

297-2621-902

Succession Networks

# Gateway IMT (GIMT)

## Application Guide

SN07

Standard 01.01

October 2004

---



---

Succession Networks

# Gateway IMT (GIMT)

## Application Guide

---

Publication number: 297-2621-902

Product release: SN07

Document release: Standard 01.01

Date: October 2004

---

Copyright © 2004 Nortel Networks

All rights reserved

Printed in the United States of America

**NORTEL NETWORKS CONFIDENTIAL:** The information contained in this document is the property of Nortel Networks. Except as specifically authorized in writing by Nortel Networks, the holder of this document shall keep the information contained herein confidential and shall protect same in whole or in part from disclosure and dissemination to third parties and use same for evaluation, operation, and maintenance purposes only.

Information is subject to change without notice. Nortel Networks reserves the right to make changes in design or components as progress in engineering and manufacturing may warrant.

DMS, DMS-100, MAP, NetID, TOPS, and TOPS IWS are trademarks of Nortel Networks. Windows NT is a trademark of Microsoft Corporation. Adobe Acrobat Reader is a trademark of Adobe Systems Incorporated. Pentium is a trademark of Intel Corporation. Netscape is a trademark of Netscape Communications Corporation. HP OpenView is a trademark of Hewlett-Packard Company.

---



---

## Publication history

---

### October 2004

Initial release 01.01 for software release SN07.



---

# Contents

---

## About this document 13

- When to use this document 13
- How to check the version and issue of this document 13
- References in this document 13
- What precautionary messages mean 13
- How commands, parameters, and responses are represented 15
  - Input prompt (>) 15
  - Commands and fixed parameters 15
  - Variables 15
  - Responses 15

---

## Chapter 1: Overview 17

- What is the Gateway IMT? 17
- National network vs. international network 17
- What are the hardware requirements? 18
- Which signaling protocols does the Gateway IMT use? 18
- Which gateway features are available? 19
- Which trunk agencies does the Gateway IMT interwork with? 21
- Which call types does the Gateway IMT support? 22
  - Which maintenance features are available? 22
    - Test calls 23
- How is billing affected? 23
- What feature interactions should I be aware of? 24

---

## Chapter 2: Call Types 27

- What are the types of calls? 27
- Direct termination calls 28
  - Direct termination outbound international 28
    - Outgoing initial address message information for a direct termination outbound international call 29
  - Direct termination inbound national 30
    - Incoming initial address message information for a direct termination inbound national call 31
- Transit calls 32
  - Transit inbound national 33
    - Incoming initial address message information for transit inbound national calls 34
  - Transit outbound international 33
    - Outgoing initial address message information for transit outbound international calls 35

---

Transit inbound international	36
Tie-route connections	37
Direct termination inbound national tie-route connection	38
Direct termination outbound international tie-route connection	39
Transit outbound international tie-route connection	40
IDDD calls	42
How does the direct termination outbound international IDDD call work?	42
How does the direct termination inbound national IDDD call work?	43
How does the transit outbound international IDDD call work?	44
How does the transit inbound international IDDD call work?	44
Operator-assisted calls	44
Direct termination inbound national operator-assisted	44
How does the direct termination inbound national operator-assisted call work?	45
Direct termination outbound international operator-assisted	45
Transit outbound international operator-assisted	46
How do the direct termination and transit international operator-assisted call work?	46
code 11 and code 12 calls	47
Direct termination outbound international code 11 and code 12 calls	47
How does the direct termination outbound international code 11 and code 12 call work?	47
Transit outbound international code 11 and code 12	48
How does the transit outbound international code 11 and code 12 call work?	48
Direct termination inbound national code 11 and code 12	49
How does the direct termination inbound national code 11 and code 12 call work?	50
Transit inbound national code 11 and code 12 call	50

---

### **Chapter 3: Q.767 Gateway IMT** **51**

What is the Q.767 Gateway IMT?	51
How do I implement the Q.767 Gateway IMT trunk agency?	51
Which features does the Q.767 Gateway IMT support?	53
Which messages and parameters does the Q.767 Gateway IMT support?	54
What are messages?	54
What are parameters?	55
Which messages and parameters does the Q.767 Gateway IMT support?	56
How does the Q.767 Gateway IMT handle unrecognizable and unexpected messages?	57
Which interworkings does the Q.767 Gateway IMT support?	58
What is interworking?	58
Which trunk agency interworkings does the Q.767 Gateway IMT support?	60

---

### **Chapter 4: ISUP'92 Gateway IMT** **63**

What is the ISUP'92 Gateway IMT?	63
How do I implement the ISUP'92 Gateway IMT trunk agency?	63
Which features does the ISUP'92 Gateway IMT support?	66
Which messages and parameters does the ISUP'92 Gateway IMT support?	67
What are messages?	67
What are parameters?	68
Which messages and parameters does the ISUP'92 Gateway IMT support?	69
How does the ISUP'92 Gateway IMT handle unrecognizable and unexpected messages and parameters?	70



---

Message compatibility parameter processing	70
Parameter compatibility parameter processing	73
Unexpected messages	78
Which interworkings does the Q.767 Gateway IMT support?	79
What is interworking?	79
Which trunk agency interworkings does the ISUP'92 Gateway IMT support?	80

---

## **Appendix A: Gateway IMT features** **83**

A-law/U-law pulse code modulation encoding conversion	83
Why must the CS 2000 switch convert A-law to U-law PCM encoding?	83
bearer capability screening	84
Origination screening	84
Termination screening	85
calling party category handling	85
What is a calling party category?	85
cause value handling	93
How do I enter data into the tables?	96
country code processing	99
What is a country code?	99
How does the CS 2000 switch process the country code over the Gateway IMT?	99
How do I activate country code processing?	100
data calls	101
Interworking of parameters specific to data calls	102
How data calls appear on the call detail report	109
Data call identification	110
NetworkBuilder	111
overlap sending	111
protocol timers	112
satellite indication	116
What is satellite indication?	116
Double-hop-satellite restriction	116
Satellite indication on the Gateway IMT	116
Satellite indication on the UCP (inter/intra) ISUP IMT	117
Satellite indication on an SS7 FGD	117
Satellite indicator's value in the outgoing IAM	118
Test calls	121
Manual test calls	121
Automatic trunk testing	126
Initial address message information in a test call	126
Translations and terminations of test calls	127
Parameter interworking for test calls	128
How test calls affect billing	129
Table Trunk Group (TRKGRP) nature of address enhancements	129

---

## **Appendix B: Q.767 Gateway IMT messages** **131**

## **Appendix C: Q.767 messages and parameters** **135**

Address complete message (ACM)	136
Answer message (ANM)	137
Blocking acknowledgement (BLA) message)	138
Blocking (BLO) message)	139
Call modification request (CMR) message)	140

---

Call progress (CPG) message	141
Circuit group blocking acknowledgement (CGBA) message	142
Circuit group blocking (CGB) message	143
Circuit group reset acknowledge (GRA) message	144
Circuit group reset (GRS) message	145
Circuit group unblock acknowledged (CGUA) message	146
Circuit group unblocking (CGUA) message	147
Connect (CON) message	148
Continuity check (CCR) message	149
Continuity (COT) message	150
Forward transfer (FOT) message	151
Initial address message (IAM)	152
Release complete (RLC) message	154
Release (REL) message	155
Reset circuit (RSC) message	156
Subsequent address message (SAM)	157
Unblocking acknowledgement (UBA) message	158
Unblock (UBL) message	159

---

**Appendix D: Q.767 Gateway IMT and PRI interworking** 161

The Q.767 Gateway IMT's messages mapped to the PRI's messages	162
The PRI's messages mapped to the Q.767 Gateway IMT's parameters	176

---

**Appendix E: Q.767 Gateway IMT and PTS signaling protocol interworking** 193

Q.767 Gateway IMT's messages interworked to the PTS signaling protocol's messages	193
The PTS signaling protocol mapped to the Q.767 Gateway IMT's messages	198

---

**Appendix F: Q.767 Gateway IMT and UCP ISUP signaling protocol interworking** 205

The Q.767 Gateway IMT's messages mapped to the messages	205
UCP ISUP signaling protocol's messages interworked to the Q.767 Gateway IMT's messages	219

---

**Appendix G: ISUP'92 Gateway IMT messages** 233

---

**Appendix H: ISUP'92 Gateway IMT messages and parameters** 237

Address complete message (ACM)	238
Answer message (ANM)	240
Blocking acknowledgement (BLA) message	242
Blocking (BLO) message	243
Call progress (CPG) message	244
Circuit group reset acknowledgement (GRA) message	246
Circuit group reset (GRS) message	247
Circuit group block acknowledgement (CGBA) message	248
Circuit group block (CGB) message	249
Circuit group unblocking acknowledgement (CGUA) message	250
Circuit group unblocking (CGU) message	251
Confusion (CFN) message	252
Connect (CON) message	253

---

Continuity check request (CCR) message	255
Continuity (COT) message	256
Facility Accept (FAA) and Facility Request (FAR) messages	257
Facility Reject (FRJ) message	258
Forward transfer (FOT) message	259
Initial address message (IAM)	260
Release complete (RLC) message	263
Release (REL) message	264
Reset circuit (RSC) message	266
Subsequent address message (SAM)	267
Suspend (SUS) and Resume (RES) Messages	268
Unblock acknowledged (UBA) message	269
Unblock (UBL) message	270
User-to-User Information (USR) message	271

---

**Appendix I: CS 2000ISUP'92 Gateway and PRI interworking 273**

The ISUP'92 Gateway IMT's messages mapped to the PRI's messages	274
The PRI's message mapped to the ISUP'92 Gateway IMT's messages	289

---

**Appendix J: ISUP'92 Gateway and PTS signaling protocol interworking 307**

ISUP'92 Gateway IMT's messages interworked to the PTS signaling protocol's messages	307
The PTS signaling protocol mapped to the ISUP'92 Gateway IMT's messages	312

---

**Appendix K: ISUP'92 Gateway and UCP ISUP signaling protocol interworking 319**

The ISUP'92 Gateway IMT's messages mapped to the UCP ISUP signaling protocol's messages	320
UCP ISUP signaling protocol's messages mapped to the ISUP'92 Gateway IMT's messages	339

---

**Appendix L: Q.767 Gateway IMT and ISUP'92 Gateway IMT interworking 353****Appendix M: Gateway IMT call flowchart 355****List of terms 367****Ordering Information 375**

---



---

## About this document

---

### When to use this document

Use this document to learn how the Gateway IMT works in your network, how to activate the Gateway IMT, what features are provided on the Gateway IMT, and which messages, parameters, and interworkings are supported on the Gateway IMT.

### How to check the version and issue of this document

The version and issue of the document are indicated by numbers, for example, 01.01.

The first two digits indicate the version. The version number increases each time the document is updated to support a new software release. For example, the first release of a document is 01.01. In the *next* software release cycle, the first release of the same document is 02.01.

The second two digits indicate the issue. The issue number increases each time the document is revised but rereleased in the *same* software release cycle. For example, the second release of a document in the same software release cycle is 01.02.

### References in this document

The following documents are referred to in this document:

- *UCS DMS-250 Data Schema Reference Manual*, 297-2631-851
- *UCS DMS-250 General Description*, 297-2621-100
- *UCS DMS-250 Logs Reference Manual*, 297-2631-840
- *UCS DMS-250 Operational Measurements Reference Manual*, 297-2631-814

### What precautionary messages mean

The types of precautionary messages used in NT documents include attention boxes and danger, warning, and caution messages.

An attention box identifies information that is necessary for the proper performance of a procedure or task or the correct interpretation of information or data. Danger, warning, and caution messages indicate possible risks.


Examples of the precautionary messages follow.

**ATTENTION** Information needed to perform a task


**ATTENTION**

If the unused DS-3 ports are not deprovisioned before a DS-1/VT Mapper is installed, the DS-1 traffic will not be carried through the DS-1/VT Mapper, even though the DS-1/VT Mapper is properly provisioned.


**DANGER** Possibility of personal injury

 **DANGER**  
Risk of electrocution  
Do not open the front panel of the inverter unless fuses F1, F2, and F3 have been removed. The inverter contains high-voltage lines. Until the fuses are removed, the high-voltage lines are active, and you risk being electrocuted.

**WARNING** Possibility of equipment damage

 **WARNING**  
Damage to the backplane connector pins  
Align the card before seating it, to avoid bending the backplane connector pins. Use light thumb pressure to align the card with the connectors. Next, use the levers on the card to seat the card into the connectors.

**CAUTION** Possibility of service interruption or degradation

 **CAUTION**  
Possible loss of service  
Before continuing, confirm that you are removing the card from the inactive unit of the peripheral module. Subscriber service will be lost if you remove a card from the active unit.

---

## How commands, parameters, and responses are represented

Commands, parameters, and responses in this document conform to the following conventions.

### Input prompt (>)

An input prompt (>) indicates that the information that follows is a command:  
>BSY

### Commands and fixed parameters

Commands and fixed parameters that are entered at a MAP terminal are shown in uppercase letters:  
>BSY CTRL

### Variables

Variables are shown in lowercase letters:  
>BSY CTRL ctrl\_no

The letters or numbers that the variable represents must be entered. Each variable is explained in a list that follows the command string.

### Responses

Responses correspond to the MAP display and are shown in a different type:  
FP 3 Busy CTRL 0: Command request has been submitted.  
FP 3 Busy CTRL 0: Command passed.

The following excerpt from a procedure shows the command syntax used in this document:

- 1 Manually busy the CTRL on the inactive plane by typing  
>BSY CTRL ctrl\_no  
and pressing the Enter key.

*where*

ctrl\_no is the number of the CTRL (0 or 1)

*Example of a MAP response:*

FP 3 Busy CTRL 0: Command request has been submitted.

FP 3 Busy CTRL 0: Command passed.





---

## Chapter 1: Overview

---

### What is the Gateway IMT?

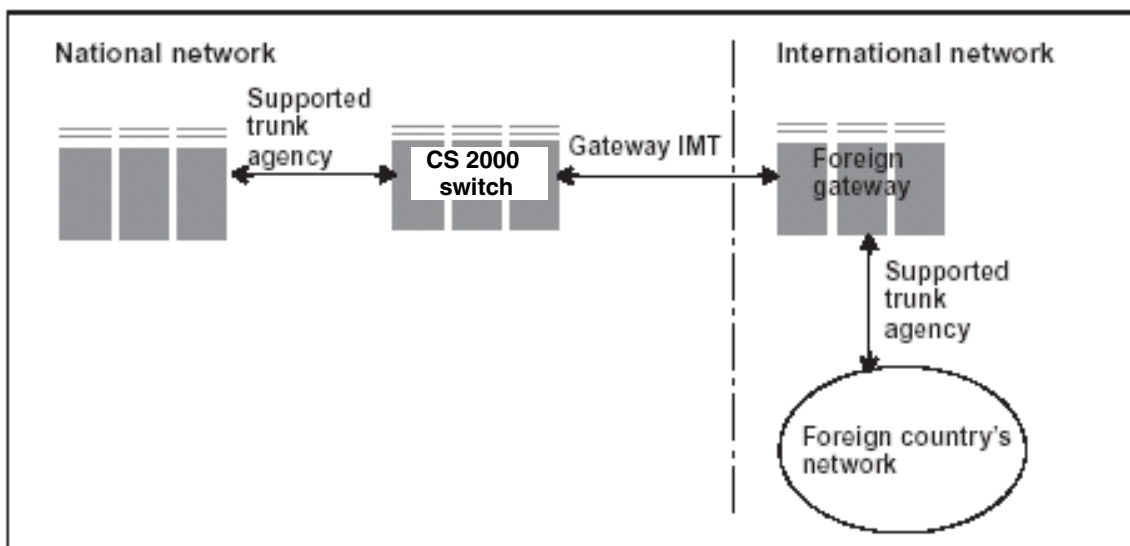
The Gateway inter-machine trunk (IMT) is an IMT trunk agency that you configure to support a limited set of gateway services. The Gateway IMT

- complies partially with ITU-T recommendations for the Q.767 and ISUP'92 signaling protocols based on DMS-300 switch implementation
- allows the CS 2000 switch in World Zone-1 (WZ-1) countries to provide limited gateway services with either Q.767 or ISUP'92 protocols
- allows the CS 2000 switch to connect directly to foreign gateways in the international network with either Q.767 or ISUP'92 protocol signaling

### National network vs. international network

The national network is the network within the country in which the CS 2000 switch resides. The Gateway IMT connects the national network to the international network. The international network contains the foreign gateways, which serve as gateways to the foreign countries' networks. See Figure 1, "National and international networks," on page 18.

Figure 1 National and international networks



### What are the hardware requirements?

The following hardware is required for the Gateway IMT:

- GWC with SN07 + PVG

### Which signaling protocols does the Gateway IMT use?

The Gateway IMT uses two signaling protocols:

- Q.767 is a signaling protocol that recognizes, receives, and sends messages based on the ITU-T Recommendation Q.767 Blue Book. For a complete list and explanations of these messages, see
  - Appendix B: “Q.767 Gateway IMT messages.”
  - Appendix C: “Q.767 messages and parameters.”

For interworking relationships, see

- Appendix D: “Q.767 Gateway IMT and PRI interworking.”
- Appendix E: “Q.767 Gateway IMT and PTS signaling protocol interworking.”
- Appendix F: “Q.767 Gateway IMT and UCP ISUP signaling protocol interworking.”
- Appendix L: “Q.767 Gateway IMT and ISUP’92 Gateway IMT interworking.”
- ISUP’92 is a signaling protocol that recognizes, receives, and sends messages based on the ITU-T Recommendation Q.764 White Book. For a complete list and explanations of these messages, see
  - Appendix G: “ISUP’92 Gateway IMT messages.”

- 
- Appendix H: “ISUP’92 Gateway IMT messages and parameters.”

For interworking relationships, see

- Appendix I: “CS 2000ISUP’92 Gateway and PRI interworking.”
- Appendix J: “ISUP’92 Gateway and PTS signaling protocol interworking.”
- Appendix K: “ISUP’92 Gateway and UCP ISUP signaling protocol interworking.”
- Appendix L: “Q.767 Gateway IMT and ISUP’92 Gateway IMT interworking.”

### **Which gateway features are available?**

Table 1, “Gateway features,” lists the gateway features, describes each feature, and shows which signaling protocols support each feature.

*Note 1:* See Appendix A: “Gateway IMT features,” for information on each feature.

*Note 2:* The Gateway IMT does not support release link trunk (RLT) functionality. This includes the support of the RLT option on the ISUP’92 and Q.767 trunk agencies and the interworking of the ISUP’92 and Q.767 Gateway IMT trunk agencies with RLT trunk agencies.

Table 1 Gateway features

Feature	Description of feature	Q.767	ISUP '92
A-law/U-law conversion	converts A-law to U-law pulse code modulation (PCM) encoding. U-law PCM encoding is required to interwork the CS 2000 Enet U-law PCM encoding with T1 spans to interwork with the A-law PCM encoding and E1 spans (Gateway IMT trunk agencies).	X	X
bearer capability screening	determines whether a trunk is capable of carrying a call that requires a trunk with a specific bearer capability.	X	X
calling party category (CPC) handling	provides CPC screening, CPC routing, and CPC override	X	X
cause value handling	maps causes to treatments when the release message contains a cause value other than Normal call clearing	X	X
country code processing.	processes the country code in international calls.	X	X
<b>Note:</b> You must order and activate SOC GIMT0003 to use the gateway features.			
data calls	allows the Gateway IMT to process data calls and to mark an incoming call as a data call.	X	X
NetworkBuilder	allows the CS 2000 switch to query a service control point (SCP), which is a database that exists outside of the CS 2000 switch, to perform additional services. <b>Note:</b> Calls that originate on the ISUP'92 Gateway IMT are not supported by NetworkBuilder.	X	X
Network Security (NETSEC)	allows the generation of a call detail record (CDR) or NETS601/NETS603 log at call answer time based on the screening result. NETS602/NETS604 may be generated at call disconnect time if CDR or NETS601/NETS603 was generated at call answer time.	X	X
overlap sending	allows the Gateway IMT to receive the address message in sections, rather than in one message.	X	X
protocol timers	allows you to set signaling timers per trunk sub-group.	X	X
satellite Indication	indicates whether the call came over a satellite at any point in its route before it reached the CS 2000 switch.	X	X

Feature	Description of feature	Q.767	ISUP '92
test calls	are calls you send over a trunk to test the trunk.	X	X
Table TRKGRP nature of address enhancements	enhances nature of address (NOA) delivery in the called party address parameter of the outgoing initial address message (IAM).	X	X
<i>Note:</i> You must order and activate SOC GIMT0003 to use the gateway features.			

### Which trunk agencies does the Gateway IMT interwork with?

The Gateway IMT with Q.767 or ISUP'92 signaling protocols can interwork with the following CS 2000 trunk agencies:

- SS7 UCP (Inter) IMT
- SS7 UCP (Intra) IMT
- SS7 FGD (UCP)
- PTS FGD
- FGB
- PRI
- DAL TIE

Table 2, "Trunk agency interworkings," shows which trunk agencies' signaling protocols can interwork together.

**Table 2 Trunk agency interworkings**

Originating trunk agency	Terminating trunk agency
ISUP'92 Gateway IMT	ISUP'92 Gateway IMT
Q.767 Gateway IMT	Q.767 Gateway IMT
ISUP'92 Gateway IMT	Q.767 Gateway IMT
Q.767 Gateway IMT	ISUP'92 Gateway IMT
ISUP'92/Q.767 Gateway IMT	SS7 UCP (inter) IMT
ISUP'92/Q.767 Gateway IMT	SS7 UCP (intra) IMT
ISUP'92/Q.767 Gateway IMT	SS7 FGD (UCP)
ISUP'92/Q.767 Gateway IMT	PTS FGD
ISUP'92/Q.767 Gateway IMT	FGB
ISUP'92/Q.767 Gateway IMT	PRI
ISUP'92/Q.767 Gateway IMT	DAL-TIE
SS7 UCP (inter) IMT	ISUP'92/Q.767 Gateway IMT
SS7 UCP (intra) IMT	ISUP'92/Q.767 Gateway IMT
SS7 FGD (UCP)	ISUP'92/Q.767 Gateway IMT
PTS FGD	ISUP'92/Q.767 Gateway IMT
FGB	ISUP'92/Q.767 Gateway IMT
PRI	ISUP'92/Q.767 Gateway IMT
DAL-TIE	ISUP'92/Q.767 Gateway IMT

### Which call types does the Gateway IMT support?

The Gateway IMT supports four types of calls:

- direct termination and transit international direct-dialed-digits (IDDD)
- direct termination and transit international operator-assisted calls
- direct termination and transit code 11 and code 12 calls
- tie-route connections between two CS 2000 switches

**Note 1:** The Gateway IMT handles each of these call types as automatic service calls.

**Note 2:** For a detailed description of each of these call types, see Chapter 2: “Call Types.”

**Note 3:** For a call flowchart, see Appendix M: “Gateway IMT call flowchart.”

### Which maintenance features are available?

The Gateway IMT trunk agency supports the existing IMT trunk operational measurements (OMs) and logs. For more information, see the *UCS DMS-250 Operational Measurements Reference Manual* and the *UCS DMS-250 Logs Reference Manual*. In addition to those maintenance features, Gateway IMT also supports test calls, as described below.

## Test calls

The Gateway IMT trunk agency supports the test calls maintenance feature, which includes calls that originate from test facilities on the near-end switch. Test calls allow you to simulate normal operating conditions, thereby testing the trunk connections to other offices, both local and toll.

The test calls feature includes the following types of testing facilities:

- manual test calls, which originate from the TST or OP commands at the Trunk Test Position (TTP) level of the MAP terminal
- automatic test calls, which originate from the Automatic Trunk Test (ATT) level of the MAP terminal

Test Line Tests (TLT) occur when test calls are sent over the test lines. The calling office controls the TSTs, which can be initiated as follows:

- manually from the Trunk Test Position (TTP) level of the MAP terminal (using the TST and OP commands)
- automatically from the Automatic Trunk Test (ATT) level of the MAP terminal

The testing facility ensures that test calls designed to test Gateway IMT trunks are terminated on the specified test lines. The testing facility designates which trunk member to test, and then outpulses a called party number to the terminating end (far-end) switch. The far-end switch performs translations to terminate to the remote test device or trunk. Based on the incoming digits, the far-end switch can terminate the call to any remote test device available for IMT trunk testing on the CS 2000 International switch.

The Gateway IMT trunk agency supports the following three types of test calls, which travel over corresponding, dedicated test lines:

- T100 (balanced termination test line)
- T101<sup>1</sup> (communication test line)
- T102 (Milliwatt test line)

**Note:** For more information on test calls, see “Test calls” in Appendix A: “Gateway IMT features.”

## How is billing affected?

The Gateway IMT supports the SN07 and above CDR templates. The call detail record's (CDR's) fields are captured as shown in the *UCS DMS-250 Billing Records Application Guide*, with the following exceptions:

- The INCINTL field is set based on the nature of address (NOA) in the calling party address parameter. If the NOA in the calling party address parameter is set to INTL\_SIG\_NUMBER, then the field is set to Y (yes).

---

1. T101 testline is supported only in a hybrid configuration.

- The CLGPTYNO field captures up to the most significant 15 digits of the calling party's address received in the calling party address parameter of the initial address message (IAM).
- The CALLEDNO field captures the most significant 15 digits of the called party's address used in translations.
- The DIALEDNO field captures the most significant 15 digits of the called party's address after pretranslations.
- The OUTPUTNO field captures the most significant 15 digits of the outpulsed number. If translations inserts a B or C digits in the outpulsed number, then these digits are represented by \* (for the B digit) and # (for the C digit) signs in the TBCD digit format.
- The PREDIG field contains three bits that define the dialed prefix digits. When a call is a code 11 or code 12 call, this field captures a 0.
- The CNPREDIG field contains the called number's prefix digits. When a call is a code 11 or code 12 call, this field captures a 0.

### What feature interactions should I be aware of?

The following restrictions apply to the Gateway IMT:

- For Gateway IMT, CS 2000 must be configured as a carrier switch like the DMS-250.
- If there is no Recording Unit (RU) for the call, no NETS logs are generated, even if all of the screening criteria are met.
- Profile index 0 of table NETSPROF is reserved for indicating no profile screening is required. Index zero (0) is not allowed to be datafilled in table NETSPROF, therefore, only 255 "fraud" profiles are supported.
- Regardless of the state of SOC UBFR0003, fraud profile index is displayed when issuing LISTFRAUD, SET, and LIST subcommands.
- It is the user's responsibility to datafill CCTABLE table. If the real country code is not datafilled in this table, FALSE is returned as Country\_code screening result, meaning the country code is not matched.
- In the case that the originator reoriginates the call after answer and before the terminator disconnects, if NETS601/NETS603/CDR is generated at the call answer time and SOC UBFR0003 was in the ON state, NETS602/NETS604 is generated.

**Note:** NETSEC functionality is not supported on SS7 Intra IMT.

- The Gateway IMT does not support CLI screening.
- The Gateway IMT does not support local number portability (LNP).
- The Gateway IMT does not support release link trunk (RLT). This restriction includes the interworking of the Gateway IMT with RLT trunk agents.



- The Gateway IMT does not support CIC Routing. If the Gateway IMT receives the TNS or CIP parameters, it discards the parameters. When the Gateway IMT is the terminating agent, it does not deliver these parameters.
- The Gateway IMT is unable to originate NetworkBuilder calls. NetworkBuilder calls can terminate to the Gateway IMT. See “NetworkBuilder,” in Appendix A: “Gateway IMT features,” for more information.
- CGETS functionality, including IAM priority, is not supported.



---

## Chapter 2: Call Types

---

This chapter describes the call types the Gateway IMT supports. It is divided into two parts:

- The first part describes the paths calls can take through the network in which the Gateway IMT and the CS 2000 switch reside.
- The second part of this chapter describes the calls the Gateway IMT supports.

*Note:* For a call flowchart, see Appendix M: “Gateway IMT call flowchart.”

### What are the types of calls?

The Gateway IMT supports four types of calls:

- direct termination and transit international direct-dialed digits (IDDD) calls
- direct termination and transit operator-assisted (OA) calls
- direct termination and transit code 11 and code 12 calls
- tie-route connections

*Note:* The CS 2000 switch handles the call types as automatic service calls.

The CS 2000 switch uses the country code to determine the call type. If the country code equals the serving country code, the CS 2000 switch identifies the call as a direct termination outbound international call; otherwise, it identifies the call as a transit outbound international call.

*Note:* For more information on country code processing, see Appendix A: “Gateway IMT features.”

The Gateway IMT supports 15-digit international direct-dialed digit (IDDD) requirements for the called party number and the calling party number. The Gateway IMT can receive and outpulse nature of address (NOA) values for the called party number and the calling party number. The national significant value (0000011) is supported on three call types:

- direct termination IDDD calls
- direct termination operator-assisted calls

- direct termination code 11/12 calls

The international significant value (0000100) is also supported on three call types:

- transit IDDD calls
- transit operator-assisted calls
- transit code 11/12 calls

## Direct termination calls

The term “direct” means a call goes straight to its destination, rather than traveling through more than one foreign gateway to reach its destination. A call is a direct termination call if either the call originates in the national network and terminates directly to the foreign gateway that serves as a gateway to the foreign country the caller is calling, or the call originates in the foreign gateway and terminates directly to the national network that the caller is calling.

The Gateway IMT supports two types of direct termination calls:

- direct termination outbound international
- direct termination inbound national

*Note:* Although these calls are described above as international or national, they are all international calls. “Outbound international” means the call is leaving the national network and entering a foreign gateway; “inbound national” means the call is leaving a foreign gateway and entering the national network.

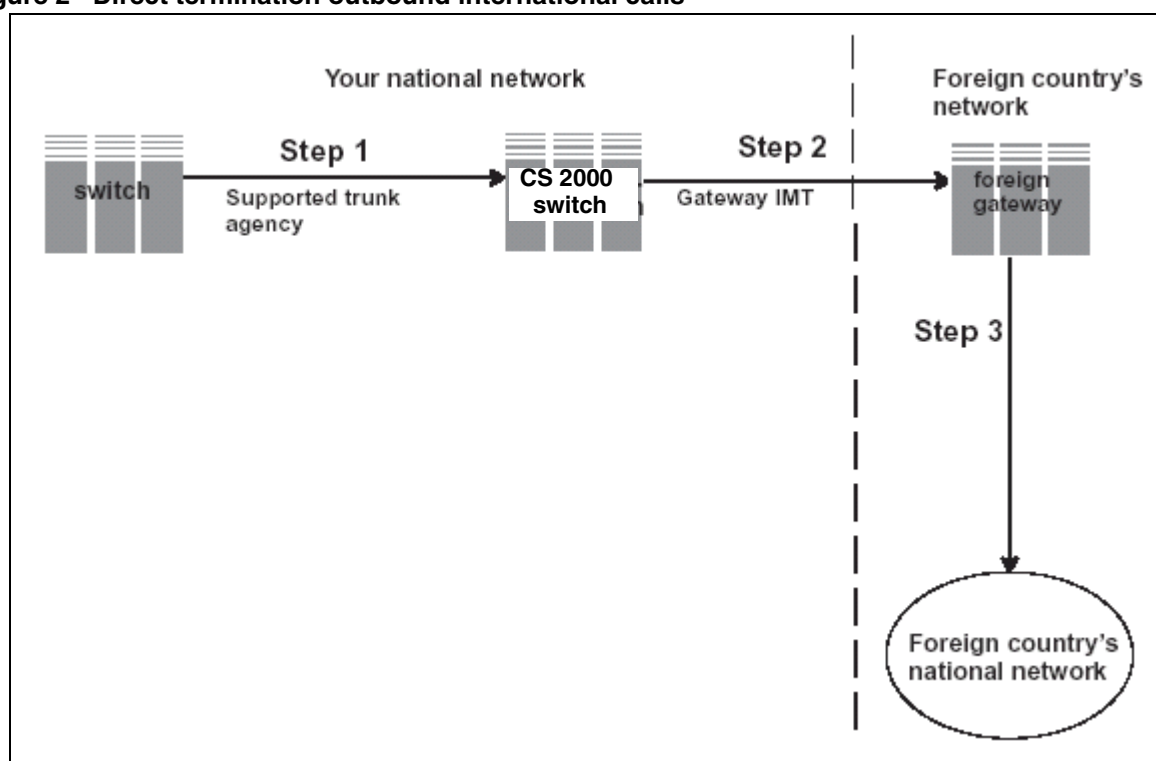
### Direct termination outbound international

Direct termination outbound international calls are calls that terminate directly to the foreign gateway of the foreign country the caller is calling. The term “outbound” means that the call is leaving the national network. For example, if you are placing a call from your country to a foreign country, your call will follow this path:

1. Your call travels from a switch in your national network to the CS 2000 switch with the Gateway IMT.
2. The CS 2000 switch sends the call across the Gateway IMT to the foreign gateway that serves the foreign country you are calling.
3. The foreign gateway routes the call to that foreign country’s national network.

