3GPP2 N.S0016-0

Version 1.0

TIA/EIA-41-D Internationalization

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FOREWORD

This Interim Standard contains recommendations for modifications and enhancements to ANSI/TIA/EIA-41-D that are required to support international intersystem operations.

The ANSI recommendation upon which this Interim Standard builds is:

- *TIA/EIA-41-D* *Cellular Radiotelecommunications Intersystem Operations*, Telecommunications Industry Association; December 1997.

EDITORIAL KEY

This section identifies the editorial style for the use of the right-hand margin vertical diffmarks, strikethrough lines, and underscore lines. The editorial style employed is:

a. TIA/EIA-41-D original text deleted by N.S0016-0 has a strikethrough line.

b. Original text added by N.S0016-0 has a single underline.

c. Both additions and deletions are indicated by a right hand margin vertical diffmark.

ASSUMPTIONS

The following items are basic understandings used during the development of this document:

a. E.212 global title translation is provisioned for message routing between national networks.

b. A national SS7 network is an administrative set of SS7 nodes that are interconnected by a common national signaling point code addressing scheme.

c. The signal transfer points which reside in both the international and national signaling levels (i.e., gateway STPs) convert from national MTP and SCCP to international MTP and SCCP and vice versa. This conversion includes changes to global title indicator, translation type, numbering plan, encoding scheme, and nature of address indicator.

d. International addressing implementations not employing global title translation are beyond the scope of this interim standard.

e. An MSC supporting N.S0016-0 or later is assumed to be capable of receiving digit strings in parameters of DigitsType with Nature of Number indicating *International* as well as in parameters of DigitsType with Nature of Number indicating *National*. Moreover, if the MSC receives a digit string containing the *International* encoding of E.164 number from its own country's telephony numbering plan (or the leading digits of such a number), the MSC is assumed to be capable of stripping the country code from that digit string to convert it to National (Significant) Number form.

REVISION HISTORY

Revision	Date	Remarks
0.0	August, 1999	Initial Publication

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1. INTRODUCTION

1.1 OBJECTIVE

This Interim Standard (N.S0016-0) provides recommendations for supporting internationalization enhancements for *ANSI/TIA/EIA-41-D*.

1.2 SCOPE

This document specifies the *ANSI/TIA/EIA-41-D* Chapters 1, 3, 5 and 6 enhancements that are necessary to support international intersystem operations.

1.3 ORGANIZATION

This document is organized as per *ANSI/TIA/EIA-41-D*.

2. *TIA/EIA-41-D Chapter 1* "Functional Overview" Modifications

2.1 NORMATIVE REFERENCES

(*TIA/EIA-41-D* Chapter 1, page 1-2)

ITU-T:

- *Recommendation E.212 - The International Identification Plan for Mobile Terminals and Mobile Users*, November 1998.
- *Recommendation Q.713 (07/96) - Signalling Connection Control Part formats and codes*, July 1996.

ANSI T1 Standards:

- *ANSI T1.112-1996~~1988~~ Signaling System Number 7 - Signaling Connection Control Part (SCCP)*

TIA/EIA:

- *TIA/EIA IS-751 TIA/EIA 41-D Modifications to Support IMSI*, February 1998.

3.1 DEFINITIONS

(*TIA/EIA-41-D* Chapter 1, page 1-5)

International Mobile Subscriber Identity (IMSI)

The IMSI is a string of decimal digits, up to a maximum of 15 digits, that identifies a unique mobile terminal or mobile subscriber internationally. The IMSI consists of three fields: the mobile country code, the mobile network code, and the mobile subscriber identification number.

Mobile Station Identity (MSID)

The identifier for a mobile station. A choice of either MIN or IMSI.

4 SYMBOLS AND ABBREVIATIONS

(*TIA/EIA-41-D* Chapter 1, page 1-14)

IMSI	International Mobile Subscriber Identity
MSID	Mobile Station Identity

7 GENERAL BACKGROUND AND ASSUMPTIONS

(*TIA/EIA-41-D* Chapter 1, page 1-30)

The omitted portions of this section are retained without modification.

~~Against this background, p~~Procedures for the implementation of the identified intersystem services have been defined with due regard to the following general considerations:

The omitted portions of this section are retained without modification.

8) The procedures defined here are based on the assumption that intersystem handoff relies upon dedicated intersystem trunks. This is required since intersystem handoff is a tightly controlled activity of the cellular systems involved. Intersystem handoff cannot be considered any differently than an inter-cell handoff. ~~The intersystem handoff may or may not be inter LATA (Local Access and Transport Area) depending upon where the LATA boundary is and also where the mobile call was placed.~~

The remainder of this section is retained without modification.

3. *TIA/EIA-41-D* Chapter 3 "Automatic Roaming Information Flows" Modifications

4.17.2 Successful LocationRequest: Route to a Local MS

(*TIA/EIA-41-D* Chapter 3, page 3-76)

The omitted portions of this section are retained without modification.

b. The HLR determines that the call shall be routed to a local MS (i.e., an MS served by the Originating MSC) and returns this information to the Originating MSC in the `locreq`.

Parameters are as in Section 4.18.1, Step-b, with the exception that PSTNRoutingInfo is not included and with the following additions:

Parameters	Usage	Type
PC_SSN	Originating MSC PC_SSN. Include if SS7 carriage services are used.	O
LocalRoutingInfo:	Call routing information:	
[TerminationList]	Local termination information. Include if TerminationList is allowed.	O
[Digits(Destination)]	Destination digits for use in intra-MSC call routing (may be MS's MIN). Include if applicable and if TerminationList is not allowed.	O
[RoutingDigits]	Special routing instructions. Include if applicable and if not specified within the TerminationList parameter.	O
[Digits(Carrier)]	Called subscriber's PIC for use in intra-MSC, inter~~-LATA~~ exchange call routing. Include if applicable and if not specified within the TerminationList parameter.	O

4.17.3 Successful LocationRequest: Route to an MS on Another MSC

(*TIA/EIA-41-D* Chapter 3, page 3-77)

The omitted portions of this section are retained without modification.

b. The HLR determines that the call shall be routed to an MS on another MSC and returns this information to the Originating MSC in the `locreq`.

Parameters are as in Section 4.17.1, Step-b, with the exception that PSTNRoutingInfo is not included and with the following additions:

Parameters	Usage	Type
PC_SSN	Serving MSC PC_SSN. Include if SS7 carriage services are used.	O
IntersystemRoutingInfo:	Call routing information:	
[TerminationList]	Intersystem termination information. Include if TerminationList is allowed.	O
[Digits(Destination)]	Destination digits for use in inter-MSC call routing. Include if TerminationList is not allowed.	O
[RoutingDigits]	Special routing instructions. Include if applicable and if not specified within the TerminationList parameter.	O
[Digits(Carrier)]	Called subscriber's PIC for use in inter-MSC, inter~~-LATA~~ exchange call routing. Include if applicable and if not specified within the TerminationList parameter.	O

4.17.5 Successful LocationRequest: Route to Multiple Terminations

(*TIA/EIA-41-D* Chapter 3, page 3-79)

The omitted portions of this section are retained without modification.

b. The HLR determines that the call shall be routed to multiple terminations and returns this information to the Originating MSC in the `locreq`.

Parameters are as in Section 4.17.1, Step-b, with the exception that MSCID, PC_SSN, and PSTNRoutingInfo are not included and with the following additions:

Parameters	Usage	Type
MultipleRoutingInfo:	Call routing information:	
[TerminationList]	Multiple termination information.	R
[RoutingDigits]	Special routing instructions. Include if applicable and if not specified within the TerminationList parameter.	O
[Digits(Carrier)]	Called subscriber's PIC for use in inter-MSC, inter~~-LATA~~exchange call routing. Include if applicable and if not specified within the TerminationList parameter.	O

4. *TIA/EIA-41-D* Chapter 5 "Signaling Protocol" Modifications

5.1 ANSI SS7-BASED DATA TRANSFER SERVICES

(*TIA/EIA-41-D* Chapter 5, page 5-6)

The omitted portions of this section are retained without modification.

5.1.2 Signaling Connection Control Part

(*TIA/EIA-41-D* Chapter 5, page 5-8)

For *TIA/EIA-41* applications, the SCCP is defined in *ANSI T1.112*, with the following exceptions and limitations:

- SCCP Class 0 connectionless service is used.
- The message types are Unitdata (UDT) and Unitdata Service (UDTS). The SCCP shall return a UDTS message when a received UDT message cannot be delivered to the specified destination and has the *return message on error* option set.
- Whether to set the *return message on error* or *discard message on error* option in the Protocol Class parameter of the UDT message is at the discretion of the implementation.
- The *TIA/EIA-41* Mobile Application Part has assigned the following Subsystem Numbers (SSN). Use of the following SSN values ~~are~~ is recommended:
  - 5: Mobile Application Part (MAP)
  - 6: Home Location Register (HLR)
  - 7: Visitor Location Register (VLR)
  - 8: Mobile Switching Center (MSC)
  - 9: Equipment Identification Register (EIR) (reserved)[1]
  - 10: Authentication Center (AC)
  - 11: Short Message Service
- In accordance with *ANSI T1.112* an SSN shall be included in all messages even if message routing is based on Global Title Translation (GTT). The null SSN (i.e., value 0) should be used when the subsystem is not known (e.g., before a global title translation takes place) per *ANSI T1.112*.
- Global title addresses are required in the SCCP Called Party Address and the SCCP Calling Party Address for international roaming purposes.

[1] Detailed transactions relative to SSN value 9 are for further study.

- Global Title Translation on Mobile Identification Number can be used for communication with the HLR on the ANSI SS7 network.[1] The following encoding may be used:

Table 5.1.2a ANSI SS7 – MIN to HLR Global Title

Field	Sub-field	Value
Address Indicator	SSN Indicator	1
	Point Code Indicator	0 or 1
	Global Title Indicator	2 (0010_2)
	Routing Indicator	0
	National or International Indicator	1 (National use)
Subsystem Number		*Include applicable value if known or zero*
Global Title	Translation Type	3 (00000011_2) "Cellular Nationwide Roaming Service"
	Address Information	*MIN*

- ~~Global Title Translation on Mobile Identification Number can be used for communication with the HLR. Global Title Indicator type 2 (0010) is used. A translation type value of 3 is used for "MIN to HLR" translation. The global title address information field contains the 10 digit MIN[2]. The encoding scheme is BCD. Each address signal is coded as described in Section 3.4.2.3.1 of the *ANSI T1.112* specification.~~

[1] An administrative set of SS7 nodes that are interconnected by a common national signaling point code addressing scheme.

[2] ~~Dialed digits must be converted to a 10 digit MIN for the Location Request Task and Call Data Request Task when Global Title Translation communication with the HLR is used.~~

- Global Title Translation on Mobile Identification Number can be used for communication with a Message Center on the ANSI SS7 network. The following encoding can be used:

Table 5.1.2b ANSI SS7 – MIN to MC Global Title

Field	Sub-field	Value
Address Indicator	SSN Indicator	1
	Point Code Indicator	0 or 1
	Global Title Indicator	2 (0010_2)
	Routing Indicator	0
	National or International Indicator	1 (National use)
Subsystem Number		*Include applicable value if known or zero*
Global Title	Translation Type	12 (00001100_2) "Wireless MIN-Based Short Message Service"
	Address Information	*MIN*

- ~~Global Title Translation on Mobile Identification Number can be used for communication with a Message Center. Global Title Indicator type 2 (0010) is used. A translation type value of 12 is used for Short Message Service for "MIN to MC" translation. The encoding scheme is BCD. Each address signal is coded as described in Section 3.4.2.3.1 of the *ANSI T1.112* specification.~~

- Global Title Translation on IMSI (ITU-T E.212 International Mobile Subscriber Identity) can be used for communication from a Serving System (MSC or VLR) to an HLR on the same, or a different, national SS7 network using the IMSI of a roaming mobile. It may also be used for communication to any network element that is identified by an E.212 formatted address on the same, or a different national SS7 network. The following encoding can be used:

Table 5.1.2c ANSI SS7 – E.212 Global Title

Field	Sub-field	Value
Address Indicator	SSN Indicator	1
	Point Code Indicator	0 or 1
	Global Title Indicator	2 (0010_2)
	Routing Indicator	0
	National or International Indicator	1 (National use)
Subsystem Number		*Include applicable value if known or zero*
Global Title	Translation Type	9 (00001001_2) "National and International PCS Roaming"
	Address Information	*IMSI or other E.212 formatted address*

- Global Title Translation on an E.164 number (e.g. Mobile Directory Number) can be used for communication to an HLR on the same, or a different, national SS7 network based on the Mobile Directory Number. The following encoding can be used:

