ISDN MESSAGE SET (NTT_INS-89)

Reference Manual

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Reference Manual

SUPPORTED MESSAGE SETS

A number of ISDN D-Channel Layer 3 Message Sets are available to support all application monitor and simulation tests. CCITT is the international message set and is provided as the default to all ISDN users.

Contact your IDACOM/HP sales representative to either purchase additional sets and/or update existing message sets.

The following table contains a complete list of all currently available message sets and the corresponding release dates and numbers.

Message Set	Description	Release Date	Release #
International			
CCITT_1988	CCITT Q.931/I.451 Network Layer, Blue Book (1988)	November 1990	R01
North America			
ATT_5E6	AT&T 5D5-900-321, 5E6 Generic Program (03/89)	November 1990	R01
ATT_41449	AT&T Primary Rate Interface Spec, TR41449 (07/89)	November 1990	R01
NT_S208-4	Northern Telecom NIS S208-4 (1988), Functional	November 1990	R01
NT_S208-2	Northern Telecom NIS S208-2 (1986), Stimulus	November 1990	R01
NT_A211-1	Northern Telecom NIS A211-1, Issue AB01 (03/87)	November 1990	R01
Europe			
VN2_133e	CNET Tech Spec ST/LAA/RSM/ 133, Ed 3 (07/88) English	November 1990	R01
VN2_133f	CNET Tech Spec ST/LAA/RSM/ 133, Ed 3 (07/88) French	November 1990	R01
1TR6_MGK	FTZ 1TR6 ISDN-D-Kanal-Protokoll (Ausgabe 1.90) - MGK	November 1990	R01
1TR6_NSA	FTZ 1TR6 ISDN-D-Kanal-Protokoll (Ausgabe 1.90) - NStAnl	November 1990	R01
Asia			
NTT_INS-89	NTT INS Net 64/1500 Service Interface (1989)	November 1990	R01

This manual is intended to provide a list of message identifiers, information element identifiers, and information element structures for the NTT_INS-89 Message Set. Refer to the ISDN Programmer's Manual for a list of identifiers and structures for the CCITT (default) message set.

This manual is not intended to provide basic user instruction, but rather provides examples which apply standard techniques for writing layer 3 test scripts using the Interactive Test Language (ITL). Refer to the Programmer's Reference Manual for general programming information, and the ISDN Programmer's Manual for more information and examples regarding ISDN test scripts. Refer to the machine specific User Manual for a quick reference to the basic operation of the protocol tester and for instructions to load and operate the software.

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1

INTRODUCTION

This message set is implemented in accordance with: NTT INS Net Service Interface, Volume 3 (Layer 3 Line/Switch Section), June 1989.

The message set name (NTT_INS-89) is used with the LOAD_MESSAGE_SET command or the *Load Message Set* function key under the **MessageSet** topic. This name is also displayed on various menus, and is used to identify the message set variation when layer 3 complete report format is selected. The corresponding entry on the Message Set Selection Menu identifies the message set name, description, and release number:

NTT_INS-89   **NTT INS Net 64/1500 Service Interface (1989)**   **R01**

This message set contains unique identifiers which can be used in ISDN test scripts to reference received and transmitted messages. These identifiers are listed in three sections:
* Message Type Identifiers
* Information Element Identifiers
* Information Element Structures (including parameter field selectors and associated field values constants)

The following subsections provide some examples illustrating the use of each of these types of identifiers. Refer to the ISDN Programmer's Manual for more information and detailed examples.

1.1 Using Message Identifiers

Message identifiers uniquely identify a message type in both received and transmitted messages, and are expressed in the following form:

M#xxxx (eg. M#SETUP)

In addition, the following default identifiers (specific received messages only) are also included with each message set:
* M#ANY (any valid message)
* M#INVALID (an invalid message)
* M#UNDEF (an unknown/undefined message type)

Example 1:
After receiving a Setup message, perform an action (eg. send a Setup Acknowledge response, increment a counter, etc.).

```
M#SETUP ?L3_MSG
ACTION[
        ( code specifying action taken if Setup message received )
]ACTION
```

Example 2:
Send an Alert message in an I frame complete with desired information elements.

```
M#ALERT MESSAGE>
        I#DISPLAY
        I#SIGNAL
<SEND
```

Message identifiers can also be used for filter/trigger management from within a script.

Example 3:
Set the display/report filter to only pass Setup and Connect messages.

```
R_FILTER                ( Select the display filter )
F3=NONE                 ( Block all message types )
M#SETUP F+MSG           ( Pass Setup messages )
M#CONN  F+MSG           ( Pass Connect messages )
```

1.2 Using IE Identifiers

IE identifiers uniquely identify an information element in both received and transmitted messages, and are expressed in the following form:

I#xxxx (eg. I#CAUSE)

Example 1:
Determine if the Cause IE appears in the last received message at least once.

```
I#CAUSE 1 ?L3_IE
IF
        ( code specifying action taken if the first Cause IE is found )
ELSE
        ( code specifying action taken if the first Cause IE is not found;
          ie: none present )
ENDIF
```

Example 2:
Prepare a Cause IE for later inclusion and transmission within a message.

```
I#CAUSE ELEMENT>
        ALL_EXCLUDED
        OCTET_3 INCLUDED
        OCTET_4 INCLUDED
        OCTET_5 INCLUDED
<ELEMENT
```

Also in this group are octet identifiers which uniquely identify an octet number that can be used for any IE that contains that octet number. Octet identifiers are used in both received and transmitted messages and are expressed in the following form:

OCTET_xx (eg. OCTET_3.1)

Example 1:
Determine if Octet 3A is present in the Cause IE of the latest message received.

```
I#CAUSE OCTET_3A ?L3_OCTET
IF
    ( code specifying action taken if the octet is present;
      ie: process the specified Recommendation )
ENDIF
```

1.3 Using IE Structures

Information element structures consist of the information element parameter field selectors and the associated field value identifiers.

