

PNO-ISC Specification Number 006 Interconnect User Part (IUP)

ICS 35.110

National foreword

This Published Document has been prepared by Technical Committee TCT/50 Public Network Operators Interconnect Standards Committee. It supersedes PD 6645:2000 which is withdrawn. It specifies the signalling procedures, formats and codes that shall be used to support standard customer services and network features at the point of interconnect between public networks in the UK using the C7 IUP protocol.

This Published Document has been produced with place markers for some sections, not yet available, which will be issued as amendments to this Published Document when they become available.

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

PD 6659	PNO-ISC/INFO/004
PD 6660	PNO-ISC/INFO/008
PD 6625	PNO-ISC/SER/001
PD 6624	PNO-ISC/SER/002
PD 6656	PNO-ISC/SER/006
PD 6646	PNO-ISC/SPEC/001
PD 6638	PNO-ISC/SPEC/003
PD 6650	PNO-ISC/SPEC/004
PD 6639	PNO-ISC/SPEC/005

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 0-18, pages 1-1 and 1-2, pages 2-1 to 2-64, pages 3-1 to 3-76, pages 4-1 to 4-9, a blank page, page 5-1, a blank page, pages 6-1 to 6-9, a blank page, page 7-1, a blank page, page 8-1, a blank page, pages 9-1 to 9-9, a blank page, pages 10-1 to 10-3, a blank page, pages 11-1 to 11-4, pages 12-1 and 12-2, page 13-1, a blank page, page 14-1, a blank page, page 15-1, a blank page, pages 16-1 to 16-12, an inside back cover and a back cover.

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INTERCONNECT USER PART (IUP)

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0.2 Normative Information

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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	0-9
0.5	Issue Control	0-9
0.6	References	0-10
0.7	Glossary of Terms	0-11
0.7.1	Abbreviations	0-11
0.7.2	Terminology	0-15
1	INTRODUCTION	1-1
1.0	Scope	1-1
1.1	Scope of PNO-ISC/SPEC/006	1-1
1.2	Contents of PNO-ISC/SPEC/006	1-2
2	MESSAGE TYPES AND CONTENTS	2-1
2.0	Scope	2-1
2.1	General	2-2
2.1.1	Message Formats	2-2
2.1.2	Standard Telephony Label	2-2
2.1.3	IUP Message Header	2-2
2.1.4	Format Principles	2-3
2.2	Message Groups and Types	2-4
2.2.1	Message Groups	2-4
2.2.2	Message Types	2-7
2.3	Message Contents	2-9
2.3.1	Additional Call Information (ACI) Message	2-9
2.3.2	Additional Set-up Information (ASUI) Message	2-11
2.3.3	Address Complete Message (ACM)	2-12
2.3.4	Answer (ANS) Message	2-12
2.3.5	Blocking (BLO) Message	2-13
2.3.6	Blocking Acknowledgement (BLA) Message	2-13
2.3.7	Call Drop Back (CDB) Message	2-13
2.3.8	Circuit Free (CCF) Message	2-13
2.3.9	Clear (CLR) Message	2-13
2.3.10	Coin and Fee Checking (CFC) Message	2-13
2.3.11	Confusion (CFN) Message	2-13
2.3.12	Congestion (CNG) Message	2-14
2.3.13	Connection Not Admitted (CNA) Message	2-14
2.3.14	Extend Call Message (ECM)	2-14
2.3.15	Final Address Message (FAM)	2-14
2.3.16	Howler (HLR) Message	2-14
2.3.17	Initial Address Message (IAM)	2-14
2.3.18	Initial and Final Address Message (IFAM)	2-15
2.3.19	ISDN Composite Service Information Message (SIM)	2-15
2.3.20	Nodal End-to-End Data (NEED) Message	2-18
2.3.21	Operator Condition Message (OCM)	2-18
2.3.22	Operator Override (OOR) Message	2-18

2.3.23	Overload Message (OLM)	2-18
2.3.24	Re-Answer (RAN) Message	2-18
2.3.25	Release (REL) Message	2-18
2.3.26	Repeat Attempt Message (RAM)	2-19
2.3.27	Send Additional Set-up Information (SASUI) Message	2-19
2.3.28	Send All Digits (SAD) Message	2-19
2.3.29	Send N Digits (SND) Message	2-19
2.3.30	Send Service Message (SSM)	2-20
2.3.31	Service (SER) Message	2-20
2.3.32	Subscriber Engaged Message (SEM)	2-20
2.3.33	Subscriber Out-of-Order (SOO) Message	2-20
2.3.34	Subsequent Address Message (SAM)	2-20
2.3.35	Swap Message	2-21
2.3.36	Terminal Congestion Message (TCM)	2-21
2.3.37	Unblocking (UBL) Message	2-21
2.3.38	Unblocking Acknowledgement (UBA) Message	2-21
2.3.39	User Initiated 'Suspend' (SUS) Message	2-21
2.3.40	User Initiated 'Resume' (RES) Message	2-22
2.3.41	User-to-User Data (UUD) Message	2-22
2.3.42	Enveloped-ISUP Message (EIM)	2-22
2.3.43	Enveloped-ISUP Segmented Message (EISM)	2-22
2.3.44	Protocol Negotiation Message (PNM)	2-22
2.3.45	OSS Node-to-node (ONN) Message	2-22
2.4	Parameter Formats and Code Allocations	2-23
2.4.1	General	2-23
2.4.2	Additional Call Information Message Information Contained Code and Information Requested Code	2-24
2.4.3	Additional Call Information Message Type 1 - Message Indicators	2-25
2.4.4	Additional Call Information Message Type 3 - Message Indicators	2-26
2.4.5	Additional Call Information Message Type 4 - Message Indicators	2-26
2.4.6	Additional Call Information Message Type 8 - Message Indicators	2-26
2.4.7	Address Complete Message Indicators	2-26
2.4.8	Additional Set-up Information Message Information Contained	2-28
2.4.9	Called Address	2-29
2.4.10	Called Subscriber's Terminating Facility Marks	2-30
2.4.11	Calling/Called Subscriber's Basic Service Marks	2-31
2.4.12	Calling Subscriber's Originating Facility Marks	2-33
2.4.13	Closed User Group (CUG) Interlock Code	2-33
2.4.14	Confusion Message Qualifier	2-35
2.4.15	Connection Not Admitted (CNA) - Reason	2-35
2.4.16	IAM/IFAM Message Indicators	2-39
2.4.17	ISDN Composite SIM - Facility Indicator Code (FIC)	2-43
2.4.18	ISDN Composite SIM - Information Contained and Information Requested	2-44
2.4.19	Line identity (LI)	2-46
2.4.20	Nodal End-to End Data Message - Content Qualifier	2-48
2.4.21	Nodal End-to End Data	2-48
2.4.22	Operator Condition Indicators	2-48
2.4.23	Partial Calling Line Identity (PCLI)	2-48
2.4.24	Release - Reason	2-49
2.4.25	Send Additional Set-Up Information Message - Information Indicator	2-54
2.4.26	'Send N Digits' Message - Number of Digits Requested	2-54
2.4.27	Service Indicator Code (SIC)	2-54
2.4.28	'Service' Message - Service Code	2-54
2.4.29	Six Character Network Address Extension (NAE) - (Sub-Address)	2-55

2.4.31	User-to-User Data	2-56
2.4.32	Call Drop Back Message - Calling Line Information Indicator	2-56
2.4.33	Call Drop Back Message - Call Log Indicators	2-56
2.4.34	Call Drop Back Message - Service Control Point (SCP) Information	2-56
2.4.35	Call Drop Back Message - Translated Address	2-56
2.4.36	Connection Not Admitted - Diagnostics	2-56
2.4.37	ISUP Message	2-57
2.4.38	EISM Segmentation Information	2-57
2.4.39	ISUP Message Segment	2-57
2.4.40	Protocol Negotiation Message Indicators	2-57
2.A	ANNEX 2.A - Service Indicator Code (SIC) Allocations	2-58
2.A.1	General	2-58
2.A.2	Octet 1	2-58
2.A.3	Octet 2	2-61
2.B	ANNEX 2.B - Validity of Release Reasons when RPI=0	2-64
3	COMMON PROCEDURES	3-1
3.0	Scope	3-1
3.1	General	3-1
3.2	Common Call Control Procedures	3-2
3.2.1	Bearer Establishment Protocol	3-4
3.2.2	Call Establishment	3-13
3.2.3	Call Supervision	3-31
3.2.4	Bearer Release Protocols	3-37
3.2.5	Transit Network Procedures	3-50
3.2.6	Treatment of Reserved Fields and Values	3-58
3.3	Call Control Error Handling Procedures	3-61
3.3.1	Definitions of Faulty and Unexpected Messages	3-61
3.3.2	Procedures for Handling Receipt of Faulty Messages	3-62
3.3.3	Handling of Unexpected Non Group 7 Messages	3-62
3.3.4	Group 7 Messages - Confusion Message Procedures	3-64
3.3.5	Unsupported SHP/CPI Combinations	3-64
3.4	Circuit Blocking/ Unblocking Procedures	3-65
3.4.1	Unidirectional/Bothway Circuit (idle state) - Blocking and Unblocking Procedures	3-66
3.4.2	Blocking (during release) Procedures	3-68
3.5	MTP INTERACTIONS	3-70
3.5.1	Signalling Relation Management	3-70
3.5.2	Message Flow Control	3-70
3.5.2.1	Reduction of traffic	3-70
3.6	Timer Table	3-73
4	TELEPHONY CALL	4-1
4.0	Scope	4-1
4.1	Service Overview	4-1
4.2	Formats and Codes	4-2
4.3	Signalling Procedures	4-6
4.3.1	Initial action of the outgoing network	4-6
4.3.2	Subsequent action of both networks (up to and including called customer answer)	4-6
4.3.3	Transmission Path Connection	4-7
4.3.4	Clear (Re-Answer)	4-7
4.3.5	Call Release	4-8
4.4	Message Sequence Diagram	4-9

