0 0 0 1 <u>1</u> x	3	Layer identification and user information layer 1 protocol (Rec. G.711 A/ μ-law)

- ii) Voice band data modem
 User Service Information parameter

1 0 0 1 0 0 0 0	Octet 1	Coding standard and information transfer capability (3.1 kHz audio)
1 0 0 1 0 0 0 0	2	Transfer mode and information transfer rate (64 kbit/s)
1 0 1 0 0 0 1 <u>1</u> x	3	Layer identification and user information layer 1 protocol (Rec. G.711 A/ μ-law)

Low layer compatibility information element

0 1 1 1 1 1 0 0	Octet 1	LLC information element identifier
0 0 0 0 0 1 1 1	2	Length (7 octets)
1 0 0 1 0 0 0 0	3	Coding standard and information transfer capability (3.1 kHz audio)
1 0 0 1 0 0 0 0	4	Transfer mode and information transfer rate (64 kbit/s)
0 0 1 0 0 0 1 x	5	Layer identification and user information layer 1 protocol (G.711 A/μ)
0 x 0 user rate	5a	Synchronous/asynchronous:user rate
0 0 0 x x x x 0	5b	Intermediate rate,with/without NIC and with/without flow control on Tx & Rx
0 x x x x x x x	5c	Number of stop bits, number of data bits,parity
1 x	5d	Half/full duplex,modem type

- c) Speech
 User Service Information parameter

1 0 0 0 0 0 0 0	Octet 1	Coding standard and information transfer capability (speech)
1 0 0 1 0 0 0 0	2	Transfer mode and information transfer rate (64 kbit/s)
1 0 1 0 0 0 1 <u>1</u> x	3	Layer identification and user information layer 1 (Rec. G.711 A/ μ-law)

4.4 Clarifications for practical interconnections

4.4.1 Start up procedures

(This section is not applicable to the Interconnect ISUP specification)

The start up procedures will be developed on a bilateral basis for National network interconnection.

4.4.2 Interconnection test

4.4.2.1 Validation tests

See Recommendations Q.780, Q.784 and Q.785.

4.4.2.2 Compatibility tests

See Recommendations Q.780, Q.784 and Q.785.

4.4.2.3 Terminal to terminal tests (operational test calls)

The aim of ISDN operational test calls is to verify, before opening ISDN services between networks, that these services are working properly from the user point of view. These calls are to be established as normal calls from real terminals in each interconnecting network, to called numbers (corresponding to ISDN or non ISDN subscribers) provided by the other network, aiming to verify that:

- calls are correctly set up and compatible called terminals are selected, or calls are correctly rejected if no compatible called terminal exists;
- the data or voice transmission is possible with a normal quality;
- calls can be correctly released by the calling or called user.

4.4.3 Routing

~~See Recommendation E.172.~~

Routing between National interconnecting networks is subject to bilateral agreements.



AUSTRALIAN COMMUNICATIONS INDUSTRY FORUM
SIGNALLING SYSTEM NO.7 - INTERCONNECT ISUP

A N N E X E S

INFORMATION RELATING TO ANNEXES

(to the Interconnect ISUP Specification)
(to Recommendation Q.767)

ISDN User Part of Signalling System No. 7 for Interconnect ISUP international interconnections

Used conventions

- sections which are not applicable are replaced with:
(This section is not applicable to the Interconnect ISUP specification international interface)
OR
(This section is not applicable to the Interconnect ISUP specification)
- paragraphs or sentences in a section which are not applicable are:
~~struck out~~
- added sections, paragraphs or sentences included in the ITU-T Q.767 Recommendation are :
underlined
- added sections, paragraphs or sentences are :
underlined
- changed text in the ITU-T Q.767 Recommendation is:
IN SMALL ITALIC CAPITALS
- changed text included from later version of the ITU-T Recommendation cited for the Annex is:
IN SMALL ITALIC CAPITALS

Contents

Annex A: Recommendation Q.761

Annex B: Recommendation Q.762

Annex C: Recommendation Q.763

Annex D: Recommendation Q.764

~~Annex E: Recommendation Q.730~~

Annex E.1

ANNEX A

(to the Interconnect
ISUP Specification)

(to Recommendation
Q.767)

Functional description of the ISDN User Part of Signalling System No. 7 for Interconnect ISUP international interconnections

A.1 General

The ISDN User Part is the Signalling System No.7 protocol which provides the signalling functions required to support basic bearer services and supplementary services for voice and non-voice applications in an integrated services digital network.

The ISDN User Part is also suited for application in dedicated telephone and circuit switched data networks and in analogue and mixed analogue/digital networks. In particular the ISDN User Part meets the requirements defined by ITU-T/CCITT for worldwide international semiautomatic and automatic telephone and circuit switched data traffic.

The ISDN User Part is furthermore suitable for national applications. Most signalling procedures, information elements and message types specified for international use are also required in typical national applications. Moreover, coding space has been reserved in order to allow national administrations and recognised private operating agencies to introduce network specific signalling messages and elements of information within the internationally standardised protocol structure.

The ISDN User Part makes use of the services provided by the Message Transfer Part (MTP) and in some cases by the Signalling Connection Control Part (SCCP) for the transfer of information between ISDN User Parts.

THE ISDN USER PART PROTOCOL FOR National ~~INTERNATIONAL~~ INTERCONNECTIONS WHICH SUPPORTS THE BASIC BEARER SERVICE IS DESCRIBED IN § 3.2 AND ANNEX A TO § 3.5 AND ANNEX D, AND Q.766. A GENERAL DESCRIPTION OF ISDN USER PART SIGNALS AND MESSAGES IS PROVIDED IN § 3.3 AND ANNEX B. MESSAGE FORMATS AND MESSAGE FIELD CODINGS ARE DEFINED IN § 3.4 AND ANNEX C, WHILE THE SIGNALLING PROCEDURES ARE DESCRIBED IN § 3.5 AND ANNEX D. RECOMMENDATION Q.766 DEALS WITH ISDN USER PART PERFORMANCE OBJECTIVES.

ISDN USER PART PROTOCOL ELEMENTS WHICH SUPPORT SUPPLEMENTARY SERVICES ARE DESCRIBED IN § 3.6 AND ANNEX E.

Note – The message set, message formats and procedures specified in this version of the ISDN User Part protocol are not in complete alignment with those of the 1984 version (Red Book). The two versions of the protocol are therefore not compatible in all aspects.

A.2 Services supported by the ISDN User Part

The ISDN User Part protocol supports the basic bearer service, i.e. the establishment, supervision and release of 64 kbit/s circuit switched network connections between subscriber line exchange terminations.

THE ISDN USER PART SUPPORTS THE FOLLOWING SERVICES:

BEARER SERVICES:

- *64 kbit/s UNRESTRICTED*
- *SPEECH*
- *3.1 kHz AUDIO*

TELESERVICES:

- *TELEPHONY*
- *TELETEX*
- *TELEFAX GR 4*
- *MIXED MODE*
- *VIDEOTEX*
- *TELEFAX GR 2/3*

SUPPLEMENTARY SERVICES:

- *CALLING LINE IDENTIFICATION PRESENTATION (CLIP)*
- *CALLING LINE IDENTIFICATION RESTRICTION (CLIR)*
- ~~*CONCOCTED LINE IDENTIFICATION PRESENTATION*~~
- ~~*CONCOCTED LINE IDENTIFICATION RESTRICTION*~~
- ~~*CLOSED USER GROUP (CUG)*~~
- *USER TO USER SERVICE 1 IMPLICITLY REQUESTED (UUS1)*
- *DIRECT DIALING IN (DDI)*
- *SUBADDRESSING (SUB)*
- Malicious Call Trace
- Call Diversion

A.3 Services assumed from the Message Transfer Part (MTP)

A.3.1 General

This section describes the functional interface presented by the Message Transfer Part to the ISDN User Part. In accordance with the description techniques defined by the open system interconnection (OSI) model, information is transferred to and from the MTP in the form of parameters carried by primitives.

The general syntax of a primitive is as follows:

X	Generic name	Specific name	Parameter
---	--------------	---------------	-----------

where:

- X designates the function providing the service (the MTP, in this case),
- the generic name describes an action by X,
- the specific name indicates the purpose of the primitive, i.e. whether it conveys a request for service, an indication that service related information has been received, a response to a service request or a confirmation that the requested service has been performed, and
- the parameters contain the elements of supporting information transferred by the primitive.

A.3.2 Description of primitives

The following paragraphs describe the primitives used across the ISDN User Part Message Transfer Part functional interface. The primitives together with the parameters carried by each primitive are also shown in Table A-1/Q-767.

A.3.2.1 Transfer

The MTP-TRANSFER service primitives are used either by the ISDN User Part to access the signalling message handling function of the Message Transfer Part or by the latter to deliver signalling message information to the ISDN User Part.

A.3.2.2 Pause

The MTP-PAUSE primitive is sent by the Message Transfer Part to indicate its inability to transfer messages to the destination specified as a parameter.

A.3.2.3 Resume

The MTP-RESUME primitive is sent by the Message Transfer Part to indicate its ability to resume unrestricted transfer of messages to the destination specified as a parameter.

A.3.2.4 Status

The MTP STATUS primitive is sent by the Message Transfer Part to indicate that the signalling route to a specific destination is congested ~~or the ISDN user part at the destination is unavailable~~. The affected destination and the congestion indication are carried as parameters (see Table A-1/Q-767) in the primitive.

TABLE A-1/Q.767

Message Transfer Part service primitives

Primitives		Parameters
Generic name	Specific name	
MTP-TRANSFER	Request Indication	OPC
		DPC
		SLS
		SIO
		INF
MTP-PAUSE	Indication	Affected DPC
MTP-RESUME	Indication	Affected DPC
MTP-STATUS	Indication	Affected DPC Cause (see Note)

OPC Originating point code
DPC Destination point code
SLS Signalling link selection code
SIO Service information octet

Note -The cause parameter can assume one value:

- ~~signalling network congested (level), Where level is included only if national options with congestion priorities and multiple signalling states without congestion priorities (see Recommendations Q.704) are implemented.~~
- Remote user unavailable

A.4. End-to-end signalling

(This section is not applicable to the Interconnect ISUP specification international interface)

A.5 Future enhancements

Requirements for additional protocol capabilities, such as the ability to support new supplementary services, will result from time to time in the need to add to or modify existing protocol elements and thus to create a new protocol version.

In order to ensure adequate service continuity, the insertion of a new protocol version into one part of a network should be transparent to the remainder of the network. Compatible interworking between protocol versions is optimised by adhering to the following guidelines when specifying a new version:

- 1) Existing protocol elements, i.e. procedures, messages, parameters and codes, should not be changed unless a protocol error needs to be corrected or it becomes necessary to change the operation of the service that is being supported by the protocol.
- 2) The semantics of a message, a parameter or of a field within a parameter should not be changed.
- 3) Established rules for the formatting and encoding messages should not be modified.

- 4) The addition of parameters to the mandatory part of an existing message should not be allowed. If needed, a new message should be defined containing the desired set of existing and new mandatory parameters.
- 5) A parameter may be added to an existing message as long as it is allocated to the optional part of the message.
- 6) The addition of new octets to an existing mandatory fixed length parameter should be avoided. If needed, a new optional parameter should be defined containing the desired set of existing and new information fields.
- 7) The sequence of fields in an existing variable length parameter should remain unchanged. New fields may be added at the end of the existing sequence of parameter fields. If a change in the sequence of parameter fields is required, a new parameter should be defined.
- 8) The all zeros code point should be used exclusively to indicate an unallocated (spare) or insignificant value of a parameter field. This avoids an all zeros code, sent by one protocol version as a spare value, to be interpreted as a significant value in another version.

ANNEX B General function of messages and signals

(to the Interconnect

ISUP Specification)

~~(to Recommendation~~

~~Q.767)~~

THIS RECOMMENDATION DESCRIBES THE ELEMENTS OF SIGNALLING INFORMATION USED BY THE ISDN USER PART PROTOCOL FOR National ~~INTERNATIONAL~~ INTERCONNECTIONS AND THEIR FUNCTION. THE ENCODING OF THESE ELEMENTS, THE FORMAT OF THE MESSAGES IN WHICH THEY ARE CONVEYED AND THEIR APPLICATION IN THE ISDN USER PART SIGNALLING PROCEDURES ARE DESCRIBED IN § 3.4 AND ANNEX C, AND § 3.5 AND ANNEX D. TABLE B-1/~~Q.767~~ GIVES THE MANDATORY OR OPTIONAL PARAMETERS IN THE ISDN USER PART MESSAGES AND TABLE B-2/~~Q.767~~ THE LIST OF ABBREVIATIONS OF THESE MESSAGES.

TABLE B-1/Q.767 (SHEET 1 OF 6)

Mandatory or optional parameters in the ISDN user part messages

Message	Group	Forward set-up		Gen-sup.	Backward set-up		Call Supervision			Circuit Supervision									
		IAM	SAM		COI	ACM	CON	CPG	ANM	FOI	REL	RLC	GCR RSC	BLO UBL	BLA UBA	SUS RES	CGB CGU	CGB A-C GUA	GRS GRA
Parameter field	Type Q.763 Annex C																		
Message type	2.1	M	M	M	M	M	M	M	M	M									M
Access transport	3.2	O			O	O	O												
Automatic congestion level	3.3										O								
Backward call indicators	Charge indicator Called party's status indic. Called party's category ind. End to end method ind. Interworking ind. End to end information ind. ISDN user part ind. Holding-indicator ISDN access indicator Echo control device ind. SCCP-method ind.																		
Called party number	3.7	M						M	M	O									

Bold characters means "default value is used". M = Mandatory O = Optional

TABLE B-2/Q.767

ISDN User Part message acronyms

English	French	Spanish	
ACM	ACO	MDC	Address complete
ANM	REP	RST	Answer
BLA	BLA	AEB	Blocking acknowledgment
BLO	BLO	BLO	Blocking
CCR	CCD	PPC	Continuity check request
CFN	ICO	CFN	Confusion
CGB	BLG	BGC	Circuit group blocking
CGBA	BGA	ARBG	Circuit group blocking ack.
CGU	DBG	DGC	Circuit group unblocking
CGUA	DGA	ARDG	Circuit group unblocking ack.
CMC	MAE	MLC	Call modification completed
CMR	MAD	PLM	Call modification request
CMRJ	MAR	RFA	Call modification reject
CON	CON	CNX	Connect
COT	CCP	CON	Continuity
CPG	PRG	PRL	Call progress
CRG	TAX	TAS	Charge information
CQM	IGD	IGC	Circuit group query
CQR	IGR	RIG	Circuit group query response
DRS	LID	LID	Delayed release
FAA	SUAC	FAA	Facility accepted
FAR	SUDM	PFA	Facility request
FOT	IOP	INT	Forward transfer
FRJ	SURF	RFA	Facility reject
GRA	RZA	ARRG	Circuit group reset ack.
GRS	RZG	RGC	Circuit group reset
IAM	MIA	MID	Initial address
INF	INF	INF	Information
INR	IND	PIN	Information request
LPA	BOA	AEB	Loop-back acknowledgment
OLM	SUR	SBC	Overload
PAM	FAP	MDP	Pass along
REL	LIB	LIB	Release
RES	RPR	REA	Resume
RLC	LIT	LIC	Release complete
RSC	RZC	RCI	Reset circuit
SAM	MSA	MSD	Subsequent address
SUS	SUS	SUS	Suspend
UBL	DBO	DBL	Unblocking
UBA	DBA	ARD	Unblocking acknowledgment
UCIC	CINE	CICN	Unequipped circuit identifica-
USR	UAU	IUU	User to user information

B.1 Signalling messages

B.1.1 Address complete message (ACM)

A message sent in the backward direction indicating that all the address signals required for routing the call to the called party have been received.

B.1.2 Answer message (ANM)

A message sent in the backward direction indicating that the call has been answered. In semi-automatic working this message has a supervisory function. In automatic working this message is used in conjunction with charging information in order to:

- start metering the charge to the calling subscriber (see Recommendation Q.28), and
- start measurement of call duration for ~~international~~ accounting purposes (see Recommendation E.260).

B.1.3 Blocking message (BLO)

A message sent only for maintenance purposes to the exchange at the other end of a circuit, to cause an engaged condition of that circuit for subsequent calls outgoing from that exchange. When a circuit is used in the bothway mode of operation an exchange receiving the blocking message must be capable of accepting incoming calls on the concerned circuit unless it has also sent a blocking message. Under certain conditions, a blocking message is also a proper response to a reset circuit message.

B.1.4 Blocking acknowledgement message (BLA)

A message sent in response to a blocking message indicating that the circuit has been blocked.

B.1.5 Call modification completed message (CMC)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.1.6 Call modification reject message (CMRJ)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.1.7 Call modification request message (CMR)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.1.8 Call progress message (CPG)

A message sent in the backward direction during the setup phase after the ACM, or active phase of the call, indicating that an event which is of significance has occurred during call setup which should be relayed to the calling party.

B.1.9 Charge information message (CRG) (national use)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.1.10 Circuit group blocking message (CGB)

A message sent to the exchange at the other end of an identified group of circuits to cause an engaged condition of this group of circuits for subsequent calls outgoing from that exchange. An exchange receiving a circuit group blocking message must be able to accept incoming calls on the group of blocked circuits unless it has also sent a blocking message. Under certain conditions, a circuit group blocking message is also a proper response to a reset circuit message.

B.1.11 Circuit group blocking acknowledgement message (CGBA)

A message sent in response to a circuit group blocking message to indicate that the requested group of circuits has been blocked.

B.1.12 Circuit group reset message (GRS)

A message sent to release an identified group of circuits when, due to memory mutilation or other causes, it is unknown whether for example, a release or release complete message is appropriate for each of the circuits in the group. If at the receiving end a circuit is remotely blocked, reception of this message should cause that condition to be removed.

This message should not, however, be used to unblock circuits.

B.1.13 Circuit group reset acknowledgement message (GRA)

A message sent in response to a circuit group reset message and indicating that the requested group of circuits has been reset. The message also indicates the maintenance blocking state of each circuit.

B.1.14 Circuit group unblocking message (CGU)

A message sent to the exchange at the other end of an identified group of circuits to cause cancellation in that group of circuits of an engaged condition invoked earlier by a blocking or circuit group blocking message.

B.1.15 Circuit group unblocking acknowledgement message (CGUA)

A message sent in response to a circuit group unblocking message to indicate that the requested group of circuits has been unblocked.

B.1.16 Circuit group query message (CQM)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.1.17 Circuit group query response message (CQR)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.1.18 Confusion message (CFN)

A MESSAGE SENT RESPONSE TO ANY MESSAGE (OTHER THAN A CONFUSION MESSAGE) IF THE EXCHANGE DOES NOT RECOGNISE THE MESSAGE OR DETECTS A PART OF THE MESSAGE AS BEING UNRECOGNISED.

B.1.19 Connect message (CON)

A message sent in the backward direction indicating that all the address signals required for routing the call to the called party have been received and that the call has been answered.

This message is returned when an automatic answering terminal answers the call.

B.1.20 Continuity message (COT)

(This section is not applicable to the Interconnect ISUP specification)

B.1.21 Continuity check request message (CCR)

(This section is not applicable to the Interconnect ISUP specification)

B.1.22 Delayed release message (DRS) (national use)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.1.23 Facility accepted message (FAA)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.1.24 Facility reject message (FRJ)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.1.25 Facility request message (FAR)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.1.26 Forward transfer message (FOT)

(This section is not applicable to the Interconnect ISUP specification)

B.1.27 Information message (INF)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.1.28 Information request message (INR)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.1.29 Initial address message (IAM)

A message sent in the forward direction to initiate seizure of an outgoing circuit and to transmit number and other information relating to the routing and handling of a call.

B.1.30 Loop back acknowledgement message (LPA) (national use)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.1.31 Overload message (OLM) (national use)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.1.32 Pass along message (PAM)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.1.33 Release message (REL)

A message sent in either direction to indicate that the circuit is being released due to the reason (cause) supplied and is ready to be put into the idle state on receipt of the release complete message. ~~In case the call was forwarded or is to be rerouted, the appropriate indicator is carried in the message together with the redirection address and the redirecting address.~~

B.1.34 Release complete message (RLC)

A message sent in either direction in response to the receipt of a released message, or if appropriate to a reset circuit message, when the circuit concerned has been brought into the idle condition.

B.1.35 Reset circuit message (RSC)

A message sent to release a circuit when, due to memory mutilation or other causes, it is unknown whether for example, a release or a release complete message is appropriate. If, at the receiving end, the circuit is remotely blocked, reception of this message should cause that condition to be removed.

The RSC message should not be the message normally used to unblock circuits.

B.1.36 Resume message (RES)

A message sent in either direction indicating that the calling or called party, after having been suspended, is reconnected.

B.1.37 Subsequent address message (SAM)

A message that may be sent in the forward direction following an initial address message, to convey additional called party number information.

B.1.38 Suspend message (SUS)

A message sent in either direction indicating that the calling or called party has been temporarily disconnected.

B.1.39 Unblocking message (UBL)

A message sent to the exchange at the other end of a circuit to cancel, in that exchange, the engaged condition of the circuit caused by a previously sent blocking or circuit group blocking message.

B.1.40 Unblocking acknowledgement message (UBA)

A message sent in response to an unblocking message indicating that the circuit has been unblocked.

B.1.41 Unequipped circuit identification code message (UCIC) (national use)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.1.42 User-to-user information message (USR)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2 Signalling information**B.2.1 Access transport**

Information generated on the access side of a call and transferred transparently in either direction between originating and terminating local exchanges. The information is significant to both users and local exchanges.

B.2.2 Address presentation restricted indicator

Information sent in either direction to indicate that the address information is not to be presented to a public network user, but can be passed to another public network. ~~IT IS ALSO USED TO INDICATE THE NON AVAILABILITY OF THE ADDRESS.~~

B.2.3 Address signal

An element of information in a network number. The address signal may indicate digit values 0 to 9, ~~code 11 or code 12~~ and the overdecadic digits 10 to 15. One address signal value (ST) is may be reserved, by bilateral agreement, to indicate the end of the called party number.

B.2.4 Automatic congestion level

Information sent to the exchange at the other end of a circuit to indicate that a particular level of congestion exists at the sending exchange.

B.2.5 Call forwarding may occur indicator

Information sent in the backward direction indicating that call forwarding may occur, depending on the response received (or lack thereof) from the called party.

B.2.6 Call identity

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.7 Call reference

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.8 Called party number

Information to identify the called party.

B.2.9 Called party's category indicator

Information sent in the backward direction indicating the category of the called party, e.g. ordinary subscriber or payphone.

B.2.10 Called party's status indicator

Information sent in the backward direction indicating the status of the called party, e.g. subscriber free.

B.2.11 Calling party number

Information sent in the forward direction to identify the calling party.

B.2.12 Calling party address request indicator

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.13 Calling party address response indicator

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.14 Calling party number incomplete indicator

Information sent in the forward direction indicating that the complete calling party number is not included.

B.2.15 Calling party's category

Information sent in the forward direction indicating the category of the calling party and, in case of semiautomatic international calls, the service language to be spoken by the incoming, delay and assistance operators.

Definitions for each category valid for this Interconnect ISUP specification are listed below.

The Calling Party Category information is determined to be customer service information. It can be used within a national network to :

1. Identify the customer, or network preferred, method of charging for all calls from that customer line. That is, it provides information on whether the national network must generate multimeter pulses for call charging.

Note: For interworking to analogue PSTN national networks, the generation of multimeter pulses for call charging may be the only network option for customer charging.

2. To determine if this category of customer should be provided with access to specific network destinations or network services.
3. To provide information for national network feature-related actions

The CPC must be set by the interconnecting network as follows :

Calling Party Category 10 - International Customer or Payphone

This CPC indicates that the calling party is from an international location, either from an international ordinary customer or an international payphone.

This CPC may be used for barring of services and code destinations.

Note : A national network generated Calling party number may be used.

Calling Party Category 239 - Inhibit Call Diversion

This CPC indicates that the call must not be forwarded (ie., by one of the call forward features). This is used to prevent circular call forwarding, or to support certain national network functions such as ring back price.

Calling Party Category 241 - International Operator

This CPC indicates that the call is from a foreign Operator.

This CPC may be delivered at the customer access to MFC in-dialling PABXs and ISDN PRA customers with the appropriate category marking.

This CPC may be used for barring of services and code destinations.

Note: A national network generated Calling party number may be used.

Calling Party Category 242 - National Operator

This CPC indicates that the call is from a national Operator.

This CPC may be delivered at the customer access to MFC in-dialling PABXs and ISDN PRA customers with the appropriate category marking.

This CPC may be used for barring of services and code destinations.

Note: A national network generated Calling party number may be used.

Calling Party Category 243 - Customer, CLI

This CPC indicates that the calling party is an ordinary customer located in part of the national network which is capable of delivering full CLI.

Calling Party Category 244 - Customer or pay-phone, partial CLI

This CPC indicates that the calling party is an ordinary customer or pay-phone located in a part of the analogue PSTN which cannot provide full CLI.

Note: For interworking to analogue PSTN national networks, the generation of multimeter pulses for call charging is the only network option available for customer charging.

Calling Party Category 245 - Customer with CLI, MM required

This CPC indicates that the calling party is an ordinary customer located in part of the network which is capable of delivering full CLI. Meter pulses are required from the national network for customer private meter equipment.

Calling Party Category 247 - Mobile Customer

This CPC indicates that the calling party is a mobile customer.

Note: A national network generated Calling party number may be used.

Calling Party Category 249 - CCR Customer

This CPC indicates that the calling party is an ordinary customer located in part of the national network which is capable of delivering full CLI.

Calling Party Category 250 - CCR Customer, MM required

This CPC indicates that the calling party is an ordinary customer located in part of the network which is capable of delivering full CLI. Meter pulses are required from the national network for customer private meter equipment.

Calling Party Category 251 - Transmission test position

This CPC may be used in an analogue network to direct a call to a TCARS position to perform testing of transmission capabilities. In a national digital network, this CPC may be used for other testing purposes.

This CPC may be barred access to specific network destinations or network services.

Note: A national network generated Calling party number may be used.

Calling Party Category 253 - Payphone, Public, CLI

This CPC indicates that the calling party is a public payphone located in part of the national network that is capable of delivering full CLI. Meter pulses are required from the national network.

This CPC may be barred access to specific network destinations or network services.

Calling Party Category 254 - Payphone, Non-Public, CLI, MM required

This CPC indicates that the calling party is a non-public payphone located in part of the national network that is capable of delivering full CLI. Meter pulses are required from the national network.

This CPC may be barred access to specific network destinations or network services.

B.2.16 Calling party's category request indicator

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.17 Calling party's category response indicator

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.18 Cause value

Information sent in either direction indicating the reason for sending the message (e.g. release message).

Definitions for each cause value are listed below.

a) Normal class

Cause 1 – Unallocated (unassigned) number

This cause indicates that the called party cannot be reached because, although the called party number is in a valid format, it is not currently allocated (assigned).

Cause 2 – ~~No route to specified transit network~~

(This section is not applicable to the Interconnect ISUP specification)

Cause 3 – No route to destination

This cause indicates that the called party cannot be reached because the network through which the call has been routed does not serve the destination desired. This cause is supported on a network-dependent basis.

Cause 4 – ~~Send special information tone~~

(This section is not applicable to the Interconnect ISUP specification international interface)

Cause 5 – Misdialed trunk prefix (national use)

This cause indicates the erroneous inclusion of a trunk prefix in the called party number.

Cause 16 – Normal call clearing

This cause indicates that the call is being cleared because one of the users involved in the call has requested that the call be cleared. Under normal situation, the source of this cause is not the network.

Cause 17 – User busy

This cause is used when the called party is unable to accept another call because the user busy condition has been encountered. ~~has indicated the inability to accept another call.~~ This cause value may be generated by the called user or by the network. In the case of user determined user busy, it is noted that the user equipment is compatible with the call.

Cause 18 – No user responding

This cause is used when a called party does not respond to a call establishment message with either an alerting or connect indication within the prescribed period of time.

Cause 19 – No answer from user (user alerted)

This cause is used when the called party has been alerted but does not respond with a connect indication within the prescribed period of time.

This cause is not necessarily generated by ISDN access signalling procedures but may be generated by internal network timers.

Cause 21 – Call rejected

This cause indicates that the equipment sending this cause does not wish to accept this call, although it could have accepted the call because the equipment sending this cause is neither busy nor incompatible.

Cause 22 – Number changed

This cause is returned to a calling party when the called number indicated by the calling party is no longer assigned. ~~The new called number may optionally be included in the diagnostic field. If a network does not support this capability, cause number 1 shall be used.~~

Cause 27 – Destination out of order

This cause indicates that the destination requested by the user cannot be reached because the interface to the destination is not functioning correctly. The term “not functioning correctly” indicates that a signalling message was unable to be delivered to the remote party; e.g. a physical layer or data link layer failure at the remote party, user equipment off-line, etc.

Cause 28 – Address incomplete

This cause indicates that the called party cannot be reached because the called party number is not in a valid format or is not complete. This condition may be determined ~~in the incoming international exchange (or in the national destination network):~~

- immediately after reception of an ST signal, or
- on timeout after the last received digit, or
- when the minimum or fixed number of digits have been received

Cause 29 – Facility rejected

This cause is returned when a supplementary service requested by the user cannot be provided by the network.

Cause 31 – Normal, unspecified

This cause is used to report a normal event only when no other cause in the normal class applies.

b) Resource unavailable class

Cause 34 – No circuit available

This cause indicates that there is no appropriate circuit presently available to handle the call.

Cause 38 – Network out of order

This cause indicates that the network is not functioning correctly and that the condition is likely to last a relatively long period of time, e.g. immediately re-attempting the call is not likely to be successful.

Cause 41 – Temporary failure

This cause indicates that the network is not functioning correctly and that the condition is not likely to last a long period of time, e.g. the user may wish to try another call attempt almost immediately.

Cause 42 – Switching equipment congestion

This cause indicates that the switching equipment generating this cause is experiencing a period of high traffic.

Cause 43 - access information discarded

This cause indicates that the network could not deliver access information to the remote user as requested, i.e., user-to-user information, low layer compatibility, high layer compatibility, or sub-address, as indicated in the diagnostic.

It is noted that the particular type of access information discarded is optionally included in the diagnostic.

Cause 44 – Requested circuit / channel not available

This cause is returned when the circuit or channel indicated by the requesting entity cannot be provided by the other side of the interface.

Cause 47 – Resource unavailable, unspecified

This cause is used to report a resource unavailable event only when no other cause in the resource unavailable class applies.

c) Service or option not available class

Cause 50 – Requested facility not subscribed

(This section is not applicable to the Interconnect ISUP specification international interface)

Cause 55 – Incoming calls barred within CUG

(This section is not applicable to the Interconnect ISUP specification)

Cause 57 – Bearer capability not authorised

This cause indicates that the user has requested a bearer capability which is implemented by the equipment which generated this cause but the user is not authorised to use.

Cause 58 – Bearer capability not presently available

This cause indicates that the user has requested a bearer capability which is implemented by the equipment which generated this cause but which is not available at this time.

Cause 63 – Service or option not available, unspecified

This cause is used to report a service or option not available event only when no other cause in the service or option not available class applies.

d) Service or option not implemented class

Cause 65 – Bearer capability not implemented

This cause indicates that the equipment sending this cause does not support the bearer capability requested.

Cause 69 – Request facility not implemented

(This section is not applicable to the Interconnect ISUP specification international interface)

Cause 70 – Only restricted digital information bearer capability is available

(This section is not applicable to the Interconnect ISUP specification international interface)

Cause 79 – Service or option not implemented, unspecified

This cause is used to report a service or option not implemented event only when no other cause in the service or option not implemented class applies.

e) Invalid message (e.g. parameter out of range) class

Cause 87 – Called user not member of CUG

(This section is not applicable to the Interconnect ISUP specification)

Cause 88 – Incompatible destination

This cause indicates that the equipment sending this cause has received a request to establish a call which has low layer compatibility or high layer compatibility or other compatibility attributes (e.g.data rate) which cannot be accommodated.

Cause 91 – Invalid transit network selection

(This section is not applicable to the Interconnect ISUP specification international interface)

Cause 95 – Invalid message, unspecified

This cause is used to report an invalid message event only when no other cause in the invalid message class applies.

f) Protocol error (e.g. unknown message) class

Cause 97 – Message type nonexistent or not implemented

THIS CAUSE INDICATES THAT THE EQUIPMENT SENDING THIS CAUSE HAS RECEIVED A MESSAGE WITH A MESSAGE TYPE IT DOES NOT RECOGNISE EITHER BECAUSE THIS IS A MESSAGE NOT DEFINED OR DEFINED BUT NOT IMPLEMENTED BY THE EQUIPMENT SENDING THIS CAUSE.

Cause 99 – Parameter not existent or not implemented discarded

THIS CAUSE INDICATES THAT THE EQUIPMENT SENDING THIS CAUSE HAS RECEIVED A MESSAGE WHICH INCLUDES INFORMATION ELEMENT(S) / PARAMETER(S) NOT RECOGNISED BECAUSE THE INFORMATION ELEMENT IDENTIFIER(S)/PARAMETER NAME(S) ARE NOT DEFINED OR ARE DEFINED BUT NOT IMPLEMENTED BY THE EQUIPMENT SENDING THE CAUSE. THIS CAUSE INDICATES THAT THE INFORMATION ELEMENT(S) / PARAMETER(S) WERE DISCARDED. HOWEVER, THE INFORMATION ELEMENT IS NOT REQUIRED TO BE PRESENT IN THE MESSAGE IN ORDER FOR THE EQUIPMENT SENDING THE CAUSE TO PROCESS THE MESSAGE.