The parameter field selectors are expressed in the following form:

->xxx_yyyy (eg. ->BC_CODING_STANDARD)

where: xxx = the information element associated with that parameter field
                 (eg: Bearer Capability)
           yyyy = the parameter field (either a string or a bit field)

The field value identifiers are expressed in the following form:

#xxxxx (eg. #INTERNATIONAL = 0b00000001)

All parameter field selectors are used with the *DEC and *COD structure indicators. *DEC provides the base address of the decoder parameter structure. When used with a field selector, decoded parameter values can be accessed. *COD complements *DEC and provides the base address of the coder parameter structure for the current connection. The contents of specific parameter fields can then be changed prior to transmission.

Example 1:
Depending on the contents of the received Bearer Capability Coding Standard parameter field
(Octet 3, 2 bits), perform one of two different actions.

```
*DEC ->BC_CODING_STANDARD @        ( Obtain the received value )
#CCITT =                           ( Compare with identifier )
IF
     T." Coding Standard is CCITT" TCR
ELSE
     T." Coding Standard is not CCITT" TCR
ENDIF
```

> **NOTE**
> *The preceding example uses a bit field and @ (fetch); ! (store) and T. (print value) can also be used. If the parameter is a string (a sequence of one or more characters), !STRING or T.TYPE can be used.*

Example 2:
Set the appropriate values of the two parameter fields of Octet 4 of the Bearer Capability IE prior
to transmission.

```
#CIRCUIT_MODE *COD ->BC_TRANSFER_MODE !
#384KBIT/S    *COD ->BC_TRANSFER_RATE !
```

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MESSAGE IDENTIFIERS

2.1 Q.931 Protocol Discriminator

M#ALERT	Alerting
M#CALL_PROC	Call Proceeding
M#CONN	Connect
M#CONN_ACK	Connect Acknowledge
M#CON_CON	Congestion Control
M#DISC	Disconnect
M#INFO	Information
M#NOTIFY	Notify
M#PROG	Progress
M#REL	Release
M#REL_COM	Release Complete
M#RES	Resume
M#REST	Restart
M#REST_ACK	Restart Acknowledge
M#RES_ACK	Resume Acknowledge
M#RES_REJ	Resume Reject
M#SETUP	Setup
M#STATUS	Status
M#STATUS_ENQ	Status Enquiry
M#SUSP	Suspend
M#SUSP_ACK	Suspend Acknowledge
M#SUSP_REJ	Suspend Reject
M#USER_INFO	User Information

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IE IDENTIFIERS

3.1 Codeset 0

I#BEARER_CAP	Bearer Capability
I#CALLED_NUM	Called Party Number
I#CALLED_SAD	Called Party Subaddress
I#CALLING_NUM	Calling Party Number
I#CALLING_SAD	Calling Party Subaddress
I#CALL_ID	Call Identity
I#CALL_STATE	Call State
I#CAUSE	Cause
I#CHANNEL_ID	Channel Identification
I#CONG_LEVEL	Congestion Level
I#DATE/TIME	Date/time
I#DISPLAY	Display
I#FACILITY	Facility
I#FEAT_ACT	Feature Activation
I#FEAT_IND	Feature Indication
I#HI_LAY_COMP	High Layer Compatibility
I#KEYPAD	Keypad
I#LOW_LAY_COMP	Low Layer Compatibility
I#MORE_DATA	More Data
I#NOTIFIC_IND	Notification Indicator
I#PROGRESS_IND	Progress Indicator
I#RESTART_IND	Restart Indicator
I#SHIFT	Shift
I#SIGNAL	Signal
I#TRANS_NW_SEL	Transit Network Select
I#UU_INFO	User-user Information

3.2 Codeset 5

I#SHIFT	Shift

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3.3 Codeset 6

I#CHARGE_ADVICE   Advice Of Charge
I#SHIFT   Shift

3.4 Codeset 7

I#SHIFT   Shift

4

IE STRUCTURES

4.1 Advice Of Charge IE (I#CHARGE_ADVICE)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

->CA_IND_TYPE	Indication type, Octet 3
#TOTAL_CHARGE	*Total charge*
->CA_CHARGING_DATA	Charging data, Octet 4 *
(IA5 characters)	*max. length 11 octets*

4.2 Bearer Capability IE (I#BEARER_CAP)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4, OCTET_4A, OCTET_4B, OCTET_5, OCTET_5A, OCTET_6, OCTET_7