5 SPARE	5-1
6 ISDN CALL	6-1
6.0 Scope	6-1
6.1 Service Overview	6-1
6.2 Formats and codes	6-2
6.3. Signalling Procedures	6-5
6.3.1 <i>Initial Action of the Outgoing Network</i>	6-5
6.3.2 <i>Subsequent Action of Both Networks (up to and including Called Customer Answer)</i> ..	6-5
6.3.3 <i>Transmission Path Connection</i>	6-6
6.3.4 <i>User-initiated SUSPEND and RESUME</i>	6-6
6.3.5 <i>SWAP procedure</i>	6-6
6.3.6 <i>Treatment of CONFUSION message</i>	6-7
6.3.7 <i>Call Release</i>	6-8
6.4 Message Sequence Diagram	6-8
7 SPARE	7-1
8 SPARE	8-1
9 CALLING LINE IDENTIFICATION PRESENTATION & RESTRICTION (CLIP & CLIR)	9-1
9.0 Scope	9-1
9.1 Service Overview	9-1
9.2 Information Flows	9-1
9.2.1 <i>Preferred method</i>	9-1
9.2.2 <i>Alternative method</i>	9-1
9.3 Formats and Codes	9-2
9.3.1 <i>Messages</i>	9-2
9.3.2 <i>Codings</i>	9-2
9.4 Signalling Procedures	9-5
9.4.1 <i>Initial actions at originating network</i>	9-5
9.4.2 <i>Actions at terminating network on receipt of IAM/IFAM</i>	9-5
9.4.3 <i>Actions at originating network on receipt of ACI Type 7 or SIM'A'</i>	9-6
9.4.4 <i>Actions at terminating network on receipt of ACI Type 1</i>	9-6
9.4.5 <i>Actions at terminating network on receipt of SIM'B'</i>	9-7
9.5 Variances	9-8
9.5.1 <i>Actions at terminating network that does not support the Presentation Number Indicator, on receipt of IAM/IFAM</i>	9-8
9.5.2 <i>Actions at originating network that has indicated that a Presentation Number is not available, on receipt of ACI Type 7 with IRC=12</i>	9-8
9.5.3 <i>Actions at originating network at which CLI is not available, on receipt of ACI Type 7</i> ..	9-8
9.5.4 <i>Actions at terminating network on receipt of CONFUSION or ACI Type 2 with ICC=3 in response to ACI Type 7, or on expiry of TO-14</i>	9-9
10 NUMBER PORTABILITY	10-1
10.0 Scope	10-1
10.1 Formats and Codes	10-1
10.1.1 <i>Messages</i>	10-1
10.1.2 <i>Parameters</i>	10-1
10.2 Signalling Procedures	10-3
10.2.1 <i>Actions at the Donor Network</i>	10-3

10.2.2	<i>Actions at the Third Party Network</i>	10-3
10.2.3	<i>Actions at the Recipient Network</i>	10-3
10.3	Message Sequence Diagram	10-3
11	COMPLETION OF CALLS TO BUSY SUBSCRIBER (CCBS)	11-1
11.0	Scope	11-1
11.1	Service Overview	11-1
11.1.1	<i>Activation</i>	11-1
11.1.2	<i>Invocation and Operation</i>	11-1
11.2	Formats and Codes	11-1
11.2.1	<i>Initial Address Message/Initial and Final Address Message (IAM/IFAM)</i>	11-1
11.2.2	<i>Connection Not Admitted (CNA) Message</i>	11-1
11.3	Signalling Procedures	11-2
11.3.1	<i>General</i>	11-2
11.3.2	<i>Initial Call</i>	11-2
11.3.3	<i>CCBS Call</i>	11-2
11.4	Message Sequence Diagrams	11-3
11.4.1	<i>Initial Call to Busy User</i>	11-3
11.4.2	<i>CCBS Call</i>	11-3
12	TARGETED TRANSIT	12-1
12.0	Scope	12-1
12.1	Formats and Codes	12-1
12.1.1	<i>Messages</i>	12-1
12.1.2	<i>Parameters</i>	12-1
12.2	Signalling Procedures	12-2
12.2.1	<i>Actions at the Originating Network</i>	12-2
12.2.2	<i>Actions at the Transit Network</i>	12-2
12.2.3	<i>Actions at the Receiving Network</i>	12-2
12.2.4	<i>Message Sequence Diagram</i>	12-2
13	SPARE	13-1
14	SPARE	14-1
15	SPARE	15-1
16	OPERATOR SERVICES	16-1
16.0	Scope	16-1
16.1	Service Overview	16-2
16.1.1	<i>Basic Service</i>	16-2
16.1.2	<i>Enhanced Services</i>	16-2
16.1.2.1	<i>Override Service</i>	16-2
16.1.2.2	<i>Interception Service</i>	16-2
16.2	Message Types and Contents	16-3
16.2.1	<i>Basic service</i>	16-3
16.2.2	<i>Enhanced services</i>	16-3
16.3	Signalling Procedures - Basic Service	16-8
16.3.1	<i>Basic service - general</i>	16-8
16.3.2	<i>Manual Hold - Clear (Re-answer)</i>	16-8
16.3.3	<i>Manual Hold - call release</i>	16-8

16.4 Signalling Procedures - Override Service 16-9
 16.4.1 *Initial Action* 16-9
 16.4.2 *Subsequent Action* 16-9
 16.4.3 *Transmission path connection*..... 16-9
 16.4.4 *Call Release*..... 16-10
 16.4.5 *Message Sequence Diagram* 16-10
16.5 Signalling Procedures - Interception Service 16-11
 16.5.1 *Initial Action*..... 16-11
 16.5.2 *Subsequent Action* 16-11
 16.5.3 *Transmission path connection*..... 16-11
 16.5.4 *Call Release*..... 16-12
 16.5.5 *Message sequence diagram* 16-12

0.4 History

Revision	Date of Issue	Updated By	Description
Issue 3	May 1999	PNO-ISC Editors	First Published Version
Issue 3.1	February 2000	PNO-ISC Editors	Updated Sec. 16 to issue 2.1
Issue 3.2	July 2000	PNO-ISC Editors	Revision of Sections 2 and 9 to issue 3.1
Issue 4	June 2001	PNO-ISC Editors	Technical revisions to sections 0, 2, 3, 9,10, 12 & 16. Numerous editorial corrections throughout the document.

0.5 Issue Control

Section	Page	Issue	Date
0	All	4	June 2001
1	All	4	June 2001
2	All	4	June 2001
3	All	4	June 2001
4	All	4	June 2001
5	-	0	
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9	All	4	June 2001
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11	All	4	June 2001
12	All	4	June 2001
13	-	0	
14	-	0	
15	-	0	
16	All	4	June 2001

NOTE: Sections that are revised in this issue are shown in this table as **bold**.

0.6 References

- /1/ PNO-ISC/INFO/004 – Proprietary extensions to IUP
- /2/ PNO-ISC/INFO/008 – PNO switch identities – management and allocation
- /3/ PNO-ISC/SER/001 – UK Completion of Calls to Busy Subscriber Supplementary Service
- /4/ PNO-ISC/SER/002 – CLIP/CLIR service description
- /5/ PNO-ISC/SER/006 – PNO-IG High Level Service Description for Targeted Transit
- /6/ PNO-ISC/SPEC/001 – Structure and Use of Point Codes in the UK
- /7/ PNO-ISC/SPEC/003 – Interconnect Signalling Connection Control Part (SCCP)
- /8/ PNO-ISC/SPEC/004 – C7 Interconnect Transaction Capabilities (TC)
- /9/ PNO-ISC/SPEC/005 – C7 Interconnect Message Transfer Part (MTP)
- /10/ ITU-T Recommendation E.164
- /11/ EN 300 356-18 (1998) – ETSI CCBS
- /12/ ETSI GSM Specification 03.93 GSM CCBS
- /13/ Licence granted by The Secretary of State for Trade and Industry to British Telecommunications under Section 7 of the Telecommunications Act 1984
- /14/ The High Level Service Description For Geographic Number Portability is contained in PNO-IG/GNP/1 Issue 3.
- /15/ The High Level Service Description for Non-Geographic Number Portability of the PNO-IG Task Group, Issue 2.
- /16/ The Code of Practice for Network Operators in relation to Customer Line Identity Display services and other related services Edition 3.
- /17/ PNO-ISC Service Description Number 008 Mobile Number Portability

0.7 Glossary of Terms

0.7.1 Abbreviations

ACI	Additional Call Information (message)
ACM	Address Complete Message
AD&C	Advice of Duration and Charge
ADPCM	Adaptive Differential Pulse Code Modulation
AMC	Automanual Centre (non-C7)
ANS	Answer (message)
ARR	Automatic Re-Routeing
ASUI	Additional Set Up Information (message)
BCD	Binary Coded Decimal
BLA	Blocking Acknowledgement (message)
BLO	Blocking (message)
C7	CCITT Signalling System Number 7
CBI	CLI Blocking Indicator
CCBS	Completion of Calls to Busy Subscriber
CCF	Circuit Free (message)
CCITT	International Telegraph and Telephone Consultative Committee
CCSS	Call Completion Supplementary Services
CCT	Circuit
CDB	Call Drop Back (message)
CdPC	Called Party Category
CFC	Coin and Fee Checking (message)
CFN	Confusion (message)
CIC	Circuit Identification Code
CLI	Calling Line Identity
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
CLR	Clear (message)
CNA	Connection Not Admitted (message)
CND	Calling Number Display
CNG	Congestion (message)
CNI	Changed Number Interception
CPC	Calling Party Category
CPI	Call Path Indicator
CSA	Called Subscriber Answer
CSH	Called Subscriber Held
CTI	Call Type Indicator
CUG	Closed User Group
DASS2	Digital Access Signalling System No 2
DCC	Data Country Code
DDI	Direct Dialling In
DNIC	Data Network Identification Code
DPC	Destination Point Code

