

PNO-ISC Information Document Number 004 Proprietary Extensions to C7 Interconnect User Part (IUP)

ICS 33.040.35

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

BSI
Documents

AVA

Document Sharing Hub

National foreword

This Published Document has been prepared by Technical Committee TCT/50. It describes the proprietary extensions to the C7 Interconnect User Part (IUP) protocol.

This Published Document contains ISC references to other documents, which are published as Published Documents. The following list cross-references these against existing PD publications:

PD 6645	PNO-ISC/SPEC/006
PD 6623	PNO-ISC/SPEC/007
PD 6651	PNO-ISC/SPEC/008

This Published Document is not to be regarded as a British Standard.

Summary of pages

This document comprises a front cover, an inside front cover, pages 0-1 to 0-12, pages 1-1 to 1-4, pages 2-1 to 2-24, pages 3-1 to 3-18, pages 4-1 to 4-2, pages 5-1 to 5-24, pages 6-1 to 6-38, pages 7-1 to 7-18, page 8-1 and a back cover.

The BSI copyright notice displayed in this document indicates when the document was last issued.

This British Standard, having been prepared under the direction of the DISC Board, was published under the authority of the Standards Committee and comes into effect on 15 January 2000

© BSI 01-2000

Amendments issued since publication

Amd. No.	Date	Comments

**PNO-ISC INFORMATION DOCUMENT NUMBER 004
PROPRIETARY EXTENSIONS TO
C7 INTERCONNECT USER PART (IUP)**

NETWORK INTEROPERABILITY CONSULTATIVE COMMITTEE

Office of Telecommunications

50 Ludgate Hill

London EC4M 7JJ

0.2 Normative Information

All enquiries about distribution reproduction and clarifications should be addressed in the first instance to the Chairman of the NICC/PNO-IG/ISC at the address on the title page.

DISCLAIMER The information contained herein is the property of the NICC and is supplied without liability for errors or omissions.

0.3 Contents

0 PREFACE	0-1
0.1 Title	0-1
0.2 Normative Information	0-2
0.3 Contents	0-3
0.4 History	0-6
0.5 Issue Control	0-6
0.6 References	0-7
0.7 Glossary of Terms	0-8
0.7.1 Abbreviations	0-8
0.7.2 Terminology	0-11
1. INTRODUCTION	1-1
1.0 Scope	1-1
1.1 Definitions of Terms Used in PNO-ISC/INFO/004	1-2
1.2 Scope of PNO-ISC/INFO/004	1-2
1.3 Contents of PNO-ISC/INFO/004	1-3
2 MESSAGE TYPES AND CONTENTS	2-1
2.0 Scope	2-1
2.1 General	2-2
2.2 Message Groups and Types	2-3
2.2.1 Message Groups	2-3
2.3 Message Contents	2-5
2.3.7 Call Drop Back (CDB) Message	2-5
2.3.20 Nodal End-to-End Data (NEED) Message	2-6
2.3.21 Operator Condition Message (OCM)	2-6
2.3.41 User-to-User Data (UUD) Message	2-7
2.3.42 Enveloped-ISUP Message (EIM)	2-7
2.3.43 Enveloped-ISUP Segmented Message (EISM)	2-8
2.3.44 Protocol Negotiation Message (PNM)	2-8
2.3.45 OSS Node to Node Message (ONN)	2-8
2.4 Parameter Formats and Code Allocations	2-9
2.4.2 Additional Call Information Message Information Contained and Information Requested	2-9
2.4.6 Additional Call Information Message, Type 8 - Message Indicators	2-9
2.4.9 Called Address	2-11
2.4.16 IAM/IFAM Message Indicators	2-11
2.4.20 Nodal End-to-End Data Message - Content Qualifier	2-12
2.4.21 Nodal End-to-End Data	2-12
2.4.22 Operator Condition Indicators	2-13
2.4.31 User-to-User Data	2-14
2.4.32 Call Drop Back Message - Calling Line Information Indicator	2-15
2.4.33 Call Drop Back Message - Call Log Indicators	2-15
2.4.34 Call Drop Back Message - Service Control Point (SCP) Information	2-16
2.4.35 Call Drop Back Message - Translated Address	2-18
2.4.37 ISUP Message	2-20
2.4.38 EISM Segmentation Information	2-21

2.4.39 ISUP Message Segment	2-22
2.4.40 Protocol Negotiation Message Indicators.....	2-23
3. COMMON PROCEDURES.....	3-1
3.0 Scope	3-1
3.1 General	3-2
3.2 Common Call Control Procedures.....	3-3
3.2.1 Bearer Establishment Protocol	3-5
3.2.2 Call Establishment.....	3-6
3.2.4 Bearer Release Protocols.....	3-14
3.2.5 Transit Network Procedures	3-14
3.2.6 Treatment of Reserved Fields and Values.....	3-14
3.3. Call Control Error Handling Procedures	3-17
3.4 Circuit Blocking / Unblocking Procedures.....	3-17
3.5 Timer Table.....	3-17
4 DELETED.....	4-1
5 RING BACK WHEN FREE	5-1
5.0 Scope	5-1
5.1 Service Overview	5-2
5.1.1 General.....	5-2
5.1.2 Activation.....	5-2
5.1.3 Deactivation.....	5-2
5.1.4 Invocation and Operation.....	5-2
5.1.5 Exceptional Procedures - Invocation and Operation	5-2
5.2 Formats and codes	5-3
5.2.2 IUP ACI Type 8.....	5-3
5.2.3 IUP NEED	5-3
5.2.4 CNA/RELEASE message	5-4
5.2.5 DPNSS ISRM	5-4
5.2.6 DPNSS CRM.....	5-5
5.2.7 DPNSS NAM	5-6
5.2.8 DPNSS EEM	5-6
5.3 Signalling procedures	5-7
5.3.1 General.....	5-7
5.3.2 Bearer Call	5-7
5.3.3 Initial Call to Busy User.....	5-9
5.3.4 RBWF-Request	5-9
5.3.5 RBWF Free Notification	5-11
5.3.6 RBWF Call.....	5-14
5.3.7 RBWF Cancel Request.....	5-17
5.3.8 Call Clear.....	5-18
5.3.9 Error and Exceptional Situations.....	5-19
5.4 Message sequence diagrams.....	5-20
5.4.1 RBWF Request.....	5-20
5.4.2 RBWF Free Notification	5-21
5.4.3 RBWF Call.....	5-22
5.4.4 RBWF Cancel Request.....	5-23