->BC_CODING_STANDARD	Coding standard, Octet 3
#CCITT	*CCITT*
->BC_TRANSFER_CAP	Info. trans. cap., Octet 3
#SPEECH	*speech*
#UNRESTRICTED	*unrestricted digital information*
#3.1KHZ_AUDIO	*3.1 kHz audio*
->BC_TRANSFER_MODE	Transfer mode, Octet 4
#CIRCUIT_MODE	*circuit mode*
#PACKET_MODE	*packet mode*
->BC_TRANSFER_RATE	Info. transfer rate, Octet 4
#PACKET	*packet mode call*
#64KBIT/S	*64 kbit/s*
#384KBIT/S	*384 kbit/s*
#1536KBIT/S	*1536 kbit/s*
->BC_STRUCTURE	Structure, Octet 4a
#DEFAULT	*default*
#8KHZ_INTEGRITY	*8 kHz integrity*
#SDU_INTEGRITY	*service data unit integrity*
->BC_CONFIGURATION	Configuration, Octet 4a
#POINT_TO_POINT	*point—to—point*
->BC_ESTABLISHMENT	Establishment, Octet 4a
#DEMAND	*demand*

->BC_SYMMETRY	Symmetry, Octet 4b
#BIDIRECT_SYMMETRIC	*bidirectional symmetric*
->BC_TRANSFER_RATE_4B	Info. transfer rate, Octet 4b
#PACKET	*packet mode call*
#64KBIT/S	*64 kbit/s*
#384KBIT/S	*384 kbit/s*
#1536KBIT/S	*1536 kbit/s*
->BC_LAYER1_ID	Layer identifier, Octet 5
(numeric value)	*valid value: 1*
->BC_L1_PROTOCOL	Layer 1 protocol, Octet 5
#RATE_ADAPTION	*CCITT rate adaption V.110/X.30*
#G.711_ULAW	*Rec. G.711 u-law*
#X.31_HDLC	*CCITT rate adaption X.31 HDLC*
->BC_SYNC/ASYNC	Sync/Async, Octet 5a
#SYNCHRONOUS	*synchronous*
#ASYNCHRONOUS	*asynchronous*
->BC_NEGOTIATION	Negotiation, Octet 5a
#NEG_NOT_POSSIBLE	*in-band negotiation not possible*
#NEG_POSSIBLE	*in-band negotiation possible*
->BC_USER_RATE	User rate, Octet 5a
#56KBIT/S	*56 kbit/s Rec. V.6*
->BC_LAYER2_ID	Layer identifier, Octet 6
(numeric value)	*valid value: 2*
->BC_L2_PROTOCOL	Layer 2 protocol, Octet 6
#Q.921	*Rec. Q.921 (I.441)*
#X.25_LINK	*Rec. X.25 link level*
->BC_LAYER3_ID	Layer identifier, Octet 7
(numeric value)	*valid value: 3*
->BC_L3_PROTOCOL	Layer 3 protocol, Octet 7
#Q.931	*Rec. Q.931 (I.451)*
#X.25_PACKET	*Rec. X.25 packet layer*

4.3 Call Identity IE (I#CALL_ID)

Possible octet inclusions/exclusions:

OCTET_3

->CI_CALL_ID	Call identity, Octet 3 *
(hex characters)	*max. length 8 octets*

4.4 Call State IE (I#CALL_STATE)

Possible octet inclusions/exclusions:

OCTET_3

->CS_CODING_STANDARD	Coding standard, Octet 3
#CCITT	*CCITT*
#INTERNATIONAL	*other international standards*
#NATIONAL	*national standard*
#NETWORK_SPECIFIC	*standard defined for the network*
->CS_CALL_STATE	Call state, Octet 3
#NULL	*Null*
#CALL_INIT	*Call Initiated*
#OUTGOING_CALL_PROC	*Outgoing Call Proceeding*
#CALL_DELIVERED	*Call Delivered*
#CALL_PRESENT	*Call Present*
#CALL_RECEIVED	*Call Received*
#CONNECT_REQUEST	*Connect Request*
#INCOMING_CALL_PROC	*Incoming Call Proceeding*
#ACTIVE	*Active*
#DISC_REQUEST	*Disconnect Request*
#DISC_INDICATION	*Disconnect Indication*
#SUSPEND_REQUEST	*Suspend Request*
#RESUME_REQUEST	*Resume Request*
#RELEASE_REQUEST	*Release Request*
#CALL_ABORT	*Call Abort*
#RESTART_REQUEST	*Restart Request*
#RESTART	*Restart*

4.5 Called Party Number IE (I#CALLED_NUM)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

->CLDN_NUMBER_TYPE	Type of number, Octet 3
#UNKNOWN	*unknown*
->CLDN_NUMBERING_PLAN	Numbering plan, Octet 3
#UNKNOWN_PLAN	*unknown*
->CLDN_NUMBER	Number, Octet 4 *
(IA5 characters)	*max. length 35 octets*

4.6 Called Party Subaddress IE (I#CALLED_SAD)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

->CLDS_ADDRESS_TYPE	Type of subaddress, Octet 3
#NSAP	*NSAP (X.213 / ISO 8348 AD2)*
#USER_SPECIFIC	*user specific*
->CLDS_ODD/EVEN	Odd/even indicator, Octet 3
#EVEN_NUMBER	*even number of address digits*
#ODD_NUMBER	*odd number of address digits*
->CLDS_ADDRESS	Subaddress, Octet 4 *
(IA5 characters)	*max. length 20 octets*

