

ENHANCED INTERNATIONAL DIALING,
CALLING NUMBER IDENTIFICATION & CALLBACK,
CALLING PARTY CATEGORY IDENTIFICATION

CONTENTS

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

LIST OF TABLES..... iii

REVISION HISTORY iv

INTRODUCTION 1

 1 GENERAL 1

 2 REFERENCES..... 1

 3 ORGANIZATION 1

 4 EDITORIAL CONVENTIONS 1

TIA/EIA-664 MODIFICATIONS 3

 5 Voice Feature Descriptions 3

 5.8 Calling Number Identification Presentation (CNIP) 3

 7 Mobile Station Functionality 5

 7.1 Digit Entry Keys 5

 7.2 Function Keys 5

 7.7 Numeric Display 6

 7.8 Alphanumeric Display 6

 7.8.3 Interactions with Other Cellular Services 6

 7.16 Call Back 7

 7.17 Storage of Phone Numbers 7

 8 System Functionality 8

 8.5 Indications Received from the Mobile Station 8

 8.6 Indications Applied Toward the Mobile Station 8

TIA/EIA-41.1-D MODIFICATIONS 9

 2 REFERENCES..... 9

 2.1 NORMATIVE REFERENCES 9

 4 SYMBOLS AND ABBREVIATIONS 9

TIA/EIA-41.5-D MODIFICATIONS

 6.4 MAP OPERATIONS 10

 6.4.2.2 LocationRequest 10

 6.4.2.2 OriginationRequest 11

 6.5 MAP PARAMETERS 12

 6.5.2.1 Profile 12

 6.5.2.xx CallingPartyCategory 13

TIA/EIA-41.6-D MODIFICATIONS 14

 3.2.3 MSC Analyze Dialed Number 14

PN-4863 V&V

5.8.1	HLR CNIP Terminating Call Invocation	14	1
5.8.4	MSC CNIP Terminating Call Invocation.....	15	2
			3
			4
			5
			6
			7
			8
			9
			10
			11
			12
			13
			14
			15
			16
			17
			18
			19
			20
			21
			22
			23
			24
			25
			26
			27
			28
			29
			30
			31
			32
			33
			34
			35
			36
			37
			38
			39
			40
			41
			42
			43
			44
			45
			46
			47
			48
			49
			50
			51
			52
			53
			54
			55
			56
			57
			58
			59
			60

U U V W X Y Z

LIST OF TABLES

Table 60: Letter to Digit Key Mapping 5

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

PN-4863 V&V

REVISION HISTORY

Version	Date	
0	December 11, 2000	V&V

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

U U V V W W X X Y Y Z Z

INTRODUCTION

This document presents a recommended plan for the implementation of enhanced international dialing, calling number identification and callback, and calling party category identification for use in the Wireless Radiotelephone Service.

1 GENERAL

This document describes the enhanced international dialing and calling number identification and callback network capabilities and the intersystem operations to enable a wireless system to these capabilities. This document also describes the intersystem operations that enable identification of the calling party category.

2 REFERENCES

This Interim Standard builds on the following standards:

- *ANSI/TIA/EIA-664*, Cellular Features Description; Telecommunications Industry Association; June 1996
- *ANSI/TIA/EIA-41-D*, Cellular Radiotelecommunications Intersystem Operations; Telecommunications Industry Association; 1997
- *ITU-T Q.763*, Signalling System No. 7 – ISDN user part formats and codes; September 1997.

3 ORGANIZATION

This document is organized as follows:

- The *TIA/EIA-664* Modifications section provides the modifications and additions to “Cellular Features Descriptions” for enhanced international dialing, calling number identification and callback.
- The *TIA/EIA-41.1-D* Modifications section provides the modifications and additions to *TIA/EIA-41-D* Chapter 1 for calling party category.
- The *TIA/EIA-41.5-D* Modifications section provides the modifications and additions to *TIA/EIA-41-D* Chapter 5 for calling party category.
- The *TIA/EIA-41.6-D* Modifications section provides the modifications and additions to *TIA/EIA-41-D* Chapter 6 for enhanced international dialing, calling number identification and callback.