6	ENHANCEMENTS TO IUP TO PROVIDE ENVELOPED ISUP.....	6-1
6.0	Scope.....	6-1
6.1	SERVICE OVERVIEW.....	6-1
6.1.1	General	6-1
6.1.2	Key Features.....	6-3
6.2	Formats And Codes.....	6-5
6.2.1	Enveloped-ISUP.....	6-5
6.2.2	ISUP Message as conveyed in Enveloped-ISUP	6-5
6.3	Signalling Procedures.....	6-6
6.3.1	Establishment of Enveloped-ISUP call using En-bloc signalling	6-7
6.3.2	Establishment of Enveloped-ISUP call using IAMs with digit-by-digit signalling.....	6-19
6.3.3	Modifications to ISUP as used by Enveloped-ISUP.....	6-23
6.3.4	Modification to IUP as used by Enveloped-ISUP.....	6-27
6.3.6	IUP Segmentation/Reassembly Procedures for EIMs	6-32
7	VOICE MESSAGING SERVICE.....	7-1
7.0	Scope.....	7-1
7.1	Service Overview	7-2
7.2	Formats And Codes.....	7-3
7.3	Signalling Procedures.....	7-3
7.3.1	Message deposit and customer remote access for message retrieval / customer-control options call.....	7-4
7.3.2	Local message-retrieval and customer control options call	7-10
7.3.3	Control of dial tone or ring-tone-no-reply timeout	7-14
8.	DELETED	8-1

0.4 History

Revision	Date of Issue	Updated by	Description
Issue 2	October 1999	PNO-ISC Editors	First Published Version

0.5 Issue Control

Section	Page	Issue	Date
0	All	1	May 1999
1	All	1	May 1999
2	All	2	May 1999
3	All	2	May 1999
4	-	0	-
5	All	1	March 1999
6	All	2	March 1999
7	All	1	March 1999
8	-	0	-

0.6 References

- /1/ PNO-ISC/SPEC/006 - Interconnect User Part (IUP)
- /2/ PNO-ISC/SPEC/007 - ISDN User Part (ISUP)
- /3/ PNO-ISC/SPEC/008 - C7 IUP - ISUP Interworking
- /4/ BTNR 188 - Digital Private Network Signalling System No.1 (DPNSS1)

0.7 Glossary of Terms

0.7.1 Abbreviations

ACI	Additional Call Information (message)
ACK	Acknowledge
ACM	Address Complete Message
ANM	Answer Message (ISUP protocol)
ANS	Answer message (IUP protocol)
ASUI	Additional Set Up Information (message)
BY	Busy
BES	Business Exchange Services
C7	CCITT Signalling System Number 7
CC	Clearing Cause
CCB	Coin Collecting Box
CCBS	Completion of Calls to Busy Subscriber
CCF	Circuit Free message
CCM	Call Connected Message
CDB	Call Drop back
CFC	Coin and Fee Checking (message)
CIC	Circuit Identification Code
CLC-NET	Calling Line Category - Network
CLR	Clear message
CNA	Connection Not Admitted (message)
CNI	Changed Number Interception
CON	Congestion (DPNSS protocol)
CON	Connect message
CPC	Calling Party Category
CPI	Call Path Indicator
CQ	Content Qualifier
CRM	Clear Request Message
CT	Call Termination
CTI	Call Type Indicator
DA	Destination Address
DPNSS	Digital Private Network Signalling System No.1
DPNSS-CLI	Called Line Identity
DQ	Directory Enquiries
DSS1	Digital Subscriber Signalling System No.1
ECM	Extend Call Message
EIM	Enveloped ISUP Message
EISM	Enveloped ISUP Segmented Message
E-ISUP	Enveloped-ISUP (A technique for conveying SS C7 ISUP signalling messages across an IUP signalling network.)
Euro-ISDN	A general term used to describe an ISDN which has been implemented according to European Telecommunication Standards
FAM	Final Address Message
FNR	Facility Not Registered

HLR	Howler (message)
IAM	Initial Address Message
ICC	Information Contained Code
IFAM	Initial and Final Address Message
IRC	Information Requested Code
ISC	Interconnect Standards Committee
ISDN	Integrated Services Digital Network
ISRM(C)	Initial Service Request Message (Complete)
ISUP	ISDN User Part
ISUP-RES	ISUP-Resume message
ISUP-SUS	ISUP-Suspend message
IUP	Interconnect User Part
IUP+	IUP enhanced to support Enveloped-ISUP
IUP-CLI	Calling Line Identity
IUP-RES	IUP-User Initiated Resume message
IUP-SUS	IUP-User Initiated Suspend message
IW	Interworking (with non C7 Signalling network/ route)
LDLI	Last Diverting Line Identity
LPD	Long Propagation Delay
MDG	Meter Delay Guard Timeout
NAM	Number Acknowledge Message
NEED	Nodal End to End Data (message)
NI	Network Initiated
NSI	Non-Specified Information
NT	Network Termination
NU	Number Unobtainable
OCM	Operator Condition Message
OLI	Originating Line Identity
OOR	Operator Override (message)
OSS	Operator Services System
PBX	Private Branch Exchange
PNM	Protocol Negotiation Message
PNO-IG	Public Network Operators - Interest Group
PNO-ISC	Public Network Operators - Interconnect Standards Committee
PRI	Protocol Request Indicator
PSTN	Public Switched Telephone Network
RAN	Re-Answer message
REJ	Reject
REL	Release message
RLC	Release Complete message
RPI	Release Protocol Indicator
SAD	Send All Digits (message)
SAM	Subsequent Address Message

SEE PAGE 2 FOR THE NORMATIVE INFORMATION



SASUI	Send Additional Set Up Information (message)
SCP	Service Control Point
SCT	Subscriber Call Termination
SER	Service (message)
SHP	Service Handling Protocol
SIC	Service Indicator Code
SIM	ISDN Composite Service Information Message
SIM-A	ISDN Composite Service Information Message Type 7 or 1
SIO	Service Information Octet
SND	Send N Digits (message)
SSM	Send Service Message
SSP	Service Switching Point
ST	Service Termination
STU	Service Temporarily Unavailable
SU	Service Unavailable
SVI	Service Interception
UI	User Initiated
UUD	User-to-User Data (message)
VMS	Voice Messaging Service
VPN	Virtual Private Network
VPS	Virtual Private Service

0.7.2 Terminology

A-User

The User who activates RBWF service i.e. the calling User.

B-User

The User who is busy i.e. the called User.

Bearer Call

The IUP call carrying the Enveloped DPNSS protocol. Bearer call set-up occurs before any Enveloped DPNSS messages can be sent.