Table 5.1.2d ANSI SS7 – MDN to HLR (E.164) Global Title

Field	Sub-field	Value
Address Indicator	SSN Indicator	1
	Point Code Indicator	0 or 1
	Global Title Indicator	2 (0010_2)
	Routing Indicator	0
	National or International Indicator	1 (National use)
Subsystem Number		*Include applicable value if known or zero*
Global Title	Translation Type	14 (00001110_2) "Mobile Subscriber Addressing"
	Address Information	*E.164 Mobile Directory Number*

- Global Title Translation on IMSI can be used for communication from a Serving System (MSC or VLR) to a Message Center on the same, or a different, national SS7 network.[1] The following encoding may be used:

Table 5.1.2e ANSI SS7 – IMSI to MC Global Title

Field	Sub-field	Value
Address Indicator	SSN Indicator	1
	Point Code Indicator	0 or 1
	Global Title Indicator	2 (0010_2)
	Routing Indicator	0
	National or International Indicator	1 (National use)
Subsystem Number		*Include applicable value if known or zero*
Global Title	Translation Type	13 (00001101_2) "Wireless IMSI-based Short Message Service"
	Address Information	*IMSI*

- ~~Use of signaling point codes, global titles, and subsystem numbers must meet *ANSI T1.112* requirements; such that, any allowable combination of these addressing elements is supported. For example, as stated in *T1.112.3*, Section 3.4.1:~~

  ~~"The address consists of any one or any combination of the following elements:~~

  ~~1) signaling point code,~~

  ~~2) global title (MIN to HLR for *TIA/EIA-41*),~~

  ~~3) subsystem number,~~

  ~~where, the referenced address is either the called party address or the calling party address fields in SCCP messages."~~

- When an originating functional entity sends an SS7 message within a national SS7 signaling network with a global title in the SCCP called party address field, the SCCP calling party address field should include the point code and subsystem number of the originating functional entity. Note that a Signaling Transfer Point (STP) is considered to be an intermediate functional entity, not an originating functional entity.

- When an originating functional entity sends an SS7 message across a national SS7 signaling network boundary, the SCCP calling party address field should include an E.212 global title address identifying the originating functional entity to allow response messages (RETURN RESULT, RETURN ERROR, or REJECT) to be routed back to the originating node.

[1] No ITU-T Q.713 translation selector exists for IMSI to Message Center translation.

- Replies to messages shall use the received Calling Party Address as the Called Party Address, in accordance with *ANSI T1.112*. (As exceptions, if the PC_SSN parameter is received in an AuthenticationRequest INVOKE or in a RegistrationNotification INVOKE, the address used for the response may be derived from the received PC_SSN parameter provided the INVOKE was received from a functional entity within the same national SS7 signaling network.)

5.3 ITU-T SS7-BASED DATA TRANSFER SERVICES

(*TIA/EIA-41-D* Chapter 5, page 5-11)

The omitted portions of this section are retained without modification.

5.3.2 Signaling Connection Control Part

(*TIA/EIA-41-D* Chapter 5, page 5-11)

For *TIA/EIA-41* applications, the SCCP is defined in *ITU Q.711 - Q.714*, with the following exceptions and limitations:

- SCCP Class 0 connectionless service is used.
- The message types are Unitdata (UDT) and Unitdata Service (UDTS). The SCCP shall return a UDTS message when a received UDT message cannot be delivered to the specified destination and has the *return message on error* option set.

Note: Other message types may have to be supported for segmentation.

- Whether to set the *return message on error* or *discard message on error* option in the Protocol Class parameter of the UDT message is at the discretion of the implementation.
- Use of the following SSN values ~~are~~ is recommended:
  - 5: Mobile Application Part (MAP)
  - 6: Home Location Register (HLR)
  - 7: Visitor Location Register (VLR)
  - 8: Mobile Switching Center (MSC)
  - 9: Equipment Identification Register (EIR) (reserved)[1]
  - 10: Authentication Center (AC)
  - TBD:Short Message Service (SMS)
  - ~~11: Short Message Service~~
- In accordance with *ITU Q.713* an SSN is recommended to be included in all messages even if message routing is based on Global Title Translation (GTT). The null SSN (i.e., value 0) should be used when the subsystem is not known (e.g., before a global title translation takes place).

[1] Detailed transactions relative to SSN value 9 are for further study.

- Global title addressing is required on the SCCP Called Party Address and the SCCP Calling Party Address for international roaming purposes.
- Global Title Translation on Mobile Identification Number (MIN), for communication with an HLR or MC, is left to mutual agreement.
- Global Title Translation on International Mobile Subscriber Identity (IMSI) can be used for communication with the HLR on the same, or a different, national SS7 network. It may also be used for communication to any network element that is identified by an E.212 formatted address on the same, or a different national SS7 network. The following encoding can be used:

Table 5.3.2a ITU-T SS7 – E.212 Global Title

Field	Sub-field	Value
Address Indicator	Point Code Indicator (PCI)	0 or 1
	SSN Indicator (SSNI)	1
	Global Title Indicator (GTI)	4 (0100_2)
	Routing Indicator (RI)	0
	Reserved for national use	0 (international use) or 1 (national use)[1]
Subsystem Number		*Include applicable value if known or zero*
Global Title	Translation Type	0
	Encoding Scheme	1=odd number of digits, 2=even
	Numbering Plan	6 (0110_2)
	Nature of address indicator	4 (0000100_2)
	Address Information	*E.212 IMSI or other E.212 formatted address*

[1] The national/international indicator is intended to indicate the **"format"** of the encoding and not the national or international nature of the type of address. A national/international indicator = 0 means that both the address indicator and the address are encoded according to international specifications. A national/international indicator = 1 means that both the address indicator and the address are encoded according to national specifications.

- ~~Global Title Translation on Mobile Identification Number (MIN) or International Mobile Station Identifier (IMSI) can be used for communication with the HLR. Global Title Indicator type 4 (0100) is used. The following figure represents the Global title format for indicator 0100:~~

~~8~~	~~7~~	~~6~~	~~5~~	~~4~~	~~3~~	~~2~~	~~1~~	
~~Translation type~~								~~Octet 1~~
~~Numbering plan~~				~~Encoding scheme~~				~~Octet 2~~
~~Spare~~		~~Nature of address indicator~~						~~Octet 3~~
~~Address information~~								~~Octet 4 and further~~

  - ~~The global title address information field contains the 10 digit MIN[1].~~
  - ~~The encoding scheme is 1 for an uneven number of BCD Digits, and 2 for an even number of BCD Digits.~~
  - ~~The Nature of Address is 3 for National Significant Number and 4 for International Number.~~
  - ~~Each address signal is coded as described the *ITU Q.713* specification.~~
  - ~~Translation Type assignment is left to mutual agreements.~~
  - ~~Numbering Plan for Global Titles based on MIN is left to mutual agreements.~~

- Global Title Translation on Mobile Identification Number or International Mobile Station Identity can be used for communication with a Message Center based on mutual agreement.

~~[1]Dialed digits must be converted to a 10-digit MIN for the Location Request Task and Call Data Request Task when Global Title Translation communication with the HLR is used.~~

- Global Title Translation on Mobile Directory Number can be used for routing messages to an HLR connected to the same or different national signaling levels:

Table 5.3.2b ITU-T SS7 – E.164 Global Title

Field	Sub-field	Value
Address Indicator	Point Code Indicator (PCI)	0 or 1
	SSN Indicator (SSNI)	1
	Global Title Indicator (GTI)	4 (0100_2)
	Routing Indicator (RI)	0
	Reserved for national use	0 (international use) or 1 (national use)[1]
Subsystem Number		*Include applicable value if known or zero*
Global Title	Translation Type	0
	Encoding Scheme	1=odd number of digits, 2=even
	Numbering Plan	1 (0001_2)
	Nature of address indicator	4 (0000100_2)
	Address Information	*E.164 Mobile directory number*

- ~~Use of signaling point codes, global titles, and subsystem numbers must meet *ITU Q.713* requirements; such that, any allowable combination of these addressing elements is supported. For example, as stated in *ITU Q.713*:~~

  ~~"The address consists of one or any combination of the following elements:~~

  ~~1) signaling point code,~~

  ~~2) subsystem number,~~

  ~~3) global title (MIN to HLR for *TIA/EIA 41*)."~~

- When an originating functional entity sends an SS7 message within a national SS7 signaling network with a global title in the SCCP called party address field, the SCCP calling party address field should include the point code and subsystem number of the originating network entity.

- When an originating functional entity sends an SS7 message across a national SS7 signaling network boundary, the SCCP calling party address field should include an E.212 global title address identifying the originating functional entity

[1] The national/international indicator is intended to indicate the **"format"** of the encoding and not the national or international nature of the type of address. A national/international indicator = 0 means that both the address indicator and the address are encoded according to international specifications. A national/international indicator = 1 means that both the address indicator and the address are encoded according to national specifications.

to allow response messages (RETURN RESULT, RETURN ERROR, or REJECT) to be routed back to the originating node.

- Replies to messages shall use the received Calling Party Address as the Called Party Address. (As exceptions, if the PC_SSN parameter is received in an AuthenticationRequest INVOKE or in a RegistrationNotification INVOKE, the address used for the response may be derived from the received PC_SSN parameter provided the INVOKE was received from a functional entity within the same national SS7 signaling network.)

6.4.2.4 AuthenticationRequest

(*TIA/EIA-41-D* Chapter 5, page 5-34)

The AuthenticationRequest operation is used to request authentication of an authentication-capable MS.

The AuthenticationRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

Table 17 AuthenticationRequest INVOKE Parameters

AuthenticationRequest INVOKE Parameters				**Timer: ART**
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	6.3.2.1	
Length	variable octets	M	6.3.2.1	
Contents				
ElectronicSerialNumber		M	6.5.2.63	
MobileIdentificationNumber		M	6.5.2.81	
MSCID (Serving MSC)		M	6.5.2.82	
SystemAccessType		M	6.5.2.145	
SystemCapabilities (Serving)		M	6.5.2.146	
AuthenticationData		O	6.5.2.9	a
AuthenticationResponse		O	6.5.2.10	b
CallHistoryCount		O	6.5.2.18	b
ConfidentialityModes (Actual)		O	6.5.2.50	c
Digits (Dialed)		O	6.5.2.58	d
PC_SSN (Serving MSC or VLR or HLR)		O	6.5.2.93	e
RandomVariable		O	6.5.2.101	b
SenderIdentificationNumber		O	6.5.2.116	f
TerminalType		O	6.5.2.154	g

Notes:

a. Include if the SystemAccessType value is *Call Origination* and if the air interface encoding of dialed digits is not TBCD.

b. Include if the SystemAccessType value is *Call Origination*, *Page Response*, or *Registration* and the authentication parameters were requested (AUTH=1 in the Overhead Message Train) on the system access.

c. Include if the SystemAccessType value is *Flash Request* and if the SignalingMessageEncryptionKey parameter was provided to the Serving MSC.

d. Include if the SystemAccessType value is *Call Origination* or *Flash Request*.

e. Include to override lower layer addressing if the receiving VLR, HLR, or AC is known to be in the same national SS7 network. If included, it identifies the functional entity sending the message.

f. Include to identify the functional entity sending the message.

The remainder of this section is retained without modification.

6.4.2.13 FeatureRequest

(*TIA/EIA-41-D* Chapter 5, page 5-48)

> This operation was named RemoteFeatureControlRequest prior to this revision of the Interim Standard.

The FeatureRequest operation is used to request feature-related treatment on behalf of a registered MS.

The FeatureRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

Table 35 FeatureRequest INVOKE Parameters

FeatureRequest INVOKE Parameters				**Timer: FRRT**
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	6.3.2.1	
Length	variable octets	M	6.3.2.1	
Contents				
Digits (Dialed)		M	6.5.2.58	
ElectronicSerialNumber		M	6.5.2.63	
MobileIdentificationNumber		M	6.5.2.81	
BillingID (Originating)		O	6.5.2.16	a
CallingPartyNumberDigits1		O	6.5.2.21	b, k
CallingPartyNumberDigits2		O	6.5.2.22	b, k
CallingPartySubaddress		O	6.5.2.25	b
ConferenceCallingIndicator		O	6.5.2.49	c
MobileDirectoryNumber		O	6.5.2.80	d
MSCID (Serving)		O	6.5.2.82	e
MSCIdentificationNumber		O	6.5.2.83	~~b~~ j
OneTimeFeatureIndicator		O	6.5.2.88	f
PC_SSN		O	6.5.2.93	g
SenderIdentificationNumber		O	6.5.2.116	h
TransactionCapability		O	6.5.2.160	i

Notes:

a. Include for recording purposes or for call correlation (see *DMH)*.

b. Include if applicable.

c. Include to indicate the number of conferees already in the call.

d. Include if available for recording purposes (see *DMH)*.

e. Include to identify the Anchor MSC. (This may become the Originating MSC for subsequent call redirection.)

f. Include if any OneTimeFeatureIndicator parameter status bits are set (i.e., have value of *1*).

g. Include if SS7 may be used for subsequent call redirection.

h. Include if different from the MSCIdentificationNumber to identify the functional entity sending the message.

i. Include on *IS-41-C* or later.

j. Include on N.S0016-0 or later to identify the MSC sending the message. Do not include if N.S0016-0 is not supported by this entity.

k. Send only the National (Significant) Number (with Nature of Number set to *National*) if the E.164 country code of the caller's number matches the E.164 country code used for numbers from the MSC's Country's numbering plan.

The FeatureRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

Table 36 FeatureRequest RETURN RESULT Parameters

FeatureRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	6.3.2.2	
Length	variable octets	M	6.3.2.2	
Contents				
FeatureResult		M	6.5.2.67	
AccessDeniedReason		O	6.5.2.1	a
ActionCode		O	6.5.2.2	b
AnnouncementList		O	6.5.2.6	c
CallingPartyNumberString1		O	6.5.2.23	d
CallingPartyNumberString2		O	6.5.2.24	d
CallingPartySubaddress		O	6.5.2.25	d
CarrierDigits		O	6.5.2.28	d
ConferenceCallingIndicator		O	6.5.2.49	e
Digits (Dialed)		O	6.5.2.58	f
DMH_AccountCodeDigits		O	6.5.2.59	g
DMH_AlternateBillingDigits		O	6.5.2.60	g
DMH_BillingDigits		O	6.5.2.61	g
DMH_RedirectionIndicator		O	6.5.2.62	d
GroupInformation		O	6.5.2.69	h
MobileDirectoryNumber		O	6.5.2.80	g
NoAnswerTime		O	6.5.2.87	d
OneTimeFeatureIndicator		O	6.5.2.88	i
PACAIndicator		O	6.5.2.91	j
PilotNumber		O	6.5.2.95	h
RedirectingNumberDigits		O	6.5.2.107	d
RedirectingNumberString		O	6.5.2.108	d
RedirectingSubaddress		O	6.5.2.109	d
RoutingDigits		O	6.5.2.114	d
TerminationList		O	6.5.2.156	k
TerminationTriggers		O	6.5.2.159	d

Notes:

a. Include if access is denied. If included, no other optional parameters shall be included (with the exception of the AnnouncementList parameter).

b. Include if action to be performed is not implied through presence of other parameters.

c. Include if provision of one or more tones or announcements is required.

d. Include if applicable.

e. Include to direct that ongoing call be transformed into a Conference Call.

f. Include if digits remain to be analyzed by the MSC. Encode the Digits (Dialed) as *International* if:

- The digits being returned are the result of a stored translation of the termination address into a destination address (e.g., the expansion of an abbreviated dialing string), and
- the Serving MSC is known to be capable of accepting digits in International format (e.g., the MSCIdentificationNumber parameter was received).

g. Include if applicable and for recording purposes (see *DMH*).

h. Include for multileg calls.

i. Include if modification to normal feature processing is required for call in progress.

j. Include to indicate PACA priority level.

k. Include if call routing is required.

6.4.2.24 InterSystemPage

(*TIA/EIA-41-D* Chapter 5, page 5-71)

The omitted portions of this section are retained without modification.

Table 57 InterSystemPage INVOKE Parameters

InterSystemPage INVOKE Parameters				**Timer: ISPRT**
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	6.3.2.1	
Length	variable octets	M	6.3.2.1	
Contents				
BillingID (Originating)		M	6.5.2.16	
ElectronicSerialNumber		M	6.5.2.63	
MobileIdentificationNumber		M	6.5.2.81	
DMH_AccountCodeDigits		O	6.5.2.59	a
AlertCode		O	6.5.2.3	a
CallingPartyNumberString1		O	6.5.2.23	a
CallingPartyNumberString2		O	6.5.2.24	a
CallingPartySubaddress		O	6.5.2.25	a
CDMASlotCycleIndex		O	6.5.2.40	b
CDMAStationClassMark		O	6.5.2.41	c
DMH_AlternateBillingDigits		O	6.5.2.60	a
DMH_BillingDigits		O	6.5.2.61	a
ExtendedMSCID (Serving MSC)		O	6.5.2.64	d
ExtendedSystemMyTypeCode (Serving MSC)		O	6.5.2.65	e
LegInformation		O	6.5.2.75	f
LocationAreaID		O	6.5.2.77	f
MobileDirectoryNumber		O	6.5.2.80	a
MSCID (Originating MSC)		O	6.5.2.82	g
MSCIdentificationNumber (Originating MSC)		O	6.5.2.83	~~f~~ n
OneTimeFeatureIndicator		O	6.5.2.88	f
PageIndicator		O	6.5.2.92	h
PC_SSN (Originating MSC)		O	6.5.2.93	i
PilotBillingID		O	6.5.2.94	j
PilotNumber		O	6.5.2.95	k
RedirectingNumberString		O	6.5.2.108	a
RedirectingSubaddress		O	6.5.2.109	a
SenderIdentificationNumber (Serving MSC)		O	6.5.2.116	~~f~~ m
SystemMyTypeCode (Originating MSC)		O	6.5.2.147	l
TerminationTreatment		O	6.5.2.158	f
TerminationTriggers		O	6.5.2.159	a

Notes:

a. Include if available (i.e., provided in the associated RoutingRequest INVOKE).

b. Included when the Serving MSC knows that the MS is operating in CDMA Slotted Mode.

c. Include if a CDMA channel is in use.

d. Include to identify serving system.

e. Include to identify serving system manufacturer.

f. Include if known.

g. Include to identify originating system.

h. Include if request is to listen only. May include if request is to page.

i. Include if available for subsequent call redirection.

j. Include if appropriate.

k. Include on a multileg call.

l. Include to identify originating system manufacturer.

m. Include to identify the Serving MSC.

n. Include on N.S0016-0 or later to identify the originating system. Do not include if N.S0016-0 is not supported by this entity.

The InterSystemPage operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

Table 58 InterSystemPage RETURN RESULT Parameters

InterSystemPage RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	6.3.2.2	
Length	variable octets	M	6.3.2.2	
Contents				
AccessDeniedReason		O	6.5.2.1	a
BillingID (Terminating)		O	6.5.2.16	b, c
ConditionallyDeniedReason		O	6.5.2.48	d
Digits (Destination)		O	6.5.2.58	c
ExtendedMSCID (Border MSC)		O	6.5.2.64	c
ExtendedSystemMyTypeCode (Border MSC)		O	6.5.2.65	c
MSCIdentificationNumber		O	6.5.2.83	e
PC_SSN (Border MSC)		O	6.5.2.93	f

Notes:

a. Include if access may be denied.

b. Required for recording purposes (see *DMH)*.

c. If one parameter is present, they all must be present.

d. Include if Call Waiting is possible.

e. Include to identify the Border MSC.

f. ~~Include if Digits (Destination) parameter is provided, and SS7 is used.~~ Include if Digits (Destination) parameter is provided, SS7 is used, and the Originating MSC and the Border MSC may be in the same national SS7 network.

6.4.2.27 LocationRequest

(*TIA/EIA-41-D* Chapter 5, page 5-77)

The LocationRequest operation is used by an Originating MSC to obtain call treatment instructions from the HLR. The call is identified by the dialed MS address digits received by the Originating MSC.

The LocationRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

Table 63 LocationRequest INVOKE Parameters

LocationRequest INVOKE Parameters				**Timer: LRT**
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	6.3.2.1	
Length	variable octets	M	6.3.2.1	
Contents				
BillingID (Originating)		M	6.5.2.16	
Digits (Dialed)		M	6.5.2.58	
MSCID (Originating)		M	6.5.2.82	
SystemMyTypeCode (Originating)		M	6.5.2.147	
CallingPartyNumberDigits1		O	6.5.2.21	a, f
CallingPartyNumberDigits2		O	6.5.2.22	a, f
CallingPartySubaddress		O	6.5.2.25	a
MSCIdentificationNumber		O	6.5.2.83	b
PC_SSN (Originating)		O	6.5.2.93	c
RedirectingNumberDigits		O	6.5.2.107	a
RedirectingSubaddress		O	6.5.2.109	a
TerminationAccessType		O	6.5.2.155	d
TransactionCapability		O	6.5.2.160	e

Notes:

a. Include if available (i.e., provided in call origination).

b. Include on N.S0016-0 or later to identify the MSC sending the message. Do not include if N.S0016-0 is not supported by this entity.

c. Include if SS7 may be used for subsequent call redirection.

d. Include if call involves a special access situation (e.g., *Roamer port access*).

e. Include on *IS-41-C* or later.

f. Send only the National (Significant) Number (with Nature of Number set to *National*) if the E.164 country code of the caller's number matches the E.164 country code used for numbers from the MSC's Country's numbering plan. This consideration only applies for MS to MS calls recognized as such by the MSC serving the calling MS.

The LocationRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

Table 64 LocationRequest RETURN RESULT Parameters

LocationRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	6.3.2.2	
Length	variable octets	M	6.3.2.2	
Contents				
ElectronicSerialNumber		M	6.5.2.63	a
MobileIdentificationNumber		M	6.5.2.81	a
MSCID (Serving MSC)		M	6.5.2.82	b
AccessDeniedReason		O	6.5.2.1	c
AnnouncementList		O	6.5.2.6	d
CallingPartyNumberString1		O	6.5.2.23	e
CallingPartyNumberString2		O	6.5.2.24	e
Digits (Carrier)		O	6.5.2.58	f
Digits (Destination)		O	6.5.2.58	g, h, p
DMH_AccountCodeDigits		O	6.5.2.59	i
DMH_AlternateBillingDigits		O	6.5.2.60	i
DMH_BillingDigits		O	6.5.2.61	i
DMH_RedirectionIndicator		O	6.5.2.62	j
GroupInformation		O	6.5.2.69	k
MobileDirectoryNumber		O	6.5.2.80	i
NoAnswerTime		O	6.5.2.87	l
OneTimeFeatureIndicator		O	6.5.2.88	m
PC_SSN (Serving MSC or VLR)		O	6.5.2.93	n
RedirectingNumberDigits		O	6.5.2.107	j
RedirectingNumberString		O	6.5.2.108	f
RedirectingSubaddress		O	6.5.2.109	e, j
RoutingDigits		O	6.5.2.114	f
TerminationList		O	6.5.2.156	o
TerminationTriggers		O	6.5.2.159	f

Notes:

a. Value is all zeroes, if unknown.

b. Value is MSCID (Originating), if access is denied or routing to a directory number.

c. Include if access may be denied.

d. Include if one or more tones or announcements is to be applied to the MS.

e. Include if feature is active and if a LocalTermination parameter is included within the TerminationList parameter.

f. Include if applicable.

g. Include if call is to be routed over a network.

h. Use only with system not capable of using the TerminationList parameter.

i. Include if available for recording purposes (see *DMH)*.

j. Include if available and call redirection may apply.

k. Include for multileg calls.

l. Include to request an override of the Originating MSC's default *No Answer Time* value.

m. Include if modification to normal feature processing is required for a call in progress.

n. Use is for further study.

o. Include if call routing is required.

p. For N.S0016-0 or later, encode the Digits (Destination) as *International* if it is known that the Originating MSC can accept the digits in this format (e.g., the MSCIdentificationNumber parameter was received in the INVOKE) and an HLR stored number is being provided.

6.4.2.30 OriginationRequest

(*TIA/EIA-41-D* Chapter 5, page 5-81)

The OriginationRequest operation is used to request call origination treatment on behalf of a registered MS.

The OriginationRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

Table 68 OriginationRequest INVOKE Parameters

OriginationRequest INVOKE Parameters				**Timer: ORT**
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	6.3.2.1	
Length	variable octets	M	6.3.2.1	
Contents				
BillingID (originating)		M	6.5.2.16	
Digits (Dialed)		M	6.5.2.58	
ElectronicSerialNumber		M	6.5.2.63	
MobileIdentificationNumber		M	6.5.2.81	
MSCID (Originating MSC)		M	6.5.2.82	
OriginationTriggers		M	6.5.2.90	
TransactionCapability		M	6.5.2.160	
CallingPartyNumberDigits1		O	6.5.2.21	a, g
CallingPartyNumberDigits2		O	6.5.2.22	a, g
CallingPartySubaddress		O	6.5.2.25	a
MobileDirectoryNumber		O	6.5.2.80	b
MSCIdentificationNumber		O	6.5.2.83	c
OneTimeFeatureIndicator		O	6.5.2.88	d
PC_SSN (Originating MSC)		O	6.5.2.93	e
SenderIdentificationNumber		O	6.5.2.116	f

Notes:

a. Include if applicable.

b. Include if available for recording purposes (see *DMH)*.

c. Include on N.S0016-0 or later to identify the MSC initiating the message. Do not include if N.S0016-0 is not supported by this entity.

d. Include if any OneTimeFeatureIndicator status bits are set (i.e., have value of *1*).

e. Include if SS7 may be used for subsequent call redirection.

f. Include ~~to identify intermediate message sender~~ if different from the MSCIdentificationNumber to identify the functional entity sending the message.

g. Send only the National (Significant) Number (with Nature of Number set to *National*) if the E.164 country code of the caller's number matches the E.164 country code used for numbers from the MSC's Country's numbering plan.

The OriginationRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

Table 69 OriginationRequest RETURN RESULT Parameters

OriginationRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	6.3.2.2	
Length	variable octets	M	6.3.2.2	
Contents				
AccessDeniedReason		O	6.5.2.1	a
ActionCode		O	6.5.2.2	b
AnnouncementList		O	6.5.2.6	c
CallingPartyNumberString1		O	6.5.2.23	d, e
CallingPartyNumberString2		O	6.5.2.24	d, e
CallingPartySubaddress		O	6.5.2.25	d, e, f
CarrierDigits		O	6.5.2.28	g
Digits (Dialed)		O	6.5.2.58	h
DMH_AccountCodeDigits		O	6.5.2.59	i
DMH_AlternateBillingDigits		O	6.5.2.60	i
DMH_BillingDigits		O	6.5.2.61	i
DMH_RedirectionIndicator		O	6.5.2.62	i, j
GroupInformation		O	6.5.2.69	k
MobileDirectoryNumber		O	6.5.2.80	i
NoAnswerTime		O	6.5.2.87	l
OneTimeFeatureIndicator		O	6.5.2.88	m
PilotNumber		O	6.5.2.95	k
RedirectingNumberDigits		O	6.5.2.107	f
RedirectingNumberString		O	6.5.2.108	d
RedirectingSubaddress		O	6.5.2.109	d, e
RoutingDigits		O	6.5.2.114	g
TerminationList		O	6.5.2.156	n
TerminationTriggers		O	6.5.2.57	o

Notes:

a. Include if access is denied. If included, no other optional parameters shall be included (with the exception of the AnnouncementList parameter).

b. Include if action to be performed is not implied through presence of other parameters.

c. Include if one or more tones or announcements are to be applied to the MS.

d. Include if a LocalTermination parameter is included in the TerminationList parameter.

e. Include if the related feature is active.

f. Include if a PSTNTermination parameter or an IntersystemTermination parameter is included within the TerminationList parameter.

g. Include if applicable.

h. Include if digits remain to be translated by the MSC. Encode the Digits (Dialed) as *International* if:

- The digits being returned are the result of a stored translation of the termination address into a destination address (e.g., the expansion of an abbreviated dialing string),and
- the Serving MSC is known to be capable of accepting digits in International format (e.g., the MSCIdentificationNumber parameter was received).

i. Include if available for recording purposes (see *DMH*).

j. Include if redirection may apply.

k. Include for multileg calls.

l. Include to request an override of the Serving MSC's default *No Answer Time* value.

m. Include if modification to normal feature processing is required for the call in progress.

n. Include if call routing is required.

o. Include to indicate processing in the Originating MSC for failed call attempts.

6.4.2.31 QualificationDirective

(*TIA/EIA-41-D* Chapter 5, page 5-84)

The QualificationDirective operation is used to update the authorization information, profile information, or both, previously obtained for an MS.

The QualificationDirective operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

Table 70 QualificationDirective INVOKE Parameters

QualificationDirective INVOKE Parameters				**Timer: QDT**
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	6.3.2.1	
Length	variable octets	M	6.3.2.1	
Contents				
ElectronicSerialNumber		M	6.5.2.63	
MobileIdentificationNumber		M	6.5.2.81	
QualificationInformationCode		M	6.5.2.99	
SystemMyTypeCode (HLR or VLR)		M	6.5.2.147	
AuthorizationDenied		O	6.5.2.13	a
AuthorizationPeriod		O	6.5.2.14	b
DeniedAuthorizationPeriod		O	6.5.2.53	c
Digits (Carrier)		O	6.5.2.58	d, e
Digits (Destination)		O	6.5.2.58	d, f, j
LocationAreaID		O	6.5.2.77	g
Profile **Macro**		O	6.5.2.97	h, k
SenderIdentificationNumber		O	6.5.2.116	i

Notes:

a. If included, no other optional parameters except the DeniedAuthorizationPeriod parameter shall be present.

b. Include if validation is being updated.

c. May be included if the AuthorizationDenied parameter is present to indicate the interval before re-authorization may be attempted.

d. Use only on systems not capable of supporting the TransactionCapability parameter.

e. Include if profile is being updated and preferred carrier is applicable.

f. Include if profile is being updated and originations are restricted (e.g., set to NPA-NXX to restrict originations to a 6-digit NANP office code or set to NPA-NXX-XXXX to restrict originations to a single NANP directory number).

g. May be included from VLR to MSC-V. Usage from the HLR is not defined.

h. Include applicable parameter(s) (see 6.5.2.97).

i. Include to identify the functional entity sending the message.

j. For N.S0016-0 or later, encode the Digits (Destination) as *International* if it is known that the Serving MSC can accept the digits in this format (e.g., the MSCIdentificationNumber parameter was received during registration).

k. For N.S0016-0 or later, the DMH_BillingDigits, MobileDirectoryNumber and RestrictionDigits parameters should be encoded as *International* when loaded into the profile if it is known that the Serving MSC can accept them in this format (e.g., the MSCIdentificationNumber parameter was received during registration).

The remainder of this section is retained without modification.

6.4.2.32 QualificationRequest

(*TIA/EIA-41-D* Chapter 5, page 5-86)

The QualificationRequest operation is used (a) to request validation of an MS, (b) to request an MS's profile information, or (c) both.

The QualificationRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

Table 72 QualificationRequest INVOKE Parameters

QualificationRequest INVOKE Parameters				**Timer: QRT**
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	6.3.2.1	
Length	variable octets	M	6.3.2.1	
Contents				
ElectronicSerialNumber		M	6.5.2.63	
MobileIdentificationNumber		M	6.5.2.81	
QualificationInformationCode		M	6.5.2.99	
SystemMyTypeCode (MSC or VLR)		M	6.5.2.147	
MSCID (Serving MSC or Originating MSC)		O	6.5.2.82	a
MSCIdentificationNumber		O	6.5.2.83	c
SenderIdentificationNumber		O	6.5.2.116	b
SystemAccessType		O	6.5.2.145	a
TransactionCapability		O	6.5.2.160	a

Notes:

a. Should be included on *IS-41-C* or later.

b. Include to identify the functional entity sending the message.

c. Include on N.S0016-0 or later to identify the MSC sending the message. Do not include if N.S0016-0 is not supported by this entity.

The QualificationRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

Table 73 QualificationRequest RETURN RESULT Parameters

QualificationRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	6.3.2.2	
Length	variable octets	M	6.3.2.2	
Contents				
SystemMyTypeCode (VLR or HLR)		M	6.5.2.147	
AuthorizationDenied		O	6.5.2.13	a
AuthorizationPeriod		O	6.5.2.14	b
DeniedAuthorizationPeriod		O	6.5.2.53	c
Digits (Carrier)		O	6.5.2.58	d
Digits (Destination)		O	6.5.2.58	e, h
MSCID (HLR)		O	6.5.2.82	f
Profile **Macro**		O	6.5.2.97	g, i

Notes:

a. If included, no other optional parameters except the DeniedAuthorizationPeriod parameter shall be present.

b. Include if validation requested.

c. May be included if the AuthorizationDenied parameter is present to indicate the interval before re-authorization may be attempted.

d. Include if profile requested and preferred carrier is applicable and TransactionCapability parameter is not received.

e. Include if profile requested and originations are restricted to NPA-NXX or NPA-NXX-XXXX and TransactionCapability parameter is not received.

f. Include on *IS-41-C* and later and authorization is not denied.

g. Include applicable parameter(s) (see 6.5.2.97).

h. For N.S0016-0 or later, encode the Digits (Destination) as *International* if it is known that the Serving MSC can accept the digits in this format (e.g., the MSCIdentificationNumber parameter was received in the INVOKE).

i. For N.S0016-0 or later, the DMH BillingDigits, MobileDirectoryNumber and RestrictionDigits parameters should be encoded as *International* when loaded into the profile if it is known that the Serving MSC can accept them in this format (e.g., the MSCIdentificationNumber parameter was received in the INVOKE).

6.4.2.33 RedirectionDirective

(*TIA/EIA-41-D* Chapter 5, page 5-89)

The RedirectionDirective operation is used during feature processing to direct the MSC to forward the indicated call.

The RedirectionDirective operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

Table 76 RedirectionDirective INVOKE Parameters

RedirectionDirective INVOKE Parameters				**Timer: RDT**
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	6.3.2.1	
Length	variable octets	M	6.3.2.1	
Contents				
BillingID (Originating)		M	6.5.2.16	
Digits (Destination)		M	6.5.2.58	
ElectronicSerialNumber		M	6.5.2.63	
MobileIdentificationNumber		M	6.5.2.81	
SystemMyTypeCode (MSC)		M	6.5.2.147	
Digits (Carrier)		O	6.5.2.58	a
DMH_AccountCodeDigits		O	6.5.2.59	b
DMH_AlternateBillingDigits		O	6.5.2.60	b
DMH_BillingDigits		O	6.5.2.61	b
MSCIdentificationNumber		O	6.5.2.83	c
RedirectingNumberString		O	6.5.2.108	d
RedirectingSubaddress		O	6.5.2.109	d
SenderIdentificationNumber		O	6.5.2.116	e

Notes:

a. Include if applicable.

b. Include if available for recording purposes (see *DMH*).

c. Include on N.S0016-0 or later to identify ~~the initiating~~ MSC initiating the message. Do not include if N.S0016-0 is not supported by this entity.

d. Optionally, include to override normal Originating MSC redirection number treatment.

e. Include ~~if the sending functional entity's identification number is not equal to the initiating MSC's identification number~~ if different from the MSCIdentificationNumber to identify the functional entity sending the message.

The remainder of this section is retained without modification.

6.4.2.37 RegistrationNotification

(*TIA/EIA-41-D* Chapter 5, page 5-94)

The RegistrationNotification operation is used to report the location of an MS and, optionally, to (a) validate the MS or (b) validate the MS and obtain its profile information.

The RegistrationNotification operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

Table 82 RegistrationNotification INVOKE Parameters

RegistrationNotification INVOKE Parameters				Timer: RNT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	6.3.2.1	
Length	variable octets	M	6.3.2.1	
Contents				
ElectronicSerialNumber		M	6.5.2.63	
MobileIdentificationNumber		M	6.5.2.81	
MSCID (Serving MSC)		M	6.5.2.82	
QualificationInformationCode		M	6.5.2.99	
SystemMyTypeCode (Serving MSC or VLR)		M	6.5.2.147	
AvailabilityType		O	6.5.2.15	a
BorderCellAccess		O	6.5.2.17	b
ControlChannelData		O	6.5.2.51	b
ExtendedMSCID (VLR)		O	6.5.2.64	c
LocationAreaID		O	6.5.2.77	d
MSCIdentificationNumber (Serving MSC)		O	6.5.2.83	l
PC_SSN (Serving MSC or VLR)		O	6.5.2.93	e
ReceivedSignalQuality		O	6.5.2.106	b
ReportType		O	6.5.2.112	f
SenderIdentificationNumber		O	6.5.2.116	g
SMS_Address		O	6.5.2.123	h
SMS_MessageWaitingIndicator		O	6.5.2.129	i
SystemAccessData		O	6.5.2.144	b
SystemAccessType		O	6.5.2.145	j
SystemCapabilities		O	6.5.2.146	k
TerminalType		O	6.5.2.154	j
TransactionCapability		O	6.5.2.160	j

Notes:

a. Include when MS is predictably unavailable for Call Delivery (e.g., slotted mode or sleep mode).

b. Include if access occurred in a border cell (based on internal algorithms).

c. Included by VLR if its MSCID is different than the MSC's MSCID.

d. May be included from MSC to VLR.

e. Include to override lower layer addressing if the receiving VLR or HLR is known to be in the same national SS7 network.

f. Include if authentication parameters were requested by the Serving MSC (AUTH=1 in the Overhead Message Train) but were not received from the MS for the system access.

g. Include to identify message sender.

h. Include to indicate that the Serving MSC supports Short Message Service.

i. Include if the MS was previously registered with this VLR, the MS is registering to a new serving MSC that does not support SMS, and an SMS message is pending delivery in the previous serving system. This is only used between a VLR and an HLR.

j. Include on *IS-41-C* and later.

k. Include if the system is authentication capable (including voice channel authentication only systems where all flags are zero).

l. Include on N.S0016-0 or later to identify the MSC sending the message. Do not include if N.S0016-0 is not supported by this entity.