DPNSS	Digital Private Network Signalling System
DQ	Directory Enquiries
DTE	Data Terminating Equipment
ECD	Echo Control Device
ECM	Extend Call Message
ECMA	European Computer Manufacturers' Association
EIM	Enveloped-ISUP Message
EISM	Enveloped-ISUP Segmented Message
EQ	Enquiry
ESRA	ECMA Standard Rate Adaptation
ETS	European Telecommunications Standard
ETSI	European Telecommunications Standards Institute
FAM	Final Address Message
FDX	Full Duplex
FIC	Facility Indicator Code
FM	Fixed Mandatory
FO	Fixed Optional
GNP	Geographic Number Portability
GSM	Global System for Mobile Communication
HDX	Half Duplex
HLR	Howler (message)
IAI	Incomplete Address Indicator
IAM	Initial Address Message
ICB	Incoming Calls Barred
ICC	Information Contained Code
IDA	Integrated Digital Access
IFAM	Initial and Final Address Message
IG	Interest Group
IND	International Number Dialling
INIC	ISDN Network Identification Code
INT	International Indicator
IQ	Identity Qualifier
IRC	Information Requested Code
ISC	Interconnect Standards Committee
ISDN	Integrated Services Digital Network
ISI	Interconnect Specific Information
ISPBX	ISDN PBX
ISUP	ISDN User Part
ITU	International Telecommunications Union
ITU-T	International Telecommunications Union - Telecommunications Sector
IUP	Interconnect User Part
IW	Interworking (with non C7 Signalling network/route)

LI	Line Identity
LPD	Long Propagation Delay (indicator)
LPR	Last Party Release (Indicator)
LSB	Least Significant Bit
MDG	Meter Delay Guard (timeout)
MRC	Mobile Rerouting Code
MSB	Most Significant Bit
MSD	Message Sequence Diagram
MTP	Message Transfer Part
NAE	Network Address Extension
NAI	Nature of Address Indicator
NEED	Nodal End-to-End Data (message)
NGNP	Non-Geographic Number Portability
NICC	Network Interoperability Consultative Committee
NN	Network Number
NND	National Number Dialling
NNG	National Number Group
NNIQ	Network Number Identity Qualifier
NP	Network Provided
NPP	Number Portability Prefix
NTA	Network Translated Address
NTE	Network Terminating Equipment
NTP	Network Termination Point
OCB	Outgoing Calls Barred
OCM	Operator Condition Message
OFTEL	Office of Telecommunications
OLM	Overload Message
ONN	OSS Node-to-Node (message)
OOR	Operator Override
OPC	Originating Point Code
OSS	Operator Services System
PA	Priority Access
PABX	Private Automatic Branch Exchange
PBX	Private Branch Exchange
PCLI	Partial Calling Line Identity
PCM	Pulse Code Modulation
PN	Presentation Number
PNI	Presentation Number Indicator
PNIQ	Presentation Number Identity Qualifier
PNM	Protocol Negotiation Message
PNO	Public Network Operator
PNO-IG	Public Network Operator Interest Group
PNO-ISC	Public Network Operator Interconnect Standards Committee
POI	Point Of Interconnect

PRI	Protocol Request Indicator
PROT	Protection Indicator
PSTN	Public Switched Telephone Network
RAM	Repeat Attempt Message
RAN	Re-answer (message)
RCI	Routeing Control Indicator
REC	Recipient Exchange Code
REL	Release (message)
RES	Resume (message) (user-initiated)
RPI	Release Protocol Indicator
RPOA	Recognised Private Operating Agency
SAD	Send All Digits (message)
SAM	Subsequent Address Message
SASUI	Send Additional Set Up Information (message)
SCCP	Signalling Connection Control Part
SCP	Service Control Point
SEM	Subscriber Engaged Message
SER	Service (message)
SHP	Service Handling Protocol
SI	Screening Indicator
SIC	Service Indicator Code
SIF	Signalling Information Field
SIM	Service Information Message
SIO	Service Information Octet
SND	Send N Digits (message)
SOO	Subscriber Out-of-Order (message)
SSM	Send Service Message
SSTV	Slow Scan TeleVision
SUS	Suspend (message) (user-initiated)
SVI	Service Interception
TA	Terminal Adapter
TCAP	Transaction Capabilities Application Part
TCC	Telephone Country Code
TCM	Terminal Congestion Message
TOS	Temporarily Out-of-Service
UBA	Unblocking Acknowledgement (message)
UBL	Unblocking (message)
UK	United Kingdom of Great Britain and Northern Ireland
UPNV	User Provided, Not Verified
UPVP	User Provided, Verified and Passed
UUD	User-to-User Data (message)
VM	Variable Mandatory
VO	Variable Optional

0.7.2 Terminology

Called Customer/Operator

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

Calling Customer/Operator

The customer/operator in the Originating Network initiating the call.

Calling Line Identification Presentation (CLIP) service

A supplementary service that provides the called party with the possibility of receiving identification of the calling party.

Calling Line Identification Restriction (CLIR) service

A supplementary service that allows the calling user to prevent presentation of his CLI to the called access. The CLIR service may operate in two modes, determined by a subscription option.

NOTE - CLI restriction may also be known as CLI blocking or CLI withhold.

Calling Line Identity (CLI)

The CLI is either:

A Network Number, or

A Presentation Number.

CLI available

A condition in which the CLI exists and can be passed to the called customer's access on the terminating network.

CLI restricted/withheld

A condition in which the CLI is not for transmission to the called customer, because the calling customer is directly connected to a network that supports the CLIP service, and has invoked the CLIR option.

CLI unavailable

A condition in which the CLI either:

- does not exist because interworking has been encountered, and consequently the CLI cannot be passed to the called customer's access, or
- is withheld by the network because:
 - the originating network does not support the CLIR service, or
 - the CLI must not be displayed for reasons other than invocation of the CLIR service.

codespace

A parameter or discrete part of a parameter to which a range of values may be assigned.

codepoint

A value assigned to a parameter or discrete part of a parameter.



Donor Network

The initial network where a number was located before ever being ported.

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.

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 /1/ for information only, there being no obligation on any Operator to support the service either internally or via interconnect routes with other Operators. IUP Message Types and Contents section /1/ may be used as the basis of bilateral agreements between Operators.

Intercepting Network

The network which traps a call prior to answer and passes it for answer to an operator in the terminating network.

Manual hold

A feature that permits an answered call to be maintained in this state until the called operator releases it.

Network Number (NN)

The digits that comprise a unique E.164 /10/ number that unambiguously identifies either:

- the fixed access ingress to, or egress from, the public network, i.e. the Network Termination Point; or
- a subscriber or terminal/telephone that has a non-fixed access to the public network, i.e. it is the line identity that has been allocated to an individual subscription or terminal/telephone with a non-fixed access to the public network.

NOTE 1 - This number has additional uses in connection with charging and malicious call identification.

NOTE 2 - Network number is also known as *administration number*, *electric number*, or *network provided billing number*.

NOTE 3 - A network number may be network provided (NP) or user provided verified and passed (UPVP).

NOTE 4 - Network number is always qualified as either available, unavailable or restricted/withheld.

NOTE 5 - The use of one number to identify both originating and terminating accesses is permitted by this definition, but only where both accesses are owned by one network operator, or where agreement for its use is reached between the operators involved.

Network Provided (NP) number

A number that is stored in the public network.

NOTE 1 - A network provided number may also be known as a default number.

NOTE 2 - A network provided number may be a network number or a presentation number.

NOTE 3 - On ISDN calls it is forwarded by the network if there is no special arrangement and the customer's equipment does not send a number, or the number sent fails screening.

Network Termination Point

Has the same meaning as Annex A paragraph 2, item i) of BT's Licence for fixed link terminating networks.

Originating Network

The network to which the customer/operator 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.

Ported Number

A called number which has been relocated to another network

Presentation Number (PN)

A number nominated or provided by the customer to which a return or subsequent call can be made.

NOTE 1 - Presentation number is used when the network number of the calling customer is not suitable for display. This is important where PABXs have segregated incoming and outgoing lines.

NOTE 2 - Presentation number is also known as *diallable number*.

NOTE 3 - A presentation number may be type 1 - network provided (NP), type2 - user provided verified and passed (UPVP) or type 3 - user provided not verified (UPNV).

NOTE 4 - Presentation number is always qualified as either available or restricted/withheld.

Recipient Exchange Code

A five digit code which identifies the exchange in the Recipient Network, to which the number has been ported from the Donor Network.

Recipient Network (in the context of Number Portability)

The network where the number is located after being ported.

required

Where a service/feature/message/parameter is qualified as "required" it shall be fully supported by the implementation concerned.

Note: The term may be applied independently to an interface protocol and/or the underlying functionality.

reserved

Codespace and codepoints defined in this specification as "reserved" are available for use only with the agreement of the PNO-ISC.

Service

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

Standard service

A service for which a formal description has been approved by the PNO-IG for application between networks in the UK. Where a Standard service is supported on any particular C7 IUP interconnect then that support must conform to this specification. However, there is no obligation on any Operator to support the service either internally or via interconnect routes with other Operators. PNO-ISC/SPEC/006 may be used as the basis of bilateral agreements between Operators

Targeted Network

The network targeted by the originating network when using the Targeted Transit Service /5/.

