5i’

Recommendation Q.712

DEFINITION AND FUNCTION OF SCCP MESSAGES

1 Signalling connection control part messages

The signalling connection control part (SCCP) messages are used by the peer-to-peer protocol. All messages are uniquely identified by means of a message type code, which is to be found in all the messages. The meaning and definition of the various parameter fields contained in these messages are specified in § 2. The actual inclusion of these parameter fields in a given message depends on the class of protocol and is specified in § 3.

1.1 Connection Confirm (CC)

A *Connection Confirm* | message is sent by the called SCCP to indicate to the calling SCCP that it has performed the setup of the signalling connection. On reception of a *Connection Confirm* | message, the calling SCCP completes the setup of the signalling connection, if possible.

It is used during connection establishment phase by connection-oriented protocol class 2 or 3.

1.2 Connection Request (CR)

A *Connection Request* | message is sent by a calling SCCP to a called SCCP to request the setting up of a signalling connection between the two entities. The required characteristics of the signalling connection are carried in various parameter fields. On reception of a *Connection Request*
| message, the called SCCP initiates the setup of the signalling connection if possible.

It is used during connection establishment phase by connection-oriented protocol class 2 or 3.

1.3 Connection Refused (CREF)

A *Connection Refused* | message is sent by the called SCCP or an intermediate node SCCP to indicate to the calling SCCP that the setup of the signalling connection has been refused.

It is used during connection establishment phase by connection-oriented protocol class 2 or 3.

1.4 Data Acknowledgement (AK)

A *Data Acknowledgement* | message is used to control the window flow control mechanism, which has been selected for the data transfer phase.

It is used during the data transfer phase in protocol class 3.

1.5 Data Form 1 (DT1)

A *Data Form 1* | message is sent by either end of a signalling connection to pass transparently SCCP user data between two SCCP nodes.

It is used during the data transfer phase in protocol class 2 only.

1.6 **Data Form 2 (DT2)**

A *Data Form 2* | message is sent by either end of a signalling connection to pass transparently SCCP user data between two SCCP nodes and to acknowledge messages flowing in the other direction.

It is used during the data transfer phase in protocol class 3 only.

1.7 **Expedited Data (ED)**

An *Expedited Data* | message functions as a *Data Form 2* | message but includes the ability to bypass the flow control mechanism which has been selected for the data transfer phase. It may be sent by either end of the signalling connection.

It is used during the data transfer phase in protocol class 3 only.

1.8 **Expedited Data Acknowledgement (EA)**

An *Expedited Data Acknowledgement* | message is used to acknowledge an *Expedited Data* | message. Every ED message has to be acknowledged by an EA message before another ED message may be sent.

It is used during the data transfer phase in protocol class 3 only.

1.9 **Inactivity Test (IT)**

An *Inactivity Test* | message may be sent periodically by either end of a signalling connection to check if this signalling connection is active at both ends, and to audit the consistency of connection data at both ends.

It is used in protocol classes 2 and 3.

1.10 **Protocol Data Unit Error (ERR)**

A *Protocol Data Unit Error* | message is sent on detection of any protocol errors.

It is used during the data transfer phase in protocol classes 2 and 3.

1.11 **Released (RLSD)**

A *Released* | message is sent, in the forward or backward direction, to indicate that the sending SCCP wants to release a signalling connection and the associated resources at the sending SCCP have been brought into the disconnect pending condition. It also indicates that the receiving node should release the connection and any other associated resources as well.

It is used during connection release phase in protocol classes 2 and 3.

1.12 **Release Complete (RLC)**

A *Release Complete* | message is sent in response to the *Released* | message indicating that the *Released* | message has been received, and the appropriate procedures has been completed.

It is used during connection release phase in protocol classes 2 and 3.

1.13 **Reset Confirm (RSC)**

A *Reset Confirm* | message is sent in response to a *Reset Request* | message to indicate that *Reset Request* | has been received and the appropriate procedure has been completed.

It is used during the data transfer phase in protocol class 3.

1.14 **Reset Request (RSR)**

A *Reset Request* | message is sent to indicate that the sending SCCP wants to initiate a reset procedure (re-initialization of sequence numbers) with the receiving SCCP.

It is used during the data transfer phase in protocol class 3.

1.15 **Subsystem-Allowed (SSA)**

A *Subsystem-Allowed* | message is sent to concerned destinations to inform those destinations that a subsystem which was formerly prohibited is now allowed.

It is used for SCCP subsystem management.

1.16 Subsystem-Out-of-Service-Grant (SOG)

A *Subsystem-Out-of-Service-Grant* | message is sent, in response to a *Subsystem-Out-of-Service-Request* | message, to the requesting SCCP if both the requested SCCP and the backup of the affected subsystem agree to the request.

It is used for SCCP subsystem management.

1.17 Subsystem-Out-of-Service-Request (SOR)

A *Subsystem-Out-of-Service* | message is used to allow subsystems to go out-of-service without degrading performance of the network. When a subsystem wishes to go out-of-service, the request is transferred by means of a *Subsystem-Out-of-Service-Request* | message between the SCCP at the subsystem's node and the SCCP at the duplicate subsystem's node.

It is used for SCCP subsystem management.

1.18 Subsystem-Prohibited (SSP)

A *Subsystem-Prohibited* | message is sent to concerned destinations to inform SCCP Management (SCMG) at those destinations of the failure of a subsystem.

It is used for SCCP subsystem management.

1.19 Subsystem-Status-Test (SST)

A *Subsystem-Status-Test* | message is sent to verify the status of a subsystem marked prohibited.

It is used for SCCP subsystem management.

1.20 Unitdata (UDT)

A *Unitdata* | message is used by a SCCP wanting to send data in a connectionless mode.

It is used in connectionless protocol classes 0 and 1.

1.21 Unitdata Service (UDTS)

A *Unitdata Service* | message is used to indicate to the originating SCCP that a UDT it sent cannot be delivered to its destination. A UDTS message is sent only when the option field in that UDT is set to ''return on error''.

It is used in connectionless protocol classes 0 and 1.

2 SCCP parameter

2.1 affected point code

The ''affected point code'' identifies a signalling point where the affected subsystem is located.

2.2 **affected subsystem number**

The ‘‘affected subystem number’’ parameter field identifies a subsystem which is failed, withdrawn, congested or allowed. In the case of SST messages, it also identifies the subsystem being audited. In the case of SOR or SOG messages, it identifies a subsystem requesting to go out of service.

2.3 **calling/called party address**

The ‘‘calling/called party address’’ parameter field contains enough information to uniquely identify the origination/destination signalling point and/or the SCCP service access point.

It can be any combination of a global title (dialled digits for example), a signalling point code, and a subsystem number. The subsystem number (SSN) identifies a SCCP user function when provided.

In order to allow the interpretation of this address, it begins with an address indicator indicating which information elements are present. The address indicator also includes a routing indicator specifying if translation

is required, and a global title indicator specifying global title format.