The RegistrationNotification operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

Table 83 RegistrationNotification RETURN RESULT Parameters

RegistrationNotification RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	6.3.2.2	
Length	variable octets	M	6.3.2.2	
Contents				
SystemMyTypeCode (VLR or HLR)		M	6.5.2.147	
AuthorizationDenied		O	6.5.2.13	a
AuthorizationPeriod		O	6.5.2.14	b
ControlChannelData		O	6.5.2.51	c
DeniedAuthorizationPeriod		O	6.5.2.53	d
Digits (Carrier)		O	6.5.2.58	e
Digits (Destination)		O	6.5.2.58	f, k
MSCID (HLR)		O	6.5.2.82	g
Profile **Macro**		O	6.5.2.97	h, l
ReceivedSignalQuality		O	6.5.2.106	c
SenderIdentificationNumber		O	6.5.2.116	i
SMS_MessageWaitingIndicator		O	6.5.2.129	j
SystemAccessData		O	6.5.2.144	c

Notes:

a. If included, only the ControlChannelData, DeniedAuthorizationPeriod, ReceivedSignalQuality, and SystemAccessData optional parameters have significance.

b. Include if validation requested.

c. Include if AuthorizationDenied parameter is included with value of *Multiple Access*.

d. May be included if the AuthorizationDenied parameter is present to indicate the interval before re-authorization may be attempted.

e. Include if the profile is requested, the preferred carrier is applicable, and the CarrierDigits parameter is not included in the Profile macro.

f. Include if the profile is requested, originations are restricted to NPA-NXX or NPA-NXX-XXXX, and the RestrictionDigits parameter is not included in the Profile macro.

g. Include on *IS-41-C* and later and authorization is not denied.

h. Include applicable parameter(s) (see 6.5.2.97).

i. Include to identify the functional entity sending the message.

j. Include to indicate that an SMS message is pending delivery.

k. For N.S0016-0 or later, encode the Digits (Destination) as *International* if it is known that the Serving MSC can accept the digits in this format (e.g., the MSCIdentificationNumber parameter was received in the INVOKE).

l. For N.S0016-0 or later, the DMH_BillingDigits, MobileDirectoryNumber and RestrictionDigits parameters should be encoded as *International* when loaded into the profile if it is known that the Serving MSC can accept them in this format (e.g., the MSCIdentificationNumber parameter was received in the INVOKE).

6.4.2.46 TransferToNumberRequest

(*TIA/EIA-41-D* Chapter 5, page 5-110)

The TransferToNumberRequest operation is used during feature processing to obtain an MS's forward-to number from the HLR.

The TransferToNumberRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

Table 100 TransferToNumberRequest INVOKE Parameters

TransferToNumberRequest INVOKE Parameters				**Timer: TTNRT**
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	6.3.2.1	
Length	variable octets	M	6.3.2.1	
Contents				
ElectronicSerialNumber		M	6.5.2.63	
MobileIdentificationNumber		M	6.5.2.81	
RedirectionReason		M	6.5.2.110	
SystemMyTypeCode (MSC)		M	6.5.2.147	
BillingID (Originating)		O	6.5.2.16	a
GroupInformation		O	6.5.2.69	b
LegInformation		O	6.5.2.75	c
MSCID (Originating)		O	6.5.2.82	d
MSCIdentificationNumber		O	6.5.2.83	~~e~~ g
PilotBillingID		O	6.5.2.94	f
PilotNumber		O	6.5.2.95	f
TransactionCapability		O	6.5.2.160	e

Notes:

a. Include to identify the Originating MSC and its BillingID for subsequent call redirection.

b. Include if available (i.e., if provided in the associated RoutingRequest INVOKE or LocationRequest RETURN RESULT) for the *None Reachable* termination trigger.

c. Include if available (i.e., if provided in the associated RoutingRequest INVOKE or LocationRequest RETURN RESULT) for any termination trigger except *None Reachable*.

d. Include on *TIA/EIA-41* or later.

e. Include on *IS-41-C* or later.

f. Include if available.

g. Include on N.S0016-0 or later to identify the MSC initiating the message. Do not include if N.S0016-0 is not supported by this entity.

The TransferToNumberRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

Table 101 TransferToNumberRequest RETURN RESULT Parameters

TransferToNumberRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	6.3.2.2	
Length	variable octets	M	6.3.2.2	
Contents				
Digits (Destination)		M	6.5.2.58	a, k
AccessDeniedReason		O	6.5.2.1	b
ActionCode		O	6.5.2.2	c
AnnouncementList		O	6.5.2.6	d
CallingPartyNumberString1		O	6.5.2.23	e
CallingPartyNumberString2		O	6.5.2.24	e
CallingPartySubaddress		O	6.5.2.25	e, f
Digits (Carrier)		O	6.5.2.58	g
DMH_AccountCodeDigits		O	6.5.2.59	h
DMH_AlternateBillingDigits		O	6.5.2.60	h
DMH_BillingDigits		O	6.5.2.61	h
DMH_RedirectionIndicator		O	6.5.2.62	h
GroupInformation		O	6.5.2.69	i
MobileDirectoryNumber		O	6.5.2.80	h
NoAnswerTime		O	6.5.2.87	g
RedirectingNumberDigits		O	6.5.2.107	f
RedirectingNumberString		O	6.5.2.108	e
RedirectingSubaddress		O	6.5.2.109	e, f
TerminationList		O	6.5.2.156	j
TerminationTriggers		O	6.5.2.159	g

Notes:

a. This parameter is ignored if the TerminationList parameter is provided.

b. Include if access is denied. If included, no other optional parameters shall be included (with the exception of the AnnouncementList).

c. Include if action to be performed is not implied through presence of other parameters.

d. Include if one or more tones or announcements are to be applied to the MS.

e. Include if related feature is active and if a LocalTermination parameter is included within the TerminationList parameter.

f. Optionally include if a PSTNTermination parameter or an IntersystemTermination parameter is included within the TerminationList parameter.

g. Include if applicable.

h. Include if available for recording purposes (see *DMH*).

i. Include for multileg calls.

j. Include if call routing is required.

k. For N.S0016-0 or later, encode the Digits (Destination) as *International* if it is known that the requesting MSC can accept the digits in this format (e.g., the MSCIdentificationNumber parameter was received in the INVOKE) and an HLR stored number is being provided.

6.5.2.5 AnnouncementCode

(*TIA/EIA-41-D* Chapter 5, page 5-133)

The omitted portions of this section are retained without modification.

Table 117 AnnouncementCode value

Tone (octet 1)

Bits	H	G	F	E	D	C	B	A	Value	Meaning
	0	0	0	0	0	0	0	0	0	**DialTone**. A continuous 350 Hz tone added to a 440 Hz tone.
	0	0	0	0	0	0	0	1	1	**RingBack** or **AudibleAlerting**. A 440 Hz tone added to a 480 Hz tone repeated in a 2s on 4s off pattern.
	0	0	0	0	0	0	1	0	2	**InterceptTone** or **MobileReorder**. Alternating 440 Hz and 620 Hz tones, each on for 250 ms.
	0	0	0	0	0	0	1	1	3	**CongestionTone** or **ReorderTone**. A 480 Hz tone added to a 620 Hz tone repeated in a 250 ms on, 250 ms off cycle.
	0	0	0	0	0	1	0	0	4	**BusyTone**. A 480 Hz tone added to a 620 Hz tone repeated in a 500 ms on, 500 ms off cycle.
	0	0	0	0	0	1	0	1	5	**ConfirmationTone**. A 350 Hz tone added to a 440 Hz tone repeated 3 times in a 100 ms on, 100 ms off cycle.
	0	0	0	0	0	1	1	0	6	**AnswerTone**. Answer tone is not presently used in many ~~North American~~ networks. Answer tone is not presently used in North American networks.

The remainder of this section is retained without modification.

6.5.2.58 Digits

(*TIA/EIA-41-D* Chapter 5, page 5-189)

The Digits parameter is based on the Digits parameter defined in Section 3 of *ANSI T1.114-1988*. Where there are differences, this Standard takes precedence.

Field	Value	Type	Reference	Notes
Identifier	Digits IMPLICIT DigitsType	M	6.5.1.2	a
Length	variable octets	M	6.5.1.1	

Contents

H	G	F	E	D	C	B	A	octet	Notes
Type of Digits								1	b
Nature of Number								2	c
Numbering Plan				Encoding				3	d, e
Number of Digits								4	f
2nd BCD Digit				1st BCD Digit				5	
4th BCD Digit				3rd BCD Digit				6	
• • •				• • •				• • •	
*n*th BCD Digit				*n*-1st BCD Digit				*m*	

Figure 66 Digits parameter for BCD digits

Notes for all Digits parameter variants:

a. Refer to the DigitsType parameter type (see 6.5.3.2) for notes and field encoding.

d. The Numbering Plan field is set to *Telephony Numbering*.

e. The Encoding field is set to *BCD*.

Notes for the Digits (Dialed) ~~as the dialed number~~ variant:

b. The Type of Digits field is set to *Dialed Number*. ~~The digits are the digits dialed by an MS with an unknown Nature of Number (or Numbering Plan).~~

c. The Nature of Number field is *National* or *International* ~~ignored on receipt~~.

f. The Number of Digits is between 0 and 32.

~~Notes for the Digits (Dialed) as the called number variant:~~

~~b. The Type of Digits field is set to *Dialed Number*. The digits should be a directory number assigned to a MS or for other specialized purposes.~~

~~c. The Nature of Number field is *National*.~~

~~f. The Number of Digits is set appropriately. 10 for a North American Numbering Plan number, although this may vary by country or by bilateral agreement.~~

Notes for the Digits (Carrier) variant:

b. The Type of Digits field is set to *Carrier*.

c. The Nature of Number field is *National* ~~or *International*~~.

Notes for the Digits (Destination) as a profile restriction variant:

b. The Type of Digits field is set to *Destination Number*. The digits specify ~~a~~ the national leading digits of the directory number (e.g., 6-digit NANP office code) or the leading digits of an international E.164 number or a full directory number (e.g., 10-digit NANP directory number) or a full international E.164 number used to restrict the numbers dialed by an MS as indicated by the OriginationIndicator parameter.

c. The Nature of Number field is set to *National* or to *International* as appropriate.

f. The Number of Digits is set appropriately (e.g. either 6 or 10 for NANP).

Notes for the Digits (Destination) as a network destination variant:

b. The Type of Digits field is set to *Destination Number*. The digits specify a telephone network destination address.

c. The Nature of Number field is set as necessary:

i. for a destination within the same country (or multi-country integrated numbering plan) the digits may consist of a national number without prefix digits. The Nature of Number field is set to *National*.

ii. otherwise, the digits should consist of a full E.164 number, including country code. The Nature of Number field is set to *International*.

~~i. from NANP countries to destinations within NANP, the digits should consist of 10 digits without prefix digits. The Nature of Number field is set to *National*.~~

~~ii. from non NANP countries to destinations within NANP, the Nature of Number field is set to *International*.~~

~~iii. for destinations within the same country outside of NANP, the digits should consist of a national number without prefix digits. The Nature of Number field is set to *National*.~~

~~iv. for destinations between countries outside of NANP, the digits shall consist of a country code followed by a national number without prefix digits. The Nature of Number field is set to *International*.~~

~~v. for destinations between different systems (even within the same country), the digits may consist of a country code followed by a national number without prefix digits. The Nature of Number field is set to *International*.~~

~~vi. from NANP countries to destinations outside of NANP, the digits may consist of a country code followed by a national number without prefix digits. The Nature of Number field is set to *International*.~~

f. The Number of Digits is between 0 and at least 15.

6.5.2.76 Local Termination

(*TIA/EIA-41-D* Chapter 5, page 5-208)

The LocalTermination (LOCTERM) parameter is used to provide an MSC with routing information for calls which are to be terminated on the same MSC.

