ISDN MESSAGE SET
(ATT_5E6)

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.

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<th>Description</th>
<th>Release Date</th>
<th>Release #</th>
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<td><strong>International</strong></td>
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<td></td>
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</tr>
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<td><strong>North America</strong></td>
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<tr>
<td>ATT_5E6</td>
<td>AT&amp;T 5D5–900–321, 5E6 Generic Program (03/89)</td>
<td>November 1990</td>
<td>R01</td>
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<tr>
<td>ATT_41449</td>
<td>AT&amp;T Primary Rate Interface Spec, TR41449 (07/89)</td>
<td>November 1990</td>
<td>R01</td>
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<td>Northern Telecom NIS S208–2 (1986), Stimulus</td>
<td>November 1990</td>
<td>R01</td>
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<td>Northern Telecom NIS A211–1, Issue AB01 (03/87)</td>
<td>November 1990</td>
<td>R01</td>
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<tr>
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<tr>
<td>VN2_133e</td>
<td>CNET Tech Spec ST/LAA/RSM/ 133, Ed 3 (07/88) English</td>
<td>November 1990</td>
<td>R01</td>
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<tr>
<td>VN2_133f</td>
<td>CNET Tech Spec ST/LAA/RSM/ 133, Ed 3 (07/88) French</td>
<td>November 1990</td>
<td>R01</td>
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<tr>
<td>1TR6_MGK</td>
<td>FTZ 1TR6 ISDN–D–Kanal–Protokoll (Ausgabe 1.90) – MGK</td>
<td>November 1990</td>
<td>R01</td>
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<td>FTZ 1TR6 ISDN–D–Kanal–Protokoll (Ausgabe 1.90) – NStAnl</td>
<td>November 1990</td>
<td>R01</td>
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<tr>
<td>NTT_INS–89</td>
<td>NTT INS Net 64/1500 Service Interface (1989)</td>
<td>November 1990</td>
<td>R01</td>
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</tbody>
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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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This message set is implemented in accordance with: AT&T 505–900–321, 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:

ATT_5E6 AT&T 5D5–900–321, 5E6 Generic Program (03/89) 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 )
}

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.

```xml
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.

```xml
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 !
```
### 2.1 Q.931 Protocol Discriminator

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

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
4.1 Adjunct Control IE (I#ADJUNCT_CON)

Possible octet inclusions/exclusions:

OCTET_3

-> AJC_VALUE
  #ADJUNCT_OFF
  #ADJUNCT_ON

Adjunct Control Val, Octet 3
off
on

4.2 Associated Type IE (I#ASSOC_TYP)

Possible octet inclusions/exclusions:

OCTET_3

-> AT_STATUS_VALUE
  #SETUP
  #CONNECT
  #HOLD
  #RECONNECT
  #EXCLUSION
  #CONNECT_DENIED
  #CLEARING_DENIED

Status Value, Octet 3
Setup
Connect
Hold
Reconnect
Exclusion
Connect Denied
Clearing Denied

4.3 Bearer Capability IE (I#BEARER_CAP)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4, OCTET_5, OCTET_5A

-> BC_CODING_STANDARD
  #CCITT

Coding standard, Octet 3
CCITT standardized in Q.931

-> BC_TRANSFER_CAP