The ‘‘calling/called party address’’ parameter field has two different meanings depending on whether it is included in a connection-oriented or connectionless message.

For a connection-oriented message, the significance of these fields is related to the direction of the connection setup (i.e. independent of the direction the message is going.

For a connectionless message, the significance of these fields is dependent on the direction the message is going (just as for OPC and DPC).

2.4 **credit**

The ‘‘credit’’ parameter field is used in the acknowledgements to indicate to the sender how many messages it may send, i.e., window size. It is also used in the CR and CC message to indicate the proposed and selected credit, and in the IT message to audit the consistency of this connection data at both ends of a connection section.

2.5 **data**

The ‘‘data’’ parameter field contains information coming from upper layers or from SCCP management.

In connectionless and connection-oriented messages the data parameter field contains information coming from the upper layers.

Information coming from SCCP management will be contained in the data parameter field of a UDT message. In this case the data parameter field of the UDP message will only contain the SCCP management message.

2.6 **diagnostic**

The ‘‘diagnostic’’ parameter field is for further study.

2.7 **error cause**

The ‘‘error cause’’ parameter field is used in the *Protocol Data Unit Error* | message in order to indicate what is the exact protocol error.

2.8 **end of optional parameters**

The ‘‘end of optional parameters’’ parameter field is used in any message containing optional parameters to indicate where the part allocated to these optional parameters ends.

2.9 **local reference number (source/destination)**

The ‘‘local reference number (source/destination)’’ parameter field uniquely identifies in a node a signalling connection. It is an internal working number chosen by each node independently from the destination node. At least

one local reference number is to be found in any message exchanged on a signalling connection section.

Note — Remote reference number is used to reflect the local reference number at the remote end of a connection section.

2.10 **protocol class**

For connection-oriented protocol classes, the ‘‘protocol class’’ parameter field is used during the connection establishment phase; it is negotiated between the two end SCCP. It is also used during data transfer phase to audit the consistency of this connection data at both ends of a connection section.

For connectionless protocol classes the ‘‘protocol class’’ parameter field is used to indicate whether or not a message should be returned on error occurence.

2.11 **receive sequence number**

The ‘‘receive sequence number’’ parameter field P(R) is used in the data acknowledgement message to indicate the lower edge of the receiving window.

It also indicates that at least all messages numbered up to and including P(R) — 1 are accepted.

2.12 **refusal cause**

The ‘‘refusal cause’’ parameter field is used in a *Connection Refused* | message to indicate the reason why the connection setup request was refused.

2.13 **release cause**

The ‘‘release cause’’ parameter field is used in a *Released* | message to indicate the reason of the release.

2.14 **reset cause**

The ‘‘reset cause’’ parameter field is used in a *Reset Request* | message to indicate the reason why a reset procedure is invoked.

2.15 **return cause**

For connectionless protocol classes, the ‘‘return cause’’ parameter field is used to indicate the reason why a message was returned.

2.16 **segmenting/reassembling**

The ‘‘segmenting/reassembling’’ parameter field is used in the data message for the segmenting and reassembling function. It is the more data indicator (M-bit). This is used only in connection-oriented messages.

It is set to one in a data message to indicate that more data will follow in a subsequent message.

It is set to zero in a data message to indicate that the data in this message forms the end of a complete data sequence.

2.17 **sequencing/segmenting**

The ‘‘sequencing/segmenting’’ parameter field contains the information necessary for the following functions: sequence numbering, flow control, segmenting and reassembling.

2.18 **subsystem multiplicity indicator**

The ‘‘subsystem multiplicity indicator’’ is used in SCCP management messages to indicate the number of associated replicated subsystems.

3 Inclusion of fields in the messages

The inclusion of the information elements specified in § 2 in the various messages specified in § 1 according to their type depends on the class

of protocol. SCCP messages are specified in Table 1/Q.712 and SCCP management messages are specified in Table 2/Q.712.

All SCCP management messages are embedded in the ‘‘data’’ parameter of the *Unitdata* | message.

The following applies to Tables 1/Q.712 and 2/Q.712:

m mandatory field

o optional field (which is included in a message when needed)

H.T. [T1.712]

TABLE 1/Q.712
{
Inclusion of fields in messages
}

Messages Parameter field	CR	CC	CREF	RLSD	RLC	DT1	DT2	AK	ED	EA	RSR	RSC	ERR	I
{ Destination local reference number }		m	m	m	m	m	m	m	m	m	m	m	m	r
Source local reference number	m	m		m	m						m	m		r
Called party address	m	o	o											
Calling party address	o													
Protocol class	m	m												r
Segmenting/Reassembling						m								
Receive sequence number								m						
Sequencing/Segmenting							m							m |
Credit	o	o						m						m |
Release cause				m										
Return cause														
Reset cause											m			
Error cause													m	
User data	o	o	o	o		m	m		m					
Refusal cause			m											
End of optional parameters	o	o	o	o										

a) Information in these parameter fields are ignored if the protocol class parameter indicates class 2.

Tableau 1/Q.712 [T1.712] (a l'italienne), p.1

H.T. [T2.712]

TABLE 2/Q.712

SCCP management messages

Messages Parameter fields	SSA	SSP	SST	SOR	SOG
SCMG format ID	m	m	m	m	m
Affected SSN	m	m	m	m	m
Affected PC	m	m	m	m	m

{
Subsystem multiplicity indicator
}
	m	m	m	m	m

Tableau 2/Q.712 [T2.712], p.2

Recommendation Q.713

SCCP FORMATS AND CODES

1 General

The Signalling Connection Control Part (SCCP) messages are carried on the signalling data link by means of Signal Units the format of which is described in Recommendation Q.703, § 2.2.

The Service Information Octet format and coding is described in Recommendation Q.704, § 14.2. The Service Indicator is coded 0011 for the SCCP.

The Signalling Information Field (SIF) of each Message Signal Unit containing an SCCP message consists of an integral number of octets.

A message consists of the following parts (see Figure 1/Q.713):

— the routing label;

— the message type code;

— the mandatory fixed part;

— the mandatory variable part;

— the optional part, which may contain fixed length and variable length fields.

The description of the various parts is contained in the following sections. SCCP Management messages and codes are provided in § 5 of this Recommendation.

1.1 *Routing label*

The standard routing label specified in Recommendation Q.704, § 2.2 is used. The rules for the generation of the signalling link selection (SLS) code are described in Recommendation Q.711, § 2.2.1.

Figure 1/Q.713 [T1.713], p. (a traiter comme tableau MEP)

1.2 *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 SCCP message. The allocation of message type codes, with reference to the appropriate descriptive section of this Recommendation is summarized in Table 1/Q.713. Table 1/Q.713 also contains an indication of the applicability of the various message types to the relevant classes of protocol.