Called Customer

The customer in the Terminating Network to whom the call is directed.

Calling Customer

The customer in the Originating Network initiating the call.

Calling Line Identity (CLI)

A number that identifies the originating NTP of a call.

NOTE 1 - Calling Line Identity is a generic term that may refer to either the Network Number, or a Presentation Number, and may be Network Provided or User Provided.

NOTE 2 - CLI is not necessarily the identity of the actual line from which a call originated, but may be another number related to the identity of the calling line.

Incoming Network

The network to which a call is passed from a point of interconnection between two networks.

NOTE - The incoming network may be the terminating network or a transit network.

Originating Network

The network to which the customer who originates a call is directly connected.

Outgoing Network

The network from which a call is passed to a point of interconnection between two networks.

NOTE - The outgoing network may be the originating network or a transit network.

RBWF

Ring Back When Free. An IUP implementation of CCBS using the IUP Enveloped DPNSS Protocol. RBWF enables queuing to a busy User line so that the caller receives a backward call when the called User ends the existing call. A new call is then set up between the two Users.

Terminating Network

The network to which the customer who receives a call is directly connected.

Transit Network

An UK Licensed Operators network which establishes IUP calls between an Incoming Network and an Outgoing Network.

END OF PNO-ISC/INFO/004 SECTION 0

1. INTRODUCTION

1.0 Scope

This section provides an introduction, context and supporting definitions to all of the sections of Information Document PNO-ISC/INFO/004 that together specify the proprietary extensions to the C7 Interconnect User Part (IUP) protocol.

Information Document PNO-ISC/INFO/004 should be read in conjunction with Specification PNO-ISC/SPEC/006 in order to obtain a complete description of the proprietary extensions to the Interconnect User Part.

1.1 Definitions of Terms Used in PNO-ISC/INFO/004

Service

The term service refers to both network features and customer services.

Informative service

A service for which a description has been produced by a particular supplier or operator, however, PNO-IG agreement of the description has been neither sought nor received for application of that service between networks in the UK. These services are described in the relevant sections of Document PNO-ISC/INFO/004 for information only, there being no obligation on any Operator to support the service either internally or via interconnect routes with other Operators. PNO-ISC/INFO/004 may be used as the basis of bilateral agreements between Operators.

1.2 Scope of PNO-ISC/INFO/004

PNO-ISC/INFO/004 specifies the signalling procedures, formats and codes that shall be used to support Informative customer services and network features at the point of interconnect between public networks in the UK using the C7 IUP protocol.

The inclusion in this document of any service shall not imply that the service is supported on any particular interconnect, or by any particular network. The services supported on a particular interconnect shall be determined by bilateral agreement between the operators of the interconnected networks.

Each service is described at both a service and protocol level. The service overviews are provided for information only. Full service descriptions, where available, can be found within the PNO-ISC/SER series of documents.

1.3 Contents of PNO-ISC/INFO/004

Section 1 provides general information, defines the scope and describes the structure of the C7 IUP proprietary extensions information document.

Section 2, “C7 IUP Message Types and Contents”, provides a “library” of messages and parameters, and specifies their formats and codes. These are drawn upon as necessary by the services and procedures described in Sections 3 onwards. Thus, messages, parameters or codes are only required to be supported if a service which employs them is supported. The messages and parameters specified here are in addition to those specified in section 2 of /1/.

Section 3, “C7 IUP Common Procedures”, provides a “library” of common call control procedures, which are drawn upon as necessary to realise the services described in Sections 4 onwards. A common call control procedure need only be supported if a service which employs it is supported. These procedures are in addition to those specified in Section 3 of /1/.

Section 4 is withdrawn.

Section 5, “C7 IUP Ring Back When Free Service”, specifies the signalling protocol to support the Ring Back When Free service.

Section 6, “C7 IUP Enhancements to IUP to Provide Enveloped ISUP”, specifies the signalling procedures for the Enveloped ISUP protocol.

Section 7, “C7 IUP Voice Messaging Service”, specifies the signalling procedures for the Voice Messaging Service.

END OF PNO-ISC/INFO/004 SECTION 1

2 MESSAGE TYPES AND CONTENTS

2.0 Scope

The purpose of this section is to provide a 'library' of message formats and contents in addition to those described in Section 2 of /1/. These additions are provided primarily for information only as they are used to support services in certain operators networks. Other sections describe services which utilise some of the additional messages to enable the extension of these services between networks, subject to agreement between the operators concerned. Use of the additions to support other than the services described is not recommended.

2.1 General

This document specifies message formats and contents additional to those specified in Section 2 of /1/. As such, this document is written as a 'delta' document to Section 2 of /1/. The sub-section numbers used in 2.2 onwards fit into the sequence of sub-sections in Section 2 of /1/. However, the tables in this document are numbered independently of Section 2 of /1/.

In order to determine the totality of the IUP message formats and codes specified, it is necessary to consider both this document and Section 2 of /1/.

2.2 Message Groups and Types

2.2.1 Message Groups

2.2.1.4 Backward Set-Up Information Messages (H0=3)

Add:

Call Drop Back (CDB) Message

2.2.1.5 Call Supervision Messages (H0=4)

Add:

Coin and Fee Checking (CFC) Message

Operator Override (OOR) Message

Howler (HLR) Message

Extend Call Message (ECM)

2.2.1.8 Service Information Messages (H0=7)

Add:

Additional Call Information (ACI) Message Type 8

Nodal End-to-End Data (NEED) Message

Operator Condition Message (OCM)

User to User Data (UUD) Message

Service (SER) Message

Send Service Message (SSM)

2.2.1.9 Enveloped ISUP Messages (H0=8)

Add:

Enveloped ISUP Message (EIM)

Enveloped ISUP Segmented Message (EISM)

Protocol Negotiation Message (PNM)

TABLE 2.1
Allocation of additional H0 and H1 codes

H0 H1	0	1	2	3	4	5	6	7	8
0									
1									PROTOCOL NEGOTIATION
2									ENVELOPED ISUP
3									
4									
5								OPERATOR CONDITION	
6								USER-TO-USER DATA	
7									
8									
9									
10				CALL DROP BACK					
11								NODAL END-TO-END DATA	
12									
13									
14								OSS NODE TO NODE MESSAGE	
15									
16									
130									ENVELOPED ISUP SEGMENTED

2.3 Message Contents

Replace sub-sections referencing this document with the following:

2.3.1.8 Additional Call Information (ACI) Message - Type 8

This message is used to indicate that Nodal End-to-End Data transfer may commence.