Cause 102 – Recovery on timer expiry

This cause indicates that the procedure has been initiated by the expiry of a timer in association with error handling procedure.

Cause 103 – Parameter nonexistent or not implemented passed on

THIS CAUSE INDICATES THAT THE EQUIPMENT SENDING THIS CAUSE HAS RECEIVED A MESSAGE WHICH INCLUDES PARAMETERS NOT RECOGNISED BECAUSE THE PARAMETERS ARE NOT DEFINED OR ARE DEFINED BUT NOT IMPLEMENTED BY THE EQUIPMENT SENDING THE CAUSE. THE CAUSE INDICATES THAT THE PARAMETER(S) WERE IGNORED. IN ADDITION, IF THE EQUIPMENT SENDING THIS CAUSE IS AN INTERMEDIATE POINT, THEN THIS CAUSE INDICATES THAT THE PARAMETER(S) WERE PASSED ON UNCHANGED.

CAUSE 110 - MESSAGE WITH UNRECOGNISED PARAMETER DISCARDED

THIS CAUSE INDICATES THAT THE EQUIPMENT SENDING THIS CAUSE HAS DISCARDED A RECEIVED MESSAGE WHICH INCLUDES A PARAMETER THAT IS NOT RECOGNISED.

Cause 111 – Protocol error, unspecified

This cause is used to report a protocol error event only when no other cause in the protocol error class applies.

g) Interworking class

Cause 127 – Interworking, unspecified

This cause indicates that there has been interworking with a network which does not provide causes for actions it takes; thus, the precise cause for a message which is being sent cannot be ascertained.

B.2.19 Charge indicator

Information sent in the backward direction indicating whether or not the call is chargeable.

B.2.20 Charge information request indicator (national use)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.20.A MESSAGE COMPATIBILITY INFORMATION PARAMETER

INFORMATION SENT IN EITHER DIRECTION INDICATING HOW AN EXCHANGE SHOULD REACT IN CASE THIS MESSAGE IS UNRECOGNIZED.

B.2.21 Charge information response indicator (national use)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.22 Circuit group supervision message type indicator

Information sent in a circuit group blocking or unblocking message, indicating whether blocking (unblocking) is maintenance oriented or hardware oriented.

B.2.23 Circuit identification code

Information identifying the physical path between a pair of exchanges.

B.2.24 Circuit state indicator

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.25 Closed user group call indicator

(This section is not applicable to the Interconnect ISUP specification)

B.2.26 Closed user group interlock code

(This section is not applicable to the Interconnect ISUP specification)

B.2.26.A PARAMETER COMPATIBILITY INFORMATION PARAMETER.

INFORMATION SENT IN EITHER DIRECTION INDICATING HOW AN EXCHANGE SHOULD REACT IN CASE THE PARAMETER IS UNRECOGNIZED.

B.2.27 Coding standard

Information sent in association with a parameter (e.g. cause indicators) identifying the standard in which the parameter format is described.

B.2.28 Connected number

(This section is not applicable to the Interconnect ISUP specification)

B.2.29 Connection request

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.30 Continuity check indicator

(This section is not applicable to the Interconnect ISUP specification)

B.2.31 Continuity indicator

(This section is not applicable to the Interconnect ISUP specification)

B.2.32 Credit

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.33 Diagnostic

INFORMATION SENT IN ASSOCIATION WITH A CAUSE AND WHICH PROVIDES SUPPLEMENTARY INFORMATION ABOUT THE REASON FOR SENDING THE MESSAGE.

B.2.34 Echo control device indicator

Information indicating whether or not a half echo control device is included in the connection.

B.2.35 End-to-end information indicator

Information sent in either direction indicating whether or not the sending exchange has further call information available for end-to-end transmission. In the forward direction, an indication that end-to-end information is available will imply that the destination exchange may obtain the information before alerting the called party.

Only the default value is allowed to be sent on the Interconnect ISUP international interface.

B.2.36 End-to-end method indicator

Information sent in either direction indicating the available methods, if any, for end-to-end transfer of information.

Only the default value is allowed to be sent on the Interconnect ISUP international interface.

B.2.37 Event indicator

Information sent in the backward direction indicating the type of event which caused a call progress message to be sent to the originating local exchange.

B.2.38 Event presentation restricted indicator

Information sent in the backward direction indicating that the event should not be presented to the calling party.

Only the default value is allowed to be sent on the Interconnect ISUP international interface.

B.2.39 Extension indicator

Information indicating whether or not the associated octet has been extended.

B.2.40 Facility indicator

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.41 Holding indicator (national use)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.42 Hold provided indicator (national use)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.43 In band information indicator

Information sent in the backward direction indicating that inband information or an appropriate pattern is now available.

B.2.44 Internal network number indicator

Information sent to the destination exchange indicating whether or not the call is allowed should the called party number prove to be an internal network number (e.g. mobile access point).

B.2.45 Interworking indicator

Information sent in either direction indicating whether or not Signalling System No.7 is used in all parts of the network connection.

B.2.46 ISDN access indicator

Information sent in either direction indicating whether or not the access signalling protocol is ISDN.

B.2.47 ISDN User Part indicator

Information sent in either direction to indicate that the ISDN User Part is used in all preceding parts of the network connection. When sent in the backward direction, the preceding parts are those towards the called party.

B.2.48 ISDN user preference indicator

Information sent in the forward direction indicating whether or not the ISDN User Part is required or preferred in all parts of the network connection.

B.2.49 Local reference

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.50 Location

Information sent in either direction indicating where an event (e.g. release) was generated.

B.2.51 Malicious call identification request indicator (national use)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.52 Modification indicator

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.53 National/international call indicator

Information sent in the forward direction indicating in the destination national network whether the call has to be treated as an international call or as a national call.

B.2.54 Nature of address indicator

Information sent in association with an address indicating the nature of that address, e.g. ISDN international number, ISDN national significant number, or ISDN subscriber number.

B.2.55 Numbering plan indicator

Information sent in association with a number indicating the numbering plan used for that number (e.g.ISDN number, telex number).

Only the default value is allowed to be sent on the Interconnect ISUP interface international interface.

B.2.56 Odd/even indicator

Information sent in association with an address, indicating whether the number of address signals contained in the address is even or odd.

B.2.57 Original called number

(This section is not applicable to the international interface)

Information sent in the forward direction when a call is redirected and identifies the original called party.

B.2.58 Original redirection reason

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.59 Point code

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.60 Protocol class

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.61 Protocol control indicator

Information consisting of the end-to-end method indicator, the interworking indicator, the end-to-end information indicator, the SCCP method indicator and the ISDN User Part indicator. The protocol control indicator is contained in both the forward and backward call indicators parameter field and describes the signalling capabilities within the network connection.

Whether a bit or a bit combination contained in the PCI has history or control characteristic is specified in the definitions of the individual bits or bit combinations.

B.2.62 Range

Information sent in a circuit group supervision message (e.g.circuit group blocking) to indicate the range of circuits affected by the action in the message.

B.2.63 Recommendation indicator

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.64 Redirecting indicator

IF USED, THE REDIRECTING INDICATOR CONTAINS INFORMATION SENT IN EITHER DIRECTION INDICATING WHETHER THE CALL HAS BEEN DIVERTED OR REROUTED AND WHETHER OR NOT PRESENTATION OF REDIRECTION INFORMATION TO THE CALLING PARTY IS RESTRICTED.

B.2.65 Redirecting number

IF USED, THE REDIRECTING NUMBER CONTAINS INFORMATION SENT IN THE FORWARD DIRECTION WHEN A CALL IS DIVERTED, INDICATING THE NUMBER FROM WHICH THE CALL WAS DIVERTED.

B.2.66 Redirecting reason

IF USED, THE REDIRECTING REASON CONTAINS INFORMATION SENT IN EITHER DIRECTION INDICATING, IN THE CASE OF CALLS UNDERGOING MULTIPLE REDIRECTIONS, THE REASON WHY THE CALL HAS BEEN REDIRECTED.

B.2.67 Redirection counter

IF USED, THE REDIRECTING COUNTER CONTAINS INFORMATION SENT IN EITHER DIRECTION INDICATING, THE NUMBER OF REDIRECTIONS WHICH HAVE OCCURED ON A CALL.

B.2.68 Redirection number

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.69 Routing label

Information provided to the message transfer part for the purpose of message routing (see Recommendation Q.704, § 2.2).

B.2.70 Satellite indicator

Information sent in the forward direction indicating the number of satellite circuits in the connection.

B.2.71 SCCP method indicator

(This section is not applicable to the Interconnect ISUP specification)

B.2.72 Screening indicator

Information sent in either direction to indicate whether the address was provided by the user or network.

B.2.73 Signalling point code (national use)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.74 Solicited information indicator

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.75 Status

Information sent in a circuit group supervision message (e.g.circuit group blocking) to indicate the specific circuits,within the range of circuits stated in the message,that are affected by the action specified in the message.

B.2.76 Suspend/resume indicator

Information sent in the suspend and resume messages to indicate whether suspend/resume was initiated by an ISDN subscriber or by the network.

B.2.77 Temporary trunk blocking after release (national use)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.78 Transit network selection (national use)

(This section is not applicable to the Interconnect ISUP specification international interface)

B.2.79 Transmission medium requirement

Information sent in the forward direction indicating the type of transmission medium required for the connection (e.g.64 kbit/s unrestricted,speech).

B.2.80 User service information

Information sent in the forward direction indicating the bearer capability requested by the calling party.

B.2.81 User-to-user indicators

Information sent in association with a request (or response to a request) for user-to-user signalling supplementary service(s).

Only the default value is allowed to be sent on the international interface.

B.2.82 User-to-user information

Information generated by a user and transferred transparently through the interexchange network between the originating and terminating local exchanges.

B.2.AA Connected line identity request indicator

(This section is not applicable to the Interconnect ISUP specification)

B.2.BB Network discard indicator

(This section is not applicable to the Interconnect ISUP specification)

ANNEX C Formats and codes

(to the Interconnect
ISUP Specification)

(to Recommendation
Q.767)

C.1 General

ISDN user part messages are carried on the signalling link by means of signal units the format of which is described in Recommendation Q.703, § 2.2.

The format of and the codes used in the service information octet are described in Recommendation Q.704, § 14.2. The service indicator for the ISDN user part is coded 0101.

The signalling information field of each message signal unit containing an ISDN User Part message consists of an integral number of octets and encompasses the following parts (see Figure C-1/Q.767):

- a) routing label;
- b) circuit identification code;
- c) message type code;
- d) the mandatory fixed part;
- e) the mandatory variable part;
- f) the optional part, which may contain fixed length and variable length parameter fields.

Note — The service information octet, the routing label and circuit identification code are not included in the SCCP user data parameter transferred between the ISDN user part and signalling connection control part.

A description of the various message parts is given in the following sections.

Routing label
Circuit identification code
Message type code
Mandatory fixed part
Mandatory variable part
Optional part

FIGURE C-1/Q.767

ISDN user part message parts

C.1.1 Routing label

The format and codes used for the routing label are described in Recommendation Q.704, § 2.2. For each individual circuit connection, the same routing label must be used for each message that is transmitted for that connection.

SPECIFICATION

C.1.2 Circuit identification code

The format of the circuit identification code (CIC) is shown in Figure C-2/Q.767.

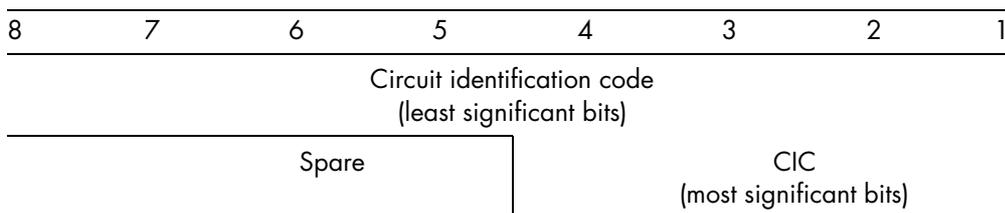


FIGURE C-2/Q.767

Circuit identification field

The allocation of circuit identification codes to individual circuits is determined by bilateral agreement and/or in accordance with applicable predetermined rules.

For international applications, the four spare bits of the circuit identification field are reserved for CIC extension, provided that bilateral agreement is obtained before any increase in size is performed. For national applications, the four spare bits can be used as required.

Allocations for certain applications are defined below :

a) 2048 kbit/s digital path

- For circuits which are derived from a 2048 kbit/s digital path (Recommendations G.732 and G.734) the circuit identification code contains in the 5 least significant bits a binary representation of the actual number of the time slot which is assigned to the communication path.
- The remaining bits in the circuit identification code are used, where necessary, to identify these circuits uniquely among all other circuits of other systems interconnecting an originating and destination point.

System Number	Channel Number																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62
3	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93
4	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124
5	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155
6	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186
7	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217
8	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248
9	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279
10	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310
etc																															

FIGURE C-2.1

Example : Allocation of CIC codes

C.1.3 Message type code*

The message type code consists of a one octet field and is mandatory for all messages. The message type code uniquely defines the function and format of each ISDN user part message. The allocation with reference to the appropriate descriptive section of this Recommendation is summarised in Table C-3/Q-767.

C.1.4 Formatting principles

Each message consists of a number of PARAMETERS listed and described in § C.2. Each parameter has a NAME which is coded as a single octet (see Table C-4/Q-767). The length of a parameter may be fixed or variable, and a LENGTH INDICATOR of one octet for each parameter may be included as described below.

The detailed format is uniquely defined for each message type as described in § C.3.

Between parameters there should be no unused (i.e. dummy) octets.

A general format diagram is shown in Figure C-3/Q-767.

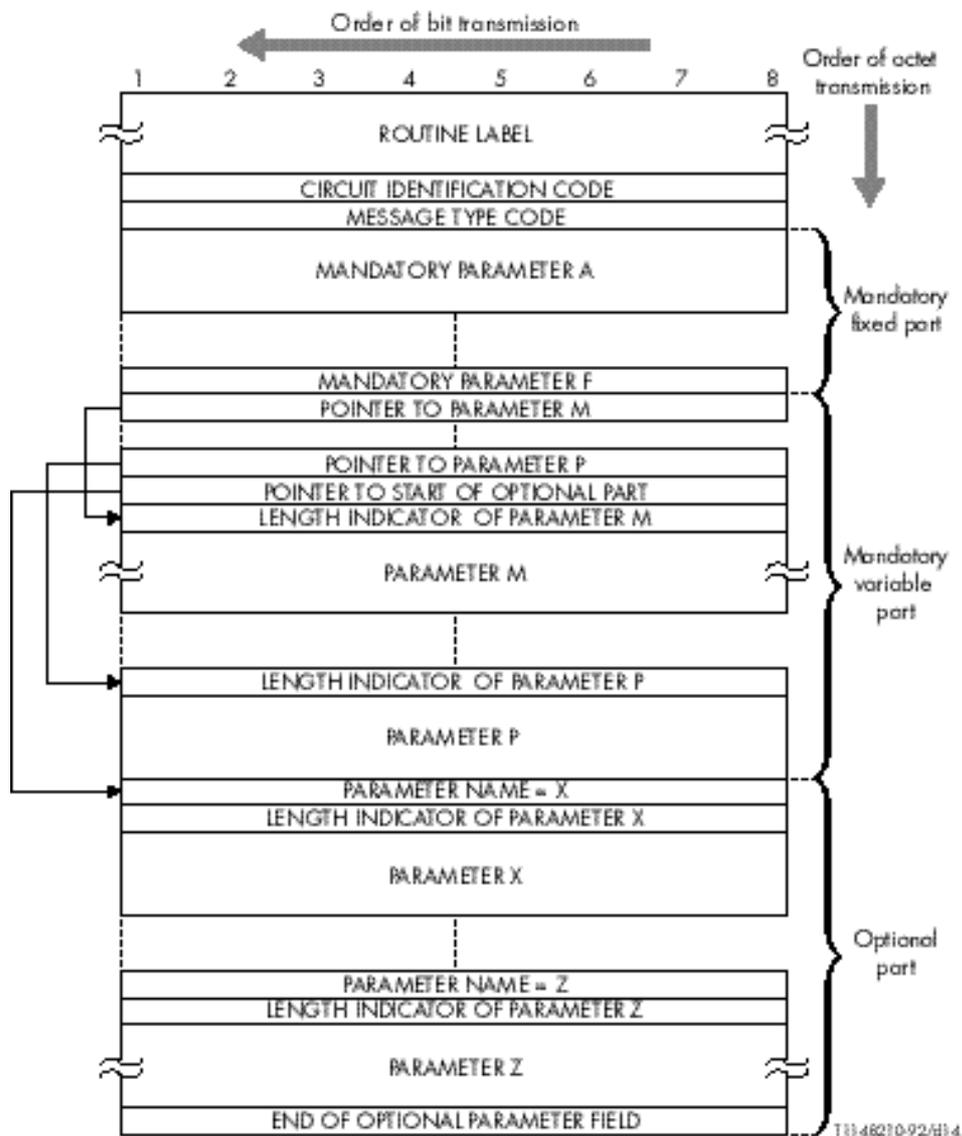


FIGURE C-3/Q-767

C.1.5 Mandatory fixed part

Those parameters that are mandatory and of fixed length for a particular message type will be contained in the mandatory fixed part. The position, length and order of the parameters is uniquely defined by the message type, thus the names of the parameters and the length indicators are not included in the message.

C.1.6 Mandatory variable part

Mandatory parameters of variable length will be included in the mandatory variable part. Pointers are used to indicate the beginning of each parameter. Each pointer is encoded as a single octet. The name of each parameter and the order in which the pointers are sent is implicit in the message type. Parameter names are, therefore, not included in the message. The details of how pointers are encoded is found in § C.2.3. The number of parameters, and thus the number of pointers is uniquely defined by the message type.

A pointer is also included to indicate the beginning of the optional part. If the message type indicates that no optional part is allowed, then this pointer will not be present. If the message type indicates that an optional part is possible (reflected by the presence of an “end of optional parameter” octet in Tables C-5 through C-28 / Q.767), but there is no optional part included in this particular message than a pointer field containing all zeros will be used. It is recommended that all future message types with a mandatory variable part indicate that an optional part is allowed.

All the pointers are sent consecutively at the beginning of the mandatory variable part. Each parameter contains the parameter length indicator followed by the contents of the parameters.

If there are no mandatory variable parameters, but optional parameters are possible, the start of optional parameters pointer (coded all “0”s, if no optional parameter is present and coded “000001” if any optional parameter is present) will be included.

Note : If no optional parameter is present, then the start of optional parameters pointer can be coded as all “0”s (as defined above) or can point to the end of optional parameters pointer if the end of optional parameters pointer is present.

C.1.7 Optional part

The optional part consists of parameters that may or may not occur in any particular message type. Both fixed length and variable length parameters may be included. Optional parameters may be transmitted in any order. Each optional parameter will include the parameter name (one octet) and the length indicator (one octet) followed by the parameter contents.

C.1.8 End of optional parameters octet

If optional parameters are present and after all optional parameters have been sent, an “end of optional parameters” octet containing all zeros will be transmitted.

If no optional parameter is present an “end of optional parameter” octet is not transmitted.

C.1.9 Order of transmission

Since all the fields consist of an integral number of octets, the formats represented as a stack of octets. The first octet transmitted is the one shown at the top of the stack and the last is the one at the bottom (see Figure C-3/Q.767).

Unless otherwise indicated, within each octet and subfield the bits are transmitted with the least significant bit first.

C.1.10 Coding of spare bits

Spare bits are coded 0 unless indicated otherwise.

Reserved bits shall also be set to zero and where parameters are defined as not to be provided but must be included to maintain bit pattern structure, they shall be set to zero.

C.1.11 National message types and parameters

(This section is not applicable to the Interconnect ISUP specification international interface)

C.2. Parameter formats and codes

C.2.1 Message type codes

The encoding of the message type is shown in Table C-3/Q.767.

C.2.2 Coding of the length indicator

The length indicator field is binary coded to indicate the number of octets in the parameter content field. The length indicated does not include the parameter name octet or the length indicator octet.

C.2.3 Coding of the pointers

The pointer value (in binary) gives the number of octets between the pointer itself (included) and the first octet (not included) of the parameter associated with that pointer.

The pointer value all zeros is used to indicate that, in the case of optional parameters, no optional parameter is present.

C.3 ISDN user part parameters

C.3.1 Parameter names

The parameter name codes are given in Table C-4/Q.767 together with references to the subsections in which they are described.

TABLE C-3/Q.767

Message type	Reference (table)	Code
Address complete	C-5/Q.767	00000110
Answer	C-6/Q.767	00001001
Blocking	C-23/Q.767	00010011
Blocking acknowledgment	C-23/Q.767	00010101
Call modification completed	C-24/Q.767	00011101
Call modification request	C-24/Q.767	00011100
Call modification reject	C-24/Q.767	00011110
Call progress	C-7/Q.767	00101100
Circuit group blocking	C-25/Q.767	00011000
Circuit group blocking ack.	C-25/Q.767	00011010
Circuit group query	C-26/Q.767	00101010
Circuit group query response	C-8/Q.767	00101011
Circuit group reset	C-26/Q.767	00010111
Circuit group reset ack.	C-9/Q.767	00101001
Circuit group unblocking	C-25/Q.767	00011001
Circuit group unblocking ack.	C-25/Q.767	00011011
Charge information	see/Q.767	00110001
Confusion	C-10/Q.767	00101111
Connect	C-11/Q.767	00000111
Continuity	C-12/Q.767	00000101
Continuity check request	C-23/Q.767	00010001
Delayed release	C-21/Q.767	00100111
Facility accepted	C-27/Q.767	00100000
Facility reject	C-13/Q.767	00100001
Facility request	C-27/Q.767	00011111
Forward transfer	C-21/Q.767	00001000
Information	C-14/Q.767	00000100
Information request	C-15/Q.767	00000011
Initial address	C-16/Q.767	00000001
Loop back acknowledgment	C-23/Q.767	00100100
Overload	C-23/Q.767	00110000
Pass along	C-28/Q.767	00101000
Release	C-17/Q.767	00001100

Message type	Reference (table)	Code
Release complete	C-18/Q.767	00010000
Reset circuit	C-23/Q.767	00010010
Resume	C-22/Q.767	00001110
Subsequent address	C-19/Q.767	00000010
Suspend	C-22/Q.767	00001101
Unblocking	C-23/Q.767	00010100
Unblocking acknowledgment	C-23/Q.767	00010110
Unequipped CIC	C-23/Q.767	00101110
User -to user information	C-20/Q.767	00101101
Reserved (used in 1984 version)		00001010 00001011 00001111 00100010 00100011 00100101 00100110

Note - the format of this message is a national matte

TABLE C - 4/Q.767

Parameter name	Reference §	Code
Access transport	C.3.2	00000011
Automatic congestion level	C.3.3	00100111
Backward call indicators	C.3.4	00010001
Call modification indicators	C.3.5	00010111
Call reference	C.3.6	00000001
Called party number	C.3.7	00000100
Calling party number	C.3.8	00001010
Calling party's category	C.3.9	00001001
Cause indicators	C.3.10	00010010
Circuit group supervision message type indicator	C.3.11	00010101
Circuit state indicator	C.3.12	00100110
Closed user interlock code	C.3.13	00011010
Connected number	C.3.14	00100001
Connection request	C.3.15	00001101
Continuity indicators	C.3.16	00010000
End of optional parameters	C.3.17	00000000
Event information	C.3.18	00100100
Facility indicators	C.3.19	00011000
Forward call indicators	C.3.20	00000111
Information indicators	C.3.21	00001111
Information request indicators	C.3.22	00001110
MESSAGE COMPATIBILITY INFORMATION	C.3.20A	00111000
Nature of connection indicators	C.3.23	00000110
Optional backward call indicators	C.3.24	00101001
Optional forward call indicators	C.3.25	00001000
ORIGINAL CALLED NUMBER	C.3.26	00101000
PARAMETER COMPATIBILITY INFORMATION	C.3.26A	00111001
Range and status	C.3.27	00010110
Redirecting number	C.3.28	00001011
Redirection information	C.3.29	00010011
Redirection number	C.3.30	00001100
Signalling point code	C.3.31	00011110
Subsequent number	C.3.32	00000101

Parameter name	Reference §	Code
Suspend/resume indicators	C.3.33	00100010
Transmit network selection	C.3.34	00100011
Transmission medium requirement	C.3.35	00000010
User service information	C.3.36	00011101
User-to-user indicators	C.3.37	00101010
User-to-user information	C.3.38	00100000
Reserved (used in 1984 version Red book)		00010100 00011001 00011011 00011100 00011111
Reserved for multi slot identifier		00100101

C.3.2 Access transport

The format of the access transport parameter field is shown in Figure C-4/Q.767.

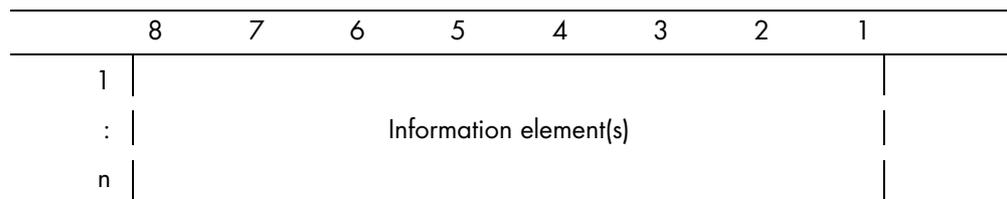


FIGURE C - 4/Q.767

Access transport parameter field

The information element is coded as described in Recommendation Q.931, § 4.5. Multiple Q.931 information elements can be included within the access transport parameter. The information elements applicable to a particular usage of the access transport parameter are dependent on, and will be determined by, the relevant procedures.

~~The maximum length should only be limited by the message length as the content of the ATP will probably evolve in the future.~~

C.3.3 Automatic congestion level

The format of the automatic congestion level parameter field is shown in Figure C-5/Q.763.



FIGURE C - 5/Q.767

Automatic congestion level parameter field

The following codes are used in the automatic congestion level parameter field :

```

00000000    spare
00000001    congestion level 1 exceeded
00000010    congestion level 2 exceeded

00000011
to          spare
11111111
    
```

C.3.4 Backward call indicators

The format of the backward call indicators parameter field is shown in Figure C-6/Q.767.

	8	7	6	5	4	3	2	1
1	H	G	F	E	D	C	B	A
2	P	O	N	M	L	K	J	I

FIGURE C-6/Q.767
Backward call indicators parameter field

The following codes are used in the backward call indicators parameter field :

```

bits  B A:      Charge indicator
      0 0      no indication
      0 1      no charge
      1 0      charge
      1 1      spare
    
```

The interpretation of these bits depends only on the originating exchange.

```

bits  D C:      Called party's status indicator
      0 0      no indication
      0 1      subscriber free
      1 0      connect when free, not used
      1 1      spare

bits  F E:      Called party's category indicator
      0 0      no indication
      0 1      ordinary subscriber
      1 0      payphone
      1 1      spare

bits  H G:      End-to-end method indicator (Note)
      0 0      no end-to-end method available (only link-by-link
                method available)
      0 1      pass along method available, not used
      1 0      SCCP method available, not used
      1 1      pass along and SCCP methods available, not used

bit   I:        Interworking indicator (Note)
      0         no interworking encountered
      1         interworking encountered

bit   J:        End-to-end information indicator (Note)
      0         no end-to-end information available
      1         end-to-end information available, not used

bit   K:        ISDN User Part indicator (Note)
      0         ISDN User Part not used all the way
      1         ISDN User Part used all the way
    
```

bit	L:	0	1	0	1	0	1	0	1	0	1
	M:										
	N:										
bits	P O:										

Note - Bits G K and O P constitute the protocol control indicator.

C.3.5 Call modification indicators

(This section is not applicable to the Interconnect ISUP specification international interface)

C.3.6 Call reference

(This section is not applicable to the Interconnect ISUP specification international interface)

C.3.7 Called party number

The format of the called party number parameter field is shown in Figure C-9/Q.767.

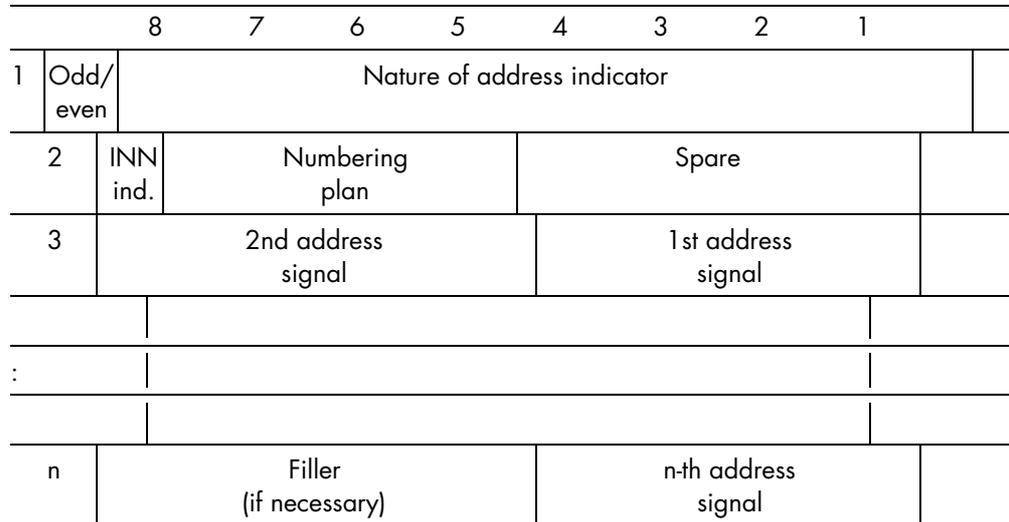


FIGURE C-9/Q.767
Called party number parameter field

The following codes are used in the subfields of the called party number parameter field:

a) Odd/even indicator

0	even number of address signals
1	odd number of address signals

b) Nature of address indicator

0000000	spare
0000001	subscriber number, not used
0000010	spare, reserved for national use, not used <u>Unknown</u>
0000011	national (significant) number, not used
0000100	international number, not used
00000101	
to	spare
11011111	
11100000	
to	reserved for national use, not used
11101110	
1111111	spare

c) Internal network number indicator (INN ind.)

0	routing to internal network number allowed
1	routing to internal network number not allowed

d) Numbering plan indicator

000	pare
001	ISDN (Telephony) numbering plan (Recommendation E.164,E.163)
010	spare
011	Data numbering plan (Recommendation X.121); not used
100	Telex numbering plan (Recommendation F.69); not used
101	reserved for national use, not used
110	reserved for national use, not used
111	spare

e) Address signal

0000	digit 0
0001	digit 1
0010	digit 2
0011	digit 3
0100	digit 4
0101	digit 5
0110	digit 6
0111	digit 7
1000	digit 8
1001	digit 9
1010	<u>spare code 10</u>
1011	code 11
1100	code 12
1101	<u>spare code 13</u>
1110	<u>spare code 14</u>
1111	<u>ST, or code 15 depending on bilateral agreements between carriers</u>

The most significant address signal is sent first. Subsequent address signals are sent in successive 4-bit fields.

f) Filler

In case of an odd number of address signals, the filler code 0000 is inserted after the last address signal.

C.3.8 Calling party number

The format of the calling party number parameter field is shown in Figure C-10/Q.767:

		8	7	6	5	4	3	2	1	
1	Odd/ even	Nature of address indicator								
2	NI ind.	Numbering plan			Presentat. restriction		Screening indicator			
3	2nd address signal				1st address signal					
:										
n	Filler (if necessary)				n-th address signal					

Note – When the address presentation restricted indicator indicates address not available, octets 3 to n are omitted.

FIGURE C - 10/Q.767
Calling party number parameter field

The following codes are used in the calling party number parameter field:

a) Odd/even indicator:

See § C.3.7 a).

b) Nature of address indicator

- 0000000 spare
- 0000001 ~~subscriber number, not used~~
- 0000010 ~~spare, reserved for national use, not used~~
- 0000011 national (significant) number, ~~not used~~
- 0000100 ~~international number, not used~~
- 0000101
- to spare
- 1101111
- 1110000
- to ~~reserved for national use, not used~~
- 1111110
- 1111111 spare

Note – Other types of nature of address indications (e.g. transit exchange identity) are for further study.

c) Calling party number incomplete indicator (NI)

0	complete
1	incomplete , <u>not used</u>

d) Numbering plan indicator

See § C.3.7 d).

e) Address presentation restricted (Pres. Restrict.) indicator

00	presentation allowed
01	presentation restricted
10	address not available (Note) , <u>not used</u>
11	spare

Note – When the address is unavailable, the subfields in items a), b), c) and d) are coded with 0's.

f) Screening indicator

00	reserved (Note) , <u>not used</u>
01	user provided, verified and passed
10	reserved (Note) , <u>not used</u>
11	network provided

Note – Code 00 and 10 are reserved for “user provided, not verified” and user provided, verified and failed respectively.

g) Address signal

0000	digit 0
0001	digit 1
0010	digit 2
0011	digit 3
0100	digit 4
0101	digit 5
0110	digit 6
0111	digit 7
1000	digit 8
1001	digit 9
1010	spare code 10
1111	code 11
1100	code 12
1101	spare code 13
1110	spare code 14
1111	spare code 15

h) Filler

See § C.3.7 f).