See “Figure 2 Direct termination outbound international calls.”

**Figure 2 Direct termination outbound international calls**



### **Outgoing initial address message information for a direct termination outbound international call**

The CS 2000 switch classifies the direct termination outbound international call as an IDDD call and performs gateway functions on four parameters in the initial address message (IAM):

- called party number parameter
- calling party number parameter
- calling party category parameter
- forward call indicator parameter

#### **Called party number parameter**

The CS 2000 switch follows the ITU-T recommendation Q.107 for the called party number parameter:

- The CS 2000 switch sets the nature of address (NOA) to the national significant value (0000011).
- The CS 2000 switch uses 15-digit IDDD +#F as the called number format.

*Note:* The CS 2000 switch adds the end-of-digit (#F) to the called number.

- The CS 2000 switch removes any international prefixes, such as 011.

- The CS 2000 switch sends the called number in en bloc format. En bloc is a signaling method in which the address digits are assembled into one block for onward transmission. The block contains all address information necessary to route the call to its destination.

### **Calling party number parameter**

If the CS 2000 switch receives the calling party number parameter in the originating call information, it does the following:

- The CS 2000 switch sets the nature of address (NOA) to the international significant value (0000100).
- The CS 2000 switch adds the national network's country code to the beginning of the calling party number.

*Note:* The maximum number of digits supported in the calling party number is 15.

- The CS 2000 switch uses calling line identifier (CLI) or automatic number identification (ANI) delivery to determine if it delivers the calling party parameter.

### **Calling party category parameter**

The CS 2000 switch does the following when it receives the calling party category (CPC) parameter:

- If the CPC value has not been overridden by the CPCSCRN option nor the SX routing selector and the CPC has a value of "not used," the CS 2000 switch sets the CPC value to ordinary calling subscriber (00001010). The "not used" values are:
  - calling party's category unknown at this time (00000000)
  - reserved (00001001)
  - spare for national use (11100000 to 11111110)

### **Forward call indicator parameter**

The CS 2000 switch sets the national/international indicator (Bit A) to call to be treated as a national call (0).

## **Direct termination inbound national**

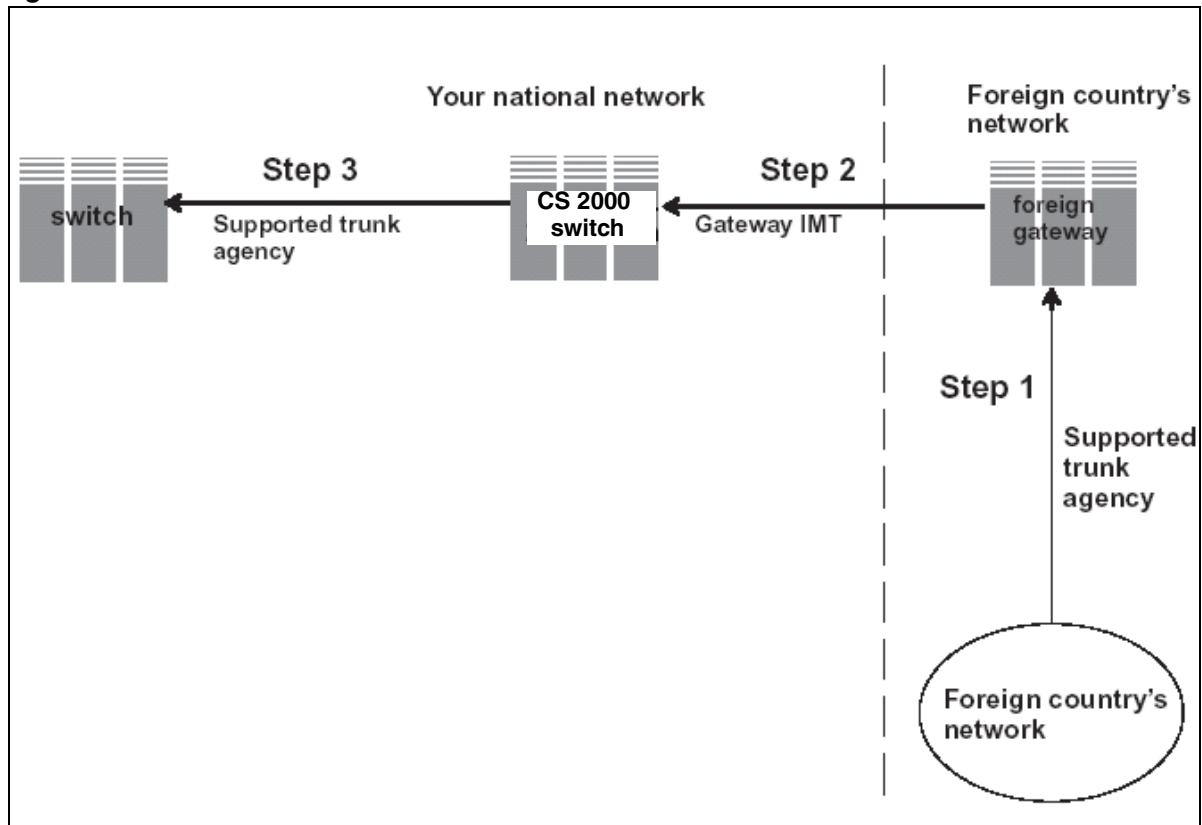
The term "inbound" means the call terminates in the national network. A call is a direct termination inbound national call if it originates in the international network and terminates directly to the national network where the CS 2000 switch resides. For example, if someone in a foreign country calls you, the call follows this path:

1. switch in the foreign country's network sends the call to the foreign gateway.

2. The foreign gateway sends the call over the Gateway IMT to the CS 2000 switch in your national network.
3. The CS 2000 switch sends the call to another switch in your national network.
4. This switch sends the call to you.

See “Figure 3 Direct termination inbound national call.”

**Figure 3 Direct termination inbound national call**



### **Incoming initial address message information for a direct termination inbound national call**

The CS 2000 switch must receive the four parameters in the initial address message (IAM) from the foreign gateway:

- called party number parameter
- calling party number parameter
- calling party category parameter
- forward call indicator parameter

#### **Called party number parameter**

The CS 2000 switch must receive the following information in the called party number parameter:

- The nature of address (NOA) must have the national significant value (0000011).
- The called number format must be 10-digit national number + #F.
- The called number must contain a world zone-1 (WZ-1) national number, which is the 10-digit, national number.
- If it receives the end-of-digit (#F) at the end of the called number, the CS 2000 switch removes the digit before it accesses table STDPRTCT.
- If the called number does not contain the end-of-digit (#F), the CS 2000 switch waits for a subsequent address message (SAM) before it proceeds with translations. If time-out occurs before it receives a SAM, the CS 2000 switch proceeds with translations.

### **Calling party number parameter**

The CS 2000 switch must receive the following information in the calling party number parameter:

- The nature of address (NOA) must have an international significant number.
- The calling party number must be prefixed with the country code of the subscriber. The calling party number must have a maximum of 15 digits. The most significant digits exceeding 15 digits are removed from the calling party number.
- If the end-of-digit (#F) is attached to the calling party number, the CS 2000 switch removes the end-of-digit.
- If it receives an incomplete calling party number, the CS 2000 switch discards the calling party number. If the calling party number is incomplete, the incomplete indicator's (NI) value is incomplete.

### **Calling party category parameter**

The foreign gateway sets the calling party category's (CPC) value to "ordinary calling subscriber" (00001010). This value depends on how the call is classified (DDD, OA).

*Note:* During translations, this value can be updated based on data in table CPCSCRN or in the SX routing selector.

### **Forward call indicator parameter**

If the foreign gateway fails to set the national/international call indicator (Bit A) to "call to be treated as national call" (0), then the CS 2000 switch sets Bit A to this value.

## **Transit calls**

A call is a transit call if it travels through more than one foreign gateway to terminate in a foreign country's network. The Gateway IMT supports three types of transit calls:



- 
- transit inbound national
  - transit outbound international
  - transit inbound international

### **Transit inbound national**

Transit inbound national calls are calls that travel through more than one foreign gateway before terminating in the national network. The CS 2000 switch handles transit inbound national calls the same as direct termination inbound national calls. See “Direct termination inbound national” in this chapter for more information.

### **Transit outbound international**

A call is a transit outbound international call if it travels through more than one foreign gateway to terminate in the international network.

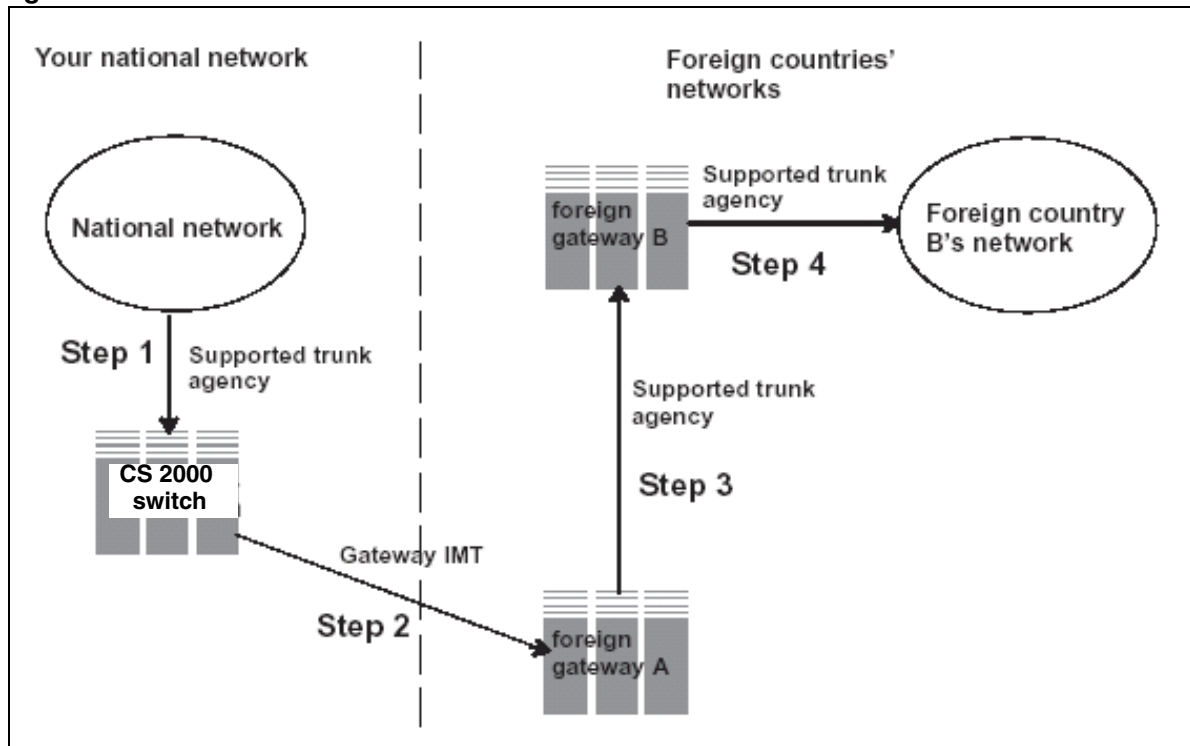
*Note:* A transit outbound international call can originate in either the foreign network or the national network. When it originates in the foreign network it is called a transit inbound international call. See “Transit inbound international” in this chapter for more information.

If you place a call to foreign country B, the call will follow this path if it is a transit outbound international call originating in the national network:

1. A switch in the national network sends your call to the CS 2000 switch.
2. The CS 2000 switch sends the call, over the Gateway IMT, to foreign gateway A.
3. Foreign gateway A sends the call to foreign gateway B.
4. Foreign gateway B sends the call to foreign country B’s national network and the call terminates in this network.

See “Figure 4 Transit outbound international calls.”

Figure 4 Transit outbound international calls



### Incoming initial address message information for transit outbound international calls

The Gateway IMT can receive the following parameters in the IAM:

- called party number parameter
- calling party number parameter

*Note:* Whether the CS 2000 switch receives these parameters and the information described in this section depends on where and how the call originated.

#### Called party number parameter

The CS 2000 switch can receive the following information in the called party number parameter:

- The nature of address (NOA) can have the international significant value (0000100).
- The called number format can be 15-digit IDDD + #F.
- The called number can contain WZ-1 national number, which is a ten-digit number.
- If the end-of-digit (#F) is attached to the end of the called number, the CS 2000 switch removes it before accessing table STDPRTCT.

- 
- If the called number is incomplete (the end-of-digit [#F] is not attached to the called number), the CS 2000 switch waits for the subsequent address message (SAM) before it proceeds with translations. If time-out occurs, the CS 2000 switch proceeds with translations.

### **Calling party number parameter**

The CS 2000 switch can receive the following information in the calling party number parameter:

- The nature of address (NOA) can be the international significant value ((0000100).
- The calling party number begins with the subscriber's country code. The calling party number can have a maximum of 15 digits, based on the 15-digit IDDD format.
- If the end-of-digit (#F) is attached to the end of the calling party number, the CS 2000 switch removes it.
- If the CS 2000 switch receives an incomplete calling party number (the calling party number incomplete indicator [NI] equals "incomplete"), it discards the calling party number parameter.

### **Outgoing initial address message information for transit outbound international calls**

The CS 2000 switch classifies the transit outbound international call as an IDDD call and sends information in four parameters of the IAM:

- called party number parameter
- calling party number parameter
- calling party category parameter
- forward call indicator parameter

### **Called party number parameter**

The CS 2000 switch sends the following information in the called party number parameter:

- The CS 2000 switch sets the nature of address (NOA) to the international significant value (0000100).
- The called number format is 15-digit IDDD + #F.
- The CS 2000 switch removes any international prefix digits from the called number based on the national dialing plan.
- The called number contains the destination country code dialed by the subscriber.
- The CS 2000 switch attaches the end-of-digit (#F) to the end of the called number.

- The CS 2000 switch delivers the called number in en bloc format. En bloc is a signaling method in which the address digits are assembled into one block for onward transmission. The block contains all address information necessary to route the call to its destination.

### **Calling party number parameter**

The CS 2000 switch sends the following information in the calling party number parameter:

*Note 1:* The calling party number parameter is only delivered if the originating trunk agency supports ANI delivery.

*Note 2:* The calling party number can have a maximum of 15 digits.

- The CS 2000 switch sets the nature of address (NOA) to the international significant value (0000100).
- If the originating trunk agent is a Gateway IMT, the CS 2000 switch assumes the previous foreign gateway attached the country code to the beginning of the calling party number.
- If the call originated on a supported UCS trunk agent, the CS 2000 switch attaches the OFC\_SERVING\_CC office parameter's value.

### **Calling party category parameter**

The CS 2000 switch sets the calling party category to “ordinary calling subscriber” (00001010) if the CPCSCRN option has not overridden it and if the CPC value has a value associated with “not used” values. The “not used” values are:

- calling party category unknown at this time (00000000)
- reserved (00001001)
- spare for national use (11100000 to 11111110)

### **Forward call indicator parameter**

If the national/international indicator (Bit A) has not been set to 1, the CS 2000 switch sets Bit A to 1.

## **Transit inbound international**

A call is a transit inbound international call if it originates in the international network, routes through the CS 2000 switch on the Gateway IMT, and terminates in the international network. The term “inbound” means the call is coming into the national network; however, in the case of transit inbound international calls, the call terminates in the international network, rather than the national network. For example, if someone in foreign country A calls someone in foreign country B, the call is a transit inbound international call if it follows this path:

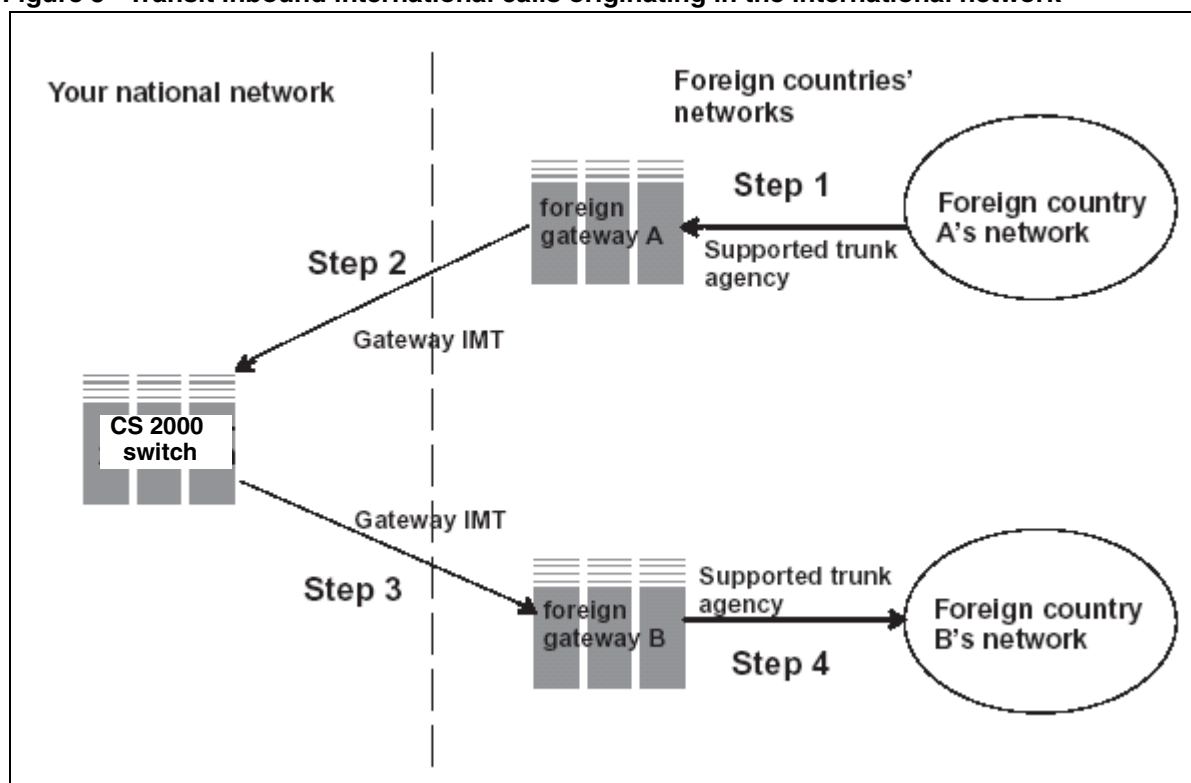
1. A switch in foreign country A sends a call to the foreign gateway.

2. The foreign gateway sends the call to the CS 2000 switch over the Gateway IMT.
3. The CS 2000 switch sends the call, over the Gateway IMT, to foreign country B's foreign gateway.
4. The foreign gateway sends the call to foreign country B's national network.

**Note:** The CS 2000 switch handles the incoming and outgoing IAM information in a transit inbound international call the same as a transit outbound international call. See “Incoming initial address message information for transit outbound international calls” and “Outgoing initial address message information for transit outbound international calls” in this chapter for the IAM information in a transit inbound international call.

See “Figure 5 Transit inbound international calls originating in the international network”.

**Figure 5 Transit inbound international calls originating in the international network**



## Tie-route connections

A call is a tie-route connection if it goes through two or more CS 2000 switches, connected by the Gateway IMT, to reach the international network. The Gateway IMT supports three types of tie-route connections:

- direct termination inbound national
- direct termination outbound international

- transit outbound international

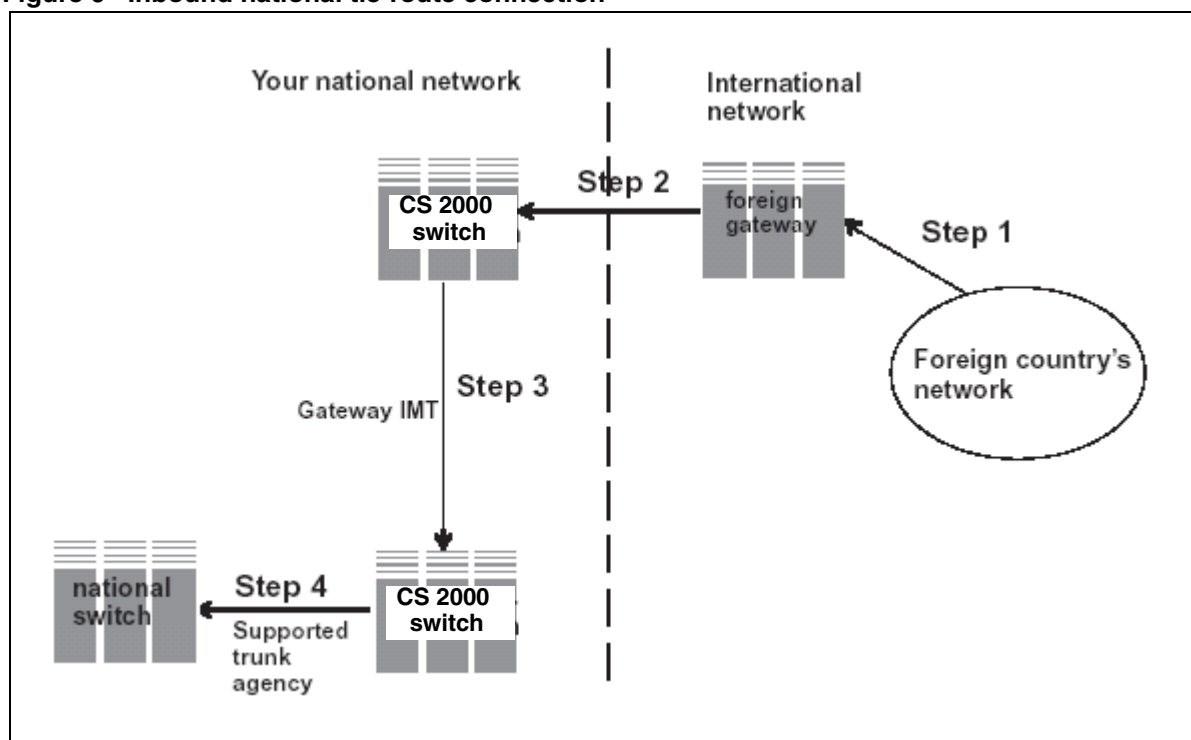
### **Direct termination inbound national tie-route connection**

If a call is a direct termination inbound national tie-route connection, it follows this path:

1. The call originates in the international network.
2. The foreign gateway sends the call to the CS 2000 switch with the Gateway IMT. This call is a direct termination inbound international call.
3. The CS 2000 switch classifies the call as a national call, routes the call over a Gateway IMT to another CS 2000 switch within the national network. The call is a direct termination inbound national call.
4. The last CS 2000 switch sends the call to a switch in the national network. The call terminates in the national network.

See “Figure 6 Inbound national tie-route connection”

**Figure 6 Inbound national tie-route connection**



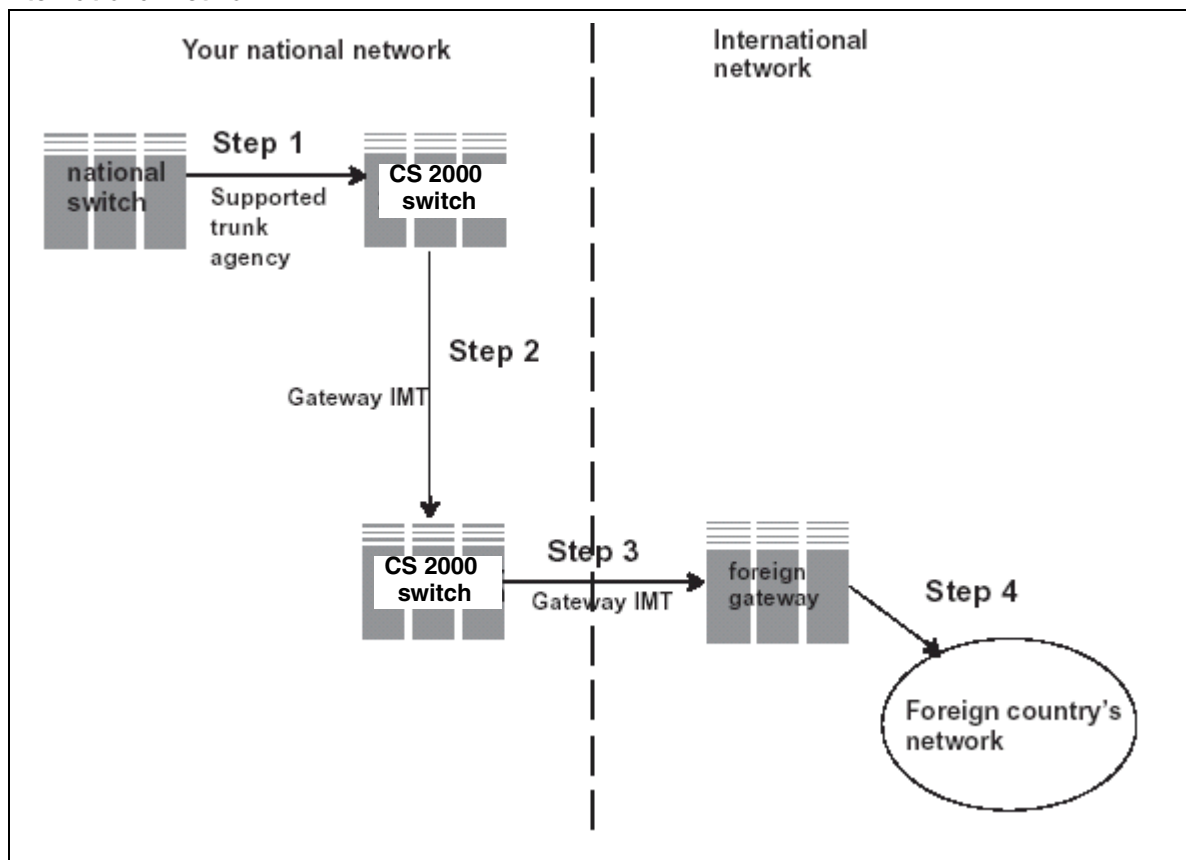
### **Direct termination outbound international tie-route connection**

If a call is a direct termination outbound international tie-route connection, it originates in the national network and terminates in either the international network or the national network. When the call terminates in the national network the first CS 2000 switch with the Gateway IMT treats the call as an outbound international call and the second CS 2000 switch it encounters treats the call as an inbound international call. If the call terminates in the international network, it follows this path:

1. The call originates in the national network. A national switch sends the call to the CS 2000 switch with the Gateway IMT.
2. The CS 2000 switch treats the call as a transit outbound international call, sends the call over a Gateway IMT to a second CS 2000 switch with the Gateway IMT. This is the tie-route connection.
3. The second CS 2000 switch treats the call as a direction outbound international call and sends the call to a foreign gateway in the international network.
4. The foreign gateway routes the call to the foreign country, where the call terminates.

See “Figure 7 Direct termination outbound international tie-route connection that terminates in the international network.”

**Figure 7 Direct termination outbound international tie-route connection that terminates in the international network**



### Transit outbound international tie-route connection

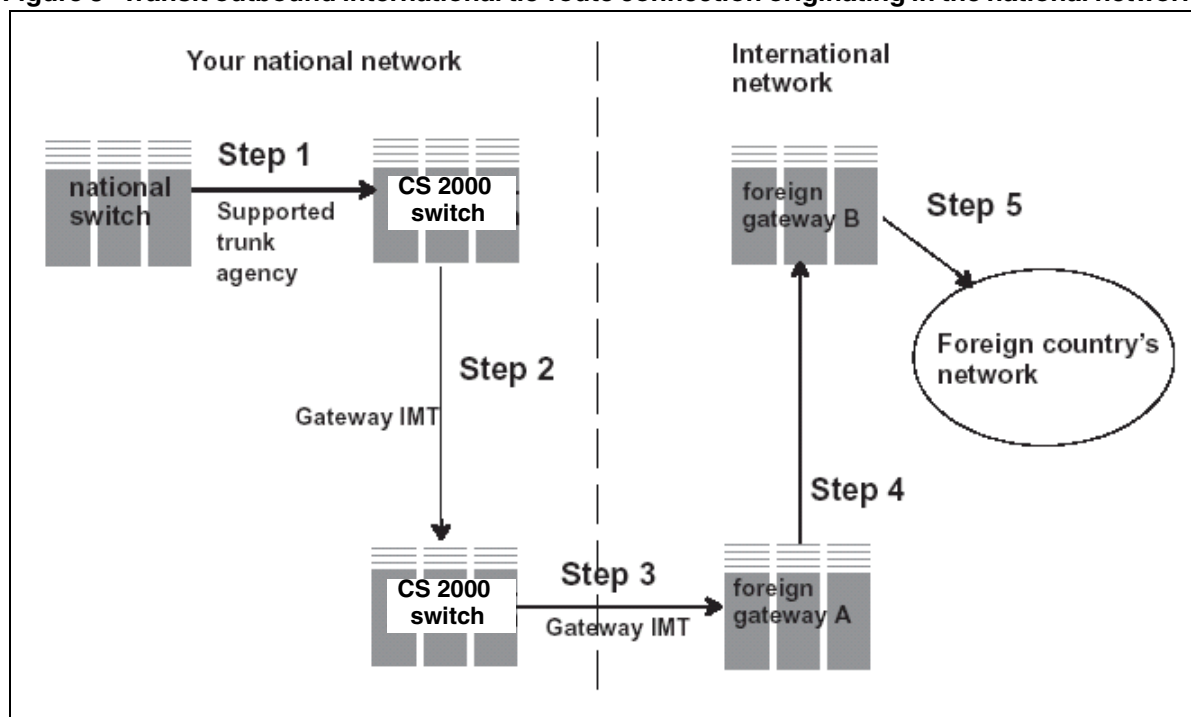
If a call is a transit outbound international tie-route connection it originates in either the national network or the international network and it terminates in the international network. If the call originates in the national network, it follows this path:

1. The call originates in the national network. A national switch sends the call to the CS 2000 switch with the Gateway IMT.
2. The CS 2000 switch treats the call as a transit outbound international call and sends the call over the Gateway IMT to a second CS 2000 switch. This connection is a tie-route connection.
3. The second CS 2000 switch treats the call as a transit outbound international call and sends the call over the Gateway IMT to a foreign gateway (foreign gateway A in Figure 8).
4. Foreign gateway A sends the call to foreign gateway B.
5. Foreign gateway B sends the call to the foreign gateway B's network where the call terminates.



See “Figure 8 Transit outbound international tie-route connection originating in the national network.”