  #SPEECH
  #UNRESTRICTED
  #RESTRICTED
  #3.1KHZ_AUDIO

Info. trans. cap., Octet 3
speech
unrestricted digital information
restricted digital information
3.1 kHz audio (modem)
### 4.4 Call State IE (ICALL_STATE)

Possible octet inclusions/exclusions:

**OCTET_3**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
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</thead>
<tbody>
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<td>Call State Value, Octet 3</td>
</tr>
<tr>
<td>#NULL</td>
<td>Null</td>
</tr>
<tr>
<td>#CALL_INIT</td>
<td>Call Init</td>
</tr>
<tr>
<td>#OVERLAP_SENDING</td>
<td>Overlap Sending</td>
</tr>
<tr>
<td>#OUTGOING_CALL_PROC</td>
<td>Outgoing Call Proceeding</td>
</tr>
<tr>
<td>#CALL_DELIVERED</td>
<td>Call Delivered</td>
</tr>
<tr>
<td>#CALL_RECEIVED</td>
<td>Call Received</td>
</tr>
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<td>Connect Request</td>
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<td>Active</td>
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<td>Disconnect Request</td>
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<tr>
<td>#DISC_INDICATION</td>
<td>Disconnect Indication</td>
</tr>
<tr>
<td>#RELEASE_REQUEST</td>
<td>Release Request</td>
</tr>
</tbody>
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**BC_TRANSFER_MODE**

Transfer mode, Octet 4
- Circuit mode
- Packet mode

**BC_TRANSFER_RATE**

Info. transfer rate, Octet 4
- used for packet transport mode
- 64 kbit/s

**BC_LAYER_ID**

Layer ident., Octet 5
- User information layer 1 protocol
- User information layer 2 protocol
- User information layer 3 protocol

**BC_PROTOCOL**

DMI Mode, Octet 5
- Standard rate adaption: Octet 5a
- CCITT Recommendation G.711 u-law
- Rec. X.25, link level – (LAPB)
- Rec. X.25 packet level

**BC_USER_RATE**

User rate, Octet 5a
- 56 kbit/s Rec I.463
4.5 Called Party Number IE (I#CALLED_NUM)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

->CLDN_NUMBER_TYPE
    #INTERNATIONAL
    #NATIONAL
    #SUBSCRIBER
->CLDN_NUMBERING_PLAN
    #ISDN_PLAN
    #PRIVATE_PLAN
->CLDN_NUMBER
 (IA5 characters)

- Type of number, Octet 3
  - international number
  - national number
  - local (directory) number
- Numbering plan id., Octet 3
  - ISDN Numbering Plan Rec. E.164
  - Private Numbering Plan
- Number digits, Octet 4 *
  - max. length 20 octets

4.6 Calling Party Number IE (I#CALLING_NUM)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_3A, OCTET_4

->CLGN_NUMBER_TYPE
    #UNKNOWN
    #INTERNATIONAL
    #NATIONAL
    #LOCAL_NUMBER
    #ABBREVIATED
->CLGN_NUMBERING_PLAN
    #UNKNOWN_PLAN
    #ISDN_PLAN
    #PRIVATE_PLAN
->CLGN_PRESENTATION
    #PRESENT_ALLOWED
    #PRESENT_RESTRICTED
    #NUMBER_UNAVAIL
->CLGN_SCREENING
    #UNSCREENED
    #VERIFY_PASSED
    #VERIFY_FAILED
    #NETWORK_PROVIDED
->CLGN_NUMBER
 (IA5 characters)

- Type of number, Octet 3
  - unknown
  - international number
  - national number
  - local (directory) number
  - abbreviated number
- Numbering plan id., Octet 3
  - ISDN Numbering Plan Rec. E.164
  - Private Numbering Plan
- Presentation ind., Octet 3a
  - Presentation allowed
  - Presentation restricted
  - not available due to interworking
- Screening indicator, Octet 3a
  - User provided – not screened
  - User provided – verified and passed
  - User provided – verified and failed
  - Network provided
- Number digits, Octet 4 *
  - max. length 20 octets
4.7 Cause IE (I#CAUSE)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

-> C_CODING_STANDARD