4 EDITORIAL CONVENTIONS

The following editorial conventions are used for this Interim Standard:

- underline: addition
- ~~cross-out~~: deletion
- change bar: indicates additions or deletions

- new sub-sections are identified in the sub-section heading
- for clarity, new sub-sections are shown with vertical change bars but are not underlined

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

U U V W X Y Z

TIA/EIA-664 MODIFICATIONS

This section describes modifications and additions to *TIA/EIA-664* for enhanced international dialing, calling number identification and callback, and calling party category identification.

5 Voice Feature Descriptions

5.8 Calling Number Identification Presentation (CNIP)

Omitted text is retained unchanged.

Normal Operation With Successful Outcome

When the CNIP service is applicable and active, the destination network provides the called subscriber with CNI during alerting on incoming calls.

For Network Validated Numbers, the calling party's network should transmit enough numbering plan digits to allow other networks and parties to identify the calling number. The number presented should be the same as would be used to reach the calling party ~~(at least for numbers within World Zone 1)~~. For purpose of automatic callback, the number presented shall not require editing while the called subscriber is located in the country in which the call was received.

It is assumed that the originating network is capable of transmitting up to 15 digits of CPN. It is also assumed that the originating network is capable of transmitting a subaddress, if provided by the calling party.

It is assumed that the redirecting network is capable of transmitting up to 15 digits of redirecting number (RN) information. It is also assumed that the redirecting network is capable of transmitting a redirecting subaddress, if provided by the redirecting party.

For Network Validated Numbers, the redirecting network should transmit enough numbering plan digits to allow other networks and parties to identify the redirecting party.

One of the CPNs presented to the subscriber shall be a Network Validated Number from the access of the calling party. The other calling party number, if present, shall be a User Provided Number from the access of the calling party. The called subscriber, by the CNIP subscription option, may select either between the single number delivery option or the two number delivery option. If single number delivery is specified, only the Network Validated Number shall be presented. If two number delivery is specified and only one number is available, the Network Validated Number shall be presented. If two number delivery is specified and two numbers are available, the Network Provided Number shall be presented and, additionally, the User Provided Number shall be presented whether it has been screened or not.

7 Mobile Station Functionality

This section describes the characteristics of a Mobile Station (MS) model to define the services and features in this Standard. It includes all external interfaces within the MS including external devices, audible annunciators, visual indications, and subscriber interaction devices. Not all of these interfaces are electrical in nature.

7.1 Digit Entry Keys

The MS shall have a key pad with the following keys for digit entry: **1**, **2**, **3**, **4**, **5**, **6**, **7**, **8**, **9**, **0**, *****, and **#**. A **+** key (or equivalent user interface convention) may be included to indicate international dialing. The digit keys should also include two, three, or four letters as indicated in the following table (NOTE: See *ITU-T Recommendation E.161*):

Key Digit	Letters	Notes
1		
2	ABC	
3	DEF	
4	GHI	
5	JKL	
6	MNO	
7	PRS	
8	TUV	
9	WXY	
*		
0	OPER	Should be distinctive from alphabet designations on the other keys.
#		
±		

Table 60: Letter to Digit Key Mapping

Omitted text is retained unchanged.

7.2 Function Keys

Omitted text is retained unchanged.

Plus (Optional)

The **+** key (or functional equivalent) is used to indicate an international number. When the Plus function is invoked, the MS user should enter the international access digits specific to the country of operation.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Omitted text is retained unchanged.

7.7 Numeric Display

The MS shall have a numeric display to allow the subscriber to enter digits and review them before sending them to the base station. The display shall have at least 10 digits. The display should be capable of displaying the following characters: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0,* , and #, and +.