The message format is:

TABLE 2.2

Parameter	Reference (sub-section)	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
ACI Message - Information Contained and Information Requested	2.4.2	FM	2
reserved	-	FM	1
ACI Type 8 Message Indicators	2.4.6	FM	2
Line Identity	2.4.19	VM	1-9

2.3.7 Call Drop Back (CDB) Message

This message indicates that release of the path in the forward direction is required and carries information to enable call set up to be completed.

The message format is:

TABLE 2.3

Parameter	Reference (sub-section)	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
Call Drop Back Message - Call Log Indicators	2.4.33	FM	1
Call Drop Back Message - SCP Information	2.4.34	VM	2-11
Call Drop Back Message - Calling Line Information Indicator	2.4.32	FM	1
Line Identity	2.4.19	VO	1-9
Partial Calling Line Identity	2.4.23	FO	9
Translated Address	2.4.35	VM	1-11

2.3.20 Nodal End-to-End Data (NEED) Message

This message is used to pass information as identified by the content qualifier transparently between networks.

The message format is:

TABLE 2.4

Parameter	Reference (sub-section)	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
Content Qualifier	2.4.20	FM	1
reserved	-	FM	1
Nodal End-to-End Data	2.4.21	VM	2-46

2.3.21 Operator Condition Message (OCM)

This message is used on calls between Operator Services in one network and Operator Services in another, to indicate changes in Operator Service conditions.

The message format is:

TABLE 2.5

Parameter	Reference (sub-section)	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
Operator Condition Indicators	2.4.22	FM	2

2.3.41 User-to-User Data (UUD) Message

This message is used to transfer data between users.

The message format is:

TABLE 2.6

Parameter	Reference (sub-section)	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
reserved	-	FM	1
User-to-User Data	2.4.31	VM	2-46

2.3.42 Enveloped-ISUP Message (EIM)

This message is used to transport ISUP message contents, thus allowing ISUP signalling flows within an IUP signalling environment.

The message format is:

TABLE 2.7

Parameter	Reference (sub-section)	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
ISUP Message	2.4.37	VM	3-265

2.3.43 Enveloped-ISUP Segmented Message (EISM)

This message is used to transport segments of an ISUP Message when IUP segmentation procedures for IUP-EIMs apply (see Section 6).

The message format is:

TABLE 2.8

Parameter	Reference (sub-section)	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
EISM Segmentation Information	2.4.38	FM	1
ISUP Message Segment (Note)	2.4.39	VM	2-53

NOTE - Except for the final message of an EISM sequence, this parameter is always 53 octets in length

2.3.44 Protocol Negotiation Message (PNM)

This message is used in the backwards direction to support the invocation of enveloped protocols when requested in the IAM/IFAM.

The message format is:

TABLE 2.9

Parameter	Reference (sub-section)	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
Protocol Negotiation Message Indicators	2.4.40	FM	2

2.3.45 OSS Node to Node Message (ONN)

Reserved for intra-network use by BT

2.4 Parameter Formats and Code Allocations

2.4.1.3 Reserved Values within Parameter Fields

Add:

Within this document certain parameter fields are marked as reserved for use by a particular Operator or Manufacturer. This indicates that the Operator/Manufacturer concerned has declared their use of the value to the ISC. The PNO-ISC will try to avoid re-allocating such values.

2.4.2 Additional Call Information Message Information Contained and Information Requested

Add the following codings:

00001010 [10] Called Line Identity, Called Party Category and Interconnect Specific Information.

Add the following ACI type to Table 2.37:

TABLE 2.10

Additional Call Information Message Type	Permitted Information Contained Codes	Permitted Information Requested Codes
ACI Type 8	00001010 [10]	00000000 [0] 00000001 [1] 00001100 [12]

2.4.6 Additional Call Information Message, Type 8 - Message Indicators

The format of the ACI, Type 8 Message Indicators parameter field is shown in Figure 2.4.5 below.

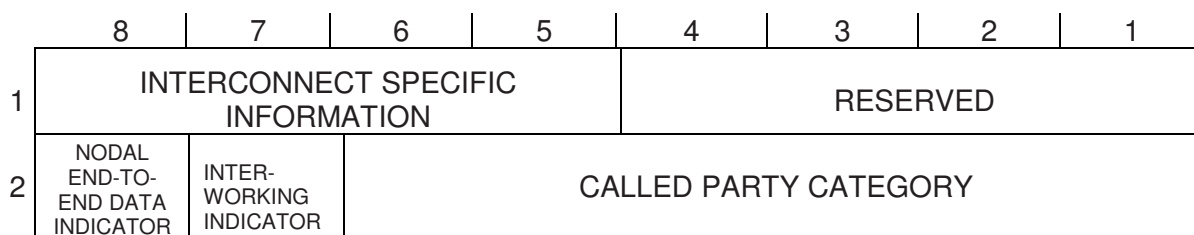


FIGURE 2.4.5

ACI Message, Type 8 - Message Indicators parameter field

The following codes are defined for use in the sub-fields of the ACI Message, Type 8 - Message Indicators parameter field.

a) Interconnect Specific Information (ISI)

This field may be used to convey information between networks interconnected by C7 IUP. Under these circumstances, the use, codings, and meaning of the field, must be mutually agreed between the PNOs concerned. This document will not specify the codings.

b) Called Party Category (CdPC)

000000	[0]	Unknown
000001	[1]	Ordinary (Residential)
000010	[2]	Ordinary (Business)
000011	[3]	Pay-on-answer coin box (Public or Private)
000100	[4]	Administration Diverted - Ordinary
000101	[5]	Administration Diverted - Payphone
000110	[6]	ISDN (Residential)
000111	[7]	ISDN (Business)
001000	[8]	Pre-payment Payphone (Public)
001001	[9]	Pre-payment Payphone (Renter's Residential)
001010	[10]	Pre-payment Payphone (Renter's, Business)
001011	[11]	Service Line
001100	[12]	Centrex
001101	[13]	Operator Services Operator
001110	[14]	AMC Operator (NND/IND)
001111	[15]	AMC Operator (NND)
010000	[16]	DPNSS 1
010001	[17]	)
to	)	reserved
111111	[63]	)

c) IW Indicator

0	No IW involved
1	IW involved

d) Nodal End-to-End Data Indicator

0	Nodal End-to-End Data transfer not available
1	Nodal End-to-End Data transfer available

2.4.9 Called Address

Add the following coding for the protocol request indicator:

Protocol Request Indicator (PRI)

000[0]	Enveloped-ISUP not requested
001[1]	Enveloped-ISUP protocol preferred
010[2]	Reserved (BT)
011[3]	Reserved (BT)
100[4]	reserved (BT)
101[5]	reserved (BT)
110[6]	reserved (BT)
111[7]	reserved (BT)

2.4.16 IAM/IFAM Message Indicators

d) Service Handling Protocol (SHP)

Add:

0011 [3]	Invoke Nodal End-to-End Data Protocol
0100 [4]	In use by ETL
1000 [8]	Enveloped-ISUP Essential

e) Message Indicators I to P

iv) NML - Call Type Indicator (CTI)

Add:

010 [2]	Call Forward No Reply (In use by Orange)
011 [3]	Call Forward Busy or Not Reachable (In use by Orange)
100 [4]	VPS Virtual Call
101 [5]	Reserved VPS Real Call
110 [6]	Public Network DPNSS Call

2.4.20 Nodal End-to-End Data Message - Content Qualifier

The format of the Nodal End-to-End Data Message - Content Qualifier parameter field is shown in Figure 2.4.19 below.

