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# **ISDN MESSAGE SET (ATT\_5E6)**

Reference Manual

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**IDACOM**

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**ISDN MESSAGE SET  
(ATT\_5E6)**

**Reference Manual**

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November 1990  
R01

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## 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 #
<b>International</b>			
CCITT_1988	CCITT Q.931/I.451 Network Layer, Blue Book (1988)	November 1990	R01
<b>North America</b>			
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
<b>Europe</b>			
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) - NStAnI	November 1990	R01
<b>Asia</b>			
NTT_INS-89	NTT INS Net 64/1500 Service Interface (1989)	November 1990	R01



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## PREFACE

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This manual is intended to provide a list of message identifiers, information element identifiers, and information element structures for the ATT\_5E6 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

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This message set is implemented in accordance with: AT&T 5D5-900-321, March 1989, 5ESS Switch ISDN Basic Rate Interface Specification, 5E6 Generic Program, Issue 1.01.

The message set name (ATT\_5E6) 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:

<b>ATT_5E6</b>	<b>AT&amp;T 5D5-900-321, 5E6 Generic Program (03/89)</b>	<b>R01</b>
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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#xxx (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)  
          yyy = 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 !
```

---

# 2

## MESSAGE IDENTIFIERS

---

### 2.1 Q.931 Protocol Discriminator

M#ALERT	Alerting
M#ASSOC	Associated
M#ASSOC_ACK	Associated Acknowledge
M#CALL_PROC	Call Proceeding
M#CONF	Conference
M#CONF_ACK	Conference Acknowledge
M#CONF_REJ	Conference Reject
M#CONN	Connect
M#CONN_ACK	Connect Acknowledge
M#DISC	Disconnect
M#DROP	Drop
M#DROP_ACK	Drop Acknowledge
M#DROP_REJ	Drop Reject
M#HOLD	Hold
M#HOLD_ACK	Hold Acknowledge
M#HOLD_REJ	Hold Reject
M#INFO	Information
M#MAN_INFO	Management Information
M#PROG	Progress
M#RECONN	Reconnect
M#RECON_ACK	Reconnect Acknowledge
M#RECON_REJ	Reconnect Reject
M#REDIRECT	Redirect
M#REL	Release
M#REL_COM	Release Complete
M#REST	Restart
M#REST_ACK	Restart Acknowledge
M#SETUP	Setup
M#SETUP_ACK	Setup Acknowledge
M#STATUS	Status
M#STATUS_ENQ	Status Enquiry
M#TRANS	Transfer
M#TRANS_ACK	Transfer Acknowledge
M#TRANS_REJ	Transfer Reject





**3****IE IDENTIFIERS****3.1 Codeset 0**

I#BEARER_CAP	Bearer Capability
I#CALLED_NUM	Called Party Number
I#CALLING_NUM	Calling Party Number
I#CALL_STATE	Call State
I#CAUSE	Cause
I#CHANNEL_ID	Channel Identification
I#KEYPAD	Keypad
I#LOW_LAYER_COMP	Low Layer Compatibility
I#PROGRESS_IND	Progress Indicator
I#RESTART_IND	Restart Indicator
I#SHIFT	Shift
I#SIGNAL	Signal
I#SWITCHHOOK	Switchhook
I#TERM_CAPAB	Terminal Capabilities

**3.2 Codeset 5**

I#SHIFT	Shift