C.3.9 Calling party's category

The format of the calling party's category parameter field is shown in Figure C-11/Q.767.

8	7	6	5	4	3	2	1
Calling party's category							

FIGURE C-11/Q.767**Calling party's category parameter field**

The following codes are used in the calling party's category parameter field:

00000000	calling party's category unknown at this time <u>not used reserved (Note 1)</u>
00000001	operator, language French <u>reserved (Note 1)</u>
00000010	operator, language English <u>not used (Note 2)</u>
00000011	operator, language German <u>reserved (Note 1)</u>
00000100	operator, language Russian <u>reserved (Note 1)</u>
00000101	operator, language Spanish <u>reserved (Note 1)</u>
00000110	<u>reserved (Note 1)</u>
00000111	<u>reserved (Note 1)</u>
00001000	<u>reserved (Note 1)</u>
00001001	reserved (see Recommendation Q.104) (Note) <u>not used reserved (Note 1)</u>
00001010	ordinary calling subscriber <u>international Customer or Payphone</u>
00001011	calling subscriber with priority <u>not used (Note 2)</u>
00001100	data call (voice band data) <u>reserved (Note 1)</u>
00001101	test call <u>not used (Note 2)</u>
00001110	spare <u>reserved (Note 1)</u>
00001111	payphone <u>not used (Note 2)</u>
00010000	<u>spare reserved (Note 1)</u>
to	
11011111	
11100000	reserved for national use, <u>not used reserved (Note 1)</u>
to	
11101110	
11101111	<u>inhibit call diversion</u>
11110000	<u>not used (Note 2)</u>
11110001	<u>International Operator</u>
11110010	<u>National Operator</u>
11110011	<u>Customer, CLI</u>
11110100	<u>Customer or Payphone, partial CLI</u>
11110101	<u>Customer with CLI, MM req'd</u>
11110110	<u>not used (Note 2)</u>
11110111	<u>Mobile Customer</u>
11111000	<u>not used (Note 2)</u>
11111001	<u>CCR Customer</u>
11111010	<u>CCR customer, MM req'd</u>
11111011	<u>Transmission test position</u>
11111100	<u>not used (Note 2)</u>
11111101	<u>Payphone, Public, CLI</u>
11111110	<u>Payphone Non-Public, CLI, MM req'd</u>
11111111	spare, <u>reserved (Note 1)</u>

Notes :

1. These CPC are reserved for future allocation and must not be used. Should these CPC values be received by a national network, then the national network should release the call.
 2. These CPC values are not recognised in this specification. Should these CPC values be received by a national network, then the national network may :
 - i) accept the received CPC parameter and map the parameter to another valid CPC parameter.
 - ii) accept the received CPC parameter and map the parameter to a default valid CPC parameter.
 - iii) accept the received CPC parameter and pass the parameter on unchanged.
- or
- iv) release the call.

Note - In national networks code 00001001 may be used to indicate that the calling party is a national operator.

C.3.10 Cause indicators

The format of the cause indicators parameter field is shown in Figure C-12/Q.767.

	8	7	6	5	4	3	2	1
1	Ext	Coding standard		Spare	Location			
<u>1A</u>	<u>EXT</u>	<u>RECOMMENDATION (NOTE 1)</u>						
2	Ext	Cause value						
<u>3</u>	<u>DIAGNOSTICS (NOTE 2)</u>							
:								
<u>3N</u>								

NOTE 1: OCTET 1A MAY BE OMITTED.

NOTE 2: OCTET 3 TO 3N MAY BE OMITTED OR REPEATED. E.G. 3' TO 3'N

FIGURE C-12/Q.767

Cause indicator parameter field

The following codes are used in the subfields of the cause indicators parameter field:

- a) Extension indicator (ext)

0	octet continues through the next octet (e.g.octet 1 to 1a), <u>not used</u>
1	last octet
- b) Coding standard

00	CCITT standard,as described below
01	<u>reserved for other international standards (Note); not used</u>
10	<u>national standard (Note); not used</u>
11	<u>standard specific to identified location (Note); not used</u>

Note - ~~These other coding standards should be used only when the desired cause cannot be represented with the CCITT standard.~~

c) Location

0000	user
0001	private network serving the local user, not used
0010	public network serving the local user, not used
0011	transit network, not used
0100	public network serving the remote user
0101	private network serving the remote user
0111	international network
1010	beyond an interworking point, all other values are reserved.

Note - Depending on the location of the users, the public network serving the local user may be the same network serving the remote user. Rules for coding the location field are defined in Recommendation Q.931 Annex J.

d) Recommendation

0000000 *CCITT Q.931*

Note - If the octet including this field is omitted, the above value is assumed.

e) Cause value

The cause value is divided into two fields, a class (bits 5 through 7) and a value within a class (bits 1 through 4). The decimal equivalent of the cause value is shown in brackets beside the cause value.

Class 000 and 001 — normal event:

0000001	(1)	unallocated (unassigned) number
0000010	(2)	no route to specified transit network (national use); not used
0000011	(3)	no route to destination
0000100	(4)	send special information tone, not used
0000101	(5)	misdialed trunk prefix, (national use), not used
0010000	(16)	normal call clearing
0010001	(17)	user busy
0010010	(18)	no user responding
0010011	(19)	no answer from user (user alerted)
0010101	(21)	call rejected
0010110	(22)	number changed
0011011	(27)	destination out of order
0011100	(28)	address incomplete
0011101	(29)	facility rejected
0011111	(31)	normal unspecified

Class 010 — resource unavailable:

0100010	(34)	no circuit available
0100110	(38)	network out of order
0101001	(41)	temporary failure
0101010	(42)	switching equipment congestion
<u>0101011</u>	<u>(43)</u>	<u>access information discarded</u>
0101100	(44)	requested channel not available
0101111	(47)	resource unavailable — unspecified

Class 011 — service or option not available:

0110010	(50)	requested facility not subscribed, not used
0110111	(55)	incoming calls barred within CUG, not used
0111001	(57)	bearer capability not authorised
0111010	(58)	bearer capability not presently available
0111111	(63)	service/option not available — unspecified

Class 100 — service or option not implemented:

1000001	(65)	bearer capability not implemented
1000101	(69)	requested facility not implemented, not used
1000110	(70)	only restricted digital information bearer capability is available, (national use)
1001111	(79)	service or option not implemented — unspecified

Class 101 — invalid message (e.g. parameter out of range):

1010111	(87)	called user not member of CUG, not used
1011000	(88)	incompatible destination
1011011	(91)	invalid transit network selection (national use), not used
1011111	(95)	invalid message — unspecified

Class 110 — Protocol error (e.g. unknown message):

1100001	(97)	message type non existent or not implemented, not used
1100011	(99)	parameter nonexistent or not implemented - discarded, not used
<u>1100110</u>	<u>(102)</u>	<u>recovery on timer expiry</u>
1100111	(103)	parameter nonexistent or not implemented - passed on, not used
<u>1101110</u>	<u>(110)</u>	<u>MESSAGE WITH UNRECOGNISED PARAMETER DISCARDED</u>
1101111	(111)	protocol error — unspecified

Class 111 — interworking:

1111111	(127)	interworking unspecified
---------	-------	--------------------------

f) Diagnostic

THE FORMAT AND EXISTENCE OF THE DIAGNOSTIC FIELD IS DEPENDANT ON THE CAUSE VALUE AND THE LOCATION OF GENERATION. FOR CAUSES GENERATED BY A PUBLIC NATIONAL NETWORK, THE FOLLOWING DIAGNAOSTICS MAY BE INCLUDED :

<u>CAUSE</u>	<u>DIAGNOSTIC</u>	<u>FORMAT</u>
<u>1</u>	<u>CONDITION</u>	<u>SEE BELOW</u>
<u>2</u>	<u>TRANSIT NETWORK IDENTITY</u>	<u>SEE C.3.34 (NOTE)</u>
<u>3</u>	<u>CONDITION</u>	<u>SEE BELOW</u>
<u>16</u>	<u>CONDITION</u>	<u>SEE BELOW</u>
<u>21</u>	<u>CONDITION</u>	<u>SEE BELOW</u>
<u>22</u>	<u>CALLED PARTY NUMBER (NEW)</u>	<u>SEE C.3.7 (NOTE)</u>
<u>29</u>	<u>REJECTED PARAMETER (NOTE)</u>	
<u>50</u>	<u>REJECTED PARAMETER (NOTE)</u>	
<u>57</u>	<u>ATTRIBUTE IDENTITY</u>	<u>SEE BELOW</u>
<u>58</u>	<u>ATTRIBUTE IDENTITY</u>	<u>SEE BELOW</u>
<u>65</u>	<u>ATTRIBUTE IDENTITY</u>	<u>SEE BELOW</u>
<u>69</u>	<u>REJECTED PARAMETER (NOTE)</u>	

<u>97</u>	<u>MESSAGE TYPE</u>	<u>SEE TABLE C-3/Q.763</u>
<u>99</u>	<u>PARAMETER NAME(S)</u>	<u>SEE TABLE C-4/Q.763</u>
<u>103</u>	<u>PARAMETER NAME(S)</u>	<u>SEE TABLE C-4/Q.763</u>
<u>110</u>	<u>PARAMETER NAME(S)</u>	<u>SEE TABLE C-4/Q.763</u>

NOTE - THESE DIAGNOSTICS SHALL ALSO INCLUDE THE PARAMETER NAME AND LENGTH OCTETS.

1) DIAGNOSTIC WITH ATTRIBUTE IDENTITY

(This section is not applicable to the Interconnect ISUP specification)

2) CONDITION DIAGNOSTIC

A CONDITION DIAGNOSTIC IS A 1 OCTET FIELD CONTAINING AN EXTENSION BIT (BIT 8) AND ONE OF THE FOLLOWING CODES IN BITS 2-1 :

<u>00</u>	<u>UNKNOWN</u>
<u>01</u>	<u>PERMANENT</u>
<u>10</u>	<u>TRANSIENT</u>
<u>11</u>	<u>SPARE</u>

BITS 3 TO 7 OF A CONDITION DIAGNOSTIC ARE SPARE.

C.3.11 Circuit group supervision message type indicator

The format of the circuit group supervision message type indicator parameter field is shown in Figure C-14/Q.767.

8	7	6	5	4	3	2	1
H	G	F	E	D	C	B	A

FIGURE C-14/Q.767

Circuit group supervision message type parameter field

The following codes are used in the circuit group supervision message type indicator parameter field:

bits	BA:	Type indicator
	0 0	maintenance oriented
	0 1	hardware failure oriented
	1 0	reserved for national use (used in 1984 version); not used
	1 1	spare
bits	CH:	spare

C.3.12 Circuit state indicator

(This section is not applicable to the Interconnect ISUP specification international interface)

C.3.13 Closed user group interlock code

(This section is not applicable to the Interconnect ISUP specification international interface)

C.3.14 Connected number

(This section is not applicable to the Interconnect ISUP specification international interface)

C.3.15 Connection request

(This section is not applicable to the Interconnect ISUP specification international interface)

C.3.16 Continuity indicators

(This section is not applicable to the Interconnect ISUP specification international interface)

C.3.17 End of optional parameters indicator

The last optional parameter field of a message is followed by the end of optional parameters indicator, which occupies a one octet field containing all zeros.

C.3.18 Event information

The format of the event information parameter field is shown in Figure C-20/Q.767.

8	7	6	5	4	3	2	1
H	G	F	E	D	C	B	A

FIGURE C-20/Q.767

Event information parameter field

The following codes are used in the forward call indicators parameter field :

bits	G	F	E	D	C	B	A:	Event indicator
	0	0	0	0	0	0	0	spare
	0	0	0	0	0	0	1	ALERTING
	0	0	0	0	0	1	0	PROGRESS
	0	0	0	0	0	1	1	in-band information or an appropriate pattern is now available
	0	0	0	0	1	0	0	call forwarded on busy, not used
	0	0	0	0	1	0	1	call forwarded on no reply, not used
	0	0	0	0	1	1	0	call forwarded unconditional, not used
	0	0	0	0	1	1	1	
				to				spare
	1	1	1	1	1	1	1	
bit	H:							Event presentation restricted indicator
	0							no indication
	1							presentation restricted, not used

C.3.19 Facility indicator

(This section is not applicable to the Interconnect ISUP specification international interface)

C.3.20 Forward call indicators

The format of the forward call indicators parameter field is shown in Figure C-22/Q.767.

	8	7	6	5	4	3	2	1
1	H	G	F	E	D	C	B	A
2	P	O	N	M	L	K	J	I

FIGURE C-22/Q.767

Forward call indicators parameter field

The following codes are used in the forward call indicators parameter field:

bit	A:	National/international call indicator
	0	call to be treated as a national call
	1	call to be treated as an international call

This bit can be set to any value in the country of origin. In the international network this bit is not checked. In the destination country, calls from the international network will have this bit set to 1.

bits	C B:	End-to-end method indicator (Note)
	0 0	no end-to-end method available (only link-by-link method available)
	0 1	pass along method available, not used
	1 0	SCCP method available, not used
	1 1	pass along and SCCP methods available, not used
bit	D:	Interworking indicator (Note)
	0	no interworking encountered (No.7 signalling all the way)
	1	interworking encountered
bit	E:	End-to-end information indicator (Note)
	0	no end-to-end information available
	1	end-to-end information available, not used
bit	F:	ISDN user part indicator (Note)
	0	ISDN user part not used all the way
	1	ISDN user part used all the way
bits	H G:	ISDN user part preference indicator
	0 0	ISDN user part preferred all the way
	0 1	ISDN user part not required all the way
	1 0	ISDN user part required all the way
	1 1	spare
bit	I:	ISDN access indicator
	0	originating access non-ISDN
	1	originating access ISDN
bits	K J:	SCCP method indicator
	0 0	no indication
	0 1	connection method available, not used
	1 0	connection oriented method available, not used
	1 1	connectionless and connection oriented methods available, not used

bit L: Spare
 bits M-P: Reserved for national use

Note - Bits B-F and J-K constitute the protocol control indicator.

C.3.20A Message compatibility information

THE FORMAT OF THE MESSAGE COMPATIBILITY INFORMATION PARAMETER FIELD IS SHOWN IN FIGURE C-22A

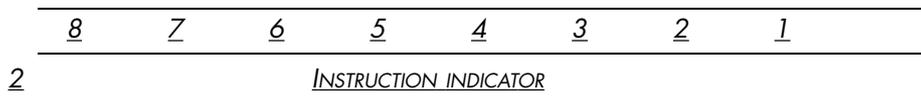


FIGURE C-22A/Q.763

MESSAGE COMPATIBILITY INFORMATION PARAMETER FIELD

THE FOLLOWING CODES ARE USED IN THE SUBFIELDS OF THE PARAMETER COMPATIBILITY INFORMATION PARAMETER FIELD:

A) INSTRUCTION INDICATORS

THE FORMAT OF THE INSTRUCTION INDICATORS SUBFIELD IS SHOWN IN FIGURE C-22B.

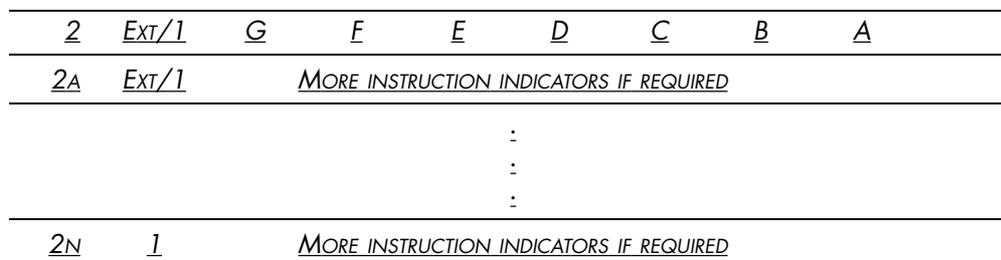


FIGURE C-22B/Q.763

Instruction indicators subfield

THE FOLLOWING CODES ARE USED IN THE INSTRUCTIONS INDICATORS SUBFIELD:

<u>BIT</u>	<u>A:</u>	<u>TRANSIT AT INTERMEDIATE EXCHANGE INDICATOR</u>
	<u>0</u>	<u>TRANSIT INTERPRETATION</u>
	<u>1</u>	<u>END NODE INTERPRETATION</u>
<u>BIT</u>	<u>B:</u>	<u>RELEASE CALL INDICATOR</u>
	<u>0</u>	<u>DO NOT RELEASE CALL</u>
	<u>1</u>	<u>RELEASE CALL</u>
<u>BIT</u>	<u>C:</u>	<u>SEND NOTIFICATION INDICATOR (NOTE 1)</u>
	<u>0</u>	<u>DO NOT SEND NOTIFICATION</u>
	<u>1</u>	<u>SEND NOTIFICATION</u>

NOTE 1 - NOTIFICATION BY CONFUSION MESSAGE.

<u>BIT</u>	<u>D:</u>	<u>DISCARD MESSAGE INDICATOR</u>
	<u>0</u>	<u>DO NOT DISCARD MESSAGE (PASS ON) (NOTE 2)</u>
	<u>1</u>	<u>DISCARD MESSAGE</u>
<u>BITS</u>	<u>G-F:</u>	<u>SPARE</u>

NOTE 2 - IF PASS ON IS SET (BIT D = 0) BUT NOT POSSIBLE THEN BITS C AND E ARE CHECKED.

<u>BIT</u>	<u>E:</u>	<u>PASS ON NOT POSSIBLE INDICATOR</u>
	<u>0</u>	<u>RELEASE CALL</u>
	<u>1</u>	<u>DISCARD INFORMATION</u>

b) EXTENSION INDICATOR

0	<u>NEXT OCTET EXISTS</u>
1	<u>LAST OCTET</u>

c) MORE INSTRUCTION INDICATORSTHE BITS WILL BE DEFINED WHEN REQUIRED.**C.3.21 Information indicators**(This section is not applicable to the Interconnect ISUP specification international interface)**C.3.22 Information request indicators**(This section is not applicable to the Interconnect ISUP specification international interface)**C.3.23 Nature of connection indicators**

The format of the nature of connection indicators parameter field is shown in Figure C-25/Q-767.

8	7	6	5	4	3	2	1
H	G	F	E	D	C	B	A

FIGURE C-25/Q-767**Nature of connection indicators parameter field**

The following codes are used in the nature of connection indicators parameter field:

bits	BA:	Satellite indicator
	0 0	no satellite circuit in the connection
	0 1	one satellite circuit in the connection
	1 0	two satellite circuits in the connection
	1 1	spare
bits	DC:	Continuity check indicator
	0 0	continuity check not required
	0 1	continuity check required on this circuit, not used
	1 0	continuity check performed on a previous circuit
	1 1	spare
bit	E:	Echo control device indicator
	0	outgoing half echo control device not included
	1	outgoing half echo control device included
bits	F-H:	spare

C.3.24 Optional backward call indicators

The format of the optional backward call indicators parameter field is shown in Figure C-26/Q-767.

8	7	6	5	4	3	2	1
H	G	F	E	D	C	B	A

FIGURE C-26/Q-767**Optional backward call indicators parameter field**

The following codes are used in the optional backward call indicators parameter field:

- bit A: In-band information indicator
 - 0 no indication
 - 1 in-band information or an appropriate pattern is now available
- bit B: Call forwarding may occur indicator
 - 0 no indication
 - 1 call forwarding may occur, ~~not used~~
- bits C-D: Spare
- bits E-H: Spare, Reserved for National Use

C.3.25 Optional forward call indicators

(This section is not applicable to the Interconnect ISUP specification)

C.3.26 Original called number

(This section is not applicable to the Interconnect ISUP specification international interface)

THE FORMAT OF THE ORIGINAL CALLED NUMBER PARAMETER FIELD CORRESPONDS TO THE FORMAT SHOWN IN FIGURE C-28/Q.763 PART A.

	8	7	6	5	4	3	2	1
1	ODD/ EVEN	NATURE OF ADDRESS INDICATOR						
2	SPARE	NUMBERING PLAN			PRESENTAT. RESTRICTED	SPARE		
3	2ND ADDRESS SIGNAL				1ST ADDRESS SIGNAL			
:								
N	FILLER (IF NECESSARY)				N-TH ADDRESS SIGNAL			

NOTE - WHEN THE ADDRESS PRESENTATION RESTRICTED INDICATOR INDICATES ADDRESS NOT AVAILABLE, OCTETS 3 TO N ARE OMITTED.

FIGURE C-28/Q.763 PART C

ORIGINAL CALLED NUMBER PARAMETER FIELD

THE FOLLOWING CODES ARE USED IN THE SUBFIELDS OF THE ORIGINAL CALLED NUMBER PARAMETER FIELD:

- A) ODD/EVEN INDICATOR: SEE SECTION C.3.7 A)
- B) NATURE OF ADDRESS INDICATOR: SEE SECTION C.3.7 B)
- C) NUMBERING PLAN INDICATOR: SEE SECTION C.3.7 D)
- D) ADDRESS PRESENTATION RESTRICTED INDICATOR: SEE SECTION C.3.8 E)
- E) ADDRESS SIGNAL: SEE SECTION 3.8 G)
- F) FILLER: SEE SECTION C.3.7 F).

C.3.26A Parameter compatibility information

THE FORMAT OF THE PARAMETER COMPATIBILITY INFORMATION PARAMETER FIELD IS SHOWN IN FIGURE C-28A.

	8	7	6	5	4	3	2	1
1	<u>1ST UPGRADED PARAMETER</u>							
2	<u>INSTRUCTION INDICATORS</u>							
	:							
	:							
	:							
N	<u>NTH UPGRADED PARAMETER</u>							
N+1	<u>INSTRUCTION INDICATORS</u>							

FIGURE C-28A./Q.763

PARAMETER COMPATIBILITY INFORMATION PARAMETER FIELD

THE FOLLOWING CODES ARE USED IN THE SUBFIELDS OF THE PARAMETER COMPATIBILITY INFORMATION PARAMETER FIELD.

A) NTH UPGRADED PARAMETER NAME

THIS FIELD CONTAINS THE PARAMETER NAME OF THE NTH UPGRADED PARAMETER IN ACCORDANCE WITH TABLE C-4.

B) INSTRUCTION INDICATORS

THE FORMAT OF THE INSTRUCTION INDICATORS SUBFIELD IS SHOWN IN FIGURE C-22B.

THE FOLLOWING CODES ARE USED IN THE INSTRUCTIONS INDICATORS SUBFIELD:

<u>BIT</u>	<u>A:</u>	<u>TRANSIT AT INTERMEDIATE EXCHANGE INDICATOR</u>
	<u>0</u>	<u>TRANSIT INTERPRETATION</u>
	<u>1</u>	<u>END NODE INTERPRETATION</u>
<u>BIT</u>	<u>B:</u>	<u>RELEASE CALL INDICATOR</u>
	<u>0</u>	<u>DO NOT RELEASE CALL</u>
	<u>1</u>	<u>RELEASE CALL</u>
<u>BIT</u>	<u>C:</u>	<u>SEND NOTIFICATION INDICATOR (NOTE 1)</u>
	<u>0</u>	<u>DO NOT SEND NOTIFICATION</u>
	<u>1</u>	<u>SEND NOTIFICATION</u>

NOTE 1 - NOTIFICATION BY CONFUSION OR A RELEASE COMPLETE MESSAGE.

<u>BIT</u>	<u>D:</u>	<u>DISCARD MESSAGE INDICATOR</u>
	<u>0</u>	<u>DO NOT DISCARD MESSAGE (PASS ON) (NOTE 2)</u>
	<u>1</u>	<u>DISCARD MESSAGE</u>

NOTE 2 - IF PASS ON IS SET (BIT D = 0) BUT NOT POSSIBLE THEN BITS C, F AND G ARE CHECKED.

<u>BIT</u>	<u>E:</u>	<u>DISCARD PARAMETER INDICATOR</u>
	<u>0</u>	<u>DO NOT DISCARD PARAMETER (PASS ON) (NOTE 3)</u>
	<u>1</u>	<u>DISCARD PARAMETER</u>

NOTE 3 - IF PASS ON IS SET (BIT E = 0) BUT NOT POSSIBLE THEN BITS C, F AND G ARE CHECKED.

BITS G-F: SPARE

c) EXTENSION INDICATOR

- 0 NEXT OCTET EXISTS
- 1 LAST OCTET

d) MORE INSTRUCTION INDICATORS

THE BITS WILL BE DEFINED WHEN REQUIRED.

C.3.27 Range and status

The format of the range and status parameter field is shown in Figure C-29/Q.767.



- in circuit group unblocking messages
 - 0 no indication
 - 1 unblocking
- in circuit group unblocking acknowledgment messages
 - 0 no indication
 - 1 unblocking acknowledgment
- in circuit group reset acknowledgment messages
 - 0 not blocked for maintenance reasons
 - 1 blocked for maintenance reasons

The number of circuits affected by a group supervision message is limited to 32 or less. For the group reset and query messages this requires that the range value be 31 or less. For the group blocking and unblocking messages the range value may be up to 255, but the number of status bits set to 1 must be 32 or less.

~~For the group blocking, unblocking and reset messages, range code 0 is reserved.~~

C.3.28 Redirecting number

THE FORMAT OF THE REDIRECTING NUMBER PARAMETER FIELD CORRESPONDS TO THE FORMAT SHOWN IN FIGURE C-28.

	8	7	6	5	4	3	2	1	
1	ODD/ EVEN	NATURE OF ADDRESS INDICATOR							
2	SPARE	NUMBERING PLAN		PRESENTAT. RESTRICTED		SPARE			
3	2ND ADDRESS SIGNAL			1ST ADDRESS SIGNAL					
:									
N	FILLER (IF NECESSARY)			N-TH ADDRESS SIGNAL					

NOTE - WHEN THE ADDRESS PRESENTATION RESTRICTED INDICATOR INDICATES ADDRESS NOT AVAILABLE, OCTETS 3 TO N ARE OMITTED.

FIGURE C-28
REDIRECTING NUMBER PARAMETER FIELD

THE FOLLOWING CODES ARE USED IN THE SUBFIELDS OF THE ORIGINAL CALLED NUMBER PARAMETER FIELD:

- A) ODD/EVEN INDICATOR: SEE SECTION C.3.7 A)
- B) NATURE OF ADDRESS INDICATOR: SEE SECTION C.3.7 B)
- C) NUMBERING PLAN INDICATOR: SEE SECTION C.3.7 D)
- D) ADDRESS PRESENTATION RESTRICTED INDICATOR: SEE SECTION C.3.8 E)
- E) ADDRESS SIGNAL: SEE SECTION 3.8 G)
- F) FILLER: SEE SECTION C.3.7 F).

C.3.29 Redirection information

THE FORMAT OF THE REDIRECTION INFORMATION PARAMETER FIELD IS SHOWN IN FIGURE C-30.

8	7	6	5	4	3	2	1
1 H	G	F	E	D	C	B	A
2 P	Q	N	M	L	K	J	I

FIGURE C-30
REDIRECTION INFORMATION PARAMETER FIELD

THE FOLLOWING CODES ARE USED IN THE REDIRECTION INFORMATION PARAMETER FIELD:

<i>BITS</i>	<i>CBA:</i>	<i>REDIRECTING INDICATOR</i>
	<i>0 0 0</i>	<i>NO REDIRECTION</i>
	<i>0 0 1</i>	<i>CALL REROUTED</i>
	<i>0 1 0</i>	<i>CALL REROUTED, ALL REDIRECTION INFORMATION PRESENTATION RESTRICTED</i>
	<i>0 1 1</i>	<i>CALL DIVERSION</i>
	<i>1 0 0</i>	<i>CALL DIVERSION, ALL REDIRECTION INFORMATION PRESENTATION RESTRICTED</i>
	<i>1 0 1</i>	<i>CALL REROUTED, REDIRECTION NUMBER PRESENTATION RESTRICTED</i>
	<i>1 1 0</i>	<i>CALL DIVERSION, REDIRECTION NUMBER PRESENTATION RESTRICTED</i>
	<i>1 1 1</i>	<i>SPARE</i>
<i>BIT</i>	<i>D</i>	<i>SPARE</i>
<i>BITS</i>	<i>HGFE:</i>	<i>ORIGINAL REDIRECTION REASONS</i>
	<i>0 0 0 0</i>	<i>UNKNOWN/NOT AVAILABLE</i>
	<i>0 0 0 1</i>	<i>USER BUSY</i>
	<i>0 0 1 0</i>	<i>NO REPLY</i>
	<i>0 0 1 1</i>	<i>UNCONDITIONAL</i>
	<i>0 1 1 1</i>	
	<i>TO</i>	<i>SPARE</i>
	<i>1 1 1 1</i>	
<i>BITS</i>	<i>KJI</i>	<i>REDIRECTION COUNTER. NUMBER OF REDIRECTIONS THE CALL HAS UNDERGONE EXPRESSED AS A BINARY NUMBER BETWEEN 1 AND 5.</i>
<i>BIT</i>	<i>L</i>	<i>SPARE</i>
<i>BITS</i>	<i>PONM:</i>	<i>REDIRECTING REASON</i>
	<i>0 0 0 0</i>	<i>UNKNOWN/NOT AVAILABLE</i>
	<i>0 0 0 1</i>	<i>USER BUSY</i>
	<i>0 0 1 0</i>	<i>NO REPLY</i>
	<i>0 0 1 1</i>	<i>UNCONDITIONAL</i>
	<i>0 1 0 0</i>	<i>DEFLECTION DURING ALERTING</i>
	<i>0 1 0 1</i>	<i>DEFLECTION IMMEDIATE RESPONSE</i>
	<i>0 1 1 0</i>	<i>MOBILE SUBSCRIBER NOT REACHABLE</i>
	<i>0 1 1 1</i>	
	<i>TO</i>	<i>SPARE</i>
	<i>1 1 1 1</i>	

(This section is not applicable to the international interface)

C.3.30 Redirection number

(This section is not applicable to the Interconnect ISUP specification international interface)

C.3.31 Signalling point code (national use)

(This section is not applicable to the Interconnect ISUP specification international interface)

C.3.32 Subsequent number

The format of the subsequent number parameter field is shown in Figure C-32/Q.767.

	<u>8</u>	<u>7</u>	<u>6</u>	<u>5</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>
<u>1</u>	ODD/ EVEN				SPARE			
<u>2</u>	2ND ADDRESS SIGNAL					1ST ADDRESS SIGNAL		
<u>N</u>	FILLER (IF NECESSARY)					N-TH ADDRESS SIGNAL		

FIGURE C-32/Q.767

Subsequent number parameter field

The following codes are used in the subfields of the subsequent number parameter field:

- a) Odd/even indicator: see § C.3.7 a)
- b) Address signal: see § C.3.7 e)
- c) Filler: see § C.3.7 f).

C.3.33 Suspend/resume indicators

The format of the suspend/resume indicators parameter field is shown in Figure C-33/Q.767.

8	7	6	5	4	3	2	1
H	G	F	E	D	C	B	A

FIGURE C-33/Q.767

Suspend/resume indicators parameter field

The following codes are used in the suspend/resume indicators parameter field:

- bit A: Suspend/resume indicator
 - 0 ISDN subscriber initiated
 - 1 network initiated
- bits B-H: Spare

C.3.34 Transit network selection (national use)

(This section is not applicable to the Interconnect ISUP specification international interface)

C.3.35 Transmission medium requirement

The format of the transmission medium requirement parameter field is shown in Figure C-35/Q-767.

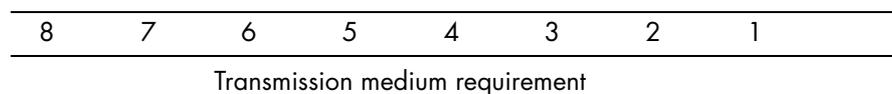


FIGURE C-35/Q-767

Transmission medium requirement parameter field

The following codes are used in the transmission medium requirement parameter field.

00000000	speech
00000001	spare
00000010	64 kbit/s unrestricted
00000011	3.1 kHz audio
00000100	alternate speech (service 2)/64 kbit/s unrestricted (service 1) (Note 1); <u>not used</u>
00000101	alternate 64 kbit/s unrestricted (service 1)/speech (service 2) (Note 2); <u>not used</u>
00000110	spare
00000111	reserved for 2¹ 64 kbit/s unrestricted, not used
00001000	reserved for 384 kbit/s unrestricted, not used
00001001	reserved for 1536 kbit/s unrestricted, not used
00001010	reserved for 1920 kbit/s unrestricted, not used
00010000	
to	spare
11011111	

~~Note 1~~ The initial mode is speech.

~~Note 2~~ The initial mode is 64 kbit/s unrestricted.

C.3.36 User service information

The format of the user service information parameter field is shown in Figure C-36/Q-767. This format is the same as the bearer capability information element from Recommendation Q.931 and not all capabilities coded here are supported at this time. More detailed information on the use of the User service Information is given in § 4.3 of Rec. Q-767 of this specification.

	8	7	6	5	4	3	2	1
1	Ext.	Coding standard		Information transfer capability				
2	Ext.	Transfer mode		Information transfer rate				
2a	Ext.	Structure			Configuration	Establishment		
2b	Ext.	Symmetry		Information transfer rate (destination to origination)				
3	Ext.	Layer ident.		User information Layer 1 protocol				
4	Ext.	Layer ident.		User information Layer 2 protocol				
5	Ext.	Layer ident.		User information Layer 3 protocol				

Note 1 - Octet 2a is omitted if default values apply to all fields of octets 2a and 2b.

Note 2 - Octet 2b is omitted if default values apply to all fields of octet 2b.