Field	Value	Type	Reference	Notes
Identifier	LocalTermination IMPLICIT SET	M	6.5.1.2	
Length	variable	M	6.5.1.1	
Contents				
ElectronicSerialNumber		M	6.5.2.63	
MobileIdentificationNumber		M	6.5.2.81	
TerminationTreatment		M	6.5.2.158	
AlertCode		O	6.5.2.3	a, b
CarrierDigits		O	6.5.2.28	b, c
DestinationDigits		O	6.5.2.56	d, e
LegInformation		O	6.5.2.75	a
MobileDirectoryNumber		O	6.5.2.80	b, f
OneTimeFeatureIndicator		O	6.5.2.88	b, g
RoutingDigits		O	6.5.2.114	b, h
TerminationTriggers		O	6.5.2.159	a, b
VoiceMailboxPIN		O	6.5.2.165	i
VoiceMailboxNumber		O	6.5.2.164	j
• • •				k

Figure 84 LocalTermination parameter

Notes:

a. Optional, if the TerminationTreatment indicates termination to an MS.

b. This parameter has precedence for this call leg over the parameters outside the TerminationList parameter or the subscriber's profile.

c. Optional, for ~~intra-MSC, inter-LATA~~ preferred carrier call routing.

d. Optionally include if TerminationTreatment parameter value is *Dialogue*, to select a dialogue or to provide information to a dialogue.

e. Optionally include if TerminationTreatment parameter value is *VoiceMailRetrieval* or *VoiceMailStorage* to select the voice mail system.

f. Include to identify the MS if different than MIN for call recording purposes.

g. Include if modification to normal feature processing is required.

h. Optional, for special routing purposes.

i. Optional, if the TerminationTreatment value is *VoiceMailRetrieval* or *VoiceMailStorage*.

j. Include if the TerminationTreatment value is *VoiceMailRetrieval* or *VoiceMailStorage* and the mailbox is not the MIN.

k. Ignore unexpected parameters, if received.

6.5.2.83 MSCIdentificationNumber

(*TIA/EIA-41-D* Chapter 5, page 5-215)

The MSCIdentificationNumber (MSCIN) parameter indicates the identification number of an MSC sending a message.

Field	Value	Type	Reference	Notes
Identifier	MSCIdentificationNumber IMPLICIT DigitsType	M	6.5.1.2	a
Length	variable octets	M	6.5.1.1	

Contents

H	G	F	E	D	C	B	A	octet	Notes
Type of Digits								1	b
Nature of Number								2	c
Numbering Plan				Encoding				3	d, e
Number of Digits								4	f
2nd BCD Digit				1st BCD Digit				5	
4th BCD Digit				3rd BCD Digit				6	
• • •				• • •				• • •	
*n*th BCD Digit				*n*-1st BCD Digit				*m*	

Figure 91 MSCIdentificationNumber parameter for BCD digits

Notes:

a. Refer to the DigitsType parameter type (see 6.5.3.2) for notes and field encoding.

b. Set to *Not Used*. The Type of Digits field is ignored on receipt.

c. The Nature of Number field bit A is set ~~as applicable~~ to *International*. Other bits are set as applicable.

d. The Numbering Plan field is set to *Land Mobile Numbering (E.212)* ~~*as applicable*~~.

e. The Encoding field is set to *BCD*.

f. The Number of Digits is between 0 and at least 15.

6.5.2.89 OriginationIndicator

(*TIA/EIA-41-D* Chapter 5, page 5-222)

The OriginationIndicator (ORIGIND) parameter defines the type of calls the MS is allowed to originate.

Field	Value	Type	Reference	Notes
Identifier	OriginationIndicator IMPLICIT Unsigned Enumerated	M	6.5.1.2	
Length	1 octet	M	6.5.1.1	
Contents				

H	G	F	E	D	C	B	A	octet	Notes
Allowed Call Types								1	a, b

Figure 97 OriginationIndicator parameter

Notes:

a. For values 4, 5, and 8, the Digits (Destination) parameter (see 6.5.2.58) shall accompany the OriginationIndicator parameter and shall contain the selected leading digits or directory number (e.g., NPA-NXX or NPA-NXX-XXXX for NANP) or international E.164 number.

b. Value 8, *Single directory number* (e.g., NPA-NXX-XXXX for NANP), shall cause all originations to be treated as if this single number had been dialed, with exceptions (e.g., "9-1-1," "*-9-1-1").

Table 154 OriginationIndicator value

Allowed Call Types (octet 1)

Bits H	G	F	E	D	C	B	A	Value	Meaning
0	0	0	0	0	0	0	0	0	Not used.
0	0	0	0	0	0	0	1	1	**Prior agreement**.
0	0	0	0	0	0	1	0	2	**Origination denied**.
0	0	0	0	0	0	1	1	3	**Local calls only**.
0	0	0	0	0	1	0	0	4	**Selected leading digits of directory number or of international E.164 number** (e.g., NPA-NXX for NANP). See Note (a) above.
0	0	0	0	0	1	0	1	5	**Selected leading digits of directory number or of international E.164 number and local calls only** (e.g., NPA-NXX for NANP). See Note (a) above.
0	0	0	0	0	1	1	0	6	**National long distance** (includes local calls and may include neighboring countries).
0	0	0	0	0	1	1	1	7	**International calls** (includes national long distance and local calls).
0	0	0	0	1	0	0	0	8	**Single directory number or international E.164 number** (e.g., NPA-NXX-XXXX for NANP). See Notes (a) and (b) above.

The remainder of this section is retained without modification.

6.5.2.90 OriginationTriggers

(*TIA/EIA-41-D* Chapter 5, page 5-223)

The OriginationTriggers (ORIGTRIG) parameter defines the origination trigger points that are currently active for the subscriber.

Field	Value	Type	Reference	Notes
Identifier	OriginationTriggers IMPLICIT OCTET STRING	M	6.5.1.2	
Length	variable octets	M	6.5.1.1	

Contents

H	G	F	E	D	C	B	A	octet	Notes
RvtC	Unrec	WZ	Int'l	~~OLATA~~ NLTOLL	~~ILATA~~ LTOLL	Local	All	1	
Reserved			PA	DP	Pound	DS	Star	2	a
7 digits	6 digits	5 digits	4 digits	3 digits	2 digits	1 digit	No digits	3	
15 digits	14 digits	13 digits	12 digits	11 digits	10 digits	9 digits	8 digits	4	
• • •								*n*	b

Figure 98 OriginationTriggers parameter

Notes:

a. Set reserved values to 0 when sending, and process other triggers before treating received reserved values the same as *All*.

b. If unknown octets with bits set are received, process other triggers before treating the same as *All*. Send only defined (or significant) octets.

Table 155 OriginationTriggers value

All Origination (All) (octet 1, bit A)

Bits H G F E D C B A	Value	Meaning
0	0	Trigger is not active.
1	1	Launch an OriginationRequest for any call attempt. This overrides all other values.

Local (octet 1, bit B)

Bits H G F E D C B A	Value	Meaning
0	0	Trigger is not active.
1	1	Launch an OriginationRequest for any local call attempt.

<u>Local</u> ~~Intra-LATA~~ Toll (<u>LTOLL</u> ~~ILATA~~) (octet 1, bit C)

Bits H G F E D C B A	Value	Meaning
0	0	Trigger is not active.
1	1	Launch an OriginationRequest for any local toll ~~intra-LATA~~ call attempt. <u>Refers to intra-LATA toll within the NANP.</u>

Table 161 OriginationTriggers value (continued)

~~Inter-LATA~~ Non-Local Toll (~~OLATA~~ NLTOLL) (octet 1, bit D)

Bits H G F E D C B A	Value	Meaning
0	0	Trigger is not active.
1	1	Launch an OriginationRequest for any ~~inter-LATA toll call attempt~~ toll calls outside the local carrier's serving area.

International (Int'l) (octet 1, bit E)

Bits H G F E D C B A	Value	Meaning
0	0	Trigger is not active.
1	1	Launch an OriginationRequest for any international call attempt.

World Zone (WZ) (octet 1, bit F)

Bits H G F E D C B A	Value	Meaning
0	0	Trigger is not active.
1	1	Launch an OriginationRequest for any call attempt outside of the current World Zone ~~(as defined in ITU-T *Rec. E.164).*~~ [not recommended for use].

Unrecognized Number (Unrec) (octet 1, bit G)

Bits H G F E D C B A	Value	Meaning
0	0	Trigger is not active.
1	1	Launch an OriginationRequest for any call attempt to an unrecognized number.

Revertive Call (RvtC) (octet 1, bit H)

Bits H G F E D C B A	Value	Meaning
0	0	Trigger is not active.
1	1	Launch an OriginationRequest for any Revertive Call attempt.

Star (octet 2, bit A)

Bits H G F E D C B A	Value	Meaning
0	0	Trigger is not active.
1	1	Launch an OriginationRequest for any number beginning with a Star '*' digit.

Double Star (DS) (octet 2, bit B)

Bits H G F E D C B A	Value	Meaning
0	0	Trigger is not active.
1	1	Launch an OriginationRequest for any number beginning with two Star '**' digits.

Pound (octet 2, bit C)

Bits H G F E D C B A	Value	Meaning
0	0	Trigger is not active.
1	1	Launch an OriginationRequest for any number beginning with a Pound '#' digit.

The remainder of this section is retained without modification.

6.5.2.93 PC_SSN

(*TIA/EIA-41-D* Chapter 5, page 5-230)

The PC_SSN parameter carries the ~~*ANSI*~~ national SS7 Point Code (PC) and Subsystem Number (SSN) of a particular wireless network ~~cellular functional~~ entity. ~~Type indicates the type of functional entity (e.g., HLR, VLR, MSC).~~ Used for subsequent routing by the application and takes precedence over lower layer addressing. The Point Code may represent a single entity or an alias for mated pair entities. Two descriptions of the format are shown, one for *ANSI* SS7 point codes and a more general format for other national point code formats.

Field	Value	Type	Reference	Notes
Identifier	PC_SSN IMPLICIT OCTET STRING	M	6.5.1.2	
Length	5 octets	M	6.5.1.1	
Contents				

H	G	F	E	D	C	B	A	octet	Notes
Reserved~~Type~~								1	b
ANSI Point Code—Member Number								2	a
ANSI Point Code—Cluster Number								3	a
ANSI Point Code—Network Number								4	a
Subsystem Number (SSN)								5	a

Figure 101 PC_SSN parameter (ANSI)

Notes:

a. See 5.1.2.

b. Reserved bits shall be ignored on receipt and set to zero on sending.

Field	Value	Type	Reference	Notes
Identifier	PC_SSN IMPLICIT OCTET STRING	M	6.5.1.2	
Length	5 octets	M	6.5.1.1	
Contents				

H	G	F	E	D	C	B	A	octet	Notes
Reserved								1	a
Point Code								2	b,c
								3	b,c
								4	b,c
Subsystem Number (SSN)								5	c

Figure 101A PC_SSN parameter (generic)

Notes:

a. Reserved bits shall be ignored on receipt and set to zero on sending.

b. Bit A of Octet 2 is the first bit that would be emitted if the point code was transmitted by the MTP layer. If the point code is less than 24 bits in length, then all bits beyond the end of the point code up to and including bit H of Octet 4, should be set to 0.

c. See 5.3.

6.5.2.97 Profile

(*TIA/EIA-41-D* Chapter 5, page 5-234)

The Profile is a collection of the subscriber's calling profile information. This information is a list of optional parameters. The Profile macro has been defined solely for editorial convenience, and does not affect the encoding in any way.

PROFILE			
	Type	**Reference**	**Notes**
Contents			
AuthenticationCapability	O	6.5.2.8	a
CallingFeaturesIndicator	O	6.5.2.20	b
CarrierDigits	O	6.5.2.28	c
DMH_AccountCodeDigits	O	6.5.2.59	d
DMH_AlternateBillingDigits	O	6.5.2.60	d
DMH_BillingDigits	O	6.5.2.61	d
GeographicAuthorization	O	6.5.2.68	e
MessageWaitingNotificationCount	O	6.5.2.78	f
MessageWaitingNotificationType	O	6.5.2.79	g
MobileDirectoryNumber	O	6.5.2.80	d
OriginationIndicator	O	6.5.2.89	h
OriginationTriggers	O	6.5.2.90	i
PACAIndicator	O	6.5.2.91	j
PreferredLanguageIndicator	O	6.5.2.96	k
RestrictionDigits	O	6.5.2.113	l
RoutingDigits	O	6.5.2.114	m
SMS_OriginationRestrictions	O	6.5.2.136	n
SMS_TerminationRestrictions	O	6.5.2.138	o
SPINIPIN	O	6.5.2.139	p
SPINITriggers	O	6.5.2.140	q
TerminationRestrictionCode	O	6.5.2.157	r
TerminationTriggers	O	6.5.2.159	s

Figure 105 Profile Macro

Notes:

a. Include on *IS-41-C* or later.

b. Include to identify feature authorization and activity.

c. Include if preferred carrier is applicable and TransactionCapability supported.

d. Include if available for recording purposes (see *DMH*).

e. Include if available for certain authorization restricted areas.

f. Include if MessageWaitingNotificationType is *Message Waiting Indication* and number of messages waiting is authorized.

g. Include if Message Waiting Notification feature is active and a message is waiting.

h. Include to indicate the type of calls allowed for origination service.

i. Include to indicate OriginationRequest triggers.

j. Include to identify the PACA feature.

k. Include to identify the Preferred Language feature.

l. Include if originations are restricted, e.g., to NPA-NXX or NPA-NXX-XXXX and TransactionCapability supported. Set Nature of Number to *International* if it is known that the destination network element for the profile can accept digits in this format (e.g. MSCIdentificationNumber parameter previously received.)

m. Include for special routing information.

n. Include for MS originated Short Message Service.

o. Include for MS terminated Short Message Service.

p. Include if local SPINI operation supported.

q. Include to indicate Subscriber PIN Intercept triggers.

r. Include to indicate the type of call termination service.

s. Include to indicate the RedirectionRequest or TransferToNumberRequest triggers.