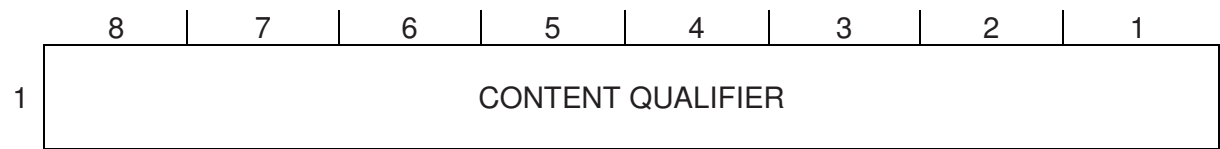


FIGURE 2.4.19
Nodal End-to-End Data Message - Content Qualifier parameter field

The following codes are defined for use in the Nodal End-to-End Data Message - Content Qualifier parameter field.

- 00000000 [0] No information on content
- 00000001 [1] DPNSS Real Call Message
- 00000010 [2] DPNSS Virtual Call Message
- 00000011 [3])
- to) reserved
- 11111111 [255])

2.4.21 Nodal End-to-End Data

The format of the Nodal-End-to-End Data parameter field is shown in Figure 2.4.20 below.

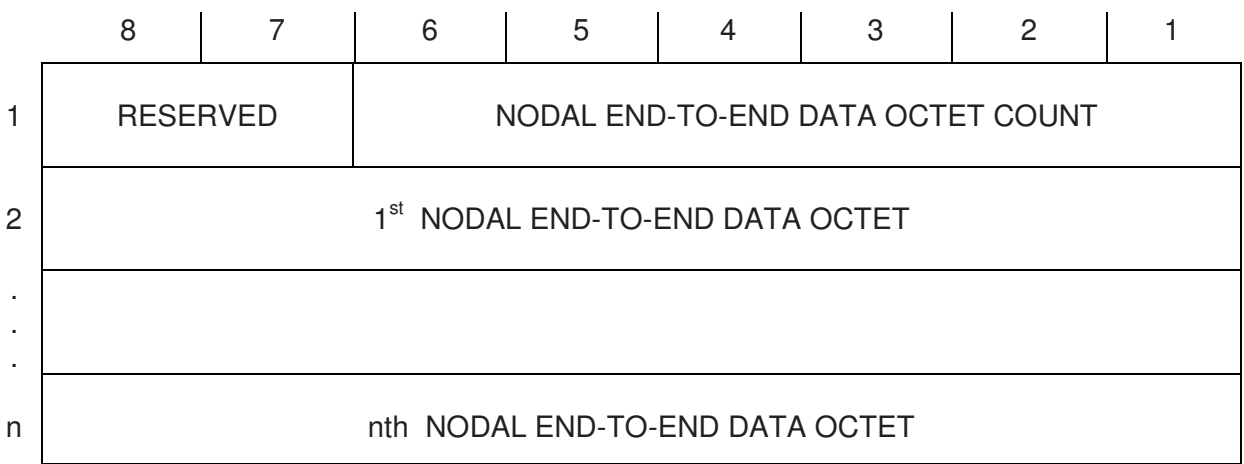


FIGURE 2.4.20
Nodal End-to-End Data parameter field

The following codes are defined for use in the sub-fields of the Nodal End-to-End Data parameter field.

a) Nodal End-to-End Data Octet Count

Set to provide, in binary form, an indication of the number of octets contained within the Nodal End-to-End Data sub-field.

000000 [0] No information on content
000001 [1])
to) Number of octets in the Nodal End-to-End Data sub-field
101101 [45])

101110 [46])
to) reserved
111111 [63])

b) Nodal End-to-End Data

The information contained within this sub-field shall be encoded/decoded as necessary by the originating/terminating VPS/DPNSS node concerned.

2.4.22 Operator Condition Indicators

The format of the Operator Condition Indicators parameter field is shown in Figure 2.4.21 below.

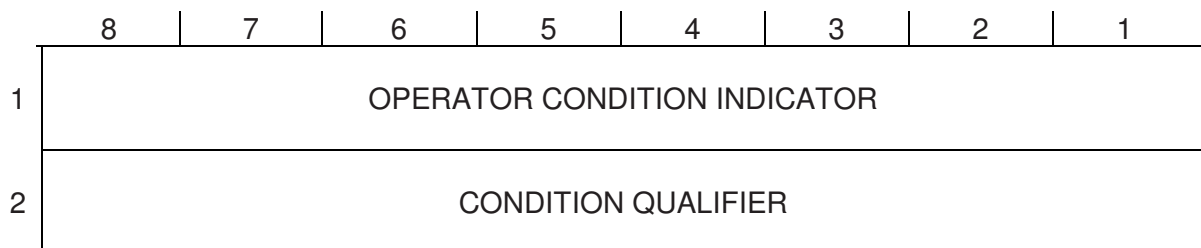


FIGURE 2.4.21

Operator Condition Indicators parameter field

The following codes are defined for use in the sub-fields of the Operator Condition Indicators parameter field.

a) Operator Condition Indicator

- 00000000 [0] Operator Answer
- 00000001 [1] Operator in circuit
- 00000010 [2] Operator out of circuit
- 00000011 [3] Operator recall
- 00000100 [4] Operator relinquish
- 00000101 [5] Subscriber Clear
- 00000110 [6])
- to) reserved
- 11111111 [255])

b) Condition Qualifier

- 00000000 [0] No information on content
- 00000001 [1] Path split
- 00000010 [2] Path not split
- 00000011 [3])
- to) reserved
- 11111111 [255])

2.4.31 User-to-User Data

The format of the User-to-User Data parameter field is shown in Figure 2.4.30 below.