Note 3 - Octets 3,4,5 or any combination of these octets may be omitted. Octet 3 may be extended as described in § C.3.36 k).

FIGURE C - 36 / Q - 767

User service information parameter field

The following codes are provided as an indication of what can be supported in the user service information parameter. The utilisation of the codes is subject to each National networks implementation and therefore is subject to bilateral agreements.

The inclusion of all the codes in this specification, in no way defines or determines the requirements of a National network, nor requires a National network to implement or support the transit of all or any of the codes.

The following codes are used in the subfields of the user service information parameter field:

a) Extension indicator (ext)

- | | |
|---|--|
| 0 | octet continues through the next octet (e.g. octet 2 to 2a, 2a to 2b, 3 to 3a) |
| 1 | last octet |

b) Coding standard

- | | |
|----|---|
| 00 | CCITT standardised coding as described below |
| 01 | reserved for other international standards (Note) |
| 10 | national standard (Note) |
| 11 | standard defined for the network (either public or private) present on the network side of the interface (Note) |

Note - These other coding standards should only be used when the desired bearer capability cannot be represented with the CCITT standardised coding.

c) Information transfer capability

00000	speech
01000	unrestricted digital information
01001	restricted digital information
10000	3.1 kHz audio
10001	7 kHz audio <u>Unrestricted digital information with tones/announcements (Note 2)</u>
11000	video

All other values are reserved.

Note 2 - Unrestricted digital information with tones/announcements (UDI-TA) is the new information transfer attribute value that had been previously named "7 kHz audio" in Recommendation Q.931(1988).

d) Transfer mode

00	circuit mode
10	packet mode

All other values are reserved.

e) Information transfer rate (octets 2 and 2b) (Note 1)

00000	This code shall be used for packet mode calls
10000	64 kbit/s
10001	2 x 64 kbit/s (Note 2)
10011	384 kbit/s
10101	1536 kbit/s
10111	1920 kbit/s

All other values are reserved.

Note 1 - When octet 2b is omitted, the bearer capability is bidirectional symmetric at the information transfer rate specified in octet 2. When octet 2b is included, the information rate in octet 2 refers to the origination to destination direction.

Note 2 - For this case, the coding of octets 1 and 2a refers to both 64 kbit/s circuits.

f) Structure

000	default (Note 1)
001	8 kHz integrity (Note 2)
100	service data unit integrity
111	unstructured

All other values are reserved.

Note 1 - If octet 2a is omitted, or the structure field is coded 000, then the value of the structure attribute is according to the following:

Transfer mode	Transfer capability	Structure
circuit	speech	8 kHz integrity
circuit	unrestricted digital	8 kHz integrity
circuit	restricted digital	8 kHz integrity
circuit	audio	8 kHz integrity
circuit	video	8 kHz integrity
packet	unrestricted digital	service data unit integrity

Note 2 - When the information transfer rate 2 x 64 kbit/s is used, 8 kHz integrity with restricted differential time delay (RDTD) is offered.

g) Configuration

00 point-to-point

All other values are reserved.If omitted,the configuration is assumed to be point-to-point.

h) Establishment

00 demand

All other values are reserved.If omitted,the establishment is assumed to be demand.

i) Symmetry

00 bidirectional symmetric

All other values are reserved.If omitted,the symmetry is assumed to be bidirectional symmetric.

j) Layer identification

00 reserved
 01 user information layer 1 protocol
 10 user information layer 2 protocol
 11 user information layer 3 protocol

Note - Bits 5-1 of the same octet represent the corresponding identification as per points k),l) and m) below. If octet 3,4 or 5 is omitted,the corresponding user information protocol is assumed to be undefined.

k) User information layer 1 protocol identification

00001 CCITT standardised rate adaption V.110/X.30.This implies the presence of octet 3a defined in § C.3.36 k) 1),and optionally octets 3b,3c and 3d defined in § C.3.36 k) 2) below.
~~00010 Recommendation G.711 μ law~~
 00011 Recommendation G.711 A law
 00100 Recommendation G.721 32 kbit/s ADPCM and Recommendation I.460
 00101 Recommendations G.722 and G.724 for 7 kHz audio
~~00110 Recommendation G.735 for 384 kbit/s video~~
 00111 non-CCITT standardised rate adaption.This implies the presence of octet 3a,and optionally 3b,3c and 3d.The use of this codepoint indicates that the user rate specified in octet 3a is defined in accordance with the non-CCITT standardised rate adaption scheme.Additionally, octets 3b,3c and 3d, if present,are defined consistent with the specified rate adaption.
 01000 CCITT standardised rate adaption V.120.This implies the presence of octet 3a defined in § C.3.36 k) 1),octet 3b defined in § C.3.36 k) 3),and optionally octets 3c and 3d defined in § C.3.36 k) 2) below.
 01001 CCITT standardised rate adaption X.31 HDLC flag stuffing.

All other values are reserved.

Note - Octet 3 shall be omitted if the transfer mode is “circuit mode”,the information transfer capability is “unrestricted digital information” or “restricted digital information”and the user information layer 1 protocol is not to be identified to the network;octet 3 may be omitted if the transfer mode is “packetmode”;otherwise octet 3 shall be present.

1) Octet 3a for layer 1 rate adaption (see Figure C-37/~~Q.767~~)

	8	7	6	5	4	3	2	1
3a	Ext.	Synch/ asynch	Negot.	User rate				

FIGURE C-37/~~Q.767~~

Basic layer 1 rate adaption fields

- The synchronous/asynchronous indicator is coded:

0	synchronous
1	asynchronous

Octets 3b to 3d may be omitted in case of synchronous user rates.

- The negotiation indicator is coded:

0	in-band negotiation not possible
1	in-band negotiation possible

Note - See Recommendations V.110 and X.30

- The user rate is coded:

00000	rate indicated by E-bits	Rec.I.460
00001	0.6 kbit/s	Recs. V.6 and X.1
00010	1.2 kbit/s	Rec. V.6
00011	2.4 kbit/s	Recs. V.6 and X.1
00100	3.6 kbit/s	Rec. V.6
00101	4.8 kbit/s	Recs. V.6 and X.1
00110	7.2 kbit/s	Rec. V.6
00111	8.0 kbit/s	Rec.I.460
01000	9.6 kbit/s	Recs. V.6 and X.1
01001	14.4 kbit/s	Rec. V.6
01010	16.0 kbit/s	Rec.I.460
01011	19.2 kbit/s	Rec. V.6
01100	32.0 kbit/s	Rec.I.460
01110	48.0 kbit/s	Recs. V.6 and X.1
01111	56.0 kbit/s	Rec. V.6
10101	0.1345 kbit/s	Rec.X.1
<u>10000</u>	<u>64.0 KBIT/S</u>	<u>REC. X.1</u>
10110	0.100 kbit/s	Rec.X.1
10111	0.075/1.2 kbit/s	Recs. V.6 and X.1 (Note)
11000	1.2/0.075 kbit/s	Recs. V.6 and X.1 (Note)
11001	0.050 kbit/s	Recs. V.6 and X.1
11010	0.075 kbit/s	Recs. V.6 and X.1
11011	0.110 kbit/s	Recs. V.6 and X.1
11100	0.150 kbit/s	Recs. V.6 and X.1
11101	0.200 kbit/s	Recs. V.6 and X.1
11110	0.300 kbit/s	Recs. V.6 and X.1
11111	12 kbit/s	Recs. V.6 and X.1

All other values are reserved.

Note - The first rate is the transmit rate in the forward direction of the call. The second rate is the transmit rate in the backward direction of the call.

2) Octets 3b, 3c and 3d for Recommendations V.110/X.30 rate adaption (see Figure C-38/Q.767)

	8	7	6	5	4	3	2	1
3b	Ext.	Intermediate rate		NIC on Tx	NIC on Rx	Flow cont. on Tx	Flow cont. on Rx	Spare
3c	Ext.	Number of stop bits		Number of data bits		Parity		
3d	Ext.	Duplex mode	Modem type					

Note - Octets 3c and 3d may be omitted.

FIGURE C - 38 / Q.767

Recommendation V.110/X.30 rate adaption extension fields

- Intermediate rate indicator is coded:

00	not used
01	8 kbit/s
10	16 kbit/s
11	32 kbit/s

- Network independent clock (NIC) on transmission (TX) indicator is coded:

0	not required to send data with NIC
1	required to send data with NIC

Note - Refers to transmission in the forward direction of the call, see Recommendations V.110 and X.30.

- Network independent clock (NIC) on reception (Rx) indicator is coded :

0	cannot accept data with NIC (i.e.sender does not support this optional procedure)
1	can accept data with NIC (i.e.sender does support this optional procedure)

Note - Refers to transmission in the backward direction of the call, see Recommendations V.110 and X.30.

- Flow control on transmission (Tx) indicator is coded:

0	not required to send data with flow control mechanism
1	required to send data with flow control mechanism

Note - Refers to transmission in the forward direction of the call, see Recommendations V.110 and X.30.

- Flow control on reception (Rx) indicator is coded:

0	cannot accept data with flow control mechanism (i.e.sender does not support this optional procedure)
1	can accept data with flow control mechanism (i.e.sender does support this optional procedure)

Note - See Recommendations V.110 and X.30.

SPECIFICATION

- Number of stop bits indicator is coded:

00	not used
01	1 bit
10	1.5 bits
11	2 bits

- Number of data bits indicator, including parity bit if present, is coded :

00	not used
01	5 bits
10	7 bits
11	8 bits

- Parity indicator is coded:

000	odd
010	even
011	none
100	forced to 0
101	forced to 1

All other values are reserved.

- Duplex mode indicator is coded:

0	half duplex
1	full duplex

- Modem type indicator is coded according to network specific rules.

3) Octet 3b for Recommendation V.120 rate adaption
(see Figure C-39/Q.767)

	8	7	6	5	4	3	2	1
3b	Ext.	Hdr/ Hdr no hdr	Multi. frame supp.	Mode	LLI. Neg.	Assigner/ Assignee	Inband/ Outband	Spare

Note - Octets 3c and 3d in Figure C-38/Q.767 may also be present.

FIGURE C-39/Q.767

Recommendation V.120 rate adaption extension fields

- Rate adaption header/no header indicator is coded:

0	rate adaption header not included
1	rate adaption header included

- Multiple frame establishment support in data link indicator is coded :

0	multiple frame establishment not supported, only UI frames allowed
1	multiple frame establishment supported

- Mode of operation indicator is coded:

0	bit transparent mode of operation
1	protocol sensitive mode of operation

- Logical link identifier (LLI) negotiation indicator is coded:

0	default, LLI = 256 only
1	full protocol negotiation (Note)

Note - A connection over which protocol negotiation will be executed is indicated in bit 2 of octet 3b.

- Assignor/assignee indicator is coded:

- 0 message originator is “default” assignee”
- 1 message originator is assignor only

- In-band/out-of-band negotiation indicator is coded:

- 0 negotiation is done with USER INFORMATION messages on a temporary signalling connection
- 1 negotiation is done inband using logical link zero

l) User information layer 2 protocol identification

- 00010 Recommendation Q.921 (I.441)
- 00110 Recommendation X.25,link level

All other values are reserved.If the transfer mode is packet mode,this octet shall be present.In other cases,the octet is present only if the protocol is to be identified to the network.

m) User information layer 3 protocol identification

- 00010 Recommendation Q.931 (I.451)
- 00110 Recommendation X.25,packet level

All other values are reserved.The octet is present only if the protocol is to be identified to the network.

C.3.37 User-to-user indicators

The format of the user-to-user indicators parameter field is shown in Figure C-40/Q.767.

8	7	6	5	4	3	2	1
H	G	F	E	D	C	B	A

FIGURE C - 40 / Q . 7 6 7
User-to-user indicators parameter field

The following codes are used in the user-to-user indicators parameter field:

bit	A	Type
	0	request, not used
	1	response

If bit A equals 0 (request):

bits	C B:	Service 1
	0 0	no information
	0 1	spare
	1 0	request,not essential
	1 1	request,essential

bits	E D:	Service 2
	0 0	no information
	0 1	spare
	1 0	request,not essential
	1 1	request,essential

SPECIFICATION

bits	G F:	Service 3
	0 0	no information
	0 1	spare
	1 0	request,not essential
	1 1	request,essential

bit H Spare

If bit A equals 1 (response):

bits	C B:	Service 1
	0 0	no information
	0 1	not provided, not used
	1 0	provided, not used
	1 1	spare, not used

bits	E D:	Service 2
	0 0	no information
	0 1	not provided, not used
	1 0	provided, not used
	1 1	spare, not used

bits	G F:	Service 3
	0 0	no information
	0 1	not provided, not used
	1 0	provided, not used
	1 1	spare, not used

bit	H	Network discard indicator
	0	no information, not used
	1	<u>UUI discarded by the network</u>

C.3.38 User-to-user information

The format of the user-to-user information parameter is shown in Figure C-41/Q-767.

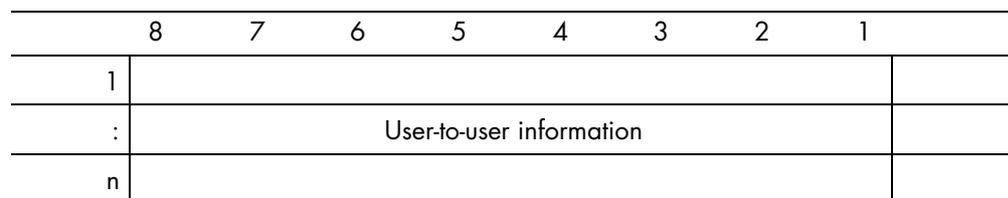


FIGURE C-41/Q-767

User-to-user information parameter field

The format of the user-to-user information parameter field is coded identically to the protocol discriminator plus user information field described in Recommendation Q.931, § 4.5.29.

C.4 ISDN User Part messages and codes

In the following tables the format and coding of ISDN User Part messages is specified. For each message, a list of the relevant parameters is given and for each parameter :

- a reference to the section where the formatting and coding of the parameter content is specified;
- the type of the parameter. The following types are used in the tables :
 F = Mandatory Fixed Length parameter;
 V = Mandatory Variable Length parameter;
 O = Optional parameter of fixed or variable length;
- the length of the parameter. The value in the table includes:
- for type F parameters the length, in octets, of the parameter content;
- for type V parameters the length, in octets, of the length indicator and of the parameter content. The minimum and the maximum length are indicated;
- for type O parameters the length, in octets, of the parameter name, length indicator and parameter content. For variable length parameters the minimum and maximum length is indicated.

For each message type, type F parameters and the pointers for the type V parameters must be sent in the order specified in the tables.

The routing label and circuit identification code fields, which are transmitted ahead of the message type field if required are not shown. Parameter names, pointers to mandatory variable fields and the optional part, and length indicators appear in the message in accordance with Figure C-3/Q.767 and are not shown explicitly in Tables C-5/Q.767 to C-28/Q.767.

TABLE C-5/Q.767

Message type: Address complete

Parameter	Reference	Type	Length (octets)
Message type	2.1	F	1
Backward call indicators	3.4	F	2
Optional backward call indicators	3.24	O	3
Cause indicators	3.10	O	4-?
Connected number	3.14	O	4-12
Call reference	3.6	O	7
User-to-user indicators	3.37	O	3
User-to-user information	3.38	O	3-131-a)
Access transport	3.2	O	3-
<i>PARAMETER COMPATIBILITY INFORMATION</i>	<i>3.26.A</i>	<i>O</i>	<i>4-?</i>
End of optional parameters	3.17	O	1

a) ~~Some networks may only support up to 35 octets.~~

TABLE C - 6/Q.767

Message type: Answer

Parameter	Reference	Type	Length (octets)
Message type	2.1	F	1
Backward call indicators	3.4	O	4
Optional backward call indicators	3.24	O	3
Call reference	3.6	⊖	7
User-to-user indicators	3.37	O	3
User-to-user information	3.38	O	3-131
Connected number	3.14	O	4-12
Access transport	3.2	O	3-?
<i>PARAMETER COMPATIBILITY INFORMATION</i>	<i>3.26.A</i>	<i>O</i>	<i>4-?</i>
End of optional parameters	3.17	O	1

a) Some networks may only support up to 35 octets.

TABLE C - 7/Q.767

Message type: Call progress

Parameter	Reference	Type	Length (octets)
Message type	2.1	F	1
Event information	3.18	F	1
Cause indicators	3.10	O	4-?
Call reference	3.6	⊖	7
Backward call indicators	3.4	O	4
Optional backward call indicators	3.24	O	3
Access transport	3.2	O	3-?
User-to-user indicators	3.37	O	3
User-to-user information	3.38	O	3-131 e)
Redirection number	3.30	⊖	5-12
<i>PARAMETER COMPATIBILITY INFORMATION</i>	<i>3.26.A</i>	<i>O</i>	<i>4-?</i>
End of optional parameters	3.17	O	1

a) Some networks may only support up to 35 octets.

TABLE C-8/Q.767Message type: ~~Circuit group query response, not used~~**TABLE C-9/Q.767**Message type: **Circuit group reset acknowledgment**

Parameter (octets)	Reference	Type	Length
Message type	2.1	F	1
Range and status	3.27	V	3-34

TABLE C-10/Q.767Message type: **Confusion, not used**

<i>PARAMETER</i>	<i>REFERENCE</i>	<i>TYPE</i>	<i>LENGTH (OCTETS)</i>
<i>MESSAGE TYPE</i>	<i>2.1</i>	<i>F</i>	<i>1</i>
<i>CAUSE INDICATORS</i>	<i>3.10</i>	<i>V</i>	<i>4-20</i>
<i>END OF OPTIONAL PARAMETERS</i>	<i>3.17</i>	<i>O</i>	<i>1</i>

TABLE C-11/Q.767Message type: **Connect**

Parameter	Reference	Type	Length (octets)
Message type	2.1	F	1
Backward call indicators	3.4	F	2
Optional backward call indicators	3.24	⊖	3
Connected number	3.14	○	4-12
Call reference	3.6	⊖	7
User-to-user indicators	3.37	○	3
User-to-user information	3.38	○	3-131 e)
Access transport	3.2	○	3-?
<i>PARAMETER COMPATIBILITY INFORMATION</i>	<i>3.26.A</i>	<i>○</i>	<i>4-?</i>
End of optional parameters	3.17	○	1

a) Some networks may only support up to 35 octets.

TABLE C-12/Q.767Message type: **Continuity, not used**

Parameter	Reference	Type	Length (octets)
Message type	2.1	F	1
Continuity indicators	3.16	F	1

TABLE C - 13 / Q.767

Message type: ~~Facility reject, not used~~

TABLE C - 14 / Q.767

Message type: ~~Information, not used~~

TABLE C - 15 / Q.767

Message type: ~~Information request, not used~~

TABLE C - 16 / Q.767

Message type: ~~Initial address~~

Parameter	Reference	Type	Length (octets)
Message type	2.1	F	1
Nature of connection indicators	3.23	F	1
Forward call indicators	3.20	F	2
Calling party's category	3.9	F	1
Transmission medium requirement	3.35	F	1
Called party number	3.7	V	4-11
Transit network selection a)	3.34	⊖	4-?
Call reference	3.6	⊖	7
Calling party number	3.8	O	4-12
Optional forward call indicators	3.25	O	3
Redirecting number	3.28	O	4-12
Redirection information	3.29	O	3-4
Closed user group interlock code	3.13	⊖	6
Connection request	3.15	⊖	7-9
<u>ORIGINAL CALLED NUMBER</u>	<u>3.26</u>	<u>O</u>	<u>4-12</u>
User-to-user information b)	3.38	O	3-131
Access transport	3.2	O	3-?
User service information e)	3.36	⊖	4-13
User to user indicators	3.37	O	3
<u>PARAMETER COMPATIBILITY INFORMATION</u>	<u>3.26.A</u>	<u>O</u>	<u>4-?</u>
End of optional parameters	3.17	O	1

a) For national use only

b) Some networks may only support up to 35 octets.

e) This parameter can be repeated in case of an alternate bearer service, in which case the initial parameter represents the initial establishment mode.

TABLE C-17/Q.767**Message type: Release**

Parameter	Reference	Type	Length (octets)
Message type	2.1	F	1
Cause indicators	3.10	V	3-?
Redirection information	3.29	O	3-4
Redirection number	3.30	⊖	5-12
Signalling point code a)	3.31	O	4
Access transport	3.2	O	3-?
User-to-user information b)	3.38	O	3-131
Automatic congestion level	3.3	O	3
<i>PARAMETER COMPATIBILITY INFORMATION</i>	<i>3.26.A</i>	<u>O</u>	<u>4-?</u>
End of optional parameters	3.17	O	1

a) ~~For national use only~~b) ~~Some networks may only support up to 35 octets.~~**TABLE C-18/Q.767****Message type: Release complete**

Parameter	Reference	Type	Length (octets)
Message type	2.1	F	1
Cause indicators	3.10	O	4-5-6
End of optional parameters	3.17	O	1

TABLE C-19/Q.767**Message type: Subsequent address**

Parameter	Reference	Type	Length (octets)
Message type	2.1	F	1
Subsequent number	3.32	V	3-10
End of optional parameters	3.17	O	1

TABLE C-20/Q.767**Message type: User-to-user information, not used****TABLE C-21/Q.767****Message type: Delayed release (national use)
Forward transfer, not used**

TABLE C - 22/Q.767

Message type: Suspend
Resume

Parameter	Reference	Type	Length (octets)
Message type	2.1	F	1
Suspend/Resume indicators	3.33	F	1
Call reference	3.6	⊖	7
End of optional parameters	3.17	○	1

TABLE C - 23/Q.767

Message type: Blocking
Blocking acknowledgment
~~Continuity check request, not used~~
~~Loop back acknowledgment (national use), not used~~
~~Overload, not used~~
Reset circuit
Unblocking
Unblocking acknowledgment
~~Unequipped circuit identification code (national use), not used~~

Parameter	Reference	Type	Length (octets)
Message type	2.1	F	1

TABLE C - 24/Q.767

Message type: ~~Call modification complete, not used~~
~~Call modification request, not used~~
~~Call modification reject, not used~~

TABLE C - 25/Q.767

Message type: Circuit group blocking
Circuit group blocking acknowledgment
Circuit group unblocking
Circuit group unblocking acknowledgment

Parameter	Reference	Type	Length (octets)
Message type	2.1	F	1
Circuit group supervision message type indications	3.11	F	1
Range and status	3.27	V	3-34

TABLE C-26/Q.767

Message type: **Circuit group reset**
~~Circuit group query, not used~~

Parameter	Reference	Type	Length (octets)
Message type	2.1	F	1
Range and status	3.27	V	2

TABLE C-27/Q.767

Message type: ~~Facility accepted, not used~~
~~Facility request, not used~~

TABLE C-28/Q.767

Message type: **Pass-along, not used**

ANNEX C.A Interpretation of spare codes

(to the Interconnect
ISUP Specification)

(to Recommendation
Q.767)

See § 4.1.1.

THIS ANNEX DESCRIBES INTERPRETATIONS WHICH CAN BE APPLIED WHEN A RECOGNIZED PARAMETER IS RECEIVED CONTAINING CODES CURRENTLY INDICATED AS BEING SPARE IN ITU-T RECOMMENDATION Q.763. THIS SITUATION CAN OCCUR WHEN AN IMPLEMENTATION IN ACCORDANCE TO THIS RECOMMENDATION SPECIFICATION INTERWORKS WITH A FUTURE VERSION OF THIS RECOMMENDATION SPECIFICATION. THE DEFAULT INTERPRETATIONS FOR SOME OF THESE CASES ARE LISTED IN TABLE A-1/Q.763.

FOR THE REMAINING CASES, LISTED IN TABLE A-2/Q.763, THERE IS NO DEFAULT WHICH IS CONSIDERED APPROPRIATE. IT IS RECOMMENDED THAT THE ENTIRE PARAMETER IN THESE CASES SHOULD BE CONSIDERED UNINTERPRETABLE EXCEPT AS NOTED.

ACTIONS TAKEN AFTER APPLYING THE DEFAULT INTERPRETATION OF UNRECOGNIZED FIELDS OR AFTER DETERMINING THAT AN ENTIRE PARAMETER SHOULD BE CONSIDERED UNINTERPRETABLE ARE DESCRIBED IN SECTION 2.10.5.3 OF THIS SPECIFICATION RECOMMENDATION Q.764. APPLICATION OF DEFAULT INTERPRETATIONS IS OF PARTICULAR INTEREST WHEN AN UNRECOGNIZED PARAMETER VALUE IS PASSED ON AT AN INTERMEDIATE EXCHANGE OR IS USED AT A CONNECTION ENDPOINT. HOWEVER, OTHER APPLICATIONS ARE NOT PRECLUDED.

TABLE A-1/Q.763

FIELDS AND THEIR DEFAULT INTERPRETATIONS

FIELD NAME WITH UNRECOGNIZED CODE	DEFAULT INTERPRETATION
CHARGE INDICATOR	CHARGE
CALLED PARTY'S STATUS INDICATOR	NO INDICATION
CALLED PARTY'S CATEGORY INDICATOR	NO INDICATION
CALLING PARTY CATEGORY	NO INDICATION Fail call
ADDRESS PRESENTATION RESTRICTED INDICATOR	PRESENTATION RESTRICTED
CAUSE INDICATOR-LOCATION	(SEE NOTE)
CAUSE VALUE (UNEXTENDED)	UNSPECIFIED: WITHIN CLASS XXX
CAUSE VALUE (EXTENDED)	UNSPECIFIED: INTERWORKING CLASS
CALLING PARTY NUMBER RESPONSE INDICATOR	CALLING PARTY NUMBER INCLUDED
CONNECTED NUMBER RESPONSE INDICATOR	CONNECTED NUMBER INCLUDED
REDIRECTING NUMBER RESPONSE INDICATOR	REDIRECTING NUMBER INCLUDED
SATELLITE INDICATOR	TWO SATELLITES
CONTINUITY CHECK INDICATOR	CONTINUITY CHECK NOT REQUIRED
REDIRECTING REASON INDICATOR	UNKNOWN/UNAVAILABLE
REDIRECTION COUNTER	MAXIMUM REDIRECTIONS
ORIGINAL REDIRECTION REASON INDICATOR	UNKNOWN/UNAVAILABLE
REDIRECTING INDICATOR	CALL FORWARDED, ALL REDIRECTION INFORMATION PRESENTATION RESTRICTED

TABLE A-1/Q.763 (cont)

FIELDS AND THEIR DEFAULT INTERPRETATIONS

<u>FIELD NAME WITH UNRECOGNIZED CODE</u>	<u>DEFAULT INTERPRETATION</u>
<u>CLOSED USER GROUP INDICATOR</u>	<u>NON-CUG CALL</u>
<u>USER-TO-USER (SERVICE 1)</u>	<u>NO INFORMATION</u>
<u>USER-TO-USER (SERVICE 2)</u>	<u>NO INFORMATION</u>
<u>USER-TO-USER (SERVICE 3)</u>	<u>NO INFORMATION</u>

NOTE - IF A NETWORK RECEIVES AN UNRECOGNIZED LOCATION FIELD FROM OTHER NETWORKS, THE DEFAULT INTERPRETATION OF THIS FIELD WILL BE THE LOCATION OF THE NETWORK WHICH SENDS THE UNRECOGNIZED LOCATION, OTHERWISE THE DEFAULT INTERPRETATION IS "BEYOND AN INTERWORKING POINT".

TABLE A-2/Q.763

FIELDS AND NO DEFAULT INTERPRETATIONS

<u>UNINTERPRETABLE FIELD</u>
<u>NATURE OF ADDRESS</u>
<u>NUMBERING PLAN</u>
<u>ADDRESS SIGNAL</u>
<u>CAUSE INDICATOR-CODING STANDARD A)</u>
<u>CAUSE INDICATOR RECOMMENDATION A)</u>
<u>DIAGNOSTIC</u>
<u>USER SERVICE INFORMATION (ANY FIELD)</u>
<u>CONNECTED NUMBER RESPONSE INDICATOR</u>
<u>TRANSMISSION MEDIUM REQUIREMENT</u>
<u>SATELLITE INDICATOR</u>
<u>CALL MODIFICATION INDICATOR</u>
<u>REDIRECTING REASON INDICATOR</u>
<u>EVENT INDICATOR</u>
<u>FACILITY INDICATOR</u>
<u>CIRCUIT STATE INDICATOR</u>
<u>CLOSED USER GROUP INDICATOR</u>
<u>AUTOMATIC CONGESTION LEVEL</u>
<u>CIRCUIT GROUP SUPERVISION MESSAGE TYPE</u>

A) CAUSE VALUE INTERPRETED AS IF CODED "UNSPECIFIED: INTERWORKING CLASS" (111111) AND THE LOCATION FIELD INTERPRETED AS ID CODED "BEYOND INTERWORKING POINT" (1010).

ANNEX D Signalling procedures

(to the Interconnect

ISUP Specification)

(to Recommendation

Q.767)

D.1 General

D.1.1 Relationship with other Recommendations

This Recommendation describes the signalling procedures for the set-up and clear-down of national and international ISDN interconnect connections. *THE MESSAGES AND SIGNALS ARE DEFINED IN § 3.3 AND ANNEX B AND THEIR FORMAT AND CONTENT ARE GIVEN IN § 3.4 AND ANNEX C, § 3.6 AND ANNEX E CONTAINS THE PROCEDURES FOR SUPPLEMENTARY SERVICES.*

D.1.2 Numbering (see Recommendations E.163, E.164)

The Australian Numbering plan will be used. Where possible alignment to Recommendations E.163 and E.164 should be attempted however bilateral agreements may be required to facilitate implementation of the numbering plan.

~~The procedures described assume that the ISDN uses the international numbering plan defined for the ISDN and thus provides a basic circuit-switched service between ISDN terminals or between ISDN terminals and terminals being connected to the existing international telephony network.~~

D.1.3 Address signalling

In general, the call set-up procedure described is standard for both speech and non-speech connections using en-bloc address signalling for calls between ISDN terminals. Overlap address signalling is also specified.

Note - The use of en-bloc or overlap signalling is based on bilateral agreements.

D.1.4 Basic procedures

The basic call control procedure is divided into three phases: call set-up, the data/conversation phase and call clear-down. Messages on the signalling link are used to establish and terminate the different phases of a call. Standard in-band supervisory tones and/or recorded announcements are returned to the caller on speech and 3.1 kHz connections to provide information on call progress. Calls originating from ISDN terminals may be supplied with more detailed call progress information by means of additional messages in the access protocol supported by a range of messages in the network.

D.1.5 Signalling methods

ONE SIGNALLING METHOD IS USED IN THIS ~~RECOMMENDATION~~ specification:

- link-by-link;
- ~~end-to-end.~~

This method is primarily used for messages that need to be examined at each exchange (see § D.2). ~~The end-to-end methods are used for messages of end-point significance (see Annex E).~~ and may be used for messages of end point significance. (However, the messages may be affected by processing delays.)

D.1.6 Layout of Annex D

THE PROCEDURES SPECIFIED IN § D.2 OF THIS ~~RECOMMENDATION~~ SPECIFICATION RELATE TO BASIC CALLS (I.E. CALLS NOT INVOLVING SUPPLEMENTARY SERVICES). SECTION D.3 OF THIS ~~RECOMMENDATION~~ SPECIFIES THE PROCEDURES RELATING TO END-TO-END SIGNALLING CONNECTIONS. THE ADDITIONAL REQUIREMENTS TO BE MET IN THE CASE OF CALLS INVOLVING SUPPLEMENTARY SERVICES AND NETWORK UTILITIES ARE SPECIFIED IN ANNEX E. THE TIMERS USED IN THIS ~~RECOMMENDATION~~ SPECIFICATION ARE SUMMARIZED IN ANNEX D.A. THE SDLS FOR THE ISDN-UP ARE PRESENTED IN ANNEX D.B.

D.1.7 Interworking with other signalling systems or user parts

Only some examples are included in this Recommendation and these should not be used as a definitive interworking guide.

D.2 Basic call control and signalling procedures

FIGURES D-1/Q.767 TO D-10/Q.767 AT THE END OF THIS SECTION SHOW THE ISDN CALL SET-UP SEQUENCES WHICH ARE DESCRIBED BELOW.

Note that the routing of calls is determined by the dialled digits, and/or the subscriber's category and/or service activated. If the originating exchange is an SSP, routing may also be determined by IN trigger points.

D.2.1 Successful call set-up

D.2.1.1 Forward address signalling — en bloc operation

D.2.1.1.1 Actions required at originating exchange

a) Circuit selection

When the originating exchange has received the complete selection information from the calling party, and has determined that the call is to be routed to another exchange, selection of a suitable, free, inter-exchange circuit takes place and an initial address message is sent to the succeeding exchange.

Appropriate routing information is either stored at the originating exchange or at a remote database to which a request may be made.

The selection of the route will depend on the called party number, connection type required and the network signalling capability required. This selection process may be performed at the exchange or with the assistance of the remote database.

In addition, in the case of a subscriber with digital access, the set-up message contains bearer capability information which is analysed by the originating exchange to determine the correct connection type and network signalling capability. The bearer capability information will be mapped into the user service information parameter of the initial address message. The information received from the access interface is used to set the value of the transmission medium requirement parameter. ~~The first value of bearer information received will be used to set the initial mode of the connection.~~

The connection types allowed are:

- speech;
- 3.1 kHz audio;
- 64 kbit/s unrestricted;
- ~~alternate speech/64 kbit/s unrestricted;~~
- ~~alternate 64 kbit/s unrestricted/speech.~~

The network signalling capabilities allowed are:

- ISDN-UP preferred;
- ISDN-UP required;
- ISDN-UP not required (any signalling system).