1.3 *Formatting principles*

Each message consists of a number of parameters listed and described in § 3. Each parameter has a ''name'' which is coded as a single octet (see § 3). 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 § 4.

A general SCCP message format is shown in Figure 2/Q.713

1.4 *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.

1.5 *Mandatory variable part*

Mandatory parameters of variable length will be included in the mandatory variable part. 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. A pointer is used to indicate the beginning of each parameter. Because of this, parameters may be sent in an order different from that of the pointers. Each pointer is encoded as a single octet. The details of how pointers are encoded is found in § 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, but there is no optional part included in this particular message, then a pointer field containing all zeros will be used.

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 parameter.

Figure 2/Q.713 (CCITT 73070), p.

1.6 *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 the parameter name (one octet) and the length indicator (one octet) followed by the parameter contents.

It is for further study if any constraint in the order of transmission will be introduced.

1.7 *End of optional parameters octet*

After all optional parameters have been sent, an end of optional parameters octet containing all zeroes will be transmitted. This octet is only included if optional parameters are present in the message.

1.8 *Order of transmission*

Since all the parameters consist of an integral number of octets, the formats are presented 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 2/Q.713).

Within each octet, the bits are transmitted with the least significant bit first.

1.9 *Coding of spare bits*

According to the general rules defined in Rec. Q.700, spare bits are coded 0 unless indicated otherwise at the originating nodes. At intermediate nodes, they are passed transparently. At destination nodes, they need not be examined.

1.10 *National message types and parameters*

If message type codes and parameter codes are required for national uses, it is suggested that the codes be selected from the highest code downwards, that is starting at code 11111110. Code 11111111 is reserved for future use.

2 Coding of the general parts

2.1 *Coding of the message type*

The coding of the message is shown in Table 1/Q.713.

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 indicator does not include the parameter name octet or the length indicator octet.

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.

3 SCCP parameters

For example, a pointer value of ‘‘00000001’’ indicates that the associated parameter begins in the octet immediately following the pointer. A pointer value of ‘‘00001010’’ indicates that nine octets of information exist between the pointer octet and the first octet of the parameter associated with that pointer.

The parameter name codes are given in Table 2/Q.713 with reference to the subsections in which they are described.

3.1 *End of optional parameters*

The ‘‘end of optional parameters’’ parameter field consists of a single octet containing all zeros.

3.2 *Destination local reference*

The ‘‘destination local reference’’ parameter field is a three-octet field containing a reference number which, in outgoing messages, has been allocated to the connection section by the remote node.

The coding ‘‘all ones’’ is reserved, its use is for further study.

H.T. [T2.713]

TABLE 1/Q.713

SCCP message types

Message type	Classes				§	Code
	0	1	2	3		
CR Connection Request			X	X	4.2	0000 0001
CC Connection Confirm			X	X	4.3	0000 0010
CREF Connection Refused			X	X	4.4	0000 0011
RLSD Released			X	X	4.5	0000 0100
RLC Release Complete			X	X	4.6	0000 0101
DT1 Data Form 1			X		4.7	0000 0110
DT2 Data Form 2				X	4.8	0000 0111
AK Data Acknowledgement				X	4.9	0000 1000
UDT Unitdata	X	X			4.10	0000 1001
UDTS Unitdata Service	X	X			4.11	0000 1010
ED Expedited Data				X	4.12	0000 1011

{
EA Expedited Data Acknowledgement
}
				X	4.13	0000 1100

RSR Reset Request				X	4.14	0000 1101
RSC Reset Confirm				X	4.15	0000 1110
ERR Protocol Data Unit Error			X	X	4.16	0000 1111
IT Inactivity Test			X	X	4.17	0001 0000

X Type of message in this protocol class.

Tableau 1/Q.713 [T2.713], p.5

Blanc

H.T. [T3.713]

TABLE 2/Q.713

SCCP parameter name codes

Parameter name Parameter name code 8765 4321 }	§ {
End of optional parameters	3.1	0000 0000
Destination local reference	3.2	0000 0001
Source local reference	3.3	0000 0010
Called party address	3.4	0000 0011
Calling party address	3.5	0000 0100
Protocol class	3.6	0000 0101
Segmenting/reassembling	3.7	0000 0110
Receive sequence number	3.8	0000 0111
Sequencing/segmenting	3.9	0000 1000
Credit	3.10	0000 1001
Release cause	3.11	0000 1010
Return cause	3.12	0000 1011
Reset cause	3.13	0000 1100
Error cause	3.14	0000 1101
Refusal cause	3.15	0000 1110
Data	3.16	0000 1111

Tableau 2/Q.713 [T3.713], p.6

Blanc

3.3 *Source local reference*

The ‘‘source local reference’’ parameter field is a three-octet field containing a reference number which is generated and used by the local node to identify the connection section.

The coding ‘‘all ones’’ is reserved, its use is for further study.

3.4 *Called party address*

The ‘‘called party address’’ is a variable length parameter. Its structure is shown in Figure 3/Q.713.

Figure 3/Q.713 [T4.713], p. (a traiter comme tableau MEP)

3.4.1 *Address indicator*

The ‘‘address indicator’’ indicates the type of address information contained in the address field (see Figure 4/Q.713). The address consists of one or any combination of the following elements:

— signalling point code;

— global title (for instance, dialled digits);

— subsystem number.

Figure 4/Q.713 [T5.713], p. (a traiter comme tableau MEP)

A ‘‘1’’ in bit 1 indicates that the address contains a signalling point code.

A ‘‘1’’ in bit 2 indicates that the address contains a subsystem number.

Bits 3-6 of the address indicator octet contain the global title indicator, which is encoded as follows:

Full E.164 numbering plan address is used in these two cases for Recommendation E.164 based global titles.

Bits	6 5 4 3
0 0 0 0	No global title included
0 0 0 1	Global title includes nature of address indicator only
0 0 1 0	Global title includes translation type only
0 0 1 1	Global title includes translation type, numbering plan and encoding scheme
0 1 0 0	Global title includes translation type, numbering plan, encoding scheme and nature of address indicator
0 1 0 1	
| o	spare international
0 1 1 1	
1 0 0 0	
| o	spare national
1 1 1 0	
1 1 1 1	reserved for extension.

When a global title is used in the called party address, it is suggested that the called party address contain a subsystem number. This serves to simplify message reformatting following global title translation. The subsystem number should be encoded ‘‘00000000’’ when the subsystem number is not known, e.g., before translation.

Bit 7 of the address indicator octet contains routing information identifying which address element should be used for routing.

A ‘‘0’’ in bit 7 indicates that routing should be based on the global title in the address.

A ‘‘1’’ in bit 7 indicates that routing should be based on the destination point code in the MTP routing label and the subsystem number information in the called party address.

Bit 8 of the address indicator octet is designated for national use.

3.4.2 *Address*

The various elements, when provided, occur in the order: point code, subsystem number, global title, as shown in Figure 5/Q.713.