The numeric display may be used for local features and for some of the applicable alphanumeric display features at the discretion of the MS manufacturer.

Omitted text is retained unchanged.

7.8 Alphanumeric Display

Omitted text is retained unchanged.

7.8.3 Interactions with Other Cellular Services

Omitted text is retained unchanged.

Calling Number Identification Presentation

The Alphanumeric Display may be used to identify the calling party of an incoming call to the called MS. The identification may be one or two numbers. Each number also has the following information:

Number: Up to 15 digits. If the number is international, it may be prefixed with an international indicator (e.g., +). International numbers should be displayed in E.164 number format (i.e., including the country code).

Presentation Indicator: *Presentation allowed.* This is usually indicated by presenting the number.

Presentation restricted. This may be indicated by a single letter "P" for "Private."

Number not available. This may be indicated with a single letter "O" for "Out of Area."

V
R
A
R
C
O
T
H
N
J

8 System Functionality

The purpose of this section is to define the characteristics of the system with respect to messaging and indications to the Mobile Station (MS) and to the calling party.

Omitted text is retained unchanged.

8.5 Indications Received from the Mobile Station

The system should be able to receive and process an indication from the MS of the international nature of the called number.

8.6 Indications Applied Toward the Mobile Station

The following indications may be applied by the system toward the mobile station during normal operation and in providing the features in this Standard, as:

- a. The MSC may indicate the international nature of an incoming call.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

V
W
X
Y
Z
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

TIA/EIA-41.1-D Modifications

This section provides modifications and additions to *TIA/EIA-41-D* Chapter 1 needed for calling party category identification.

2 REFERENCES

2.1 NORMATIVE REFERENCES

ITU-T Q.763 (Signalling System No. 7 – ISDN user part formats and codes); September 1997.

3 SYMBOLS AND ABBREVIATIONS

CPC CallingPartyCategory parameter

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

PN-4863 V&V

TIA/EIA-41.5-D Modifications

This section describes modifications and additions to *TIA/EIA-41.5-D* for enhanced international dialing, calling number identification and callback, and calling party category identification.

6.4 MAP OPERATIONS

6.4.2.1 LocationRequest

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:

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	
Comments				
••••				
CallingPartyCategory		O	6.5.2.xx	x

Notes:

••••

- x. Include to indicate the Calling Party's Category.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

File: PN-4863 Section 4 V&V last modified at December 10, 2000 3:01 PM



6.4.2.2 OriginationRequest

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:

OriginationRequest RETURN RESULTParameters				
Field	Value	Type	Reference	Notes
Identifier	SET [NATIONAL 18]	M	6.3.2.1	
Length	variable octets	M	6.3.2.1	
Comments				
••••				
CallingPartyCategory		<u>O</u>	6.5.2.xx	y

Notes:

•••

- y. Include to indicate the *Calling Party's Category* for this call.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

PN-4863 V&V

6.5.2.xx CallingPartyCategory

The CallingPartyCategory (CPC) parameter identifies the Calling Party's Category. This parameter is based on the Calling Party's Category parameter defined in Section 3.11 of ITU-T Q.763-1997 and includes the "reserved for national use" values.

Field	Value	Type	Reference	Notes					
<u>Identifier</u>	<u>CallingPartyCategory</u>	<u>M</u>	<u>6.5.1.2</u>						
	<u>one octet</u>	<u>M</u>	<u>6.5.1.1</u>						
<u>Comments</u>									
<u>H</u>	<u>G</u>	<u>F</u>	<u>E</u>	<u>D</u>	<u>C</u>	<u>B</u>	<u>A</u>	<u>Octet</u>	<u>Notes</u>
<u>Calling Party's Category</u>								<u>1</u>	<u>a, b</u>

Notes:

- a. Refer to ITU-T Q.763 (Signalling System No. 7 – ISDN user part formats and codes) for encoding of this parameter.
- b. Refer to national ISDN user part specifications for definitions and encoding of the "reserved for national use" values.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

PN-4863 V&V

TIA/EIA-41.6-D MODIFICATIONS

This section describes modifications and additions to TIA/EIA-41.6-D for enhanced international dialing, calling number identification and callback, and calling party category identification.