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**3.3 Codeset 6**

I#ADJUNCT_CON	Adjunct Control
I#ASSOC_TYP	Associated Type
I#DEST_CALL_APP	Destination Call Appearance
I#DISPLAY_CON	Display Control
I#DISPLAY_FIELD	Display Field
I#ENDPOINT_ID	Endpoint Identifier
I#FEAT_ACT	Feature Activation
I#FEAT_IND	Feature Indication
I#KEYPAD_CON	Keypad Control
I#MANAGEMENT	Management
I#ORIG_CALL_APP	Origination Call Appearance
I#OTHER_CALL_REF	Other Call Reference
I#SEL_CALL_APP	Selected Call Appearance
I#SHIFT	Shift
I#USER_CODE	User Code

**3.4 Codeset 7**

I#SHIFT

Shift

# 4

## IE STRUCTURES

### 4.1 Adjunct Control IE (I#ADJUNCT\_CON)

Possible octet inclusions/exclusions:

OCTET\_3

->AJC_VALUE	Adjunct Control Val, Octet 3
#ADJUNCT_OFF	<i>off</i>
#ADJUNCT_ON	<i>on</i>

### 4.2 Associated Type IE (I#ASSOC\_TYP)

Possible octet inclusions/exclusions:

OCTET\_3

->AT_STATUS_VALUE	Status Value, Octet 3
#SETUP	<i>Setup</i>
#CONNECT	<i>Connect</i>
#HOLD	<i>Hold</i>
#RECONNECT	<i>Reconnect</i>
#EXCLUSION	<i>Exclusion</i>
#CONNECT_DENIED	<i>Connect Denied</i>
#CLEARING_DENIED	<i>Clearing Denied</i>

### 4.3 Bearer Capability IE (I#BEARER\_CAP)

Possible octet inclusions/exclusions:

OCTET\_3, OCTET\_4, OCTET\_5, OCTET\_5A

->BC_CODING_STANDARD	Coding standard, Octet 3
#CCITT	<i>CCITT standardized in Q.931</i>
->BC_TRANSFER_CAP	Info. trans. cap., Octet 3
#SPEECH	<i>speech</i>
#UNRESTRICTED	<i>unrestricted digital information</i>
#RESTRICTED	<i>restricted digital information</i>
#3.1KHZ_AUDIO	<i>3.1 kHz audio (modem)</i>

---

->BC_TRANSFER_MODE	Transfer mode, Octet 4
#CIRCUIT_MODE	<i>circuit mode</i>
#PACKET_MODE	<i>packet mode</i>
->BC_TRANSFER_RATE	Info. transfer rate, Octet 4
#PACKET	<i>used for packet transport mode</i>
#64KBIT/S	<i>64 kbit/s</i>
->BC_LAYER_ID	Layer ident., Octet 5
#LAYER1	<i>User information layer 1 protocol</i>
#LAYER2	<i>User information layer 2 protocol</i>
#LAYER3	<i>User information layer 3 protocol</i>
->BC_PROTOCOL	DMI Mode, Octet 5
#RATE_ADAPTION	<i>Standard rate adaption: Octet 5a</i>
#G.711_ULAW	<i>CCITT Recommendation G.711 u-law</i>
#X.25_LINK	<i>Rec. X.25, link level – (LAPB)</i>
#X.25_PACKET	<i>Rec. X.25 packet level</i>
->BC_USER_RATE	User rate, Octet 5a
#56KBIT/S	<i>56 kbit/s Rec I.463</i>

---

#### 4.4 Call State IE (I#CALL\_STATE)

Possible octet inclusions/exclusions:

OCTET\_3

->CS_CALL_STATE	Call State Value, Octet 3
#NULL	<i>Null</i>
#CALL_INIT	<i>Call Init</i>
#OVERLAP_SENDING	<i>Overlap Sending</i>
#OUTGOING_CALL_PROC	<i>Outgoing Call Proceeding</i>
#CALL_DELIVERED	<i>Call Delivered</i>
#CALL_RECEIVED	<i>Call Received</i>
#CONNECT_REQUEST	<i>Connect Request</i>
#INCOMING_CALL_PROC	<i>Incoming Call Proceeding</i>
#ACTIVE	<i>Active</i>
#DISC_REQUEST	<i>Disconnect Request</i>
#DISC_INDICATION	<i>Disconnect Indication</i>
#RELEASE_REQUEST	<i>Release Request</i>

**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
#INTERNATIONAL	<i>international number</i>
#NATIONAL	<i>national number</i>
#SUBSCRIBER	<i>local (directory) number</i>
->CLDN_NUMBERING_PLAN	Numbering plan id., Octet 3
#ISDN_PLAN	<i>ISDN Numbering Plan Rec. E.164</i>
#PRIVATE_PLAN	<i>Private Numbering Plan</i>