4.7 Calling Party Number IE (I#CALLING_NUM)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_3A, OCTET_4

->CLGN_NUMBER_TYPE	Type of number, Octet 3
#UNKNOWN	*unknown*
->CLGN_NUMBERING_PLAN	Numbering plan, Octet 3
#UNKNOWN_PLAN	*unknown*
->CLGN_PRESENTATION	Presentation ind., Octet 3a
#PRESENT_ALLOWED	*presentation allowed*
#PRESENT_RESTRICTED	*presentation restricted*
#NUMBER_UNAVAIL	*not available due to interworking*
->CLGN_SCREENING	Screening indicator, Octet 3a
#VERIFY_PASSED	*user-provided, verified and passed*
#NETWORK_PROVIDED	*network provided*
->CLGN_NUMBER	Number, Octet 4 *
(IA5 characters)	*max. length 36 octets*

4.8 Calling Party Subaddress IE (I#CALLING_SAD)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

->CLGS_ADDRESS_TYPE	Type of subaddress, Octet 3
#NSAP	*NSAP (X.213 / ISO 8348 AD2)*
#USER_SPECIFIC	*user specific*
->CLGS_ODD/EVEN	Odd/even indicator, Octet 3
#EVEN_NUMBER	*even number of address digits*
#ODD_NUMBER	*odd number of address digits*
->CLGS_ADDRESS	Subaddress, Octet 4 *
(IA5 characters)	*max. length 20 octets*

4.9 Cause IE (I#CAUSE)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_3A, OCTET_4, OCTET_5

->C_CODING_STANDARD	_CALL_STATE, Octet 3
#CCITT	*CCITT & TTC standardized coding*
#NETWORK_SPECIFIC	*standard defined for the network*
->C_LOCATION	Location, Octet 3
#USER	*user*
#LOCAL_PRIVATE	*private network serving local user*
#LOCAL_PUBLIC	*public network serving local user*
#TRANSIT	*transit network*
#REMOTE_PUBLIC	*public network serving remote user*
#REMOTE_PRIVATE	*private network serving remote user*
#INTERNAT_NETWORK	*international network*
#BEYOND_INTERWORK	*network beyond interworking point*
->C_RECOMMENDATION	Recommendation, Octet 3a
#REC_Q.931	*Q.931*
#REC_X.21	*X.21*
#REC_X.25	*X.25*
->C_CAUSE_VALUE	Cause value, Octet 4
#UNASSIGNED_NUMBER	*Unassigned number*
#NO_ROUTE_TO_TRANSIT	*No route to transit network*
#NO_ROUTE_TO_DEST	*No route to destination*
#CHANNEL_UNACCEPTABLE	*Channel unacceptable*
#CALL_AWARDED	*Call awarded*
#NORMAL_CLEARING	*Normal call clearing*
#USER_BUSY	*User busy*
#NO_USER_RESPOND	*No user responding*
#NO_ANSWER_FROM_USER	*No answer from user*
#CALL_REJECTED	*Call rejected*
#NUMBER_CHANGED	*Number changed*

#NON-SELECTED_CLEARING	*Non-selected user clearing*
#OUT_OF_SERVICE	*Destination out of order*
#INVALID_NUMBER_FORMAT	*Invalid number format*
#FACILITY_REJECTED	*Facility rejected*
#STATUS_ENQ_RESPONSE	*Response to STATUS ENQUIRY*
#NORMAL_UNSPECIFIED	*Normal, unspecified*
#NO_CHANNEL_AVAIL	*No circuit/channel available*
#OUT_OF_ORDER	*Network out of order*
#TEMPORARY_FAILURE	*Temporary failure*
#SWITCH_CONGESTION	*Switching equipment congestion*
#ACCESS_INFO_DISCARD	*Access information discarded*
#CIRCUIT_UNAVAIL	*Requested circuit not available*
#RESOURCES_UNAVAIL_UNSPEC	*Resources unavailable, unspecified*
#QUALITY_UNAVAILABLE	*Quality of service unavailable*
#NOT_SUBSCRIBED	*Requested facility not subscribed*
#BEARER_NOT_AUTHOR	*Bearer capability not authorized*
#BEARER_UNAVAIL	*Bearer capability not available*
#SERVICE_UNAVAIL_UNSPEC	*Service not available*
#BEARER_SERVICE_UNIMPL	*Bearer capability not implemented*
#CHANNEL_TYPE_UNIMPL	*Channel type not implemented*
#REQ_FACILITY_UNIMPL	*Requested facility not implemented*
#ONLY_RESTRICTED	*Only restricted dig. info avail.*
#SERVICE_UNIMPL_UNSPEC	*Service not implemented*
#INVALID_CALL_REF	*Invalid call reference value*
#CHANNEL_NONEXISTENT	*Identified channel does not exist*
#CALL_ID_NONEXISTENT	*Call identity does not exist*
#CALL_ID_IN_USE	*Call identity in use*
#NO_CALL_SUSPENDED	*No call suspended*
#CALL_ID_CLEARED	*Call identity has been cleared*
#INCOMPATIBLE_DEST	*Incompatible destination*
#INV_TRANS_NW_SEL	*Invalid transit network selection*
#INVALID_MESSAGE_UNSPEC	*Invalid message, unspecified*
#MAND_IE_MISSING	*Mandatory IE is missing*
#MESSAGE_TYPE_UNIMPL	*Message type non-existent*
#MESSAGE_INCOMPAT	*Message not compatible*
#IE_UNIMPL	*IE non-existent*
#INVALID_IE_CONTENTS	*Invalid IE contents*
#MESSAGE_UNDEFINED	*Message not compatible with state*
#TIMER_EXPIRY	*Recovery on timer expiry*
#PROTOCOL_ERROR_UNSPEC	*Protocol error, unspecified*
#INTERWORK_UNSPEC	*Interworking, unspecified*
->C_DIAGNOSTIC	Diagnostic(s), Octet 5 *
(hex characters)	*max. length 27 octets*