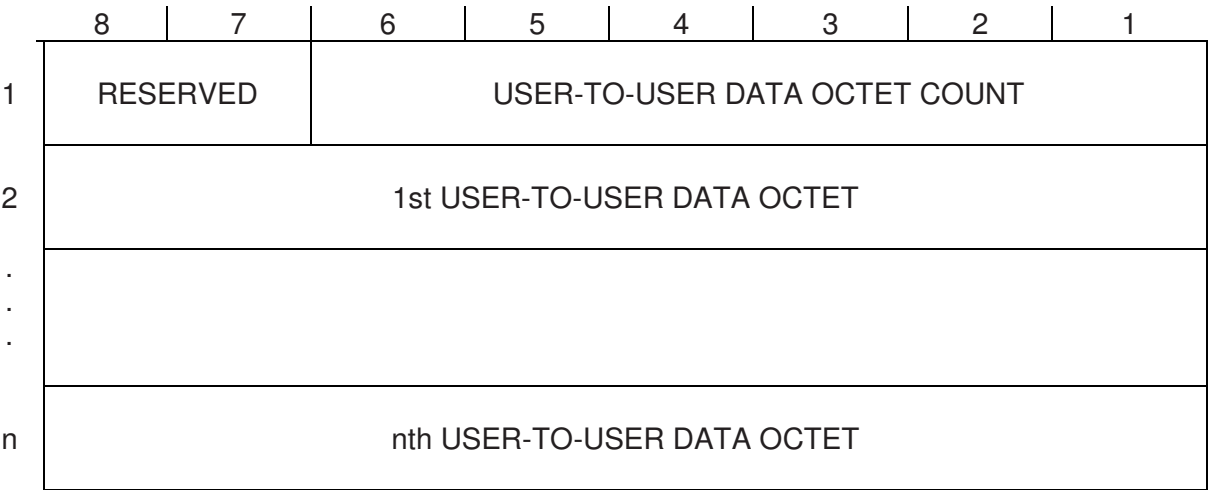


FIGURE 2.4.30
User-to-User Data parameter field

The following codes are defined for use in the sub-fields of the User-to-User Data parameter field.

a) User-to-User Data Octet Count

Set to provide a binary indication of the number of octets contained within the User-to-User Data sub-field.

```

000000 [0] reserved
000001 [1] )
to      ) Number of User-to-User Data octets included
101101 [45] )

101110 [46] )
to      ) reserved
111111 [63] )

```

b) User-to-User Data

This information shall be conveyed in the order received from the calling/called terminal and shall not be examined by the network.

2.4.32 Call Drop Back Message - Calling Line Information Indicator

An indication of whether full or partial CLI is included in the message.

The format of the Call Drop Back Message Calling Line Information Indicator parameter field is shown in Figure 2.4.31 below.

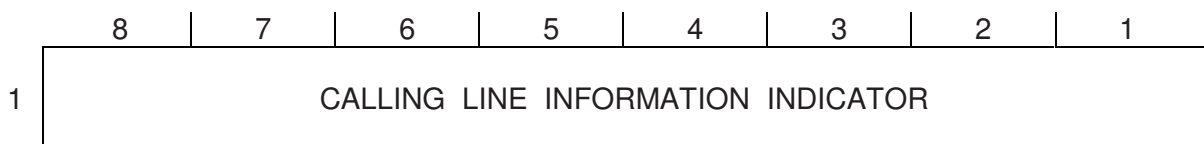


FIGURE 2.4.31

Call Drop Back Message Calling Line Information Indicator parameter field

The following codes are defined for use in the Call Drop Back Calling Line Information Indicator parameter field.

```

00000000 [0] No Full or Partial Calling Line Identity parameter included
00000001 [1] Full Calling Line Identity included
00000010 [2] Partial Calling Line Identity included
00000011 [3] )
to      ) reserved
11111111 [255] )

```

2.4.33 Call Drop Back Message - Call Log Indicators

The format of the Call Drop Back Message Call Log Indicators parameter field is shown in Figure 2.4.32 below.

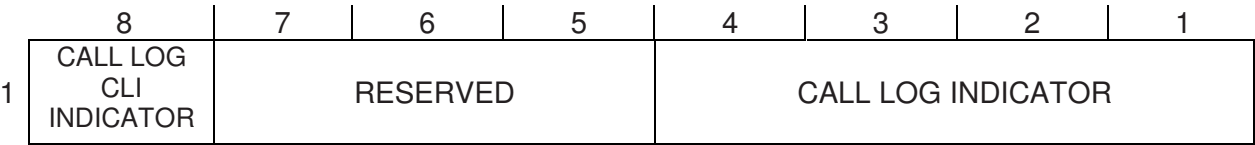


FIGURE 2.4.32
Call Drop Back Message Call Log Indicators parameter field

The following codes are defined for use in the sub-fields of the Call Drop Back Call Log Indicators parameter field.

a) Call Log Indicator

Indicating whether or not a call log record is required. This indicator shall be set by the node that initiates the Call Drop Back message.

- 0000 [0] Call Log not required
- 0001 [1] Generate Call Log if call is answered
- 0010 [2] Generate Call Log unconditionally
- 0011 [3])
- to) reserved
- 1111 [15])

b) Call Log CLI Indicator

Indicating whether or not the SSP is required to request CLI for insertion into the call logging record at the SSP.

- 0 CLI request not required for Call Logging
- 1 Request CLI for Call Logging record

2.4.34 Call Drop Back Message - Service Control Point (SCP) Information

The format of the Call Drop Back Message SCP Information parameter field is shown in Figure 2.4.33 below.