->CLDN_NUMBER	Number digits, Octet 4 *
( IA5 characters )	<i>max. length 20 octets</i>

**4.6 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	<i>unknown</i>
#INTERNATIONAL	<i>international number</i>
#NATIONAL	<i>national number</i>
#LOCAL_NUMBER	<i>local (directory) number</i>
#ABBREVIATED	<i>abbreviated number</i>
->CLGN_NUMBERING_PLAN	Numbering plan id., Octet 3
#UNKNOWN_PLAN	<i>unknown</i>
#ISDN_PLAN	<i>ISDN Numbering Plan Rec. E.164</i>
#PRIVATE_PLAN	<i>Private Numbering Plan</i>
->CLGN_PRESENTATION	Presentation ind., Octet 3a
#PRESENT_ALLOWED	<i>Presentation allowed</i>
#PRESENT_RESTRICTED	<i>Presentation restricted</i>
#NUMBER_UNAVAIL	<i>not available due to interworking</i>
->CLGN_SCREENING	Screening indicator, Octet 3a
#UNSCREENED	<i>User provided – not screened</i>
#VERIFY_PASSED	<i>User provided – verified and passed</i>
#VERIFY_FAILED	<i>User provided – verified and failed</i>
#NETWORK_PROVIDED	<i>Network provided</i>
->CLGN_NUMBER	Number digits, Octet 4 *
( IA5 characters )	<i>max. length 20 octets</i>

---

## 4.7 Cause IE (I#CAUSE)

Possible octet inclusions/exclusions:

OCTET\_3, OCTET\_4

->C_CODING_STANDARD	Coding standard, Octet 3
#CCITT	<i>CCITT standardized in Q.931</i>
->C_LOCATION	Location, Octet 3
#USER	<i>User</i>
#LOCAL_PRIVATE	<i>Private Network Serving Local User</i>
#LOCAL_PUBLIC	<i>Public Network Serving Local User</i>
#TRANSIT	<i>Transit Network</i>
#REMOTE_PUBLIC	<i>Public Network Serving Remote User</i>
#REMOTE_PRIVATE	<i>Remote Private Network</i>
#INTERNAT_NETWORK	<i>International Network</i>
#BEYOND_INTERWORK	<i>Network Beyond Interworking Point</i>
->C_CAUSE_CLASS	Class, Octet 4
#NORMAL_EVENT_0	<i>Normal event</i>
#NORMAL_EVENT_1	<i>Normal event</i>
#RESOURCE_UNAV	<i>Resource unavailable</i>
#SERV_OPT_NA	<i>Service or option not available</i>
#SERV_OPT_NI	<i>Service or option not implemented</i>
#INV_MSG	<i>Invalid message</i>
#PROTOCOL_ERROR	<i>Protocol error</i>
#INTERWORKING	<i>Interworking</i>
->C_CAUSE_VALUE	Cause value, Octet 4
#UNASS_NUMBER	<i>1 Unassigned Number</i>
#NO_ROUTE	<i>2 No route to specified network</i>
#NORMAL_CLEARING	<i>16 Normal, Clearing</i>
#USER_BUSY	<i>17 User busy</i>
#NO_USER_RESPOND	<i>18 No user responding</i>
#CALL_REJECTED	<i>21 Call rejected</i>
#NUMBER_CHANGED	<i>22 Number changed</i>
#INVALID_NUMBER_FORMAT	<i>28 Invalid number format</i>
#FACILITY_REJECTED	<i>29 Requested facility rejected</i>
#STATUS_ENQ_RESPONSE	<i>30 Response to status enquiry</i>
#NORMAL_UNSPECIFIED	<i>31 Normal, Unspecified</i>
#NO_CHANNEL_AVAIL	<i>34 No channel available</i>
#QUEUED	<i>35 Queued</i>
#TEMPORARY_FAILURE	<i>41 Temporary failure</i>
#NETWORK_CONG	<i>42 Network congestion</i>
#ACCESS_INFO_DISCARD	<i>43 Access information discarded</i>
#REQ_FAC_NOT_SUBSC	<i>50 Requested fac. not subscribed</i>
#OUTG_CALLS_BARRED	<i>52 Outgoing calls barred</i>
#INC_CALLS_BARRED	<i>54 Incoming calls barred</i>
#BEARER_CAP_UNAVAIL	<i>58 Bearer cap. not pres. available</i>
#SERVICE_UNAVAIL	<i>63 Service or option not available</i>
#BEARER_SERVICE_UNIMPL	<i>65 Bearer service not implemented</i>
#CHANNEL_TYPE_UNIMPL	<i>66 Channel type not implemented</i>
#REQ_FAC_NI	<i>69 Requested fac. not implemented</i>