Terminating Network

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

Third Party Network

The network involved in carrying a 'ported' call between Donor Network and Recipient Network, but which is neither a Donor nor a Recipient Network.

Transit Network

A network through which a call passes, but which is neither the originating network nor the terminating network for that call.

NOTE - A transit network acts as an outgoing network and as an incoming network.

User Provided, Not Verified (UPNV) number

A number supplied by a user that has not been subjected to screening or editing by the network.

User Provided, Verified and Passed (UPVP) number

A number whose most significant part is network provided and whose least significant part is supplied by a user and successfully checked by the network for length and range.

NOTE - A user provided, verified and passed number may be a network number or a presentation number.

END OF PNO-ISC/SPEC/006 § 0

1 INTRODUCTION

1.0 Scope

This section provides an introduction and context to Specification PNO-ISC/SPEC/006.

1.1 Scope of PNO-ISC/SPEC/006

PNO-ISC/SPEC/006 specifies the signalling procedures, formats and codes that shall be used to support Standard 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 specification 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.

1.2 Contents of PNO-ISC/SPEC/006

Section 1, Introduction, defines the scope and describes the structure of the C7 IUP specification.

Section 2, 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. Codepoints used only by informative services or procedures are marked in this section, for information only, with a '#' sign.

Section 3, Common Procedures, provides a "library" of common procedures. These are of two types:

Common call control procedures

These are given in Subsection 2 of Section 3 and 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 that employs it is supported.

Core procedures

These are given in the other subsections of Section 3 and are applicable to all C7 IUP interconnects.

Section 4, Telephony Call, specifies the signalling protocol to support the Telephony Call service.

Section 5 is spare.

Section 6, ISDN Call, specifies the signalling protocol to support the Basic ISDN call service.

Sections 7 & 8 are spare.

Section 9, Calling Line Identification Presentation & Restriction (CLIP & CLIR), specifies the signalling protocol to support the calling line identification presentation (CLIP) calling line identification restriction (CLIR) (incorporating calling number display) supplementary service.

Section 10, Number Portability, specifies the signalling protocol to support the Number Portability service for geographic and non-geographic numbers..

Section 11, Completion of Calls to Busy Subscriber (CCBS), specifies the signalling protocol to support the CCBS supplementary service.

Section 12, Targeted Transit, specifies the signalling protocol to support the Targeted Transit service.

Sections 13, 14 & 15, are spare.

Section 16, Operator Services, specifies the signalling protocol to support Operators Services.

END OF PNO-ISC/SPEC/006 § 1

2 MESSAGE TYPES AND CONTENTS

2.0 Scope

The purpose of this section of PNO-ISC/SPEC/006 is to provide a "library" of messages and parameters that are standardised for use across a national interconnect between two Public Network Operators. Some message and parameter codings are not standardised for use across national interconnects and their formats and codes are therefore not contained within this specification. These message and parameter formats and codes are contained in /1/, which uses corresponding subsection numbering. The use for other purposes of codes allocated to these messages and parameters is not recommended.

2.1 General

2.1.1 Message Formats

C7 IUP messages are carried on the signalling data link encapsulated in the Signalling Information Field of a MTP message signal unit, the format of which is described in /9/. The allocation of Point Codes is the subject of /6/.

A C7 IUP message consists of an integral number of octets up to a maximum of 62 or 272 (as determined by the MTP capability).

Figure 2.1 shows the format of the message presented to, or received from, the MTP.

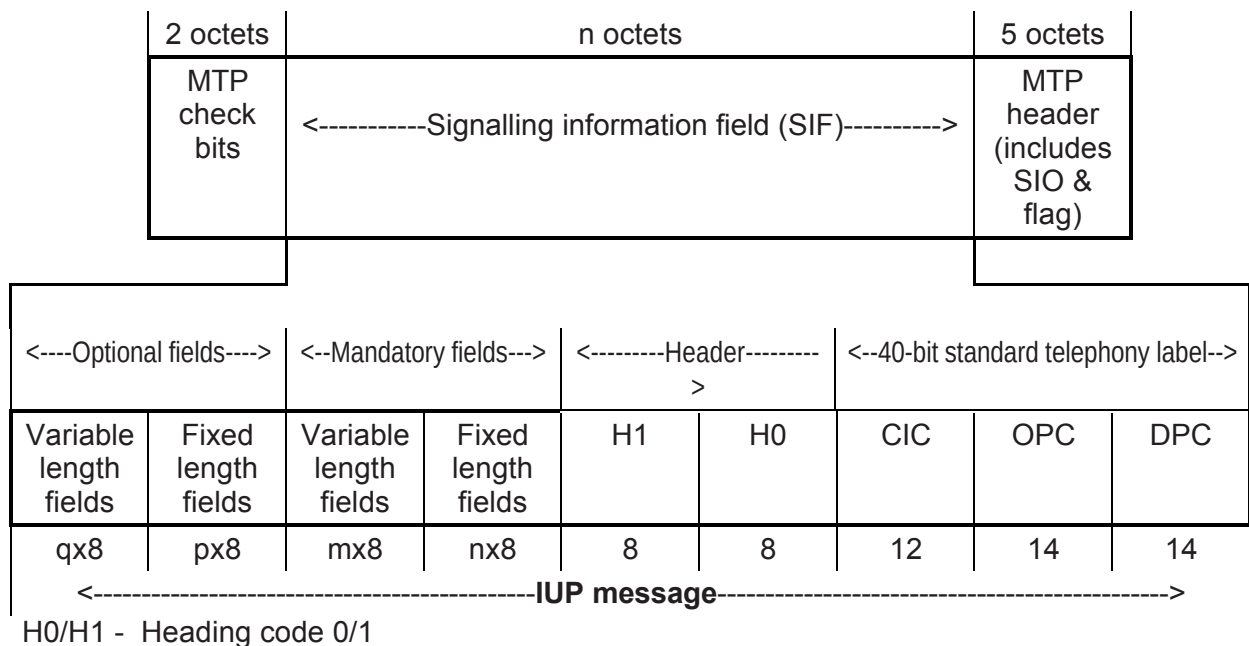


FIGURE 2.1
Standard format of the IUP Message

2.1.2 Standard Telephony Label

This consists of 40 bits and contains the originating and the destination point codes and the circuit identification code.

2.1.2.1 Point Codes

Every node using C7 has at least one unique point code. The Destination Point Code (DPC) is used by the MTP to route the message to the correct node. The Originating Point Code (OPC) is used by the receiving network to direct any replies to the correct node. Thus, for each C7 IUP message the DPC and OPC identifies the traffic route to which the message relates.

2.1.2.2 Circuit Identification Code (CIC)

The CIC uniquely identifies the particular speech circuit within the identified traffic route to which the signalling information contained in the message relates.

2.1.3 IUP Message Header

Each IUP signalling message contains a header consisting of two parts, Heading Code H0 and Heading Code H1. Code H0 identifies the message group while H1 identifies the name, and implicitly the format, of the message. The allocation of H0 and H1 codes is shown in Table 2.2.

2.1.4 Format Principles

IUP messages may contain a number of parameters as defined in 2.3. Each parameter may be of fixed length, or variable length, and the inclusion of such parameters may be mandatory or optional. These attributes are described below.

In most cases the message parameters, and their attributes, are defined by the H0/H1 code for the particular message. However, some messages are defined as having a number of different message "types". In these cases, the parameters and their attributes are specific to the message type. This is shown in 2.3.

2.1.4.1 Mandatory Parameters

Mandatory parameters shall always be included when the message is sent, and shall always be expected when a message is received.

2.1.4.2 Optional Parameters

Optional parameters are not always present in a message. They may be included, for example, based on information being available, or when required by the service in use.

In most cases, the presence or absence of an optional field is shown by an indicator which itself is either a mandatory parameter, or a field within a mandatory parameter. However, in some cases the overall length of the message is the only indication of presence of the parameter.

2.1.4.3 Fixed Length Parameters

Fixed length parameters always contain the same number of bits, whenever they are used within the message. In addition, the format of the parameter is also fixed.

2.1.4.4 Variable Length Parameters

Variable length parameters may be of any length, within the specified range. The actual length is determined by a fixed length parameter, or field within a parameter. This may be within a preceding fixed length parameter, or within the variable length parameter itself. This length may be given either as the number of octets or the number of instances of a particular type of field (e.g. number of digits).

2.1.4.5 Order of Transmission

The parameters of each message shall be transmitted in the order given in the tables of 2.3. Within each parameter, the octets shall be transmitted in the order shown in the parameter descriptions (2.4), least significant bit first.

2.2 Message Groups and Types

2.2.1 Message Groups

There are eight groups of messages (0-5, 7 & 8) defined for current use. The first four (0-3) of these are used to set up a basic telephony call. The next group (4) of messages deals with the supervisory phase of the call. There is an additional group (5) to deal with the circuit supervisory functions. The seventh group (7) of messages is used to invoke ISDN services and pass additional call information across the network. The eighth group (8) of messages is used to support enveloped ISUP. The allocation of H0 and H1 codes is shown in Table 2.1.

In C7 IUP the message groupings shall be as follows:-

2.2.1.1 Forward Address Messages (H0=0)

Messages in this group are used to initiate a call and to forward dialled digits and call instructions between networks.

The Forward Address messages are:

- Initial Address Message (IAM)
- Initial and Final Address Message (IFAM)
- Subsequent Address Message (SAM)
- Final Address Message (FAM)

2.2.1.2 Forward Set-Up Messages (H0=1)

Messages in this group are used to carry additional set-up information (excluding called address digits) between networks.