**Figure 8 Transit outbound international tie-route connection originating in the national network**

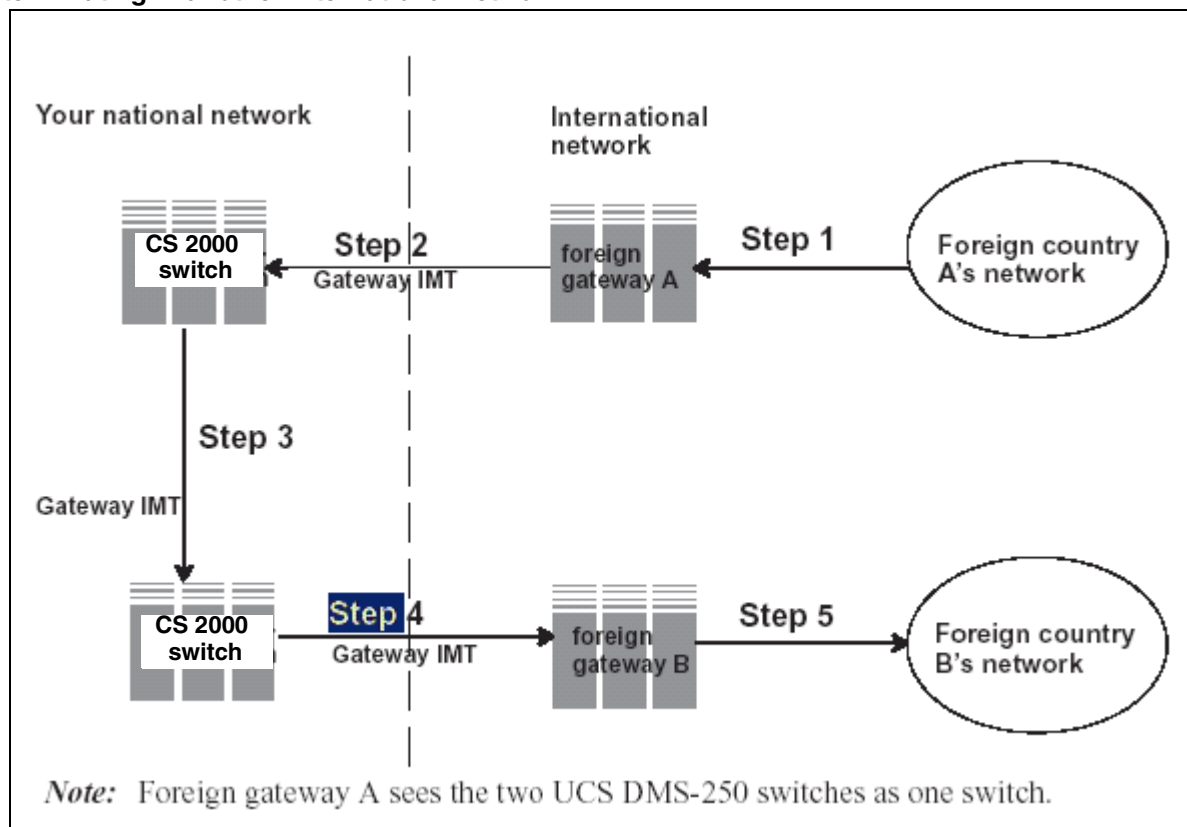


If the call originates in the international network, it follows this path:

1. The call originates in foreign country A's network. A switch in foreign country A sends the call to foreign gateway A.
2. Foreign gateway A sends the call over the Gateway IMT to the CS 2000 switch. This is a direct termination inbound international connection.
3. The CS 2000 switch treats the call as a transit outbound international call and sends the call over the Gateway IMT to a second CS 2000 switch. This is a tie-route connection.  
*Note:* Foreign gateway A sees the two CS 2000 switches that form the tie-route connection as one switch. It treats the call as a transit call because it is using the two CS 2000 switches to connect with foreign gateway B.
4. The second CS 2000 switch treats the call as a transit outbound international call and sends the call over a Gateway IMT to foreign country B's foreign gateway B.
5. Foreign gateway B sends the call to foreign country B's network where the call terminates.

See “Figure 9 Transit outbound international tie-route call originating in an international network and terminating in another international network.”

**Figure 9 Transit outbound international tie-route call originating in an international network and terminating in another international network**



## IDDD calls

An IDDD call is an international direct-dialed digit call. The Gateway IMT supports 15-digit IDDD calls, which means the called party number and the calling party number can have a maximum of 15 digits.

### How does the direct termination outbound international IDDD call work?

Direct termination calls are international direct-dialed-digit (IDDD) calls. IDDD calls are international calls that you dial directly; therefore, an IDDD call is an international call that does not require operator assistance. A 15-digit IDDD call uses the following format: country code + national number

*Note:* The terminating Gateway IMT is connected to the foreign gateway that serves the call's country code. In other words, the dialed country code equals the serving country code. This serving country code is datafilled in field SERVCC of the GWYTRK option in table TRKGRP.

If the call originates on a supported UCS trunk agency, it can use the IP and IN translations and NetworkBuilder to route the call to the terminating Gateway IMT.

---

International translations routes the call to a Gateway IMT. For the call to be a direct termination outbound international call, the call must meet the following criteria:

- The terminating trunk agent must be a Gateway IMT.
- The serving country code must be equal to the country code in the called number. The serving country code is the country code datafilled in the SERVCC field of the GWYTRK option in table TRKGRP.

### **How does the direct termination inbound national IDDD call work?**

When a call is a direct termination inbound national call, the foreign gateway routes the call to the CS 2000 switch over the Gateway IMT. The CS 2000 switch classifies the call as a national call. It classifies the call as OFFNET in the CALLFEAT field. The CALLFEAT field is in the CT selector of table STDPRTCT. Or, in the S/T selectors of table STDPRTCT.

The Gateway IMT gets the pretranslator name from table TYP2PRTM to access table STDPRTCT, based on the called party number's NOA. The Gateway IMT supports three selectors from table STDPRTCT:

- CT selector (calltype of OFFNET)
- S selector
- T selector

The Gateway IMT supports the national translation system (HNPACONT). It supports five translation routing selectors from table HNPACONT:

- S route selector
- N route selector
- T route selector (supported UCS routing tables)
- SX route selector
- TRMT route selector

The CS 2000 switch updates the outgoing call data based on the information and translations derived and performed by the CS 2000 switch.

International translations routes the call to a Gateway IMT. For the call to be a direct termination inbound international call, the call must meet the following criteria:

- The terminating trunk agent must be a Gateway IMT.
- The serving country code must be equal to the country code in the called number. The serving country code is the country code datafilled in the SERVCC field of the GWYTRK option in table TRKGRP.

### **How does the transit outbound international IDDD call work?**

If the call originates on a supported UCS trunk agency, the CS 2000 switch uses existing international translations, which include IP and IN translations, or NetworkBuilder.

The Gateway IMT uses table TYP2PRTM to get the pretranslator name and then uses this name to access table STDPRTCT, based on the called party NOA it has received. The Gateway IMT, for transit outbound international calls, supports the NT selector (IN or IP translations) in table STDPRTCT.

International translations routes the call to a Gateway IMT. For the call to be a transit outbound international call, the call must meet the following criteria:

- The terminating trunk agent must be a Gateway IMT.
- The serving country code must be unequal to the country code in the called number. The serving country code is the country code datafilled in the SERVCC field of the GWYTRK option in table TRKGRP.

### **How does the transit inbound international IDDD call work?**

If the transit inbound international call originates on a Gateway IMT, the CS 2000 switch uses existing international translations, which are the international (IN) and international partitioned (IP) translations.

## **Operator-assisted calls**

A call is an operator-assisted call if the operator helps connect the call. The Gateway IMT supports six types of operator-assisted calls:

- direct termination inbound national operator-assisted calls
- direct termination outbound international operator-assisted calls
- transit outbound international operator-assisted calls

### **Direct termination inbound national operator-assisted**

A call is an inbound national operator-assisted call if it meets the following criteria:

- the operator helps establish the connection
- the call originates in the international network
- the call terminates directly to the national network

The call follows the same path as a direct termination inbound national call. See the section entitled “Direct termination inbound national” in this chapter to learn the path this call follows.

## How does the direct termination inbound national operator-assisted call work?

Pretranslations identifies a call as a direct termination inbound national operator-assisted call. The value operator-assisted (OA) is datafilled in the TYP-CALL field of the S or T selector in table STDPRTCT, subtable STDPRT. The S and T selectors classify the call as a national call (OFFNET).

See Table 3, “Sample datafill for inbound operator-assisted calls using the T selector.” See Table 4, “Sample datafill for inbound operator-assisted calls using the S selector.”

**Table 3 Sample datafill for inbound operator-assisted calls using the T selector**

FROM-DIGS	TO-DIGS	PRE-RTSEL	TYP-CALL	NOPRE-DIG	EXTR-TEID	MIN-DIGSR	MAX-DIGSR	POS
012	012	T	OA	2	OFRT1 1	3	12	NONE

**Table 4 Sample datafill for inbound operator-assisted calls using the S selector**

FROM-DIGS	TO-DIGS	PRE-RTSEL	TYP-CALL	NOPRE-DIG	CLLI	MIN-DIGSR	MAX-DIGSR	POS
013	013	S	OA	2	UCS_T RK	3	12	NONE

The CS 2000 switch handles inbound national operator-assisted calls as direct termination inbound national calls; however, it does not modify the CPC value in the initial address message (IAM), unless the CPC value is modified by the SX routing selector in table RTEATTR.

## Direct termination outbound international operator-assisted

A call is a direct termination outbound international operator-assisted call if it meets the following criteria:

- the operator helps establish the connection
- the call originates in the national network
- the call terminates directly to the international network

The call follows the same path as a direct termination outbound international call. See the section entitled “Direct termination outbound international” in this chapter to learn more about this call’s path.

To learn how this call works, see the section entitled “How do the direct termination and transit international operator-assisted call work?” in this chapter.

### Transit outbound international operator-assisted

A call is a transit outbound international operator-assisted call if it meets the following criteria:

- the operators connects the call
- the call originates in the national network
- the call travels through more than one foreign gateway
- the call terminates in the international network

This call follows the same path as a transit outbound international call. See section “Transit outbound international” to learn more about this call’s path.

### How do the direct termination and transit international operator-assisted call work?

International operator-assisted calls are identified in the NT selector with the TYPSCALL field value OA in table STDPRTCT, subtable STDPRT. The NT selector classifies the call as an international call. The CS 2000 switch compares the country code in the called number to the terminating Gateway IMT’s serving country code to determine whether the call is a direct termination outbound international call or a transit outbound international call. (The serving country code is entered in table TRKGRP, option GWYTRK, field SERVCC.)

The CS 2000 switch modifies the calling party category (CPC) value only if the SX routing selector in table RTEATTR or the NT selector option CPCSCRN modifies the value. The NT selector option CPCSCRN in table STDPRTCT allows the CS 2000 switch to perform CPC screening, routing and override for calls originating on the Gateway IMT.

**Note:** See in Appendix A: “Gateway IMT features,” the section entitled “country code processing” for more information on country codes and the section entitled “calling party category handling” for more information on CPC screening, routing, and override.

See Table 5, “Sample datafill for outbound operator-assisted calls using the T selector”.

**Table 5 Sample datafill for outbound operator-assisted calls using the T selector**

FROM-DIGS	TODIGS	PRE-RTSEL	TYPSCALL	NOPRE-DIG	TRAN-SYS	STDPRT-OPT
0117	0117	NT	OA	3	IP	\$
0118	0118	NT	OA	3	IN	CPCSCRN 20 \$

**Note:** The call is further translated using international (IN) or international partitioned (IP) translations.

## code 11 and code 12 calls

Code 11 and code 12 are international codes that signify an international call is an operator-assisted call placed by another operator. Therefore, an operator in one country places an international call to an operator in another country. Code 11 is directory assistance and code 12 is operator assistance. When the CS 2000 switch with the Gateway IMT receives a code 11 call, it translates, through digit manipulation, the call to 121. When it receives a code 12 call, it translates, through digit manipulation, the call to 131. When the CS 2000 switch receives code 11 and code 12 calls on a Gateway IMT from a foreign switch, or from a national SS7 agent, it also adds 0 or 01, based on the nature of address, to the beginning of the called number. The CS 2000 switch must use digit manipulation datafill to convert code 121 or 131 to a B hex digit or a C hex digit before sending to the foreign country's switch. The foreign country's switch, through digit manipulation, converts the 121 to code 11 and the 131 to code 12.

**Note:** Code 11 is the B hex digit and code 12 is the C hex digit.

### Direct termination outbound international code 11 and code 12 calls

A call is a direct outbound international call if it meets the following criteria:

- the called number contains the digits 121 or 131 to specify that the call requires operator assistance
- the call originates in the national network
- the call terminates directly to the international network

### How does the direct termination outbound international code 11 and code 12 call work?

The called number contents can have the following format:

01 + country code + extra digit + 121 or 131 + digits

*where:*

01	are world zone-1 (WZ-1) prefix digits for international operator-assisted calls
country code	is the code you enter for the country you are calling.
extra digit	designates the incoming foreign gateway. This digit is used when more than one foreign gateway can be reached in the destination country. The CS 2000 switch recognizes that some existing equipment does not permit the insertion of the extra digit.
121 or 131 code	identifies the call as an international operator-to-operator call. The called number can only contain either the 121 code or the 131 code.

digits are an optional number of an operator position or group of positions.

The CS 2000 switch compares the country code in the called number to the serving country code to determine whether the call is a direct outbound international operator-assisted call. (The serving country code is in table TRKGRP, option GWYTRK, field SERVCC.)

The CS 2000 switch modifies the CPC value only if the SX routing selector in table RTEATTR or the NT selector option CPCSCRN in table STDPRTCT modifies the value.

**Note:** See in Appendix A: “Gateway IMT features,” the section entitled “country code processing” for more information on country codes and the section entitled “calling party category handling” for more information on CPC screening, routing, and override.

By mapping through the routing tables, the CS 2000 switch must remove any WZ-1 prefix digits and must convert the 121 or 131 digits to code 11 or code 12 digits, respectively.

### **Transit outbound international code 11 and code 12**

A call is a transit outbound international code 11 or code 12 call if it meets the following criteria:

- the called number contains either the code 11 or code 12 digits to specify
- at the call requires operator assistance
- the call goes through more than one foreign gateway and terminates in the international network

### **How does the transit outbound international code 11 and code 12 call work?**

If a call originates on a Gateway IMT, the CS 2000 switch scans the called number for the code 11 and code 12 digits. If the code 11 or code 12 digits are in the called number, the CS 2000 switch replaces the digits with 121 or 131, respectively. Before the CS 2000 switch performs pretranslations, the prefix 01 is added to the beginning of the called party number. The CS 2000 switch uses the pretranslator name from table TRKGRP option GWYTRK field C11C12PT to access table TYP2PRTM along with the nature of address of the called number.

The CS 2000 switch can receive the following format in the IAM from the foreign gateway:

country code + extra digit + code 11 or code 12 + digits + #F

*where:*

country code is the code you enter for the country you are calling.



---

extra digit	is an optional digit that designates the incoming foreign gateway. This digit is used when more than one incoming foreign gateway can be reached in the destination country. The CS 2000 switch recognizes that some existing equipment does not permit the insertion of the extra digit.
code 11 or code 12	identifies the call as an international operator-to-operator call. The called number can only contain either the code 11 or the code 12.
digits	make up an optional number of an operator position or group of positions.

The CS 2000 switch compares the country code in the called number to the serving country code to determine whether the call is a transit Outbound international operator-assisted call. (The serving country code is in table TRKGRP, option GWYTRK, field SERVCC.)

The CS 2000 switch modifies the CPC value only if the SX routing selector in table RTEATTR or the NT selector option CPCSCRN in table STDPRTCT modifies the value.

**Note:** See in Appendix A: “Gateway IMT features,” the section entitled “country code processing” for more information on country codes and the section entitled “calling party category handling” for more information on CPC screening, routing, and override.

By mapping through the routing tables, the CS 2000 switch must remove any WZ-1 prefix digits and must convert the 121 or 131 digits to code 11 or code 12 digits, respectively.

### **Direct termination inbound national code 11 and code 12**

A call is an inbound national code 11 or 12 call if it meets the following criteria:

- the called number contains either code 11 or code 12 digits
- the call originates in the international network
- the call terminates directly to the national network

### How does the direct termination inbound national code 11 and code 12 call work?

When the call originates on a Gateway IMT, the CS 2000 switch scans the called number for the code 11 and code 12 digits. If the code 11 or code 12 digits are in the called number, the CS 2000 switch replaces them with 121 or 131, respectively. Before the CS 2000 switch performs pretranslations, the prefix 0 is added to the beginning of the called party number. The CS 2000 switch uses the pretranslator name from table TRKGRP, option GWYTRK, field C11C12PT to access table TYP2PRTM along with the nature of address (NOA) of the called number.

The foreign gateway can send the IAM in the following format:

extra digit + code 11 or code 12 + digits + #F

*where:*

extra digit	is an optional digit that designates the incoming foreign gateway. This digit is used when more than one incoming foreign gateway can be reached in the destination country.
code 11 or code 12	identifies the call as an international operator-to-operator call. The called number can only contain either the code 11 or the code 12.
digits	are an optional number of an operator position or group of positions.

The CS 2000 switch handles direct termination inbound national code 11 and code 12 calls as a direct termination inbound national operator-assisted call based on pretranslations.

### Transit inbound national code 11 and code 12 call

A call is a transit inbound national code 11 or 12 call if it meets the following criteria:

- the called number contains either the code 11 or code 12 digits to specify that the call requires operator assistance
- the call originates in the international network
- the call terminates in the national network

**Note:** For transit inbound code 11 and code 12 calls, a maximum of 14 digits are supported in the called number.

The CS 2000 switch handles transit inbound national calls the same as direct termination inbound national calls. See section “Direct termination outbound international code 11 and code 12 calls” for more information.

---

## Chapter 3: Q.767 Gateway IMT

---

### What is the Q.767 Gateway IMT?

The Gateway IMT is an inter-machine trunk that allows the CS 2000 switch to connect to a foreign gateway. The Gateway IMT gives the CS 2000 switch a limited set of gateway functions. This means that the CS 2000 switch can send and receive international calls.

Q.767 is a signaling protocol that recognizes, receives, and sends messages based on the ITU-T Recommendation Q.767 Blue Book (International Use). Q.767 can be used on the Gateway IMT to connect the CS 2000 switch to a foreign gateway. The Gateway IMT with Q.767 signaling protocol carries messages between the CS 2000 switch and a foreign gateway.

### How do I implement the Q.767 Gateway IMT trunk agency?

To implement the Gateway IMT trunk agency with Q.767 signaling protocol, follow these steps:

1. Order and activate software optionality control (SOC) GIMT0003.

**Note:** For information on how to activate SOCs, see the *UCS DMS-250 Software Optionality Control User's Manual*.

**Note:** If SOC GIMT0001 is active, you must deactivate it. SOCs GIMT0001 and GIMT0003 are unable to function simultaneously because SOC GIMT0001 is only valid for use in countries outside of world zone-1 (WZ-1) and SOC GIMT0003 is only valid for use in countries within WZ-1.

2. Enter datafill into table TRKGRP. The following steps and tables only explain the fields that pertain to the Gateway IMT in table TRKGRP. For the rest of table TRKGRP's datafill, see the *UCS DMS-250 Data Schema Reference Manual*.
  - a Enter ADDR into the DIALPLAN field in table TRKGRP. See Table 6, "DIALPLAN field in table TRKGRP."
  - b Enter GLOBAL in the NETWKSPC field in table TRKGRP. See Table 7, "NETWKSPC field in table TRKGRP."

- c Enter N in the CLIREQ and CLISCRN fields in table TRKGRP. See Table 8, “CLIREQ and CLISCRN fields in table TRKGRP.”
  - d Enter datafill into the GWYTRK field in table TRKGRP. See Table 9, “GWYTRK field in table TRKGRP.”
3. Enter datafill into table TRKSGRP.
- a Enter BLUE in the VERSION field in table TRKSGRP. See Table 10, “VERSION and VARIANT fields in table TRKSGRP.”
  - b Enter V1 in the VARIANT field in table TRKSGRP. See Table 10, “VERSION and VARIANT fields in table TRKSGRP.”

**Table 6 DIALPLAN field in table TRKGRP**

Field	Subfield	Value
DIALPLAN		ADDR
ISUPIDX		UCSGWAY

**Table 7 NETWKSPC field in table TRKGRP**

Field	Subfield	Value
NETWKSPC		GLOBAL

**Table 8 CLIREQ and CLISCRN fields in table TRKGRP**

Field	Subfield	Value
CLIREQ		N
CLISCRN		N

**Table 9 GWYTRK field in table TRKGRP**

Field	Subfield	Value
GWYTRK	SERVCC	1 to 999
	C11C12PY	an alphanumeric value derived from the values datafilled in the PRETNAM field of table STD-PRCT. NPRT is the default.

**Table 10 VERSION and VARIANT fields in table TRKSGRP**

Field	Subfield	Value
VERSION		BLUE
VARIANT		V1

## Which features does the Q.767 Gateway IMT support?

Table 11, “Q.767 Gateway IMT feature” shows you which services the Q.767 Gateway IMT supports, describes the services, and shows which tables to datafill to activate the services.

**Note:** See Appendix A: “Gateway IMT features,” for information on each feature.

**Table 11 Q.767 Gateway IMT feature**

Feature	Description of Feature
A-law/ $\mu$ -law conversion	converts A-law to m-law pulse code modulation (PCM) encoding. m-law PCM encoding is required to interwork the CS 2000 Enet m-law PCM encoding with T1 spans to interwork with the A-law PCM encoding and E1 spans (Gateway IMT trunk agencies).  <b>Note:</b> A-law/m-law conversion is not performed for data calls.
bearer capability screening	determines whether a trunk is capable of carrying a call that requires a trunk with a specific bearer capability.
calling party category (CPC) Handling	provides CPC screening, CPC routing, and CPC override.
cause value handling	maps causes to treatments when the release message contains a cause value other than Normal call clearing.
country code processing	processes the country code in international calls.
data calls	allows the Q.767 Gateway IMT to process data calls and to mark an incoming call as a data call.
NetworkBuilder	allows the CS 2000 switch to query a service control point (SCP), a database that exists outside of the CS 2000 switch, to perform additional services.  <b>Note:</b> Calls that originate on the ISUP'92 Gateway IMT are not supported by NetworkBuilder.
<b>Note:</b> You must order and activate SOC GIMT0003 to use the gateway features.	

Feature	Description of Feature
Network Security (NETSEC)	allows the generation of a call detail record (CDR) or NETS601/NETS603 log at call answer time based on the screening result. NETS602/NETS604 may be generated at call disconnect time if CDR or NETS601/NETS603 was generated at call answer time.
overlap sending	allows the ISUP'92 Gateway IMT to receive the address message in sections, rather than in one message.
protocol timers	allows you to set timers per trunk subgroup.
satellite indication	indicates whether the call came over a satellite at any point in its route before it reached the CS 2000 switch.
test calls	are calls you send over a trunk to test the trunk.
Table TRKGRP nature of address enhancements	enhances nature of address (NOA) delivery in the called party address parameter of the outgoing initial address message (IAM).

*Note:* You must order and activate SOC GIMT0003 to use the gateway features.

## Which messages and parameters does the Q.767 Gateway IMT support?

### What are messages?

A message is a signal that the CS 2000 switch sends from one trunk agency to another trunk agency. Each trunk agency uses these signals to communicate with the other trunk agencies. When you send a fax or use your modem to connect to another computer, you can hear these signals before your fax is sent or the connection is made. However, when you're talking on the phone, you are unable to hear these signals. If a trunk is originating a call, the CS 2000 switch sends the other trunk agency signals that tell the trunk agency:

- tell them when a call is incoming
- what kind of call is incoming
- what to do with the incoming call
- when the call is ending

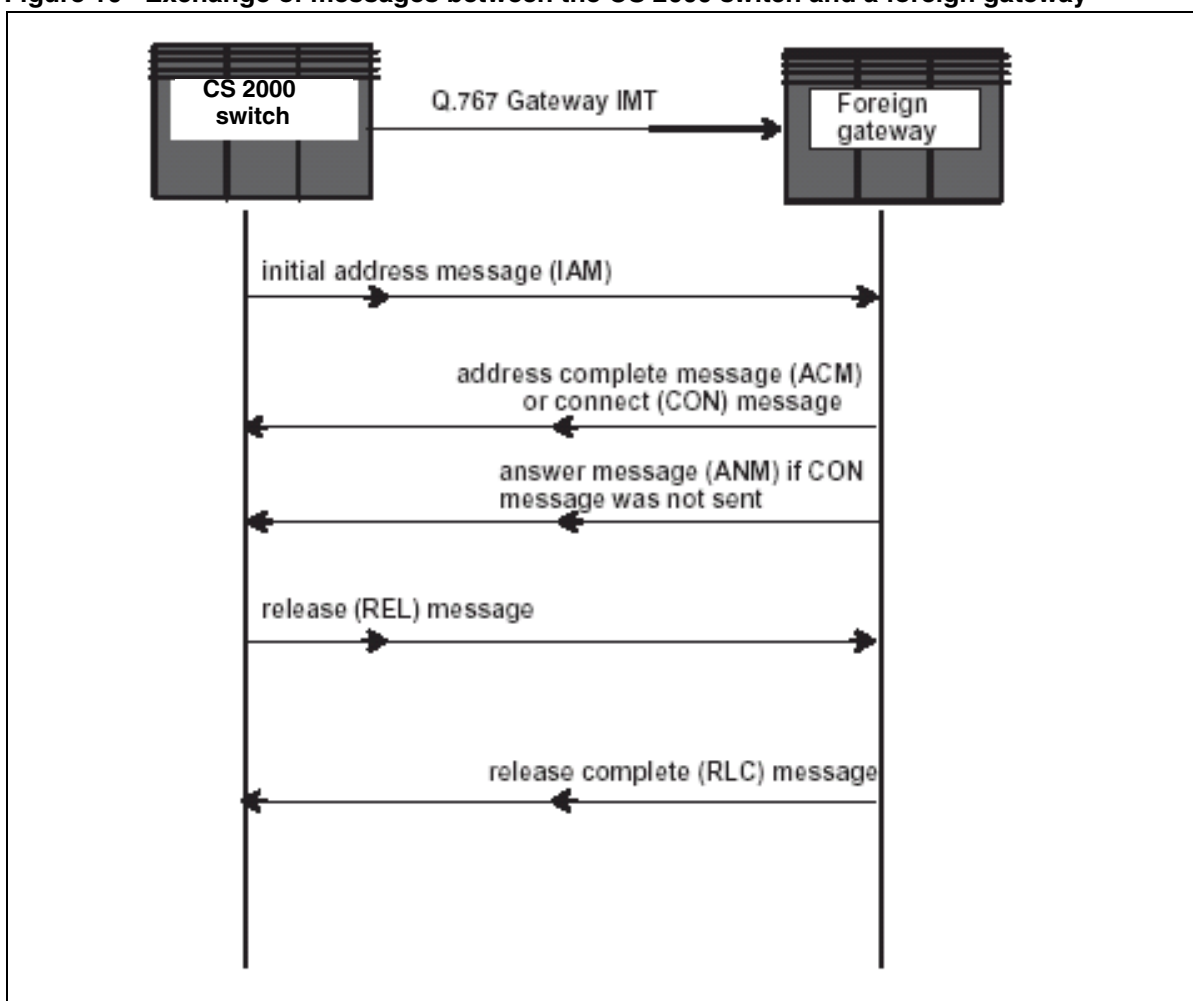
If a trunk is terminating a call, the CS 2000 switch sends the originating trunk agency signals that tell the trunk agency:

- when it has received the originating agency's messages

- when the calling party has picked up the phone (when it has received an off-hook signal)
- when the calling party has hung up the phone (when it has received an on-hook signal)

Figure 10 shows a typical exchange of messages CS 2000 switch and a foreign gateway.

**Figure 10 Exchange of messages between the CS 2000 switch and a foreign gateway**



### What are parameters?

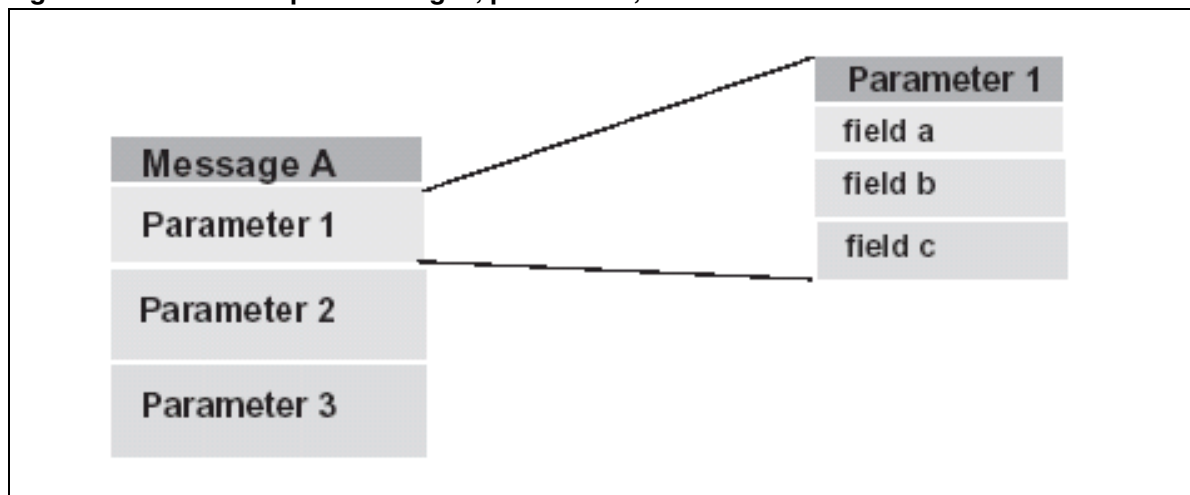
Each message contains at least one parameter. Parameters store the information that the CS 2000 switch sends between trunk agencies. There are three types of parameters:

- mandatory, fixed-length parameters (F) are parameters a message must contain, which must be a certain length
- mandatory, variable-length parameters (V) are parameters a message must contain, which can vary in length

- optional parameters (O) are parameters a message is not required to contain

Each parameter contains one or more fields. The parameters store their information in fields. The fields are made up of values. These values are the information the CS 2000 switch sends between trunk agencies. See “Figure 11 Relationship of messages, parameters, and fields.”

**Figure 11 Relationship of messages, parameters, and fields**



### **Which messages and parameters does the Q.767 Gateway IMT support?**

The Q.767 Gateway IMT uses only international Q.767 messages. When it receives national messages and their parameters, it discards both the messages and their parameters. It supports a minimum set of Q.767 parameters, which is the recommended, minimum set of parameters for each supported message in ITU-T Recommendation Q.767 Blue Book version, tables C-5 to C-28.

Appendix C: “Q.767 messages and parameters,” lists in alphabetical order the messages and the messages’ parameters that the Q.767 Gateway IMT supports. For a compiled list of the messages the Q.767 Gateway IMT supports, see Appendix B: “Q.767 Gateway IMT messages.”

The Q.767 Gateway IMT handles all messages not listed in Appendices B and C as unrecognizable messages. See the section entitled “How does the Q.767 Gateway IMT handle unrecognizable and unexpected messages?” in this chapter, to learn how the Q.767 Gateway IMT handles these messages.



---

## How does the Q.767 Gateway IMT handle unrecognizable and unexpected messages?

If the Q.767 Gateway IMT receives a message it is unable to recognize, it discards the unrecognizable message without disrupting normal call handling. The CS 2000 switch does not produce logs for unrecognized messages.