---

#INVALID_CALL_REF	<i>81 Invalid Call Reference value</i>
#CHANNEL_NONEXISTENT	<i>82 Ident. channel does not exist</i>
#INCOMPATIBLE_DEST	<i>88 Incompatible destination</i>
#NETWORK_NONEXISTENT	<i>91 Transit network does not exist</i>
#MAND_IE_MISSING	<i>96 Mandatory IE missing</i>
#MESSAGE_TYPE_UNIMPL	<i>97 Message type not implemented</i>
#MESSAGE_INCOMPAT	<i>98 Message incomp. w/ Call state</i>
#INVALID_IE_CONTENTS	<i>100 Invalid IE contents</i>
#PROTOCOL_ERROR_UNSPEC	<i>111 Protocol error, Unspecified</i>
#INTERWORK_UNSPEC	<i>127 Interworking, Unspecified</i>

---

#### 4.8 Channel Identification IE (I#CHANNEL\_ID)

Possible octet inclusions/exclusions:

OCTET\_3

->CID_INT_PRESENT	Interface ident., Octet 3
#IMPLICIT	<i>Interface implicitly identified</i>
->CID_INT_TYPE	Interface type, Octet 3
#BASIC_INTERFACE	<i>Basic Rate Interface</i>
->CID_PREF/EXCL	Preferred/Exclusive, Octet 3
#PREFERRED	<i>indicated channel is preferred</i>
#EXCLUSIVE	<i>exclusive; only this ch. acceptable</i>
->CID_DCHANNEL	D-channel indicator, Octet 3
#NOT_D_CHANNEL	<i>The channel is not the D-channel</i>
#D_CHANNEL	<i>The channel is the D-channel</i>
->CID_INFO_CHAN_SEL	Info. chan. sel., Octet 3
#NO_CHANNEL	<i>No channel</i>
#B1_CHANNEL	<i>B1-channel</i>
#B2_CHANNEL	<i>B2-channel</i>
#ANY_CHANNEL	<i>Any channel</i>

---

#### 4.9 Destination Call Appearance IE (I#DEST\_CALL\_APP)

Possible octet inclusions/exclusions:

OCTET\_3

->DCA_DEST_CALL_APP ( numeric value )	Dest. call app., Octet 3 <i>range 0 through 255</i>
--	--

---

## 4.10 Display Control IE (I#DISPLAY\_CON)

Possible octet inclusions/exclusions:

OCTET\_3

->DYC_MODE	Display Mode, Octet 3
#NO_CHANGE	<i>No Change</i>
#NORMAL	<i>Normal</i>
#INSPECT	<i>Inspect</i>
#MISC_INFO	<i>Misc. Display Information</i>
#MSG_RETRIEVAL	<i>Message Retrieval</i>
#DIRECTORY_QUERY	<i>Electronic Directory Query</i>

---

## 4.11 Display Field IE (I#DISPLAY\_FIELD)

Possible octet inclusions/exclusions:

OCTET\_3, OCTET\_4, OCTET\_5

->DF_MODE	Display Mode, Octet 3
#NORMAL	<i>Normal</i>
#INSPECT	<i>Inspect</i>
#MISC_INFO	<i>Misc. Display Information</i>
#MSG_RETRIEVAL	<i>Message Retrieval</i>
#DIRECTORY_QUERY	<i>Electronic Directory Query</i>
->DF_SUBMODE	Submode, Octet 3
#NO_SUBMODE_APPL	<i>No Submode Applicable</i>
#DIRECT	<i>Direct</i>
#REDIRECTED	<i>Redirected</i>
->DF_TYPE	Display Field Type, Octet 4
#CALL_APP_ID	<i>Call Appearance ID</i>
#CALLED_PARTY_ID	<i>Called Party Identifier</i>
#CALLING_PARTY_ID	<i>Calling Party Identifier</i>
#CALLED_PARTY	<i>Called Party Name</i>
#CALLING_PARTY	<i>Calling Party Name</i>
#ORIG_PERMISSION	<i>Originating Permissions</i>
#ISDN_CALL_ID	<i>ISDN Call Identification</i>
#MISC_CALL_INFO	<i>Misc. Call Information</i>
#ENTIRE	<i>Entire Display</i>
#DATE_TIME	<i>Date and Time of Day</i>
->DF_INFO	Display information, Octet 5 *
( IA5 characters )	<i>max. length 40 octets</i>



**4.12 Endpoint Identifier IE (I#ENDPOINT\_ID)**

Possible octet inclusions/exclusions:

OCTET\_3, OCTET\_4

->EP_USID ( numeric value )	User service id., Octet 3 <i>range 0 through 255</i>