   #CCITT

-> C_LOCATION
   #USER
   #LOCAL_PRIVATE
   #LOCAL_PUBLIC
   #TRANSIT
   #REMOTE_PUBLIC
   #REMOTE_PRIVATE
   #INTERNAT_NETWORK
   #BEYOND_INTERWORK

-> C_CAUSE_CLASS
   #NORMAL_EVENT_0
   #NORMAL_EVENT_1
   #RESOURCE_UNAV
   #SERV_OPT_NA
   #SERV_OPT_NI
   #INV_MSG
   #PROTOCOL_ERROR
   #INTERWORKING

-> C_CAUSE_VALUE
   #UNASS_NUMBER
   #NO_ROUTE
   #NORMALCLEARING
   #USER_BUSY
   #NO_USER_RESPOND
   #CALL_REJECTED
   #NUMBER_CHANGED
   #INVALID_NUMBER_FORMAT
   #FACILITY_REJECTED
   #STATUS_ENQ_RESPONSE
   #NORMAL_UNSPECIFIED
   #NO_CHANNEL_AVAIL
   #QUEUED
   #TEMPORARY_FAILURE
   #NETWORK_CONG
   #ACCESS_INFO_DISCARD
   #REQ_FAC_NOT_SUBSC
   #OUTG_CALLS_BARRED
   #INC_CALLS_BARRED
   #BEARER_CAP_UNAVAL
   #SERVICE_UNAVAL
   #BEARER_SERVICE_UNIMPL
   #CHANNEL_TYPE_UNIMPL
   #REQ_FAC_NI

Coding standard, Octet 3
CCITT standardized in Q.931

Location, Octet 3
User
Private Network Serving Local User
Public Network Serving Local User
Transit Network
Public Network Serving Remote User
Remote Private Network
International Network
Network Beyond Interworking Point

Class, Octet 4
Normal event
Normal event
Resource unavailable
Service or option not available
Service or option not implemented
Invalid message
Protocol error
Interworking

Cause value, Octet 4
1 Unassigned Number
2 No route to specified network
16 Normal, Clearing
17 User busy
18 No user responding
21 Call rejected
22 Number changed
28 Invalid number format
29 Requested facility rejected
30 Response to status enquiry
31 Normal, Unspecified
34 No channel available
35 Queued
41 Temporary failure
42 Network congestion
43 Access information discarded
50 Requested fac. not subscribed
52 Outgoing calls barred
54 Incoming calls barred
58 Bearer cap. not pres. available
63 Service or option not available
65 Bearer service not implemented
66 Channel type not implemented
69 Requested fac. not implemented
4.8 Channel Identification IE (I#CHANNEL_ID)

Possible octet inclusions/exclusions:

OCTET_3

- >CID_INT_PRESENT
  #IMPLICIT
  - >CID_INT_TYPE
    #BASIC_INTERFACE
    - >CID_PREF/EXCL
      #PREFERRED
      #EXCLUSIVE
    - >CID_DCHANNEL
      #NOT_D_CHANNEL
      #D_CHANNEL
    - >CID_INFO_CHAN_SEL
      #NO_CHANNEL
      #B1_CHANNEL
      #B2_CHANNEL
      #ANY_CHANNEL

Interface ident., Octet 3
Interface implicitly identified
Interface type, Octet 3
Basic Rate Interface
Preferred/Exclusive, Octet 3
indicated channel is preferred exclusive; only this ch. acceptable
D-channel indicator, Octet 3
The channel is not the D-channel
The channel is the D-channel
Info. chan. sel., Octet 3
No channel
B1-channel
B2-channel
Any channel

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
range 0 through 255

IDACOM

ISDN Message Set (ATT_5E6) Reference Manual
### 4.10 Display Control IE (I#DISPLAY_CON)

Possible octet inclusions/exclusions:

**OCTET_3**

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

### 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` Normal
  - `#INSPECT` Inspect
  - `#MISC_INFO` Misc. Display Information
  - `#MSG_RETRIEVAL` Message Retrieval
  - `#DIRECTORY_QUERY` Electronic Directory Query

- `->DF_SUBMODE` Submode, Octet 3
  - `#NO_SUBMODE_APPL` No Submode Applicable
  - `#DIRECT` Direct
  - `#REDIRECTED` Redirected

- `->DF_TYPE` Display Field Type, Octet 4
  - `#CALL_APP_ID` Call Appearance ID
  - `#CALLED_PARTY_ID` Called Party Identifier
  - `#CALLING_PARTY_ID` Calling Party Identifier
  - `#CALLED_PARTY` Called Party Name
  - `#CALLING_PARTY` Calling Party Name