Figure 5/Q.713 [T6.713], p. (a traiter comme tableau MEP)

3.4.2.1 *Signalling point code*

The signalling point code, when provided, is represented by two octets. Bits 7 and 8 in the second octet are set to zero (see Figure 6/Q.713).

Figure 6/Q.713 [T7.713], p. (a traiter comme tableau MEP)

3.4.2.2 *Subsystem number*

The subsystem number (SSN) identifies an SCCP user function and, when provided, consists of one octet coded as follows:

Bits	8 7 6 5 4 3 2 1	
0 0 0 0 0 0 0 0		SSN not known/not used
0 0 0 0 0 0 0 1		SCCP management
0 0 0 0 0 0 1 0		reserved for CCITT allocation
0 0 0 0 0 0 1 1		ISDN user part
0 0 0 0 0 1 0 0		OMAP
0 0 0 0 0 1 0 1		MAP (Mobile Application Part)
0 0 0 0 0 1 1 0		
to	spare	
1 1 1 1 1 1 1 0		
1 1 1 1 1 1 1 1		reserved for expansion.

Network specific subsystem numbers should be assigned in descending order starting with ‘‘11111110’’.

3.4.2.3 *Global title* |

The format of the global title is of variable length. Figure 7/Q.913, Figure 9/Q.713, Figure 10/Q.713 and Figure 11/Q.713 show four possible formats for global title.

Incorporation of NSAP address in the SCCP global title is for further study.

3.4.2.3.1 *Global title indicator = 0001*

Figure 7/Q.713 [T8.713], p. (a traiter comme tableau MEP)

Bits 1 to 7 of octet 1 contain the nature of address indicator and are coded as follows:

Bits 7 6 5 4 3 2 1

0 0 0 0 0 0 0 spare

0 0 0 0 0 0 1 subscriber number

0 0 0 0 0 1 0 reserved for national use

0 0 0 0 0 1 1 national significant number

0 0 0 0 1 0 0 international number

0 0 0 0 1 0 1

to spare

1 1 1 1 1 1 1

Bit 8 of octet 1 contains the odd/even indicator and is coded as follows:

Bit 8

0 even number of address signals

1 odd number of address signals

The octets 2 and further contain a number of address signals and possibly a filler as shown in Figure 8/Q.713.

Figure 8/Q.713 [T9.713], p. (a traiter comme tableau MEP)

Each address signal is coded as follows:

The application of these codes in actual networks is for further study.

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

1011 code 11

1100 code 12

1101 spare

1110 spare

1111 ST

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

3.4.2.3.2 *Global title indicator = 0010*

Figure 9/Q.713 shows the format of the global title, if the global title indicator equals ‘‘0010’’.

Figure 9/Q.713 [T10.713], p. (a traiter comme tableau MEP)

The translation type is a one-octet field that is used to direct the message to the appropriate global title translation function.

A translation type may for instance imply a specific service to be provided by the SCCP user, such as free phone number translation, or identify the category of service to be provided, for example, dialed number screening, password validation or transmission of digits to telephone network address.

Thus, it may be possible for the address information to be translated into different values for and different combinations of DPCs, SSNs and GTs.

This octet will be coded ‘‘00000000’’ when not used. Translation types for internetwork services will be assigned in ascending order starting with 00000001’’. Translation types for network specific services will be assigned in descending order starting with ‘‘11111110’’. The code ‘‘11111111’’ is reserved for expansion. However, the exact coding of translation types in the international network is for further study. Additional requirements may be placed on this field as a result of further work on Transaction Capabilities and the ISDN User Part.

In the case of this global title format (0010), the translation type may also imply the encoding scheme, used to encode the address information, and the numbering plan.

3.4.2.3.3 *Global title indicator = 0011*

Figure 10/Q.713 [T11.713], p. (a traiter comme tableau MEP)

The translation type is as described in § 3.4.2.3.2.

The numbering plan is encoded as follows :

Bits 8 7 6 5

0 0 0 0 unknown

0 0 0 1 ISDN/Telephony Numbering Plan (Recommendations E.163 and E.164)

0 0 1 0 spare

0 0 1 1 Data Numbering Plan (Recommendation X.121)

0 1 0 0 Telex Numbering Plan (Recommendation F.69)

0 1 0 1 Maritime Mobile Numbering Plan (Recommendations E.210, 211)

0 1 1 0 Land Mobile Numbering Plan (Recommendation E.212)

0 1 1 1 ISDN/Mobile numbering plan (Recommendation E.214)

1 0 0 0

| o spare

1 1 1 0

1 1 1 1 reserved

The encoding scheme is encoded as follows:

Bits 4 3 2 1

0 0 0 0 unknown

The support of all numbering plans is not mandatory.

0 0 0 1 BCD, odd number of digits

0 0 1 0 BCD, even number of digits

0 0 1 1

| o spare

1 1 1 0

1 1 1 1 reserved.

If the encoding scheme is binary coded decimal, the global title value, starting from octet 3, is encoded as shown in Figure 8/Q.713.

3.4.2.3.4 *Global title indicator = 0100*

Figure 11/Q.713 [T12.713], p. (à traiter comme tableau MEP)

The field ‘‘translation type’’ is as described in § 3.4.2.3.2. The fields ‘‘numbering plan’’ and ‘‘encoding scheme’’ are as described in § 3.4.2.3.3. The field ‘‘nature of address indicator’’ is as described in § 3.4.2.3.1.

If the encoding scheme is binary coded decimal, the global title value, starting from octet 4, is encoded as shown in Figure 8/Q.713.

3.5 *Calling party address*

The ‘‘calling party address’’ is a variable length parameter. Its structure is the same as the ‘‘called party address’’.

When the calling party address is a mandatory parameter but is not available or must not be sent, the calling party address parameter only consists of the address indicator octet, where bits 1 to 7 are coded all zeros.

3.6 *Protocol class*

The ‘‘protocol class’’ parameter field is a four bit field containing the protocol class.

Bits 1-4 are coded as follows:

4321

0000 class 0

0001 class 1

0010 class 2

0011 class 3

When bits 1-4 are coded to indicate a connection-oriented-protocol class (class 2, class 3), bits 5-8 are spare.

When bits 1-4 are coded to indicate a connectionless protocol class (class 0, class 1), bits 5-8 are used to specify message handling as follows:

Bits 8 7 6 5

0 0 0 0 no special options

0 0 0 1

| o spare

0 1 1 1

1 0 0 0 return message on error

1 0 0 1

| o spare

1 1 1 1

3.7 *Segmenting/reassembling*

The ‘‘segmenting/reassembling’’ parameter field is a one octet field and is structured as follows:

H.T. [T13.713]

8	7	6	5	4	3	2	1
reserve	M						

Tableau [T13.713], p.

Bits 8-2 are spare.