An unexpected message is a message that the Q.767 Gateway IMT recognizes, but has received out of sequence (at the wrong time). Table 12, “Treatment of unexpected messages from a Q.767 Gateway IMT,” shows how the Q.767 Gateway IMT handles unexpected messages from another Q.767 Gateway IMT. Table 13, “Treatment of unexpected messages when a circuit is busy,” shows how the Q.767 Gateway IMT handles unexpected messages when a circuit is busy.

**Table 12 Treatment of unexpected messages from a Q.767 Gateway IMT**

<b>If the Q.767 Gateway IMT receives</b>	<b>Then</b>
a release (REL) message from an idle circuit	it sends a release complete (RLC) message
any message other than a release (REL) message from an idle circuit	it sends a reset (RSC) message.
a release complete (RLC) message from an idle circuit	it ignores the message.

**Table 13 Treatment of unexpected messages when a circuit is busy**

<b>If the Q.767 Gateway IMT receives</b>	<b>Then</b>
a release message or circuit supervision messages any time during the call	it processes the message.
an initial address message (IAM) after the call has been established	it releases the call.
any message besides the release message and the CPG messages after it sends the IAM and before it receives an ACM or CON message	it releases the call.
any call-related message after it receives a release complete (RLC) message	it discards the message.
a release complete (RLC) message relating to a busy circuit before it sends a release (REL) message	it releases the circuit and sends a release (REL) message.
blocking message	it processes the blocking message.

## Which interworkings does the Q.767 Gateway IMT support?

### What is interworking?

Interworking is a term that describes how the messages and parameters of a trunk agency are mapped to the messages and parameters of another trunk agency. The CS 2000 switch must interwork two trunk agencies' messages and parameters so they can communicate with each other. One trunk agency

---

may support different messages than another trunk agency, but the two trunk agencies must be able to communicate with each other. To help the two trunk agencies communicate, Nortel plans the actions each trunk agency takes when it receives messages from another trunk agency.

### **How the CS 2000 switch maps parameters**

Because different trunks support different features, one trunk's messages can differ from another trunk's messages.

To interwork messages, the CS 2000 switch maps the messages of one trunk agency to the messages of another trunk agency as follows:

- maps a parameter from one trunk agency to another trunk agency's parameter
- maps a parameter's field from one trunk agency to another trunk agency's parameter's field
- maps a parameter's field from one trunk agency to another trunk agency's parameter

In the following scenario, trunk agency Z's version of message A contains one less parameter than trunk agency Y's version of message A.

1. Trunk agency Y, the originating trunk, sends message A to trunk agency Z. See "Figure 12 Messaging between agencies Y and Z."
2. The CS 2000 switch maps message A's parameters one and three to parameters one and three in Trunk agency Z's version of message A. See "Figure 12 Messaging between agencies Y and Z."
3. The CS 2000 switch discards parameter two because Trunk agency Z is unable to use it. See "Figure 13 The CS 2000 switch discards parameter 2."

**Note:** Although this scenario only shows how the CS 2000 switch maps parameters, the CS 2000 switch uses the same method to map one parameter's fields to another parameter or another parameter's fields. See the section entitled, "What are parameters?" in this chapter for more information on parameters' fields.

Figure 12 Messaging between agencies Y and Z

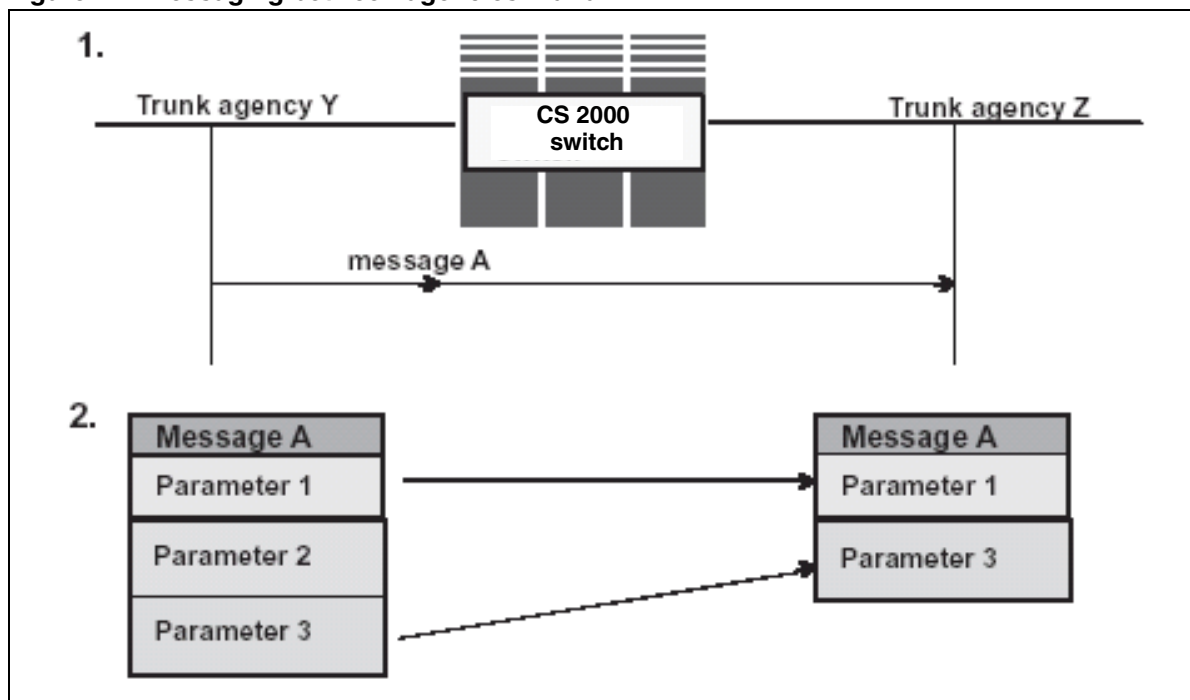
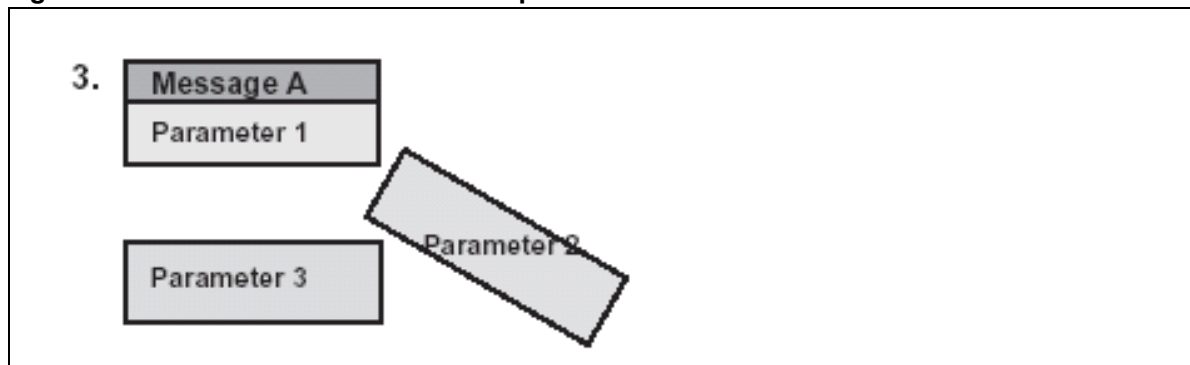


Figure 13 The CS 2000 switch discards parameter 2



### Which trunk agency interworkings does the Q.767 Gateway IMT support?

Table 14, “Trunk agency interworkings,” shows with which trunk agencies the Q.767 Gateway IMT interworks.

For descriptions of the interworking between Q.767 Gateway IMT messages and PRI messages, see Appendix D: “Q.767 Gateway IMT and PRI interworking.”

For descriptions of the interworking between Q.767 Gateway IMT messages and the PTS signaling protocol’s messages, see Appendix E: “Q.767 Gateway IMT and PTS signaling protocol interworking.”

For descriptions of the interworking between Q.767 Gateway IMT messages and the UCP ISUP signaling protocol's messages, see Appendix F: "Q.767 Gateway IMT and UCP ISUP signaling protocol interworking."

For descriptions of the interworking between Q.767 Gateway IMT messages and the ISUP'92 Gateway IMT's messages, see Appendix L: "Q.767 Gateway IMT and ISUP'92 Gateway IMT interworking."

**Table 14 Trunk agency interworkings**

<b>Originating trunk agency</b>	<b>Terminating trunk agency</b>
Q.767 Gateway IMT	SS7 UCP (inter) IMT
Q.767 Gateway IMT	SS7 UCP (intra) IMT
Q.767 Gateway IMT	SS7 FGD (UCP)
Q.767 Gateway IMT	PTS FGD
Q.767 Gateway IMT	FGB
Q.767 Gateway IMT	PRI
Q.767 Gateway IMT	DAL-TIE
Q.767 Gateway IMT	ISUP'92 Gateway IMT
SS7 UCP (inter) IMT	Q.767 Gateway IMT
SS7 UCP (intra) IMT	Q.767 Gateway IMT
SS7 FGD (UCP)	Q.767 Gateway IMT
PTS FGD	Q.767 Gateway IMT
FGB	Q.767 Gateway IMT
PRI	Q.767 Gateway IMT
DAL-TIE	Q.767 Gateway IMT
ISUP'92 Gateway IMT	Q.767 Gateway IMT



---

## Chapter 4: ISUP'92 Gateway IMT

---

### What is the ISUP'92 Gateway IMT?

The Gateway IMT is an inter-machine trunk that allows the CS 2000 switch to connect to a foreign gateway. The Gateway IMT gives the CS 2000 switch a limited set of gateway functions. This means that the CS 2000 switch can send and receive international calls.

ISUP'92 is a signaling protocol that recognizes, receives, and sends messages based on the ITU-T Recommendation Q.764 White Book (International Use). ISUP'92 can be used on the Gateway IMT to connect the CS 2000 switch to a foreign gateway. The Gateway IMT with ISUP'92 signaling protocol carries messages between the CS 2000 switch and a foreign gateway.

### How do I implement the ISUP'92 Gateway IMT trunk agency?

To implement the Gateway IMT trunk agency with ISUP'92 signaling protocol, follow these steps:

1. Order and activate software optionality control (SOC) GIMT0003.

*Note:* For information on how to activate SOCs, see the *UCS DMS-250 Software Optionality Control User's Manual*.

2. Enter datafill into table TRKGRP. The following steps and tables only explain the fields that pertain to the Gateway IMT in table TRKGRP. For the rest of table TRKGRP's datafill, see the *UCS DMS-250 Data Schema Reference Manual*.
  - a Enter ADDR into the DIALPLAN field in table TRKGRP. See Table 15, "DIALPLAN field in table TRKGRP."
  - b Enter GLOBAL in the NETWKSPC field in table TRKGRP. See Table 16, "NETWKSPC field in table TRKGRP."
  - c Enter N in the CLIREQ and CLISCRN fields in table TRKGRP. See Table 17, "CLIREQ and CLISCRN fields in table TRKGRP."
  - d Enter datafill into the GWYTRK field in table TRKGRP. See Table 18, "GWYTRK field in table TRKGRP."
3. Enter datafill into table TRKSGRP.
  - a Enter ISUP92 in the VERSION field in table TRKSGRP. See Table 19, "VERSION and VARIANT fields in table TRKSGRP."
  - b Enter V1 in the VARIANT field in table TRKSGRP. See Table 19, "VERSION and VARIANT fields in table TRKSGRP."

**Table 15 DIALPLAN field in table TRKGRP**

Field	Subfield	Value
DIALPLAN		ADDR
ISUPIDX		UCSGWAY

**Table 16 NETWKSPC field in table TRKGRP**

Field	Subfield	Value
NETWKSPC		GLOBAL

**Table 17 CLIREQ and CLISCRN fields in table TRKGRP**

Field	Subfield	Value
CLIREQ		N
CLISCRN		N



**Table 18 GWYTRK field in table TRKGRP**

<b>Field</b>	<b>Subfield</b>	<b>Value</b>
GWYTRK	SERVCC	1 to 999
	C11C12PY	an alphanumeric value derived from the values data-filled in the PRETNAM field of table STDPRTCT. NPRT is the default.

**Table 19 VERSION and VARIANT fields in table TRKSGRP**

<b>Field</b>	<b>Subfield</b>	<b>Value</b>
VERSION		ISUP'92
VARIANT		V1

## Which features does the ISUP'92 Gateway IMT support?

Table 20, “ISUP'92 Gateway IMT feature” shows you which services the ISUP'92 Gateway IMT supports, describes the services.

**Note:** See Appendix A: “Gateway IMT features,” for information on each feature.

**Table 20 ISUP'92 Gateway IMT feature**

Feature	Description of Feature
A-law/m-law conversion	converts A-law to m-law pulse code modulation (PCM) encoding. m-law PCM encoding is required to interwork the CS 2000 Enet m-law PCM encoding with T1 spans to interwork with the A-law PCM encoding and E1 spans (Gateway IMT trunk agencies).  <b>Note:</b> A-law/m-law conversion is not performed for data calls.
bearer capability screening	determines whether a trunk is capable of carrying a call that requires a trunk with a specific bearer capability.
calling party category (CPC) Handling	provides CPC screening, CPC routing, and CPC override.
cause value handling	maps causes to treatments when the release message contains a cause value other than Normal call clearing.
country code processing	processes the country code in international calls.
data calls	allows the ISUP'92 Gateway IMT to process data calls and to mark an incoming call as a data call.
NetworkBuilder	allows the CS 2000 switch to query a service control point (SCP), a database that exists outside of the CS 2000 switch, to perform additional services.  <b>Note:</b> Calls that originate on the ISUP'92 Gateway IMT are not supported by NetworkBuilder.
Network Security (NETSEC)	allows the generation of a call detail record (CDR) or NETS601/NETS603 log at call answer time based on the screening result. NETS602/NETS604 may be generated at call disconnect time if CDR or NETS601/NETS603 was generated at call answer time.
<b>Note:</b> You must order and activate SOC GIMT0003 to use the gateway features.	

Feature	Description of Feature
overlap sending	allows the ISUP'92 Gateway IMT to receive the address message in sections, rather than in one message.
protocol timers	allows you to set timers per trunk subgroup.
satellite Indication	indicates whether the call came over a satellite at any point in its route before it reached the CS 2000 switch.
test calls	are calls you send over a trunk to test the trunk.
Table TRKGRP nature of address enhancements	enhances nature of address (NOA) delivery in the called party address parameter of the outgoing initial address message (IAM).
<i>Note:</i> You must order and activate SOC GIMT0003 to use the gateway features.	

## Which messages and parameters does the ISUP'92 Gateway IMT support?

### What are messages?

A message is a signal that the CS 2000 switch sends from one trunk agency to another trunk agency. Each trunk agency uses these signals to communicate with the other trunk agencies. When you send a fax or use your modem to connect to another computer, you can hear these signals before your fax is sent or the connection is made. However, when you're talking on the phone, you are unable to hear these signals. If a trunk is originating a call, the CS 2000 switch sends the other trunk agency signals that tell the trunk agency:

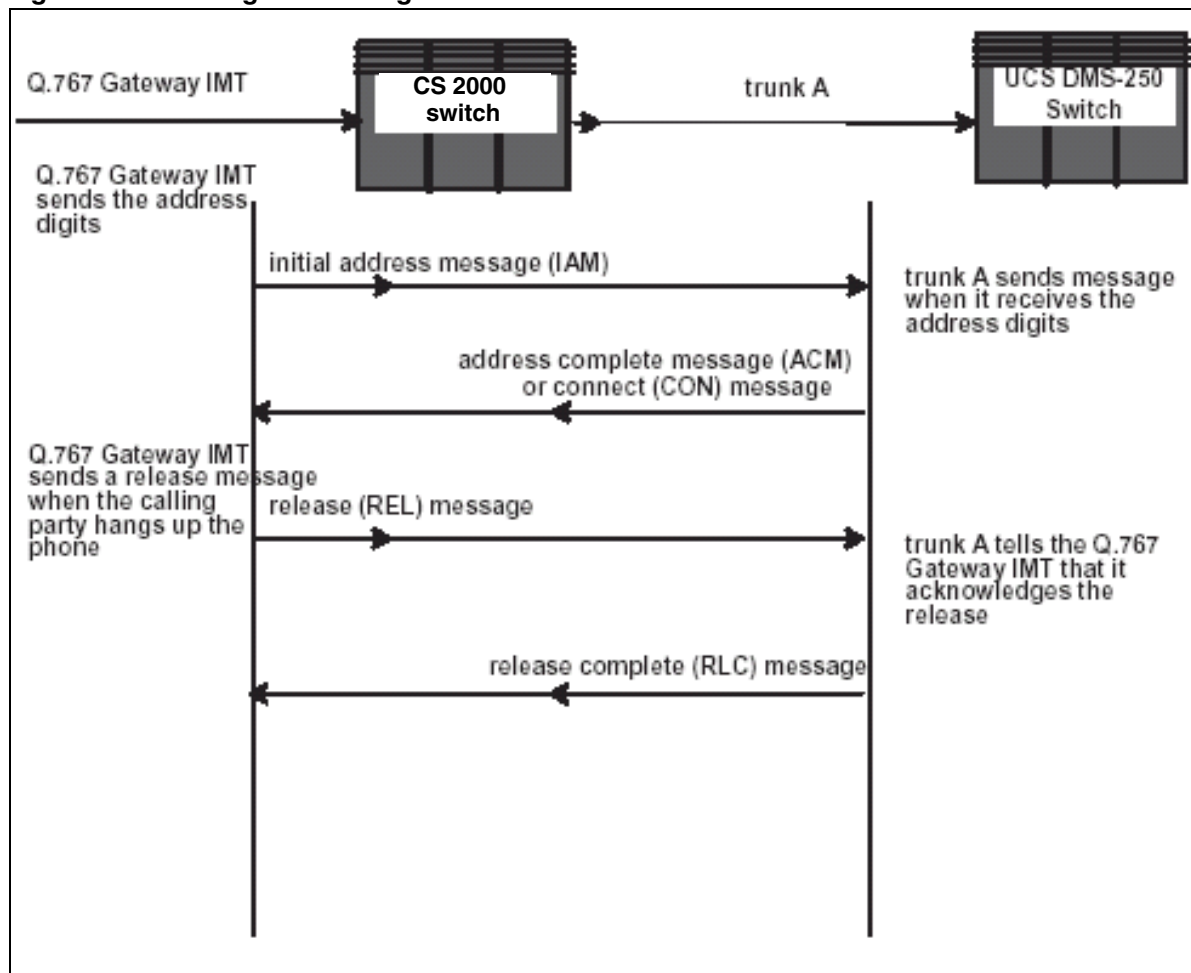
- when a call is incoming
- what kind of call is incoming
- what to do with the incoming call
- when the call is ending

If a trunk is terminating a call, the CS 2000 switch sends the originating trunk agency signals that tell the trunk agency:

- when it has received the originating agency's messages
- when the calling party has picked up the phone (when it has received an off-hook signal)
- when the calling party has hung up the phone (when it has received an on-hook signal)

“Figure 14 Exchange of messages” shows a typical exchange of messages between a ISUP'92 Gateway IMT and another trunk agency.

**Figure 14 Exchange of messages**



### What are parameters?

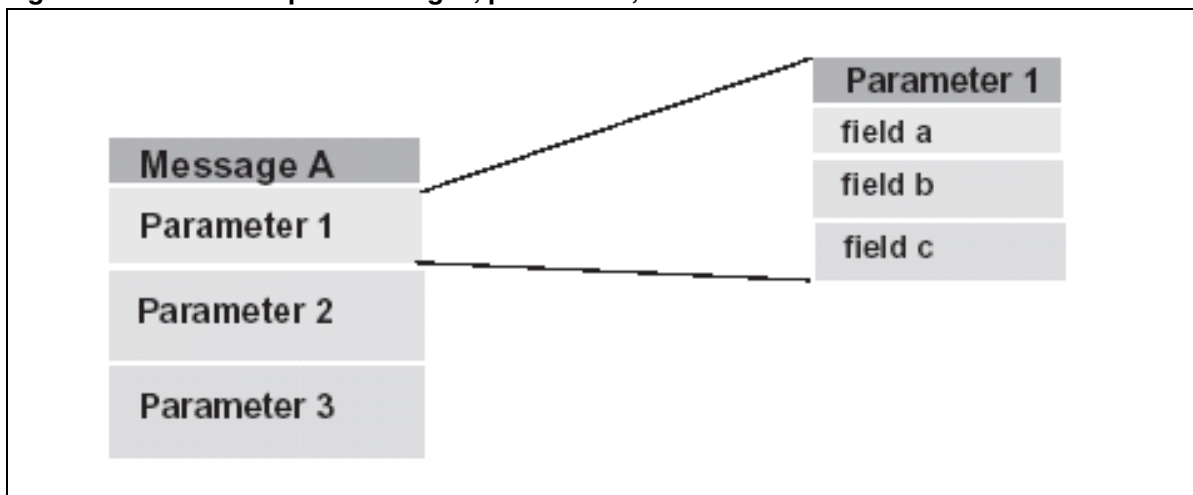
Each message contains at least one parameter. Parameters store the information that the CS 2000 switch sends between trunk agencies.

There are three types of parameters:

- mandatory, fixed-length parameters (F) are parameters a message must contain, which must be a certain length
- mandatory, variable-length parameters (V) are parameters a message must contain, which can vary in length
- optional parameters (O) are parameters a message is not required to contain

Each parameter contains one or more fields. The parameters store their information in fields. The fields are made up of values. These values are the information the CS 2000 switch sends between trunk agencies. See “Figure 15 Relationship of messages, parameters, and fields.”

**Figure 15 Relationship of messages, parameters, and fields**



### **Which messages and parameters does the ISUP'92 Gateway IMT support?**

The ISUP'92 Gateway IMT uses only international ISUP'92 messages. When it receives national messages and their parameters, it discards both the messages and their parameters. It supports a minimum set of ISUP'92 parameters, which is the recommended, minimum set of parameters for each supported message in ITU-T Recommendation ISUP'92 White Book version.

Appendix H: “ISUP'92 Gateway IMT messages and parameters,” lists in alphabetical order the messages and the messages’ parameters that the ISUP'92 Gateway IMT supports. For a compiled list of the messages the ISUP'92 Gateway IMT supports, see Appendix G: “ISUP'92 Gateway IMT messages.”

The ISUP'92 Gateway IMT handles all messages not listed in Appendices G and H as unrecognizable messages. See the section entitled “How does the ISUP'92 Gateway IMT handle unrecognizable and unexpected messages and parameters?” in this chapter, to learn how the ISUP'92 Gateway IMT handles these messages.

## How does the ISUP'92 Gateway IMT handle unrecognizable and unexpected messages and parameters?

If the ISUP'92 Gateway IMT receives a message or a parameter that it is unable to recognize, it checks the unrecognizable message for a message compatibility parameter or checks the unrecognizable parameter for a parameter compatibility parameter. The message compatibility and parameter compatibility parameters are parameters that tell the ISUP'92 Gateway IMT how to process the unrecognizable message or parameter. The CS 2000 switch does not produce logs for unrecognized messages.

### Message compatibility parameter processing

The message compatibility parameter (MCP) tells the CS 2000 switch what to do when the CS 2000 switch receives a message that the CS 2000 switch is unable to recognize. The CS 2000 switch can apply compatibility procedures at either type A or type B exchanges. A type A exchange takes place when either the originating or terminating trunk is a ISUP'92 Gateway IMT. A type B exchange takes place when both the originating and terminating trunks are ISUP'92 Gateway IMTs. In a type B exchange the CS 2000 switch can transit, or pass on, an unrecognizable message. In a type A exchange, it is unable to pass on an unrecognizable message.

The ISUP'92 Gateway IMT can attach a message compatibility parameter to the messages it sends. When the CS 2000 switch receives an unrecognizable message from a ISUP'92 Gateway IMT, it scans the message for the message compatibility parameter. If the message contains this parameter, the CS 2000 switch follows the parameter's instructions. If the message does not contain this parameter, the CS 2000 switch discards the unrecognizable message and returns a confusion (CFN) message. The confusion (CFN) message contains cause and diagnostic information. In a type B exchange, the CS 2000 switch can pass the unrecognizable message on to the next switch. In a type A exchange, the CS 2000 switch is unable to pass on the unrecognizable message.

Figure 16, "MCP bit patterns for type A exchange," shows how the CS 2000 switch, for a type A exchange, interprets the message compatibility parameter's bit patterns to follow its instructions. Figure 17, "MCP bit patterns for type B exchange," shows how the CS 2000 switch, for a type B exchange, interprets the message compatibility parameter's bit patterns to follow its instructions. Table 21, "Bit indicators' values," shows each bit indicator's range of values and the meaning of these values.

Figure 16 MCP bit patterns for type A exchange

Bits								Function of bits
H	G	F	E	D	C	B	A	
X	X	X	X	X	X	1	X	release call
X	X	X	0	0	X	0	X	release call
X	X	X	1	0	0	0	X	discard message
X	X	X	1	0	1	0	X	discard message and send confusion message
X	X	X	X	1	0	0	X	discard message
X	X	X	X	1	1	0	X	discard message and send confusion message

*Note:* Confusion messages contain appropriate cause values and diagnostic information.

Figure 17 MCP bit patterns for type B exchange

Bits								Function of bits
H	G	F	E	D	C	B	A	
X	X	X	X	X	X	1	1	release call
X	X	X	X	0	X	0	1	pass on message
X	X	X	X	1	0	0	1	discard message
X	X	X	X	1	1	0	1	discard message and send confusion message
X	X	X	X	X	X	X	0	pass on message

*Note:* Confusion messages contain appropriate cause values and diagnostic information.

**Table 21 Bit indicators' values**

bit	indicator name	values	meaning of values
A	transit at intermediate	0	transit interpretation
	exchange indicator	1	end node interpretation
<i>Note:</i> The CS 2000 switch only examines this indicator during type B exchanges. If the indicator's value is 0, the CS 2000 switch ignores the other indicators in this table.			
B	release call indicator	0	do not release
		1	release call
C	send notification indicator	0	do not send
		1	send notification
D	discard message indicator	0	do not discard message
		1	discard message
E	pass on not possible indicator	0	release call
		1	discard information
F	not applicable	none	
<i>Note:</i> Bit F is a spare bit. The CS 2000 switch does not use this bit.			
G	not applicable	none	
<i>Note:</i> Bit G is a spare bit. The CS 2000 switch does not use this bit.			
H	extension indicator	none	
<i>Note:</i> If a bit's value is x, the CS 2000 switch ignores the bit.			



---

## Parameter compatibility parameter processing

The parameter compatibility parameter (PCP) tells the CS 2000 switch what to do when the CS 2000 switch receives a message that contains a parameter the CS 2000 switch is unable to recognize.

*Note:* The CS 2000 switch recognizes all mandatory parameters. If it receives an unrecognizable optional parameter without a PCP parameter, it discards the parameter and allows the call to proceed.

The ISUP'92 Gateway IMT can attach a parameter compatibility parameter (PCP) to the messages it sends. When the CS 2000 switch receives an unrecognizable parameter in ISUP'92 Gateway IMT's message, it scans the message for the parameter compatibility parameter (PCP). If the message contains this parameter, the CS 2000 switch follows the parameter's instructions. If the message does not contain this parameter, the CS 2000 switch discards the unrecognizable message and returns a confusion (CFN) message. The confusion (CFN) message contains cause and diagnostic information.

If the CS 2000 switch receives more than one PCP in the initial address message (IAM), the CS 2000 switch follows the instructions in the PCP it received first. If the CS 2000 switch receives more than one PCP in any other message, it follows the instructions in the PCP it received first.

Figure 18, "PCP bit patterns for type A exchange," shows how the CS 2000 switch interprets the bit patterns for a type A exchange and Figure 19, "PCP bit patterns for type B exchange," shows how it interprets the bit patterns for a type B exchange. Table 21, "Bit indicators' values," shows what each bit's value means.

Figure 18 PCP bit patterns for type A exchange

Bit patterns								What the bit patterns tell the switch
H	G	F	E	D	C	B	A	
X	X	X	X	X	X	1	X	release call
X	X	X	X	1	0	0	X	discard message <i>Note:</i> If the message is an IAM message, the call is released.
X	X	X	X	1	1	0	X	discard message and send CFN message <i>Note:</i> If the message is an IAM message, the call is released without sending a CFN message.
X	X	X	1	0	X	0	X	discard parameter <i>Note:</i> If bit C is set, a CFN message is returned..
X	0	0	0	0	X	0	X	release call
X	0	1	0	0	0	0	X	discard message
X	0	1	0	0	1	0	X	discard message and send CFN message
X	1	0	0	0	X	0	X	discard parameter
X	1	1	0	0	X	0	X	release call

Figure 19 PCP bit patterns for type B exchange

Bit patterns								What the bit patterns tell the switch
H	G	F	E	D	C	B	A	
X	X	X	X	X	X	1	1	release call
X	X	X	X	1	0	0	1	discard message <i>Note:</i> If the message is an IAM message, the call is released.
X	X	X	X	1	1	0	1	discard message and send CFN message <i>Note:</i> If the message is an IAM message, the call is released without sending a CFN message.
X	X	X	1	0	X	0	1	discard parameter <i>Note:</i> If bit C is set, a CFN message is returned..
X	X	X	X	X	X	X	0	pass on parameter
X	X	X	0	0	X	0	1	pass on parameter

Table 22 Bit indicators' values

bit	indicator name	values	meaning of values
A	transit at intermediate	0	transit interpretation
	exchange indicator	1	end node interpretation
<i>Note:</i> The CS 2000 switch only examines this indicator during type B exchanges. If the indicator's value is 0, the CS 2000 switch ignores the other indicators in this table.			
B	release call indicator	0	do not release
		1	release call
C	send notification indicator	0	do not send
		1	send notification
D	discard message indicator	0	do not discard message (pass on)
<i>Note:</i> If a bit's value is x, the CS 2000 switch ignores the bit.			

bit	indicator name	values	meaning of values
		1	discard message
<i>Note:</i> If bit D=0, but pass on is not possible, then the CS 2000 switch examines bits C, F, and G.			
E	discard parameter indicator	0	do not discard parameter
		1	discard parameter
<i>Note:</i> If bit E=0, but pass on is not possible, then the CS 2000 switch examines bits C, F, and G.			
F	pass on not possible indicator	0 0	release call
		0 1	discard message
		1 0	discard parameter
		1 1	release call
G	pass on not possible indicator	0 0	release call
		0 1	discard message
		1 0	discard parameter
		1 1	release call
H	extension indicator	none	
<i>Note:</i> If a bit's value is x, the CS 2000 switch ignores the bit.			

Table 23, "PCP instructions," shows how the PCP parameter instructs the CS 2000 switch in certain situations.

**Table 23 PCP instructions**

<b>If</b>	<b>then</b>
If the PCP is received in the IAM and instructs the CS 2000 switch to discard the message or to discard the message and send notification	the CS 2000 switch releases the call.
If the CS 2000 switch receives, in the IAM, more than one instruction for a parameter	the CS 2000 switch applies the most severe instruction.
If a PCP in a type A exchange contains multiple indicators	the CS 2000 switch examines the indicators in the following order: 1 release call 2 discard parameter and send notification 3 discard parameter 4 pass on
If a PCP in a type B exchange contains multiple indicators and end node interpretation is set (bit A=1)	the CS 2000 switch examines the indicators in the following order: 1 release call 2 discard parameter and send notification 3 discard parameter 4 pass on
If a PCP in a type B exchange contains multiple indicators and transit interpretation is set (bit A=0)	the CS 2000 switch passes on the PCP with the parameters included in the PCP parameter.
If the CS 2000 switch receives more than one PCP	the CS 2000 switch uses the first PCP it received.
If the PCP is received in the REL message	only the discard and pass on possible instructions are applicable.
<b>Note:</b> The CS 2000 switch passes the PCP on to the next switch only during a type B exchange.	