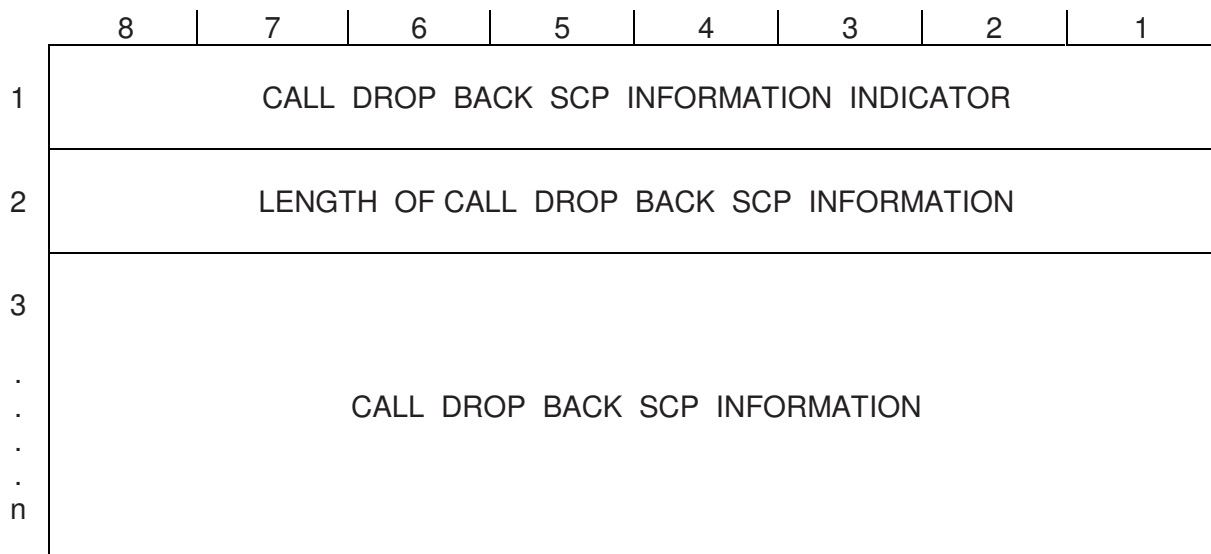


FIGURE 2.4.33

Call Drop Back Message SCP Information parameter field

The following codes are defined for use in the sub-fields of the Call Drop Back message SCP Information parameter field.

a) Call Drop Back SCP Information Indicator

Indicating the type of information contained within the CDB SCP Information field.

Set to indicate the type of information contained within the Call Drop Back SCP Information sub-field.

00000000 [0]	No information (Octet 2 shall be set to '00000000' and Octets 3 to n shall be omitted)
00000001 [1]	Reason for Termination
00000010 [2]	)
to	) reserved
01111111 [127]	)
10000000 [128]	In use by BT for Number Portability
10000001 [129]	)
to	) reserved
11111111 [255]	)

b) Length of Call Drop Back SCP Information

An indication of the number of octets of information contained within the CDB SCP Information Field, (a maximum of one octet to carry "Reason for Termination").

Set to provide a binary indication of the number of octets contained within the Call Drop Back SCP Information sub-field, i.e. from 0 to 9 octets.

```
00000000 [0]    )
    to          ) Length of Call Drop Back SCP Information
00001001 [9]    )
```

```
00001010 [10]   )
    to           ) Invalid length indication
11111111 [255]  )
```

NOTE - This sub-field shall not be coded greater than '00000001' since the only defined information that may be included is "Reason for Termination" which is a single octet fixed length sub-field.

c) Call Drop Back SCP Information

As defined by the CDB SCP Information Indicator, (restricted to "Reason for Termination"). The type of information contained within this sub-field is qualified by the Call Drop Back Information Indicator code.

i) Reason for Termination

"Reason for Termination" is a single octet with the same meanings as defined for the Reason parameter of the Release and Connection Not Admitted (CNA) messages, (Sub-sections 2.4.15 and 2.4.24 of /1/).

Only the following values shall be generated but all nodes with the ability to receive and act upon the Call Drop Back Message shall be capable of receiving any of the defined CNA/Release reasons and either passing them on unchanged or connecting the appropriate tone or announcement.

```
00110101 [53]  Flow Controlled
00110110 [54]  Out of Catchment Area
00110111 [55]  Translation Out of Service
```

2.4.35 Call Drop Back Message - Translated Address

This parameter shall contain up to a maximum of 20 address signal digits pertaining to a new called number with an indication of the number of address signals included in the message. If the Call Drop Back message contains a failure reason the Translated Address may not be present, in which case the length of the translated address will be indicated as zero address signals.

The format of the Call Drop Back Message Translated Address parameter field is shown in Figure 2.4.34 below.

	8	7	6	5	4	3	2	1
1	RESERVED			NUMBER OF TRANSLATED ADDRESS SIGNALS				
2	2nd ADDRESS SIGNAL				1st ADDRESS SIGNAL			
.								
.								
.								
m	FILLER (IF NECESSARY)				nth ADDRESS SIGNAL			

FIGURE 2.4.34

Call Drop Back Message Translated Address parameter field

The following codes are defined for use in the sub-fields of the Call Drop Back Translated Address parameter field.

a) Number of Translated Address Signals

Set to provide a binary indication of the number of Address Signals contained within the Translated Address, i.e. from 0 to 20 digits.

00000 [0] No Address Signals included
 00001 [1])
 to) Number of Address signals
 10100 [20])

10101 [21])
 to) Invalid length indication
 11111 [31])

b) Address Signals

0000 [0] Digit 0
 0001 [1] Digit 1
 0010 [2] Digit 2
 0011 [3] Digit 3
 0100 [4] Digit 4
 0101 [5] Digit 5
 0110 [6] Digit 6
 0111 [7] Digit 7
 1000 [8] Digit 8
 1001 [9] Digit 9
 1010 [10])
 to) reserved
 1111 [15])

SEE PAGE 2 FOR THE NORMATIVE INFORMATION

The most significant Address Signal shall be sent first. Subsequent Address Signals shall be sent in successive four bit sub-fields. The order of bit transmission for each digit shall be least significant bit first.

c) Filler

In the case of an odd number of Address Signals, the Filler code '0000' shall be inserted after the last Address Signal, thus ensuring that the variable length parameter containing the Translated Address always contains an integral number of octets.

2.4.37 ISUP Message

The format of the ISUP Message parameter field is shown in Figure 2.4.35 below.