->EP_INTERPRETER #MATCHES_USID+TID #MATCHES_USID	Interpreter, Octet 4 <i>matches USID and TID</i> <i>matches USID and not TID</i>
->EP_TID ( numeric value )	Terminal Id (TID), Octet 4 <i>range 0 through 127</i>

**4.13 Feature Activation IE (I#FEAT\_ACT)**

Possible octet inclusions/exclusions:

OCTET\_3, OCTET\_4

->FA_BUTTON_TYPE #UNKNOWN #CALL_APP_BUTTON #FEATURE_BUTTON	Button type, Octet 3 <i>Unknown</i> <i>Call Appearance Button</i> <i>Feature Button</i>
->FA_MODULE_NR ( numeric value )	Module number, Octet 3 <i>range 0 through 7</i>
->FA_STATUS_TYPE ( numeric value )	Status type, Octet 3 <i>range 0 through 7</i>
->FA_BUTTON_NR ( numeric value )	Button number, Octet 4 <i>range 0 through 255</i>

**4.14 Feature Indication IE (I#FEAT\_IND)**

Possible octet inclusions/exclusions:

OCTET\_3, OCTET\_4, OCTET\_5, OCTET\_6

->FI_BUTTON_TYPE #UNKNOWN #CALL_APP_BUTTON #FEATURE_BUTTON #NON_APPLIC	Button Type, Octet 3 <i>Unknown</i> <i>Call Appearance Button</i> <i>Feature Button</i> <i>None Applicable</i>
->FI_MODULE_NR ( numeric value )	Module number, Octet 3 <i>range 0 through 7</i>

---

->FI_STATUS_TYPE	Status Type, Octet 3
#FEAT_NUM_STATUS	<i>Feature Number Status</i>
#FEAT_BUTTON_STATUS	<i>Feature Button Status</i>
#MULT_BUTTON_STATUS	<i>Multiple Button Status</i>
#MAINT_STATUS	<i>Maintenance Status</i>
->FI_FEATURE_NR	Feature Number, Octet 4
( numeric value )	<i>range 0 through 255</i>
->FI_FEAT_BUTTON_NR	Feature Button No., Octet 4
( numeric value )	<i>range 0 through 255</i>
->FI_START_FEAT_BUTTON	Starting Button, Octet 4
( numeric value )	<i>range 0 through 255</i>
->FI_MAINT	Maintenance Act., Octet 4
#RESERVED	<i>reserved</i>
#TURN_OFF	<i>Turn all indicators off</i>

---

->FI_FEA_STATUS	Status, Octet 5
#ACTIVATED	<i>Feature is in the Active state</i>
#DEACTIVATED	<i>Feature is in the Inactive state</i>
#PENDING	<i>Feature is pending</i>
#LOCAL_HOLD	<i>Call associated is on hold</i>
#REMOTE_HOLD	<i>Call is on Key-System hold</i>
#CONFIRMED	<i>Feature request is confirmed</i>
#ALREADY_REQ	<i>Feature already in requested state</i>
#REJECTED	<i>Feature request is rejected</i>
->FI_INDICATOR	Indicator, Octet 5
->FI_STATUS	Status, Octet 5
#ACTIVATED	<i>Feature is in the Active state</i>
#DEACTIVATED	<i>Feature is in the Inactive state</i>
#PENDING	<i>Feature is pending</i>
#LOCAL_HOLD	<i>Call associated is on hold</i>
#REMOTE_HOLD	<i>Call is on Key-System hold</i>
#CONFIRMED	<i>Feature request is confirmed</i>
#ALREADY_REQ	<i>Feature already in requested state</i>
#REJECTED	<i>Feature request is rejected</i>
->FI_NUMBER_OF_BUTT ( numeric value )	Number of buttons, Octet 5 <i>range 0 through 255</i>
->FI_ARRAY ( hex characters )	Status Bit Array, Octet 6 * <i>max. length 32 octets</i>

---

#### 4.15 Keypad IE (I#KEYPAD)

Possible octet inclusions/exclusions:

OCTET\_3

->K_KEYPAD ( IA5 characters )	Keypad information, Octet 3 * <i>max. length 32 octets</i>
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#### 4.16 Keypad Control IE (I#KEYPAD\_CON)

Possible octet inclusions/exclusions:

OCTET\_3

->KC_CR_VALUE_TYPE	Call Ref Value Type, Octet 3
#NULL_CR	<i>Null Call Reference</i>
#NON_NULL_CR	<i>Non-Null Call Reference</i>

---