The defined Forward Set-up message is:

Additional Set-up Information (ASUI) message Types 1-2

2.2.1.3 Backward Set-Up Request Messages (H0=2)

Messages in this group are used to request information relating to the set-up of the call from the outgoing network. The Backward Set-Up Request Messages are:

- Send "N" Digits (SND) message
- Send All Digits (SAD) message
- Send Additional Set-up Information (SASUI) message

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

Messages in this group are used to indicate specific call progress conditions between networks during the call set-up phase.

The defined Backward Set-up Information messages are:

- Address Complete Message (ACM)
- Congestion (CNG) message
- Terminal Congestion Message (TCM)
- Connection Not Admitted (CNA) message
- Repeat Attempt Message (RAM)
- Subscriber Engaged Message (SEM)

Subscriber Out-of-Order (SOO) message

2.2.1.5 Call Supervision Messages (H0=4)

Messages in this group are used to supervise a call.

The Call Supervision messages are:

- Answer (ANS) message
- Clear (CLR) message
- Re-Answer (RAN) message
- Release (REL) message
- Coin and Fee Checking (CFC) message
- Operator Override (OOR) message
- Howler (HLR) message
- Extend Call Message (ECM)

2.2.1.6 Circuit Supervision Messages (H0=5)

Messages in this group are used to control the availability of the circuit.

The Circuit Supervision messages are:

- Circuit Free (CCF) message
- Blocking (BLO) message
- Unblocking (UBL) message
- Blocking Acknowledgement (BLA) message
- Unblocking Acknowledgement (UBA) message
- Overload Message (OLM)

2.2.1.7 Unallocated Group (H0=6)

2.2.1.8 Service Information Messages (H0=7)

Messages in this group are used to support the transfer of additional information between networks over and above that normally exchanged during bearer connection establishment.

This message group also includes a Confusion message in support of forward compatibility to reject service information requests not understood or not supported by the receiving network.

The defined Service Information messages are:

- Confusion (CFN) message
- ISDN Composite Service Information Message (SIM) Types 1-8
- Send Service Message (SSM)
- Service (SER) message
- Additional Call Information (ACI) message Types 1-7
- Swap message
- User-initiated Suspend (SUS) message
- User-initiated Resume (RES) message

2.2.1.9 Enveloped-ISUP Messages (H0=8)

TABLE 2.1
Allocation of H0/H1 codes

H0	0	1	2	3	4	5	6	7	8
H1									
0	INITIAL ADDRESS MESSAGE	*	*	ADDRESS COMPLETE	ANSWER	CIRCUIT FREE	*	CONFUSION	
1	INITIAL AND FINAL ADDRESS	*	*	*	CLEAR	BLOCKING	*	ISDN COMPOSITE SERVICE INFO.	#
2	SUBSEQUENT ADDRESS	*	SEND 'N' DIGITS	CONGESTION	RE-ANSWER	UNBLOCKING	*	SEND SERVICE	#
3	FINAL ADDRESS	*	SEND ALL DIGITS	TERMINAL CONGESTION	RELEASE	BLOCKING ACKNOWLEDGE	*	SERVICE	
4		ADDITIONAL SET-UP INFO.	SEND ADDITIONAL SETUP INFO.	CONNECTION NOT ADMITTED	COIN & FEE CHECKING	UNBLOCKING ACKNOWLEDGE	*	ADDITIONAL CALL INFO.	
5				REPEAT ATTEMPT	OPERATOR OVERRIDE	OVERLOAD	*	#	
6				SUB ENGAGED	HOWLER	*	*	#	
7				SUB OUT-OF-ORDER	EXTEND CALL	*	*	SWAP	
8				*	*	*			
9				*	*	*			
10				#	*	*			
11					*	*		#	
12					*	*		USER-INITIATED SUSPEND	
13					*	*		USER-INITIATED RESUME	
14		*			*	*		#	
15						*			
16						*			
130									#

* - these are not available for ISC use.

- see /1/.

All unallocated and available codings may be allocated by the PNO-ISC in the future.

2.2.2 Message Types

Table 2.2 lists the messages in alphabetical order. The table also includes a reference to where detailed information is contained, and the H0/H1 octets in binary code and decimal code in brackets.

TABLE 2.2
Message types

Message Title	Subsection Reference	Message Group Code (H0)	Message Name Code (H1)
Additional Call Information (ACI) - Type 1	2.3.1.1	00000111 [7]	00000100 [4]
Additional Call Information (ACI) - Type 2	2.3.1.2	00000111 [7]	00000100 [4]
Additional Call Information (ACI) - Type 3	2.3.1.3	00000111 [7]	00000100 [4]
Additional Call Information (ACI) - Type 4	2.3.1.4	00000111 [7]	00000100 [4]
Additional Call Information (ACI) - Type 5	2.3.1.5	00000111 [7]	00000100 [4]
Additional Call Information (ACI) - Type 6	2.3.1.6	00000111 [7]	00000100 [4]
Additional Call Information (ACI) - Type 7	2.3.1.7	00000111 [7]	00000100 [4]
Additional Call Information (ACI) - Type 8	2.3.1.8	00000111 [7]	00000100 [4]
Additional Setup Information (ASUI) -Type 1	2.3.2.1	00000001 [1]	00000100 [4]
Additional Setup Information (ASUI) -Type 2	2.3.2.2	00000001 [1]	00000100 [4]
Address Complete Message (ACM)	2.3.3	00000011 [3]	00000000 [0]
Answer (ANS)	2.3.4	00000100 [4]	00000000 [0]
Blocking (BLO)	2.3.5	00000101 [5]	00000001 [1]
Blocking Acknowledgement (BLA)	2.3.6	00000101 [5]	00000011 [3]
Call Drop Back (CDB)	2.3.7	00000011 [3]	00001010 [10]
Circuit Free (CCF)	2.3.8	00000101 [5]	00000000 [0]
Clear (CLR)	2.3.9	00000100 [4]	00000001 [1]
Coin and Fee Checking (CFC)	2.3.10	00000100 [4]	00000100 [4]
Confusion (CFN)	2.3.11	00000111 [7]	00000000 [0]
Congestion (CNG)	2.3.12	00000011 [3]	00000010 [2]
Connection Not Admitted (CNA)	2.3.13	00000011 [3]	00000100 [4]
Enveloped ISUP Message (EIM)	2.3.42	00001000 [8]	00000010 [2]
Enveloped ISUP Segmented Message (EISM)	2.3.43	00001000 [8]	10000010 [130]
Extend Call Message (ECM)	2.3.14	00000100 [4]	00000111 [7]
Final Address Message (FAM)	2.3.15	00000000 [0]	00000011 [3]
Howler (HLR)	2.3.16	00000100 [4]	00000110 [6]
Initial Address Message (IAM)	2.3.17	00000000 [0]	00000000 [0]
Initial and Final Address Message (IFAM)	2.3.18	00000000 [0]	00000001 [1]
ISDN Composite Service Information Message (SIM) - Type 1	2.3.19.1	00000111 [7]	00000001 [1]
ISDN Composite Service Information Message (SIM) - Type 2	2.3.19.2	00000111 [7]	00000001 [1]
ISDN Composite Service Information Message (SIM) - Type 3	2.3.19.3	00000111 [7]	00000001 [1]
ISDN Composite Service Information Message (SIM) - Type 4	2.3.19.4	00000111 [7]	00000001 [1]
ISDN Composite Service Information Message (SIM) - Type 5	2.3.19.5	00000111 [7]	00000001 [1]
ISDN Composite Service Information Message (SIM) - Type 6	2.3.19.6	00000111 [7]	00000001 [1]
ISDN Composite Service Information Message (SIM) - Type 7	2.3.19.7	00000111 [7]	00000001 [1]
ISDN Composite Service Information Message (SIM) - Type 8	2.3.19.8	00000111 [7]	00000001 [1]
Nodal End-to-End Data (NEED)	2.3.20	00000111 [7]	00001011 [11]

Message Title	Subsection Reference	Message Group Code (H0)	Message Name Code (H1)
Operator Condition Message (OCM)	2.3.21	00000111 [7]	00000101 [5]
Operator Override (OOR)	2.3.22	00000100 [4]	00000101 [5]
OSS Node-to-node (ONN) message	2.3.45	00000111 [7]	00001110 [14]
Overload (OLM)	2.3.23	00000101 [5]	00000101 [5]
Protocol Negotiation Message (PNM)	2.3.44	00001000 [8]	00000001 [1]
Re-answer (RAN)	2.3.24	00000100 [4]	00000010 [2]
Release (REL)	2.3.25	00000100 [4]	00000011 [3]
Repeat Attempt Message (RAM)	2.3.26	00000011 [3]	00000101 [5]
Send Additional Set-up Information (SASUI)	2.3.27	00000010 [2]	00000100 [4]
Send All Digits (SAD)	2.3.28	00000010 [2]	00000011 [3]
Send N Digits (SND)	2.3.29	00000010 [2]	00000010 [2]
Send Service Message (SSM)	2.3.30	00000111 [7]	00000010 [2]
Service (SER)	2.3.31	00000111 [7]	00000011 [3]
Subscriber Engaged Message (SEM)	2.3.32	00000011 [3]	00000110 [6]
Subscriber Out-of-Order (SOO)	2.3.33	00000011 [3]	00000111 [7]
Subsequent Address Message (SAM)	2.3.34	00000000 [0]	00000010 [2]
Swap	2.3.35	00000111 [7]	00000111 [7]
Terminal Congestion Message (TCM)	2.3.36	00000011 [3]	00000011 [3]
Unblocking (UBL)	2.3.37	00000101 [5]	00000010 [2]
Unblocking Acknowledgement (UBA)	2.3.38	00000101 [5]	00000100 [4]
User-initiated Resume (RES)	2.3.40	00000111 [7]	00001101 [13]
User-initiated Suspend (SUS)	2.3.39	00000111 [7]	00001100 [12]
User-to User Data (UUD)	2.3.41	00000111 [7]	00000110 [6]

2.3 Message Contents

This sub-section provides information on each of the IUP messages defined to support those services specified in this Issue of the Specification. Within each message description is a table that lists all the parameters contained in the message in the order in which they shall be transmitted.