If the ISDN User Part preference indicator indicates "required" and no ISDN User Part route is available, the call will be released.

The information used to determine the routing of the call by the originating exchange will be included in the initial address message (as transmission medium requirement and forward call indicators), to enable correct routing at intermediate exchanges. The initial address message conveys implicitly the meaning that the indicated circuit has been seized.

~~In the case where $N \times 64$ kbit/s ($N > 2$) connections are required, the procedures for a single 64 kbit/s connection may be used if the $N \times 64$ kbit/s are contiguous 64 kbit/s channels and are pre-assigned for $N \times 64$ kbit/s use.~~

If subaddress information is received from the calling access, this information is passed unchanged to the destination exchange in the access transport parameter of the initial address message.

b) Address information sending sequence

The sending sequence and coding of the address signals for National interconnection will be determined on a bilateral basis for each interconnected service.

~~The sending sequence of address information on international calls will be the country code (not sent to an incoming international exchange) followed by the national (significant) number. On national connections, the address information may be the local number or the national (significant) number as required by the Administration concerned. For calls to international operator positions (Code 11 and Code 12), refer to Recommendation Q.107.~~

The end-of-pulsing (ST) signal ~~will~~ may be used whenever the originating exchange or the outgoing exchange is in a position to know by digit analysis that the final digit has been sent.

c) Initial address message

The initial address message (IAM) in principle contains all the information that is required to route the call to the destination exchange and connect the call to the called party.

All initial address messages will include a protocol control indicator (in the forward call indicator parameter) and a transmission medium requirement parameter.

The originating exchange will set the parameters in the protocol control indicator and in the ISDN-UP preference indicator to indicate:

- ~~i) the only type of end-to-end method that can be accommodated (§ D.3);~~
- ii) the availability of Signalling System No.7 signalling;
- iii) the use of the ISDN-UP;
- ~~iv) whether further information is available (to be requested before the called party is alerted);~~
- v) network signalling capability required, e.g. ISDN-UP required all the way.

The ISDN-UP preference indicator is set according to the bearer service, teleservice and supplementary service(s) requested. The exact setting depends on the service demand conditions and may be different depending on individual cases. In principle, if the service demand requires ISDN-UP to be essential, then the indicator is set to "required"; if the service required is optional but preferred, it is set to "preferred", otherwise it is set to "not required". The indicator is set to either "required" or "preferred", or "not required", according to the most stringent condition required by one or more of the parameters in the initial address message. ~~In addition, if end-to-end signalling method is essential to provide the requested service, the indicator should always be set to "required" (see Recommendation E.172).~~

The transmission medium requirement parameter contains the connection type required information, e.g. 3.1 kHz audio.

The originating exchange may also include in the initial address message:

- ~~i) a call reference (including the point code of the originating exchange) to enable the destination exchange to establish an end-to-end connection (§ 3);~~
- ~~ii) the calling party number if this is to be passed forward without being requested. The calling party number could contain Code 11 or 12 if the call is from an international operator;~~
- ~~iii) an SCCP connection request parameter; and~~
- iv) other information related to supplementary services and network utilities.

The initial address message can contain an access transport parameter.

- d) Transfer of information not included in the initial address message

(This section is not applicable to the Interconnect ISUP specification international interface)

- e) Completion of transmission path

Through-connection of the transmission path will be completed in the backward direction ~~(the transmission path is completed in the forward direction on receipt of a connect or answer message)~~ at the originating exchange immediately after the sending of the initial address message, except in those cases where conditions on the outgoing circuit prevent it (see § D.2.1.9).

It is also acceptable that on speech or 3.1 kHz audio calls, through-connection of the transmission path will be completed in both directions immediately after the initial address message has been sent, except in those cases where conditions on the outgoing circuit prevent it (see § D.2.1.9).

The transmission path shall be completed in the forward direction :

- a) on receipt of an Answer Message (ANM), or
- b) on receipt of a Connect Message (CON).
- f) Network protection timer

When the originating exchange or the controlling exchange has sent the initial address message the awaiting address complete timer (T₇) is started. If timer (T₇) expires, the connection is released and an indication is returned to the calling subscriber.

D.2.1.1.2 Actions required at an intermediate national exchange

a) Circuit selection

An intermediate national exchange, on receipt of an initial address message, will analyse the called party number and the other routing information [(see D.2.1.1.1 a)] to determine the routing of the call. If the intermediate national exchange can route the call using the connection type specified in the transmission medium requirement parameter, a free inter-exchange circuit is seized and an initial address message is sent to the succeeding exchange. ~~Within a network, if the intermediate exchange does not route the call using just the connection type specified in the transmission medium requirement parameter, the exchange may also examine the user service information containing the bearer capability information (if available) to determine if a suitable route can be selected. In this case, if a new connection type is provided, the transmission medium requirement parameter is modified to the new connection type.~~

For calls between networks, the gateway exchange (e.g. outgoing ISC) must ensure that the transmission medium requirement parameter is set according to the service requested by the customer (see Recommendation E.172). More specifically, this parameter is carried unchanged within the ~~international~~ national network.

When no echo suppressor or nature-of-circuit indication is received from a preceding exchange using a signalling system with fewer facilities, the indicators will be considered as received "no" unless positive knowledge is available.

b) Parameters in the initial address message

An intermediate exchange may modify signalling information received from the preceding exchange according to the capabilities used on the outgoing route. Signalling information that may be changed is nature of connection indicator, end-to-end method indicator; and service related information; the most significant digits in the called party number may be amended or omitted [see § D.2.1.1.1 b)]. ~~A change of the end-to-end method used may also alter parameters (see § D.3).~~ Other signalling information is passed on transparently, e.g. the access transport parameter, user service information, etc.

c) Completion of transmission path

Through-connection of the transmission path in both directions will be completed at an intermediate exchange immediately after the initial address message has been sent, except in those cases where conditions on the outgoing circuit prevent it (see § D.2.1.9).

D.2.1.1.3 Actions required at the destination exchange

a) Selection of called party

Upon receipt of an initial address message, the destination exchange will analyse the called party number to determine to which party the call should be connected. It will also check the called party's line condition and perform various checks to verify whether or not the connection is allowed. These checks will include correspondence of compatibility checks, e.g. checks associated with supplementary services.

~~At this point, certain call set up information may need to be obtained from an originating or controlling exchange (see § D.2.1.6). Examination of the protocol control indicator will show whether end-to-end information is necessary to be obtained before further processing of the call, in this case the SCCP, pass-along or information request and information messages can be used.~~

In this case where the connection is allowed, the destination exchange will set up a connection to the called party. If a continuity check has to be performed on one or more of the circuits involved in a connection, setting up of the connection to the called party must be prevented until the continuity of such circuits has been verified.

D.2.1.2 Forward address signalling — Overlap operation

D.2.1.2.1 Actions required at originating exchange

a) Circuit selection

When the originating exchange has received sufficient information [see § D.2.1.2.1 c)] from the calling party to determine that the call is to be routed to another exchange, selection of a suitable, free, inter-exchange circuit takes place and an initial address message is sent to the succeeding exchange.

Appropriate routing information is either stored at the originating exchange or at a remote database to which a request may be made.

The selection of the route will depend on the called party number, connection type required and the network signalling capability required. This selection process may be performed at the exchange or with the assistance of a remote database.

In addition, in the case of a subscriber with digital access, the set-up message contains bearer capability information which is analysed by the originating exchange to determine the correct connection type and network signalling capability. The bearer capability information will be mapped into the user service information parameter of the initial address message. The information received from the access interface is used to set the value of the transmission medium requirement parameter. ~~The first value of bearer information received will be used to set the initial mode of the connection.~~

The connection types allowed are:

- speech;
- 3.1 kHz audio;
- 64 kbit/s unrestricted;
- ~~alternate speech/64 kbit/s unrestricted;~~
- ~~alternate 64 kbit/s unrestricted/speech.~~

The network signalling capabilities allowed are:

- ISDN-UP preferred;
- ISDN-UP required;
- ISDN-UP not required (any signalling system).

If the ISDN User Part preference indicator indicates “required” and no ISDN User Part route is available, the call will be released.

The information used to determine the routing of the call by the originating exchange will be included in the IAM (as transmission medium requirement and forward call indicators), to enable correct routing at intermediate exchanges. The IAM conveys implicitly the meaning that the indicated circuit has been seized.

~~In the case where N x 64 kbit/s (N-3-2) connections are required, the procedures for a single 64 kbit/s connection may be used if the N x 64 kbit/s are contiguous 64 kbit/s channels and are pre-assigned for N x 64 kbit/s use.~~

If subaddress information is received from the calling access, this information is passed unchanged to the destination exchange in the access transport parameter of the initial address message only.

b) Address information sending sequence

The sending sequence and coding of the address signals for National interconnection will be determined on a bilateral basis for each interconnected service.

The sending sequence of address information on international calls will be the country code (not sent to an incoming international exchange) followed by the national (significant) number. ~~On national connections, the address information may be the local number or the national (significant) number as required by the Administration concerned.~~ For calls to international operator positions (Code 11 and Code 12), refer to Recommendation Q.107.

The end-of-pulsing (ST) signal ~~may~~ will be used whenever the originating exchange or the outgoing exchange is in a position to know by digit analysis that the final digit has been sent.

c) Content of initial and subsequent address messages

The initial and subsequent address messages in principle contain all of the information that is required to route the call to the destination exchange and connect the call to the called party. The contents of the initial address message is the same as described in § D.2.1.1.1 c). The only purpose of the subsequent address message is to carry further digits.

~~All digits required for routing the call through the international network will be sent in the IAM. On calls with a country code in the number (except in the case of calls to special operators), the IAM will contain a minimum of 4 digits and should contain as many digits as are available. Within national networks the address information contained within the IAM may vary depending on the routing requirement within the network.~~

The remaining digits of the number may be sent in subsequent address messages containing one or several digits as they are received. Efficiency can be gained by grouping together as many digits as possible. However, to prevent an increase in postsending delay in those cases where overlap operation with subscribers' dialling is used, it may be desirable to send the last few digits individually.

The end-of-pulsing (ST) signal ~~may be~~ is always sent in the following situations:

- i) semi-automatic calls;
- ii) test calls; and
- iii) when the end-of-pulsing (ST) signal is received.

~~In automatic working, the end-of-pulsing (ST) signal will be sent whenever the originating or outgoing exchange is in a position to know, by digit analysis, that the final digit has been sent. Digit analysis may consist of an examination of the country code and counting the maximum (or fixed) number of digits of the national number. In other cases where the end-of-pulsing signal is not sent and the end-of-address information is determined by the receipt of the address complete message or connect message from the incoming exchange.~~

d) Transfer of information not included in the initial address message

(This section is not applicable to the Interconnect ISUP specification international interface)

e) Completion of transmission path

Through-connection of the transmission path in the backward direction (~~the transmission path is completed in the forward direction on receipt of connect or answer message~~) at the originating exchange will be completed except in the cases where conditions on the outgoing circuit prevent it (see § D.2.1.9):

- i) immediately after the sending of the initial address message; or
- ii) when digit analysis or timer (T10), or receipt of the address complete message indicates that all digits have been received.

It is also acceptable that on speech or 3.1 kHz audio calls, through-connection of the transmission path will be completed in both directions immediately after the initial address message has been sent, except in the cases where conditions on the outgoing circuit prevent it (see § D.2.1.9).

The transmission path shall be completed in the forward direction :

- a) on receipt of an Answer Message (ANM), or
- b) on receipt of a Connect Message (CON).
- f) Network protection timer

Each time when the originating exchange has sent an address message, the awaiting address complete timer (T7) is started. If timer (T7) expires, the connection is released and an indication is sent to the calling subscriber.

D.2.1.2.2 Actions required at an intermediate national exchange

a) Circuit selection

An intermediate exchange, on receipt of an IAM, will analyse the digits available and the other routing information [see § D.2.1.2.1 a)] to determine the routing of the call. If the intermediate exchange can route the call using the connection type specified in the transmission medium requirement parameter, a suitable free inter-exchange circuit is seized and an IAM is sent to the succeeding exchange. If the number of digits in the called party number are not sufficient to route the call, the routing will be carried out when the intermediate exchange has received additional digits in subsequent address message(s). Any address digits received in subsequent address messages during the circuit selection process may be included in this IAM. Any subsequent address messages received after the IAM has been sent are forwarded to the succeeding exchange as subsequent address message(s).

~~Within the network, if the intermediate exchange does not route the call just using the connection type specified in the transmission medium requirement parameter, the exchange may also examine the user service information containing the bearer capability information (if available) to determine if a suitable route can be selected. In this case the transmission medium requirement parameter is modified to the new connection type.~~

For calls between networks, the gateway exchange (e.g. outgoing ISC) must ensure that the transmission medium requirement parameter is set according to the service requested by the customer (see Recommendation E.172). More

specifically, this parameter is carried unchanged within the ~~international~~ national network.

When no echo suppressor or nature-of-circuit indication is received from a preceding exchange using a signalling system with fewer facilities, the indicators will be considered as received “no” unless positive knowledge is available.

Selection of the outgoing national circuit normally can start at an incoming international exchange on receipt of the IAM and signalling can proceed on the first national link.

b) Parameters in the initial address message

An intermediate exchange may modify signalling information received from the preceding exchange according to the capabilities used on the outgoing route. Signalling information that may be changed is nature of connection indicator, ~~end-to-end method indicator~~, and propagation delay counter, service related information; the most significant digits in the called party number may be amended or omitted [see § D.2.1.1.1 b)]. ~~A change of the end-to-end method used may also alter parameters (see § D.3).~~ Other signalling information is passed on transparently, e.g. the access transport parameter, user service information, etc.

c) Completion of transmission path

Through-connection of the transmission path in both directions will be completed at an intermediate exchange immediately after the initial address message has been sent, except in those cases where conditions on the outgoing circuit prevent it (see § D.2.1.9).

D.2.1.2.3 Actions required at the destination exchange

a) Selection of called party

Upon the receipt of the sufficient called party number information, the destination exchange will analyse the called party number to determine to which party the call should be connected. It will also check the called party's line condition and perform various checks, to verify whether or not the connection is allowed. These checks will include correspondence of compatibility checks, e.g. checks associated with supplementary services.

Also, if the called part has an analogue access, the connection is only allowed when the transmission medium requirement indicates “speech” or “3.1kHz audio”.

~~At this point, certain call set-up information may need to be obtained from an originating or controlling exchange (see § D.2.1.6). Examination of the protocol control indicator will show whether end-to-end information is necessary to be obtained before further processing of the call, in this case the SGGP, pass-along or information request and information messages can be used.~~

In the case where the connection is allowed, the destination exchange will set up a connection to the called party. If a continuity check has to be performed on one or more of the circuits involved in a connection, setting up of the connection to the called party must be prevented until the continuity of such circuits has been verified.

D.2.1.3 Calling party number

THE CALLING PARTY NUMBER CAN ONLY BE INCLUDED IN THE INITIAL ADDRESS MESSAGE [SEE §§ D.2.1.1.1 c) AND D.2.1.2.1 c)].

D.2.1.4 Address complete message, connect message and call progress message

D.2.1.4.1 Return of address complete message from destination exchange

An address complete message will be sent from the destination exchange as soon as ~~it has been determined that the complete called party number has been received, or an indication received from the called party that an inband tone is being connected (for this case see §§ D.2.1.5 and D.2.2.4); a response has been received from an ISDN access or it has been determined that the called party is idle.~~ However, there is no direct mapping from alerting, received from the access signalling system, to address complete in the network. ~~In the case that the continuity check is performed, the destination exchange will withhold sending the address complete message until a successful continuity indication has been received (see § D.2.1.9).~~

Address complete is sent from the destination exchange in the following conditions:

- 1) In the case where the terminating access is non ISDN, the following action takes place at the destination exchange:
 - a) In all cases an address complete message is sent as soon as it has been determined that the complete called party number has been received, and the destination exchange established that the subscriber is free. Indicators in the address complete message will be set to indicate:
 - call line status: "Subscriber free";
 - ISDN access indicator: "Non ISDN".

Ring tone shall then be applied by the terminating exchange.

- b) In the case of a PBX, an address complete message is sent as soon as it has been determined that the called party number has been received. Indicators in the address complete message will be set to indicate:
 - called line status: "No indication";
 - ISDN access indicator: "Non ISDN".
- 2) In the case where the terminating access is ISDN, the following conditions can apply:
 - a) ~~If an indication that the address is complete or no status indication has been received from the ISDN access prior to the destination exchange determining that the complete called party number has been received, the indicators in the address complete message will be set as follows:~~
 - ~~called line status: "No indication";~~
 - ~~ISDN access indicator: "ISDN".~~

Note ~~In case a) the indication that the destination user is being alerted is transferred in a call progress message (see § D.2.1.5).~~

- b) The destination exchange concludes from the receipt of an indication from the ISDN access that the complete called party number has been received. In this case the indicators in the address complete message will be set as follows:
 - called line status: "Subscriber free";
 - ISDN access indicator: "ISDN".

D.2.1.4.2 Return of connect message from the destination exchange

If a connect indication is received from the ISDN access under the following conditions:

- no alerting indication received from the ISDN access;and
- an address complete message has not yet been sent by the destination exchange,

a connect message is sent by the destination exchange.This connect message signifies both address complete and answer conditions.

Indicators in the connect message will indicate:

- called line status:“Subscriber free”;
- ISDN access indicator:“ISDN”.

The destination exchange will through-connect before the connect message is sent.

D.2.1.4.3 Receipt of address complete message or connect message at an intermediate exchange

Upon receipt of an address complete message,an intermediate national exchange will send the corresponding address complete message to the preceding exchange.If a connect message is received at an intermediate exchange instead of an address complete message,a connect message will be sent to the preceding exchange.

D.2.1.4.4 Receipt of address complete message or the connect message at the originating exchange

- a) When the originating exchange receives an address complete message,the appropriate exchange functions take place.
- b) On receipt of an address complete message with the called line status indicator set to “subscriber free”,an alerting indication is passed to the calling party if possible.
- c) On receipt of the address complete message,the awaiting address complete timer (T7) is stopped and the awaiting answer timer (T9) is started.If timer (T9) expires,the connection is released and an indication is sent to the calling subscriber.
- d) If the connect message is received,then the appropriate exchange functions take place.The awaiting address complete timer (T7) is stopped (see § D.2.1.7.2).

D.2.1.4.5 Through-connection and awaiting answer indication at the destinationexchange

The sending of the awaiting answer indication (e.g. ring tone) at the destination exchange depends on the type of call.On speech and 3.1 kHz calls and call to an analogue called party, the awaiting answer indication is applied to the transmission path to the calling party from the destination exchange on receipt of an alerting indication from the called party or from information contained within the destination exchange that the called party will not or is prohibited from providing inband tone.

Regardless of whether tones are to be provided or not, the destination exchange will through-connect after the reception of the connection indication from the called party and before sending the answer/connect message to the preceding exchange.

If the destination exchange does not send the awaiting answer indication because the destination user provides for the sending of tones, then the destination exchange will through-connect the transmission path in the backward direction on receipt of the progress indication.

The complete through-connection of the transmission path at answer is covered in § D.2.1.7.

D.2.1.4.6 Address complete message with charging information

The address complete message carries a charge indicator.

D.2.1.4.7 Address complete message with other information

Additional information can be included in the address complete messages (e.g. related to supplementary services, see Annex E).

D.2.1.4.8 Return of address complete message in interworking situations

An address complete message shall always be sent.

~~An address complete message will not be sent until the cross-office check is made, if applicable (see § D.2.1.10).~~

~~If the succeeding network does not provide electrical called party's line condition indications, the last Signalling System No. 7 exchange shall originate and send an address complete message when the end of address signalling has been determined:~~

- ~~a) by receipt of an end of pulsing (ST) signal; or~~
- ~~b) by receipt of the maximum number of digits used in the national numbering plan; or~~
- ~~c) by analysis of the national (significant) number to indicate that a sufficient number of digits has been received to route the call to the called party; or~~
- ~~d) by receipt of an end of selection signal from the succeeding network (e.g. number received signal in Signalling System No. 5); or~~
- ~~e) exceptionally, in the succeeding network uses overlap signalling and number analysis is not possible, by observing that timer (T10) has elapsed since the last digit was received, and that no fresh information has been received; in such circumstances, transmission to the national network of the last digit received must be prevented until the end of the waiting period which causes an address complete message to be sent backward. In this way, it is ensured that no national answer signal can arrive before an address complete message has been sent.~~

~~If in normal operation, a delay in the receipt of an address complete signal from the succeeding network is expected, the last common channel signalling exchange will originate and send an address complete message 15 to 20 seconds [(timer (T11))] after receiving the latest address message. The time-out condition is an upper limit considering the clauses of § D.2.9.10.3 (20 to 30 seconds waiting for address complete message timer (T7) for outgoing international exchanges in abnormal release conditions).~~

D.2.1.4.9 Return of sub-address information in address complete message, connect message or call progress message

IF SUB-ADDRESS INFORMATION IS RECEIVED FROM THE CALLED ACCESS, THIS INFORMATION IS PASSED UNCHANGED TO THE ORIGINATING EXCHANGE IN THE ACCESS TRANSPORT PARAMETER OF THE ANSWER MESSAGE, OR CONNECT MESSAGE.

D.2.1.4.10 Receipt of conflicting backward call indicators

The backward call indicators parameter may be received more than once for a call. This will be a normal occurrence for calls that are forwarded. The following shall occur if conflicting indicators are received.

1. Charge indicator

For calls that have not been forwarded, if “no indication” is received it shall be overwritten by a subsequent “charge” or “no charge”. If a subsequent indication is not received, “charge” shall be assumed.

If “charge” and “no charge” are received for a call, “no charge” shall be assumed and a fault shall be logged. If “no indication” is received after a “charge” or “no charge” it shall be ignored.

If a subsequent backward call indicators parameter is received, the charge indicator shall be ignored.

2. Other indicators

Received values of other indicators shall override the previously received values.

D.2.1.5 Call progress

The call progress message is sent (*ONLY AFTER THE ADDRESS COMPLETE MESSAGE*) from an exchange in the backward direction indicating that an event has occurred during call set-up which should be relayed to the calling party.

If a CPG message is received before ACM, the CPG shall be discarded and the call shall continue.

D.2.1.5.1 Return of call progress message from the destination exchange

The call progress message is sent from the destination exchange if the address complete message has been sent and subsequently:

- an indication is received that the called party is being alerted, the call progress message contains an event indicator that is set to “alerting”;
- a progress indication is received from the called party, the call progress message contains an event indicator that is set to “progress”.

If the indication received from the called party contains a “progress indication”, this is carried by the call progress message in the access transport parameter (transported unchanged across the public network).

The destination exchange may, on receipt of the indication from the called party that contains an appropriate progress indicator, through-connect the speech path (see § D.2.1.4.5).

In the case of call failure and the connection of a tone or announcement being returned before the address complete message has been returned, see (§ D.2.2.4).

D.2.1.5.2 Action at an intermediate exchange

On receipt of a call progress message an intermediate exchange will send the corresponding call progress message to the preceding exchange.

D.2.1.5.3 Actions at the originating exchange

On receipt of a call progress message at the originating exchange, no state change occurs (i.e. ~~the awaiting address complete~~ or the awaiting answer timer *is* not stopped), and the appropriate indication is sent to the calling user. If the call progress message contained information carried in the access transport parameter, it is transferred unaltered into the indication returned to the calling user.

If a CPG with Event = "PROGRESS" is received by the originating exchange, and if there is not a Progress information element in the Access Transport parameter, no action will be taken.

D.2.1.6 Information messages

(This section is not applicable to the Interconnect ISUP specification international interface)

D.2.1.7 Answer message

D.2.1.7.1 Return of answer message from destination exchange

When the called party answers, the destination national exchange connects through the transmission path and the ringing tone is removed if applicable. An answer message to the preceding exchange is sent. If the destination exchange is the exchange controlling charging, then charging may begin.

D.2.1.7.2 Receipt of answer message at intermediate exchange

Upon receipt of an answer message, an intermediate exchange sends the corresponding answer message to the preceding exchange and, if this is the exchange controlling charging, charging may begin, and timer (T9) is stopped.

D.2.1.7.3 Receipt of answer message at originating exchange

When the originating exchange receives an answer message indicating the required connection has been completed, the transmission path is connected-through in the forward direction, ~~if not already connected~~. The awaiting answer timer (T9) is stopped. If the originating exchange is the exchange controlling charging, charging may begin if applicable. The calling party is informed.

D.2.1.7.4 Return of answer from automatic terminals

When connections are set up to terminals having an automatic answer feature, the alerting indication may not be received from the called party. If a destination exchange receives an answer indication, an answer message is sent provided that an address complete message has been sent, otherwise the connect message is sent.

D.2.1.7.5 Answer with charging information

The answer message received from the destination exchange or from a succeeding network carries a charge indicator.

D.2.1.8 Continuity-check

(This section is not applicable to the Interconnect ISUP specification)

D.2.1.9 Special procedures at an interworking point

D.2.1.9.1 Completion of transmission path at an interworking exchange

(This section is not applicable to the Interconnect ISUP specification)

D.2.1.10 Cross-office check

(This section is not applicable to the Interconnect ISUP specification)

D.2.1.11 Charging procedures

D.2.1.11.1 Basic call charging

Charging will normally begin when the exchange(s) controlling charging receives the answer or connect message from the network. Optionally, an Administration may wish to begin charging prior to the receipt of the answer or connect message for national and/or international calls.

D.2.1.11.2 Network charging messages (national option)

(This section is not applicable to the Interconnect ISUP specification international interface)

D.2.1.12 Forward transfer message

(This section is not applicable to the Interconnect ISUP specification)

D.2.1.13 Transit network selection (national option)

(This section is not applicable to the Interconnect ISUP specification international interface)

D.2.2 Unsuccessful call set-up

If at any time in the call set-up the connection cannot be completed, a release message is returned. This message contains the reason.

D.2.2.1 Actions at exchange initiating a release message

The initiating exchange immediately starts the release of the switched path (if established). *THE EXCHANGE SENDS A RELEASE MESSAGE TO THE PRECEDING EXCHANGE AND TIMERS T1 AND T5 ARE STARTED TO ENSURE THAT A RELEASE COMPLETE MESSAGE IS RECEIVED FROM THE PRECEDING EXCHANGE WITHIN TIME T1 (EXPIRATION OF TIMERS T1 AND T5 IS COVERED IN § D.2.10.6).*

D.2.2.2 Actions at intermediate exchange

On receipt of a release message from the succeeding exchange, an intermediate exchange:

- i) immediately starts the release of the switched path; when the circuit is reselectable, a release complete message is returned to the succeeding exchange;
- ii) at the same time as the start of the release of the switched path, a release message is sent to the preceding exchange.

TIMERS T1 AND T5 ARE STARTED TO ENSURE THAT A RELEASE COMPLETE MESSAGE IS RECEIVED FROM THE PRECEDING EXCHANGE (EXPIRATION OF TIMERS T1 AND T5 IS COVERED IN § D.2.10.6).

D.2.2.3 Actions at the controlling exchange (i.e. the exchange controlling the call)

On receipt of a release message from the succeeding exchange, the controlling exchange starts the release of the switched path.

In addition, the controlling exchange will (if applicable):

- a) return an indication (in-band or out-band) to the calling party (see § D.2.2.4);
or
- b) attempt to re-route the call set-up; or
- c) initiate release procedures to the preceding exchange (as described in § D.2.2.4).

In case a) above an indication is carried in the call progress message or address complete message indicating in-band information is available (see § D.2.2.4).

When the controlling exchange is ready for circuit re-selection, a release complete message is sent to the succeeding exchange.

D.2.2.4 Tones and announcements

The applicability of tones and announcements is decided based on the transmission medium requirements. Tones and announcements are applicable for the following transmission medium requirements:

- speech.
- 3.1 kHz audio

If a call setup fails and no in-band tone or announcement has to be returned to the calling party from an exchange succeeding the controlling exchange, this exchange sends a release message to the controlling exchange. The cause value should reflect the reason of the call failure in the same way as the in-band tone or announcement to be applied.

If a call set-up fails and an in-band tone or announcement has to be returned to the calling party from an exchange or called party, the exchange or user concerned connects the in-band tone to the transmission path. If a time-out occurs at the exchange providing the in-band tone or announcement, the exchange sends a release message to the preceding exchange with cause value 31 (normal, unspecified).

If an address complete message has been returned to the preceding exchange, a call progress message indicating that in-band tone information is available is returned to the preceding exchange (see § D.2.1.5). The cause value should reflect the reason of cause failure in the same way as the in-band tone or announcement to be applied.

If an address complete message has not been returned to the preceding exchange already, an address complete message, with the appropriate cause parameter and the "in-band information" indicator set in the optional backward call indicator, will be returned to the originating exchange.

In case a special tone or announcement has to be applied due to an event only known by a certain exchange and not covered by a cause value, no cause parameter is included in either the address complete or call progress messages. The answer message must not be sent in this case.

For the preceding exchanges the inclusion of the cause parameter in the address complete or call progress message implies an unsuccessful call setup. The cause parameter will not be included for unsuccessful call setups when interworking has occurred and the in-band tone or announcement is returned from the exchange beyond the interworking point.

The tone or announcement shall be applied by the exchange closest to the originating exchange which is capable of applying the required tone or announcement. That is the reason for unsuccessful call setup messages being conveyed through the network in the form of signalling for as long as is possible. This reduces the amount of speech capacity used for the purpose of relaying tones.

D.2.2.5 Address Incomplete

The determination that the proper number of digits have been received occurs as digits are collected. When the maximum number of digits have been collected the call proceeds immediately and any further SAM messages are ignored. In addition an inter-digit timer operates, which causes immediate digit string analysis if the timer expires.

The determination that proper number of digits has not been received ~~can~~ may be made at once if the end-of-pulsing signal is received.

When overlap working is used and the end of pulsing signal has not been received, the release message with cause 28 (address incomplete) will be sent 15-20 seconds (T35) after receipt of the last digit and before receipt of the minimum or fixed number of digits required for forward routing of the call.

D.2.3 Normal call release

The release procedures are based on a two-message (release, release complete) approach whereby the release message initiates release of the circuit switched connection.

The same procedures are used in the network irrespective of whether they are initiated by the calling party, the called party or the network. The normal release procedure can be prevented by the network if this is required on a particular call (see § D.2.6).

To satisfy the need for rapid transfer of release across the network, it is required that the circuit is selectable from the subsequent exchange within the mean cross-office transfer time, T_{CU} , for simple messages as specified in Recommendation Q.766.

D.2.3.1 Release initiated by a calling party

a) Actions at the originating exchange

On receipt of a request to release the call from the calling party, the originating exchange immediately starts the release of the switched path. *A RELEASE MESSAGE TO THE SUCCEEDING EXCHANGE AND TIMERS T1 AND T5 ARE STARTED TO ENSURE THAT A RELEASE COMPLETE MESSAGE IS RECEIVED FROM THE SUCCEEDING EXCHANGE WITHIN TIME T1 (EXPIRATION OF TIMERS T1 AND T5 IS COVERED IN § D.2.10.6).*

b) Actions at an intermediate exchange

On receipt of a release message from the preceding exchange, an intermediate exchange:

- i) immediately starts the release of the switched path; when the circuit is reselectable, a release complete message is returned to the preceding exchange;
- ii) at the same time as the start of the release of the switched path, sends a release message to the succeeding exchange. *TIMERS T1 AND T5 ARE STARTED TO ENSURE THAT A RELEASE COMPLETE MESSAGE IS RECEIVED FROM THE SUCCEEDING EXCHANGE (EXPIRATION OF TIMERS T1 AND T5 IS COVERED IN § D.2.10.6.)*

c) Actions at the destination exchange

On receipt of a release message from the preceding exchange, the destination exchange will start the release of the switched path.

When the circuit is ready for reselection, a release complete message is returned to the preceding exchange.

d) Charging

Charging is stopped upon receipt of the release message at the charging exchange or on receipt of a request to release the call from the calling party when the charging exchange is the originating exchange.

The charging requirements for interconnecting services using this interconnect signalling interface specification will be determined on a bilateral basis.

e) Collision of release messages

In the case when two points in the connection both initiate the release of a call, a release message may be received at an exchange from a succeeding or preceding exchange after the release of the switched path is initiated. In this case, the exchange will return a release complete message to the exchange from which the concerned release message was received. The release complete message will be sent when the circuit is ready for re-selection.

A circuit shall only become idle after an RLC message has been sent.

D.2.3.2 Release initiated by a called party

The procedures in § D.2.3.1 apply, except that the functions at the originating and destination exchanges are transposed.

D.2.3.3 Release initiated by the network

The procedures in § D.2.3.1 apply, except that they can be initiated at any exchange (originating, destination or intermediate).

D.2.3.4 Storage and release of IAM information

Each exchange of the connection shall store during the call set-up the information contained in the initial address message sent (the originating exchange) or received (intermediate or destination exchange). The information to be stored includes all parameters in the IAM. The contents of the IAM information shall be updated, if the value of parameters change during the call set-up.