  - `#ORIG_PERMISSION` Originating Permissions
  - `#ISDN_CALL_ID` ISDN Call Identification
  - `#MISC_CALL_INFO` Misc. Call Information
  - `#ENTIRE` Entire Display
  - `#DATE_TIME` Date and Time of Day

- `->DF_INFO` Display information, Octet 5 *
  - (IA5 characters)
  - Max. length 40 octets
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
    - range 0 through 255
- `->EP_INTERPRETER` (matches USID+TID, matches USID)
  - Interpreter, Octet 4
- `->EP_TID` (numeric value)
  - Terminal Id (TID), Octet 4
    - range 0 through 127

4.13 Feature Activation IE (I#FEAT_ACT)

Possible octet inclusions/exclusions:

**OCTET_3, OCTET_4**

- `->FA_BUTTON_TYPE` (matches USID and TID, matches USID and not TID)
  - Button type, Octet 3
    - Unknown
    - Call Appearance Button
    - Feature Button
- `->FA_MODULE_NR` (numeric value)
  - Module number, Octet 3
    - range 0 through 7
- `->FA_STATUS_TYPE` (numeric value)
  - Status type, Octet 3
    - range 0 through 7
- `->FA_BUTTON_NR` (numeric value)
  - Button number, Octet 4
    - range 0 through 255

4.14 Feature Indication IE (I#FEAT_IND)

Possible octet inclusions/exclusions:

**OCTET_3, OCTET_4, OCTET_5, OCTET_6**

- `->FL_BUTTON_TYPE` (matches USID and TID, matches USID and not TID)
  - Button Type, Octet 3
    - Unknown
    - Call Appearance Button
    - Feature Button
    - None Applicable
- `->FL_MODULE_NR` (numeric value)
  - Module number, Octet 3
    - range 0 through 7
-->FL_STATUS_TYPE
  #FEAT_NUM_STATUS
  #FEAT_BUTT_STATUS
  #MULT_BUTT_STATUS
  #MAINT_STATUS

-->FL_FEATURE_NR
    ( numeric value )

-->FL_FEAT_BUTTON_NR
    ( numeric value )

-->FL_START_FEAT_BUTTON
    ( numeric value )

-->FL_MAINT
  #RESERVED
  #TURN_OFF

Status Type, Octet 3
  Feature Number Status
  Feature Button Status
  Multiple Button Status
  Maintenance Status

Feature Number, Octet 4
  range 0 through 255

Feature Button No., Octet 4
  range 0 through 255

Starting Button, Octet 4
  range 0 through 255

Maintenance Act., Octet 4
  reserved
  Turn all indicators off
4.15 Keypad IE (I#KEYPAD)

Possible octet inclusions/exclusions:

OCTET_3

-->K_KEYPAD
   ( IA5 characters )

Keypad information, Octet 3 *
   max. length 32 octets


4.16 Keypad Control IE (I#KEYPAD_CON)

Possible octet inclusions/exclusions:

OCTET_3

-->KC_CR_VALUE_TYPE
   #NULL_CR
   #NON_NULL_CR

Call Ref Value Type, Octet 3
   Null Call Reference
   Non-Null Call Reference
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
  #CCITT
  #INTERNATIONAL
  #NATIONAL
  #NETWORK_SPECIFIC

Coding standard, Octet 3

CCITT standardized in Q.931
Other international standards
National standard
Standard specific to the network

->LL_TRANSFER_CAP
  #SPEECH
  #UNRESTRICTED
  #RESTRICTED
  #3.1KHZ_AUDIO

Info. trans. cap., Octet 3

speech
unrestricted digital information
restricted digital information
3.1 kHz audio (modem)

->LL_TRANSFER_MODE
  #CIRCUIT_MODE
  #PACKET_MODE

Transfer mode, Octet 4

circuit mode
packet mode

->LL_TRANSFER_RATE
  #PACKET
  #64KBIT/S

Info. transfer rate, Octet 4

used for packet transport mode
64 kbit/s

->LL_STRUCTURE
  #DEFAULT
  #8KHZ_INTEGRITY
  #SDU_INTEGRITY
  #UNSTRUCTURED

Structure, Octet 4a

Default
8 kHz integrity
Service data unit integrity
Unstructured

->LL_CONFIGURATION
  #POINT_TO_POINT

Configuration, Octet 4a

Point-to-point

->LL_ESTABLISHMENT
  #DEMAND

Establishment, Octet 4a

Demand

->LL_SYMMETRY
  #BIDIRECT_SYMMETRIC
  #BIDIRECTASYMMETRIC
  #UNIDIRECT_ORG->DST
  #UNIDIRECT_DST->ORG