6.5.2.98 PSTNTermination

(*TIA/EIA-41-D* Chapter 5, page 5-236)

The PSTNTermination (PSTNTERM) parameter is used to provide an MSC with routing information for calls which are to be terminated in the PSTN.

Field	Value	Type	Reference	Notes
Identifier	PSTNTermination IMPLICIT SET	M	6.5.1.2	
Length	variable	M	6.5.1.1	
Contents				
DestinationDigits		M	6.5.2.56	h
CarrierDigits		O	6.5.2.28	a, b
ElectronicSerialNumber		O	6.5.2.63	c
LegInformation		O	6.5.2.75	d
MobileIdentificationNumber		O	6.5.2.81	c, e
RoutingDigits		O	6.5.2.114	b, e
TerminationTriggers		O	6.5.2.159	b, f
• • •				g

Figure 106 PSTNTermination parameter

Notes:

a. Optional, for preferred carrier ~~inter LATA~~ call routing. Note that this information may not be valid across international boundaries.

b. This parameter has precedence for this call leg over the parameters outside the TerminationList parameter or the subscriber profile.

c. Optional, for recording purposes.

d. Include if part of a multi leg call.

e. Optional, for special routing purposes.

f. Include to indicate processing for failed call attempts.

g. Ignore unexpected parameters, if received.

h. Encode the DestinationDigits as *International* if the Originating MSC is known to be capable of accepting digits in International format (e.g. MSCIdentificationNumber parameter was received.)

6.5.2.113 RestrictionDigits

(*TIA/EIA-41-D* Chapter 5, page 5-248)

The RestrictionDigits parameter specifies either the leading digits of the directory number (e.g., 6-digit NANP office code) or a full directory number (e.g., 10-digit NANP directory number) for which call originations are allowed, as indicated in the OriginationIndicator parameter.

Field	Value	Type	Reference	Notes
Identifier	RestrictionDigits IMPLICIT DigitsType	M	6.5.1.2	a
Length	variable octets	M	6.5.1.1	

Contents

H	G	F	E	D	C	B	A	octet	Notes
Type of Digits								1	b
Nature of Number								2	c
Numbering Plan				Encoding				3	d, e
Number of Digits								4	f
2nd BCD Digit				1st BCD Digit				5	
4th BCD Digit				3rd BCD Digit				6	
• • •				• • •				• • •	
*n*th BCD Digit				*n*-1st BCD Digit				*m*	

Figure 121 RestrictionDigits parameter for BCD digits

Notes:

a. Refer to the DigitsType parameter type (see 6.5.3.2) for notes and field encoding.

b. Ignore the field Type of Digits on receipt.

c. The Nature of Number field is set as applicable.

d. The Numbering Plan field is set to *Telephony Numbering*.

e. The Encoding field is set to *BCD*.

f. The Number of Digits is set as applicable (e.g. either 6 or 10 in NANP).

6.5.2.116 SenderIdentificationNumber

(*TIA/EIA-41-D* Chapter 5, page 5-251)

The SenderIdentificationNumber (SENDERIN) parameter indicates the identification number of the functional entity that is sending a message.

Field	Value	Type	Reference	Notes
Identifier	SenderIdentificationNumber IMPLICIT DigitsType	M	6.5.1.2	a
Length	variable octets	M	6.5.1.1	

Contents

H	G	F	E	D	C	B	A	octet	Notes
Type of Digits								1	b
Nature of Number								2	c
Numbering Plan				Encoding				3	d, e
Number of Digits								4	f
2nd BCD Digit				1st BCD Digit				5	
4th BCD Digit				3rd BCD Digit				6	
• • •				• • •				• • •	
*n*th BCD Digit				*n*-1st BCD Digit				*m*	

Figure 124 SenderIdentificationNumber parameter for BCD digits

Notes:

a. Refer to the DigitsType parameter type (see 6.5.3.2) for notes and field encoding.

b. Set to *Not Used*. The Type of Digits field is ignored on receipt.

c. The Nature of Number field bit A is set ~~as applicable~~ to *International*. Other bits are set as applicable.

d. The Numbering Plan field is set to *Land Mobile Numbering (E.212)* ~~*as applicable.*~~

e. The Encoding field is set to *BCD*.

f. The Number of Digits is between 0 and at least 15.

6.5.2.123 SMS_Address

(*TIA/EIA-41-D* Chapter 5, page 5-258)

The SMS_Address (SMSADDR) parameter is used to convey the current routing address of the Serving MSC for the purpose of short message termination to an MS-based SME. If SS7 is used for international SMS message routing, this parameter should be formatted as an E.212 number. If SS7 is used for national message routing, this parameter may be formatted either as an SS7 point code address or as an E.212 number.

Field	Value	Type	Reference	Notes
Identifier	SMS_Address IMPLICIT DigitsType	M	6.5.1.2	a
Length	variable octets	M	6.5.1.1	

Contents

H	G	F	E	D	C	B	A	octet	Notes
Type of Digits								1	b
Nature of Number								2	c
Numbering Plan				Encoding				3	d, e
Number of Digits								4	f
2nd BCD Digit				1st BCD Digit				5	
4th BCD Digit				3rd BCD Digit				6	
• • •				• • •				• • •	
*n*th BCD Digit				*n*-1st BCD Digit				*m*	

Figure 132 SMS_Address parameter for BCD digits

Notes:

a. See the DigitsType parameter type (see 6.5.3.2) for notes and field encoding.

b. Type of Digits is ignored on receipt.

c. Nature of Number may be *National* or *International.*

d. Numbering Plan supported shall include *E.164*, *E.212*, *X.121*, and *Private numbering plan* for this parameter variant.

e. The encoding field shall always be set to *BCD* for this parameter variant.

f. The Number of Digits ranges from 0 to at least 15.

Field	Value	Type	Reference	Notes
Identifier	SMS_Address IMPLICIT DigitsType	M	6.5.1.2	a
Length	variable octets	M	6.5.1.1	

Contents

H	G	F	E	D	C	B	A	octet	Notes
Type of Digits								1	b
Nature of Number								2	c
Numbering Plan				Encoding				3	d, e
MSB								4	
IP Address								5	
								6	
							LSB	7	

Figure 133 SMS_Address Encoding for an IP address

Notes:

a. See the DigitsType parameter type (see 6.5.3.2) for notes and field encoding.

b. Type of Digits is ignored on receipt.

c. Nature of Number may be *National* or *International.*

d. Numbering Plan shall be *IP* for this parameter variant.

e. Encoding shall be *octet string* for this parameter variant.

Field	Value	Type	Reference	Notes
Identifier	SMS_Address IMPLICIT DigitsType	M	6.5.1.2	a
Length	variable octets	M	6.5.1.1	

Contents

H	G	F	E	D	C	B	A	octet	Notes
Type of Digits								1	b
Nature of Number								2	c
Numbering Plan				Encoding				3	d, e
Point Code—Member Number								4	
Point Code—Cluster Number								5	
Point Code—Network Number								6	
Subsystem Number (SSN)								7	

Figure 134 SMS_Address parameter for an *ANSI* SS7 Point Code Address

Notes:

a. See the DigitsType parameter type (see 6.5.3.2) for notes and field encoding.

b. Type of Digits is ignored on receipt.

c. Nature of Number ~~may~~ shall be *National* ~~or *International*~~.

d. Numbering Plan shall be *SS7* for this parameter variant.

e. Encoding shall be *octet string* for this parameter variant.

Field	Value	Type	Reference	Notes
Identifier	SMS_Address IMPLICIT DigitsType	M	6.5.1.2	a
Length	variable octets	M	6.5.1.1	
Contents				

H	G	F	E	D	C	B	A	octet	Notes
Type of Digits								1	b
Nature of Number								2	c
Numbering Plan				Encoding				3	d, e
Point Code								4	f
								5	
								6	
Subsystem Number (SSN)								7	

Figure 134A SMS_Address Parameter for a Generic SS7 Point Code Address

Notes:

a. See the DigitsType parameter type (see 6.5.3.2) for notes and field encoding.

b. Type of Digits is ignored on receipt.

c. Nature of Number shall be *National.*

d. Numbering Plan shall be *SS7* for this parameter variant.

e. Encoding shall be *octet string* for this parameter variant.

f. Bit A of Octet 4 is the first bit that would be emitted if the point code was transmitted by the MTP layer. If the point code is less than 24 bits in length, then all bits beyond the end of the point code up to and including bit H of Octet 6, should be set to 0.

6.5.2.140 SPINITriggers

(*TIA/EIA-41-D* Chapter 5, page 5-287)

The SPINITriggers parameter defines the trigger points that are currently active for the subscriber.

Field	Value	Type	Reference	Notes
Identifier	SPINITriggers IMPLICIT OCTET STRING	M	6.5.1.2	
Length	variable octets	M	6.5.1.1	

Contents

H	G	F	E	D	C	B	A	octet	Notes
RvtC	Unrec	WZ	Int'l	~~OLATA~~ NLTOLL	~~ILATA~~ LTOLL	Local	All	1	
Reserved			PA	DP	Pound	DS	Star	2	a
7 digits	6 digits	5 digits	4 digits	3 digits	2 digits	1 digit	No digits	3	
15 digits	14 digits	13 digits	12 digits	11 digits	10 digits	9 digits	8 digits	4	
• • •								*n*	b

Figure 157 SPINITriggers parameter

Notes:

a. Set reserved values to 0 when sending, and process other triggers before treating received reserved values the same as *All*.

b. If unknown octets with bits set are received, process other triggers before treating the same as *All*. Send only defined (or significant) octets.

Table 177 SPINITriggers value

All Origination (All) (octet 1, bit A)

Bits H G F E D C B A	Value	Meaning
0	0	Trigger is not active.
1	1	Execute local SPINI procedures for any call origination. This overrides all other values.

Local (octet 1, bit B)

Bits H G F E D C B A	Value	Meaning
0	0	Trigger is not active.
1	1	Execute local SPINI procedures for any local call attempt.

Table 177 (continued)

Local ~~Intra-LATA~~ Toll (LTOLL ~~ILATA~~) (octet 1, bit C)

Bits H G F E D C B A	Value	Meaning
0	0	Trigger is not active.
1	1	Execute local SPINI procedures for any local toll ~~intra-LATA~~ call attempt. Refers to intra-LATA toll within the NANP.

~~Inter-LATA~~ Non-Local Toll (~~OLATA~~ NLTOLL) (octet 1, bit D)

Bits H G F E D C B A	Value	Meaning
0	0	Trigger is not active.
1	1	Execute local SPINI procedures for any ~~inter-LATA toll call attempt~~ toll calls outside the local carrier's serving area.

International (Int'l) (octet 1, bit E)

Bits H G F E D C B A	Value	Meaning
0	0	Trigger is not active.
1	1	Execute local SPINI procedures for any international call attempt.

World Zone (WZ) (octet 1, bit F)

Bits H G F E D C B A	Value	Meaning
0	0	Trigger is not active.
1	1	Execute local SPINI procedures for any call attempt outside of the current World Zone ~~(as defined in ITU-T *Rec. E.164)*~~. *This value is not recommended for use.*

Unrecognized Number (Unrec) (octet 1, bit G)

Bits H G F E D C B A	Value	Meaning
0	0	Trigger is not active.
1	1	Execute local SPINI procedures for any call attempt to an unrecognized number.

Revertive Call (RvtC) (octet 1, bit H)

Bits H G F E D C B A	Value	Meaning
0	0	Trigger is not active.
1	1	Execute local SPINI procedures for any Revertive Call attempt.

Star (octet 2, bit A)

Bits H G F E D C B A	Value	Meaning
0	0	Trigger is not active.
1	1	Execute local SPINI procedures for any number beginning with a Star '*' digit.