The IAM information can be released from memory:

- a) in the originating exchange when the address complete message or connect message has been received and the calling party does not subscribe to a supplementary service which would cause a new call set-up (e.g. call transfer). The release of the information when the calling party does subscribe to a supplementary service is covered in Annex E;
- b) in the intermediate exchange when the address complete message or the connect message has been received;
- c) in the destination exchange when the address complete message or connect message has been sent and the called party does not subscribe to a supplementary service which would cause a new call set-up (e.g. call transfer). The release of the information when the called party does subscribe to a supplementary service is covered in Annex E, and when the call is released earlier and no automatic repeat attempt is to be attempted.

D.2.4 Transfer of user-to-user information

D.2.4.1 Requirements for transfer of user-to-user data

See Annex E.

D.2.5 Suspend, resume

D.2.5.1 Suspend

The suspend message indicates a temporary cessation of communication without releasing the call. It can only be accepted during the conversation/data phase. A suspend message can be either generated in response to a suspend request from the calling/called party or generated by the network in response to a clearback indication from an interworking node or an on-hook condition from an analogue called (telephone) party.

D.2.5.1.1 Suspend initiated by a calling party

A suspend message is generated in response to a suspend request or notification from a calling party. The suspend request controlling exchange is within the network of the suspend initiating user.

a) Actions at originating exchange

On receipt of a suspend request or notification from the calling party, the originating exchange sends a suspend message to the succeeding exchange.

b) Actions at an intermediate exchange

On receipt of the suspend message from the preceding exchange, the intermediate exchange sends a suspend message to the succeeding exchange.

c) Actions at destination exchange

On receipt of the suspend message from the preceding exchange, the destination exchange informs the called party that a suspend has been requested.

d) Actions at the suspend request controlling exchange

On receipt of the suspend request from a user or the suspend message, the controlling exchange starts a timer (T2) to ensure that a resume request or resume message is received within timer (T2). If the timer (T2) expires, the procedures in § D.2.5.3 apply.

D.2.5.1.2 Suspend initiated by a called party

The procedures in § D.2.5.1.1 apply, except that the functions at the originating and destination exchanges are transposed.

The suspend request controlling exchange is within the network of the suspend initiating user.

D.2.5.1.3 Suspend initiated by the network

A suspend message can be generated by the network in response to a clearback indication from an interworking node or an on-hook condition from an analogue called party.

- a) Action at the terminating exchange (destination) or an interworking exchange

On receipt of an on-hook condition in the terminating exchange or a clearback signal at the interworking exchange, the exchange may send a suspend (network) message to the preceding exchange.

- b) Action at the intermediate exchange

On receipt of a suspend message, the exchange will send a suspend message to the preceding exchange.

- c) Action at the controlling exchange

On receipt of the on-hook condition or clearback indication or suspend message, the controlling exchange starts a timer (T6) to ensure that an off-hook condition, a re-answer indication, a resume (network) message or a release message is received. The value of this timer (T6) is covered in Recommendation Q.118. If the timer (T6) expires, the procedures in § D.2.5.3 apply.

D.2.5.2 Resume

A resume message indicates a request to recommence communication. A request to release the call received from the calling or called party will override the suspend/resume sequence and the procedures given in § D.2.3 will be followed.

D.2.5.2.1 Resume initiated by a calling party

Having initiated a suspend condition, a calling party may request a reconnection within timer T2. The procedures in § D.2.5.1.1 items a), b) and c) apply, except that the resume message replaces the suspend message. On receipt of the resume message, the controlling exchange cancels the timer (T2).

D.2.5.2.2 Resume initiated by a called party

The procedures in § D.2.5.2.1 apply, except that the functions at the originating and destination exchange are transposed.

D.2.5.2.3 Resume initiated by the network

A resume message is initiated by the network, if a suspend message had previously been sent, in response to a re-answer indication from an interworking node or an off-hook condition from an analogue called party.

- a) Action at the terminating exchange or interworking exchange

On receipt of a re-answer indication at the interworking exchange or an off-hook condition in the terminating exchange, the exchange may send a resume (network) message to the preceding exchange if a suspend (network) message had previously been sent.

b) Actions of the intermediate exchange

On receipt of a resume message, the exchange will send a resume message to the preceding exchange.

c) Action of the controlling exchange (i.e. exchange controlling the call)

On receipt of the off-hook condition, re-answer signal, release message or resume message the controlling exchange stops the timer (T6) [started in § D.2.5.1.3 c)].

D.2.5.3 Expiration of timer (T2) or timer (T6)

If a request for reconnection or a resume message is not received within timer (T2) or timer (T6) covered in Recommendation Q.118, then the controlling exchange will initiate the release procedure outlined in § D.2.3.3. Cause value #102 is used in the release message.

D.2.6 Delayed release (national option)

(This section is not applicable to the Interconnect ISUP specification international interface)

D.2.7 In-call modification

(This section is not applicable to the Interconnect ISUP specification international interface)

D.2.8.2 Forward direction

D.2.8.2.1 Actions at the originating exchange

If an originating exchange has sufficient information to determine that echo control is necessary for the outgoing circuit, then:

- an outgoing half echo control device is enabled; and
- the echo control device indicator of the nature of connection indicators parameter field in the IAM is set.

D.2.8.2.2 Actions at an intermediate exchange

If an intermediate exchange has sufficient information to determine that echo control is required for the outgoing circuit, then one of the following actions can occur:

- a) When the nature of connection indicators parameter field in the IAM indicates that an echo control device is already included:
 - no change to the nature of connection indicators parameter field in the IAM is made;
 - an incoming half echo control device is reserved; and
 - any outgoing half echo control device is disabled.
- b) When the nature of connection indicators parameters in the IAM does not indicate that an echo control device is already included:
 - an outgoing half echo control device is enabled; and
 - the echo control device indicator in the nature of connection indicators parameter field is set.

If the intermediate exchange has sufficient information to determine that echo control is not required for the outgoing circuit, then one of the following actions can occur:

- a) When the nature of connection indicators parameter field in the IAM indicates that an echo control device is already included:
 - no change to the nature of connection indicators parameter field in the IAM is made; and
 - an incoming half echo control device is reserved.
- b) When the nature of connection indicator parameter field in the IAM does not indicate that an echo control device is already included:
 - no additional action is required.

D.2.8.2.3 Actions at the destination exchange

See § D.2.8.3.1 below.

D.2.8.3 Backward direction

D.2.8.3.1 Actions at the destination exchange

Upon the receipt of an IAM with the indication “outgoing half echo control device included” in the nature of connection indicators parameter field, the following action is taken:

- an incoming half echo control device is enabled; and
- the echo control device indicator of the backward call indicators parameter field in the first backward message (i.e. ACM or connect ~~or call progress~~) is set.

If the destination exchange is unable to include an incoming half echo control device, the information is conveyed to the preceding exchange by an echo control device indicator in *THE BACKWARD CALL INDICATORS PARAMETER FIELD* in the first backward message.

D.2.8.3.2 Actions at an intermediate exchange

Upon receipt of the first backward message (i.e. ACM or connect ~~or call progress~~) in response to an IAM with echo control indication, then one of the following actions can occur:

- a) When the backward call indicators parameter field indicates that an incoming half echo control device is not already included:
 - the reserved incoming half echo control device is included; and
 - the echo control device indicator in the backward call indicators parameter field is set.
- b) When the backward call indicators parameter field indicates that an incoming half echo control device is already included:
 - the reserved incoming half echo control is released; and
 - no change to the backward call indicators parameter field in the backward message is made.

D.2.8.3.3 Actions at the originating exchange

No additional action is required.

D.2.9 Network features

D.2.9.1 Automatic repeat attempt

Automatic repeat attempt, as defined in Recommendation Q.12, is provided in Signalling System No.7. An automatic repeat attempt will be made (up to the point when the initial address message information is released, see § D.2.3.4):

- i) on detection of dual seizure (at the non-control exchange) (see § D.2.10.1.4);
- ii) on receipt of the blocking message after sending an address message and before any backward message has been received (see § D.2.9.2);
- iii) on receipt of a reset circuit message after sending an address message and before a backward message has been received [see § D.2.10.3.1 e);
- ~~iv) on failure of continuity check, when a continuity check is performed;~~
- v) on receipt of an unreasonable message during call set up (see § D.2.10.5).

D.2.9.2 Blocking and unblocking of circuits and circuit groups

The blocking (unblocking) message and the circuit group blocking (unblocking) message are provided to permit the switching equipment or maintenance system to remove from (and return to) traffic the distant terminal(s) of a circuit or group of circuits because of a fault or to permit testing.

Since the circuits served by the ISDN user part have both-way capability, the blocking message or circuit group blocking message can be originated by either exchange. The receipt of a blocking message or a circuit group blocking message will have the effect of prohibiting non test calls on the relevant circuit(s) outgoing from the exchange until an unblocking message or an appropriate circuit group unblocking message is received, but will not prohibit test calls incoming to that exchange. An acknowledgment sequence is always required for the blocking and unblocking message as well as for the circuit group blocking message and circuit group unblocking messages using the blocking acknowledgment message, the unblocking acknowledgment message, the appropriate circuit group blocking acknowledgment messages and the appropriate circuit group unblocking acknowledgment message respectively. The acknowledgment is not sent until the appropriate action - either blocking or unblocking - has been taken. The release message ~~should~~ shall not override a blocking message and return circuits to service which might be faulty. The blocked circuit(s) will be returned to service on transmission of the unblocking acknowledgment message or the appropriate circuit group unblocking acknowledgment message at one exchange and on receipt of the unblocking acknowledgment message or the appropriate circuit group unblocking acknowledgment message at the other exchange.

Note - The correct method to unblock a circuit is by using the Unblocking message for a single circuit or the Group unblocking message for a group of circuits. The Reset circuit (or Circuit group reset) message shall only be used to reset circuits in a fault situation where the exact state of the circuit(s) is unknown.

D.2.9.2.1 Other actions on receipt of a blocking message

In the event of a blocking message being received, after an initial address message has been sent in the opposite direction on that circuit, and before a backward message relating to that call has been received, an automatic repeat attempt will be made on another circuit. The exchange receiving the blocking message releases the original call attempt in the normal manner after sending the blocking acknowledgment message and will not seize that circuit for subsequent calls.

If the blocking message is received:

- after an initial address message has been sent for that circuit in the opposite direction and after at least one backward message relating to that call has been received; or

- after an initial address message has been received for that circuit beforehand,

the exchange will not seize that circuit for subsequent calls, and the current call proceeds.

The fact that the circuit is engaged on a call will not delay transmission of the blocking (unblocking) acknowledgment message.

If a blocking message is sent and subsequently an initial address message is received in the opposite direction, the following action is taken:

- for test calls, the call should be accepted, if possible. In the case where the test call cannot be accepted, the blocking message must be returned;
- for calls other than test calls, the blocking message must be returned and the initial address message discarded.

When a circuit is blocked by use of the blocking message, the maintenance system should be informed at both ends of the circuit.

D.2.9.2.2 Circuit group blocking and unblocking messages

The following circuit group blocking (unblocking) messages and their corresponding acknowledgment messages are provided:

- maintenance oriented circuit group blocking (unblocking) message;
- hardware failure oriented circuit group blocking (unblocking) message.

The circuits to be blocked (unblocked) are indicated in the status field.

The maximum number of circuits to be blocked (unblocked) with one circuit group blocking (unblocking) message is limited to 32.

A received circuit group blocking (unblocking) acknowledgment message has to match in the parameter value of the circuit identification code, the circuit group supervision message type indicator, and the range field (see Annex C) with the previously sent group blocking (unblocking) message in order to be considered a valid acknowledgment.

A circuit is controlled by the ISDN user part if it can be used by the ISDN user part as a circuit switched bearer. Hence, time slots in a digital path that are used for synchronisation (e.g. time slot 0 in a 2048 kbit/s digital path) or as signalling channels are not circuits whose control is allocated to the ISDN user part.

~~Some of the circuit identification code values covered by the range field of a circuit group blocking (unblocking acknowledgment) message may not be allocated to any circuit. Then the corresponding status bits in the status field are set to 0. This is not allowed for the circuit identification code values related to status bits being set to 1. Those circuit identification code values must always be allocated to circuits whose control is allocated to the ISDN user part. In particular, the circuit identification code value indicated in the label of a message must be allocated to a circuit.~~

The maintenance oriented circuit group blocking (unblocking) procedures set (remove) the same blocking states as the blocking (unblocking) procedures. This means that a blocking state set by a maintenance oriented circuit group blocking message or indicated as blocked for maintenance purposes in the status field of a circuit group reset acknowledgment message can be removed by an unblocking message. Similarly, a blocking state set by a blocking message can be removed by a maintenance oriented circuit group unblocking message.

The maintenance blocked state set by maintenance oriented circuit group blocking message, by a status indicator in a circuit group reset acknowledgment message or a blocking message cannot be removed by a hardware oriented circuit group unblocking message.

The range of circuits to be blocked (unblocked) is indicated in the range field. Those circuits within the range that have to be blocked (unblocked) are indicated in the status field. The same rule applies to the acknowledgments.

For the circuits blocked for maintenance reasons, the same conditions apply and the same actions have to be taken as described in § D.2.9.2.1.

For the circuits seized by ongoing calls or call attempts and blocked for reasons of hardware failure, the following actions will be taken:

- all interconnected circuits have to be released by the appropriate messages;
- the affected circuits are set to the condition “idle hardware blocked” without any exchange of release messages.

The fact that a circuit is engaged on a call will not delay the transmission of the corresponding circuit group blocking (unblocking) acknowledgment message.

The hardware blocked state can only be removed by a hardware failure oriented circuit group unblocking message.

For all instances of circuit group blocking, the maintenance system should be notified at both ends of the circuit(s).

D.2.9.2.3 Abnormal blocking and circuit group blocking procedures

The following procedures are designed to cover abnormal cases which may occur in the circuit group blocking/unblocking procedures.

- i) If a circuit group blocking message is received relating to remotely blocked circuits, then blocking acknowledgment indications for those circuits are given in the status field of the corresponding circuit group blocking acknowledgment message which will be sent in response.
- ii) If a circuit group unblocking message is received relating to circuits which are not in the state remotely blocked, then unblocking acknowledgment indications for those circuits are given in the status field of the corresponding circuit group unblocking acknowledgment message which will be sent in response.

- iii) When an exchange upon receipt of a circuit group blocking (unblocking) message is not able to give an appropriate blocking (unblocking) acknowledgment indication for each circuit identification code (~~e.g. because that/those circuit identification code(s) is(are) not allocated to any circuit at the receiving exchange~~) for which also a blocking (unblocking) indication is given in the status field of the received group blocking (unblocking) message, then no blocking (unblocking) acknowledgment indication relating to that/those circuit identification code(s) will be given in the status field of the corresponding circuit group blocking (unblocking) acknowledgment message which will be sent in response.
- iv) If a circuit group blocking acknowledgment message in response to a circuit group blocking message is received containing in the status field no blocking acknowledgment indications for the circuits which are to be blocked due to the previously sent circuit group blocking message, *THEN THE MAINTENANCE SYSTEM SHOULD BE NOTIFIED FOR THE CIRCUITS CONCERNED*. The same rule applies to the unblocking procedures.
- v) If a circuit group blocking acknowledgment message in response to a circuit group blocking message is received containing in the status field blocking acknowledgment indications for the circuits which are not to be blocked due to the previously sent circuit group blocking message and are not marked locally blocked, *THEN THE MAINTENANCE SYSTEM SHOULD BE NOTIFIED* for the circuits concerned.
- vi) If a circuit group unblocking acknowledgment message in response to a group unblocking message is received containing in the status field unblocking acknowledgment indications for circuits which are not to be unblocked due to the previously sent circuit group unblocking message and have to remain marked locally blocked, then *THE MAINTENANCE SYSTEM SHOULD BE NOTIFIED* for the circuits concerned.
- vii) If a circuit group blocking acknowledgment message which is not expected as an acknowledgment for any circuit group blocking message is received:
- relating to circuits which all are in the status locally blocked the received circuit group blocking acknowledgment will be discarded,
 - relating to circuits *PART OR ALL OF WHICH ARE NOT IN THE STATUS LOCALLY BLOCKED, THEN THE MAINTENANCE SYSTEM SHOULD BE NOTIFIED*.
- viii) If a circuit group unblocking acknowledgment message which is not expected as an acknowledgment for any circuit group unblocking message is received:
- relating to circuits none of which is in the status locally blocked, then the circuit group unblocking acknowledgment message will be discarded,
 - relating to circuits part or all of which are locally blocked, then *THE MAINTENANCE SYSTEM SHOULD BE NOTIFIED FOR THE CIRCUITS CONCERNED*.
- ix) If a circuit group blocking (unblocking) message or a circuit group blocking (unblocking) acknowledgment message refers to status changes for more than 32 circuits, the receiving exchange *SHALL* discard that message.
- x) If a blocking message is received for a blocked circuit, a blocking acknowledgment message will be sent.
- xi) If an unblocking message is received for an unblocked circuit, an unblocking acknowledgment message will be sent.

xii) If a blocking acknowledgment message, which is not expected as an acknowledgment for a blocking message, is received:

- relating to a circuit which is locally blocked, the blocking acknowledgment message is discarded,
- relating to a circuit which is not locally blocked, then the maintenance system should be notified.

xiii) If an unblocking acknowledgment message, which is not an expected response to an unblocking message, is received:

- relating to a circuit which is not locally blocked, the received unblocking acknowledgment message is discarded,
- relating to a circuit which is locally blocked, then the maintenance system should be notified.

xiv) If a non test initial address message is received on a remotely blocked circuit, the remotely blocked state of the circuit is removed and the initial address message is processed normally unless the circuit is also locally blocked in which case the initial address message is discarded. This applies to the blocking state whether maintenance, hardware or both. However, it should not be the preferred method of unblocking a circuit.

D.2.9.3 Circuit group query

(This section is not applicable to the Interconnect ISUP specification international interface)

D.2.10 Abnormal conditions

D.2.10.1 Dual seizure

Because Signalling System No.7 circuits have the capability of bothway operation, it is possible that the two exchanges will attempt to seize the same circuit at approximately the same time.

D.2.10.1.1 Unguarded interval

The exchange must detect dual seizure and take action as defined in § D.2.10.1.4.

D.2.10.1.2 Detection of dual seizure

A dual seizure is detected by an exchange from the fact that it receives an initial address message for a circuit for which it has sent an initial address message, but before it receives a valid backwards message.

D.2.10.1.3 Preventive action

Different methods for circuit selection can be envisaged to minimise the occurrence of dual seizure. In the following, two methods are described. Further study is required to determine the field of application of each method and to ensure that the two methods do inter-work satisfactorily.

~~Other methods for circuit selection may also be used provided that they give the same degree of protection against dual seizure also when one of the methods specified is used at the other end.~~

Method 1

An opposite order of selection is used at each exchange of a bothway circuit group.

Method 2

Each exchange of a bothway circuit group has priority access to the group of circuits which it is controlling (see § D.2.10.1.4). Of this group the circuit which has been released the longest is selected (first-in, first-out). In addition each exchange of a bothway circuit group has non-priority access to the group of circuits which it is non-controlling. Of this group the latest released circuit is selected (last-in, first-out) if all circuits in the group are busy.

For call control purposes a bothway circuit group can be subdivided into subgroups in an exchange.

It is necessary to take preventive action in cases where Signalling System No. 7 uses a signalling data link with long propagation time.

D.2.10.1.4 Action to be taken on detection of dual seizures

Each exchange will control one half of the circuits in a bothway circuit group. On detection of a dual seizure, the call being processed by the control exchange for that circuit will be completed and the received initial address message will be disregarded.

Under these conditions, the call being processed by the control exchange will be allowed to mature. The call being processed by the non-control exchange will be backed off and the switch-path released. A release message will not be sent. The non-control exchange will make an automatic repeat attempt on the same or on an alternative route.

For the purpose of resolution of dual seizure on bothway circuits, the exchange with the higher signalling point code will control all even-numbered circuits (circuit identification code) and the other exchange the odd-numbered circuits. ~~The designation of control may also be used for maintenance system purposes.~~

D.2.10.2 Transmission alarm handling for digital inter-exchange circuits

When fully digital circuits are provided between two exchanges, which have some inherent fault indication feature giving an indication to the switching system when faults on transmission systems are detected, the switching system should inhibit selection of the circuits concerned for the period the fault conditions persist.

D.2.10.3 Reset of circuits and circuit groups

In systems which maintain circuit status in memory, there may be occasions when the memory becomes mutilated. In such a case the circuits must be reset to the idle condition at both exchanges to make them available for new traffic. Since the exchange with the mutilated memory does not know whether the circuits are idle, busy outgoing, busy incoming, blocked, etc., reset circuit messages or a circuit group reset message should be sent as appropriate for the affected circuits.

Only the restarting exchange shall send reset circuit or group circuit messages.

D.2.10.3.1 Reset circuit message

If only a few circuits are concerned, a reset circuit message should be sent for each affected circuit.

On receipt of a reset circuit message, the receiving (unaffected) exchange will:

- a) If it is the incoming or outgoing exchange on a connection in any state of call set-up or during a call, accept the message as a release message and respond by sending a release complete message, after the circuit has been made idle.
- b) If the circuit is in the idle condition, accept the message as a release message and respond by sending a release complete message.
- c) If it has previously sent a blocking message, or if it is unable to release the circuit as described above, respond by the blocking message. If an incoming or outgoing call is in progress, this call should be released and the circuit returned to the "idle, blocked" state. A release complete message is sent following the blocking message. The blocking message should be acknowledged by the affected exchange. If the acknowledgment is not received, the repetition procedure specified in § D.2.10.4 should be followed.
- d) If it has previously received a blocking message, respond by releasing a possible outgoing call or call attempt on the circuit, remove the blocked condition, restore the circuit to the idle state, and respond with a release complete message.
- e) If the message is received after the sending of an initial address message but before receipt of a backward message relating to that call, clear the circuit and make an automatic repeat attempt on another circuit if appropriate.
- f) If the message is received after having sent a reset circuit message, respond by a release complete message. *THE CIRCUIT SHALL BE MADE AVAILABLE FOR SERVICE AFTER RECEIPT OF THE APPROPRIATE ACKNOWLEDGEMENT MESSAGE.*
- g) Clear any interconnected circuits by the appropriate method (e.g. release).

The affected exchange will then reconstruct its memory according to the received response(s) to the reset circuit and respond to the message(s) in the normal way, i.e. blocking acknowledgment message in response to a blocking message.

If no release complete message is received in acknowledgment to the reset circuit message before ~~4-15~~ 15-60 seconds (T16), the reset circuit message should be repeated. If an acknowledgment for the message is not received within ~~± 5-15~~ minutes (T17), after the initial reset circuit message, the maintenance system should be notified. However, the sending of the reset circuit message should continue at ~~± 5-15~~ minutes (T17) intervals until maintenance intervention occurs.

D.2.10.3.2 Circuit group reset message

If a considerable number of circuits or all circuits are affected by a memory mutilation, (a) circuit group reset message(s) should be used to make them available for new traffic.

The maximum number of circuits to be reset with a circuit group reset message is limited to 32.

On receipt of a circuit group reset message, the receiving (unaffected) exchange will:

- a) restore the circuits to the idle state;
- b) send the appropriate circuit group blocking message(s) if it had previously sent a hardware failure oriented circuit group blocking message;

- c) respond by a circuit group reset acknowledgment message in which the status indicator bits of the circuits available for service or blocked for reasons of hardware failure are coded 0 and the status indicator bits of all circuits blocked for maintenance reasons are set to 1;
- d) if it had previously received (a) blocking message(s) or (a) circuit group blocking message(s) for one or more of the circuit(s) involved, the blocked condition will be removed and the circuits will be made available for service;
- e) if a circuit group reset message is received concerning circuits for which a circuit group reset message or reset circuit message(s) have been sent, the circuits concerned are made available for service after receipt of the appropriate acknowledgment message;
- f) appropriate messages should be sent on interconnected circuits to release them.

The affected exchange will then reconstruct its memory according to the possibly received circuit group blocking messages and the received circuit group reset acknowledgment message. It will respond to the possibly received circuit group blocking messages in the normal way.

If no acknowledgment to a circuit group reset message is received before ~~4-15~~ 15-60 seconds (T22), the circuit group reset message should be repeated. If an acknowledgment for the circuit group reset message is not received within ~~± 5-15~~ minutes (T23) after sending the initial circuit group reset message, the maintenance system should be notified. However, the sending of the circuit group reset message should continue at ~~± 5-15~~ minutes (T23) intervals until maintenance intervention occurs.

A correct acknowledgment should match the original circuit group reset message in range and circuit identification code indicated in the routing label.

The circuit identification code in the routing label of both circuit group reset messages and circuit group reset acknowledgment messages should belong to a circuit whose control is allocated to the ISDN-UP.

All circuit identification codes in the range of a circuit group reset and circuit group reset acknowledgment message must belong to circuits whose control is allocated to the ISDN-UP.

D.2.10.3.3 Abnormal circuit group reset message procedures

- i) If a circuit group reset message is received indicating reset of more circuits than allowed by the receiving exchange, it is discarded.
- ii) If a circuit group reset acknowledgment message is received which is not a correct response to a sent circuit group reset message, it is discarded.
- iii) If a circuit group reset message is received requesting reset of circuits that are not controlled by the ISDN user part, or a circuit group reset acknowledgment message that contains circuit identification codes that are not controlled by the ISDN-UP, the message is discarded.

D.2.10.4 Failure in the blocking/unblocking sequence

An exchange will repeat the blocking (unblocking) message or the circuit group blocking (unblocking) message on failure to receive the appropriate acknowledgment in response to one of these messages before ~~4-15~~ 15-60 seconds (T12 for Blocking message, T14 for Unblocking message, T18 for Circuit group blocking message, T20 for Circuit group unblocking message). (see § D.2.9.2).

If the appropriate acknowledgment is not received within a period of $\pm 5-15$ minutes (T13 for Blocking message, T15 for Unblocking message, T19 for Circuit group blocking message, T21 for Circuit group unblocking message) after sending the initial blocking (unblocking) message or group blocking (unblocking) message, the maintenance system should be alerted, the repetition of the blocking (unblocking) message or circuit group blocking (unblocking) message should be continued at one-minute intervals until maintenance intervention occurs and the circuit(s) taken out of (returned to) service as appropriate.

D.2.10.5 Receipt of unreasonable and unrecognised signalling information messages

The message transfer part of the signalling system will avoid missequencing, or double delivery, of messages with a high reliability (Recommendation Q.706, § 2). However, undetected errors at the signalling link level and exchange malfunctions may produce signalling information messages that are either ambiguous or inappropriate.

The procedures listed below do not include the procedures for the blocking, circuit group blocking and the circuit group reset; these are covered in § D.2.9.2.3 and § D.2.10.3.3 respectively.

D.2.10.5.1 Handling of unexpected messages

An unexpected message is one which is recognised and valid but has been received in the wrong phase of the call.

In order to resolve possible ambiguities in the state of a circuit when unexpected messages are received, the following will apply:

- a) if a release message is received relating to an idle circuit, it will be acknowledged with a release complete message;
- b) if a release complete message is received relating to an idle circuit, it will be discarded;
- c) if a release complete message is received relating to a busy circuit for which a release message has not been sent, the circuit will be released and a release message will be sent ~~(the possibility of maintaining the connection is for further study)~~;
- d) if other unreasonable signalling information is received, the following actions will be undertaken:
 - if the circuit is idle, the reset circuit message is sent;
 - if the circuit has been seized by a call, after receipt of a backward message required for the call set-up, the unreasonable signalling information is discarded;
 - if the circuit has been seized by a call, before receipt of a backward message required for the call set-up, the reset circuit message is sent. If the circuit is seized by an incoming call, the call will be released. If the circuit is seized by an outgoing call, an automatic repeat attempt is provided on another circuit;
- e) if unreasonable signalling information caused by conflicting code point values in the protocol control indicator as specified in Annex C is received in a backwards call set-up message, and if the conflicting conditions can be reconciled by assuming lower network capability in the affected parameter, the call should be allowed to continue if the service requirements for the call can be satisfied.

Except in certain cases (see § D.2.10.1), any other unexpected messages received will be discarded. If the discarding of the signalling information prevents a call from being completed, that call will eventually be released by the expiry of a time out.

D.2.10.5.2 General requirements on receipt of unrecognised signalling information messages and parameters

IT MAY HAPPEN THAT AN EXCHANGE RECEIVES UNRECOGNIZED SIGNALLING INFORMATION, I.E. MESSAGES, PARAMETER TYPES OR PARAMETER VALUES. THIS CAN TYPICALLY BE CAUSED BY THE UPGRADING OF THE SIGNALLING SYSTEM USED BY OTHER EXCHANGES IN THE NETWORK. IN THESE CASES, THE FOLLOWING COMPATIBILITY PROCEDURES ARE INVOKED TO ENSURE THE PREDICTABLE NETWORK BEHAVIOUR.

THE PROCEDURES TO BE USED ON RECEIPT OF UNRECOGNIZED INFORMATION MAKE USE OF:

- A) COMPATIBILITY INFORMATION RECEIVED IN THE SAME MESSAGE AS THE UNRECOGNIZED INFORMATION;
- B) THE CONFUSION MESSAGE;
- C) THE RELEASE MESSAGE;
- D) THE RELEASE COMPLETE MESSAGE;
- E) THE FACILITY REJECT MESSAGE; OR
- F) THE CAUSE INDICATORS PARAMETER; THE FOLLOWING CAUSE VALUES ARE USED:
 - (97) MESSAGE TYPE NON-EXISTENT OR NOT IMPLEMENTED – DISCARDED;
 - (99) PARAMETER NON-EXISTENT OR NOT IMPLEMENTED – DISCARDED;
 - (103) PARAMETER NON-EXISTENT OR NOT IMPLEMENTED – PASSED ON (SEE NOTE);
 - (110) MESSAGE WITH UNRECOGNIZED PARAMETER – DISCARDED.

NOTE- THIS CAUSE VALUE MAY BE RECEIVED FROM A BLUE BOOK (1988) ISDN USER PART, BUT WILL NOT BE GENERATED FROM A (1992) ISDN USER PART.

FOR ALL THE ABOVE CAUSE VALUES A DIAGNOSTIC FIELD IS INCLUDED CONTAINING, DEPENDANT ON THE CAUSE VALUE EITHER, THE UNRECOGNIZED PARAMETER NAME(S), THE MESSAGE TYPE CODE, OR THE MESSAGE TYPE CODE AND THE UNRECOGNIZED PARAMETER NAME(S).

THE PROCEDURES ARE BASED ON THE FOLLOWING ASSUMPTIONS:

- i) SIGNALLING FOR A FACILITY COMPLETELY PROVIDED BETWEEN THE ORIGINATING AND DESTINATION LOCAL EXCHANGES WILL UTILIZE ONE OF THE END-TO-END METHODS DEFINED IN RECOMMENDATION Q.730, I.E. SUCH FACILITIES DO NOT HAVE TO BE SUPPORTED BY TRANSIT EXCHANGES.
- ii) THE FORWARD COMPATIBILITY INFORMATION CONTAINS DIFFERENT INSTRUCTIONS FOR DIFFERENT EXCHANGES. THERE ARE TWO TYPES OF EXCHANGES, TYPE A AND TYPE B EXCHANGES. THE CLASSIFICATION OF TYPE A AND B EXCHANGES TO THE FUNCTIONAL TYPE AN EXCHANGE MAY PERFORM IS LISTED BELOW. IT IS DETERMINED ON A PER CALL BASIS.

TYPE A:

- ORIGINATING EXCHANGE, I.E. THE EXCHANGE IN WHICH THE CALL IS GENERATED FROM A NATIONAL PUBLIC NETWORK POINT OF VIEW.
- DESTINATION EXCHANGE, I.E. THE EXCHANGE TO WHICH THE CALL IS DESTINED FROM A NATIONAL PUBLIC NETWORK POINT OF VIEW.

- INTERWORKING EXCHANGE, I.E. THE EXCHANGE IN WHICH INTERWORKING IS PERFORMED BETWEEN ISDN USER PART AND OTHER USER PARTS OR SIGNALLING SYSTEMS.
- INCOMING OR OUTGOING INTERNATIONAL EXCHANGE (SEE NOTE).

NOTE- IN AN INCOMING OR OUTGOING INTERNATIONAL EXCHANGE, THE INSTRUCTION TO PASS ON A MESSAGE OR A PARAMETER DOES NOT PRECLUDE THE NORMAL POLICING FUNCTIONS OF THESE EXCHANGES. IT IS RECOMMENDED THAT AN EXCHANGE INTERCONNECTING TWO NATIONAL NETWORKS SHOULD BEHAVE AS AN INCOMING OR OUTGOING INTERNATIONAL EXCHANGE.

TYPE B:

- NATIONAL OR INTERNATIONAL TRANSIT EXCHANGE, I.E. AN EXCHANGE THAT ACTS JUST AS A TRANSIT NODE.

III) SINCE TYPE A AND TYPE B EXCHANGES CAN BE BOTH NATIONAL AND INTERNATIONAL EXCHANGES, THE COMPATIBILITY MECHANISM IS APPLICABLE TO THE NATIONAL AND INTERNATIONAL NETWORK.

IV) AS A MINIMUM, ALL IMPLEMENTATIONS MUST RECOGNIZE ALL MESSAGES SPECIFIED IN TABLE 3/Q.761Annex A AND ALL PARAMETERS SPECIFIED IN TABLE 4/Q.761Annex A.

V) IF AN EXCHANGE RECEIVES A CONFUSION, A RELEASE, A RELEASE COMPLETE OR FACILITY REJECT MESSAGE INDICATING AN UNRECOGNIZED MESSAGE OR PARAMETER RECEIVED, IT ASSUMES INTERACTION WITH AN EXCHANGE AT A DIFFERENT FUNCTIONAL LEVEL. SEE D.2.10.5.3 FOR MORE DETAILS ON THIS.