3.2.3 MSC Analyze MS Dialed Number

Upon demand the Anchor MSC shall do the following:

- 1 IF flash privileges are suspended (by the *Flash Privileges* in the OneTime-Feature-Indicator parameter e.g., Call Transfer, Call Waiting, Three-Way Calling):
 - 1-1 Include the TransactionCapability parameter with the number of multiple terminations set to 0.
- 2 ELSEIF Call Transfer, Three-Way Calling or similar feature is being invoked:
 - 2-1 Include the TransactionCapability parameter with the number of multiple terminations set to 1.
- 3 ELSE:
 - 3-1 Include the TransactionCapability parameter with the number of multiple terminations set appropriately.
- 4 ENDIF.
- 5 IF the NatureOfNumber field in the dialed digits has the value *National* AND IF the digit string begins with the international access digits that are relevant to the area of operation:
 - 5-1 Remove the international access digits from the dialed digit string.
 - 5-2 Set the NatureOfNumber field in the dialed digits to *International*.
- 6 ENDIF.
- 7 IF the MS dialed a locally allowed number (e.g., 9-1-1, *9-1-1, *N11):

The remaining steps of Section 3.2.3 are retained unchanged.

5.8.1 HLR CNIP Terminating Call Invocation

Upon CNIP invocation, the HLR shall do the following:

- 1 IF the CallingPartyNumberDigits1 parameter is received:
 - 1-1 Include the CallingPartyNumberString1 parameter set to indicate the identity of the calling party.

- 1-2 IF the NatureOfNumber field in the CallingPartyNumberString1 parameter has the value *National* AND IF the MS user is roaming outside the subscriber's home *E.164* country:
- 1-2-1 Prepend the *E.164* country code of the country of the HLR associated with the subscriber to the CallingPartyNumberString1 digits and set the NatureOfNumber field to *International*.
- 1-3 ENDIF.
- 2 ENDIF.
- 3 IF the CallingPartyNumberDigits2 parameter is received:
- 3-1 IF the NatureOfNumber field in the CallingPartyNumberString2 parameter has the value *National* AND IF the MS user is roaming outside the subscriber's home *E.164* country:
- 3-1-1 Prepend the *E.164* country code of the country of the HLR associated with the subscriber to the CallingPartyNumberString2 digits and set the NatureOfNumber field to *International*.
- 3-2 ENDIF.
- 4 ENDIF.
- 5 IF the CallingPartySubaddress parameter is received:
- 5-1 Include the CallingPartySubaddress parameter set to indicate the subaddress of the calling party.
- 6 ENDIF.
- 7 IF the call is being redirected by the HLR (e.g., CFB, CFD, CFNA, CFU, FA, or MAH, PCA, or SCA):
- 7-1 Include the RedirectingNumberString parameter set to indicate the identity of the last redirecting party (i.e., called mobile directory number or pilot directory number, except for Call Delivery).
- 7-2 IF the redirecting party has a subaddress:
- 7-2-1 Include the RedirectingSubaddress parameter set to indicate the subaddress of the last redirecting party.
- 7-3 ENDIF.
- 8 ELSEIF the RedirectingNumberDigits parameter is received:
- 8-1 Include the RedirectingNumberString parameter set to indicate the identity of the last redirecting party.
- 8-2 IF the RedirectingSubaddress parameter is received:
- 8-2-1 Include the RedirectingSubaddress parameter set to indicate the subaddress of the last redirecting party.
- 8-3 ENDIF.
- 9 ENDIF.
- 10 Return to the calling task.