Bit 1 is used for the More Data indication and is coded as follows:

0 = no more data

1 = more data

3.8 *Receive sequence number*

The ‘‘receive sequence number’’ parameter field is a one octet field and is structured as follows:

H.T. [T14.713]

8	7	6	5	4	3	2	1
P(R)	/						

Tableau [T14.713], p.

Bits 8-2 contain the receive sequence number P(R) used to indicate the sequence number of the next expected message. P(R) is binary coded and bit 2 is the LSB.

Bit 1 is spare.

3.9 *Sequencing/segmenting*

The sequencing/segmenting parameter field consists of two octets and is structured as follows:

H.T. [T15.713]

8	7	6	5	4	3	2	1	
octet 1	P(S)	/						
octet 2	P(R)	M						

Tableau [T15.713], p.

Bits 8-2 of octet 1 are used for indicating the send sequence number P(S). P(S) is binary coded and bit 2 is the LSB.

Bit 1 of octet 1 is spare.

Bits 8-2 of octet 2 are used for indicating the receive sequence number P(R). P(R) is binary coded and bit 2 is the LSB.

Bit 1 of octet 2 is used for the More Data indication and is coded as follows:

0 = no more data

1 = more data

The sequencing/segmenting parameter field is used exclusively in protocol class 3.

3.10 *Credit*

The ‘‘credit’’ parameter field is a one-octet field used in the protocol classes which include flow control functions. It contains the window size value coded in pure binary.

3.11 *Release cause*

The release cause parameter field is a one-octet field containing the reason for the release of the connection.

The coding of the release cause field is as follows:

Subsystem congestion control procedure is for further study.

Bits 8 7 6 5 4 3 2 1

0 0 0 0 0 0 0 0 end user originated

0 0 0 0 0 0 0 1 end user congestion

0 0 0 0 0 0 1 0 end user failure

0 0 0 0 0 0 1 1 SCCP user originated

0 0 0 0 0 1 0 0 remote procedure error

0 0 0 0 0 1 0 1 inconsistent connection data

0 0 0 0 0 1 1 0 access failure

0 0 0 0 0 1 1 1 access congestion

0 0 0 0 1 0 0 0 subsystem failure

0 0 0 0 1 0 0 1 subsystem congestion

0 0 0 0 1 0 1 0 network failure

0 0 0 0 1 0 1 1 network congestion

0 0 0 0 1 1 0 0 expiration of reset timer

0 0 0 0 1 1 0 1 expiration of receive inactivity timer

0 0 0 0 1 1 1 0 not obtainable

0 0 0 0 1 1 1 1 unqualified

0 0 0 1 0 0 0 0

| o spare

1 1 1 1 1 1 1 1

Note — A more comprehensive list of causes covering X.96 call progress information is for further study.

3.12 *Return cause*

In the *Unitdata Service* message, the <<return cause>> parameter field is a one octet field containing the reason for message return. Bits 1-8 are coded as follows:

Bits 8 7 6 5 4 3 2 1

0 0 0 0 0 0 0 0 no translation for an address of such nature

0 0 0 0 0 0 0 1 no translation for this specific address

0 0 0 0 0 0 1 0 subsystem congestion

0 0 0 0 0 0 1 1 subsystem failure

0 0 0 0 0 1 0 0 unequipped user

0 0 0 0 0 1 0 1 network failure

0 0 0 0 0 1 1 0 network congestion

0 0 0 0 0 1 1 1 unqualified

0 0 0 0 1 0 0 0

| o spare

1 1 1 1 1 1 1 1

3.13 *Reset cause*

The ‘‘reset cause’’ parameter field is a one octet field containing the reason for the resetting of the connection.

The coding of the reset cause field is as follows:

Bits 8 7 6 5 4 3 2 1

0 0 0 0 0 0 0 0 end user originated

0 0 0 0 0 0 0 1 SCCP user originated

0 0 0 0 0 0 1 0 message out of order — incorrect P(S)

0 0 0 0 0 0 1 1 message out of order — incorrect P(R)

0 0 0 0 0 1 0 0 remote procedure error — message out of window

0 0 0 0 0 1 0 1 remote procedure error — incorrect P(S) after (re)initialization

0 0 0 0 0 1 1 0 remote procedure error — general

0 0 0 0 0 1 1 1 remote end user operational

0 0 0 0 1 0 0 0 network operational

0 0 0 0 1 0 0 1 access operational

0 0 0 0 1 0 1 0 network congestion

0 0 0 0 1 0 1 1 not obtainable

0 0 0 0 1 1 0 0 unqualified

0 0 0 0 1 1 0 1

| o spare

1 1 1 1 1 1 1 1

3.14 *Error cause*

The ‘‘error cause’’ parameter field is a one octet field containing the indication of the exact protocol error.

The coding of the error cause field is as follows:

Bits 8 7 6 5 4 3 2 1

0 0 0 0 0 0 0 0 local reference number (LRN) mismatch — unassigned destination LRN

0 0 0 0 0 0 0 1 local reference number (LRN) mismatch — inconsistent source LRN

0 0 0 0 0 0 1 0 point code mismatch

0 0 0 0 0 0 1 1 service class mismatch

0 0 0 0 0 1 0 0 unqualified

0 0 0 0 0 1 0 1

| o spare

1 1 1 1 1 1 1 1

National option.

3.15 *Refusal cause*

The refusal cause parameter field is a one octet field containing the reason for the refusal of the connection.

The coding of the refusal cause field is as follows:

Bits 8 7 6 5 4 3 2 1

0 0 0 0 0 0 0 0 end user originated

0 0 0 0 0 0 0 1 end user congestion

0 0 0 0 0 0 1 0 end user failure

0 0 0 0 0 0 1 1 SCCP user originated

0 0 0 0 0 1 0 0 destination address unknown

0 0 0 0 0 1 0 1 destination inaccessible

0 0 0 0 0 1 1 0 network resource — QOS not available/non-transient

0 0 0 0 0 1 1 1 network resource — QOS not available/transient

0 0 0 0 1 0 0 0 access failure

0 0 0 0 1 0 0 1 access congestion

0 0 0 0 1 0 1 0 subsystem failure

0 0 0 0 1 0 1 1 subsystem congestion

0 0 0 0 1 1 0 0 expiration of the connection establishment timer

0 0 0 0 1 1 0 1 incompatible user data

0 0 0 0 1 1 1 0 not obtainable

0 0 0 0 1 1 1 1 unqualified

0 0 0 1 0 0 0 0

| o spare

1 1 1 1 1 1 1 1

Note 1 — The inclusion of the routing failure causes as specified for the ‘‘return cause’’ parameter in Recommendation Q.713, § 3.12, is for further study.

Note 2 — A more comprehensive list of causes covering CCITT Recommendation X.96 call progress information is for further study.

3.16 *Data*

The ‘‘data’’ parameter field is a variable length field containing SCCP-user data to be transferred transparently between the SCCP user functions.