4.10 Channel Identification IE (I#CHANNEL_ID)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_3.1, OCTET_3.2, OCTET_3.3

->CID_INT_PRESENT	Interface ident., Octet 3
#IMPLICIT	*implicitly identified*
#EXPLICIT	*explicitly identified*
->CID_INT_TYPE	Interface type, Octet 3
#BASIC_INTERFACE	*basic interface*
#OTHER_INTERFACE	*other interface*
->CID_PREF/EXCL	Preferred/Exclusive, Octet 3
#PREFERRED	*preferred*
#EXCLUSIVE	*exclusive*
->CID_DCHANNEL	D-channel indicator, Octet 3
#NOT_D_CHANNEL	*not D-channel*
#D_CHANNEL	*D-channel identified*
->CID_INFO_CHAN_SEL	Info. chan. sel., Octet 3
#NO_CHANNEL	*no channel*
#AS_INDICATED	*as indicated*
#B1_CHANNEL	*B1 channel*
#B2_CHANNEL	*B2 channel*
#ANY_CHANNEL	*any channel*
->CID_INT_ID	Interface ident., Octet 3.1 *
(hex characters)	*max. length 8 octets*
->CID_CODING_STANDARD	Coding standard, Octet 3.2
#CCITT	*CCITT*
#INTERNATIONAL	*other international standards*
#NATIONAL	*national standard*
#NETWORK_SPECIFIC	*standard defined for the network*
->CID_NUMBER/MAP	Number/Map, Octet 3.2
#NUMBER	*number*
#MAP	*map*
->CID_CHANNEL/MAP_TYPE	Chan./Map type, Octet 3.2
#B_CHANNEL_UNITS	*B-channel units*
#H0_CHANNEL_UNITS	*H0-channel units*
#H11_CHANNEL_UNITS	*H11-channel units*
->CID_MAP	Slot map, Octet 3.3 *
(hex characters)	*max. length 3 octets*
->CID_NUMBER	Channel number, Octet 3.3
(numeric value)	*range 0 through 127*

4.11 Congestion Level IE (I#CONG_LEVEL)

->CL_CONGESTION_LEVEL   Congestion level
    #RECEIVER_READY   *receiver ready*
    #RECEIVER_NOT_READY   *receiver not ready*

4.12 Date/Time IE (I#DATE/TIME)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4, OCTET_5, OCTET_6, OCTET_7, OCTET_8

->DT_YEAR   Year, Octet 3
    (numeric value)   *range 0 through 255*
->DT_MONTH   Month, Octet 4
    (numeric value)   *range 0 through 255*
->DT_DAY   Day, Octet 5
    (numeric value)   *range 0 through 255*
->DT_HOUR   Hour, Octet 6
    (numeric value)   *range 0 through 255*
->DT_MINUTE   Minute, Octet 7
    (numeric value)   *range 0 through 255*
->DT_SECOND   Second, Octet 8
    (numeric value)   *range 0 through 255*

4.13 Display IE (I#DISPLAY)

Possible octet inclusions/exclusions:

OCTET_3

->D_DISPLAY   Display information, Octet 3 *
    (IA5 characters)   *max. length 32 octets*

4.14 Facility IE (I#FACILITY)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4, OCTET_5, OCTET_6

->FC_SERVICE_DISCR	Service discr., Octet 3
#SUPP_SERVICES	*supplementary service applications*
->FC_CLASS	Class, Octet 4
#UNIVERSAL	*universal*
#APPLICATION-WIDE	*application-wide*
#CONTEXT-SPECIFIC	*context-specific*
#PRIVATE_USE	*private use*
->FC_FORM	Form, Octet 4
#PRIMITIVE	*primitive*
#CONSTRUCTOR	*constructor*
->FC_COMP_TAG	Component tag, Octet 4
#INVOKE	*invoke*
#RETURN_RESULT	*return result*
#RETURN_ERROR	*return error*
#REJECT	*reject*
->FC_LENGTH_FMT	Length format, Octet 5
#ONE_OCTET	*one octet*
->FC_COMP_LENGTH	Length of component, Octet 5
(numeric value)	*range 0 through 127*
->FC_COMPONENT	Component, Octet 6 *
(hex characters)	*max. length 32 octets*

4.15 Feature Activation IE (I#FEAT_ACT)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_3A

->FA_FEAT_NUM	Feature ID number, Octet 3 & 3a
(numeric value)	*range 0 through 16383*

4.16 Feature Indication IE (I#FEAT_IND)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_3A, OCTET_4

->FI_FEAT_NUM	Feature ID number, Octet 3 & 3a
(numeric value)	*range 0 through 16383*
->FI_STATUS	Status indicator, Octet 4
#DEACTIVATED	*feature is in the deactivated state*
#ACTIVATED	*feature is in the active state*
#PROMPT	*feature prompt (waiting for input)*
#PENDING	*feature is pending*