Symmetry, Octet 4b

Bidirectional symmetric
Bidirectional asymmetric
Unidirectional (orig -> dest)
Unidirectional (dest -> orig)

->LL_TRANSFER_RATE_4B
  #PACKET
  #64KBIT/S

Info. transfer rate, Octet 4b

used for packet transport mode
64 kbit/s

->LL_LAYER_ID
  #LAYER1
  #LAYER2
  #LAYER3

Layer ident., Octet 5

User information layer 1 protocol
User information layer 2 protocol
User information layer 3 protocol
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
  range 0 through 255

- MM_TRANS_REF
  #SYNC_OP
  Transaction Ref., Octet 4
  Synchronous Operation

- MM_OP_CLASS
  #UNCONF_OP
  #CONF_OP
  Operation Class, Octet 5
  Unconfirmed Operation
  Confirmed Operation
  Return Result
  Return Result Continued
  Return Error
  Reject
Operation Type, Octet 5

- Action
- Event Report
- Get
- Set

Param. Group Code, Octet 6

- Unspecified Error
- Protocol Violation
- Unrecognized Operation
- No Non-Synchronous Operation
- Activate Loopback
- Deactivate Loopback
- Reset
- Initialization Request
- Endpoint Service State Change
- Service Profile Information
- Address Information
- Call Status Information
- Equipment Information

Parameter length, Octet 8

range 0 through 255

Parameter contents, Octet 9

max. length 10 octets

4.19 Origination Call Appearance IE (I#ORIG_CALL_APP)

Possible octet inclusions/exclusions:

OCTET_3

- OCA_ORIG_CALL_APP

(numeric value)

Orig. call app., Octet 3

range 0 through 255
4.20 Other Call Reference IE (l#OTHER_CALL_REF)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4, OCTET_5

->OCR_FLAG  Flag, Octet 3
  #ORIG_SIDE  origination side
  #DEST_SIDE  destination side
->OCR_VALUE  Other Call Ref., Octet 3, 4 & 5
  ( numeric value )

4.21 Progress Indicator IE (l#PROGRESS_IND)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

->PL_CODING_STANDARD  Coding standard, Octet 3
  #CCITT  CCITT standardized in Q.931
->PL_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  Remote Private Network
    #INTERNAT_NETWORK  International Network
    #BEYOND_INTERWORK  Network Beyond Interworking Point
->PL_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  Inband treatment has been applied

4.22 Restart Indicator IE (l#RESTART_IND)

Possible octet inclusions/exclusions:

OCTET_3

->RL_CLASS  Class, Octet 3
  #INDICATED_BCHAN  Indicated B-channel
  #SINGLE_INTERFACE  Single Interface
4.23 Selected Call Appearance IE (I#SEL_CALL_APP)

Possible octet inclusions/exclusions:

OCTET_3

->SCA_SEL_CALL_APP
   ( numeric value )
   Button Nr/Call App, Octet 3
   range 0 through 255

4.24 Shift IE (I#SHIFT)

->SH_TYPE
   #LOCKING
   Shift type
   locking

->SH_CODESET
   #CODESET5
   #CODESET6
   #CODESET7
   New codeset ident.
   IEs reserved for national use
   local service network specific IEs
   user specific IEs

4.25 Signal IE (I#SIGNAL)

Possible octet inclusions/exclusions:

OCTET_3

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

### 4.26 Switchhook IE (I#SWITCHHOOK)

Possible octet inclusions/exclusions:

**OCTET_3**

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

### 4.27 Terminal Capabilities IE (I#TERM_CAPAB)

Possible octet inclusions/exclusions:

**OCTET_3**

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

### 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  Any  
  #ACCOUNT_CODE  Account Code  
  #LOGIN_DIGITS  Login Digits  
  #SUB_INFO  Subscriber Information  
  #AUTH_CODE  Authorization Code  
->UEC_VALUE  User Code value, Octet 4  
  (IA5 characters)  
  max. length 32 octets