## Unexpected messages

An unexpected is a message that the ISUP'92 Gateway IMT recognizes, but has received out of sequence (at the wrong time) Table 24, "Treatment of unexpected messages from an ISUP'92 Gateway IMT," shows how the ISUP'92 Gateway IMT handles unexpected messages from another ISUP'92 Gateway IMT. Table 25, "Treatment of unexpected messages when a circuit is busy," shows how the ISUP'92 Gateway IMT handles unexpected messages when a circuit is busy.

**Table 24 Treatment of unexpected messages from an ISUP'92 Gateway IMT**

<b>If the ISUP'92 Gateway IMT receives</b>	<b>then</b>
a release (REL) message from an idle circuit	it acknowledges the message with a release complete (RLC) message.
any message other than a release (REL) message from an idle circuit	it sends a reset (RSC) message.
a release complete (RLC) message from an idle circuit	it ignores the message.

**Table 25 Treatment of unexpected messages when a circuit is busy**

<b>If the ISUP'92 Gateway IMT receives</b>	<b>then</b>
a release message or circuit supervision messages any time during the call	it processes the message.
an initial address message (IAM) on the originating trunk after the call has been established	it releases the call.
any message besides the release message and the CPG messages after it sends the IAM and before it receives an ACM or CON message	it releases the call.
any call-related message after it receives a release (REL) message	it discards the message.
a release complete (RLC) message relating to a busy circuit before it sends a release (REL) message	it releases the circuit and sends a release (REL) message.
blocking message	it processes the blocking message.

---

## Which interworkings does the Q.767 Gateway IMT support?

### What is interworking?

Interworking is a term that describes how the messages and parameters of a trunk agency are mapped to the messages and parameters of another trunk agency. The CS 2000 switch must interwork two trunk agencies' messages and parameters so they can communicate with each other. One trunk agency may support different messages than another trunk agency, but the two trunk agencies must be able to communicate with each other. To help the two trunk agencies communicate, Nortel plans the actions each trunk agency takes when it receives messages from another trunk agency.

### How the CS 2000 switch maps parameters

Because different trunks support different features, one trunk's messages can differ from another trunk's messages.

To interwork messages, the CS 2000 switch maps the messages of one trunk agency to the messages of another trunk agency as follows:

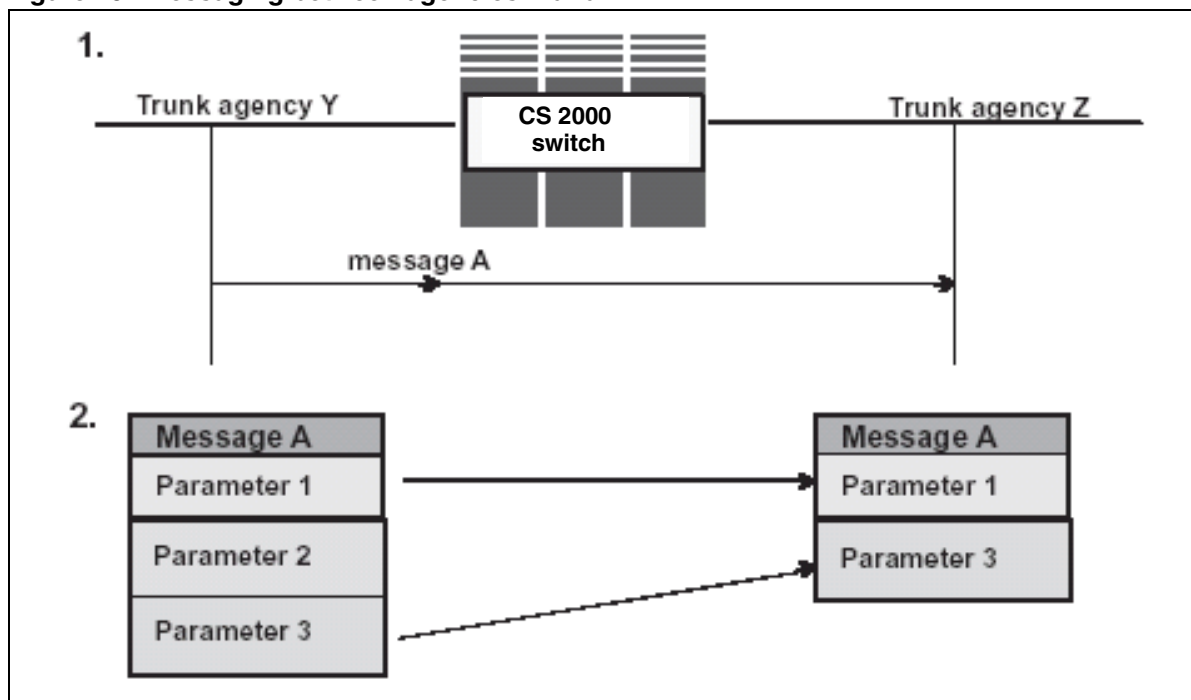
- maps a parameter from one trunk agency to another trunk agency's parameter
- maps a parameter's field from one trunk agency to another trunk agency's parameter's field
- maps a parameter's field from one trunk agency to another trunk agency's parameter

In the following scenario, trunk agency Z's version of message A contains one less parameter than trunk agency Y's version of message A.

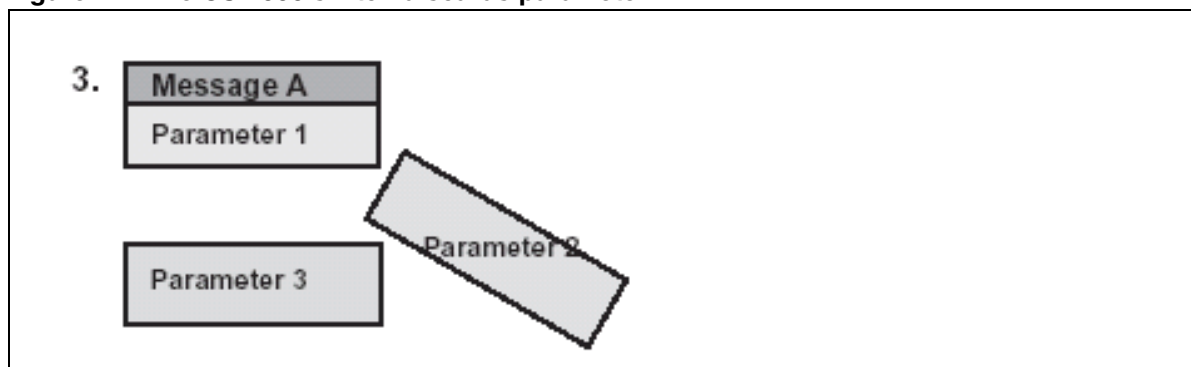
1. Trunk agency Y, the originating trunk, sends message A to trunk agency Z. See Figure 20, "Messaging between agencies Y and Z."
2. The CS 2000 switch maps message A's parameters one and three to parameters one and three in Trunk agency Z's version of message A. See Figure 20, "Messaging between agencies Y and Z."
3. The CS 2000 switch discards parameter two because Trunk agency Z is unable to use the parameter. See Figure 21, "The CS 2000 switch discards parameter 2."

**Note:** Although this scenario only shows how the CS 2000 switch maps parameters, the CS 2000 switch uses the same method to map one parameter's fields to another parameter or another parameter's fields. See the section entitled, "What are parameters?" in this chapter for more information on parameters' fields.

**Figure 20 Messaging between agencies Y and Z**



**Figure 21 The CS 2000 switch discards parameter 2**



**Which trunk agency interworkings does the ISUP'92 Gateway IMT support?**

Table 26, "Trunk agency interworkings," shows with which trunk agencies the ISUP'92 Gateway IMT interworks.

For descriptions of the interworking between ISUP'92 Gateway IMT messages and PRI messages, see Appendix I: "CS 2000ISUP'92 Gateway and PRI interworking."

For descriptions of the interworking between Q.767 Gateway IMT messages and the PTS signaling protocol's messages, see Appendix J: "ISUP'92 Gateway and PTS signaling protocol interworking."



For descriptions of the interworking between ISUP'92 Gateway IMT messages and the UCP ISUP signaling protocol's messages, see Appendix K: "ISUP'92 Gateway and UCP ISUP signaling protocol interworking."

For descriptions of the interworking between ISUP'92 Gateway IMT messages and the ISUP'92 Gateway IMT's messages, see Appendix L: "Q.767 Gateway IMT and ISUP'92 Gateway IMT interworking."

**Table 26 Trunk agency interworkings**

<b>Originating trunk agency</b>	<b>Terminating trunk agency</b>
ISUP'92 Gateway IMT	SS7 UCP (inter) IMT
ISUP'92 Gateway IMT	SS7 UCP (intra) IMT
ISUP'92 Gateway IMT	SS7 FGD (UCP)
ISUP'92 Gateway IMT	PTS FGD
ISUP'92 Gateway IMT	FGB
ISUP'92 Gateway IMT	PRI
ISUP'92 Gateway IMT	DAL-TIE
ISUP'92 Gateway IMT	Q.767 Gateway IMT
SS7 UCP (inter) IMT	ISUP'92 Gateway IMT
SS7 UCP (intra) IMT	ISUP'92 Gateway IMT
SS7 FGD (UCP)	ISUP'92 Gateway IMT
PTS FGD	ISUP'92 Gateway IMT
FGB	ISUP'92 Gateway IMT
PRI	ISUP'92 Gateway IMT
DAL-TIE	ISUP'92 Gateway IMT
Q.767 Gateway IMT	ISUP'92 Gateway IMT



---

## Appendix A: Gateway IMT features

---

This appendix lists the Gateway IMT features in alphabetical order. Below each feature name is a table that tells:

- which signaling protocol supports the feature
- which software optionality control (SOC), if any, activates the feature
- which hardware is required for the feature

### A-law/U-law pulse code modulation encoding conversion

Feature	SOC	Q.767	ISUP'92	hardware
A-law/U-law conversion	None	x	x	DTCO+ peripherals with NT6x44EA card

#### Why must the CS 2000 switch convert A-law to U-law PCM encoding?

The Succession CS2000 should be configured to use u-law PCM encoding in world zone-1. The ISUP92/Q.767 trunk agencies are only supported on E1 spans using A-law PCM encoding. The PVG will perform A-law to u-law conversion as required.

PCM encoding conversion on a per call basis is enabled, if transmission medium requirement parameter indicates speech and 3.1 kHz (PCM encoding conversion requirements is based on Q.764 section 2.1.1.3 b). The user information layer 1 protocol identification field of the user service information (USI) parameter in IAM must reflect the proper PCM encoding: 'Recommendation G.711 u-law' for supported UCS SS7 trunk agents (SS7 FGD, SS7 IMT Intra, and SS7 IMT Inter) and 'Recommendation G.711 A-law' for the ISUP92/Q.767 trunk agent. For UCS PRI trunk agent, user information layer 1 protocol identification field of the Low layer compatibility element in the Q.931 Setup must reflect 'Recommendation G.711, u-law speech'.

For 64K unrestricted data calls, the conversion between A-law and u-law PCM encoding on a per call basis is disabled. The user information layer 1 protocol identification field must reflect the proper PCM encoding value as stated in the previous paragraph.

The CS 2000 switch converts PCM encoding on a per-call basis if the transmission medium requirement (TMR) parameter, in the initial address message (IAM), indicates speech and 3.1 kHz. The IAM's user service information (USI) parameter's user information layer 1 protocol identification field must reflect the proper PCM encoding:

- Recommendation G.711 U-law for SS7 trunk agents
- Recommendation G.711 a-law for the Gateway IMTs
- Recommendation G.711 U-law speech for PRI trunk agents' user information layer 1 protocol identification field of the low layer compatibility element in the Q.931 Setup

#### ATTENTION

64K unrestricted data calls disable the conversion between A-law and U-law PCM encoding on a per-call basis. The user information layer 1 protocol identification field must reflect the proper PCM encoding value.

## bearer capability screening

Feature	SOC	Q.767	ISUP'92	hardware
bearer capability screening	None	x	x	None

Bearer capability screening is a screening process that determines whether a trunk can carry a call with a specific bearer capability value.

*Note:* For interworking information on data calls, see “data calls” in this appendix.

## Origination screening

The CS 2000 switch uses table BCCOMPAT to compare the call's bearer capability (CALLBC) with the value in the BCNAME field in table TRKGRP of the originating trunk. The value in the BCNAME field is called the FILEDBC.

If the bearer capability screening fails, the CS 2000 switch sends the call to service currently unavailable (SCUN) treatment.

## Termination screening

The CS 2000 switch uses table BCCOMPAT to compare the call's bearer capability (CALLBC) with the bearer capability of the terminating trunk. The values in table BCCOMPAT determine whether the screening passes or fails. Table BCCOMPAT shows which bearer capabilities are compatible with one another. For example, in Table 27, "Table BCCOMPAT values" the fourth row means a trunk with a bearer capability of VOICE\_DATA can allow a call with a bearer capability of 64K data.

**Table 27 Table BCCOMPAT values**

CALLBC	TERMBC
56KDATA	64KDATA
64KDATA	VOICE_DATA
56KDATA	VOICE_DATA
VOICE_DATA	64KDATA
VOICE_DATA	56KDATA
<i>Note 1:</i> The data in this table is for example purposes only.	
<i>Note 2:</i> The bearer capabilities must be defined in table BCDEF.	

If terminating screening fails, the call advances to the next route choice in the route list. If the call exhausts all routes, the CS 2000 switch blocks the call and applies generalized no circuit treatment (GNCT).

*Note:* If a data call terminates over a UCP INTRA IMT trunk with the I3PA dial plan, the information digits are outputted as "56" only when the call is a 56k data call.

## calling party category handling

Feature	SOC	Q.767	ISUP'92	hardware
calling party category (CPC) handling	None	x	x	None
<i>Note:</i> This feature is only applicable to calls that originate on the Gateway IMT.				

### What is a calling party category?

The calling party category (CPC) is a parameter in the initial address message (IAM). This parameter classifies the calling party. When a call comes into the CS 2000 switch, the CS 2000 switch can replace the CPC value in the CPC parameter of the outgoing IAM. The calling party category can be one of 15 values:

- unknown (00000000)
- operator whose language is French (00000001)
- operator whose language is English (00000010)

- operator whose language is German (00000011)
- operator whose language is Russian (00000100)
- operator whose language is Spanish (00000101)
- values you can use to select a language by a mutual agreement (00000100 to 00001000)
- reserved (00001001)
- ordinary calling subscriber (00001011)
- calling subscriber with priority (00001100)
- data call (voice band data) (00001100)
- test call (00001101)
- spare (00001110 TO 11011111)
- reserved for national use (11100000 to 11111110)
- spare (11111111)

The Gateway IMT supports the table CPC screen (CPCSCRN). Table CPCSCRN provides three functions:

- CPC screening
- CPC routing
- CPC override

To access table CPCSCRN the CS 2000 switch uses either the table STDPRTCT's CT or NT selectors' option CPCSCRN index value (CPCINDEX) and the CS 2000 switch uses the incoming call's CPC value (0 to 255).

**Note:** If the CPCINDEX tuple is not present in table CPCSCRN, the call continues.

The CS 2000 switch can access the table CPCSCRN when the CT selector's field CALLFEAT has a value of OFFNET or the NT selector's field TYPICAL has a value of DD or OA. See Table 28, "STDPRTCT CT selector" and Table 29, "STDPRTCT NT selector" for an example of the data.

**Table 28 STDPRTCT CT selector**

Selector	CALLFEAT	MINDIGS	MAXDIGS	NOPREDIGS	OPTIONS
CT	OFFNET	0 to 18	0 to 18	0 to 7	CPCSCRN

**Table 29 STDPRTCT NT selector**

<b>Selector</b>	<b>TYPICAL</b>	<b>NOPREDIGS</b>	<b>TRANSYS</b>	<b>OPTIONS</b>
NT	DD	0 to 18	IP, IN	CPCSCRN
NT	OA	0 to 7	IN, IP	CPCSCRN
<i>Note:</i> If the TYPICAL field's value is NP meaning Nil type of call or NL meaning No prefix local, the CPC-SCRN option is unavailable.				

The CS 2000 switch uses table CPCSCRN to screen the calling party category. See Table 30, "Table CPCSCRN."

Table 30 Table CPCSCRN

Field	Description of the field	Range of values
CPCSCRN_IDX	the index into table CPCSCRN	0 to 255
CPC	an alphanumeric string that identifies the CPC	<ul style="list-style-type: none"> <li>• UNKOWN</li> <li>• OP_FRENCH</li> <li>• OP_ENGLISH</li> <li>• OP_GERMAN</li> <li>• OP_RUSSIAN</li> <li>• OP_SPANISH</li> <li>• CPC_6</li> <li>• CPC_7</li> <li>• CPC_8</li> <li>• OP_NATIONAL</li> <li>• SUBSCRIBER1</li> <li>• PRIORITY</li> <li>• DATA</li> <li>• TEST</li> <li>• NON_VOICE</li> <li>• PAYPHONE</li> <li>• CPC_16 to CPC_255</li> </ul> <p><b>Note:</b> See Table 31 to learn which integer the IAM message out-pulses.</p>
ACTION	determines whether to allow the call to continue or to block the call; this field screens the incoming CPC value; if this field blocks the call, it routes the call to call not allowed (CNAD) treatment	<ul style="list-style-type: none"> <li>• ACTION_CONTINUE</li> <li>• ACTION_BLOCK</li> </ul>



Field	Description of the field	Range of values
OVRDSTS (override STS)	determines whether to replace the STS with another STS; provides a new STS value for the call when this field is set to yes; if this field is set to no, the last derived STS value is used for the call	<ul style="list-style-type: none"> <li>• Y</li> <li>• N</li> </ul>
STS	if OVERRIDE_STS is set to yes, the STS entered in this field replaces the previously derived STS	000 TO 999
OVRDCPC (override CPC)	determines whether to replace the previously derived CPC with a new CPC; if this field is set to no, table CPCSCRN does not prompt for a new CPC value and maintains the incoming CPC value	<ul style="list-style-type: none"> <li>• Y</li> <li>• N</li> </ul>
CPC	an alphanumeric string that identifies the CPC	<ul style="list-style-type: none"> <li>• UNKNOWN</li> <li>• OP_FRENCH</li> <li>• OP_ENGLISH</li> <li>• OP_GERMAN</li> <li>• OP_RUSSIAN</li> <li>• OP_SPANISH</li> <li>• CPC_6</li> <li>• CPC_7</li> <li>• CPC_8</li> <li>• OP_NATIONAL</li> <li>• SUBSCRIBER1</li> <li>• PRIORITY</li> <li>• DATA</li> <li>• TEST</li> <li>• NON_VOICE</li> <li>• PAYPHONE</li> </ul> <p><i>Note:</i> See Table 31 to learn which integer the IAM message outpulses.</p>

Table 31, “CPC values in table CPCSCRN” shows the CPC values you can enter into table CPCSCRN and what the values mean.

**Table 31 CPC values in table CPCSCRN**

This CPC value	is outputted as this integer in the IAM message
UNKNOWN	0
OP_FRENCH	1
OP_ENGLISH	2
OP_GERMAN	3
OP_RUSSIAN	4
OP_SPANISH	5
CPC-6	6
CPC-7	7
CPC-8	8
OP_NATIONAL	9
SUBSCRIBER1	10
PRIORITY	11
DATA	12
TEST	13
NON_VOICE	14
PAYPHONE	15
CPC_16 to CPC_255	16 TO 255

*Note:* You can assign your own values to the CPC\_x values, where x=6 to 8 and 16 to 255.

During translations, the SX selector can replace the CPC value in the CPC parameter. The SX value provides the index to access table RTEATTR. The REPLACE field prompts for a CPC value. Table 32, “Table RTEATTR data,” shows the data for table RTEATTR. Table 33, “RPLCPARM=CPC Field descriptions,” shows the CPC values in the RPLCPARM of table RTEATTR. Table 34, “CPC values as outputted in IAM,” shows the integers the IAM message outputted for each CPC value in table RTEATTR.

*Note:* This functionality is only available on the Gateway IMT.

Table 32 Table RTEATTR data

Field	Subfield or refinement	Entry	Explanation and action
KEY			KEY. Enter datafill into the INCLPARM, EXCLPARM, RPLCPARM, and OPTION subfields.
INCLUDE		vector of up to 42 multiples	INCLUDE VECTOR. The INCLUDE vector specifies the optional parameters that are sent out at termination. Enter datafill into the INCLPARM subfield.
	INCLPARM	CPN, TNS, GENADDR, GENDIGS, CIP, CGN	INCLUDE PARAMETER. Enter the optional parameter to be included at termination. See sections INCLPARM=GENDIGS and INCLPARM=GENADDR for refinement datafill.
EXCLUDE		vector of up to 42 multiples	EXCLUDE VECTOR. The EXCLUDE vector specifies the parameters are stripped off before termination. Enter datafill into the EXCLPARM subfield.
	EXCLPARM	CPN, TNS, GENADDR, GENDIGS, CIP, CGN	EXCLUDE PARAMETER. Enter the Generic Digit type to be excluded. See sections EXCLPARM=GENDIGS and EXCLPARM=GENADDR for refinement datafill.
REPLACE		vector of up to 6 multiples	REPLACE VECTOR. The REPLACE vector specifies the digit stream (Dialed Number or Completion Number) used in replacing the Called Party Number. Enter datafill into the RPLCPARM subfield.
	RPLCPARM	CPA, CPC	REPLACE PARAMETER. Enter the value of the parameter to be replaced. See section RPLCPARM=CPA for refinement datafill. See section RPLCPARM=CPC for refinement datafill.

Field	Subfield or refinement	Entry	Explanation and action
OPTION		vector of up to 6 multiples	OPTION VECTOR. The OPTION vector controls functionality of the call based on the terminating route. Enter datafill into the OPTION subfield.
	OPTION	ANSCDR or CDRTMPLT	ANSWER CDR. Enter ANSCDR or CDRTMPLT to be prompted for TEMPLTIDX, the index into table CDRTMPLT to format the CDR for the call. See section OPTION=ANSCDR for refinement datafill.

Table 33 RPLCPARM=CPC Field descriptions

Field	Subfield or refinement	Entry	Explanation and action
	CPC	UNKNOWN, OP_FRENCH, OP_ENGLISH, OP_GERMAN, OP_RUSSIAN, OP_SPANISH, CPC_6, CPC_7, CPC_8, OP_NATIONAL, SUBSCRIBER1, PRIORITY, DATA, TEST, NON_VOICE, PAYPHONE	CALLING PARTY CATEGORY. Enter the CPC to be outpulsed when the call is routed through the SX selector.

*Note:* For more information on table RTEATTR, see the *UCS DMS-250 Data Schema Reference Manual*.

**Table 34 CPC values as outpulsed in IAM**

This CPC value	is outpulsed as this integer in the IAM message
UNKNOWN	0
OP_FRENCH	1
OP_ENGLISH	2
OP_GERMAN	3
OP_RUSSIAN	4
OP_SPANISH	5
CPC-6	6
CPC-7	7
CPC-8	8
OP_NATIONAL	9
SUBSCRIBER1	10
PRIORITY	11
DATA	12
TEST	13
NON_VOICE	14
PAYPHONE	15

### cause value handling

Feature	SOC	Q.767	ISUP'92	hardware
cause value handling	None	x	x	None

**Note:** For calls originating and terminating on the Q.767 or ISUP'92 Gateway IMT, the keys to tables TMTMAP and CSEMAP include the Q.767 protocol.

The CS 2000 switch accesses table CSEMAP with the originating trunk agent's protocol and with the cause value during the following two conditions:

- the terminating trunk releases the call before the originating trunk
- the terminating trunk releases the call with a cause value that is not Normal call clearing (cause value 16)

The CS 2000 switch maps the cause value to an extended treatment value when the fields RTEADV and RECOL in table CSEMAP are set to N. The CS 2000 switch uses the extended treatment value and the trunk agent's protocol to access table TMTMAP to determine what action to take with the call. If the CS 2000 switch has already applied a treatment, the CS 2000 switch uses this treatment and the trunk agent's protocol to access table TMTMAP to determine what action to take with the call.

For local treatment calls, the CS 2000 switch applies existing functionality. The call is a local treatment call if the TMTPROC field in table TMTMAP has a value of LOCAL, ISLOCAL, or INTLOCAL.

For non-local treatment calls that originate on Q.767 or ISUP'92 Gateway IMTs, you must enter the Q.767 protocol in table TMTMAP to show the call originated in the international network. Set the location field's value to INTL\_NET (International network). The call is a non-local treatment call if the TMTPROC field in table TMTMAP has a value of NOLOCAL.

If the call originates on a supported UCS trunk agent and terminates on either a Q.767 or ISUP'92 Gateway IMT, the CS 2000 switch modifies the location field to INTL\_NET (International network) to show the call originated in the international network.

If the call originates on a supported UCS trunk agent and either terminates to another UCS trunk agent or fails to route successfully to a Q.767 or ISUP'92 Gateway IMT, the existing table TMTMAP functionality is used and the location field is not modified.

A type A exchange takes place when the originating trunk agency is an ISUP'92 Gateway IMT and the terminating trunk agency is not an ISUP'92 Gateway IMT. If the call goes through a type A exchange, the CS 2000 switch, before it accesses table CSEMAP, maps the following cause values to normal, unspecified (cause value 31):

- pre-emption (T1.619) (8 or CSE\_8)
- pre-emption circuit reserved for reuse (9 or CSE\_9)
- subscriber absent (20 or CSE\_20)
- user information discarded (43 or CSE\_43)
- no preempt circuit available (46 or CSE\_46)
- incompatible agents (53 or CSE\_53)
- inconsistency in designated info (62 or CSE\_62)
- non-existent CUG (90 or CSE\_90)
- message with unrecognized parameter discarded (110 or CSE\_110)

The CS 2000 switch, before it sends the CAUSE value for non-local treatments, also maps the same cause values from table TMTMAP to normal, unspecified (cause value 31).

**Note:** A type B exchange takes place when both the originating and terminating trunk agencies are ISUP'92 Gateway IMTs. If the call goes through a type B exchange, the CS 2000 switch does not map these values to normal, unspecified (cause value 31).

Table 35, "Mapping of ISUP'92 cause values for non-ISUP'92 trunks," shows the mapping of ISUP'92 cause values for non-ISUP'92 trunks.

**Table 35 Mapping of ISUP'92 cause values for non-ISUP'92 trunks**

<b>Release incoming trunk</b>	<b>Table CSEMAP cause</b>	<b>Release outgoing trunk</b>	<b>Outgoing cause</b>
ISUP'92 Gateway IMT	ISUP'92 cause	ISUP'92 Gateway IMT	Table CSEMAP cause value
ISUP'92 Gateway IMT	Non-ISUP'92 Gateway IMT	ISUP'92 Gateway IMT	Table CSEMAP cause value
ISUP'92 Gateway IMT	ISUP'92 cause	Q.767 Gateway IMT	Normal, unspecified cause value
ISUP'92 Gateway IMT	Non-ISUP'92 cause	Q.767 Gateway IMT	Table CSEMAP cause value
ISUP'92 Gateway IMT	ISUP'92 cause	supported UCS trunk agency	Normal, unspecified cause value
ISUP'92 Gateway IMT	Non-ISUP'92 cause	supported UCS trunk agency	Table CSEMAP cause value
Q.767 Gateway IMT	ISUP'92 cause	ISUP'92 Gateway IMT	Normal, unspecified cause value
Q.767 Gateway IMT	Non-ISUP'92 cause	ISUP'92 Gateway IMT	Table CSEMAP cause value
Q.767 Gateway IMT	ISUP'92 cause	Q.767 Gateway IMT	Normal, unspecified cause value
Q.767 Gateway IMT	Non-ISUP'92 cause	Q.767 Gateway IMT	Table CSEMAP cause value
Q.767 Gateway IMT	ISUP'92 cause	supported UCS trunk agency	Normal, unspecified cause value
Q.767 Gateway IMT	Non-ISUP'92 cause	supported UCS trunk agency	Table CSEMAP cause value

Release incoming trunk	Table CSEMAP cause	Release outgoing trunk	Outgoing cause
supported UCS trunk agency	ISUP'92 cause <i>Note:</i> Table CSEMAP does not differentiate between CCITT coding standards and national coding standards.	Q.767 Gateway IMT	Normal, unspecified cause value
supported UCS trunk agency	ISUP'92 cause <i>Note:</i> Table CSEMAP does not differentiate between CCITT coding standards and national coding standards.	ISUP'92 Gateway IMT	Normal, unspecified cause value
supported UCS trunk agency	Non-ISUP'92 cause	Q.767 Gateway IMT	Table CSEMAP cause value
supported UCS trunk agency	Non-ISUP'92 cause	ISUP'92 Gateway IMT	Table CSEMAP cause value

### How do I enter data into the tables?

1. Enter data into table CSEMAP. See Table 36, "Table CSEMAP datafill," for the fields into which you must enter data.
2. Enter data into table TMTMAP. See Table 37, "Table TMTMAP datafill," for the fields into which you must datafill.



**Table 36 Table CSEMAP datafill**

<b>Field</b>	<b>Field's function</b>	<b>accepted range of values</b>
PROTOCOL	identifies the protocol	<ul style="list-style-type: none"> <li>• Q764</li> <li>• Q931</li> <li>• Q767</li> </ul>
CAUSE		<ul style="list-style-type: none"> <li>• (Q764) multiple with CAUSE - ISUP_CAUSE_INDICATOR</li> <li>• (Q931) multiple with CAUSE - PRI_CAUSE_TYPE</li> <li>• (Q767) multiple with CAUSE - ISUP_CAUSE_INDICATOR</li> </ul>
TMT		EXTENDED_TREATMENT
RTEADV		<ul style="list-style-type: none"> <li>• N</li> <li>• Y</li> </ul>
RECOL		<ul style="list-style-type: none"> <li>• N</li> <li>• Y</li> </ul>
OPTION		NIL

**Table 37 Table TMTMAP datafill**

<b>Field</b>	<b>Field's function</b>	<b>accepted range of values</b>
TMTMPKEY	key into table TMT-MAP	TMTMAP_KEY multiple with PROTOCOL - (Q764, Q931, Q767) TMT - EXTENDED_TREATMENT BC_CT - (ALLBC)
FORMAT		<ul style="list-style-type: none"> <li>• ISUP</li> <li>• PRI</li> </ul>
TMTPROC		<ul style="list-style-type: none"> <li>• (LOCAL) ISUP_TMT_NIL</li> <li>• (INTLOCAL) multiple with CAUSE - ISUP_CAUSE_INDICATOR LOCATION - LOCATION_TYPE LOG - (N, Y)</li> <li>• (ISLOCAL) multiple with CAUSE - ISUP_CAUSE_INDICATOR LOCATION - LOCATION_TYPE LOG - (N, Y)</li> <li>• (NOLOCAL) multiple with CAUSE - ISUP_CAUSE_INDICATOR LOCATION - LOCATION_TYPE LOG - (N, Y)</li> </ul>

## country code processing

Feature	SOC	Q.767	ISUP'92	hardware
country code processing	None	x	x	None

### What is a country code?

A country code is a code the CS 2000 switch uses to determine in which or to which country a call is either originating or terminating.

### How does the CS 2000 switch process the country code over the Gateway IMT?

The CS 2000 switch uses the country code to determine the call type. When you implement the Gateway IMT you specify, in table TRKGRP, the country code of the country the CS 2000 switch resides in. When a call terminates on the Gateway IMT the CS 2000 switch compares the country code in table TRKGRP to the country code in table CCTABLE.