4.17 High Layer Compatibility IE (I#HI_LAY_COMP)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4, OCTET_4A

->HL_CODING_STANDARD	Coding standard, Octet 3
#CCITT	*CCITT*
#INTERNATIONAL	*other international standards*
#NATIONAL	*national standard*
#NETWORK_SPECIFIC	*standard defined for the network*
->HL_INTERPRETATION	Interpretation, Octet 3
#FIRST_CHARACTER	*first HL characteristics to be used*
->HL_PRESENTATION	Presentation method, Octet 3
#PROTOCOL_PROFILE	*high layer protocol profile*
->HL_CHARACTER	HL characteristics, Octet 4
#TELEPHONY	*telephony Rec. G.711*
#FAX_GROUP_2/3	*fax group 2/3 Rec. T.62*
#FAX_GROUP_4	*fax group 4 Rec. T.503*
#MIXED_MODE	*mixed mode Rec. T.501*
#PROC_FORM	*processable form Rec. T.502*
#TELETEX	*teletext Rec. T.62 & T.70*
#VIDEOTEX	*videotex Rec. T.504*
#TELEX	*telex*
#MHS	*Message Handling Systems Rec. X.400*
#OSI_APPLICATION	*OSI application Rec. X.200*

```
->HL_EX_CHARACTER                    HL characteristics, Octet 4a
    #TELEPHONY                         telephony Rec. G.711
    #FAX_GROUP_2/3                      fax group 2/3 Rec. T.62
    #FAX_GROUP_4                        fax group 4 Rec. T.503
    #MIXED_MODE                        mixed mode Rec. T.501
    #PROC_FORM                         processable form Rec. T.502
    #TELETEX                           teletext Rec. T.62 & T.70
    #VIDEOTEX                          videotex Rec. T.504
    #TELEX                             telex
    #MHS                               Message Handling Systems Rec. X.400
    #OSI_APPLICATION                   OSI application Rec. X.200
```

4.18 Keypad IE (I#KEYPAD)

Possible octet inclusions/exclusions:

OCTET_3

```
->K_KEYPAD                           Keypad information, Octet 3  *
    ( IA5 characters )                 max. length 32 octets
```

4.19 Low Layer Compatibility IE (I#LOW_LAY_COMP)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_3A, OCTET_4, OCTET_4A, OCTET_4B, OCTET_5, OCTET_5A, OCTET_5B, OCTET_5C, OCTET_5D, OCTET_6, OCTET_6A, OCTET_7, OCTET_7A

```
->LL_CODING_STANDARD                 Coding standard, Octet 3
    #CCITT                             CCITT
    #INTERNATIONAL                     other international standards
    #NATIONAL                          national standard
    #NETWORK_SPECIFIC                  standard defined for the network
->LL_TRANSFER_CAP                    Info. trans. cap., Octet 3
    #SPEECH                            speech
    #UNRESTRICTED                      unrestricted digital information
    #3.1KHZ_AUDIO                      3.1 kHz audio
->LL_NEG_IND                         Negotiation ind., Octet 3a
    #NEG_NOT_POSSIBLE                  out-band negotiation not possible
    #NEG_POSSIBLE                      out-band negotiation possible
->LL_TRANSFER_MODE                   Transfer mode, Octet 4
    #CIRCUIT_MODE                      circuit mode
    #PACKET_MODE                       packet mode
```

->LL_TRANSFER_RATE	Info. transfer rate, Octet 4
#PACKET	*packet mode call*
#64KBIT/S	*64 kbit/s*
#384KBIT/S	*384 kbit/s*
#1536KBIT/S	*1536 kbit/s*
->LL_STRUCTURE	Structure, Octet 4a
#DEFAULT	*default*
#8KHZ_INTEGRITY	*8 kHz integrity*
#SDU_INTEGRITY	*service data unit integrity*
->LL_CONFIGURATION	Configuration, Octet 4a
#POINT_TO_POINT	*point-to-point*
->LL_ESTABLISHMENT	Establishment, Octet 4a
#DEMAND	*demand*
->LL_SYMMETRY	Symmetry, Octet 4b
#BIDIRECT_SYMMETRIC	*bidirectional symmetric*
->LL_TRANSFER_RATE_4B	Info. transfer rate, Octet 4b
#PACKET	*packet mode call*
#64KBIT/S	*64 kbit/s*
#384KBIT/S	*384 kbit/s*
#1536KBIT/S	*1536 kbit/s*
->LL_LAYER1_ID	Layer identifier, Octet 5
(numeric value)	*valid value: 1*
->LL_L1_PROTOCOL	Layer 1 protocol, Octet 5
#RATE_ADAPTION	*CCITT rate adaption V.110/X.30*
#G.711_ULAW	*Rec. G.711 u-law*
#G.711_ALAW	*Rec. G.711 A-law*
#G.721_ADPCM	*Rec. G.721 32 kbits/s ADPCM*
#G.7XX_AUDIO	*Rec. G.722 and G.724 7kHz audio*
#G.7XX_VIDEO	*Rec. G.7XX 384 kbit/s video*
#NON-CCITT	*non-CCITT rate adaption*
#V.120	*CCITT rate adaption V.120*
#X.31_HDLC	*CCITT rate adaption X.31 HDLC*
->LL_SYNC/ASYNC	Sync/Async, Octet 5a
#SYNCHRONOUS	*synchronous*
#ASYNCHRONOUS	*asynchronous*
->LL_NEGOTIATION	Negotiation, Octet 5a
#NEG_NOT_POSSIBLE	*in-band negotiation not possible*
#NEG_POSSIBLE	*in-band negotiation possible*
->LL_USER_RATE	User rate, Octet 5a
#E_BITS	*indicated by E-bits Rec. I.460*
#0.6KBIT/S	*0.6 kbit/s Rec V.6 and X.1*
#1.2KBIT/S	*1.2 kbit/s Rec V.6*
#2.4KBIT/S	*2.4 kbit/s Rec V.6 and X.1*
#3.6KBIT/S	*3.6 kbit/s Rec V.6*
#4.8KBIT/S	*4.8 kbit/s Rec V.6 and X.1*
#7.2KBIT/S	*7.2 kbit/s Rec V.6*
#8KBIT/S	*8 kbit/s Rec I.460*
#9.6KBIT/S	*9.6 kbit/s Rec V.6 and X.1*
#14.4KBIT/S	*14.4 kbit/s Rec V.6*
#16KBIT/S	*16 kbit/s Rec I.460*
#19.2KBIT/S	*19.2 kbit/s Rec V.6*
#32KBIT/S	*32 kbit/s Rec I.460*
#48KBIT/S	*48 kbit/s Rec V.6 and X.1*