4 SCCP messages and codes

4.1 *General*

4.1.1 In the following sections, the format and coding of the SCCP messages is specified.

For each message a list of the relevant parameters is given in a tabular form.

4.1.2 For each parameter the table also includes:

— *a reference* | o the section where the formatting and coding of the parameter content is specified;

— *the type* | f 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* | f the parameter. The value in the table includes:

— *for type F parameters* | he length, in octets, of the parameter content;

— *for type V parameters* | he length, in octets, of the length indicator and of the parameter content; (The minimum and the maximum length are indicated.)

— *for type O parameters* | he length, in octets, of the parameter name, length indicator and parameter content. (For variable length parameters the minimum and maximum length is indicated.)

4.1.3 For each message the number of pointers included is also specified.

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

4.2 *Connection request (CR)*

The CR message contains:

— the routing label,

— 2 pointers,

— the parameters indicated in Table 3/Q.713.

4.3 *Connection confirm (CC)*

The CC message contains:

— the routing label,

— 1 pointer,

— the parameters indicated in Table 4/Q.713.

4.4 *Connection refused (CREF)*

The message contains:

— the routing label,

— 1 pointer,

— the parameters indicated in Table 5/Q.713.

4.5 *Released (RLSD)*

The RLSD message contains:

— the routing label,

— 1 pointer,

— the parameters indicated in Table 6/Q.713.

4.6 *Release complete (RLC)*

The RLC message contains:

— the routing label,

— no pointers,

— the parameters indicated in Table 7/Q.713.

4.7 *Data form 1 (DT1)*

The DT1 message contains:

— the routing label,

— 1 pointer,

— the parameters indicated in Table 8/Q.713.

4.8 *Data form 2 (DT2)*

The DT2 message contains:

— the routing label,

— 1 pointer,

— the parameters indicated in Table 9/Q.713.

H.T. [T16.713]
TABLE 3/Q.713
Message type: Connection request

Parameter	§	Type (F V O)	Length (octets)
Message type code	2.1	F	1
Source local reference	3.3	F	3
Protocol class	3.6	F	1
Called party address	3.4	V	3 minimum
Credit	3.10	O	3
Calling party address	3.5	O	4 minimum
Data	3.16	O	3 | (hy | 30
End of optional parameters	3.1	O	1

Tableau 3/Q.713 [T16.713], p.19

H.T. [T17.713]
TABLE 4/Q.713
Message type: Connection confirm

Parameter	§	Type (F V O)	Length (octets)
Message type	2.1	F	1
Destination local reference	3.2	F	3
Source local reference	3.3	F	3
Protocol class	3.6	F	1
Credit	3.10	O	3
Called party address	3.4	O	4 minimum
Data	3.16	O	3 | (hy | 30
End of optional parameter	3.1	O	1

Tableau 4/Q.713 [T17.713], p.20

H.T. [T18.713]

TABLE 5/Q.713

Message type: Connection refused

Parameter	§	Type (F V O)	Length (octets)
Message type	2.1	F	1
Destination local reference	3.2	F	3
Refusal cause	3.15	F	1
Called party address	3.4	O	4 minimum
Data	3.16	O	3 | (hy | 30
End of optional parameter	3.1	O	1

Tableau 5/Q.713 [T18.713], p.21

H.T. [T19.713]

TABLE 6/Q.713

Message type: Released

Parameter	§	Type (F V O)	Length (octets)
Message type	2.1	F	1
Destination local reference	3.2	F	3
Source local reference	3.3	F	3
Release cause	3.11	F	1
Data	3.16	O	3 | (hy | 30
End of optional parameter	3.1	O	1

Tableau 6/Q.713 [T19.713], p.22

Blanc

H.T. [T20.713]
TABLE 7/Q.713
Message type: Release complete

Parameter	§	Type (F V O)	Length (octets)
Message type	2.1	F	1
Destination local reference	3.2	F	3
Source local reference	3.3	F	3

Tableau 7/Q.713 [T20.713], p.23

H.T. [T21.713]
TABLE 8/Q.713
Message type: Data form 1

Parameter	§	Type (F V O)	Length (octets)
Message type	2.1	F	1
Destination local reference	3.2	F	3
Segmenting/reassembling	3.7	F	1
Data	3.16	V	2 | (hy | 56

Tableau 8/Q.713 [T21.713], p.24

H.T. [T22.713]
TABLE 9/Q.713
Message type: Data form 2

Parameter	§	Type (F V O)	Length (octets)
Message type	2.1	F	1
Destination local reference	3.2	F	3
Sequencing/Segmenting	3.9	F	2
Data	3.16	V	2 | (hy | 56

Table 9/Q.713 [T22.713], p.

4.9 *Data acknowledgement (AK)*

The AK message contains:

— the routing label,

— no pointers,

— the parameters indicated in Table 10/Q.713.

H.T. [T23.713]

TABLE 10/Q.713

Message type: Data acknowledgement

Parameter	§	Type (F V O)	Length (octets)
Message type	2.1	F	1
Destination local reference	3.2	F	3
Receive sequence number	3.8	F	1
Credit	3.10	F	1

Table 10/Q.713 [T23.713], p.

4.10 *Unitdata (UDT)*

The UDT message contains:

— the routing label,

— 3 pointers,

— the parameters indicated in Table 11/Q.713.

H.T. [T24.713]

TABLE 11/Q.713

Message type: Unitdata

Parameter	§	Type (F V O)	Length (octets)
Message type	2.1	F	1
Protocol class	3.6	F	1
Called party address	3.4	V	3 minimum
Calling party address	3.5	V	2 minimum
Data	3.16	V	2 | (hy | | ua)

a) Due to the ongoing studies on the SCCP called and calling party address, the maximum length of this parameter needs further study. It is also noted that the transfer of up to 255 octets of user data is allowed when the SCCP called and calling party address do not include global title.

Table 11/Q.713 [T24.713], p.

4.11 *Unitdata service (UDTS)*

The UDTS message contains:

— the routing label,

— 3 pointers,

— the parameters indicated in Table 12/Q.713.

H.T. [T25.713]
TABLE 12/Q.713
Message type: Unitdata service

Parameter	§	Type (F V O)	Length (octets)
Message type	2.1	F	1
Return cause	3.12	F	1
Called party address	3.4	V	3 minimum
Calling party address	3.5	V	2 minimum
Data	3.16	V	2 | (hy | | ua)

a) See a) Table 11/Q.713.

Table 12/Q.713 [T25.713], p.

4.12 *Expedited data (ED)*

The ED message contains:

— the routing label,

— 1 pointer,

— the parameters indicated in Table 13/Q.713.

H.T. [T26.713]
TABLE 13/Q.713
Message type: Expedited data

Parameter	§	Type (F V O)	Length (octets)
Message type	2.1	F	1
Destination local reference	3.2	F	3
Data	3.16	V	2 | (hy | 3

Table 13/Q.713 [T26.713], p.