The parameter "Types" are:

FM - Fixed Mandatory

VM - Variable Mandatory

FO - Fixed Optional

VO - Variable Optional

NOTE - Where a parameter is shown as reserved it shall be handled as defined in 2.4.1.2.

2.3.1 Additional Call Information (ACI) Message

There are several types of ACI message, all having the same H0/H1 code. Each type is defined by the Information Contained/Information Requested parameter, see 2.4.2.

2.3.1.1 Additional Call Information (ACI) Message - Type 1

This message is used to send Full Calling/Called Line Identity, Last Diverting Line Identity, or Presentation Number (PN).

The message format is shown in Table 2.3.

TABLE 2.3

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0/H1 Codes)	2.2.2	FM	2
ACI Message - Information Contained and Information Requested	2.4.2	FM	2
Reserved (Note)	-	FM	2
ACI Type 1 Message Indicators	2.4.3	FM	1
Line Identity	2.4.19	VM	1-9

NOTE - Use of the reserved parameter is not recommended due to historical use within the BT network.

2.3.1.2 Additional Call Information (ACI) Message - Type 2

This message is used to send a Partial Called/Calling Line Identity (PCLI).

The message format is shown in Table 2.4.

TABLE 2.4

Parameter	Reference Subs.	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
Partial Calling/Called Line Identity (PCLI)	2.4.23	FM	9

2.3.1.3 Additional Call Information (ACI) Message - Type 3

This message is used to send Full Calling/Called Line Identity with Calling/Called Subscriber's Basic Service Marks.

The message format is shown in Table 2.5.

TABLE 2.5

Parameter	Reference Subs.	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
Calling/Called Subscriber's Basic Service Marks	2.4.11	FM	2
ACI Type 3 Message Indicators	2.4.4	FM	1
Line Identity	2.4.19	VM	1-9

2.3.1.4 Additional Call Information (ACI) Message - Type 4

This message is used to send Called Subscriber's Basic Service Marks.

The message format is shown in Table 2.6.

TABLE 2.6

Parameter	Reference Subs.	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
Calling/Called Subscriber's Basic Service Marks	2.4.11	FM	2
ACI Type 4 Message Indicators	2.4.5	FM	1

2.3.1.5 Additional Call Information (ACI) Message - Type 5

This message is used to send Calling Subscriber's Originating Facility Marks.

The message format is shown in Table 2.7.

TABLE 2.7

Parameter	Reference Subs.	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
Calling Subscriber's Originating Facility Marks	2.4.12	FM	2

2.3.1.6 Additional Call Information (ACI) Message - Type 6

This message is used to send Called Subscriber's Terminating Facility Marks.

The message format is shown in Table 2.8.

TABLE 2.8

Parameter	Reference Subs.	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
Called Subscriber's Terminating Facility Marks	2.4.10	FM	2

2.3.1.7 Additional Call Information (ACI) Message - Type 7

This type of ACI is used to request additional call information.

The message format is shown in Table 2.9.

TABLE 2.9

Parameter	Reference Subs.	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

2.3.1.8 Additional Call Information (ACI) Message - Type 8

See /1/.

2.3.2 Additional Set-up Information (ASUI) Message

There are two types of Additional Set-up Information Message both having the same H0/H1 code.

2.3.2.1 Additional Set-up Information (ASUI) Message - Type 1

This message is used to send (full) Calling Line Identity.

The message format is shown in Table 2.10.

TABLE 2.10

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
ASUI Message - Information Contained	2.4.8	FM	1
Line Identity	2.4.19	FM	1-9

2.3.2.2 Additional Set-up Information (ASUI) Message - Type 2

This message is used to send Partial Calling Line Identity.

The message format is shown in Table 2.11.

TABLE 2.11

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
ASUI Message - Information Contained	2.4.8	FM	1
Reserved	-	FM	1
Partial Calling Line Identity	2.4.23	FM	9

2.3.3 Address Complete Message (ACM)

This message is returned from the incoming network to indicate that all address signals required for routing the call have been received.

The message format is shown in Table 2.12.

TABLE 2.12

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
Address Complete Message Indicators	2.4.7	FM	3

2.3.4 Answer (ANS) Message

This message is sent by the incoming network to indicate that switch through to the destination has occurred.

The message format is shown in Table 2.13.

TABLE 2.13

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
Type of Answer	2.4.30	FM	1

2.3.5 Blocking (BLO) Message

This message is a request to inhibit the selection of a circuit between networks.

The message format is shown in Table 2.14.

TABLE 2.14

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2

2.3.6 Blocking Acknowledgement (BLA) Message

This message is an acknowledgement to a Blocking message.

The message comprises only a Label and Header, and its format is shown in Table 2.14.

2.3.7 Call Drop Back (CDB) Message

See /1/.

2.3.8 Circuit Free (CCF) Message

This message indicates that the switched connection has been successfully released and the circuit is available for further use.

The message comprises only a Label and Header, and its format is shown in Table 2.14.

2.3.9 Clear (CLR) Message

This message indicates that the calling or called party has cleared.

The message comprises only a Label and Header, and its format is shown in Table 2.14.

2.3.10 Coin and Fee Checking (CFC) Message

This message provides operator control of pay-on-answer coinbox telephones.

The message comprises only a Label and Header, and its format is shown in Table 2.14.

2.3.11 Confusion (CFN) Message

This message is used to indicate that a Group 7 message which is not understood, or not valid, has been received, or when the receiving network cannot provide any of the information requested in that Group 7 message.

The message format is shown in Table 2.15.

TABLE 2.15

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
Confusion Message Qualifier	2.4.14	FO	1

NOTE - It is recommended that a Confusion Message Qualifier is included with the Confusion message.

2.3.12 Congestion (CNG) Message

This message is used to indicate that the call has encountered congestion.

The message comprises only a Label and Header, and its format is the same as that shown in Table 2.14.

2.3.13 Connection Not Admitted (CNA) Message

This message is used to indicate that the call cannot be connected for any of the reasons listed in 2.4.15. The message format is shown in Table 2.16.

TABLE 2.16

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
CNA Reason	2.4.15	FM	1
CNA Diagnostics	2.4.36	FM	1

2.3.14 Extend Call Message (ECM)

This message is used on SVI calls to enable the SVI operator to extend the call to the required customer.

The message comprises only a Label and Header, and its format is shown in Table 2.14.

2.3.15 Final Address Message (FAM)

This message is used in response to a request for further digits, when the digits contained within the message complete the called address.

The message format is shown in Table 2.17.

TABLE 2.17

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
Reserved	-	FM	1
Called Address	2.4.9	VM	1-10

2.3.16 Howler (HLR) Message

This message enables a network to request application of 'howler' to a customer's line on another network.

The message comprises only a Label and Header, and its format is shown in Table 2.14.

2.3.17 Initial Address Message (IAM)

This message is used to initiate a call attempt.

The message format is shown in Table 2.18.

TABLE 2.18

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
IAM/IFAM Message Indicators	2.4.16	FM	5
Called Address	2.4.9	VM	1-11
Line Identity	2.4.19	VO	1-9

2.3.18 Initial and Final Address Message (IFAM)

This message is used to initiate a call attempt when the complete called address is available.

The IFAM format is the same as the IAM format as shown in Table 2.18.

2.3.19 ISDN Composite Service Information Message (SIM)

This message is used to request/send ISDN-related information. There are several types of ISDN Composite SIM, all having the same H0/H1 code combination. Each type is defined by the Information Contained/Information Requested parameter, see 2.4.18.

2.3.19.1 ISDN Composite Service Information Message (SIM) - Type 1

The message format is shown in Table 2.19.

NOTE - This message is obsolescent and should not be used by new implementations. New implementations should use ISDN Composite SIM Type 7.

TABLE 2.19

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
ISDN Composite SIM - Information Contained & Information Requested	2.4.18	FM	2

2.3.19.2 ISDN Composite Service Information Message (SIM) - Type 2

The message format is shown in Table 2.20.

TABLE 2.20

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
ISDN Composite SIM - Information Contained & Information Requested	2.4.18	FM	2
Facility Indicator Code	2.4.17	FM	2
Service Indicator Code	2.4.27	FM	2
Reserved	-	FM	1
Line Identity	2.4.19	VM	1-9

2.3.19.3 ISDN Composite Service Information Message (SIM) - Type 3

The message format is shown in Table 2.21.

TABLE 2.21

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
ISDN Composite SIM - Information Contained & Information Requested	2.4.18	FM	2
Facility Indicator Code	2.4.17	FM	2
Service Indicator Code	2.4.27	FM	2
Closed User Group Interlock Code	2.4.13	FM	4
Reserved	-	FM	1
Line Identity	2.4.19	VM	1-9

2.3.19.4 ISDN Composite Service Information Message (SIM) - Type 4

The message format is shown in Table 2.22.

NOTE - This message is obsolescent and should not be used by new implementations. New implementations should use ISDN Composite SIM Type 8.

TABLE 2.22

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
ISDN Composite SIM - Information Contained & Information Requested	2.4.18	FM	2
Reserved	-	FM	1
Line Identity	2.4.19	VM	1-9

2.3.19.5 ISDN Composite Service Information Message (SIM) - Type 5

The message format is shown in Table 2.23.