#56KBIT/S	*56 kbit/s Rec V.6*
#0.1345KBIT/S	*0.1345 kbit/s Rec. X.1*
#0.100KBIT/S	*0.100 kbit/s Rec. X.1*
#0.075/1.2KBIT/S	*0.075/1.2 kbit/s Rec. V.6 and X.1*
#1.2/0.075KBIT/S	*1.2/0.075 kbit/s Rec. V.6 and X.1*
#0.050KBIT/S	*0.050 kbit/s Rec. V.6 and X.1*
#0.075KBIT/S	*0.075 kbit/s Rec. V.6 and X.1*
#0.110KBIT/S	*0.110 kbit/s Rec. V.6 and X.1*
#0.150KBIT/S	*0.150 kbit/s Rec. V.6 and X.1*
#0.200KBIT/S	*0.200 kbit/s Rec. V.6 and X.1*
#0.300KBIT/S	*0.300 kbit/s Rec. V.6 and X.1*
#12KBIT/S	*12 kbit/s Rec. V.6*
->LL_INTERIM_RATE	Intermediate rate, Octet 5b
#INT_NOT_USED	*not used*
#INT_8KBIT/S	*8 kbit/s*
#INT_16KBIT/S	*16 kbit/s*
#INT_32KBIT/S	*32 kbit/s*
->LL_NIC_ON_TX	NIC on Tx, Octet 5b
#DATA_NOT_REQUIRED	*data not required*
#DATA_REQUIRED	*data required*
->LL_NIC_ON_RX	NIC on Rx, Octet 5b
#CANNOT_ACCEPT_DATA	*cannot accept data*
#CAN_ACCEPT_DATA	*can accept data*
->LL_FLOW_CTRL_TX	Flow Control on Tx, Octet 5b
#NOT_REQUIRED	*not required*
#REQUIRED	*required*
->LL_FLOW_CTRL_RX	Flow Control on Rx, Octet 5b
#NOT_ACCEPT	*cannot accept*
#ACCEPT	*can accept*
->LL_RATE_HEADER	Rate adaption, Octet 5b
#NOT_INCLUDED	*header not included*
#INCLUDED	*header included*
->LL_MULTI_FRAME	Multiple frame est., Octet 5b
#NOT_SUPPORTED	*not supported*
#SUPPORTED	*supported*
->LL_OPER_MODE	Operation mode, Octet 5b
#BIT_TRANSPARENT	*bit transparent mode*
#PROT_SENSITIVE	*protocol sensitive mode*
->LL_LLI_NEG	LLI negotiation, Octet 5b
#DEFAULT	*default, LLI = 256 only*
#FULL_NEGOTIATION	*full protocol negotiation*
->LL_ASSIG	Assignor/Assignee, Octet 5b
#ASSIGNEE	*message orig. is default assignee*
#ASSIGNOR	*message orig. is assignor only*
->LL_BAND_NEG	In-band/out-band, Octet 5b
#WITH_INFO	*neg. is done with INFO messages*
#WITH_LL0	*neg. is done with logical link zero*
->LL_STOP_BITS	Number of stop bits, Octet 5c
#NOT_USED	*not used*
#1_STOP_BIT	*1 bit*
#1.5_STOP_BITS	*1.5 bits*
#2_STOP_BITS	*2 bits*

->LL_DATA_BITS	Number of data bits, Octet 5c
#NOT_USED	*not used*
#5_DATA_BITS	*5 bits*
#7_DATA_BITS	*7 bits*
#8_DATA_BITS	*8 bits*
->LL_PARITY	Parity, Octet 5c
#ODD_PARITY	*odd*
#EVEN_PARITY	*even*
#NO_PARITY	*none*
#FORCED_TO_0	*forced to 0*
#FORCED_TO_1	*forced to 1*
->LL_DUPLEX_MODE	Duplex mode, Octet 5d
#HALF_DUPLEX	*half duplex*
#FULL_DUPLEX	*full duplex*
->LL_MODEM_TYPE	Modem type, Octet 5d
(numeric value)	*range 0 through 63*
->LL_LAYER2_ID	Layer identifier, Octet 6
(numeric value)	*valid value: 2*
->LL_L2_PROTOCOL	Layer 2 protocol, Octet 6
#ISO_1745	*basic mode ISO 1745*
#Q.921	*Rec. Q.921 (I.441)*
#X.25_LINK	*Rec. X.25, link level*
#X.25_MULTI	*Rec. X.25 Multilink*
#EXT_LAPB	*extended LAPB (T.71)*
#HDLC_ARM	*HDLC ARM (ISO 4335)*
#HDLC_NRM	*HDLC NRM (ISO 4335)*
#HDLC_ABM	*HDLC ABM (ISO 4335)*
#LAN_LLC	*LAN LLC (ISO 8802/2)*
#X.75_SLP	*Rec. X.75, SLP*
->LL_L2_INFO	Optional layer 2, Octet 6a
(numeric value)	*range 0 through 127*
->LL_LAYER3_ID	Layer identifier, Octet 7
(numeric value)	*valid value: 3*
->LL_L3_PROTOCOL	Layer 3 protocol, Octet 7
#Q.931	*Rec. Q.931 (I.451)*
#X.25_PACKET	*Rec. X.25, packet layer*
#ISO_8208	*ISO 8208*
#ISO_8348	*ISO 8348*
#ISO_8473	*ISO 8473*
#T.70	*Rec. T.70, minimum network layer*
->LL_L3_INFO	Optional layer 3, Octet 7a
(numeric value)	*range 0 through 127*