## 4.17 Low Layer Compatibility IE (I#LOW\_LAY\_COMP)

Possible octet inclusions/exclusions:

OCTET\_3, OCTET\_4, OCTET\_4A, OCTET\_4B, OCTET\_5, OCTET\_5A

->LL_CODING_STANDARD	Coding standard, Octet 3
#CCITT	<i>CCITT standardized in Q.931</i>
#INTERNATIONAL	<i>Other international standards</i>
#NATIONAL	<i>National standard</i>
#NETWORK_SPECIFIC	<i>Standard specific to the network</i>
->LL_TRANSFER_CAP	Info. trans. cap., Octet 3
#SPEECH	<i>speech</i>
#UNRESTRICTED	<i>unrestricted digital information</i>
#RESTRICTED	<i>restricted digital information</i>
#3.1KHZ_AUDIO	<i>3.1 kHz audio (modem)</i>
->LL_TRANSFER_MODE	Transfer mode, Octet 4
#CIRCUIT_MODE	<i>circuit mode</i>
#PACKET_MODE	<i>packet mode</i>
->LL_TRANSFER_RATE	Info. transfer rate, Octet 4
#PACKET	<i>used for packet transport mode</i>
#64KBIT/S	<i>64 kbit/s</i>
->LL_STRUCTURE	Structure, Octet 4a
#DEFAULT	<i>Default</i>
#8KHZ_INTEGRITY	<i>8 kHz integrity</i>
#SDU_INTEGRITY	<i>Service data unit integrity</i>
#UNSTRUCTURED	<i>Unstructured</i>
->LL_CONFIGURATION	Configuration, Octet 4a
#POINT_TO_POINT	<i>Point-to-point</i>
->LL_ESTABLISHMENT	Establishment, Octet 4a
#DEMAND	<i>Demand</i>
->LL_SYMMETRY	Symmetry, Octet 4b
#BIDIRECT_SYMMETRIC	<i>Bidirectional symmetric</i>
#BIDIRECT_ASYMMETRIC	<i>Bidirectional asymmetric</i>
#UNIDIRECT_ORG->DST	<i>Unidirectional ( orig -&gt; dest )</i>
#UNIDIRECT_DST->ORG	<i>Unidirectional ( dest -&gt; orig )</i>
->LL_TRANSFER_RATE_4B	Info. transfer rate, Octet 4b
#PACKET	<i>used for packet transport mode</i>
#64KBIT/S	<i>64 kbit/s</i>
->LL_LAYER_ID	Layer ident., Octet 5
#LAYER1	<i>User information layer 1 protocol</i>
#LAYER2	<i>User information layer 2 protocol</i>
#LAYER3	<i>User information layer 3 protocol</i>

->LL_PROTOCOL	DMI Mode, Octet 5
#RATE_ADAPTION	<i>Standard rate adaption: Octet 5a</i>
#G.711_ULAW	<i>CCITT Recommendation G.711 u-law</i>
#G.711_ALAW	<i>CCITT Recommendation G.711 A-law</i>
#G.721_ADPCM	<i>Rec. G.721 32 kbits/s ADPCM &amp; I.460</i>
#NON_CCITT	<i>Non-CCITT rate adaption: Octet 5a</i>
#Q.921	<i>Rec. Q.921 (I.441) - (LAPD)</i>
#X.25_LINK	<i>Rec. X.25, link level - (LAPB)</i>
#Q.931	<i>Rec. Q.931 (I.451)</i>
#X.25_PACKET	<i>Rec. X.25 packet level</i>
->LL_SYNC/ASYNC	Sync/Async, Octet 5a
#SYNCHRONOUS	<i>Synchronous</i>
#ASYNCHRONOUS	<i>Asynchronous</i>
->LL_USER_RATE	User rate, Octet 5a
#UNDEFINED	<i>Undefined</i>
#0.6KBIT/S	<i>0.6 kbit/s Rec X.1 I.461</i>
#1.2KBIT/S	<i>1.2 kbit/s Rec X.1 and I.461</i>
#2.4KBIT/S	<i>2.4 kbit/s Rec X.1 and I.461</i>
#3.6KBIT/S	<i>3.6 kbit/s Rec V.6 and I.463</i>
#4.8KBIT/S	<i>4.8 kbit/s Rec X.1 and I.461</i>
#7.2KBIT/S	<i>7.2 kbit/s Rec V.6 and I.461</i>
#8KBIT/S	<i>8 kbit/s Rec I.461</i>
#9.6KBIT/S	<i>9.6 kbit/s Rec X.1 and I.461</i>
#14.4KBIT/S	<i>14.4 kbit/s Rec V.6 and I.461</i>
#16KBIT/S	<i>16 kbit/s Rec I.461</i>
#19.2KBIT/S	<i>19.2 kbit/s Rec I.463</i>
#32KBIT/S	<i>32 kbit/s Rec I.460</i>
#48KBIT/S	<i>48 kbit/s Rec X.1 and I.461</i>
#56KBIT/S	<i>56 kbit/s Rec I.463</i>

#### 4.18 Management IE (I#MANAGEMENT)

Possible octet inclusions/exclusions:

OCTET\_3, OCTET\_4, OCTET\_5, OCTET\_6, OCTET\_7, OCTET\_8, OCTET\_9

->MM_PROTOCOL_DISCR ( numeric value )	Management PD, Octet 3 <i>range 0 through 255</i>