The remainder of this section is retained without modification.

6.5.3.2 DigitsType

(*TIA/EIA-41-D* Chapter 5, page 5-323)

The omitted portions of this section are retained without modification.

The minimum length of this parameter type variant is 7 octets.

Field	Value	Type	Reference	Notes
Identifier	DigitsType IMPLICIT OCTET STRING	M	6.5.1.2	
Length	*m* variable octets	M	6.5.1.1	a
Contents				

H	G	F	E	D	C	B	A	octet	Notes
Type of Digits								1	b
Nature of Number								2	c
Numbering Plan				Encoding				3	d,e
Point Code								4	f
								5	f
								6	f
Subsystem Number (SSN)								7	

Figure XXX DigitsType parameter type variant for a generic SS7 point code address

Notes:

a. Where *m* = 7 for this parameter type variant.

b. Type of Digits is ignored upon receipt.

c. Nature of Number shall be *National*.

d. Numbering Plan shall be SS7 for this parameter variant.

e. Encoding shall be *octet string* for this parameter variant.

f. Bit A of Octet 4 is the first bit that would be emitted if the point code was transmitted by the MTP layer. If the point code is less than 24 bits in length, then all bits beyond the end of the point code up to and including bit H of Octet 6, should be set to 0.

Table 196 DigitsType value

Type of Digits (octet 1, bits A-H)

Bits H	G	F	E	D	C	B	A	Value	Meaning
0	0	0	0	0	0	0	0	0	Not Used.
0	0	0	0	0	0	0	1	1	**Dialed Number** or **Called Party Number**.
0	0	0	0	0	0	1	0	2	**Calling Party Number**.
0	0	0	0	0	0	1	1	3	**Caller Interaction**. These are the digits dialed by a user in response to a prompt (not used in this Standard).
0	0	0	0	0	1	0	0	4	**Routing Number**. This number is used to steer a call towards its ultimate destination.
0	0	0	0	0	1	0	1	5	**Billing Number**. This is the number to use for ANI, Charge Number or other recording purposes.
0	0	0	0	0	1	1	0	6	**Destination Number**. This is the network address of the called party.
0	0	0	0	0	1	1	1	7	**LATA** (not used in this Standard).
0	0	0	0	1	0	0	0	8	**Carrier**. The identity of ~~In North America the three, four, or five digits represent an interexchange or international~~ a preferred carrier.
X	X	X	X	X	X	X	X	-	Other values are reserved.

Table 196 (continued)

Nature of Number (octet 2, bits A-H)

Bits H	G	F	E	D	C	B	A	Value	Meaning
							0	-	**National**.
							1	-	**International**.
						0		-	**Presentation Allowed**.
						1		-	**Presentation Restricted**.
					0			-	**Number is available**.
					1			-	**Number is not available**.
		0	0					-	**User provided, not screened**.
		0	1					-	**User provided, screening passed**.
		1	0					-	**User provided, screening failed**.
		1	1					-	**Network provided**.
X	X			X				-	Reserved.

Encoding (octet 3, bits A-D)

Bits H	G	F	E	D	C	B	A	Value	Meaning
				0	0	0	0	0	Not used.
				0	0	0	1	1	**BCD** (see Digit definition below).
				0	0	1	0	2	**IA5**. The International Alphabet 5 as defined in ITU-T *Rec. T.50*. (also known as the International Reference Alphabet (IRA)).
				0	0	1	1	3	**Octet string**. This is used for IP and SS7 addresses.
				X	X	X	X	-	Other values are reserved.

Numbering Plan (octet 3, bits E-H)

Bits H	G	F	E	D	C	B	A	Value	Meaning
0	0	0	0					0	Unknown or not applicable.
0	0	0	1					1	**ISDN Numbering** (not used in this Standard).
0	0	1	0					2	**Telephony Numbering** (ITU-T *Rec. E.164, E.163*).
0	0	1	1					3	**Data Numbering** (ITU-T *Rec. X.121)* (not used in this Standard).
0	1	0	0					4	**Telex Numbering** (ITU-T *Rec. F.69)* (not used in this Standard).
0	1	0	1					5	**Maritime Mobile Numbering** (not used in this Standard).
0	1	1	0					6	**Land Mobile Numbering** (ITU-T *Rec. E.212*)
0	1	1	1					7	**Private Numbering Plan** (service provider defined).
1	1	0	1					13	***~~ANSI~~* SS7 Point Code (PC) and Subsystem Number (SSN)**.
1	1	1	0					14	**Internet Protocol (IP) Address**.
1	1	1	1					15	Reserved for extension.
X	X	X	X					-	Other values are reserved.

The remainder of this section is retained without modification.

5. *TIA/EIA-41-D* Chapter 6 "Signaling Procedures" Modifications

2.1 INTERSYSTEM HANDOFF PROCEDURES

(*TIA/EIA-41-D* Chapter 6, page 6-5)

This section provides the transaction procedures defined for the Intersystem Handoff. All messages and associated parameters are defined in Chapter 5; Timer values are specified in Section 7 of this Chapter.

The omitted portions of this section are retained without modification.

The procedures defined here are based on the assumption that intersystem handoff relies upon dedicated intersystem trunks. This is required since intersystem handoff is a tightly controlled activity of the cellular systems involved. Intersystem handoff cannot be considered any differently than an inter-cell handoff. ~~The intersystem handoff may or may not be inter LATA depending upon where the LATA boundary is and also where the mobile call was placed.~~

The handoff procedures specified in the following sections can be applied to consecutive inter-MSC handoffs for the same MS. A non-Anchor Serving MSC that has handed off a call becomes a Tandem MSC. The initial Serving MSC retains its role as an Anchor MSC.

3.2.3 MSC Analyze MS Dialed Number

(*TIA/EIA-41-D* Chapter 6, page 6-15)

Upon demand the Anchor MSC shall do the following:

The omitted portions of this section are retained without modification.

9 ELSEIF the OriginationTriggers *Revertive Call* trigger is on AND the dialed number is the MS's mobile directory number (or MIN if the mobile directory number is not available):[1]

9-1 Execute the "MSC Initiating an Origination Request" task (see 4.31.1) to set the PointOfReturn.

The omitted portions of this section are retained without modification.

11 ELSEIF any of OriginationTriggers *Local*, LTOLL ~~*ILATA*~~, ~~*OLATA*~~, *NLTOLL*, *Int'l*, *WZ*, or *Unrec*, triggers are on AND the call type matches the corresponding trigger:

11-1 Execute the "MSC Initiating an Origination Request" task (see 4.31.1) to set the PointOfReturn.

11-2 IF a Digits (Dialed) parameter is received:

[1] If the MS is a foreign roamer and plus code dialing has not been used, the revertive call condition is satisfied if the dialed digits consist of the international prefix followed by the full E.164 form of the MS's MDN. If the MS is a foreign roamer and plus code dialing has been used, this condition is detected if the dialed digits consist of the full E.164 form of the MS's MDN.

11-2-1 IF the type of the Digits is *unknown*.

11-2-1-1 Process the dialed number locally to set the PointOfReturn.

11-2-2 ENDIF.

11-3 ENDIF.

12 ELSEIF the any unknown OriginationTriggers are on (e.g., reserved bits set to 1 or extra octets with any bit set to 1):

12-1 Execute the "MSC Initiating an Origination Request" task (see 4.31.1) to set the PointOfReturn.

12-2 IF a Digits (Dialed) parameter is received:

12-2-1 IF the type of the Digits is *unknown*.

12-2-1-1 Process the dialed number locally to set the PointOfReturn.

12-2-2 ENDIF.

12-3 ENDIF.

13 ELSEIF the call type matches an active trigger in the SPINITriggers parameter:[1]

13-1 Execute the "MSC SPINI Originating Call Invocation" task (see 5.21.3) to set the PointOfReturn.

The omitted portions of this section are retained without modification.

4.25.2 MSC Receiving InterSystemPage

(*TIA/EIA-41-D* Chapter 6, page 6-177)

When an MSC receives an InterSystemPage INVOKE, it shall perform the following:

The omitted portions of this section are retained without modification.

~~1-9-6-2-1-5~~ ~~Include the Digits (Destination) parameter set to the assigned TLDN.~~

1-9-6-2-1-5 IF the MSCIdentificationNumber parameter was received (or the originating MSC is otherwise known to support internationally formatted TLDNs):

1-9-6-2-1-5-1 Include the Digits (Destination) parameter set equal to the TLDN in international E.164 format with the nature of number set to International.

1-9-6-2-1-X ELSE:

1-9-6-2-1-X-1 Include the Digits (Destination) parameter set equal to the TLDN in national E.164 format with the Nature of Number set to National.

1-9-6-2-1-Y ENDIF.

[1] If the MS is a foreign roamer and plus code dialing has not been used, the revertive call condition is satisfied if the dialed digits consist of the international prefix followed by the full E.164 form of the MS's MDN. If the MS is a foreign roamer and plus code dialing has been used, this condition is detected if the dialed digits consist of the full E.164 form of the MS's MDN.

The remainder of this section is retained without modification.

4.38.2 VLR Receiving RegistrationNotification INVOKE

(*TIA/EIA-41-D* Chapter 6, page 6-235)

The omitted portions of this section are retained without modification.

(The MS is geographically authorized.)

12-11 IF an SMS_Address parameter is received:

12-11-1 IF the SMS_Address is different than the current SMS temporary routing address:

12-11-1-1 GOTO Register the MS.

12-11-2 ENDIF.

12-12 ELSE:

12-12-1 IF an SMS temporary routing address exists:

12-12-1-1 Clear the SMS temporary routing address.

12-12-1-2 GOTO Register the MS (to report loss of SMS capability).

12-12-2 ENDIF.

12-13 ENDIF.

12-x If the MSCIdentificationNumber parameter is received:

12-x-1 IF the current serving MSC did not provide its MSCIdentificationNumber during registration:

12-x-1-1 GOTO Register the MS.

12-x-2 ENDIF.

12-y ELSE (the MSCIdentificationNumber parameter is not received):

12-y-1 IF the current serving MSC did provide its MSCIdentificationNumber during registration:

12-y-1-1 GOTO Register the MS.

12-y-2 ENDIF.

12-z ENDIF.

12-14 IF the information requested by the QualificationInformationCode is available:

12-14-1 IF the QualificationInformationCode indicates *Profile only* or *Validation and profile:*

12-14-1-1 Execute the “Loading of Profile Parameters” task (see 3.1.3).

12-14-2 ENDIF.

12-14-3 IF the QualificationInformationCode indicates *Validation only* or *Validation and profile:*

12-14-3-1 Include the AuthorizationPeriod parameter set appropriately.

12-14-4 ENDIF.

12-14-5 Send a RETURN RESULT to the requesting MSC.

12-14-6 Exit this task.

12-15 ENDIF.

13 ENDIF.

Register the MS:

4.41.3 MSC Receiving RoutingRequest INVOKE

(*TIA/EIA-41-D* Chapter 6, page 6-254)

When an MSC receives a RoutingRequest INVOKE, it shall perform the following:

The omitted portions of this section are retained without modification.

1-4-6-1-2 IF the paging was successful on a bordering system.

1-4-6-1-2-1 Relay all parameters received via the InterSystemPage RETURN RESULT or UnsolicitedResponse INVOKE.

1-4-6-1-2-X IF a TLDN was received in the UnsolicitedResponse INVOKE:

1-4-6-1-2-X-1 IF the MSCIdentificationNumber parameter was received in the RoutingRequest INVOKE (or the originating MSC is otherwise known to support internationally formatted TLDNs):

1-4-6-1-2-X-1-1 Convert the Digits (Destination) to International format, using, as country code, the country code of the border MSC.

1-4-6-1-2-X-2 ENDIF.

1-4-6-1-2-Y ENDIF.

1-4-6-1-2-2 Send a RETURN RESULT to the requesting VLR.

1-4-6-1-2-3 Exit this task.

The omitted portions of this section are retained without modification.

(TLDN is selected here.)

1-6 IF TLDN is available:

1-6-1 CASE termination treatment OF:

The omitted portions of this section are retained without modification.

1-6-7 ENDCASE.

~~1-6-8 Include the Digits (Destination) parameter set equal to the TLDN.~~

1-6-8 IF the MSCIdentificationNumber parameter was received (or the originating MSC is otherwise known to support internationally formatted TLDNs):

1-6-8-1 Include the Digits (Destination) parameter set equal to the TLDN in international E.164 format with the Nature of Number set to *International.*

1-6-8A ELSE:

1-6-8A-1 Include the Digits (Destination) parameter set equal to the TLDN in national E.164 format with the Nature of Number set to *National.*

1-6-8B ENDIF.