The CS 2000 switch accesses table CCTABLE when the terminating trunk is a Gateway IMT. The most significant 18 digits of the called number are used to index into table CCTABLE. The CS 2000 switch accesses table CCTABLE with the number it will outpulse. (The outpulsed number is the called number after undergoing translations.) The CC field identifies the country code associated with the tuple that matches the outpulsed number. For international calls, the CS 2000 switch adds the true country code to the beginning of the outpulsed number; the value of the CC field equals the country code in the outpulsed number.

The CS 2000 switch compares the country code from table CCTABLE to the serving country code. The serving country code is in the SERVCC field of the GWYTRK option in table TRKGRP. If the country code equals the serving country code, the CS 2000 switch identifies the call as a direct termination outbound international call; otherwise, it identifies the call as a transit outbound international call.

**Note:** For more information on call types, see Chapter 2: “Call Types.”

### How do I activate country code processing?

1. Set the office parameter OFC\_SERVCC in table OFCVAR. See Table 38, “OFC\_SERVCC office parameter in table OFCVAR.”
2. Enter datafill into table CCTABLE. See Table 39, “Table CCTABLE.”

**Table 38 OFC\_SERVCC office parameter in table OFCVAR**

Office parameter	Range of values
OFC_SERVCC	1 is the default value
<i>Note:</i> The OFC_SERVCC office parameter contains the country code of the country that the CS 2000 switch resides in. Since the Gateway IMT is only supported in world zone 1 (WZ1) countries, you can only datafill the value 1 in the OFC_SERVCC office parameter.	

**Table 39 Table CCTABLE**

Field	Description of the field	value
FROMDIGS	an 18-digit register	18 digits valid digits = 0 to 9 valid letters = B, C Letters B and C are each equal to one digit
TODIGS	an 18-digit register	18 digits valid digits = 0 to 9 valid letters = B, C Letters B and C are each equal to one digit
CC	the country code that matches the outpulsed number	valid range = 1 to 999
<i>Note:</i> Table CCTABLE is only accessed when the terminating trunk agent is a Gateway IMT.		

---

## data calls

Feature	SOC	Q.767	ISUP'92	hardware
data calls	None	x	x	None

### What are data calls?

Data calls are calls you make using a modem. Faxes and e-mail are examples of data calls. Data calls are supported on the following bearer services:

- 64K unrestricted
- 64K restricted
- 56K

Table 40, “Interworking matrix for data calls,” shows which trunk agency interworkings support data calls.

**Table 40 Interworking matrix for data calls**

Originating agencies	Terminating agencies							
	Gateway IMT	UCP Intra IMT	UCP Inter IMT	FGD SS7	FGD PTS	PRI	FGB	DAL TIE
Gateway IMT	x	x	x	x	x	x	x	x
UCP Intra IMT	x							
UCP Inter IMT	x							
FGD SS7	x							
FGD PTS	x							
PRI	x							
FGB	x							
DAL TIE	x							

### Interworking of parameters specific to data calls

This section describes how parameters specific to data calls interwork between the

- Q.767 and ISUP'92 Gateway IMTs and the UCP (Intra/Inter) IMT
- Q.767 and ISUP'92 Gateway IMTs and Q.767 and ISUP'92 Gateway IMTs

### Q.767 and ISUP'92 Gateway IMTs' parameters mapped to the UCP (Intra/Inter) IMT's parameters

The user service information (USI) parameter is optional in the initial address message (IAM) of the Q.767 and ISUP'92 Gateway IMTs. Table 41, "Mapping of USI parameter on the UCP (Intra/Inter) IMT when no USI is received on the Q.767/ISUP'92 Gateway IMT," shows how the USI parameter is mapped from the Q.767 and ISUP'92 Gateway IMTs to the UCP (Intra/Inter) IMT when the parameter is not received on the Q.767 and ISUP'92 Gateway IMTs.

**Table 41 Mapping of USI parameter on the UCP (Intra/Inter) IMT when no USI is received on the Q.767/ISUP'92 Gateway IMT**

Q.767/ ISUP'92 Gateway IMT TMR parameter	Q.767/ ISUP'92 Gateway IMT USI parameter	UCP (Intra/Inter) IMT's USI parameter
64K unrestricted	none	Information transfer capability: 64K unrestricted Information transfer rate: 64K Coding standard: National standard Transfer mode: Circuit mode

Table 42, "Mapping of USI parameter on the UCP (Intra/Inter) IMT when no USI is received on the Q.767/ISUP'92 Gateway IMT," shows how the USI parameter is mapped from the Q.767 and ISUP'92 Gateway IMTs to the UCP (Intra/Inter) IMT when a two-byte USI parameter is received on the Q.767 and ISUP'92 Gateway IMTs.

*Note:* A three-byte USI is invalid for data calls.

**Table 42 Mapping of USI parameter on the UCP (Intra/Inter) IMT when no USI**

## is received on the Q.767/ISUP'92 Gateway IMT

Q.767/ ISUP'92 Gateway IMT TMR parameter	Q.767/ ISUP'92 Gateway IMT USI parameter	UCP (Intra/Inter) IMT's USI parameter
64K unrestricted	Information transfer capability: any value supported  Information transfer rate: <ul style="list-style-type: none"> <li>• 64K</li> <li>• Packet mode calls (00000)</li> <li>• for other values give BCNI treatment</li> </ul> <p><i>Note:</i> BCNI treatment is given when wideband data calls originate on non-wideband trunks. Wideband data calls on wideband trunks are blocked with FNAL treatment.</p> Coding standard: all values  Transfer mode: <ul style="list-style-type: none"> <li>• Circuit mode</li> <li>• Packet mode</li> </ul> <p><i>Note:</i> Packet mode data calls are blocked with feature not allowed (FNAL) treatment.</p>	Information transfer capability: 64K unrestricted  Information transfer rate: <ul style="list-style-type: none"> <li>• 64K</li> <li>• 64K</li> <li>• call fails</li> </ul> <p><i>Note:</i> BCNI treatment is given when wideband data calls originate on non-wideband trunks. Wideband data calls on wideband trunks are blocked with FNAL treatment.</p> Coding standard: National standard  Transfer mode: <ul style="list-style-type: none"> <li>• Circuit mode</li> <li>• Call fails</li> </ul> <p><i>Note:</i> Packet mode data calls are blocked with feature not allowed (FNAL) treatment.</p>

Table 43, "Mapping of USI parameter on the UCP (Intra/Inter) IMT when a four-byte USI is received on the Q.767/ISUP'92 Gateway IMT," shows how the USI parameter is mapped from the Q.767 and ISUP'92 Gateway IMTs to the UCP (Intra/Inter) IMT when a four-byte USI parameter is received on the Q.767 and ISUP'92 Gateway IMTs.

*Note:* A three-byte USI is invalid for data calls.



**Table 43 Mapping of USI parameter on the UCP (Intra/Inter) IMT when a four-byte USI is received on the Q.767/ISUP'92 Gateway IMT**

Q.767/ ISUP'92 Gateway IMT TMR parameter	Q.767/ ISUP'92 Gateway IMT USI parameter	UCP (Intra/Inter) IMT's USI parameter
64K unrestricted	<p>Information transfer capability: any value supported</p> <p>Information transfer rate:</p> <ul style="list-style-type: none"> <li>• 64K</li> <li>• Packet mode calls (00000)</li> <li>• for other values give BCNI treatment</li> </ul> <p><i>Note:</i> BCNI treatment is given when wideband data calls originate on non-wideband trunks. Wideband data calls on wideband trunks are blocked with FNAL treatment.</p> <p><i>Note:</i> Information transfer rate with values of 1472K with coding standard as national and multi-rate are unrecognized USI values.</p> <p>Coding standard: all values</p> <p>Transfer mode:</p> <ul style="list-style-type: none"> <li>• Circuit mode</li> <li>• Packet mode</li> </ul> <p><i>Note:</i> Packet mode data calls are blocked with feature not allowed (FNAL) treatment.</p> <p>Layer 1 information: any supported value</p> <p>User rate:</p> <ul style="list-style-type: none"> <li>• 56K</li> <li>• all other values</li> </ul>	<p>Information transfer capability: 64K unrestricted</p> <p>Information transfer rate:</p> <ul style="list-style-type: none"> <li>• 64K</li> <li>• 64K</li> <li>• call fails</li> </ul> <p><i>Note:</i> BCNI treatment is given when wideband data calls originate on non-wideband trunks. Wideband data calls on wideband trunks are blocked with FNAL treatment.</p> <p><i>Note:</i> Information transfer rate with values of 1472K with coding standard as national and multi-rate are unrecognized USI values.</p> <p>Coding standard: National standard</p> <p>Transfer mode:</p> <ul style="list-style-type: none"> <li>• Circuit mode</li> <li>• Call fails</li> </ul> <p><i>Note:</i> Packet mode data calls are blocked with feature not allowed (FNAL) treatment.</p> <p>Layer 1 information: tandemed</p> <p><i>Note:</i> The layer 1 information is built on the UCP only if the user rate is 56K. The four-byte USI is tandemed only if the user rate is 56K; otherwise, the four-byte USI is tandemed as a two-byte USI.</p> <p>User rate:</p> <ul style="list-style-type: none"> <li>• 56K</li> <li>• not built</li> </ul>

Table 44, “Mapping of Q.767/ISUP’92 Gateway IMT’s CPC parameter to the UCP (Intra/Inter) IMT’s CPC parameter,” shows how the Q.767/ISUP’92 Gateway IMT’s calling party category (CPC) parameter, located in the initial address message (IAM), maps to the UCP (Intra/Inter) IMT’s CPC parameter.

**Table 44 Mapping of Q.767/ISUP’92 Gateway IMT’s CPC parameter to the UCP (Intra/Inter) IMT’s CPC parameter**

Q.767/ ISUP’92 Gateway IMT CPC parameter	UCP (Intra/Inter) IMT’s CPC parameter
ISUP_CPC_DATA_CALL	ISUP_CPC_DATA_CALL

### Q.767/ISUP’92 Gateway IMT to Q.767/ISUP’92 Gateway IMT

The Q.767/ISUP’92 Gateway IMT tandems the TMR and USI values. If the Q.767/ISUP’92 Gateway IMT does not receive a USI, it builds a default two-byte USI when the incoming TMR is 64K unrestricted. See Table 45, “Default two-byte USI.”

**Table 45 Default two-byte USI**

Q.767/ ISUP’92 Gateway IMT’s TMR parameter	Q.767/ ISUP’92 Gateway IMT’s optional USI parameter
64K unrestricted	Information transfer capability: 64K unrestricted Information transfer rate: 64K unrestricted Coding standard: National standard Transfer mode: Circuit mode

### UCP (Intra/Inter) IMT to Q.767/ISUP’92 Gateway IMT

Table 46, “UCP (Intra/Inter) IMT’s CPC mapped to the Q.767/ISUP’92 Gateway IMT’s CPCI,” shows how the UCP (Intra/Inter) IMT’s calling party category (CPC) maps to the Q.767/ISUP’92 Gateway IMT’s CPC when the UCP (Intra/Inter) IMT’s IAM contains optional parameters or the option ISDNXFER is set in the UCP (Intra/Inter) IMT’s table TRKGRP.

**Table 46 UCP (Intra/Inter) IMT’s CPC mapped to the Q.767/ISUP’92 Gateway**

### IMT's CPCI

UCP (Intra/Inter) IMT's CPC parameter	Q.767/ ISUP'92 Gateway IMT's CPC parameter
ISUP_CPC_DATA_CALL	ISUP_CPC_DATA_CALL

Table 47, "Mapping of UCP (Intra/Inter) IMT's USI parameter to the Q.767/ISUP'92 Gateway IMT's TMR and optional USI parameter," shows how the UCP (Intra/Inter) IMT's USI parameter maps to the Q.767/ISUP'92 Gateway IMT's TMR and optional USI parameters when the UCP (Intra/Inter) IMT's IAM contains optional parameters or the option ISDNXFER is set in the UCP (Intra/Inter) IMT's table TRKGRP.

**Table 47 Mapping of UCP (Intra/Inter) IMT's USI parameter to the Q.767/ISUP'92 Gateway IMT's TMR and optional USI parameter**

UCP (Intra/Inter) IMT's USI parameter	Q.767/ ISUP'92 Gateway IMT TMR parameter	Q.767/ ISUP'92 Gateway IMT optional USI parameter
Information transfer capability:		Information transfer capability:
<ul style="list-style-type: none"> <li>• 64K unrestricted</li> <li>• 64 restricted</li> </ul>	<ul style="list-style-type: none"> <li>• 64K unrestricted</li> <li>• 64 restricted</li> </ul>	<ul style="list-style-type: none"> <li>• 64K unrestricted</li> <li>• 64 restricted</li> </ul>
Information transfer rate:		Information transfer rate:
<ul style="list-style-type: none"> <li>• 64K</li> <li>• Packet mode calls (00000)</li> <li>• for other values give BCNI treatment</li> </ul> <p><i>Note:</i> BCNI treatment is given when wideband data calls originate on non-wideband trunks. Wideband data calls on wideband trunks are blocked with FNAL treatment.</p>		<ul style="list-style-type: none"> <li>• 64K</li> <li>• call fails</li> </ul> <p><i>Note:</i> BCNI treatment is given when wideband data calls originate on non-wideband trunks. Wideband data calls on wideband trunks are blocked with FNAL treatment.</p>
Coding standard:		Coding standard:
all values	Coding standard: all values	National standard
	Transfer mode:	Transfer mode:
	<ul style="list-style-type: none"> <li>• Circuit mode</li> <li>• Packet mode</li> </ul> <p><i>Note:</i> Packet mode data calls are blocked with feature not allowed (FNAL) treatment.</p>	<ul style="list-style-type: none"> <li>• Circuit mode</li> <li>• call fails</li> </ul> <p><i>Note:</i> Packet mode data calls are blocked with feature not allowed (FNAL) treatment.</p>

UCP (Intra/Inter) IMT's USI parameter	Q.767/ ISUP'92 Gateway IMT TMR parameter	Q.767/ ISUP'92 Gateway IMT optional USI parameter
	Layer 1 information: any supported value	Layer 1 information: tandemed <i>Note:</i> The layer 1 information is built on the UCP only if the user rate is 56K. The four-byte USI is tandemed only if the user rate is 56K; otherwise, the four-byte USI is tandemed as a two-byte USI.
	User rate: <ul style="list-style-type: none"> <li>• 56K</li> <li>• all other values</li> </ul>	User rate: <ul style="list-style-type: none"> <li>• 56K</li> <li>• not built</li> </ul>

Table 48, “Outgoing TMR and outgoing optional USI,” shows how the UCP (Intra/Inter) IMT maps the USI and TMR to the Q.767/ISUP'92 Gateway IMT when the ISDNXFER option is not set in table TRKGRP for the originating trunk agent and there are no optional parameters in the IAM.

**Table 48 Outgoing TMR and outgoing optional USI**

<b>Outgoing TMR</b>	<b>Outgoing optional USI</b>
64K unrestricted	Information transfer capability: 64K unrestricted
	Information transfer rate: 64K
	Coding standard: national standard
	Transfer mode: circuit mode
	Layer 1 information: layer 1 rate adaptation
	User rate: 56K

Table 49, “UCP (Intra/Inter) IMT’s CPC mapped to the Q.767/ISUP’92 Gateway IMT’s CPC,” UCP (Intra/Inter) IMT’s CPC mapped to the Q.767/ISUP’92 Gateway IMT’s CPC, shows how the UCP (Intra/Inter) IMT’s calling party category (CPC) maps to the Q.767/ISUP’92 Gateway IMT’s CPC when the UCP (Intra/Inter) IMT’s IAM contains no optional parameters and the option ISDNXFER is not set in the UCP (Intra/Inter) IMT’s table TRKGRP.

**Table 49 UCP (Intra/Inter) IMT’s CPC mapped to the Q.767/ISUP’92 Gateway IMT’s CPC**

<b>UCP (Intra/Inter) IMT’s CPC parameter</b>	<b>Q.767/ ISUP’92 Gateway IMT’s CPC parameter</b>
_DATA	_SUBSCRIBER1

### How data calls appear on the call detail report

A data call is indicated with the value Y in the DIGDATA field of the call detail report (CDR). This field is a boolean.

## Data call identification

### UCP ISUP IMT originations

When a call originates on a UCP ISUP IMT (Intra/Inter), the CS 2000 switch identifies the call as a data call if

- the information digits of the I3PA dial plan are “56.”

*Note:* If the information digits are “56,” then the call is a 56K data call.

- the information transfer capability (ITC) in the user service information (USI) parameter of the incoming initial address message (IAM) indicates either “UNRESTRICTED DIGITAL” or “RESTRICTED DIGITAL.” If the ITC equals “UNRESTRICTED DIGITAL” and the user rate in the USI parameter is 56K, the call is a 56k unrestricted digital call; otherwise, it is a 64K unrestricted digital call. If the ITC equals “RESTRICTED DIGITAL,” the call is a 64K restricted digital call.

### Gateway IMT originations

When a call originates on a Q.767 or ISUP’92 Gateway IMT, the CS 2000 switch identifies the call as a data call if the transmission medium requirement (TMR) parameter in the incoming IAM indicates “UNRESTRICTED DIGITAL.” The user rate in the user service information (USI) parameter specifies whether the data call is 56K or 64K. If the user rate is 56K, the data call is 56K; otherwise, it is a 64K unrestricted digital call.

*Note:* The TMR parameter is a mandatory parameter while the USI parameter is an optional parameter. If the incoming IAM contains both parameters, the TMR parameter determines whether the call is a data call.

### PRI originations

When a call originates on a PRI trunk, the CS 2000 switch identifies the call as a data call if the information transfer capability (ITC) in the bearer capability parameter in the incoming SETUP message indicates either “UNRESTRICTED DIGITAL” or “RESTRICTED DIGITAL.” If the ITC is “UNRESTRICTED DIGITAL” and the access data rate in the bearer capability is 56K, then the call is a 56K unrestricted digital call; otherwise, it is a 64K unrestricted digital call. If the ITC is “RESTRICTED DIGITAL,” the call is a 64K restricted digital call.

### PTS originations

When a call originates on a PTS trunk, the CS 2000 switch identifies the call as a data call if the BCNAME field in table TRKGRP for the PTS CLLI is set to either 64KDATA or 56KDATA.

*Note:* While 64K data may be datafilled on the PTS (FGD) agent, the rate will be treated as 56K. 64K data rate is not supported on PTS agents.

## NetworkBuilder

Feature	SOC	Q.767	ISUP'92	hardware
NetworkBuilder	None	x	x	None
<i>Note:</i> Calls that originate on the Q.767/ISUP'92 Gateway IMT are not supported by NetworkBuilder.				

NetworkBuilder allows the CS 2000 switch to query a service control point (SCP), a database that exists outside of the CS 2000 switch, to perform additional services. Calls that originate on the Q.767 and ISUP'92 Gateway IMTs are not supported by NetworkBuilder.

**ATTENTION**  
Calls that originate on the Q.767 and ISUP'92 Gateway IMT are not supported by NetworkBuilder.

Calls, on the CS 2000 switch, that use NetworkBuilder can terminate to the Q.767 and ISUP'92 Gateway IMTs. Any point in calls (PICs), trigger detection points (TDPs), triggers, and event detection points (EDPs) on the CS 2000 switch can terminate to the Q.767 and ISUP'92 Gateway IMTs with the following restrictions:

- The Q.767 and ISUP'92 Gateway IMT trunk agencies only send NetworkBuilder SS7 messages and parameters that are supported on the Q.767 and ISUP'92 Gateway IMT. See Appendix C: "Q.767 messages and parameters," and Appendix H: "ISUP'92 Gateway IMT messages and parameters," for the messages and parameters supported by the Q.767 and ISUP'92 Gateway IMT trunk agencies.
- The CS 2000 switch supports direct termination routing to the Q.767 and ISUP'92 Gateway IMT trunks only through table TERMRTE.
- The terminating call model is not supported.

## overlap sending

Feature	SOC	Q.767	ISUP'92	hardware
overlap sending	None	x	x	None

Overlap sending is a process in signaling that allows a trunk to send the called party number in multiple messages. If the incoming initial address message (IAM) does not contain digits in the called party number parameter or contains incomplete digits in that parameter, the CS 2000 switch enters overlap mode.

When overlap sending is active, the CS 2000 switch waits for the trunk to send the “#F” digit, which signifies the end of the address message. The CS 2000 switch waits five seconds for the trunk to send a subsequent address message (SAM). If the trunk does not send a SAM, the CS 2000 switch processes the called number. If the T35 timer is set in table C7UPTMR, then the CS 2000 switch waits one to 60 seconds for the trunk to send a (SAM). Specify in table C7UPTMR how long the CS 2000 switch waits for the SAM. If the trunk does not send a SAM in the time you specified, the CS 2000 switch processes the called number.

**Note:** For more information on table C7UPTMR and timers, see “protocol timers” in this appendix.

To activate overlap sending, enter Y in the OVRLAP field in table TRKSGRP.

## protocol timers

Feature	SOC	Q.767	ISUP'92	hardware
protocol timers	None	x	x	None

Protocol timers place a time limit on how long the CS 2000 switch waits for a response to a message it sent. You can set each timer on a trunk subgroup basis in table C7UPTMR. In table TRKSGRP, the value in the field TMRNAME provides the index into table C7UPTMR. If you do not enter datafill into the TMRNAME field, the default values are used.

Table 50 “Gateway IMT protocol timers,” shows the name of each timer, the reason the timer starts, the table C7UPTMR timer, and the range of values you can enter for each timer.

**Table 50 Gateway IMT protocol timers**

Timer name	Reason timer starts	Table C7UPTMR timer	range of values
T1 4–15 s	When release message is sent	NQ764T1	1–60 s default = 15 s
T2 3 min	When suspend request controlling gateway receives suspend (user) message	NQ764T2	1–240 s default = 180 s



Timer name	Reason timer starts	Table C7UPTMR timer	range of values
T3	Not used on the international interface		
T4	Not used on the international interface		
T5 1 min	When initial release message is sent	NQ764T5	1–180 s default = 60 s
T6 Q.118	When controlling gateway receives suspend (network)	NQ764T6	1–240 s default = 90 s
<p><b>Note:</b> The Gateway IMT does not support the T6 timer because it does not support suspend (SUS) and resume (RES) messages. It ignores the T6 timer and, when the Gateway IMT is the originating trunk agency, tandems SUS and RES messages. For other originating trunk agencies, the existing SUS and RES functionality is performed.</p>			
T7 20–30 s	When the latest address message is sent	NQ764T7	1–60 s default = 20 s
T8 10–15 s	When transit or incoming international gateway receives initial address message requiring continuity check on this circuit, or indicates that continuity check has been performed on a previous circuit	NQ764T8	1–60 s default = 15 s
T9 Q.118 2–4 min	When national controlling or outgoing international gateway receives ACM	Q.118	120–240 s default = 180 s
<p><b>Note:</b> The T9 timer is not used for answer timing. Field LCDDUR in table TRKGRP1 is used for answer timing. The value of the LCDDUR field for the terminating trunk provides the answer timing. The range of the LCDDUR field is 0 to 60; it supports up to 60 minutes for answer timing. If the value is zero, then the CS 2000 switch does not perform answer timing and the call continues.</p>			
T10 4–6 s	When last digit is received in interworking situations	NQ764T10	1–30 s default = 5 s

Timer name	Reason timer starts	Table C7UPTMR timer	range of values
T11 15–20 s	When latest address message is received in interworking situations	NQ764T11	1–60 s default = 15 s
T12 4–15 s	When blocking message is sent	NQ764T12	1–60 s default = 10 s
T13 1 min	When initial blocking message is sent	NQ764T13	1–180 s default = 60 s
T14 4–15 s	When unblocking message is sent	NQ764T14	1–60 s default = 10 s
T15 1 min	When initial unblocking message is sent	NQ764T15	1–180 s default = 60 s
T16 4–15 s	When reset circuit message is sent not due to the expiration of Timer T5	NQ764T16	1–60 s default = 10 s
T17 1 min	When initial reset circuit message is sent	NQ764T17	1–180 s default = 60 s
T18 4–15 s	When group blocking message is sent	NQ764T18	1–60 s default = 10 s
T19 1 min	When initial group blocking message is sent	NQ764T18	1–180 s default = 60 s
T20 4–15 s	When group unblocking message is sent	NQ764T20	1–60 s default = 10 s
T21 1 min	When initial group unblocking message is sent	NQ764T21	1–180 s default = 60 s
T22 4–15 s	When circuit group reset message is sent	NQ764T22	1–60 s default = 10 s

Timer name	Reason timer starts	Table C7UPTMR timer	range of values
T23 1 min	When initial circuit group reset message is sent	NQ764T23	1–180 s default = 60 s
T24 less than 2 s	When check tone is sent	NQ764T24	0.1–2 s default = 1 s
T25 1–10 s	When initial continuity check failure is detected	NQ764T25	1–30 s default = 10 s
T26 1–3 min	When second or subsequent continuity check failure is detected	NQ764T26	1–240 s default = 120 s
T27 4 min	When continuity check failure indication is received	NQ764T27	1–300 s default = 240 s
T28	Not used on the international interface		
T29 300–600 ms	Congestion indication received when T29 not running	Not implemented	
T30 5–10 s	Congestion indication received when T29 not running	Not implemented	
T31	Not used on the international interface		
T32	Not used on the international interface		
T33	Not used on the international interface		
T34	Not used on the international interface		

Timer name	Reason timer starts	Table C7UPTMR timer	range of values
T35 15–20 s	At receipt of the latest digit and before the minimum or fixed number of digits have been received	NQ764T35	1–60 s default = 20 s
T36 10–15 s	When transit or incoming international gateway receives continuity check request message	NQ764T8	1–60 s default = 15 s

## satellite indication

Feature	SOC	Q.767	ISUP'92	hardware
satellite indication	None	x	x	None

### What is satellite indication?

The nature of connection (NOC) parameter in the initial address message (IAM) contains the satellite indicator value. This value tells the next switch the call encounters whether the call came over a satellite at any point in its route before it reached that switch.

The Gateway IMT, UCP (Inter/Intra) ISUP IMT, and SS7 FGD trunk agencies support outgoing satellite indication. You can set table TRKSGRP's satellite (SAT) field to indicate whether a satellite exists in the call path. The RI, PTS FGD, FGB, and DAL-TIE trunks only support land-based transmissions and are unable to provide an outgoing satellite indicator. This means, the CS 2000 switch only receives the satellite indication if the call originates on a Gateway IMT, a UCP (Inter/Intra) ISUP IMT, or an SS7 FGD trunk agency.

### Double-hop-satellite restriction

The Gateway IMT supports double-satellite-hop restriction. The CS 2000 switch restricts double-satellite-hop when the terminating trunk agent's table TRKSGRP's SAT field contains the value Y.

If the originating call's satellite indication shows that the call has already encountered a satellite, the CS 2000 switch restricts the call from terminating on a trunk agent that has a table TRKSGRP SAT field value of Y.

### Satellite indication on the Gateway IMT

The table TRKSGRP SAT field can have two values:

- no (N) means there is no satellite circuit in the connection

- yes (Y) means there is a satellite circuit in the connection

The nature of connection (NOC) can have one of four values to specify whether a call encountered a satellite:

- no satellite circuit in the connection (00)
- one satellite circuit in the connection (01)
- two satellite circuits in the connection (10)
- spare (11)

### **Satellite indication on the UCP (inter/intra) ISUP IMT**

The table TRKSGRP SAT field can have two values:

- no (N) means there is no satellite circuit in the connection
- yes (Y) means there is one satellite circuit in the connection

The nature of connection can have one of four values to specify whether a call encountered a satellite:

- no satellite circuit in the connection (00)
- one satellite circuit in the connection (01)
- two satellite circuits in the connection (10)
- three or more satellite circuits in the connection (11)

If the call uses an I3PA dialing plan, it will contain a two-digit facility code that gives the following information:

- The first digit gives the calltype:
  - 0x means national calls
  - 2x means class of service (COS)
  - 56 means data call
- The second digit is the facility code:
  - queued at previous switch
  - satellite at previous switch

### **Satellite indication on an SS7 FGD**

The table TRKSGRP SAT field can have two values:

- no (N) means there is no satellite circuit in the connection
- yes (Y) means there is one satellite circuit in the connection

The nature of connection can have one of four values to specify whether a call encountered a satellite:

- no satellite circuit in the connection (00)

- one satellite circuit in the connection (01)
- two satellite circuits in the connection (10)
- three or more satellite circuits in the connection (11)

### Satellite indicator's value in the outgoing IAM

In Table 51, "Satellite indicator's value in the outgoing IAM," the Gateway IMT is the originating trunk that sends the IAM to the terminating UCP (inter/intra) ISUP IMT.

**Table 51 Satellite indicator's value in the outgoing IAM**

Gateway IMT as originator		UCP (inter/intra) ISUP IMT as terminator		
Incoming indicator	SAT field's value	SAT field's value	outgoing indicator	13PA's indicator
00	N	N	00	N
00	Y	N	01	Y
00	N	Y	01	Y
01	N	N	01	Y
01	Y	N	01	Y
10	N	N	10	Y
10	Y	N	10	Y
11	N	N	10	Y
11	Y	N	10	Y

**Note:** The satellite (SAT) indicator field is in table TRKSGRP.

**Note:** For all combinations not listed in this table, the call is route advanced until it reaches a route whose terminating trunk has the SAT field set to N.

In Table 52, "Satellite indicator's value in the outgoing IAM to an SS7 FGD," the Gateway IMT is the originating trunk that sends the IAM to the terminating SS7 FGD.

**Table 52 Satellite indicator's value in the outgoing IAM to an SS7 FGD**

Gateway IMT as originator		SS7 FGD as terminator	
Incoming indicator	SAT field's value	SAT field's value	outgoing indicator
00	N	N	00
00	Y	N	01
00	N	Y	01
01	N	N	01
01	Y	N	01
10	N	N	10
10	Y	N	10
11	N	N	10
11	Y	N	10

**Note:** The satellite (SAT) indicator field is in table TRKSGRP.

**Note:** For all combinations not listed in this table, the call is route advanced until it reaches a route whose terminating trunk has the SAT field set to N.

In Table 53, “Satellite indicator's value in the outgoing IAM to a Gateway IMT,” the originating Gateway IMT sends the IAM to the terminating Gateway IMT.

**Table 53 Satellite indicator's value in the outgoing IAM to a Gateway IMT**

Gateway IMT as originator		Gateway IMT as terminator	
Incoming indicator	SAT field's value	SAT field's value	outgoing indicator
00	N	N	00
00	Y	N	01
00	N	Y	01
01	N	N	01
01	Y	N	01
10	N	N	10
10	Y	N	10
11	N	N	10
11	Y	N	10

**Note:** The satellite (SAT) indicator field is in table TRKSGRP.

**Note:** For all combinations not listed in this table, the call is route advanced until it reaches a route whose terminating trunk has the SAT field set to N.

In Table 54, “Satellite indicator in the outgoing IAM to a Gateway IMT,” the originating SS7 FGD or UCP (inter/intra) ISUP IMT trunks send the IAM to a Gateway IMT.

**Table 54 Satellite indicator in the outgoing IAM to a Gateway IMT**

SS7 FGD or UCP (inter/intra) ISUP IMT as originator		Gateway IMT as terminator	
Incoming indicator	SAT field's value	SAT field's value	outgoing indicator
00	N	N	00
00	N	Y	01
00	Y	N	01
01	N	N	01
01	Y	N	01
10	N	N	10
10	Y	N	10
11	N	N	10
11	Y	N	10

**Note:** The satellite (SAT) indicator field is in table TRKSGRP.

**Note:** For all combinations not listed in this table, the call is route advanced until it reaches a route whose terminating trunk has the SAT field set to N.