5.8.4 MSC CNIP Terminating Call Invocation

Upon request, the MSC shall do the following:

- 1 IF the subscriber has CNIP1 or CNIP2 activated:

1-1	IF the CallingPartyNumberString1 parameter is received:	1
1-1-1	IF the CallingPartyNumberString1 is not presentation restricted:	2
1-1-1-1	Include the CallingPartyNumberString1 parameter.	3
1-1-1-2	IF the CallingPartySubaddress parameter is received:	4
1-1-1-2-1	Include the CallingPartySubaddress parameter.	5
1-1-1-3	ENDIF.	6
1-1-1-4	IF the subscriber has CNIP2 activated:	7
1-1-1-4-1	IF the CallingPartyNumberString2 parameter is received:	8
1-1-1-4-1-1	IF the CallingPartyNumberString2 is not presentation restricted:	9
1-1-1-4-1-1-1	Include the CallingPartyNumberString2 parameter.	10
1-1-1-4-1-2	ELSE (presentation of calling number 2 is restricted):	11
1-1-1-4-1-2-1	Include the CallingPartyNumberString2 parameter set to <i>Restricted</i> .	12
1-1-1-4-1-3	ENDIF.	13
1-1-1-4-2	ELSE (CallingPartyNumberString2 not received):	14
1-1-1-4-2-1	Include the CallingPartyNumberString2 parameter set to <i>Unavailable</i> .	15
1-1-1-4-3	ENDIF.	16
1-1-1-5	ENDIF.	17
1-1-2	ELSE (presentation of calling number 1 is restricted):	18
1-1-2-1	Include the CallingPartyNumberString1 parameter set to <i>Restricted</i> .	19
1-1-3	ENDIF.	20
1-2	ELSE (CallingPartyNumberString1 not received):	21
1-2-1	Include the CallingPartyNumberString1 parameter set to <i>Unavailable</i> .	22
1-3	ENDIF.	23
1-4	<u>IF the CallingPartyNumberString1 parameter has been included:</u>	24
1-4-1	<u>IF the NatureOfNumber field in the CallingPartyNumberString1 parameter has the value <i>International</i> AND IF the calling party number indicates the same <i>E.164</i> country code as the country code of the current serving system:</u>	25
1-4-1-1	<u>Remove the <i>E.164</i> country code from the CallingPartyNumberString1 digits and set the NatureOfNumber field to <i>National</i>.</u>	26
1-4-2	<u>ENDIF.</u>	27
1-5	<u>ENDIF.</u>	28
1-6	<u>IF the CallingPartyNumberString2 parameter has been included:</u>	29
1-6-1	<u>IF the NatureOfNumber field in the CallingPartyNumberString2 parameter has the value <i>International</i> AND IF the calling party number indicates the same <i>E.164</i> country code as the country code of the current serving system:</u>	30
1-6-1-1	<u>Remove the <i>E.164</i> country code from the CallingPartyNumberString2 digits and set the NatureOfNumber field to <i>National</i>.</u>	31
1-6-2	<u>ENDIF.</u>	32
1-7	<u>ENDIF.</u>	33
1-8	IF the RedirectingNumberString parameter is received:	34

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1-8-1 IF the RedirectingNumberString parameter is not presentation restricted:
1-8-1-1 Include the RedirectingNumberString parameter.
1-8-1-2 IF the RedirectingSubaddress parameter is received:
1-8-1-2-1 Include the RedirectingSubaddress parameter.
1-8-1-3 ENDIF.
1-8-2 ELSE (presentation of redirecting number is restricted):
1-8-2-1 Include the RedirectingNumberString parameter set to *Restricted*.
1-8-3 ENDIF.
1-9 ELSE:
1-9-1 Include the RedirectingNumberString parameter set to *Unavailable*.
1-10 ENDIF.
1-11 Return to the calling task as *accepted*.
2 ENDIF.
3 Return to the calling task as *refused*.

PN-4863 V&V