->MM_TRANS_REF #SYNC_OP	Transaction Ref., Octet 4 <i>Synchronous Operation</i>
->MM_OP_CLASS #UNCONF_OP	Operation Class, Octet 5 <i>Unconfirmed Operation</i>
#CONF_OP	<i>Confirmed Operation</i>
#RETURN_RESULT	<i>Return Result</i>
#RETURN_RESULT_CONT	<i>Return Result Continued</i>
#RETURN_ERROR	<i>Return Error</i>
#REJECT	<i>Reject</i>

---

->MM_OP_TYPE	Operation Type, Octet 5
#ACTION	<i>Action</i>
#EVENT_REPORT	<i>Event Report</i>
#GET	<i>Get</i>
#SET	<i>Set</i>
->MM_MANAG_CODE	Param. Group Code, Octet 6
#UNSPEC_ERROR	<i>Unspecified Error</i>
#VIOLATION	<i>Protocol Violation</i>
#UNRECOG_OP	<i>Unrecognized Operation</i>
#NO_NONSYNC	<i>No Non-Synchronous Operation</i>
#ACT_LOOPBACK	<i>Activate Loopback</i>
#DEACT_LOOPBACK	<i>Deactivate Loopback</i>
#RESET	<i>Reset</i>
#INIT_REQ	<i>Initialization Request</i>
#SERV_STATE_CHG	<i>Endpoint Service State Change</i>
#SERV_PROF_INFO	<i>Service Profile Information</i>
#ADDR_INFO	<i>Address Information</i>
#CALL_STAT_INFO	<i>Call Status Information</i>
#EQUIP_INFO	<i>Equipment Information</i>
->MM_PARAM_ID	Parameter Ident, Octet 7
#SPID	<i>Service Profile Identifier (SPID)</i>
#EPID	<i>Endpoint Identifier (USID/TID)</i>
#CRID	<i>Call Reference Identifier</i>
#CSID	<i>Call State Identifier</i>
#CHID	<i>Channel Identifier</i>
#SERVICE_STATE	<i>Service State</i>
#SERVICE_MSG_ERROR	<i>Service Message Error Code</i>
#LOOPBACK_LOC	<i>Loopback Location</i>
#SUPP_CAPAB	<i>Supplementary Capabilities</i>
#CAUSE_ID	<i>Cause Identifier</i>
->MM_PARAM_LENGTH	Parameter length, Octet 8
( numeric value )	<i>range 0 through 255</i>
->MM_PARAM	Parameter contents, Octet 9 *
( hex characters )	<i>max. length 10 octets</i>

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#### 4.19 Origination Call Appearance IE (I#ORIG\_CALL\_APP)

Possible octet inclusions/exclusions:

OCTET\_3

->OCA_ORIG_CALL_APP	Orig. call app., Octet 3
( numeric value )	<i>range 0 through 255</i>

**4.20 Other Call Reference IE (I#OTHER\_CALL\_REF)**

Possible octet inclusions/exclusions:

OCTET\_3, OCTET\_4, OCTET\_5

->OCR_FLAG	Flag, Octet 3
#ORIG_SIDE	<i>origination side</i>
#DEST_SIDE	<i>destination side</i>
->OCR_VALUE	Other Call Ref., Octet 3, 4 & 5
( numeric value )	<i>range 0 through 524287</i>

**4.21 Progress Indicator IE (I#PROGRESS\_IND)**

Possible octet inclusions/exclusions:

OCTET\_3, OCTET\_4

->PI_CODING_STANDARD	Coding standard, Octet 3
#CCITT	<i>CCITT standardized in Q.931</i>
->PI_LOCATION	Location, Octet 3
#USER	<i>User</i>
#LOCAL_PRIVATE	<i>Private Network Serving Local User</i>
#LOCAL_PUBLIC	<i>Public Network Serving Local User</i>
#TRANSIT	<i>Transit Network</i>
#REMOTE_PUBLIC	<i>Public Network Serving Remote User</i>
#REMOTE_PRIVATE	<i>Remote Private Network</i>
#INTERNAT_NETWORK	<i>International Network</i>
#BEYOND_INTERWORK	<i>Network Beyond Interworking Point</i>
->PI_DESCRIPTION	Progress desc., Octet 4
#NOT_END_TO_END	<i>Call is not end-to-end ISDN</i>
#DEST_NON_ISDN	<i>Destination address is non-ISDN</i>
#ORIG_NON_ISDN	<i>Origination address is non-ISDN</i>
#RETURNED_TO_ISDN	<i>Call has returned to the ISDN</i>
#INBAND_INFO_AVAIL	<i>Inband treatment has been applied</i>