In Table 54, “Satellite indicator in the outgoing IAM to a Gateway IMT,” the originating PTS FGD, FGB or PRI trunk agencies terminate to a Gateway IMT.

**Table 55 Satellite indicator values for PTS FGD, FGB, and PRI agencies terminating to a Gateway IMT**

PTS FGD, FGB, DAL-TIE, or PRI as originator		Gateway IMT as terminator	
SAT field's value	SAT field's value	outgoing indicator	
N	N	00	
N	Y	01	
Y	N	01	

**Note:** The satellite (SAT) indicator field is in table TRKSGRP.

**Note:** For all combinations not listed in this table, the call is route advanced until it reaches a route whose terminating trunk has the SAT field set to N.



## Test calls

Feature	SOC	Q.767	ISUP'92	hardware
test calls	None	x	x	None

Test calls are calls you send over a test line to test trunk connections to local and toll offices. You send a test call over a trunk to determine if the trunk needs maintenance. The calling office runs test line tests (TLTs) The Q.767 and ISUP'92 Gateway IMTs support two types of test calls:

- manual test calls (TTP)
- automatic trunk testing (ATT)

Test calls originate from test facilities on the near-end switch, go over the trunk that is being tested, and terminate on test equipment at the far-end switch. The Q.767 and ISUP'92 Gateway IMTs support test calls on three testlines:

- T100 (balanced termination testline)
- T101 (communication testline)
- T102 (milliwatt testline)

### Manual test calls

Use two commands at the TTP level of the MAP terminal to place test calls:

- TST command
- OP command

#### TST command

Use the TST command to initiate a test call over the T100 or the T102 test lines. The TST command uses the syntax

```
>TST T10x
```

where:

x = 0 or 2

The following example explains the translations on the near-end switch for a test call placed with the TST command:

1. The command TST T102 is used to place a test call at the TTP level of the MAP terminal.
2. The near-end switch accesses table CLLIMTC. Table CLLIMTC provides the fields TSTNOIND, used to index into table TSTLCONT, and MWIDX, used to index into table MWDATA. See Table 56, "Table CLLIMTC tuple information."

**Table 56 Table CLLIMTC tuple information**

field name	field's data
CLLI	IMT761LP00
SCLLI	IMT61
MINALM	5
MAJALM	10
CRITALM	15
SYNCTYPE	NSS
TSTNOIND	0
MWIDX	0
SIGTST	N
PRFXDIG	N
DIAGDATA	(4)

3. Table TSTLCONT contains the address digits, 102, to be outputted for the corresponding Testline. See Table 57, "Table TSTLCONT, subtable TLNOS." The initial address message (IAM) of the outgoing test call contains these address digits as address information. The IAM's nature of address (NOA) parameter is set to test line test code. This NOA parameter at the far-end switch indicates the office parameter GLOBAL\_TESTCALL\_PRTNM for pretranslations.

*Note:* Since table TSTLCONT is unable to contain more than 12 address digits, the TST command is unable to output more than 12 address digits.

**Table 57 Table TSTLCONT, subtable TLNOS**

field name	field's data
TESTLINE	T102
TLNUMBER	102
TL_MFC_OG_SIG	N

Table MWDATA provides the frequency and the decibel level which the near-end switch expects from the far-end switch. In this example, the decibel level is 0 Hz and the frequency is 1004 Hz. See Table 58, "Table MWDATA."

**Table 58 Table MWDATA**

field name	field's data
IDXKEY	0
MWDATA	0 1004

The following example explains the translations on the far-end switch when the test call terminates through a route specified in table STDPRTCT:

1. The far-end switch gets a pretranslator name from the office parameter GLOBAL\_TESTCALL\_PRTNM. See Table 59, “Table OFCVAR, position GLOBAL\_TESTCALL\_PRTNM.”

**Table 59 Table OFCVAR, position GLOBAL\_TESTCALL\_PRTNM**

office parameter	parameter's value
GLOBAL_TESTCALL_PRTNM	C7PT
Note: If the value is NPRT, then the PRTNM in table TRKGRP is used.	

2. Table STDPRTCT, subtable STDPRT specifies the test call's route. See Table 60, “Table STDPRTCT, subtable STDPRT.”

**Table 60 Table STDPRTCT, subtable STDPRT**

field name	field's data
FROMDIGS	1-2
TODIGS	102
PRETRTE	DD 3 TERM102T 3 3 NONE

3. The test call terminates on TERM102T Test Line and subsequent tests are performed on the trunk group.

### OP command

Use the OP command to initiate a test call over the T100, T101, or T102 test lines. The OP command uses two formats:

>OP xxxxxxxx

where:

xxxxxxx = dialed digits that the far-end office can translate

>OP T10x

where:

x = 0, 1, or 2

**Note:** The OP command is unable to be used to outpulse more than 12 address digits because it takes these digits from table TSTLCONT; table TSTLCONT is unable to contain more than 12 address digits.

The following example explains the translations on the near-end switch for a test call placed with the OP command:

1. The command OP 2141001234 is used to place a test call at the TTP level of the MAP terminal.

2. Since the number of address digits equals ten, the nature of address in the IAM is set to “national significant number.” The far-end switch indicates the pretranslations name (PRTNM) in table TRKGRP is to be used for pretranslations.

The following example explains the translations on the far-end switch for a test call placed with the OP command when the call terminates through a route specified in universal translations:

1. The far-end switch accesses table TRKGRP. See Table 61, “Table TRKGRP.”

**Table 61 Table TRKGRP**

field name	field's data
GRPKEY	IMT761LP00
GRPTYP	IMT
TRAFSNO	40
PADGRP	NPDGP
NCCLS	NCIM
GRPINFO	UCSUST 0 2W IMT MIDL 16 7 16 UCS2UCS NIL CN NONE 4 ALWAYS ADDR 111 0 GLOBAL N N N VOICE_DATA NONE 4 160 (OHQ) (OHQ-TERM) \$

2. The far-end switch obtains the OPART and TPART from table TRKGRP to derive the STS from table PARTOSTS. See Table 62, “Table PARTOSTS.”

**Table 62 Table PARTOSTS**

key	STS
00 111	611

3. The far-end switch uses the PRTNM obtained from table TRKGRP and the incoming nature of address are used to access table TYP2PRTM. See Table 63, “Table TYP2PRTM.”

**Table 63 Table TYP2PRTM**

key	OPRTNM
IMT NATL	IMT

4. The far-end switch accesses table PRETNAME. See Table 64, “Table PRETNAME.”

**Table 64 Table PRETNAME**

field	field's data
PRTNM	IMT
STDPRTNM	IMT
ASTPRTNM	NPRT
OCTPRTNM	OCTR

5. The far-end switch accesses table STDPRTCT. See Table 65, “Table STDPRTCT.”

**Table 65 Table STDPRTCT**

field name	field's data
FROMDIGS	214
TODIGS	21
PRETRTE	CT OFFNET 2 20 0 (UNIVIDX CT) \$

6. The far-end switch uses the derived STS to index into table STS2CTDB to get the translator name for the call. See Table 66, “Table STS2CTDB.”

**Table 66 Table STS2CTDB**

field name	field's data
STS	611
OFFXNAM	IUCS611
ONXNAM	IUCS611

7. The far-end switch accesses table CTCODE. See Table 67, “Table CTCODE.”

**Table 67 Table CTCODE**

field name	field's data
XLANAME	IUCS611
FROMD	214
TOD	214
XLADATA	RTE (PF 0) (MM 7 15) (DEST 111) \$

8. The far-end switch accesses table CTRTE. See Table 68, “Table CTRTE.”

**Table 68 Table CTRTE**

field name	field's data
XLANAME	IUCS611
RTEREF	111
RTELIST	(S IMT762C7DR03) \$

9. The test call terminates on IMT762C7DR03.

### Automatic trunk testing

The CS 2000 switch uses tables ATTSCHEM and ATTOPTNS to specify which trunks to test and what information to include in the test logs.

Table ATTOPTNS defines the options for the test classes:

- quarterly (QUAR)
- periodic (PERD)
- manual (MAN, MAN1, MAN2, MAN3, MAN4)
- ATME No. 2 (ATME, ATME1)
- semi-yearly (SYR)
- nonstandard (NSTD)
- PATT100
- ATT123

*Note:* See the *Automatic Trunk Testing Description* for more information on automatic trunk testing.

### Initial address message information in a test call

The near-end switch formats the initial address message (IAM) as a test call IAM and sends this IAM to the far-end switch. The test call IAM contains four parameters:

- nature of connection indicator
- calling party category parameter
- called party number
- user service information

### Nature of connection indicator

The nature of connection indicator contains the following information:

- The value of the satellite indicator field depends on the data in table TRKSGRP.
- The continuity check indicator contains the continuity check not required value (00), regardless of the data in table TRKSGRP.

- The echo suppressor indicator contains the outgoing half echo suppressor not included value (0), regardless of the data in table TRKSGRP.

### Calling party category parameter

The calling party category parameter contains the test call value (00001101). The near-end switch sends this value regardless of which facility initiates the test, regardless of the line call, and regardless of the number of digits.

### Called party number parameter

To allow the terminating, far-end switch to terminate the call to the appropriate test line, the nature of address indicator and numbering plan indicator fields of the called party number parameter depend on the called party number:

- If the called party number contains more than three digits, the nature of address field is encoded with the national significant value (00000011) and the numbering plan indicator is encoded with the ISDN/telephony numbering plan value (001).
- If the called party number contains a test line number (a three-digit test code), the nature of address field is encoded with the test line value (1110111) and the numbering plan indicator is encoded with the unknown numbering plan value (000).

### User service information

The layer 1 information field of the user service information depends on the data in table CARRMTC.

## Translations and terminations of test calls

If the nature of address in the called party number parameter is testline test (1110111), the far-end switch gets the pretranslator name from the office parameter GLOBAL\_TESTCALL\_PRTNM. If the GLOBAL\_TESTCALL\_PRTNM office parameter is set to NPRT, the far-end switch gets the pretranslator name from the PRTNM field of table TRKGRP.

**Note:** For testline numbers, the office parameter GLOBAL\_TESTCALL\_PRTNM usually contains the value C7PT.

The dialplan depends on the numbering plan indicator of the incoming IAM:

- If the numbering plan indicator contains the value ISDN\_TELEPHONY\_NUM\_PLAN, the dialplan in table TRKGRP is used. If the dialplan in table TRKGRP is NIL, the dialplan from table OPT250 is used.
- If the numbering plan indicator contains the value UNKNOWN\_NUM\_PLAN, the ADDR dialplan is used.

If the nature of address (NOA) in the called party number parameter indicates testline test (1110111), table STDPRTCT subtable STDPRT must contain the data standard route to testlines. If this route is not contained in the table, the call uses universal translations. In this case, the serving translation scheme (STS) is derived in the following manner:

- If the call originates on a UCP (intra) IMT, the STS is derived from the office parameter DEFAULT\_STS in table OFCVAR.
- If the call originates on a Gateway IMT, the STS is derived using the OPART and TPART fields of table TRKGRP.

**Note:** The selectors in table STDPRTCT, subtable STDPRT supported for pretranslations of test calls are the S, T, D, and CT selectors.

When the trunk under test (TUT) is connected to the specified testline at the far-end switch, the test equipment at the near-end switch starts the test. When the test is complete, a log report indicates the results.

## Parameter interworking for test calls

### Q.767/ISUP'92 Gateway IMT to UCP (Intra/Inter) IMT

Table 69, “TMR parameter mapped from Q.767/ISUP'92 Gateway IMT to UCP (Intra/Inter) IMT,” shows how the transmission medium requirement (TMR) parameter in the initial address message (IAM) is mapped from the Q.767/ISUP'92 Gateway IMT to UCP (Intra/Inter) IMT.

**Table 69 TMR parameter mapped from Q.767/ISUP'92 Gateway IMT to UCP (Intra/Inter) IMT**

Q.767/ISUP'92 Gateway IMT TMR parameter mapped to	the UCP (Intra/Inter) IMT TMR parameter
3.1 kHz audio	speech

### Test call terminating on an IMT trunk

Table 70, “Mapping of CPA parameter in terminating IMT,” shows the mapping of the nature of address (NOA) and numbering plan indicator fields in the called party address (CPA) parameter in the outgoing initial



**Table 70 Mapping of CPA parameter in terminating IMT**

Outgoing IAM parameter	when CPA length is greater than three	when CPA length is less than three
called party nature of address	NATIONAL (0000011)	ISUP_TESTLINE (1110111)
called party numbering plan indicator	ISDN/Telephony numbering plan (001)	Unknown (000)

### How test calls affect billing

The office parameter CDR\_FOR\_TESTLINE in table OFCOPT controls the generation of call detail reports (CDRs) for test calls. If you set the CDR\_FOR\_TESTLINE office parameter to “Y,” the CDR for the test call will contain the value 7 in the COMPCODE field.

**Note:** After a test call, initiated with the OP command, has successfully completed, you must use the RLS R command at the TTP level of the MAP terminal to release the trunk. When you use this command, the COMPCODE field in the CDR contains the value 5.

**Table Trunk Group (TRKGRP) nature of address enhancements**

Feature	SOC	Q.767	ISUP'92	hardware
Table TRKGRP nature of address enhancements	None	x	x	None
<b>Note:</b> The table TRKGRP NOA enhancements feature is only applicable to direct termination inbound national calls that terminate on ISUP (inter/intra) IMTs.				

Table TRKGRP nature of address (NOA) enhancements enhances NOA delivery in the called party address parameter of the outgoing initial address message (IAM). The field OUTNOA in table TRKGRP contains the NOA value that is outputted in the IAM's called party address parameter.

#### ATTENTION

The table TRKGRP NOA enhancements feature is only applicable to direct termination inbound national calls that terminate on ISUP (inter/intra) IMTs.

See Appendix A of the *UCS DMS-250 General Description* for more information on this feature.



---

## Appendix B: Q.767 Gateway IMT messages

---

Table 71, “Q.767 international messages,” has two functions:

- it lists the Q.767 international messages the CS 2000 switch
- recognizes
- it shows what the CS 2000 switch does with the messages which signaling protocol supports the feature

Table 71 Q.767 international messages

Message's name	Message's acronym	sends	receives	processes	tandems
address complete message	ACM	x	x	x	
answer message	AM	x	x	x	
blocking	BLO	x	x	x	
blocking	BLA	x	x	x	
acknowledgement					
call progress	CPG	x	x		x
circuit group blocking	CGB		x	x	
circuit group blocking acknowledgement	CGBA	x		x	
circuit group reset	GRS	x	x	x	
circuit group reset acknowledgement	GRA	x	x	x	
circuit group unblocking	CGU		x	x	
circuit group unblocking acknowledgement	CGUA	x		x	
connect	CON	x	x	x	
continuity	COT	x	x	x	
continuity check requests	CCR	x	x	x	
forward transfer	FOT	x	x		x
initial address message	IAM	x	x	x	
information request	INR	x		x	
<b>Note:</b> The CS 2000 switch does not do call processing for this message. It sends a information not available message (INF) in the backward direction. The CS 2000 switch delivers the CLI in en bloc format. If it receives an incomplete CLI, it does not create a INR message; instead, it discards the calling party category.					
release	REL	x	x	x	
release complete	RLC	x	x	x	
reset circuit	RSC	x	x	x	
resume	RES	x	x		x
<b>Note:</b> If the resume indicator in the RES message is set to network initiated and the message is received on the terminator after the ANM message, the message is tandemed; otherwise, the message is discarded.					

Message's name	Message's acronym	sends	receives	processes	tandems
subsequent address message	SAM	x	x	x	
suspend	SUS	x	x		x
<b>Note:</b> If the suspend indicator in the SUS message is set to network initiated and the message is received on the terminator after the ANM, the message is tandemed; otherwise, it is discarded.					
unblocking	UBL	x	x	x	
unblocking acknowledgement	UBA	x	x	x	



---

## Appendix C: Q.767 messages and parameters

---

This appendix lists all the messages the Q.767 Gateway IMT supports. Each message begins on a new page in this appendix. Below each message's name and acronym are two tables:

- The first table shows if the Q.767 Gateway IMT sends and receives the message and if it processes or tandems the message. These tables appear without labels.
- The second table lists the message's parameters and tells what type of parameters they are, what type of action the Q.767 Gateway IMT takes with the parameters, and any notes regarding the parameter. These tables are labeled Tables 72 through 94.

**Note:** The note "Q.767 minimum set" in the notes column refers to the recommended minimum set of parameters for each supported message based on ITU-T Recommendation Q.767 Blue Book version tables C-5 through C-28.

## Address complete message (ACM)

Message	sends	receives	processes	tandems
address complete	x	x	x	

**Table 72 ACM message's parameters**

Parameter	Type	Action	Notes
Optional backward call indicators	O	tandem	Q.767 minimum set
Cause indicator	O	tandem	Q.767 minimum set
User-to-user	O	tandem	Q.767 minimum set
<b>Note:</b> The CS 2000 switch tandems this parameter only if it is valid per Q.767 recommendations.			
User-to-user information	O	tandem	Q.767 minimum set
Access transport	O	tandem	Q.767 minimum set



## Answer message (ANM)

Message	sends	receives	processes	tandems
answer	x	x	x	

**Table 73 ANM message's parameters**

Parameter	Type	Action	Notes
Backward call indicators	O	tandem	Q.767 minimum set
Connected number	O	tandem	Q.767 minimum set
<b>Note:</b> The CS 2000 switch tandems this parameter only if it is valid per Q.767 recommendations.			
User-to-user information	O	tandem	Q.767 minimum set
Access transport	O	tandem	Q.767 minimum set

**Blocking acknowledgement (BLA) message)**

<b>Message</b>	<b>sends</b>	<b>receives</b>	<b>processes</b>	<b>tandems</b>
blocking acknowledgement	x	x	x	

**Table 74 BLA message's parameters**

<b>Parameter</b>	<b>Type</b>	<b>Action</b>	<b>Notes</b>
Message type	F	process	Q.767 minimum set

---

**Blocking (BLO) message)**

<b>Message</b>	<b>sends</b>	<b>receives</b>	<b>processes</b>	<b>tandems</b>
blocking	x	x	x	

**Table 75 BLO message's parameters**

<b>Parameter</b>	<b>Type</b>	<b>Action</b>	<b>Notes</b>
Message type	F	process	Q.767 minimum set

## Call modification request (CMR) message)

Table 76 CMR message's parameters

Parameter	Type	Action	Notes
Message type	F	process	Q.767 minimum set

## Call progress (CPG) message

Message	sends	receives	processes	tandems
call progress	x	x		x

**Table 77 CPG message's parameters**

Parameter	Type	Action	Notes
Optional backward call indicators	O	tandem	Q.767 minimum set
backward call indicators	O	tandem	Q.767 minimum set
User-to-user information	O	tandem	Q.767 minimum set
Access transport	O	tandem	Q.767 minimum set

## Circuit group blocking acknowledgement (CGBA) message

Message	sends	receives	processes	tandems
circuit group blocking acknowledgement	x		x	

**Table 78 CGB message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	Q.767 minimum set
Circuit group supervision message type indicator	F	process	Q.767 minimum set
Range and status	V	process	Q.767 minimum set

## Circuit group blocking (CGB) message

Message	sends	receives	processes	tandems
circuit group blocking	x	x	x	

**Table 79 CGB message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	Q.767 minimum set
Circuit group supervision message type indicator	F	process	Q.767 minimum set
Range and status	V	process	Q.767 minimum set

**Circuit group reset acknowledge (GRA) message**

<b>Message</b>	<b>sends</b>	<b>receives</b>	<b>processes</b>	<b>tandems</b>
circuit group reset acknowledgement	x	x	x	

**Table 80 CGB message's parameters**

<b>Parameter</b>	<b>Type</b>	<b>Action</b>	<b>Notes</b>
Message type	F	process	Q.767 minimum set
Range and status	V	process	Q.767 minimum set



---

## Circuit group reset (GRS) message

Message	sends	receives	processes	tandems
circuit group reset	x	x	x	

**Table 81 CGB message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	Q.767 minimum set
Range and status	V	process	Q.767 minimum set

**Circuit group unblock acknowledged (CGUA) message**

Message	sends	receives	processes	tandems
circuit group unblocking acknowledgement	x		x	

**Table 82 CGUA message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	Q.767 minimum set
Circuit group supervision message type indicator	F	process	Q.767 minimum set
Range and status	V	process	Q.767 minimum set

## Circuit group unblocking (CGUA) message

Message	sends	receives	processes	tandems
circuit group unblocking		X	x	

**Table 83 CGUA message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	Q.767 minimum set
Circuit group supervision message type indicator	F	process	Q.767 minimum set
Range and status	V	process	Q.767 minimum set

## Connect (CON) message

Message	sends	receives	processes	tandems
connect	x	X	x	

**Table 84 CGUA message's parameters**

Parameter	Type	Action	Notes
Backward call indicator	M	tandem	Q.767 minimum set
Connected number	O	tandem	Q.767 minimum set
<b>Note:</b> The CS 2000 switch tandems this parameter only if it is valid per Q.767 recommendations.			
User -to-user indicators	O	tandem	Q.767 minimum set
User -to-user information	O	tandem	Q.767 minimum set
Access transport	O	tandem	Q.767 minimum set

---

## Continuity check (CCR) message

Message	sends	receives	processes	tandems
Continuity check	x	X	x	

**Table 85 CCR message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	Q.767 minimum set

## Continuity (COT) message

Message	sends	receives	processes	tandems
Continuity	x	X	x	

**Table 86** COT message's parameters

Parameter	Type	Action	Notes
Message type	F	process	Q.767 minimum set
Continuity indicators	F	tandem	Q.767 minimum set

## Forward transfer (FOT) message

Message	sends	receives	processes	tandems
forward transfer	x	X		x

**Table 87 FOT message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	Q.767 minimum set
End of optional parameters	O	tandem	Q.767 minimum set
Call reference	O	discard	national use only

**Initial address message (IAM)**

Message	sends	receives	processes	tandems
initial address message	x	X	x	

**Table 88 IAM message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	Q.767 minimum set
Nature of connection indicators	F	process	Q.767 minimum set
Forward call indicators	F	process	Q.767 minimum set
Calling party's category (CPC)	F	process	Q.767 minimum set
Transmission medium requirement (TMR)	F	process	Q.767 minimum set
Called party number	V	process	Q.767 minimum set
Access transport	O	tandem	Q.767 minimum set
Closed user group interlock code	O	tandem	Q.767 minimum set
Calling party number	O	process	Q.767 minimum set
End of optional parameters	O	process	Q.767 minimum set
Optional forward call indicators	O	tandem	Q.767 minimum set
User service information	O	process	Q.767 minimum set
User-to-user information	O	tandem	Q.767 minimum set
Call reference	O	discard	for national use only
Generic digit	O	discard	for national use only



---

<b>Parameter</b>	<b>Type</b>	<b>Action</b>	<b>Notes</b>
Network specific facility	O	discard	for national use only
Remote operations	O	discard	for national use only
Service activation	O	discard	for national use only
Transit network selection	O	discard	for national use only

## Release complete (RLC) message

Message	sends	receives	processes	tandems
release complete	x	X	x	

**Table 89 RLC message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	Q.767 minimum set
Cause indicators	O	none <b>Note:</b> RLC is a point-to point message	Q.767 minimum set
End of optional parameters	O	none <b>Note:</b> RLC is a point-to point message	Q.767 minimum set

## Release (REL) message

Message	sends	receives	processes	tandems
release	x	X	x	

**Table 90 REL message's parameters**

Parameter	Type	Action	Notes
User-to-user information	O	tandem	Q.767 minimum set
Automatic congestion level	O	process	Q.767 minimum set
<b>Note:</b> The CS 2000 switch processes this parameter only if it is valid per Q.767 recommendations. It does not tandem this parameter.			

**Reset circuit (RSC) message**

Message	sends	receives	processes	tandems
reset circuit	x	X	x	

**Table 91 RSC message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	Q.767 minimum set

## Subsequent address message (SAM)

Message	sends	receives	processes	tandems
subsequent address message	x	X	x	

**Table 92 SAM message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	Q.767 minimum set
Subsequent number	V	process	Q.767 minimum set
End of optional parameters	O	process	Q.767 minimum set

**Unblocking acknowledgement (UBA) message**

<b>Message</b>	<b>sends</b>	<b>receives</b>	<b>processes</b>	<b>tandems</b>
unblocking acknowledgement	x	X	x	

**Table 93 UBA message's parameters**

<b>Parameter</b>	<b>Type</b>	<b>Action</b>	<b>Notes</b>
Message type	F	process	Q.767 minimum set

---

## Unblock (UBL) message

Message	sends	receives	processes	tandems
unblocking	x	X	x	

**Table 94 UBL message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	Q.767 minimum set





---

## Appendix D: Q.767 Gateway IMT and PRI interworking

---

This appendix describes the interworking between the Q.767 Gateway IMT and the PRI trunk agent. It contains two sections:

- “The Q.767 Gateway IMT’s messages mapped to the PRI’s messages”
- “The PRI’s messages mapped to the Q.767 Gateway IMT’s parameters”

The section “The Q.767 Gateway IMT’s messages mapped to the PRI’s messages” is divided into seven additional sub-sections:

- “Backward call indicator”
- “Calling party number parameter”
- “Cause indicator parameter”
- “Forward call indicator”
- “Bearer capability of a 56K data call mapped to the user service information parameter”
- “Bearer capability of a 64K data call”
- “Voice calls (3.1 kHz audio calls or speech calls)”

The section “The PRI’s messages mapped to the Q.767 Gateway IMT’s parameters” is divided into five additional sub-sections:

- “Calling party number parameter”
- “Cause indicator”
- “Bearer capability of a 56K data call mapped to the user service information parameter”
- “Bearer capability of a 64K data call”
- “Voice calls (3.1 kHz audio calls or speech calls)”

### The Q.767 Gateway IMT's messages mapped to the PRI's messages

Four Q.767 Gateway IMT messages interwork to the PRI's messages:

- address complete message (ACM)
- answer message (ANM)
- initial address message (IAM)
- release message (REL)

Table 95, “The Q.767 Gateway IMT's messages mapped to the PRI's messages” shows the mapping of the Q.767 Gateway IMT's messages to the PRI's messages.

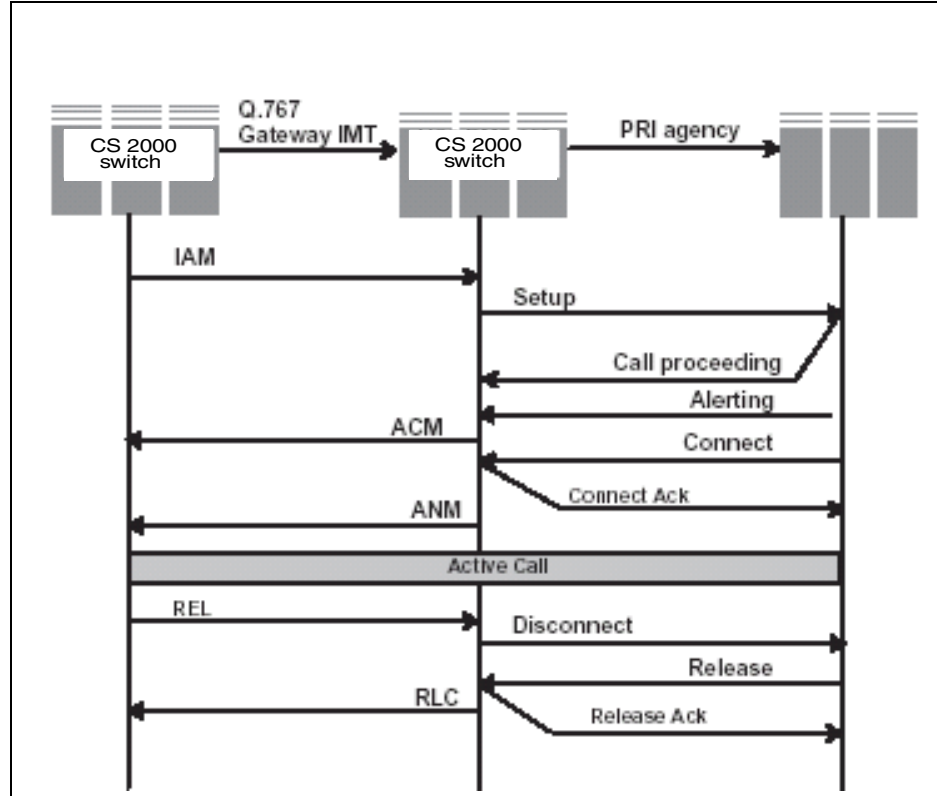
Tables 96 through 99 show the mapping of the Q.767 Gateway IMT's messages to the PRI's messages.

**Table 95 The Q.767 Gateway IMT's messages mapped to the PRI's messages**

these Q.767 Gateway IMT messages:	map to these PRI messages:
ACM	ALERT (if Backward Call Indicator bit is set to “no interworking encountered”)  PROGRESS (if Backward Call Indicator is set to “interworking encountered”)
ANM	CONNECT
IAM	SETUP
REL	DISCONNECT/RELEASE

See Figure 22 “The Q.767 Gateway IMT's messages interworked to the PRI's messages.”

**Figure 22 The Q.767 Gateway IMT's messages interworked to the PRI's messages**



**Table 96 The Q.767 Gateway IMT's ACM message's parameter mapped to the PRI's ALERT or PROGRESS message's parameter**

this Q.767 Gateway IMT's ACM parameter:	maps to this PRI ALERT or PROGRESS parameter
Backward Call Indicators (F)	no mapping
user to user information (O)	
<b>Note:</b> User to user information mapping only takes place during an ACM to ALERT message exchange because user to user information mapping is defined only for non-interworking scenarios.	

**Table 97 The Q.767 Gateway IMT's ANM message's parameter mapped to the PRI's CONNECT messages**

<b>this Q.767 Gateway IMT's ANM parameter:</b>	<b>maps to this PRI CONNECT parameter</b>
user to user information (O)	user to user information

**Table 98 The Q.767 Gateway IMT's IAM message's parameter mapped to the PRI's SETUP messages**

<b>this Q.767 Gateway IMT's IAM parameter:</b>	<b>maps to these PRI SETUP parameter</b>
transmission medium requirement (V)	bearer capability
user service information (O)	bearer capability
called party number (V)	called party number
access transport (O)	access transport parameter contains one or more of: HLC, LLC, Called party subaddress, calling party subaddress, display, facility. These are inserted in the setup message in accordance with UCS PRI encoding rules.
calling party number (O)	calling party number
forward call indicators (F)	progress indicator
user to user info (O)	user to user info

**Table 99 The Q.767 Gateway IMT's REL message's parameter mapped to the PRI's RELEASE or DISCONNECT message's parameter**

<b>this Q.767 Gateway IMT's REL parameter:</b>	<b>maps to this PRI RELEASE or DISCONNECT parameter</b>
cause indicator (V)	cause indicator
<p><b>Note:</b> If the cause indicator parameter has a cause value other than CI_NORMAL_CLEARING or if the call goes to treatment then the tables TMT-MAP and CSEMAP are used and the mappings are done as per the datafill in these tables.</p>	

## Backward call indicator

See Table 100, “The Q.767 Gateway IMT’s ACM message’s backward call indicator’s field mapped to the PRI.”