TABLE 2.23

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
ISDN Composite SIM - Information Contained & Information Requested	2.4.18	FM	2
Facility Indicator Code	2.4.17	FM	2
Service Indicator Code	2.4.27	FM	2
Reserved	-	FM	1
Line Identity	2.4.19	VM	1-9
Six Character Network Address Extension	2.4.29	VM	2-7

2.3.19.6 ISDN Composite Service Information Message (SIM) - Type 6

The message format is shown in Table 2.24.

TABLE 2.24

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
ISDN Composite SIM - Information Contained & Information Requested	2.4.18	FM	2
Facility Indicator Code	2.4.17	FM	2
Service Indicator Code	2.4.27	FM	2
Closed User Group Interlock Code	2.4.13	FM	4
Reserved	-	FM	1
Line Identity	2.4.19	VM	1-9
Six Character Network Address Extension	2.4.29	VM	2-7

2.3.19.7 ISDN Composite Service Information Message (SIM) - Type 7

The message format is shown in Table 2.25.

TABLE 2.25

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
ISDN Composite SIM - Information Contained & Information Requested	2.4.18	FM	2
Facility Indicator Code	2.4.17	FM	2

2.3.19.8 ISDN Composite Service Information Message (SIM) - Type 8

The message format is shown in Table 2.26.

TABLE 2.26

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
ISDN Composite SIM - Information Contained & Information Requested	2.4.18	FM	2
Facility Indicator Code	2.4.17	FM	2
Reserved	-	FM	1
Line Identity	2.4.19	VM	1-9

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

See /1/.

2.3.21 Operator Condition Message (OCM)

See /1/.

2.3.22 Operator Override (OOR) Message

This message enables an operator in one network to offer an incoming call to a customer on another network who is already engaged on another call.

The message comprises only a Label and Header, and its format is shown in Table 2.14.

2.3.23 Overload Message (OLM)

This message is used to indicate that the call attempt has been rejected due to overload.

The message comprises only a Label and Header, and its format is the same as that shown in Table 2.14.

2.3.24 Re-Answer (RAN) Message

This message is sent after a clear message to indicate that a call has returned to the answered state. The message comprises only a Label and Header, and its format is the same as that shown in Table 2.14.

2.3.25 Release (REL) Message

This message may be returned from a network to cause release of a call for any of the reasons listed in 2.4.24.

The message format is shown in Table 2.27.

TABLE 2.27

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
Release Reason (Note)	2.4.24	FO	1

NOTE - It is recommended that a reason parameter is included with the Release Message.

2.3.26 Repeat Attempt Message (RAM)

This message is used to indicate that the call has been unsuccessful and should be reattempted on the same route.

The message comprises only a Label and Header, and its format is the same as that shown in Table 2.14.

2.3.27 Send Additional Set-up Information (SASUI) Message

This message is used to request further information concerning call establishment.

The message format is shown in Table 2.28.

TABLE 2.28

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
Information Indicator	2.4.25	FM	1

2.3.28 Send All Digits (SAD) Message

This message is used to request that all digits are forwarded as soon as possible, i.e. those available en bloc and the rest individually as they become available.

The message format is shown in Table 2.29.

TABLE 2.29

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
Reserved	-	FM	1

2.3.29 Send N Digits (SND) Message

This message is used to request a specific number of digits to be forwarded.

The message format is shown in Table 2.30.

TABLE 2.30

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
Number of Digits Requested	2.4.26	FM	1

2.3.30 Send Service Message (SSM)

This message is sent by the terminating network to elicit the operator service required by the originating network.

The message comprises only a Label and Header, and its format is shown in Table 2.14.

2.3.31 Service (SER) Message

This message is sent by the originating network to the terminating network in response to a Send Service Message, in order to identify the operator service required.

The message format is shown in Table 2.31.

TABLE 2.31

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
Service Code	2.4.28	FM	1

2.3.32 Subscriber Engaged Message (SEM)

This message is used to indicate an unsuccessful call set-up due to the required subscriber being engaged on another call.

NOTE - The preferred means of indicating Subscriber Engaged is the CNA or Release Message equivalent with reason "Subscriber Engaged".

The message comprises only a Label and Header, and its format is shown in Table 2.14.

2.3.33 Subscriber Out-of-Order (SOO) Message

This message is used to indicate an unsuccessful call set-up due to the required subscribers line being temporarily out of order.

NOTE - The preferred means of indicating Subscriber Out-of-Order is the CNA or Release Message equivalent with reason "Subscriber Out-of-Order".

The message comprises only a Label and Header, and its format is shown in Table 2.14.

2.3.34 Subsequent Address Message (SAM)

This message is used in response to requests for further digits at call set-up.

The message format is shown in Table 2.32.

TABLE 2.32

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
Reserved	-	FM	1
Called Address	2.4.9	VM	2-10

2.3.35 Swap Message

This message is used on ISDN calls to change between voice and data mode, or from one data mode to another.

The message format is shown in Table 2.33.

TABLE 2.33

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
Service Indicator Code	2.4.27	FM	2
Reserved	-	FM	1

2.3.36 Terminal Congestion Message (TCM)

This message is used to indicate an unsuccessful call set-up due to congestion if re-routing is not possible.

NOTE - The preferred means of indicating Terminal Congestion is the CNA or Release Message equivalent with reason "Congestion (Re-routing not permitted)".

The message comprises only a Label and Header, and its format is shown in Table 2.14.

2.3.37 Unblocking (UBL) Message

This message is used to remove a Blocking condition.

The message comprises only a Label and Header, and its format is shown in Table 2.14.

2.3.38 Unblocking Acknowledgement (UBA) Message

This message is used as an acknowledgement to an Unblocking message.

The message comprises only a Label and Header, and its format is shown in Table 2.14.

2.3.39 User Initiated 'Suspend' (SUS) Message

This message is used to indicate that the call has been suspended by the user.

The message format is shown in Table 2.34.

TABLE 2.34

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
Reserved	-	FM	1

2.3.40 User Initiated 'Resume' (RES) Message

This message is used to indicate that the suspended call has been resumed by the user.

The message format is shown in Table 2.35.

TABLE 2.35

Parameter	Reference Subs.	Type	Length (octets)
Label	2.1.2	FM	5
Header - (H0 and H1 Codes)	2.2.2	FM	2
Reserved	-	FM	1

2.3.41 User-to-User Data (UUD) Message

See /1/.

2.3.42 Enveloped-ISUP Message (EIM)

See /1/.

2.3.43 Enveloped-ISUP Segmented Message (EISM)

See /1/.

2.3.44 Protocol Negotiation Message (PNM)

See /1/.

2.3.45 OSS Node-to-node (ONN) Message

See /1/.

2.4 Parameter Formats and Code Allocations

2.4.1 General

2.4.1.1 Parameter Titles

Table 2.36 lists the parameters in alphabetical order together with references to the subsections in which they are described.

TABLE 2.36
Parameter titles

Parameter Title	Subsection Reference
Additional Call Information Message - Information Contained Code & Information Requested Code	2.4.2
Additional Call Information Message Type 1 - Message Indicators	2.4.3
Additional Call Information Message Type 3 - Message Indicators	2.4.4
Additional Call Information Message Type 4 - Message Indicators	2.4.5
Additional Call Information Message Type 8 - Message Indicators	2.4.6
Additional Set-up Information Message - Information Contained	2.4.8
Address Complete Message Indicators	2.4.7
Call Drop Back Message - Calling Line Information Indicator	2.4.32
Call Drop Back Message - Call Log Indicators	2.4.33
Call Drop Back Message - Service Control Point (SCP) Information	2.4.34
Call Drop Back Message - Translated Address	2.4.35
Called Address	2.4.9
Called Subscriber's Terminating Facility Marks	2.4.10
Calling/Called Subscriber's Basic Service Marks	2.4.11
Calling Subscriber's Originating Facility Marks	2.4.12
Closed User Group (CUG) Interlock Code	2.4.13
Confusion Message Qualifier	2.4.14
Connection Not Admitted - Diagnostics	2.4.36
Connection Not Admitted - Reason	2.4.15
EISM Segmentation Information	2.4.38
IAM/IFAM Message Indicators	2.4.16
ISDN Composite SIM - Facility Indicator Code	2.4.17
ISDN Composite SIM - Information Contained and Information Requested	2.4.18
ISUP Message	2.4.37
ISUP Message Segment	2.4.39
Line Identity (LI)	2.4.19
Nodal End-to-End Data	2.4.21
Nodal End-to-End Data Message - Content Qualifier	2.4.20
Operator Condition Indicators	2.4.22
Partial Calling Line Identity (PCLI)	2.4.23
Protocol Negotiation Message Indicators	2.4.40
Release Reason	2.4.24
Send Additional Set-Up Information Message - Information Indicator	2.4.25
Send N Digits Message - Number of Digits Requested	2.4.26
Service Indicator Code (SIC)	2.4.27
Service Message - Service Code	2.4.28
Six Character Network Address Extension (Sub-Address)	2.4.29
Type of Answer	2.4.30
User-to-User Data	2.4.31

2.4.1.2 Reserved Parameter Fields

Some of the parameter fields within the parameters detailed in this sub-section are shown as "reserved". No significance shall be attached to the value of the bits within reserved parameter fields (but see Section 3 for transit operation). Some of these fields are reserved for current use outside the scope of this specification. Others are reserved for future ISC use and must not be assigned a meaning without endorsement by the ISC. However, the ISC may endorse the use and meaning of a parameter field prior to it appearing in an issued ISC Specification.

2.4.1.3 Reserved Values within Parameter Fields

Some of the parameter field values detailed in this sub-section are shown as "reserved". Some of these values are reserved for current use outside the scope of this specification. Others are reserved for future ISC use and must not be assigned a meaning without endorsement by the ISC. However, the ISC may endorse the use and meaning of a parameter field value prior to it appearing in an issued ISC Specification.