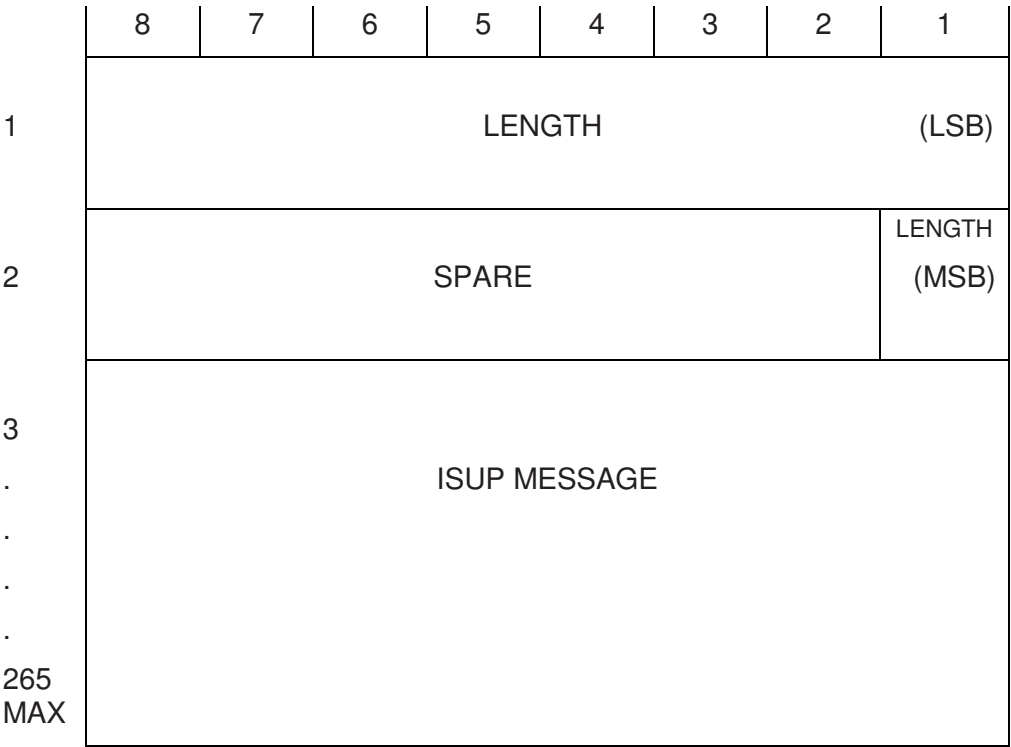


FIGURE 2.4.35
ISUP Message parameter field

The following codes are defined for use in the sub-fields of the ISUP Message parameter field:

a) Length (excluding “Length” octets 1 & 2)

0 00000000[0] Invalid
 0 00000001[1])
 to) ISUP Message length (Note)
 1 00000111[263])

 1 00001000[264])
 to) Invalid
 1 11111111[511])

NOTE - If 62 octet MTP applies this will be between 1 and 52 octets. If 272 octet MTP applies this will be between 1 and 263 octets.

b) ISUP Message

The formatting and coding of this parameter field will be in accordance with the formatting and coding of ISUP messages, beginning with the ISUP message type code.

2.4.38 EISM Segmentation Information

The format of the EISM Segmentation information parameter field is shown in Figure 2.4.36 below.

	8	7	6	5	4	3	2	1
1	1st SI	SPARE			NUMBER OF SEGMENTS REMAINING			

FIGURE 2.4.36

EISM Segmentation Information parameter field

The following codes are defined for use in the sub-fields of the EISM Segmentation Information parameter field

a) Number of Segments Remaining

0000 [0] No further segments to be sent (last segment indication).
 0001 [1])
 to) Number of segments still to be sent.
 0101 [5])

 0110 [6])
 to) Invalid
 1111 [15])

b) First Segment Indicator (1st SI)

- 0 Subsequent message segment
- 1 First segment of a segmented message sequence

2.4.39 ISUP Message Segment

The format of the ISUP Message Segment parameter field is shown in Figure 2.4.37 below

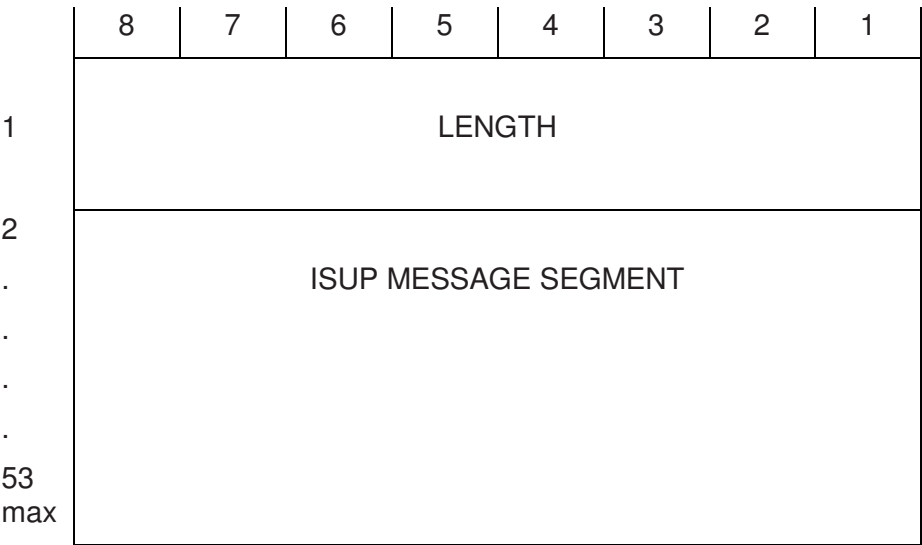


FIGURE 2.4.37
ISUP Message Segment parameter field

a) Length (excluding “Length” octet 1)

00000000[0]) Invalid
00000001[1])
to) ISUP Message length
00110100[52])

00110101[53])
to) Invalid
11111111[255])

b) ISUP Message Segment

This shall contain a segment of the ISUP message derived as described in Section 6.

2.4.40 Protocol Negotiation Message Indicators

The format of the Protocol Negotiation Message Indicators parameter field is shown in Figure 2.4.38 below

	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 2.4.38

Protocol Negotiation Message Indicators parameter field

The following codes are defined for use in the sub-fields of the Protocol Negotiation Message Indicators parameter field.

A Send ISUP-IAM Indicator

- 0 No information
- 1 Preceding node requested to send EIM[ISUP-IAM]

B to P - reserved

END OF PNO-ISC/INFO/004 SECTION 2

3. COMMON PROCEDURES

3.0 Scope

The purpose of this section of PNO-ISC/INFO/004 is to provide a “library” of common call procedures in addition to those described in section 3 of /1/ which may be employed across a national interconnect between two Public Network Operators. The common call control procedures (given in 3.2) are drawn upon as necessary to realise the services described in later sections of this document. Thus, compliance to a common call control procedure is only necessary for compliance to a service which employs that common call control procedure given in sub-section 3.2. This document does not include any procedures for transit network operation.

3.1 General

This section of PNO-ISC/INFO/004 gives specific information for the additional call control procedures, information flows, error handling procedures and timer requirements for the support of information services established between Public Network Operator networks. Where details already exist in Section 3 of /1/ a reference is made to that document.

The messages, procedures and message parameter codes, specific to an information service are listed in the specification relevant to the service concerned.

The following Message Sequence Diagrams (MSDs) and accompanying numbered text give the message flows across the interface between two interconnected Public Network Operator Networks using C7 IUP.

Details relating to the control of the transmission path are not given in this section, these requirements are given in the individual service sections of this document.