4.13 *Expedited data acknowledgement (EA)*

The EA message contains:

— the routing label,

— no pointers,

— the parameters indicated in Table 14/Q.713.

H.T. [T27.713]
TABLE 14/Q.713
Message type: Expedited data acknowledgement

Parameter	§	Type (F V O)	Length (octets)
Message type	2.1	F	1
Destination local reference	3.2	F	3

Table 14/Q.713 [T27.713], p.

4.14 *Reset request (RSR)*

The RSR message contains:

— the routing label,

— 1 pointer,

— the parameters indicated in Table 15/Q.713.

H.T. [T28.713]
TABLE 15/Q.713
Message type: Reset request

Parameter	§	Type (F V O)	Length (octets)
Message type	2.1	F	1
Destination local reference	3.2	F	3
Source local reference	3.3	F	3
Reset cause	3.13	F	1

Table 15/Q.713 [T28.713], p.

4.15 *Reset confirm (RSC)*

The RSC message contains:

— the routing label,

— no pointers,

— the parameters indicated in Table 16/Q.713.

H.T. [T29.713]
TABLE 16/Q.713
Message type: Reset confirmation

Parameter	§	Type (F V O)	Length (octets)
Message type	2.1	F	1
Destination local reference	3.2	F	3
Source local reference	3.3	F	3

Table 16/Q.713 [T29.713], p.

4.16 *Protocol data unit error (ERR)*

The ERR message contains:

— the routing label,

— 1 pointer,

— the parameters indicated in Table 17/Q.713.

H.T. [T30.713]
TABLE 17/Q.713
Message type: Protocol data unit error

Parameter	§	Type (F V O)	Length (octets)
Message type	2.1	F	1
Destination local reference	3.2	F	3
Error cause	3.14	F	1

Table 17/Q.713 [T30.713], p.

4.17 *Inactivity test (IT)*

The IT message contains:

— the routing label,

— no pointers,

— the parameters indicated in Table 18/Q.713.

H.T. [T31.713]
TABLE 18/Q.713
Message type: Inactivity test

Parameter	§	Type (F V O)	Length (octets)
Message type	2.1	F	1
Destination local reference	3.2	F	3
Source local reference	3.3	F	3
Protocol class	3.6	F	1
{ Sequencing/segmenting | ua) }	3.9	F	2
Credit | ua)	3.10	F	1

a) Information in these parameter fields reflect those values sent in the last data Form 2 or Data acknowledgement message. They are ignored if the protocol class parameter indicates class 2.

Table 18/Q.713 [T31.713], p.

5 SCCP Management messages and codes

5.1 *General*

SCCP Management (SCMG) messages are carried using the connectionless service of the SCCP. When transferring SCMG messages, class 0 is requested with the ‘‘discard message on error’’ option. SCCP management message parts are provided in the ‘‘data’’ parameter of the *Unitdata message* .

The *Unitdata* message contains:

— the routing label,

— 3 pointers,

— the parameters indicated in Table 19/Q.713.

Descriptions of the various parts are contained in the following sections.

H.T. [T32.713]

TABLE 19/Q.713

SCCP management message format

Parameter	§	Type (F V O)	Length (octets)
Message type (= Unitdata)	2.1	F	1

{
Protocol class
(= Class 0, no return)
}
	3.6	F	1

{
Called party address
(SSN = SCCP management)
}
	3.4	V	3 minimum

{
Calling party address
(SSN = SCCP management)
}
	3.5	V	3 minimum | ua)

{
Data
(Data consists of an SCMG message with form as in Table 22/Q.713)
}
	3.16	V	6

a) SSN is always present.

Table 19/Q.713 [T32.713], p.

5.1.1 *SCMG format identifier*

The SCMG format identifier consists of a one-octet field, which is mandatory for all SCMG messages. The SCMG format identifier uniquely defines the function and format of each SCMG message. The allocation of SCMG format identifiers is shown in Table 20/Q.713.

H.T. [T33.713]

TABLE 20/Q.713

SCMG format identifiers

Message	Code 87654321
SSA Subsystem-Allowed	00000001
SSP Subsystem-Prohibited	00000010

{
SST Subsystem-Status-Test
}
	00000011

{
SOR Subsystem-Out-of-Service-Request
}
	00000100

{
SOG Subsystem-Out-of-Service-Grant
}
	00000101

Table 20/Q.713 [T33.713], p.

5.1.2 *Formatting principles*

The formatting principles used for SCCP messages, as described in §§ 1.3, 1.4, 1.5, 1.6, 2.2 and 2.3 apply to SCMG messages.

5.2 *SCMG message parameters*

SCMG parameter name codes are given in Table 21/Q.713 with reference to the subsections in which they are described. Presently, these parameter name codes are not used since all SCMG messages contain mandatory fixed parameters only.

H.T. [T34.713]

TABLE 21/Q.713

SCMG parameter name codes

Parameter name	§	Parameter name code 87654321
End of optional parameters	5.2.1	00000000
Affected SSN	5.2.2	00000001
Affected PC	5.2.3	00000010

{
Subsystem multiplicity indicator
}
	5.2.4	00000011

Table 21/Q.713 [T34.713], p.

5.2.1 *End of optional parameters*

The ‘‘end of optional parameters’’ parameter field consists of a single octet containing all zeros.

5.2.2 *Affected SSN*

The ‘‘affected subsystem number (SSN)’’ parameter field consists of one octet coded as directed for the called party address field, § 3.4.2.1.

5.2.3 *Affected PC*

The ‘‘affected signalling point code (PC)’’ parameter field is represented by two octets which are coded as directed for the called party address field, § 3.4.2.2.

5.2.4 *Subsystem multiplicity indicator*

The ‘‘subsystem multiplicity indicator’’ parameter field consists of one octet coded as shown in Figure 12/Q.713.

Figura 12/Q.713 [T35.713], p. (a traiter comme tableau MEP)

The coding of the SMI field is as follows:

Bits 21

00 affected subsystem multiplicity unknown

01 affected subsystem is solitary

10 affected subsystem is duplicated

11 spare

Bits 3-8 are spare.

5.3 *SCMG messages*

Presently, all SCMG messages contain mandatory fixed parameters only. Each SCMG message contains:

— 0 pointers

— the parameters indicated in Table 22/Q.713.

H.T. [T36.713]

TABLE 22/Q.713

SCMG Message

Parameter	§	Type (F V O)	Length (octets)

{
SCMG format identifier
(Message type code)
}
	5.1.1	F	1

Affected SSN	5.2.2	F	1
Affected PC	5.2.3	F	2

{
Subsystem multiplicity indicator
}
	5.2.4	F	1

Table 22/Q.713 [T36.713], p.