VI) ALL UNRECOGNIZED MESSAGES THAT CAN BE RECEIVED ONLY CONTAIN PARAMETERS CODED AS OPTIONAL PARAMETERS, NO "NEW" MESSAGES WILL CONTAIN MANDATORY FIXED OR MANDATORY VARIABLE PARAMETERS.

IF MESSAGES ARE RECEIVED WITHOUT COMPATIBILITY INFORMATION AND ARE NOT RECOGNIZED, THEY ARE DISCARDED AND THE CONFUSION MESSAGE IS SENT.

WHEN AN UNRECOGNIZED PARAMETER OR MESSAGE IS RECEIVED, THE EXCHANGE SHOULD FIND SOME CORRESPONDING INSTRUCTIONS CONTAINED IN THE PARAMETER COMPATIBILITY INFORMATION OR MESSAGE COMPATIBILITY INFORMATION PARAMETERS RESPECTIVELY. THE PARAMETER COMPATIBILITY INFORMATION PARAMETER MAY CONTAIN COMPATIBILITY INSTRUCTIONS FOR MORE THAN ONE PARAMETER. THE MESSAGE COMPATIBILITY INFORMATION PARAMETER CONTAINS THE INSTRUCTIONS SPECIFIC FOR THE HANDLING OF THE COMPLETE MESSAGE.

IF THE EXCHANGE DOES NOT FIND INSTRUCTIONS IN AN APPROPRIATE COMPATIBILITY PARAMETER OR IF THE COMPATIBILITY PARAMETER IS NOT FOUND IN THE MESSAGE, THE ACTIONS DEFAULT TO A BASIC ACTION. DETAILS OF THIS ARE FOUND IN D.2.10.5.3.

THE INSTRUCTION INDICATORS ARE A SET OF BOOLEAN INDICATORS. THE FOLLOWING GENERAL RULES APPLY TO THE EXAMINATION OF THESE INSTRUCTION INDICATORS:

I) DEPENDING ON THE ROLE OF THE EXCHANGE IN THE CALL, I.E. TYPE A OR TYPE B, AND THE SETTINGS OF THE INDICATORS ONLY A SUBSET OF THE INDICATORS ARE EXAMINED, SOME BEING IGNORED.

ONLY TYPE B EXCHANGES EXAMINE THE "TRANSIT AT INTERMEDIATE EXCHANGE INDICATOR". IF IT IS SET TO "TRANSIT INTERPRETATION", THE OTHER INDICATORS ARE IGNORED. IF IT IS SET TO "END NODE INTERPRETATION", THE ACCORDING ACTIONS ARE PERFORMED.

TYPE A EXCHANGES ALWAYS INTERPRET THE REMAINING INDICATORS, I.E. ALL INDICATORS EXCEPT THE "TRANSIT AT INTERMEDIATE EXCHANGE INDICATOR".

CONSEQUENTLY, "END NODE INTERPRETATION" MEANS THAT ALL KINDS OF EXCHANGES, I.E. TYPE A AND TYPE B, HAVE TO INTERPRET THE INSTRUCTION INDICATORS.

- ii) INSTRUCTION INDICATORS MARKED AS "SPARE" ARE NOT EXAMINED. THEY MAY BE USED BY FUTURE VERSIONS OF THE ISDN USER PART; IN THIS CASE THE FUTURE VERSION OF THE ISDN USER PART WILL SET THE CURRENTLY DEFINED INSTRUCTION INDICATORS TO A REASONABLE VALUE FOR THE CURRENT VERSION. THIS RULE ENSURES THAT MORE TYPES OF INSTRUCTIONS CAN BE DEFINED IN THE FUTURE WITHOUT CREATING A BACKWARD COMPATIBILITY PROBLEM.*
- iii) AN EXCHANGE MUST DECIDE WHAT EXCHANGE TYPE IT IS FOR THE CALL BEFORE PERFORMING COMPATIBILITY ACTIONS.*
- iv) AT A TYPE B EXCHANGE THE UNRECOGNIZED INFORMATION SHOULD BE PASSED ON UNCHANGED, IF THE "TRANSIT AT INTERMEDIATE EXCHANGE INDICATOR" IS SET TO "TRANSIT INTERPRETATION".*
- v) AT A TYPE A EXCHANGE THE "TRANSIT AT INTERMEDIATE EXCHANGE INDICATOR" IS NOT APPLICABLE.*
- vi) AT A TYPE B EXCHANGE THAT HAS NOT BEEN INSTRUCTED TO PASS ON THE UNRECOGNIZED INFORMATION, IF THE "RELEASE CALL INDICATOR" IS SET TO "RELEASE CALL", THE CALL IS RELEASED.*
- AT A TYPE A EXCHANGE, THE CALL IS RELEASED IF THE "RELEASE CALL INDICATOR" IS SET TO "RELEASE CALL".*
- vii) AT A TYPE B EXCHANGE THAT HAS NOT BEEN INSTRUCTED TO PASS ON THE UNRECOGNIZED INFORMATION OR AT A TYPE A EXCHANGE, IN ANY CASE THE FOLLOWING IS APPLICABLE IF THE "RELEASE CALL INDICATOR" IS SET TO "DO NOT RELEASE CALL":*
- IF THE "DISCARD MESSAGE INDICATOR", OR THE "DISCARD PARAMETER INDICATOR" IS SET TO "DISCARD MESSAGE/DISCARD PARAMETER", THE MESSAGE OR PARAMETER IS DISCARDED, AS INSTRUCTED.*
 - AND THEN, IF THE "SEND NOTIFICATION INDICATOR" IS SET TO "SEND NOTIFICATION", A CONFUSION MESSAGE IS SENT TOWARDS THE EXCHANGE THAT SENT THE UNRECOGNIZED INFORMATION.*
- viii) FOR THE CASE OF AN UNRECOGNIZED PARAMETER IT IS POSSIBLE FOR THE INSTRUCTION TO REQUIRE THAT EITHER THE UNRECOGNIZED PARAMETER OR THE WHOLE MESSAGE IS DISCARDED. THIS PROVIDES FOR THE CASE WHERE THE SENDING EXCHANGE DETERMINES THAT IT IS NOT ACCEPTABLE FOR THE MESSAGE TO CONTINUE BEING PROCESSED WITHOUT THIS PARAMETER.*
- ix) IN CASE A PARAMETER IS INCLUDED MORE THAN ONCE IN THE SAME MESSAGE, THE INSTRUCTION INDICATOR OF THE PARAMETER COMPATIBILITY INFORMATION PARAMETER IS SET ACCORDING TO THE MOST STRINGENT COMBINATION OF THE POSSIBLE CODINGS (I.E. THE CODING "1" OF A BIT IN THE INSTRUCTION INDICATOR IS DOMINANT).*
- x) IN CASE A MESSAGE IS USED FOR MORE THAN ONE PROCEDURE SIMULTANEOUSLY AND THE CODINGS OF THE INSTRUCTION INDICATOR OF THE MESSAGE COMPATIBILITY INFORMATION PARAMETER DESCRIBED IN THE CORRESPONDING TEXTS ARE DIFFERENT, THE INSTRUCTION INDICATOR IS SET ACCORDING TO THE MOST STRINGENT COMBINATION OF THE POSSIBLE CODINGS (I.E. THE CODING "1" OF A BIT IN THE INSTRUCTION INDICATOR IS DOMINANT).*
- xi) AT A TYPE A EXCHANGE WHERE "PASS ON" HAS BEEN SPECIFIED FOR A MESSAGE OR PARAMETER AND "PASS ON" IS NOT POSSIBLE, THEN THE "PASS ON NOT POSSIBLE INDICATOR" AND "SEND NOTIFICATION INDICATOR" ARE CHECKED.*
- xii) THE FOLLOWING TABLES 1 AND 2 CLARIFY THE HANDLING OF THE RECEIVED COMPATIBILITY INFORMATION.*

D.2.10.5.3 PROCEDURES FOR THE HANDLING OF THE UNRECOGNIZED MESSAGES OR PARAMETERS

A CONFUSION MESSAGE MUST NOT BE SENT IN RESPONSE TO A RECEIVED CONFUSION, ~~FACILITY REJECT~~, ~~RELEASE~~ OR ~~RELEASE COMPLETE~~ MESSAGE. ANY UNRECOGNIZED PARAMETERS RECEIVED IN A CONFUSION, ~~FACILITY REJECT~~ OR ~~RELEASE COMPLETE~~ MESSAGE ARE DISCARDED. ANY UNRECOGNIZED MANDATORY PARAMETER VALUE RECEIVED IN A CONFUSION OR ~~FACILITY REJECT~~ MESSAGE WILL RESULT IN THE MESSAGE BEING DISCARDED.

TABLE D-1A**ON RECEIPT OF MESSAGE COMPATIBILITY INFORMATION PARAMETER**

INSTRUCTION INDICATOR			
B	C	D	REQUIRED ACTION
<u>0</u>	<u>0</u>	<u>0</u>	PASS ON MESSAGE (NOTE 2)
<u>0</u>	<u>0</u>	<u>1</u>	DISCARD MESSAGE
<u>0</u>	<u>1</u>	<u>0</u>	PASS ON MESSAGE (DON'T SEND A NOTIFICATION) (NOTES 2 AND 3)
<u>0</u>	<u>1</u>	<u>1</u>	DISCARD MESSAGE AND SEND NOTIFICATION
<u>1</u>	<u>X</u>	<u>X</u>	RELEASE CALL
BIT	<u>B</u>	RELEASE CALL INDICATOR	
	<u>0</u>	DO NOT RELEASE CALL	
	<u>1</u>	RELEASE CALL	
BIT	<u>C</u>	SEND NOTIFICATION INDICATOR	
	<u>0</u>	DO NOT SEND NOTIFICATION	
	<u>1</u>	SEND NOTIFICATION	
BIT	<u>D</u>	DISCARD MESSAGE INDICATOR	
	<u>0</u>	DO NOT DISCARD MESSAGE (PASS ON)	
	<u>1</u>	DISCARD MESSAGE	

NOTES

- 1 «X» = DON'T CARE.
- 2 APPLICABLE FOR TYPE B EXCHANGES AND INCOMING OR OUTGOING INTERNATIONAL EXCHANGES USING AN ISUP'92 OR A LATER VERSION. OTHER EXCHANGES (E.G. ORIGINATING, TERMINATING, INTERWORKING) IGNORE BIT D.
- 3 IN CASE OF PASSING ON A MESSAGE, NO NOTIFICATION IS SENT, BIT C IS IGNORED.

D.2.10.5.3.1 UNRECOGNIZED MESSAGES

1) ACTIONS AT TYPE A EXCHANGES

A) COMPATIBILITY PARAMETER RECEIVED

DEPENDING ON THE INSTRUCTIONS RECEIVED IN THE "MESSAGE COMPATIBILITY INFORMATION PARAMETER", A TYPE A EXCHANGE RECEIVING AN UNRECOGNIZED MESSAGE WILL EITHER:

- *TRANSFER THE MESSAGE TRANSPARENTLY (NOTE);*
- *DISCARD THE MESSAGE;*
- *DISCARD THE MESSAGE AND SEND CONFUSION; OR*
- *RELEASE THE CALL.*

NOTE - THE TRANSPARENT PASSING OF A MESSAGE IS ONLY APPLICABLE WHEN THE SIGNALLING IS ISUP'92 OR A LATER VERSION.

A RELEASE AND A CONFUSION MESSAGE SHALL INCLUDE THE CAUSE VALUE 97, "MESSAGE TYPE NON-EXISTENT OR NOT IMPLEMENTED - DISCARDED", FOLLOWED BY A DIAGNOSTIC FIELD CONTAINING THE MESSAGE TYPE CODE.

B) COMPATIBILITY PARAMETER NOT RECEIVED

IF AN UNRECOGNIZED MESSAGE IS RECEIVED WITHOUT "MESSAGE COMPATIBILITY INFORMATION PARAMETER" AT AN EXCHANGE, THE MESSAGE IS DISCARDED AND A CONFUSION MESSAGE IS RETURNED. A CONFUSION MESSAGE SHALL INCLUDE THE CAUSE VALUE 97, "MESSAGE TYPE NON-EXISTENT OR NOT IMPLEMENTED - DISCARDED", FOLLOWED BY A DIAGNOSTIC FIELD CONTAINING THE MESSAGE TYPE CODE.

NOTE - ALL MESSAGES NOT INCLUDED IN TABLE 3/Q.761 ANNEX A MAY BE REGARDED AS UNRECOGNIZED. AS A MINIMUM ALL IMPLEMENTATIONS MUST RECOGNIZE ALL MESSAGES SPECIFIED IN TABLE 3/Q.761 ANNEX A

2) ACTIONS AT TYPE B EXCHANGE

A) COMPATIBILITY PARAMETER RECEIVED

DEPENDING ON THE INSTRUCTIONS RECEIVED IN THE "MESSAGE COMPATIBILITY INFORMATION PARAMETER", A TYPE B EXCHANGE RECEIVING AN UNRECOGNIZED MESSAGE WILL EITHER:

- TRANSFER THE MESSAGE TRANSPARENTLY;
- DISCARD THE MESSAGE;
- DISCARD THE MESSAGE AND SEND CONFUSION; OR
- RELEASE THE CALL.

A CONFUSION MESSAGE SHALL INCLUDE THE CAUSE VALUE 97, "MESSAGE TYPE NON-EXISTENT OR NOT IMPLEMENTED - DISCARDED", FOLLOWED BY A DIAGNOSTIC FIELD CONTAINING THE MESSAGE TYPE CODE.

A RELEASE MESSAGE SHALL INCLUDE THE CAUSE VALUE 97, "MESSAGE TYPE NON-EXISTENT OR NOT IMPLEMENTED - DISCARDED", FOLLOWED BY A DIAGNOSTIC FIELD CONTAINING THE MESSAGE TYPE CODE.

NOTE - ALL MESSAGES NOT INCLUDED IN TABLE 3/Q.761 ANNEX A MAY BE REGARDED AS UNRECOGNIZED. AS A MINIMUM ALL IMPLEMENTATIONS MUST RECOGNIZE ALL MESSAGES SPECIFIED IN TABLE 3/Q.761 ANNEX A

B) COMPATIBILITY PARAMETER NOT RECEIVED

IF AN UNRECOGNIZED MESSAGE IS RECEIVED WITHOUT "MESSAGE COMPATIBILITY INFORMATION PARAMETER" AT AN EXCHANGE, THE MESSAGE IS DISCARDED AND A CONFUSION MESSAGE IS RETURNED. A CONFUSION MESSAGE SHALL INCLUDE THE CAUSE VALUE 97, "MESSAGE TYPE NON-EXISTENT OR NOT IMPLEMENTED - DISCARDED", FOLLOWED BY A DIAGNOSTIC FIELD CONTAINING THE MESSAGE TYPE CODE.

TABLE D-1B

ON RECEIPT OF PARAMETER COMPATIBILITY INFORMATION PARAMETER

INSTRUCTION INDICATOR

<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>REQUIRED ACTION</u>
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>PASS ON PARAMETER (NOTE 2)</u>
<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>DISCARD PARAMETER</u>
<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>DISCARD MESSAGE</u>
<u>0</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>DISCARD MESSAGE</u>
<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>PASS ON PARAMETER (DON'T SEND A NOTIFICATION) (NOTES 2 AND 3)</u>
<u>0</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>DISCARD PARAMETER AND SEND NOTIFICATION</u>
<u>0</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>DISCARD MESSAGE AND SEND NOTIFICATION</u>
<u>0</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>DISCARD MESSAGE AND SEND NOTIFICATION</u>
<u>1</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>RELEASE CALL</u>

<u>BIT</u>	<u>B</u>	<u>RELEASE CALL INDICATOR</u>
	<u>0</u>	<u>DO NOT RELEASE CALL</u>
	<u>1</u>	<u>RELEASE CALL</u>
<u>BIT</u>	<u>C</u>	<u>SEND NOTIFICATION INDICATOR</u>
	<u>0</u>	<u>DO NOT SEND NOTIFICATION</u>
	<u>1</u>	<u>SEND NOTIFICATION</u>
<u>BIT</u>	<u>D</u>	<u>DISCARD MESSAGE INDICATOR</u>
	<u>0</u>	<u>DO NOT DISCARD MESSAGE (PASS ON)</u>
	<u>1</u>	<u>DISCARD MESSAGE</u>
<u>BIT</u>	<u>E</u>	<u>DISCARD PARAMETER INDICATOR</u>
	<u>0</u>	<u>DO NOT DISCARD PARAMETER (PASS ON)</u>
	<u>1</u>	<u>DISCARD PARAMETER</u>

NOTES

- 1 «X» = DON'T CARE.
- 2 APPLICABLE FOR TYPE B EXCHANGES AND INCOMING OR OUTGOING INTERNATIONAL EXCHANGES USING AN ISUP'92 OR A LATER VERSION. OTHER EXCHANGES (E.G. ORIGINATING, TERMINATING, INTERWORKING) IGNORE BIT D.
- 3 IN CASE OF PASSING ON A MESSAGE, NO NOTIFICATION IS SENT, BIT C IS IGNORED.

D.2.10.5.3.2 UNRECOGNIZED PARAMETERS

RECEIPT OF UNRECOGNIZED PARAMETERS CAN ONLY REFER TO OPTIONAL PARAMETERS, SINCE MANDATORY PARAMETERS WILL ALWAYS BE RECOGNIZED BY THEIR LOCATION IN A MESSAGE.

THE MINIMUM SET OF RECOGNIZED PARAMETERS IS CONTAINED IN TABLE 4/Q.761 ANNEX A. UNEXPECTED PARAMETERS (A PARAMETER IN THE "WRONG" MESSAGE) ARE HANDLED LIKE UNRECOGNIZED PARAMETERS.

1) ACTIONS AT TYPE A EXCHANGE

A) COMPATIBILITY PARAMETER RECEIVED

DEPENDING ON THE INSTRUCTIONS RECEIVED IN THE "PARAMETER COMPATIBILITY INFORMATION PARAMETER", A TYPE A EXCHANGE RECEIVING AN UNRECOGNIZED PARAMETER WILL EITHER:

- TRANSFER THE PARAMETER TRANSPARENTLY;
- DISCARD THE PARAMETER;
- DISCARD THE MESSAGE;
- DISCARD THE PARAMETER AND SEND CONFUSION;
- DISCARD THE MESSAGE AND SEND CONFUSION; OR
- RELEASE THE CALL.

NOTE- THE TRANSPARENT PASSING OF A PARAMETER IS ONLY APPLICABLE WHEN THE SIGNALLING IS ISUP'92 OR A LATER VERSION.

A CONFUSION MESSAGE SHALL INCLUDE THE CAUSE VALUE 99, "PARAMETER NON-EXISTENT OR NOT IMPLEMENTED - DISCARDED" FOLLOWED BY A DIAGNOSTIC FIELD CONTAINING THE PARAMETER NAME, OR 110, "MESSAGE WITH UNRECOGNIZED PARAMETER - DISCARDED", FOLLOWED BY A DIAGNOSTIC FIELD CONTAINING THE MESSAGE NAME AND THE NAME OF THE FIRST DETECTED UNRECOGNIZED PARAMETER WHICH CAUSED THE MESSAGE TO BE DISCARDED. A CONFUSION MESSAGE MAY REFER TO MULTIPLE UNRECOGNIZED PARAMETERS.

A RELEASE MESSAGE SHALL INCLUDE THE CAUSE VALUE 99, "PARAMETER NON-EXISTENT OR NOT IMPLEMENTED - DISCARDED", FOLLOWED BY A DIAGNOSTIC FIELD CONTAINING THE PARAMETER NAME.

IF AN UNRECOGNIZED PARAMETER IS RECEIVED IN A FACILITY REQUEST MESSAGE, THE PARAMETER IS HANDLED LIKE UNRECOGNIZED PARAMETERS IN OTHER MESSAGES.

IF A RELEASE MESSAGE IS RECEIVED CONTAINING AN UNRECOGNIZED PARAMETER, DEPENDING ON THE INSTRUCTIONS RECEIVED IN THE COMPATIBILITY INFORMATION PARAMETER, A TYPE A EXCHANGE WILL EITHER:

- DISCARD THE PARAMETER; OR
- DISCARD THE PARAMETER AND SEND A CAUSE 99, "PARAMETER NON-EXISTENT OR NOT IMPLEMENTED - DISCARDED", IN THE RELEASE COMPLETE MESSAGE.

B) COMPATIBILITY PARAMETER NOT RECEIVED

IF AN EXCHANGE RECEIVES AND DETECTS AN UNRECOGNIZED PARAMETER WITHOUT A "PARAMETER COMPATIBILITY INFORMATION PARAMETER", THE ACTIONS TAKEN WILL BE DEPENDENT ON WHETHER THE UNRECOGNIZED PARAMETER IS PASSED ON OR DISCARDED. IF THE UNRECOGNIZED PARAMETER IS DISCARDED, A CONFUSION MESSAGE IS SENT TO THE EXCHANGE FROM WHICH THE UNRECOGNIZED PARAMETER WAS RECEIVED. THE CONFUSION MESSAGE CONTAINS THE CAUSE VALUE 99, "PARAMETER NON-EXISTENT OR NOT IMPLEMENTED - DISCARDED", FOLLOWED BY A DIAGNOSTIC FIELD CONTAINING THE PARAMETER NAME. A CONFUSION MESSAGE MAY REFER TO MULTIPLE UNRECOGNIZED PARAMETERS. IF THE UNRECOGNIZED PARAMETER IS PASSED ON UNMODIFIED, NO SUBSEQUENT ACTIONS ARE NECESSARY.

IF A FACILITY REQUEST MESSAGE IS RECEIVED WITH UNRECOGNIZED PARAMETERS, THE MESSAGE IS DISCARDED AND A FACILITY REJECT MESSAGE IS RETURNED INCLUDING THE CAUSE VALUE 99, "PARAMETER NON-EXISTENT OR NOT IMPLEMENTED - DISCARDED", FOLLOWED BY THE PARAMETER NAME CODE IN THE DIAGNOSTIC FIELD.

IF A RELEASE MESSAGE CONTAINING AN UNRECOGNIZED PARAMETER IS RECEIVED AT A TYPE A EXCHANGE, A RELEASE COMPLETE MESSAGE IS RETURNED INCLUDING THE CAUSE VALUE 99, "PARAMETER NON-EXISTENT OR NOT IMPLEMENTED – DISCARDED".

ii) ACTIONS AT TYPE B EXCHANGE

A) COMPATIBILITY PARAMETER RECEIVED

DEPENDING ON THE INSTRUCTIONS RECEIVED IN THE "PARAMETER COMPATIBILITY INFORMATION PARAMETER", A TYPE B EXCHANGE RECEIVING AN UNRECOGNIZED PARAMETER WILL EITHER:

- TRANSFER THE PARAMETER TRANSPARENTLY;
- DISCARD THE PARAMETER;
- DISCARD THE MESSAGE;
- DISCARD THE PARAMETER AND SEND CONFUSION;
- DISCARD THE MESSAGE AND SEND CONFUSION; OR
- RELEASE THE CALL.

A CONFUSION MESSAGE SHALL INCLUDE THE CAUSE VALUE 99, "PARAMETER NON-EXISTENT OR NOT IMPLEMENTED – DISCARDED", FOLLOWED BY A DIAGNOSTIC FIELD CONTAINING THE PARAMETER NAME, OR 110, "MESSAGE WITH UNRECOGNIZED PARAMETER – DISCARDED", FOLLOWED BY A DIAGNOSTIC FIELD CONTAINING THE MESSAGE NAME AND THE NAME OF THE FIRST DETECTED UNRECOGNIZED PARAMETER WHICH CAUSED THE MESSAGE TO BE DISCARDED. A CONFUSION MESSAGE MAY REFER TO MULTIPLE UNRECOGNIZED PARAMETERS. IF THE UNRECOGNIZED PARAMETER IS PASSED ON UNMODIFIED, NO SUBSEQUENT ACTIONS ARE NECESSARY.

A RELEASE MESSAGE SHALL INCLUDE THE CAUSE VALUE 99, "PARAMETER NON-EXISTENT OR NOT IMPLEMENTED – DISCARDED", FOLLOWED BY A DIAGNOSTIC FIELD CONTAINING THE PARAMETER NAME.

~~IF AN UNRECOGNIZED PARAMETER IS RECEIVED IN A FACILITY REQUEST MESSAGE, THE PARAMETER IS HANDLED LIKE UNRECOGNIZED PARAMETERS IN OTHER MESSAGES.~~

DEPENDING ON THE INSTRUCTIONS RECEIVED IN THE "PARAMETER COMPATIBILITY INFORMATION PARAMETER", AN EXCHANGE RECEIVING AN UNRECOGNIZED PARAMETER IN A RELEASE MESSAGE WILL EITHER:

- TRANSFER THE PARAMETER TRANSPARENTLY;
- DISCARD THE PARAMETER; OR
- DISCARD THE PARAMETER AND SEND A CAUSE 99, "PARAMETER NON-EXISTENT OR NOT IMPLEMENTED – DISCARDED", IN THE RELEASE COMPLETE MESSAGE.

b) COMPATIBILITY PARAMETER NOT RECEIVED

IF AN EXCHANGE RECEIVES AND DETECTS AN UNRECOGNIZED PARAMETER WITHOUT A "PARAMETER COMPATIBILITY INFORMATION PARAMETER", THE ACTIONS TAKEN WILL BE DEPENDENT ON WHETHER THE UNRECOGNIZED PARAMETER IS PASSED ON OR DISCARDED. IF THE UNRECOGNIZED PARAMETER IS DISCARDED, A CONFUSION MESSAGE IS SENT TO THE EXCHANGE FROM WHICH THE UNRECOGNIZED PARAMETER WAS RECEIVED. THE CONFUSION MESSAGE CONTAINS THE CAUSE VALUE 99, "PARAMETER NON-EXISTENT OR NOT IMPLEMENTED – DISCARDED", FOLLOWED BY A DIAGNOSTIC FIELD CONTAINING THE PARAMETER NAME. A CONFUSION MESSAGE MAY REFER TO MULTIPLE UNRECOGNIZED PARAMETERS. IF THE UNRECOGNIZED PARAMETER IS PASSED ON UNMODIFIED, NO SUBSEQUENT ACTIONS ARE NECESSARY.

~~IF A FACILITY REQUEST MESSAGE IS RECEIVED WITH UNRECOGNIZED PARAMETERS, THE MESSAGE IS DISCARDED AND A FACILITY REJECT MESSAGE IS RETURNED INCLUDING THE CAUSE VALUE 99, "PARAMETER NON-EXISTENT OR NOT IMPLEMENTED – DISCARDED", FOLLOWED BY THE PARAMETER NAME CODE IN THE DIAGNOSTIC FIELD.~~

~~IF A RELEASE MESSAGE CONTAINING AN UNRECOGNIZED PARAMETER THAT CANNOT BE PASSED ON IS RECEIVED AT A TYPE B EXCHANGE, A RELEASE COMPLETE MESSAGE IS RETURNED INCLUDING THE CAUSE VALUE 99, "PARAMETER NON-EXISTENT OR NOT IMPLEMENTED – DISCARDED".~~

D.2.10.5.3.3 UNRECOGNIZED PARAMETER VALUES

ANY PARAMETER VALUES MARKED AS "SPARE", "RESERVED" OR "NATIONAL USE" IN Annex C MAY BE REGARDED AS UNRECOGNIZED.

~~IF AN EXCHANGE RECEIVES AND DETECTS A RECOGNIZED PARAMETER, BUT THE CONTENTS ARE UNRECOGNIZED, THEN THE ACTIONS ARE AS DEFINED AS BELOW:~~

A) UNRECOGNIZED MANDATORY PARAMETER VALUES

~~UNRECOGNIZED MANDATORY PARAMETER VALUES CAN ONLY OCCUR FOR PARAMETERS DEFINED IN MESSAGES OF THE BLUE BOOK (1988) ISDN USER PART. THIS ISDN USER PART DOES NOT CONTAIN ANY MANDATORY PARAMETERS IN NEW MESSAGES.~~

~~IF AN EXCHANGE RECEIVES AND DETECTS AN UNRECOGNIZED MANDATORY PARAMETER VALUE, THE ACTIONS TAKEN IN THE DIFFERENT TYPES OF EXCHANGES WILL BE DEPENDENT ON THE TABLES A.2/Q.763 Annex A AND A.3/Q.763 Annex C.~~

~~IF A FACILITY REQUEST MESSAGE IS RECEIVED WITH UNRECOGNIZED MANDATORY PARAMETER VALUE(S) AND WITHOUT PARAMETER COMPATIBILITY INFORMATION, THE ACTIONS TO BE TAKEN ARE DESCRIBED IN THE ABOVE MENTIONED TABLES, I.E. THE MESSAGE IS DISCARDED AND A FACILITY REJECT MESSAGE IS RETURNED INCLUDING THE CAUSE VALUE 99, "PARAMETER NON-EXISTENT OR NOT IMPLEMENTED – DISCARDED", FOLLOWED BY THE PARAMETER NAME CODE IN THE DIAGNOSTIC FIELD INDICATING THE FIRST DETECTED UNRECOGNIZED PARAMETER.~~

~~IF A RELEASE MESSAGE IS RECEIVED WITH UNRECOGNIZED MANDATORY PARAMETER VALUE(S) AND WITHOUT PARAMETER COMPATIBILITY INFORMATION, THE ACTIONS TO BE TAKEN ARE DESCRIBED IN THE ABOVE MENTIONED TABLES.~~

B) UNRECOGNIZED OPTIONAL PARAMETER VALUES

~~THE PROCEDURES AS STATED FOR UNRECOGNIZED PARAMETERS APPLY. THERE IS NO SPECIFIC COMPATIBILITY INFORMATION FIELD FOR EACH PARAMETER VALUE. FOR ALL PARAMETER VALUES CONTAINED IN A PARAMETER, THE COMPATIBILITY INFORMATION OF THE PARAMETER APPLIES.~~

~~IF UNRECOGNIZED PARAMETER VALUES ARE RECEIVED AND DETECTED IN OPTIONAL PARAMETERS WHICH ARE ALREADY DEFINED IN BLUE BOOK RECOMMENDATION Q.763, Annex C. THE ACTIONS TAKEN WILL BE DEPENDENT ON THE TABLES CONTAINED IN RECOMMENDATION Q.763 Annex C.~~

D.2.10.5.4 Procedures for the handling of responses indicating unrecognized information has been sent

D.2.10.5.4.1 TYPE A EXCHANGES

ACTION TAKEN ON RECEIPT OF THESE MESSAGES AT AN ORIGINATING OR TERMINATING EXCHANGE WILL DEPEND ON THE CALL STATE AND THE AFFECTED SERVICE.

THE DEFINITION OF ANY PROCEDURE THAT IS OUTSIDE THE BASIC CALL SET-UP PROTOCOL, AS DEFINED IN THIS RECOMMENDATION, SHOULD INCLUDE PROCEDURES FOR HANDLING RESPONSES THAT INDICATE THAT ANOTHER EXCHANGE HAS RECEIVED, BUT NOT RECOGNIZED, INFORMATION BELONGING TO THAT PROCEDURE. THE PROCEDURE RECEIVING THIS RESPONSE SHOULD TAKE THE APPROPRIATE ACTIONS.

THE DEFAULT ACTION TAKEN ON RECEIPT OF A CONFUSION MESSAGE IS TO DISCARD THE MESSAGE WITHOUT DISRUPTING NORMAL CALL PROCESSING.

D.2.10.5.4.2 Type B EXCHANGES

i) CONFUSION (MESSAGE TYPE NON-EXISTENT OR NOT IMPLEMENTED – DISCARDED)

AN EXCHANGE RECEIVING CONFUSION (MESSAGE TYPE NON-EXISTENT OR NOT IMPLEMENTED – DISCARDED) HAS TO DETERMINE THE APPROPRIATE SUBSEQUENT ACTIONS AS DESCRIBED FOR TYPE A EXCHANGES IN THE ABOVE SUBCLAUSE.

ii) CONFUSION (PARAMETER NON-EXISTENT OR NOT IMPLEMENTED – DISCARDED, OR PASSED ON)

THE ACTIONS TAKEN AT A TYPE B EXCHANGE, ON RECEIPT OF A CONFUSION MESSAGE WILL DEPEND ONWHETHER THE EXCHANGE HAS THE FUNCTIONALITY TO GENERATE THE PARAMETER IDENTIFIED IN THE DIAGNOSTIC FIELD :

A) IF THE EXCHANGE DOES NOT HAVE THE FUNCTIONALITY TO GENERATE THE PARAMETER, THE DECISION ON WHAT ACTION SHOULD BE TAKEN IS DEFERRED TO AN EXCHANGE THAT DOES CONTAIN THIS FUNCTIONALITY. THIS IS ACHIEVED BY PASSING THE CONFUSION MESSAGE TRANSPARENTLY THROUGH THE TYPE B EXCHANGE.