2.4.2 Additional Call Information Message Information Contained Code and Information Requested Code

The format of the ACI Message Information Contained/Information Requested parameter field is shown in Figure 2.2.

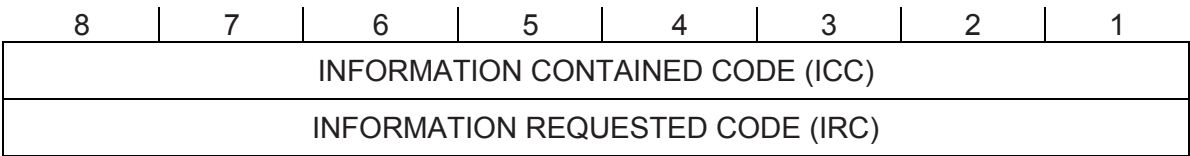


FIGURE 2.2
ACI Message Information Contained Code / Information Requested Code parameter

The Information Contained Code indicates the contents of an ACI message. The Information Requested Code indicates the information being requested by an ACI message. The ICC and IRC code meanings shall be common to both fields, and are as follows:

- 00000000 [0] No information
- 00000001 [1] Full Calling Line Identity
- 00000010 [2] Full Called Line Identity
- 00000011 [3] Partial Calling Line Identity
- 00000100 [4] Partial Called Line Identity
- 00000101 [5] Full Calling Line Identity with Calling Subscriber's Basic Service Marks
- 00000110 [6] Full Called Line Identity with Called Subscriber's Basic Service Marks
- 00000111 [7] Called Subscriber's Basic Service Marks
- 00001000 [8] Calling Subscriber's Originating Facility Marks
- 00001001 [9] Called Subscriber's Terminating Facility Marks
- 00001010 [10] see /1/
- 00001011 [11] Last Diverting Line Identity
- 00001100 [12] Presentation Number Line Identification
- 00001101 [13])
- to) reserved
- 11111111 [255])

Each combination of ICC and IRC defines an ACI Message Type. The format of each type is different and these are detailed in 2.3.1.

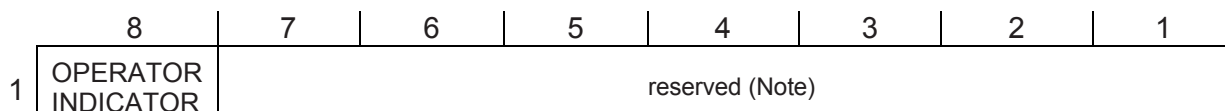
Table 2.37 lists the allowed ICC and IRC combinations for ACI Types 1 to 7.

TABLE 2.37
ACI Message Types 1 to 7 - Information Contained/Information Requested

Additional Call Information Message Type	Permitted Information Contained Codes	Permitted Information Requested Codes
ACI Type 1	00000001 [1] 00000010 [2] 00001011 [11] 00001100 [12]	00000000 [0]
ACI Type 2	00000011 [3] 00000100 [4]	00000000 [0]
ACI Type 3	00000101 [5] 00000110 [6]	00000000 [0]
ACI Type 4	00000111 [7]	00000000 [0]
ACI Type 5	00001000 [8]	00000000 [0]
ACI Type 6	00001001 [9]	00000000 [0]
ACI Type 7	00000000 [0]	00000001 [1] 00000010 [2] 00000101 [5] 00000110 [6] 00000111 [7] 00001000 [8] 00001001 [9] 00001011 [11] 00001100 [12]

2.4.3 Additional Call Information Message Type 1 - Message Indicators

The format of the ACI, Type 1 Message Indicators parameter is shown in Figure 2.3.



NOTE - Use of Bits 1-7 is not recommended due to historical use within the BT network.

FIGURE 2.3

ACI Message Type 1 - Message Indicators parameter

The following codes are defined for use in the fields of the ACI Message Type 1 - Message Indicators parameter.

Operator Indicator

- 0 No information
- 1 Operator involved in call set-up

2.4.4 Additional Call Information Message Type 3 - Message Indicators

The format of the ACI, Type 3 Message Indicators parameter shown in Figure 2.4.

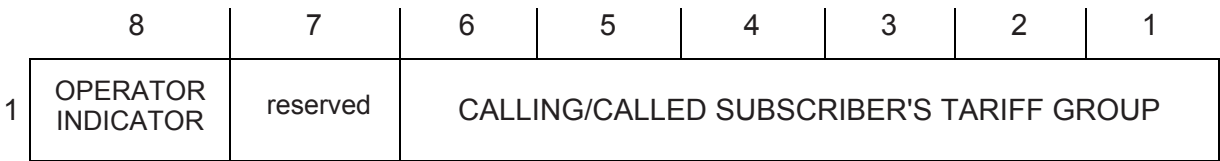


FIGURE 2.4
ACI Message Type 3 - Message Indicators parameter

The following codes are defined for use in the fields of the ACI Message Type 3 - Message Indicators parameter.

a) Calling/ Called Subscriber's Tariff Group

000000) Code allocations are network specific only, but meanings may be mutually
to) agreed between the PNOs concerned. This Specification does not specify
111111) the codings.

The contents of this field shall be ignored by the receiving network if no bilateral agreement exists between the PNOs concerned.

b) Operator Indicator

0 No information
1 Operator involved in call set-up

2.4.5 Additional Call Information Message Type 4 - Message Indicators

The format of the ACI, Type 4 Message Indicators parameter field is shown in Figure 2.5.

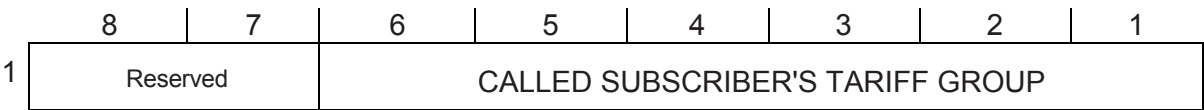


FIGURE 2.5
ACI Message Type 4 - Message Indicators parameter

The following codes are defined for use in the sub-fields of the ACI Message Type 4 - Message Indicators parameter field.

Called Subscriber's Tariff Group

000000) Code allocations are network specific only, but meanings may be mutually
to) agreed between the PNOs concerned. This Specification does not specify the
111111) codings.

The contents of this field shall be ignored by the receiving network if no bilateral agreement exists between the PNOs concerned.

2.4.6 Additional Call Information Message Type 8 - Message Indicators

See /1/.

2.4.7 Address Complete Message Indicators

The format of the Address Complete message Indicators parameter is shown in Figure 2.7.

	8	7	6	5	4	3	2	1
1	Reserved		CALLED PARTY CATEGORY					
2	reserved	CHARGE INDICATOR	reserved					
3	reserved	ECHO CONTROL DEVICE INDICATOR	INTERWORKING INDICATORS				LAST PARTY RELEASE INDICATOR	

FIGURE 2.7

Address Complete Message Indicators parameter

The following codes are defined for use in the fields of the Address Complete Message Indicators parameter.

a) Called Party Category (CdPC)

Providing information on the classification of the called line, (if available).

000000 [0]	Unknown
000001 [1]	Ordinary (Residential)
000010 [2]	Ordinary (Business)
000011 [3]	Payphone (General)
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]	)

b) Charge Indicator

0	No charge
1	Charge

c) Last Party Release (LPR) Indicator

To indicate that last party release is to be used on the call.

0	Invoke normal (calling party) release
1	Invoke Last Party Release

d) Interworking Indicators

Indicating the nature of signalling system and transmission path that has been encountered within the interconnected networks.

- 00000 [0] Analogue interworking encountered within the PSTN or call encounters an analogue or digital signalling system of lesser capability than C7 IUP, i.e. Group 7 messages are not supported (see 2.2.1.8).
- 00001 [1] Fully digital internodal transmission path available with message based signalling of equivalent capability to C7 IUP, connecting a digitally-connected customer/PBX.
- 00010 [2] Fully digital internodal transmission path available with message based signalling of equivalent capability to C7 IUP, connecting an analogue-connected customer/PBX.
- 00011 [3])
- to) reserved
- 01111 [15])
- 10000 [16] reserved
- 10001 [17] Fully digital internodal transmission path available with C7(IUP) signalling (or equivalent), accessing a digital private network.
- 10010 [18] Fully digital internodal transmission path available with C7(IUP) signalling (or equivalent), accessing a digital private network; analogue part of private network encountered, (early backward transmission path requested).
- 10011 [19])
- to) reserved
- 11111 [31])

e) Echo Control Device Indicator

Indicating whether an 'incoming half echo canceller' device has been included in the backward transmission path of the connection. Refer also to 2.4.16 where the complementary IAM/IFAM forward indication is described.

- 0 Incoming half echo control device not included
- 1 Incoming half echo control device included

2.4.8 Additional Set-up Information Message Information Contained

The format of the ASUI Message Information Contained parameter is shown in Figure 2.8.

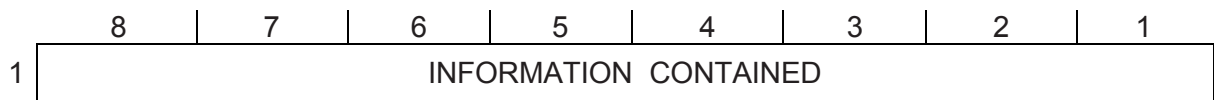


FIGURE 2.8
ASUI Message - Information Contained parameter

The content and hence the Type of each ASUI message shall be determined by the binary code held within the 8 bit "Information Contained" field.

The following codes are defined for use in the fields of the ASUI Message - Information Contained parameter: