ISDN MESSAGE SET
(NT_S208 -2)
Reference Manual

IDACOM
A division of
Hewlett Packard
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.

<table>
<thead>
<tr>
<th>Message Set</th>
<th>Description</th>
<th>Release Date</th>
<th>Release #</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>International</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>North America</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<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>
</tr>
<tr>
<td>ATT_41449</td>
<td>AT&amp;T Primary Rate Interface Spec, TR41449 (07/89)</td>
<td>November 1990</td>
<td>R01</td>
</tr>
<tr>
<td>NT_S208–2</td>
<td>Northern Telecom NIS S208–2 (1986), Stimulus</td>
<td>November 1990</td>
<td>R01</td>
</tr>
<tr>
<td>NT_A211–1</td>
<td>Northern Telecom NIS A211–1, Issue AB01 (03/87)</td>
<td>November 1990</td>
<td>R01</td>
</tr>
<tr>
<td><strong>Europe</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<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>
</tr>
<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>
</tr>
<tr>
<td>1TR6_MGK</td>
<td>FTZ 1TR6 ISDN-D-Kanal–Protokoll (Ausgabe 1.90) – MGK</td>
<td>November 1990</td>
<td>R01</td>
</tr>
<tr>
<td>1TR6_NSA</td>
<td>FTZ 1TR6 ISDN-D-Kanal–Protokoll (Ausgabe 1.90) – NStAnl</td>
<td>November 1990</td>
<td>R01</td>
</tr>
<tr>
<td><strong>Asia</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NTT_INS–89</td>
<td>NTT INS Net 64/1500 Service Interface (1989)</td>
<td>November 1990</td>
<td>R01</td>
</tr>
</tbody>
</table>
This manual is intended to provide a list of message identifiers, information element identifiers, and information element structures for the NT_S208-2 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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# TABLE OF CONTENTS

## SUPPORTED MESSAGE SETS

### PREFACE

1. **INTRODUCTION** ................................................................. 1–1
   1.1 Using Message Identifiers ............................................... 1–1
   1.2 Using IE Identifiers ..................................................... 1–2
   1.3 Using IE Structures .................................................... 1–3

2. **MESSAGE IDENTIFIERS** ..................................................... 2–1
   2.1 Q.931 Protocol Discriminator (value = 0X08) ...................... 2–1

3. **IE IDENTIFIERS** .............................................................. 3–1
   3.1 Codeset 0 ..................................................................... 3–1
   3.2 Codeset 6 ..................................................................... 3–1

4. **IE STRUCTURES** ................................................................. 4–1
   4.1 B-channel Control IE (l#B-CHAN_CONTR) ........................... 4–1
   4.2 Bearer Capability IE (l#BEARER_CAP) ............................... 4–1
   4.3 Cause IE (l#CAUSE) ...................................................... 4–2
   4.4 Channel Identification IE (l#CHANNEL_ID) ....................... 4–2
   4.5 Connect Address IE (l#CONN_ADDR) ................................. 4–3
   4.6 Destination Address IE (l#DEST_ADDR) ............................. 4–3
   4.7 Display IE (l#DISPLAY) .................................................. 4–4
   4.8 Initialize IE (l#INIT) ..................................................... 4–4
   4.9 Keypad IE (l#KEYPAD) ................................................. 4–4
   4.10 Low Layer Compatibility IE (l#LOW_LAY_COMP) .............. 4–4

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ISDN Message Set (NT_S208-2) Reference Manual
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.11</td>
<td>Feature Activation IE (I#NTL_FEAT_ACT)</td>
<td>4-5</td>
</tr>
<tr>
<td>4.12</td>
<td>Feature Indication IE (I#NTL_FEAT_IND)</td>
<td>4-5</td>
</tr>
<tr>
<td>4.13</td>
<td>Origination Address IE (I#ORIG_ADDR)</td>
<td>4-6</td>
</tr>
<tr>
<td>4.14</td>
<td>Progress Indicator IE (I#PROGRESS_IND)</td>
<td>4-6</td>
</tr>
<tr>
<td>4.15</td>
<td>Redirecting Address IE (I#REDIRING_ADDR)</td>
<td>4-7</td>
</tr>
<tr>
<td>4.16</td>
<td>Shift IE (I#SHIFT)</td>
<td>4-7</td>
</tr>
<tr>
<td>4.17</td>
<td>Signal IE (I#SIGNAL)</td>
<td>4-7</td>
</tr>
<tr>
<td>4.18</td>
<td>Terminal Capabilities IE (I#TERM_CAPAB)</td>
<td>4-8</td>
</tr>
<tr>
<td>4.19</td>
<td>Terminal Profile IE (I#TERM_PROF)</td>
<td>4-8</td>
</tr>
</tbody>
</table>
This message set is implemented in accordance with: Northern Telecom NIS S208–2, Issue AA03, ISDN Basic Rate Access User–Network Interface Specification, September 1986.

The message set name (NT_S208–2) 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:

NT_S208–2 Northern Telecom NIS S208–2 (1986), Stimulus 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 (e.g., 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:

```
l#xxxx (eg. l#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)
   yyyyy = 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 \(\rightarrow\)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

\textbf{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 \(\rightarrow\)BC,TRANSFER_MODE !
#384KBIT/S *COD \(\rightarrow\)BC,TRANSFER_RATE !
2 MESSAGE IDENTIFIERS

2.1 Q.931 Protocol Discriminator (value = 0X08)

<table>
<thead>
<tr>
<th>M#INFO</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>M#SETUP</td>
<td>Setup</td>
</tr>
</tbody>
</table>
3.1 Codeset 0

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#BEARER_CAP</td>
<td>Bearer Capability</td>
</tr>
<tr>
<td>#CAUSE</td>
<td>Cause</td>
</tr>
<tr>
<td>#CHANNEL_ID</td>
<td>Channel Identification</td>
</tr>
<tr>
<td>#CONN_ADDR</td>
<td>Connect Address</td>
</tr>
<tr>
<td>#DEST_ADDR</td>
<td>Destination Address</td>
</tr>
<tr>
<td>#DISPLAY</td>
<td>Display</td>
</tr>
<tr>
<td>#KEYPAD</td>
<td>Keypad</td>
</tr>
<tr>
<td>#LOW_LAY_COMP</td>
<td>Low Layer Compatibility</td>
</tr>
<tr>
<td>#ORIG_ADDR</td>
<td>Origination Address</td>
</tr>
<tr>
<td>#PROGRESS_IND</td>
<td>Progress Indicator</td>
</tr>
<tr>
<td>#REDIRING_ADDR</td>
<td>Redirecting Address</td>
</tr>
<tr>
<td>#SHIFT</td>
<td>Shift</td>
</tr>
<tr>
<td>#SIGNAL</td>
<td>Signal</td>
</tr>
<tr>
<td>#TERM_CAPAB</td>
<td>Terminal Capabilities</td>
</tr>
</tbody>
</table>

3.2 Codeset 6

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#B_CHAN_CONTR</td>
<td>B-channel Control</td>
</tr>
<tr>
<td>#INIT</td>
<td>Initialize</td>
</tr>
<tr>
<td>#NTL_FEAT_ACT</td>
<td>Feature Activation</td>
</tr>
<tr>
<td>#NTL_FEAT_IND</td>
<td>Feature Indication</td>
</tr>
<tr>
<td>#SHIFT</td>
<td>Shift</td>
</tr>
<tr>
<td>#TERM_PROF</td>
<td>Terminal Profile</td>
</tr>
</tbody>
</table>
4.1 B-channel Control IE (I#B-CHAN_CONTR)

Possible octet inclusions/exclusions:

OCTET_3

->BCC_PARAM
  #0
  #1
  #2
  #3

B-Channel Parameter, Octet 3
  release B1
  release B2
  connect B1
  connect B2

4.2 Bearer Capability IE (I#BEARER_CAP)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

->BC_CODING_STANDARD
  #CCITT
  #NETWORK_SPECIFIC

Coding standard, Octet 3
  CCITT
  network specific

->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

->BC_TRANSFER_MODE
  #CIRCUIT_MODE
  #PACKET_MODE

Transfer mode, Octet 4
  circuit mode
  packet mode

->BC_TRANSFER_RATE
  #PACKET
  #64KBIT/S

Info. transfer rate, Octet 4
  channel size (packet mode)
  64 kbit/s circuit-mode
4.3 Cause IE (I#CAUSE)

Possible octet inclusions/exclusions:

**OCTET_3, OCTET_4, OCTET_4A, OCTET_5**

- **C_CODING_STANDARD**
  - Coding standard, Octet 3
    - CCITT
    - NETWORK_SPECIFIC
- **C_LOCATION**
  - Location, Octet 3
    - USER
    - LOCAL_PRIVATE
    - LOCAL_PUBLIC
    - TRANSIT
    - REMOTE_PUBLIC
    - REMOTE_PRIVATE
- **C_CAUSE_VALUE**
  - Cause value, Octet 4
    - UNASSIGNED_NUMBER
    - NORMAL_CLEARING
    - USER_BUSY
    - CALL_REJECTED
    - INVALID_NUMBER_FORMAT
    - NORMAL_UNSPECIFIED
    - NO_CHANNEL_AVAIL
    - SWITCH_CONGESTION
    - RESOURCE_UNAVAIL_UNSPEC
    - SERVICE_UNAVAIL_UNSPEC
    - INVALID_CALL_REF
    - INCOMPATIBLE_DEST
    - CALL_NOT_SUBSCRIBED
    - MESSAGE_TYPE_UNIMPL
    - IE_UNIMPL
    - INVALID_IE_CONTENTS
    - PROTOCOL_ERROR_UNSPEC
    - CAUSE_UNKNOWN
- **C_DIAG_LENGTH**
  - Diagnostic Length, Octet 4a
    - (numeric value)
  - **C_DIAGNOSTIC**
    - Diagnostic(s), Octet 5
      - (hex characters)

4.4 Channel Identification IE (I#CHANNEL_ID)

Possible octet inclusions/exclusions:

**OCTET_3**

- **CID_INT_PRESENT**
  - Interface ident., Octet 3
    - IMPLICIT
    - EXPLICIT
- **C_DIAGNOSTIC**
  - Diagnostic(s), Octet 5
    - max. length 18 octets
4.5 Connect Address IE (I#CONN_ADDR)

Possible octet inclusions/exclusions:

**OCTET_3, OCTET_4**

- `->CA_ADDR_TYPE` ( numeric value )
  Type of Address, Octet 3
  range 0 through 7
- `->CA_NUMBER/ADDR` ( numeric value )
  Number/Address Plan, Octet 3
  range 0 through 15
- `->CA_ADDR_DIGIT` ( IAS characters )
  Address Digit, Octet 4 *
  max. length 16 octets

4.6 Destination Address IE (I#DEST_ADDR)

Possible octet inclusions/exclusions:

**OCTET_3, OCTET_4**

- `->DA_ADDR_TYPE` ( numeric value )
  Type of Address, Octet 3
  range 0 through 7
- `->DA_NUMBER/ADDR` ( numeric value )
  Number/Address Plan, Octet 3
  range 0 through 15
- `->DA_ADDR_DIGIT` ( IAS characters )
  Address Digit, Octet 4 *
  max. length 16 octets
4.7 Display IE (I#DISPLAY)
Possible octet inclusions/exclusions:

OCTET_3

-->DNTLDISPLAY
( IA5 characters )

Display, Octet 3 *
max. length 40 octets

4.8 Initialize IE (I#INIT)
Possible octet inclusions/exclusions:

OCTET_3

-->IN_PARAM
#INIT_TERMINAL

Initialize Param, Octet 3
initialize terminal

4.9 Keypad IE (I#KEYPAD)
Possible octet inclusions/exclusions:

OCTET_3

-->KNTS_KEYPAD
( IA5 characters )

Keypad information, Octet 3 *
max. length 30 octets

4.10 Low Layer Compatibility IE (I#LOW_LAY_COMP)
Possible octet inclusions/exclusions:

OCTET_3, OCTET_3A, OCTET_3B

-->LL_CODING_STANDARD
#CCITT
#NETWORK_SPECIFIC

Coding standard, Octet 3
CCITT
network specific

-->LL_MODEM/DATA
#MODEM
#DATA_TERMINAL
#NO_MODEM/DTU

Modem/Data Terminal, Octet 3
modem
data terminal unit
modem/DTU not indicated

-->LL_MODEM/DTU
( numeric value )

Modem/DTU Protocol, Octet 3a
range 0 through 127

-->LL_ASYNC/SYNCH
#ASYNCHRONOUS
#SYNCHRONOUS

Asyn/Synch, Octet 3b
asynchronous
synchronous
<table>
<thead>
<tr>
<th>Access Data Rate, Octet 3b</th>
<th>Feature value, Octet 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.6 kbit/s Rec V.6 and X.1</td>
<td>range 0 through 127</td>
</tr>
<tr>
<td>1.2 kbit/s Rec V.6</td>
<td></td>
</tr>
<tr>
<td>2.4 kbit/s Rec V.6 and X.1</td>
<td></td>
</tr>
<tr>
<td>3.6 kbit/s Rec V.6</td>
<td></td>
</tr>
<tr>
<td>4.8 kbit/s Rec V.6 and X.1</td>
<td></td>
</tr>
<tr>
<td>7.2 kbit/s Rec V.6</td>
<td></td>
</tr>
<tr>
<td>8 kbit/s Rec I.460</td>
<td></td>
</tr>
<tr>
<td>9.6 kbit/s Rec V.6 and X.1</td>
<td></td>
</tr>
<tr>
<td>16 kbit/s Rec I.460</td>
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<tr>
<td>19.2 kbit/s Rec V.6</td>
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</tr>
<tr>
<td>32 kbit/s Rec I.460</td>
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<tr>
<td>48 kbit/s Rec V.6 and X.1</td>
<td></td>
</tr>
<tr>
<td>56 kbit/s Rec V.6</td>
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</tr>
<tr>
<td>75 bit/s Rec. V.6 and X.1</td>
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</tr>
<tr>
<td>150 bit/s Rec. V.6 and X.1</td>
<td></td>
</tr>
<tr>
<td>300 bit/s Rec. V.6 and X.1</td>
<td></td>
</tr>
</tbody>
</table>

4.11 Feature Activation IE (I#NTL_FEAT_ACT)

Possible octet inclusions/exclusions:

**OCTET_3**

`->FA_VALUE` ( numeric value )

4.12 Feature Indication IE (I#NTL_FEAT_IND)

Possible octet inclusions/exclusions:

**OCTET_3, OCTET_4**

`->FI_VALUE` ( numeric value )

`->FI_STATE_PARAM` State Parameter, Octet 4

- `#IDLE`
- `#DIALING/ACTIVE`
- `#INCOMING_CALL`
- `#HELD`
- `#ASSO_CALL_ACTIVE`
- `#INACTIVE`
- `#ACTIVE`
- `#REQUESTED_CALL`
- `#PARAMETER_ENTRY`

- `idle`
- `dialing or active`
- `incoming call offered`
- `held`
- `associated call active`
- `inactive`
- `active`
- `requested call offered`
- `parameter entry`
4.13 Origination Address IE (I#ORIG_ADDR)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

-->OA_ADDR_TYPE
   ( numeric value )
   Type of Address, Octet 3
   range 0 through 7

-->OA_NUMBER/ADDR
   ( numeric value )
   Number/Address Plan, Octet 3
   range 0 through 15

-->OA_ADDR_DIGIT
   ( IA5 characters )
   Address Digit, Octet 4 *
   max. length 16 octets

4.14 Progress Indicator IE (I#PROGRESS_IND)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

-->PI_CODING_STANDARD
   #CCITT
   Coding standard, Octet 3
   CCITT
   network specific

-->PI_LOCATION
   #USER
   Location, Octet 3
   user
   private network serving local user
   public network serving local user
   transit network
   public network serving remote user
   private network serving remote user

-->PI_DESCRIPTION
   #NOT_END_TO_END
   Progress ind., Octet 4
   call is not end-to-end ISDN
destination address is non-ISDN
origination address is non-ISDN
call has returned to the ISDN
treatment applied to call
call proceeding
call alerting at destination
call connect at destination
dialing
disconnect
4.15 Redirecting Address IE (I#REDIRING_ADDR)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

- RA_ADDR_TYPE
  ( numeric value )
  Type of Address, Octet 3
  range 0 through 7
- RA_NUMBER/ADDR
  ( numeric value )
  Number/Address Plan, Octet 3
  range 0 through 15
- RA_ADDR_DIGIT
  ( IA5 characters )
  Address Digit, Octet 4 *
  max. length 16 octets

4.16 Shift IE (I#SHIFT)

- SH_TYPE
  Locking
  non-locking
- SH_CODESET
  CODESET0
  CODESET6
  Codeset ident.
  I.451 (Q.931) IE
  local network specific IE

4.17 Signal IE (I#SIGNAL)

Possible octet inclusions/exclusions:

OCTET_3

- SL_VALUE
  Dial tone on
  ring back tone on
  network congestion tone on
  busy tone on
  confirm tone on
  call waiting tone on
  off-hook warning tone on
  busy verify tone
  special dial tone
  barge in warning
  expensive route
  tones off
  alerting on – pattern 0
  alerting on – pattern 1
  alerting on – pattern 2
  alerting on – pattern 3
  alerting on – pattern 4
  alerting on – pattern 5
#ALERTING_ON_6
alerting on – pattern 6

#ALERTING_ON_7
alerting on – pattern 7

#ALERTING_OFF
alerting off

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

Possible octet inclusions/exclusions:

**OCTET_3**

- `->TC_CODING_STANDARD` Coding Standard, Octet 3
  - `#NETWORK_SPECIFIC` network specific
- `->TC_DISCRIPTION` Terminal Descrip, Octet 3
  - `#STIMULUS_MODE` stimulus mode terminal

### 4.19 Terminal Profile IE (I#TERM_PROF)

Possible octet inclusions/exclusions:

**OCTET_3**

- `->TP_TERM_PROFILE` Terminal Profile id, Octet 3
  - (numeric value)
  - `range 0 through 255`