4.20 More Data IE (I#MORE_DATA)

☝ NOTE
There are no selectors for this information element.

4.21 Notification Indicator IE (I#NOTIFIC_IND)

Possible octet inclusions/exclusions:

OCTET_3

->NI_DESCRIPTION	Notification desc., Octet 3
#USER_SUSPENDED	*user suspended*
#USER_RESUMED	*user resumed*
#BEARER_CHANGE	*bearer service change*

4.22 Progress Indicator IE (I#PROGRESS_IND)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

->PI_CODING_STANDARD	Coding standard, Octet 3
#CCITT	*CCITT*
#INTERNATIONAL	*other international standards*
#NATIONAL	*national standard*
#NETWORK_SPECIFIC	*standard defined for the network*
->PI_LOCATION	Location, Octet 3
#USER	*user*
#LOCAL_PRIVATE	*private network serving local user*
#LOCAL_PUBLIC	*public network serving local user*
#REMOTE_PUBLIC	*public network serving remote user*
#REMOTE_PRIVATE	*private network serving remote user*
#BEYOND_INTERWORK	*network beyond interworking point*
->PI_DESCRIPTION	Progress desc., Octet 4
#NOT_END_TO_END	*call is not end—to—end ISDN*
#DEST_NON_ISDN	*destination address is non—ISDN*
#ORIG_NON_ISDN	*origination address is non—ISDN*
#RETURNED_TO_ISDN	*call has returned to the ISDN*
#INBAND_INFO_AVAIL	*in—band info. now available*

4.23 Restart Indicator IE (I#RESTART_IND)

Possible octet inclusions/exclusions:

OCTET_3

->RI_CLASS	Class, Octet 3
#INDICATED_CHANNEL	*indicated channels*
#SINGLE_INTERFACE	*single interface*
#ALL_INTERFACES	*all interfaces*

4.24 Shift IE (I#SHIFT)

->SH_TYPE	Shift type
#LOCKING	*locking*
#NON_LOCKING	*non−locking*
->SH_CODESET	Codeset ident.
#CODESET0	*I.451 (Q.931) IE*
#CODESET5	*national use IE*
#CODESET6	*local network specific IE*
#CODESET7	*user specific IE*

4.25 Signal IE (I#SIGNAL)

Possible octet inclusions/exclusions:

OCTET_3

->SI_VALUE	Signal value, Octet 3
#DIAL_ON	*dial tone on*
#RING_BACK_ON	*ring back tone on*
#INTERCEPT_ON	*intercept tone on*
#CONGESTION_ON	*network congestion tone on*
#BUSY_ON	*busy tone on*
#CONFIRM_ON	*confirm tone on*
#ANSWER_ON	*answer tone on*
#CALL_WAITING_ON	*call waiting tone on*
#OFF_HOOK_ON	*off−hook warning tone on*
#TONES_OFF	*tones off*
#ALERTING_ON_0	*alerting on − pattern 0*
#ALERTING_ON_1	*alerting on − pattern 1*
#ALERTING_ON_2	*alerting on − pattern 2*
#ALERTING_ON_3	*alerting on − pattern 3*
#ALERTING_ON_4	*alerting on − pattern 4*
#ALERTING_ON_5	*alerting on − pattern 5*
#ALERTING_ON_6	*alerting on − pattern 6*
#ALERTING_ON_7	*alerting on − pattern 7*
#ALERTING_OFF	*alerting off*

▬ 4.26 Transit Network Select IE (I#TRANS_NW_SEL)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

->TR_NET_ID_TYPE	Network id. type, Octet 3
#USER_SPECIFIED_ID	*user specified*
#NAT_NET_ID	*national network identification*
#INT_NET_ID	*international network ident.*
->TR_NET_ID_PLAN	Network id. plan, Octet 3
#UNKNOWN	*unknown*
#CARRIER_ID_CODE	*Carrier Identification Code*
#DATA_ID_CODE	*Data network id. code (Rec. X.121)*
->TR_NET_ID	Network ident., Octet 4 *
(IA5 characters)	*max. length 16 octets*

▬ 4.27 User–User Information IE (I#UU_INFO)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

->UU_PROTOCOL_DISCR	Protocol discr., Octet 3
(numeric value)	*range 0 through 255*
->UU_USER_INFO	User information, Octet 4 *
(hex characters)	*max. length 128 octets*