B) IF THIS EXCHANGE DOES HAVE THE FUNCTIONALITY TO GENERATE THE PARAMETER, THE PROCEDURAL ELEMENT THAT CREATED OR MODIFIED THE INFORMATION SHOULD DETERMINE ANY SUBSEQUENT ACTIONS, AS DESCRIBED FOR TYPE A EXCHANGES ABOVE.

iii) ~~FACILITY REJECT~~

~~IF A TYPE B EXCHANGE DOES NOT HAVE THE CAPABILITY TO TAKE ACTION ON RECEIPT OF FACILITY REJECT, IT SHOULD PASS THE MESSAGE TRANSPARENTLY TO THE PRECEDING OR SUCCEEDING EXCHANGE.~~

iv) RELEASE AND RELEASE COMPLETE

ACTION TAKEN ON RECEIPT OF A RELEASE OR A RELEASE COMPLETE MESSAGE WITH CAUSE INDICATING UNRECOGNIZED INFORMATION IS AS FOR THE NORMAL PROCEDURES FOR THESE MESSAGES.

THE ABOVE ACTIONS ARE SUMMARIZED IN TABLE 3.

TABLE D-1c

A) HANDLING OF RESPONSES INDICATING UNRECOGNIZED INFORMATION HAS BEEN SENT

<u>EXCHANGE HAS THE FUNCTIONALITY TO GENERATE THE INFORMATION</u>				
<u>CAUSE</u>				
<u>MESSAGE</u>	<u>PARAMETER DISCARDED</u>	<u>PARAMETER PASSED ON</u>	<u>MESSAGE DISCARDED</u>	<u>MESSAGE PASSED ON</u>
<u>CONFUSION</u>	<u>(PROCEDURE DEPENDENT ACTION)</u>			
<u>FACILITY REJECT</u>	<u>NORMAL PROCEDURES</u>	<u>PROCEDURE-DEPEND. ACT.</u>	<u>NOT APPLICABLE</u>	<u>NOT APPLICABLE</u>
<u>RELEASE</u>	<u>NORMAL PROCEDURES</u>	<u>NOT APPLICABLE</u>	<u>NOT APPLICABLE</u>	<u>NOT APPLICABLE</u>
<u>RELEASE COMPLETE</u>	<u>NORMAL PROCEDURES</u>	<u>NORMAL PROCEDURES</u>	<u>NOT APPLICABLE</u>	<u>NOT APPLICABLE</u>

TABLE D-1D

B) HANDLING OF RESPONSES INDICATING UNRECOGNIZED INFORMATION HAS BEEN SENT

<i>EXCHANGE DOES NOT HAVE THE FUNCTIONALITY TO GENERATE THE INFORMATION</i>				
<i>CAUSE</i>				
<i>MESSAGE</i>	<i>PARAMETER DISCARDED</i>	<i>PARAMETER PASSED ON</i>	<i>MESSAGE DISCARDED</i>	<i>MESSAGE PASSED ON</i>
<i>CONFUSION</i>	<i>DEFER ACTION (TRANSIT CONFUSION)</i>			
<i>FACILITY REJECT</i>	<i>DEFER ACTION (TRANSIT)</i>			
<i>RELEASE PROCEDURES</i>	<i>NORMAL PROCEDURES</i>	<i>NOT APPLICABLE</i>	<i>NOT APPLICABLE</i>	<i>NOT APPLICABLE</i>
<i>RELEASE COMPLETE</i>	<i>NORMAL PROCEDURES</i>	<i>NORMAL PROCEDURES</i>	<i>NOT APPLICABLE</i>	<i>NOT APPLICABLE</i>

D.2.10.5.5 PROCEDURES FOR HANDLING UNREASONABLE INFORMATION

IF A MESSAGE IS RECEIVED THAT

- A) IS OF VALID TYPE, I.E. IT IS NOT UNEXPECTED OR UNRECOGNIZED AS DESCRIBED IN D.2.10.5.1 AND D.2.10.5.3; AND*
- B) IT CONTAINS PARAMETERS OF RECOGNIZED TYPE AND VALUE, I.E. THE PROCEDURES IN D.2.10.5.3 DO NOT APPLY.*

IT IS STILL POSSIBLE THAT THE CONTENTS OF THE MESSAGE IS UNREASONABLE. THIS CAN BE AS A RESULT OF CONFLICTING INFORMATION WITHIN THE MESSAGE. THE FOLLOWING EXAMPLE OF THIS IS IDENTIFIED:

- THE PROTOCOL CONTROL INDICATORS, (IN EITHER THE FORWARD OR BACKWARD CALL INDICATORS) CAN CONTAIN CONFLICTING INFORMATION. E.G. END-TO-END METHOD INDICATOR SET TO "NO METHOD AVAILABLE", BUT THE SCCP METHOD INDICATOR SET TO INDICATE THAT AN SCCP METHOD IS AVAILABLE. THIS SITUATION SHOULD BE HANDLED BY ASSUMING THE LOWER NETWORK CAPABILITY FOR THE AFFECTED PARAMETER.*

D.2.10.6 Failure to receive a "release complete" message — time T1 and T5

If a release complete message is not received in response to a release message before time (T1), the exchange will retransmit the release message.

On *reTRANSMITTING* the initial release message, a ~~one-minute~~ **5-15 minute** timer (T5) is started. If no release complete message is received on the expiry of this timer (T5), the exchange shall:

- i) send a reset circuit message;
- ii) alert the maintenance system;
- iii) remove the circuit from service;
- iv) continue the sending of the reset circuit message at 1-minute intervals until maintenance action occurs.

D.2.10.7 Failure to receive a response to an information request message

(This section is not applicable to the Interconnect ISUP specification international interface)

D.2.10.8 Other failure conditions

D.2.10.8.1 Inability to release in response to a release message

If an exchange is unable to return the circuit to the idle condition in response to a release message, it should immediately remove the circuit from service, alert the maintenance system and send the blocking message.

Upon receipt of the blocking acknowledgment message, the release complete message is sent in acknowledgment of the release message.

D.2.10.8.2 Call-failure

The call-failure indication (cause #31) is sent in a release message (see § D.2.2) whenever a call attempt fails and other specific signals do not apply. Reception of the release message at any Signalling System No.7 exchange will cause the release message to be sent to preceding exchanges. If the signalling does not permit the release message to be sent, the appropriate signal, tone or announcement is sent to preceding exchanges.

D.2.10.8.3 Abnormal release conditions

If the conditions for normal release as covered in § D.2.3 are not fulfilled, release will take place under the following conditions:

a) ~~Outgoing international~~ or national controlling exchange

The exchange shall:

- release all equipment and the connection on failure to meet the conditions for normal release of address and routing information before 20-30 seconds after sending the latest address message;
- release all equipment and release the connection on failure to receive an answer message within time (T9) specified in Recommendation Q.118 after the receipt of the address complete message.

b) Incoming international exchange

(This section is not applicable to the Interconnect ISUP specification international interface)

c) *Transit exchange*

The exchange shall release all equipment and the connection and send back the release message in the following cases:

- on failure to receive a continuity message if applicable before 10-15 seconds after receipt of the initial address message; or
- on failure to meet the conditions for normal release as covered in § D.2.3 before 20-30 seconds after sending the latest address message;
- on failure to receive an address message before 15-20 seconds (T35) after receipt of the latest address message and before the minimum or fixed number of digits have been received.

The procedures for the release message are detailed in § D.2.2.2.

~~D.2.10.8.4 If messages are lost during an end-to-end transfer, appropriate actions will be taken according to the type of end-to-end technique being used.~~

~~D.2.10.8.5 For calls involving the SCCP, expiration of the call supervision timer (concerned with call set-up) will result in the SCCP being notified of an error condition.~~

D.2.10.9 Temporary trunk blocking (TTB) (national use)

(This section is not applicable to the Interconnect ISUP specification international interface)

D.2.10.10 Temporary trunk blocking before release of call (use of a discrete overload message)

(This section is not applicable to the Interconnect ISUP specification international interface)

D.2.11 ISDN user part signalling congestion control

D.2.11.1 General

On receipt of congestion indication primitives (see also Recommendation Q.704 § 11.2.3), the ISDN user part should reduce traffic load (e.g. call attempts) into the affected direction in several steps.

D.2.11.2 Procedures

When the first congestion indication primitive is received by the ISDN user part, the traffic load into the affected direction is reduced by one step. At the same time two timers T29 and T30 are started. During T29 all received congestion indication primitives for the same direction are ignored in order not to reduce traffic too rapidly. Reception of a congestion indication primitive after the expiry of T29, but still during T30, will decrease the traffic load by one more step and restart T29 and T30. This stepwise reduction of the ISDN user part signalling traffic is continued until maximum reduction is obtained by arriving at the last step. If T30 expires (i.e. no congestion indication primitives having been received during the T30 period), traffic will be increased by one step and T30 will be restarted unless full traffic load has been resumed.

Timers T29 and T30 have the following values:

T29 = 300-600 ms,

T30 = 5-10 s.

The number of steps of traffic reduction and the type and/or amount of increase/decrease of traffic load at the various steps are considered to be an implementation matter.

Step 1 User-User Information Messages discarded

Step 2 IAMs, Circuit Management Messages discarded.

Step 3 All ISUP Messages discarded.

D.2.12 Automatic congestion control

Automatic congestion control (ACC) is used when an exchange is in an overload condition (see also Recommendation Q.542). Two levels of congestion are distinguished: a less severe congestion threshold (congestion level 1) and a more severe congestion threshold (congestion level 2).

If either of the two congestion thresholds are reached, an automatic congestion level parameter is added to all release messages generated by the exchange. This parameter indicates the level of congestion (congestion level 1 or 2) to the adjacent exchanges. The adjacent exchanges, when receiving a release message containing an automatic congestion level parameter, should reduce their traffic to the overload affected exchange.

If the overloaded exchange returns to a normal traffic load, it will cease including automatic congestion level parameters in release messages.

The adjacent exchanges then, after a predetermined time, automatically return to their normal status.

D.2.12.1 Receipt of a release message containing an automatic congestion level parameter

When an exchange receives a release message containing an automatic congestion level parameter, the ISDN user part should pass the appropriate information to the signalling system independent network management/overload control function within the exchange. This information consists of the received congestion level information and the circuit identification to which the release message applies.

If the ACC procedure is not implemented, the ACC parameter is not acted upon and discarded as normal.

ACC actions are applicable only at exchanges adjacent to the congested exchange. Therefore, an exchange that receives a release message containing an automatic congestion level parameter should discard that parameter after notifying the network management/overload control function.

D.2.12.2 Actions taken during overload

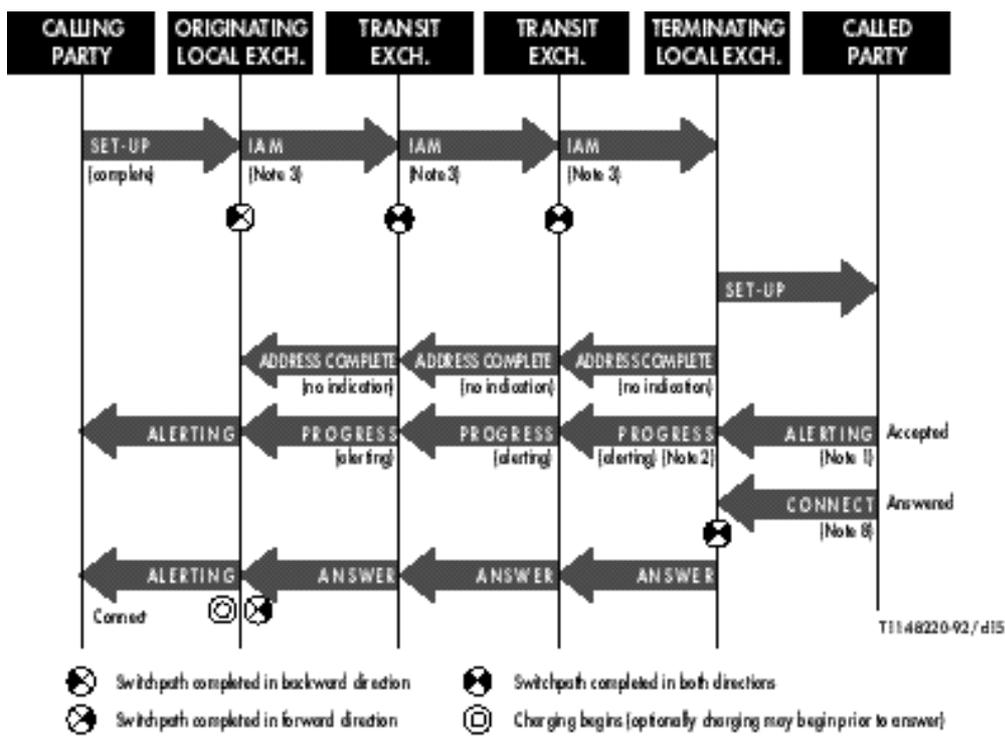
Whenever an exchange is in an overload state (congestion level 1 or 2), the signalling system independent network management/overload control function will direct the ISDN user part to include an automatic congestion level parameter in every release message transmitted by the exchange.

The network management/overload control function will indicate which congestion level (1 or 2) to code in the automatic congestion level parameter.

When the overload condition has ended, the network management/overload control function will direct the ISDN user part to cease including automatic congestion level parameters in the transmitted release messages.

D.2.13 Unequipped circuit identification code message (national option)

(This section is not applicable to the Interconnect ISUP specification international interface)



Notes referring to Figures D-1/Q.767 and D-2/Q.767

Note 1 - The alerting message may not be given by a called terminal having automatic answer. Under these circumstances the Connect Message will not be sent as soon as the Connect Message is received and through connection of the speech path has been completed.

Note 2 - For telephone calls within the ISDN, ringing tone will be applied by the terminating exchange as soon as it knows that the subscriber is free. In the case of a PABX connected to the access interface there is the option of an early through connection of the switchpath so that the in-band call arrival indication generated in the PABX is returned to the calling user. For data calls, ringing tone is not applied.

Note 8 - Access protocol example is for point-to-point operation only.

FIGURE D-1/Q.767
Successful ordinary call (en bloc operation)

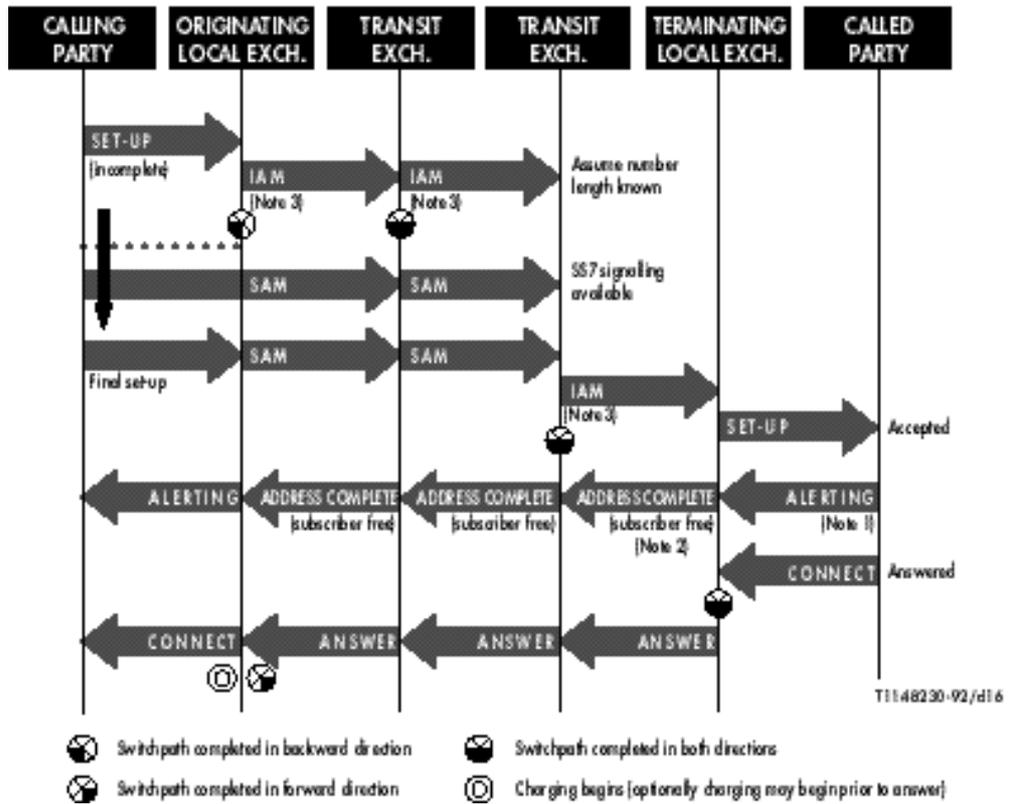


FIGURE D-2/Q.767
Successful ordinary call (overlap operation)

(This figure is not applicable to the National ISUP interface)

FIGURE D-3/Q.767

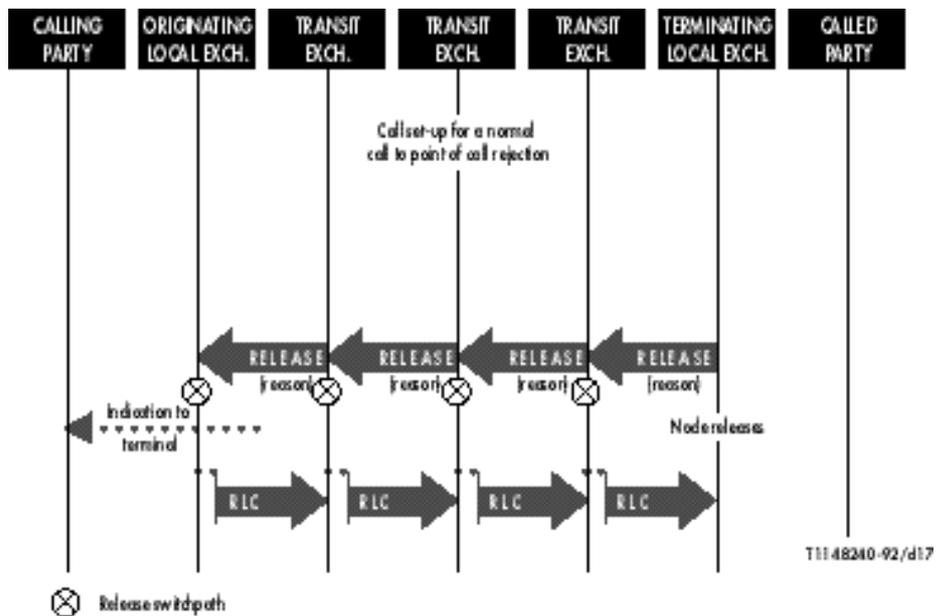


FIGURE D-4/Q.767
Unsuccessful call set-up (no rerouting)

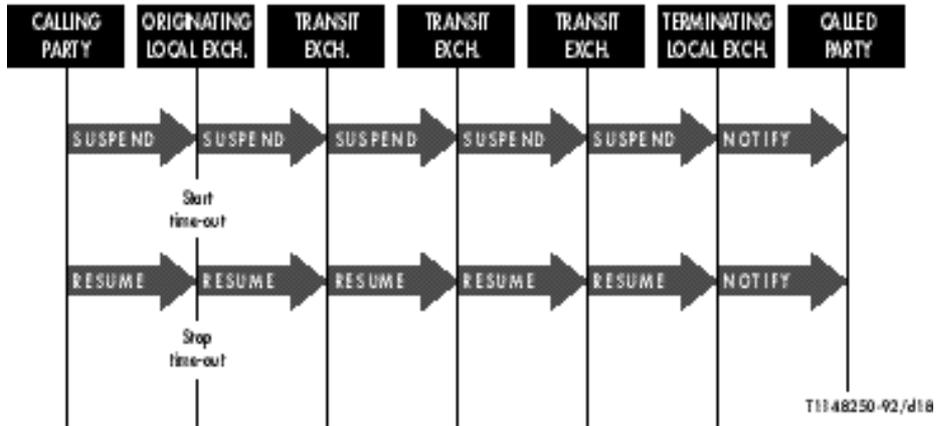


FIGURE D-5/Q-767
Suspend request and resume

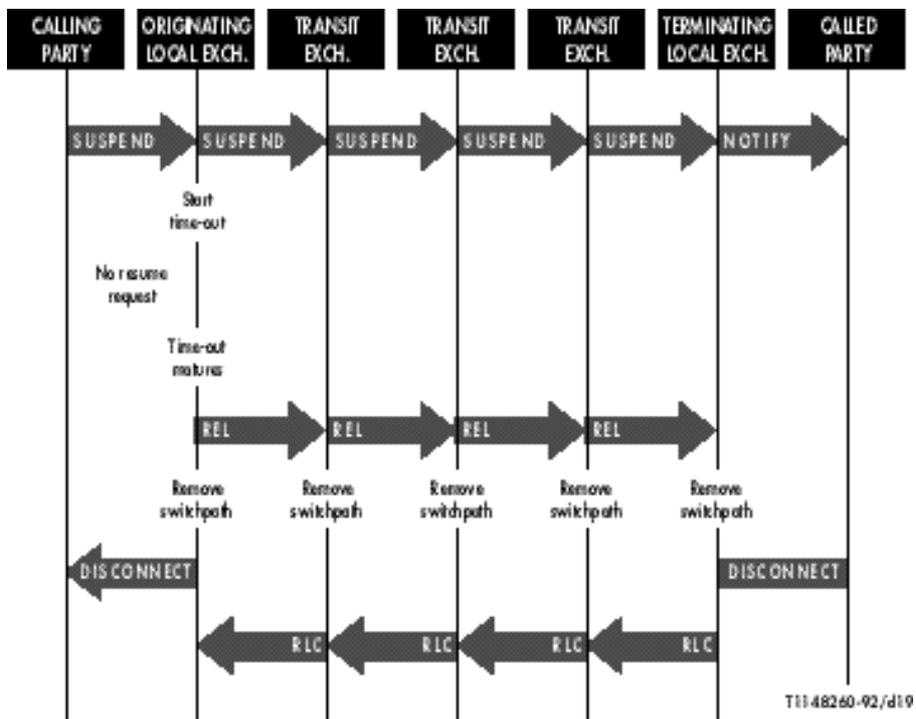


FIGURE D-6/Q-767
Suspend request with no connection

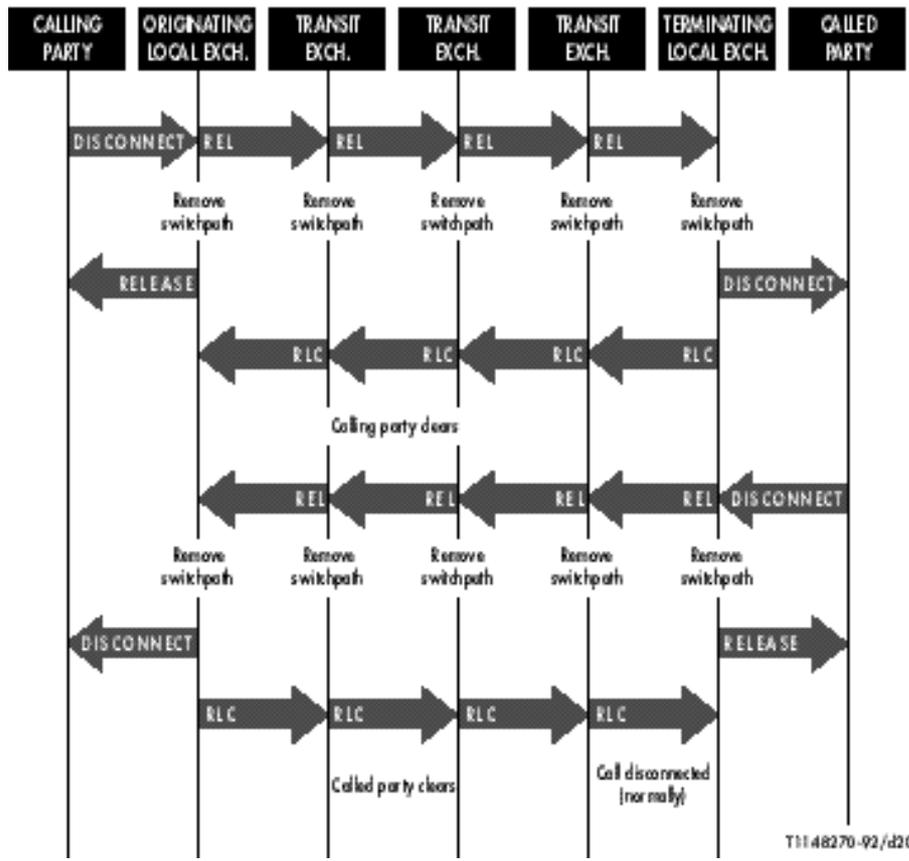


FIGURE D-7/Q.767
 Normal call release

SPECIFICATION

TABLE D-1/Q.767 (SHEET 1 OF 5)

Timers used in Annex D

Symbol	Time-out value	Significance	Cause for initiation	Normal termination	At expiry	Section
T1	4-15-15-60 seconds	Local	When release message is sent	At the receipt of release complete message	Re-transmit release message and start timer T1	2.2 - 2.3.1 2.10.6
T2	3 min	Dual	When suspend request controlling exchange receives suspend (user) message	At the receipt of resume (user) message at controlling exchange	Initiate release procedure	2.5.1.1 2.5.2.1 2.5.3
T3			Not used on the international interface			2.6
T4			Not used on the international interface			2.7.1 2.7.2
T5	1-5-15 mins	Local	When initial release message is sent	At receipt of release complete message	Send reset circuit message, alert maintenance personnel and remove the circuit from service, stop T1 start T17. Procedure continues until maintenance intervention occurs	2.2 2.3.1 2.10.6
T6	Covered in Rec. Q.118	Dual	When controlling exchange receives suspend (network)	At the receipt of resume (network) message	Initiate release procedure	2.5.1.3 2.5.2.3 - 2.5.3
T7	20-30 s	Dual	When the latest address message is sent	When the condition for normal release of address and routing information is met (receipt of ACM, CON messages)	Release all equipment and connection (send release message)	2.1.1.1 2.1.4.4 2.1.4.8 2.1.2.1 f) 2.10.8.3
T8	10-15 s	Local	When transit or incoming international exchange receives initial address message requiring continuity check on this circuit, or indicates that continuity check has been performed on a previous circuit	At receipt of continuity message	Release all equipment and connection into national network (send release message)	2.1.8 2.10.8.3

TABLE D-1/Q-767 (SHEET 2 OF 5)

Timers used in Annex D

Symbol	Time-out value	Significance	Cause for initiation	Normal termination	At expiry	Section
T9	Interval specified in Rec. Q.118	Dual	When national controlling or outgoing international exchange receives ACM	At the receipt of answer	Release connection and send back release message	2.1.4.4 2.1.7.2 2.1.7.3 2.10.8.3
T10	4-6 s	Dual	When last digit is received in interworking situations	At the receipt of fresh information	Send address complete message	2.1.2.1 e) 2.1.4.8
T11	15-20 s	Dual	When latest address message is received in interworking situations	When ACM is sent	Send address complete message	2.1.4.8
T12	4-15-15-60 seconds	Local	When blocking message is sent	At receipt of blocking acknowledgment	Re-transmit blocking message and start T12	2.10.4
T13	1-5-15 mins	Local	When initial blocking message is sent	At receipt of blocking acknowledgment	Transmit blocking message, alert maintenance personnel and start T13; stop T12. Procedure continues until maintenance intervention occurs	2.10.4
T14	4-15-15-60 seconds	Local	When unblocking message is sent	At receipt of unblocking acknowledgment	Re-transmit unblocking message and start T14	2.10.4
T15	1-5-15 mins	Local	When initial unblocking message is sent	At receipt of unblocking acknowledgment	Re-transmit unblocking message and alert maintenance personnel, start T15, and stop T14. Procedure continues until maintenance intervention occurs	2.10.4
T16	4-15-15-60 seconds	Local	When reset circuit message is sent not due to the expiry of Timer T5	At the receipt of the acknowledgment (RLC message)	Re-transmit reset circuit message start T16	2.10.3.1

SPECIFICATION

TABLE D-1/Q.767 (SHEET 3 OF 5)

Timers used in Annex D

Symbol	Time-out value	Significance	Cause for initiation	Normal termination	At expiry	Section
T17	4-15 5-15 mins	Local	When initial reset circuit message is sent	At the receipt of the acknowledgment	Alert maintenance personnel, retransmit reset circuit message, start T17 and stop T16. Procedure continues until maintenance intervention occurs	2.10.3.1
T18	4-15-15-60 15-60 seconds	Local	When group blocking message is sent	At receipt of group blocking acknowledgment	Re-transmit group blocking message and start T18	2.10.4
T19	4-15 5-15 mins	Local	When initial group blocking message is sent	At receipt of group blocking acknowledgment	Re-transmit group blocking message, alert maintenance personnel, start T19 and stop T18. Procedure continues until maintenance intervention occurs	2.10.4
T20	4-15-15-60 15-60 seconds	Local	When group unblocking message is sent	At receipt of group unblocking acknowledgment	Re-transmit group unblocking message and start T20	2.10.4
T21	4-15 5-15 mins	Local	When initial group unblocking message is sent	At the receipt of group unblocking acknowledgment	Re-transmit group unblocking message, alert maintenance personnel, start T21 and stop T20. Procedure continues until maintenance intervention occurs	2.10.4
T22	4-15-15-60 15-60 seconds	Local	When circuit group reset message is sent	At the receipt of the acknowledgment	Re-transmit circuit group reset message, start T22	2.10.3.2

TABLE D-1/Q-767 (SHEET 4 OF 5)

Timers used in Annex D

Symbol	Time-out value	Significance	Cause for initiation	Normal termination	At expiry	Section
T23	4-5-15 mins	Local	When initial circuit group reset message is sent	At receipt of the acknowledgment	Alert maintenance personnel and start T23, re-transmit circuit group reset message, stop T22. Procedure continues until maintenance intervention occurs	2.10.3.2
T24	< 2 s	Local	When check tone is sent	At the receipt of backward check tone	Send continuity message with failure indication and: a) start T25 if continuity check was asked in an AM and make automatic repeat attempt, or b) start T26 if continuity check was asked in a CCR	Rec. Q.724, § 7.4.1
T25	1-10 s	Local	When initial continuity check failure is detected		Send CCR message and repeat continuity check	Rec. Q.724, § 7.3
T26	1-3 min	Local	When second or subsequent continuity check failure is detected		Send CCR message and repeat continuity check	Rec. Q.724, § 7.3
T27	4 min	Local	When continuity check failure indication is received	At receipt of continuity check request message	Send reset circuit message; start T16 and T17	2.1.8
T28			Not used on the international interface			2.9.3.2
T29	300-600 ms	Local	Congestion indication received when T29 not running		New congestion indication will be taken into account	2.11.2
T30	5-10 s	Local	Congestion indication received when T29 not running		Restore traffic by one step if not yet at full load and start T30	2.11.2

TABLE D-1/Q.767 (SHEET 5 OF 5)

Timers used in Annex D

Symbol	Time-out value	Significance	Cause for initiation	Normal termination	At expiry	Section
T31			Not used on the international interface			3.7.2 3.7.3 3.7.4
T32			Not used on the international interface			3.7.5
T33			Not used on the international interface			2.1.6.2 2.10.7
T34			Not used on the international interface			2.9.3.2
T35	15-20 s	Dual	At receipt of the latest digit (< > ST) and before the minimum or fixed number of digits have been received	At receipt of ST or when the minimum or fixed number of digits have been received <u>Depending on bilateral agreements between carriers</u>	Send release message (cause 28)	2.2.5 2.10.8.3
T36	10-15 s	Local	When transit or incoming international exchange receives continuity check request message	At receipt of continuity or release message	Release all equipment, send reset circuit message, start T16 and T17	2.1.8

D.3 End-to-end signalling

(This section is not applicable to the Interconnect ISUP specification international interface)

ANNEX E.1 Service Descriptions

(to the Interconnect
ISUP Specification)

E1.1 General

A service description shall describe the end to end interconnect requirements for a service to be interconnected in a National network.

The service description may be supported by a Stage 1 supplementary description and a Stage 3 supplementary description.

The Stage 1 supplementary description identifies any specific end to end interconnect requirements for the service as it is applied in an Australian interconnecting domestic network environment.

The Stage 3 supplementary description identifies any specific network signalling requirements or procedures for the service that must be supported in addition to this specification.

A service description may be developed for consideration on an industry basis or may be developed on a bilateral basis by interconnecting network operators.

In principle, the implementation of an interconnecting service shall be in accordance with the ITU-T/CCITT Recommendations. However, a national network may implement any service or supplementary service within its network in accordance with its own network requirements.

Please refer to the appropriate Stage 3 Supplementary Descriptions for the services supported by this specification. (Refer section 2 of this document.)

Notes :

1. Defined ISDN bearer services generally do not require an additional Stage 3 description. That is, the service procedures for ISDN bearer services are fully defined within this specification.
2. ISDN teleservices are generally transparent to this specification.
3. Supplementary services that are 'without significance' to this specification are those services that do not add, modify or require any changes to this specification for their support within a National network.
4. Supplementary services that are 'implicitly supported' by this specification are those services that use the information and procedures already fully defined within this specification.

Care should be taken to ensure that material used is from the current version of the Standard or Code and that it is updated whenever the Standard or Code is amended or revised. The number and date of the Standard or Code should therefore be clearly identified. If in doubt please contact ACIF.



Published by:

**THE AUSTRALIAN COMMUNICATIONS
INDUSTRY FORUM LTD**

Level 9, 32 Walker Street
North Sydney NSW 2060

Correspondence: PO Box 444
Milsons Point NSW 2061

Telephone: (02) 9959 9111

Facsimile: (02) 9954 6136

E-mail: acif@acif.org.au

Web Site: <http://www.acif.org.au/>