ANNEX A

(to Recommendation Q.713)

Mapping for cause parameter values

A.1 *Introduction*

During connection refusal/release/reset, the SCCP and its users could take necessary corrective actions, if any, only upon relevant information available to them. Thus, it would be very helpful if those information could be conveyed correctly.

During connection release, the ‘‘release cause’’ parameter in the *Released* (RLSD) message and the N-DISCONNECT primitive (with parameters ‘‘originator’’ and ‘‘reason’’) are used together to convey those information on the initiator and the cause of the connection release. In addition, the N-DISCONNECT primitive is also used together with the ‘‘refusal cause’’ parameter

in the *Connection Refused* (CREF) message to convey those information during connection refusal. During connection reset, the ‘‘reset cause’’ parameter in the *Reset Request* (RSR) message and the N-RESET primitive (with parameters ‘‘originator’’ and ‘‘reason’’) are used together similarly.

In order to convey those information correctly, this Annex provides a guideline for the mapping of values between the cause parameters and the corresponding N-primitive parameters during various scenarios.

A.2 *Connection refusal*

Table A-1/Q.713 describes the mapping of values between the ‘‘refusal cause’’ parameter (§ 3.15, Rec. Q.713) and the ‘‘originator’’, ‘‘reason’’ parameters in the N-DISCONNECT primitive (§ 2.1.1.2.4, Rec. Q.711).

A.3 *Connection release*

Table A-2/Q.713 describes the mapping of values between the ‘‘release cause’’ parameter (§ 3.11, Rec. Q.713) and the ‘‘originator’’, ‘‘reason’’ parameters in the N-DISCONNECT primitive (§ 2.1.1.2.4, Rec. Q.711).

A.4 *Connection reset*

Table A-3/Q.713 describes the mapping of values between the ‘‘reset cause’’ parameter (§ 3.13, Rec. Q.713) and the ‘‘originator’’, ‘‘reason’’ parameters in the N-RESET primitive (§ 2.1.1.2.3, Rec. Q.711).

Blanc

H.T. [T37.713]

TABLE A-1/Q.713

Mapping during connection refusal

CREF Message		N-DISCONNECT primitive	
Code	Refusal cause	Reason	Originator
00000000 connection refusal — end user originated }	end user originated NSU	{	
00000001 connection refusal — end user congestion }	end user congestion NSU	{	
00000010 connection refusal — end user failure }	end user failure NSU	{	
00000011 connection refusal — SCCP user originated }	SCCP user originated NSU	{	
00000100 connection refusal — destination address unknown (non-transient condition) }	destination address unknown NSP	{	
00000101 connection refusal — destination inaccessible/transient condition }	destination inaccessible NSP	{	
00000110 network resource — QOS unavailable/non-transient } connection refusal — QOS unavailable/non-transient condition }	{ { NSP | ua)		
00000111 network resource — QOS unavailable/transient } connection refusal — QOS unavailable/transient condition }	{ { NSP | ua)		
00001000 connection refusal — access failure }	access failure NSU	{	
00001001 connection refusal — access congestion }	access congestion NSU	{	
00001010 connection refusal — destination inaccessible/non-transient condition }	subsystem failure NSP	{	
00001011 connection refusal — subsystem congestion }	subsystem congestion NSU	{	
00001100 expiration of connection estimated timer } connection refusal — reason unspecified/transient }	{ { NSP | ua)		
00001101 connection refusal — incompatible information in NSDU }	inconsistent user data NSU	{	
00001110 connection refusal — reason unspecified/transient }	not obtainable NSP | ua)	{	
00001110 connection refusal — undefined }	not obtainable undefined	{	
00001111 connection refusal — reason unspecified/transient	unqualified	{	

}	NSP | ua)		
00001111 connection refusal — undefined	unqualified	{	
}	undefined		

NSU Network Service User

NSP Network Service Provider

a) Only those cases will be applicable if the SCCP originates the refusal procedure in response to REQUEST interface element.

Tableau A-1/Q.713 [T37.713], p.40

H.T. [T38.713]

TABLE A-2/Q.713

Mapping during connection release

RLSD Message		N-DISCONNECT primitive	
Code	Release cause	Reason	Originator
00000000 disconnection — normal condition }	end user originated NSU	{	
00000001 disconnection — end user congestion }	end user congestion NSU	{	
00000010 disconnection — end user failure }	end user failure NSU	{	
00000011 disconnection — SCCP user originated }	SCCP user originated NSU	{	
00000100 disconnection — abnormal condition of transient nature }	remote procedure error NSP	{	
00000101 disconnection — abnormal condition of transient nature }	inconsistent connection data NSP	{	
00000110 disconnection — access failure }	access failure NSU	{	
00000111 disconnection — access congestion }	access congestion NSU	{	
00001000 disconnection — abnormal condition of non-transient nature }	subsystem failure NSP	{	
00001001 disconnection — subsystem congestion }	subsystem congestion NSU	{	
00001010 disconnection — abnormal condition of non-transient nature }	network failure NSP	{	
00001011 disconnection — abnormal condition of transient nature }	network congestion NSP	{	
00001100 disconnection — abnormal condition of transient nature }	expiration of reset timer NSP	{	
00001101 expiration of receive inactivity timer } disconnection — abnormal condition of transient nature }	{ { NSP		
00001110	not obtainable | ua)	disconnection — undefined	NSP
00001110	not obtainable | ua)	disconnection — undefined	undefined
00001111 disconnection — abnormal condition }	unqualified NSU	{	
00001111	unqualified	disconnection — undefined	NSP
00001111	unqualified	disconnection — undefined	undefined

NSU Network Service User

NSP Network Service Provider

a) The need for this value is for further study.

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TABLE A-3/Q.713

Mapping during connection reset

RSR Message		N-RESET primitive	
Code	Reset cause	Reason	Originator
00000000 reset — user synchronization }	end user originated NSU	{	
00000001 reset — user synchronization }	SCCP user originated NSU	{	
00000010 message out of order — incorrect P(S) }	{ reset — unspecified	 NSP	
00000011 message out of order — incorrect P(R) }	{ reset — unspecified	 NSP	
00000100 remote procedure error — message out of window }	{ reset — unspecified	 NSP	
00000101 remote procedure error — incorrect P(S) after initialization }	{ reset — unspecified	 NSP	
00000110 remote procedure error — general }	{ reset — unspecified	 NSP	
00000111 reset — user synchronization }	remote end user operational NSU	{	
00001000	network operational	reset — unspecified	NSP
00001001 reset — user synchronization }	access operational NSU	{	
00001010	network congestion	reset — network congestion	NSP
00001011	not obtainable | ua)	reset — unspecified	NSP
00001011	not obtainable | ua)	reset — undefined	undefined
00001100	unqualified	reset — unspecified	NSP
00001100	unqualified	reset — undefined	undefined

NSU Network Service User

NSP Network Service Provider

a) The need for this value is for further study.

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