**4.22 Restart Indicator IE (I#RESTART\_IND)**

Possible octet inclusions/exclusions:

OCTET\_3

->RI_CLASS	Class, Octet 3
#INDICATED_BCHAN	<i>Indicated B-channel</i>
#SINGLE_INTERFACE	<i>Single Interface</i>

---

### 4.23 Selected Call Appearance IE (I#SEL\_CALL\_APP)

Possible octet inclusions/exclusions:

OCTET\_3

->SCA\_SEL\_CALL\_APP                      Button Nr/Call App, Octet 3  
    ( numeric value )                      *range 0 through 255*

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### 4.24 Shift IE (I#SHIFT)

->SH\_TYPE                                  Shift type  
    #LOCKING                              *locking*  
->SH\_CODESET                              New codeset ident.  
    #CODESET5                            *IEs reserved for national use*  
    #CODESET6                            *local service network specific IEs*  
    #CODESET7                            *user specific IEs*

---

### 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                        *Ringback (audible ring) 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*  
    #CUSTOM\_TONE                         *Custom tone on*  
    #RECALL\_DIAL\_ON                      *Recall Dial tone on*  
    #BUSY\_VERIFY\_ON                      *Busy verify tone on*  
    #ERROR\_ON                            *Error tone on*  
    #STUTTER\_ON                          *Stutter Dial tone on*  
    #EXPENSIVE\_ROUTE                     *Expensive Routing tone on*  
    #TONES\_OFF                           *Tones off*  
    #ALERTING\_ON\_0                       *Normal alerting*  
    #ALERTING\_ON\_1                       *Distinctive alerting for inter term*  
    #ALERTING\_ON\_2                       *Distinctive alerting for prior call*  
    #ALERTING\_ON\_3                       *"Coded" or "Intercom" alerting*  
    #ALERTING\_ON\_4                       *May be used for forwarded calls*  
    #ALERTING\_ON\_5                       *"Party" or "tip" ringing equivalent*



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#ALERTING_ON_6	<i>Attendant timed reminder alerting</i>
#ALERTING_ON_7	<i>Selective Distinctive Alerting Pat.</i>
#ALERTING_OFF	<i>Alerting off</i>
#RESERVED_SIGNAL	<i>Reserved</i>
#UNSPEC_TONE	<i>Unspecified Tone</i>

---

#### 4.26 Switchhook IE (I#SWITCHHOOK)

Possible octet inclusions/exclusions:

OCTET\_3

->SW_VALUE	Switchhook Value, Octet 3
#ON_HOOK	<i>On-hook</i>
#OFF_HOOK	<i>Off-hook</i>

---

#### 4.27 Terminal Capabilities IE (I#TERM\_CAPAB)

Possible octet inclusions/exclusions:

OCTET\_3

->TC_CODING_STANDARD	Coding standard, Octet 3
#CCITT	<i>CCITT standardized in Q.931</i>
->TC_DESCRIPTION	Capability Descr., Octet 3
#TYPE2_STIMULUS	<i>Type 2 stimulus</i>

---

#### 4.28 User Code IE (I#USER\_CODE)

Possible octet inclusions/exclusions:

OCTET\_3, OCTET\_4

->UEC_TYPE	Type of User Code, Octet 3
#ANY	<i>Any</i>
#ACCOUNT_CODE	<i>Account Code</i>
#LOGIN_DIGITS	<i>Login Digits</i>
#SUB_INFO	<i>Subscriber Information</i>
#AUTH_CODE	<i>Authorization Code</i>
->UEC_VALUE	User Code value, Octet 4 *
( IA5 characters )	<i>max. length 32 octets</i>