**Table 100 The Q.767 Gateway IMT’s ACM message’s backward call indicator’s field mapped to the PRI**

these Q.767 Gateway IMT BCI fields: map to these PRI values:	map to these PRI values:
Charge indicator	no indication
Called party status indicator	subscriber free
Called party category	ordinary subscriber
end-to-end method	no end-to-end method available
interworking indicator	If the PRI agency sends an ALERTING message, the interworking indicator in the BCI is set to no interworking and the ISUP indicator is set to ISUP all the way. If a PROGRESS message comes from the PRI side, the Interworking indicator in the BCI is set to interworking encountered and the ISUP indicator is set to Not ISUP all the way.
End-to-end information indicator	no end-to-end information available
ISUP indicator	If the PRI agency sends an ALERTING message, the interworking indicator in the BCI is set to no interworking and the ISUP indicator is set to ISUP all the way. If a PROGRESS message comes from the PRI side, the Interworking indicator in the BCI is set to Interworking encountered and the ISUP indicator is set to Not ISUP all the way.
Reverse holding indicator	not required
ISDN access indicator	access ISDN

<b>these Q.767 Gateway IMT BCI fields: map to these PRI values:</b>	<b>map to these PRI values:</b>
echo control device indicator	echo control device not included
SCCP method indicator	connectionless and connection-oriented methods available

## Calling party number parameter

Table 101 shows the mapping of the Q.767 Gateway IMT's CPN parameter's octets to the PRI's CPN parameter's octets.

**Table 101 The Q.767 Gateway IMT's CPN parameter's octets to the PRI's CPN parameter's octets**

these Q.767 Gateway IMT CPN parameter's octets:	map to these PRI CPN parameter's octets:
Nature of Address, Octet 1	Type of Address, Octet 3
0000100 International Number	001 International Number
Incomplete Indicator (NI), Octet 2	
0 Complete	Not mapped
1 Incomplete	CPN discarded
Numbering Plan Indicator, Octet 2	Numbering Plan Identification, Octet 3
001 ISDN/Telephony Numbering Plan	0001 ISDN/Telephony numbering plan
Address Presentation, Octet 2	Address Presentation, Octet 3a
00 Presentation allowed	00 Presentation allowed
01 Presentation restricted	01 Presentation restricted
others	01 Presentation restricted
Screening Indicator, Octet 2	Screening Indicator, Octet 3a
01 User provided, verified and passed	01 User provided, verified and passed
11 Network provided	11 Network provided
others	00 user provided, not screened

### Cause indicator parameter

Table 102 shows the mapping of the Q.767 Gateway IMT's cause indicator's octets mapped to the PRI's cause indicator's octets.

**Table 102 The Q.767 Gateway IMT's CPN parameter's octets to the PRI's cause indicator's octets**

these Q.767 Gateway IMT cause indicator's octets:	map to these PRI cause indicator's octets:
Location, Octet 1 0111 International Network	Location, Octet 3 based on the data in the Location field of table TRKSGRP
Coding Standard, Octet 1 00 CCITT Standard (default)	Coding Standard, Octet 3 00 CCITT Standard (default)
Diagnostics, Octet 3 - n not mapped	Diagnostics, Octet 5 - 5b, not mapped
<p><b>Note:</b> If the cause indicator parameter has a cause value other than CI_NORMAL_CLEARING or if the call goes to treatment, then the tables TMTMAP (treatment to cause mapping) and CSEMAP (cause to treatment mapping) are used and the mappings are done as per the datafill in these tables.</p>	



## Forward call indicator

Table 103 shows the mapping of the Q.767 Gateway IMT's forward call indicator to the PRI's forward call indicator.

**Table 103** The Q.767 Gateway IMT's forward call indicator to the PRI's forward call indicator

these Q.767 Gateway IMT forward call indicator:	map to these PRI forward call indicators:
Interworking indicator	Progress description
Interworking encountered	call is not end to end ISDN
<b>Note:</b> If there is no Progress indicator then the Interworking indicator is set to No interworking encountered.	

Table 104, "The default values of forward call, when ISDNXFER option is selected, indicator for interworking between the Q.767 Gateway IMT and the PRI", "The default values of forward call," when ISDNXFER option is selected, for interworking between the Q.767 Gateway IMT and the PRI, shows the default values for the FCI when the terminating trunk agent has the option ISDNXFER selected in table TRKGRP. When this option is selected the terminating trunk agent can tandem the ISDN optional parameters, which carry ISDN services.

Table 105, "The default values of forward call indicator, when ISDNXFER option is selected, for interworking between the Q.767 Gateway IMT and the PRI" shows the default values for the FCI when the terminating trunk agent does not have the option ISDNXFER selected in table TRKGRP.

**Table 104 The default values of forward call, when ISDNXFER option is selected, indicator for interworking between the Q.767 Gateway IMT and the PRI**

<b>this forward indicator:</b>	<b>has this default value:</b>
National/ international call indicator	depends on the call type
End to end method indicator	No end to end method available
Interworking indicator	No interworking encountered
End to end information indicator	No end to end information available
ISDN user part indicator	ISDN user part used all the way
ISDN user part preference indicator	ISDN user part preferred all the way
ISDN access indicator	Originating access ISDN
SCCP method indicator	No indication

**Table 105 The default values of forward call indicator, when ISDNXFER option is selected, for interworking between the Q.767 Gateway IMT and the PRI**

<b>this forward indicator:</b>	<b>has this default value:</b>
National/ international call indicator	depends on the call type
End to end method indicator	No end to end method available
Interworking indicator	Interworking encountered
End to end information indicator	No end to end information available
ISDN user part indicator	ISDN user part not used all the way
ISDN user part preference indicator	ISDN user part not required
ISDN access indicator	Originating access non ISDN
SCCP method indicator	No indication

### Bearer capability of a 56K data call mapped to the user service information parameter

The following mapping for bearer capability and user service information (USI) is based on different call scenarios. It is not mapped octet by octet, because the octet's contents may affect the other octet's existence.

See Table 106, "The Q.767 Gateway IMT's TMR parameter's octet mapped to the PRI's bearer capability's octet" and Table 108, "The Q.767 Gateway IMT's USI parameter's octets mapped to the PRI's bearer capability's octets" below.

**Table 106 The Q.767 Gateway IMT's TMR parameter's octet mapped to the PRI's bearer capability's octet**

<b>this Q.767 Gateway IMT TMR parameter's octet:</b>	<b>maps to this PRI bearer capability's octet:</b>
00000010 unrestricted digital info	Information Transfer Capability: 010000 unrestricted digital info
Octet 1, Coding Standard 00 CCITT	Octet 3, Coding Standard 00 CCITT
Octet 1 Information Transfer Capability 01000 unrestricted digital info	Octet 3, Information Transfer Capability 01000 unrestricted digital info
Octet 2, Transfer Mode 00 Circuit Mode	Octet 4, Transfer Mode 00 Circuit Mode
Octet 2, Information Transfer Rate 10000 64 kbits/s	Octet 4, Information Transfer Rate 10000 64 kbits/s
Octet 3, User Information layer 1 protocol 00001 Layer 1 Rate Adaption	Octet 5, Bearer Capability Multiplier 00001 CCITT Standardized rate adaption
Octet 3a, User Rate 01111 56 kbits/s	Octet 5a, Access Data Rate 01111 56 kbits/s

## Bearer capability of a 64K data call

The following mapping for bearer capability and user service information (USI) is based on different call scenarios. It is not mapped octet by octet, because the octet's contents may affect the other octet's existence.

See Table 107, "The Q.767 Gateway IMT's TMR parameter's octet mapped to the PRI's bearer capability's octet" and Table 108, "The Q.767 Gateway IMT's USI parameter's octets mapped to the PRI's bearer capability's octets" below.

**Table 107 The Q.767 Gateway IMT's TMR parameter's octet mapped to the PRI's bearer capability's octet**

<b>this Q.767 Gateway IMT TMR parameter's octet:</b>	<b>maps to this PRI bearer capability's octet:</b>
00000010 unrestricted digital info	Information Transfer Capability: 01000 unrestricted digital info

**Table 108 The Q.767 Gateway IMT's USI parameter's octets mapped to the PRI's bearer capability's octets**

<b>these Q.767 Gateway IMT USI parameter's octets:</b>	<b>map to these PRI bearer capability's octets:</b>
Octet 1, Coding Standard 00 CCITT	Octet 3, Coding Standard 00 CCITT
Octet 1 Information Transfer Capability 01000 unrestricted digital info	Octet 3, Information Transfer Capability 01000 unrestricted digital info
Octet 2, Transfer Mode 00 Circuit Mode	Octet 4, Transfer Mode 00 Circuit Mode
Octet 2, Information Transfer Rate 10000 64 kbits/s	Octet 4, Information Transfer Rate 10000 64 kbits/s

**Voice calls (3.1 kHz audio calls or speech calls)**

This section shows the mapping of the octets of the following parameters:

- transmission medium requirement (TMR) parameter
- user service information (USI) parameter

Table 109 and Table 110 show the mapping of the TMR and USI parameters' octets to the PRI's octets.

**Table 109 The Q.767 Gateway IMT's TMR parameter's octet mapped to the PRI's bearer capability's octet**

<b>these Q.767 Gateway IMT USI parameter's octets:</b>	<b>map to these PRI bearer capability's octets:</b>
	Octet 3, Information Transfer Capability:
00000000 Speech	00000 Speech
00000011 3.1 kHz Audio	10000 3.1 kHz Audio

**Table 110 The Q.767 Gateway IMT's USI parameter's octets mapped to the PRI's bearer capability's octets**

<b>these Q.767 Gateway IMT USI parameter's octets:</b>	<b>map to these PRI bearer capability's octets:</b>
Octet 1, Coding Standard 00 CCITT	Octet 3, Coding Standard 00 CCITT
Octet 1 Information Transfer Capability 00000 speech  10000 3.1 kHz audio	Octet 3, Information Transfer Capability based on the TMR value
Octet 2, Transfer Mode 00 Circuit Mode	Octet 4, Transfer Mode 00 Circuit Mode
Octet 2, Information Transfer Rate 10000 64 kbits/s	Octet 4, Information Transfer Rate 10000 64 kbits/s
Octet 3, User information layer 1 protocol 00010 Recommendation G.711 A- law	Octet 5, User Information Layer 1 Protocol 00010 Recommendation G.711 Mu-law Speech

### **The PRI's messages mapped to the Q.767 Gateway IMT's parameters**

Eight PRI messages interwork to the Q.767 Gateway IMT's messages:

- alerting (ALERT)
- connect (CONN)
- disconnect (DISC)
- progress (PROG)
- release (REL)
- release complete (REL COM)
- restart (RESTART)
- setup (SETUP)

See Table 111, "The PRI's messages mapped to the Q.767 Gateway IMT's messages."

Tables 112 through 118 show the mapping of the PRI's messages to the Q.767 Gateway IMT's messages.

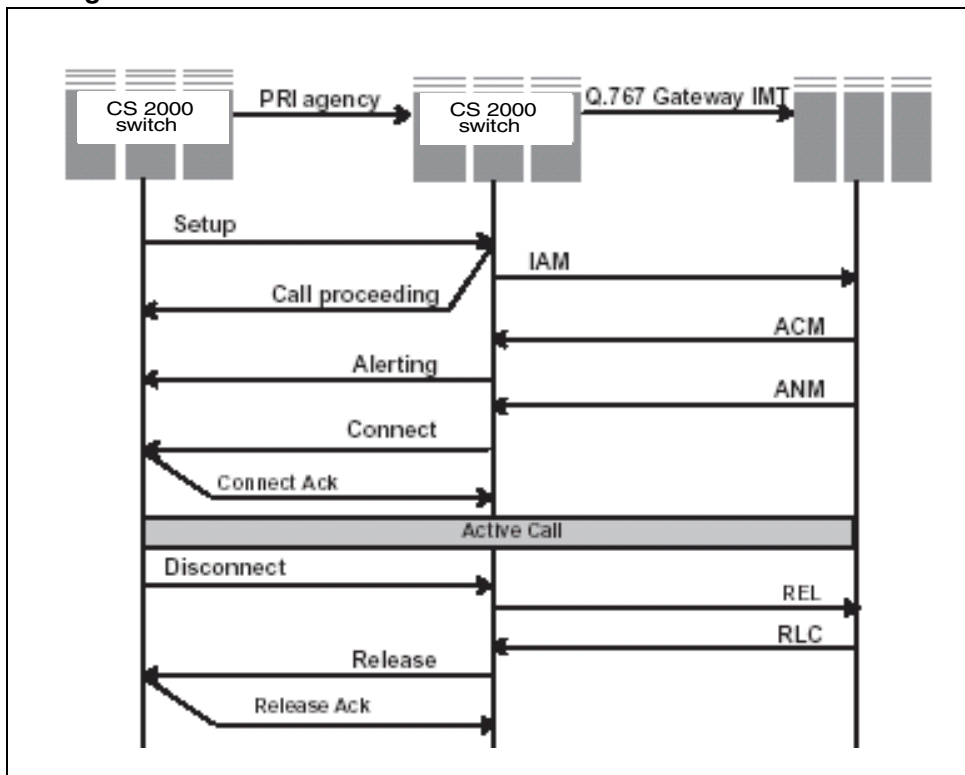


Table 111 The PRI's messages mapped to the Q.767 Gateway IMT's messages.

these PRI messages	map to these Q.767 Gateway IMT's messages
ALERTING	ACM
<b>Note:</b> If the ALERT message is received, the interworking indicator of BCI in the ACM is set to "no interworking encountered."	
CONNECT	CON (if ACM has not been sent) ANM (if ACM has been sent)
DISCONNECT	REL
PROGRESS	ACM
<b>Note:</b> If the PROGRESS message is received, the interworking indicator of BCI in the ACM is set to "interworking encountered."	
RELEASE	REL
RELEASE COMPLETE	REL
RESTART	REL
SETUP	IAM
<b>Note:</b> The table TRKGRP ISDNXFER option for the terminating ISUP agency controls the support of the ISDN services when the originating trunk agency is a PRI trunk. It is recommended to use this option when the entire call path is predetermined to be all the way ISDN user part (all the way ISDN and SS7). If the entire call path is not ISUP all the way, then this option need not be selected.	

See Figure 23 "The PRI's messages interworking to the Q.767 Gateway IMT's messages"

**Figure 23 The PRI's messages interworking to the Q.767 Gateway IMT's messages**



**Note:** When the originating trunk agency is a PRI agency and the terminating trunk agency is a Q.767 Gateway IMT trunk agency, the ISDNXFER option of table TRKGRP controls the support of ISDN services.

**Table 112 The PRI's ALERT message's parameters mapped to the Q.767 Gateway IMT's ACM message's parameters.**

these PRI ALERT messages's parameters	map to these Q.767 Gateway IMT ACM messages parameters
progress indicator (O)	no mapping
user to user info (O)	user to user info

**Note:** If an ALERT message is received, an ACM with BCI set to no interworking required and ISUP all the way is sent on the ISUP side.

**Table 113 The PRI's CONNECT message's parameter mapped to the Q.767 Gateway IMT's ANM or CON message's parameter**

<b>this PRI CONNECT parameters</b>	<b>maps to this Q.767 Gateway IMT ANM or CON message's parameter:</b>
user to user info (O)	user to user info

**Table 114 The PRI's DISCONNECT message's parameter mapped to the Q.767 Gateway IMT's REL message's parameter**

<b>these PRI DISCONNECT message's parameters</b>	<b>maps to these Q.767 Gateway IMT REL message's parameter:</b>
cause (V)	cause indicator
<p><b>Note:</b> The cause parameter is mandatory in the first call clearing message.</p>	
user to user info (O)	user to user info
<p><b>Note:</b> If the cause indicator parameter has a cause value other than CI_NORMAL_CLEARING or if the call goes to treatment then the tables TMTMAP and CSEMAP are used and the mappings are done as per the datafill in these tables.</p>	

**Table 115 The PRI's PROGRESS message's parameter mapped to the Q.767 Gateway IMT's ACM message's parameter**

<b>this PRI PROGRESS message's parameter:</b>	<b>maps to this Q.767 Gateway IMT ACM message's parameter:</b>
progress indicator (F)	no mapping
<p><b>Note:</b> If a PROGRESS message is received, an ACM with BCI set to interworking required and Not ISUP all the way is sent on the ISUP side.</p>	

**Table 116 The PRI's RELEASE message's parameters mapped to the Q.767 Gateway IMT's REL message's parameters**

these PRI RELEASE parameters	maps to these Q.767 Gateway IMT REL parameters:
cause (O)	cause indicator
<b>Note:</b> The cause parameter is mandatory in the first call clearing message.	
user to user info (O)	user to user info
<b>Note:</b> If the cause indicator parameter has a cause value other than CI_NORMAL_CLEARING or if the call goes to treatment then the tables TMTMAP and CSEMAP are used and the mappings are done as per the datafill in these tables.	

**Table 117 The PRI's RELEASE COMPLETE message's parameters mapped to the Q.767 Gateway IMT's REL message's parameters**

these PRI RELEASE COMPLETE parameters	maps to these Q.767 Gateway IMT REL parameterS:
cause (O)	cause indicator
<b>Note:</b> The cause parameter is mandatory in the first call clearing message.	
user to user info (O)	user to user info
<b>Note:</b> If the cause indicator parameter has a cause value other than CI_NORMAL_CLEARING or if the call goes to treatment then the tables TMTMAP and CSEMAP are used and the mappings are done as per the datafill in these tables.	

**Table 118 The PRI's SETUP message's parameter mapped to the Q.767 Gateway IMT's IAM message's parameters**

these PRI SETUP message's parameters	maps to these Q.767 Gateway IMT IAM message's parameters:
bearer capability (M)	user service info/ transmission medium requirement
called party number (M)	called party number
called party subaddress (O)	access transport
<b>Note:</b> The IAM message contains only one access transport parameter, which contains the UCS PRI IEs. The access transport parameter mapping depends on the data in table ISDNPARM.	
calling party number (O)	calling party number
calling party subaddress (O)	access transport
low layer compatibility (O)	access transport
high layer compatibility (O)	access transport
progress indicator (O)	forward call indicators
user to user (O)	user to user info

### Calling party number parameter

Table 119, “The PRI’s CPN parameter’s octets mapped to the Q.767 Gateway IMT’s CPN parameter’s octets” shows the mapping of the PRI calling party number (CPN) parameters’ octets to the Q.767 Gateway IMT’s octets.

**Table 119 The PRI’s CPN parameter’s octets mapped to the Q.767 Gateway IMT’s CPN parameter’s octets**

these PRI CPN parameter’s octets:	map to these Q.767 Gateway IMT CPN parameter’s octets:
Type of Address, Octet 3	Nature of Address, Octet 1
001 International Number	0000100 International Number
010 National Number	0000100 International Number
Numbering Plan Identification, Octet 3	Numbering Plan Indicator, Octet 2
0001 ISDN/Telephony numbering plan	001 ISDN/Telephony Numbering Plan
others	001 ISDN/Telephony Numbering Plan
Presentation Indicator, Octet 3a	Address Presentation, Octet 2
00 Presentation allowed	00 Presentation allowed
01 Presentation restricted	01 Presentation restricted
10 Number not available due to interworking	00 Presentation allowed
Screening Indicator, Octet 3a	Screening Indicator, Octet 2
11 network provided	11 network passed
<p><b>Note:</b> When the originating trunk agency is a PRI agency and the terminating trunk agency is a Q.767 Gateway IMT, the ISDNXFER option of table TRKGRP is required for the delivery of the CPN; otherwise, the CPN parameter is not sent in the outgoing IAM.</p>	

---

these PRI CPN parameter's octets:	map to these Q.767 Gateway IMT CPN parameter's octets:
others	CPN discarded
<p><b>Note:</b> If the CPN is received with screening indicator as User provided, not screened (00); user provided, verified and passed (01); or user provided, verified and failed (10), then the CPN is not mapped.</p>	
<p><b>Note:</b> When the originating trunk agency is a PRI agency and the terminating trunk agency is a Q.767 Gateway IMT, the ISDNXFER option of table TRKGRP is required for the delivery of the CPN; otherwise, the CPN parameter is not sent in the outgoing IAM.</p>	

## Cause indicator

Table 120 shows the mapping of these PRI's cause indicator's octets to the Q.767 Gateway IMT's octets.

**Table 120 The PRI's cause indicator's octets mapped to the Q.767 Gateway IMT's cause indicator's octets**

these PRI cause indicator's octets:	map to these Q.767 Gateway IMT cause indicator's octets:
Location, Octet 1	Location, Octet 3
0000 User	0111 International Network
0001 Local Private Network	
0010 Local Network	
0011 Transit Network (default)	
0100 Public Network serving the remote user	
0101 Private Network serving the remote user	
0111 International Network	
Coding Standard, Octet 1	Coding Standard, Octet 3
00 CCITT Standard (default)	00 CCITT Standard (default)
10 National Standard	
Diagnostics, Octet 3-n not mapped	Diagnostics, Octet 5-5b not mapped



## Forward call indicator

Table 121 shows the mapping of these PRI's cause of the PRI progress indicator to the Q.767 Gateway IMT's forward call indicator.

**Table 121 The ISUP'92 Gateway IMT's forward call indicator mapped to the PRI's progress indicator**

this PRI cause indicator's octets:	map to this Q.767 Gateway IMT forward call indicator:
Progress description	Interworking indicator
call is not end to end ISDN	Interworking encountered
<b>Note:</b> If there is no Progress indicator then the Interworking indicator is set to No interworking encountered.	

Table 122, "The default values of forward call indicator, when ISDNXFER option is selected, for interworking between the ISUP'92 Gateway IMT and the PRI", shows the default values for the FCI when the terminating trunk agent has the option ISDNXFER selected in table TRKGRP. When this option is selected the terminating trunk agent can tandem the ISDN optional parameters, which carry ISDN services.

Table 123, "The default values of forward call indicator, when ISDNXFER option is not selected, for interworking between the ISUP'92 Gateway IMT and the PRI" shows the default values for the FCI when the terminating trunk agent does not have the option ISDNXFER selected in table TRKGRP.

**Table 122 The default values of forward call indicator, when ISDNXFER option is selected, for interworking between the ISUP'92 Gateway IMT and the PRI**

<b>this forward call indicator:</b>	<b>has this default value:</b>
National/ international call indicator	depends on the call type
End to end method indicator	No end to end method available
Interworking indicator	No interworking encountered
End to end information indicator	No end to end information available
ISDN user part indicator	ISDN user part used all the way
ISDN user part preference indicator	ISDN user part preferred all the way
ISDN access indicator	Originating access ISDN
SCCP method indicator	No indication
<b>Note:</b> When the originating trunk agent is a PRI trunk agent, the ISDNXFER option in table TRKGRP is required to be present for the support of ISDN services. Otherwise, the PRA-ISUP call supports only the mandatory parameters and the forward call indicator's default values are as shown in Table 123.	

**Table 123 The default values of forward call indicator, when ISDNXFER option is not selected, for interworking between the ISUP'92 Gateway IMT and the PRI**

<b>this forward call indicator:</b>	<b>has this default value:</b>
National/ international call indicator	depends on the call type
End to end method indicator	No end to end method available
Interworking indicator	Interworking encountered
End to end information indicator	No end to end information available
ISDN user part indicator	ISDN user part not used all the way
ISDN user part preference indicator	ISDN user part not required
ISDN access indicator	Originating access non ISDN
SCCP method indicator	No indication

### **Bearer capability of a 56K data call mapped to the user service information parameter**

The following mapping for bearer capability and user service information (USI) is based on different call scenarios. It is not mapped octet by octet, because the octet's contents may affect the other octet's existence.

See Table 124, "The PRI's bearer capability octets mapped to the Q.767 Gateway IMT's TMR parameter's octets" and Table 125, "The PRI's bearer capability octets mapped to the Q.767 Gateway IMT's USI parameter's octets."

**Table 124 The PRI's bearer capability octets mapped to the Q.767 Gateway IMT's TMR parameter's octets**

<b>this PRI bearer capability's octet:</b>	<b>maps to this Q.767 Gateway IMT TMR parameter's octet:</b>
Information Transfer Capability: 010000 unrestricted digital info	00000010 unrestricted digital info
01001 restricted digital info	00000010 unrestricted digital info

**Table 125 The PRI's bearer capability octets mapped to the Q.767 Gateway IMT's USI parameter's octets**

<b>this PRI bearer capability's octet:</b>	<b>maps to this Q.767 Gateway IMT USI parameter's octet:</b>
Octet 3, Coding Standard 00 CCITT	Octet 1, Coding Standard 00 CCITT
Octet 3, Information Transfer Capability 01000 unrestricted digital info	Octet 1 Information Transfer Capability 01000 unrestricted digital info
Octet 4, Transfer Mode 00 Circuit Mode	Octet 2, Transfer Mode 00 Circuit Mode
Octet 4, Information Transfer Rate 10000 64 kbits/s	Octet 2, Information Transfer Rate 10000 64 kbits/s
Octet 5, Bearer Capability Multiplier 00001 CCITT Standardized rate adaption	Octet 3, User Information layer 1 protocol 00001 Layer 1 Rate Adaption
Octet 5a, Access Data Rate 01111 56 kbits/s	Octet 3a, User Rate 01111 56 kbits/s

### Bearer capability of a 64K data call

The following mapping for bearer capability and user service information (USI) is based on different call scenarios. It is not mapped octet by octet, because the octet's contents may affect the other octet's existence.

See Table 126, "The PRI's bearer capability's octet mapped to the Q.767 Gateway IMT's TMR parameter's octet" and Table 127, "The PRI's bearer capability's octet mapped to the Q.767 Gateway IMT's TMR parameter's octet".

**Table 126** The PRI's bearer capability's octet mapped to the Q.767 Gateway IMT's TMR parameter's octet

<b>this PRI bearer capability's octet:</b>	<b>maps to this Q.767 Gateway IMT TMR parameter's octet:</b>
Octet 3, Information Transfer Capability 01000 unrestricted digital info	00000010 unrestricted digital info

**Table 127** The PRI's bearer capability's octet mapped to the Q.767 Gateway IMT's TMR parameter's octet

<b>this PRI bearer capability's octet:</b>	<b>maps to this Q.767 Gateway IMT USI parameter's octet:</b>
Octet 3, Coding Standard 00 CCITT	Octet 1, Coding Standard 00 CCITT
Octet 3, Information Transfer Capability 01000 unrestricted digital info	Octet 1 Information Transfer Capability 01000 unrestricted digital info
Octet 4, Transfer Mode 00 Circuit Mode	Octet 2, Transfer Mode 00 Circuit Mode
Octet 4, Information Transfer Rate 10000 64 kbits/s	Octet 2, Information Transfer Rate 10000 64 kbits/s

### Voice calls (3.1 kHz audio calls or speech calls)

This section shows the mapping of the octets of the following parameters:

- transmission medium requirement (TMR) parameter
- user service information (USI) parameter

Tables 128, and 129 show the mapping of the PRI TMR and USI parameters' octets to the Q.767 Gateway IMT's octets.

**Table 128 The PRI bearer capability's octet mapped to the Q.767 Gateway IMT's TMR parameter's octet**

<b>this PRI bearer capability's octet:</b>	<b>maps to this Q.767 Gateway IMT TMR parameter's octet:</b>
Octet 3, Information Transfer Capability	
00000 Speech	00000000 Speech
10000 3.1 kHz Audio	00000011 3.1 kHz Audio

**Table 129 The PRI bearer capability's octet mapped to the Q.767 Gateway IMT's USI parameter's octet**

<b>this PRI bearer capability's octet:</b>	<b>maps to this Q.767 Gateway IMT USI parameter's octet:</b>
Octet 3, Coding Standard	Octet 1, Coding Standard
00 CCITT	00 CCITT
Octet 3, Information Transfer Capability	Octet 1 Information Transfer Capability
00000 Speech	00000 Speech
10000 3.1 kHz Audio	10000 3.1 kHz Audio
Octet 4, Transfer Mode	Octet 2, Transfer Mode
00 Circuit Mode	00 Circuit Mode

<b>this PRI bearer capability's octet:</b>	<b>maps to this Q.767 Gateway IMT USI parameter's octet:</b>
Octet 4, Information Transfer Rate 10000 64 kbits/s	Octet 2, Information Transfer Rate 10000 64 kbits/s
Octet 5, User Information Layer 1 Protocol 00010 Recommendation G.711 Mu-law Speech	Octet 3, User Information Layer 1 Protocol 00011 Recommendation G.711 A-law



---

## Appendix E: Q.767 Gateway IMT and PTS signaling protocol interworking

---

This appendix describes the interworking between the Q.767 Gateway IMT and the PTS signaling. It contains two sections:

- “Q.767 Gateway IMT’s messages interworked to the PTS signaling protocol’s messages”
- “The PTS signaling protocol mapped to the Q.767 Gateway IMT’s messages”

The trunk agencies, with the PTS signaling protocol, that can interwork with the Q.767 Gateway IMT are:

- PTS FGD
- FGB
- DAL-TIE

When this appendix refers to the PTS signaling protocol, you can assume it is referring to the three supported trunk agencies with that signaling protocol.

### **Q.767 Gateway IMT’s messages interworked to the PTS signaling protocol’s messages**

The following Q.767 messages are interworked to the PTS signaling protocol:

- address complete message (ACM)
- answer message (ANM)
- initial address message (IAM)
- release message (REL)
- subsequent address message (SAM)

Table 130, “The Q.767 Gateway IMT’s messages mapped to the PTS signaling protocols,” shows the mapping of the Q.767 Gateway IMT’s messages to the PTS signaling protocol.

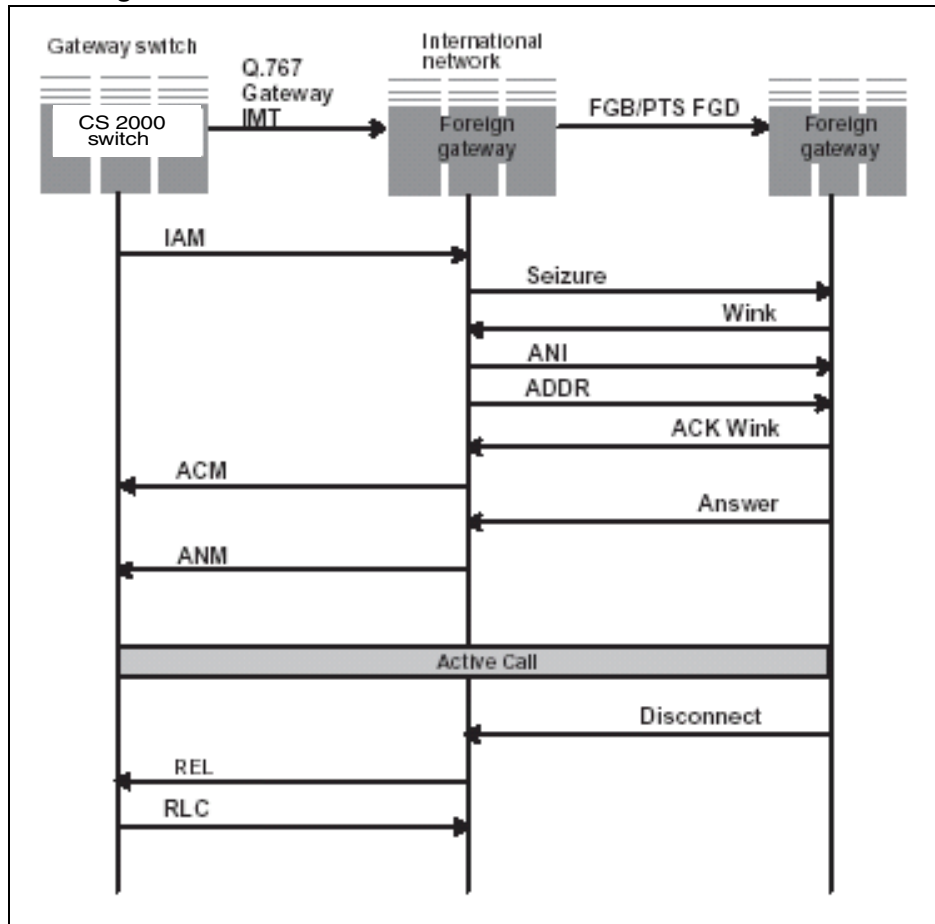
**Table 130 The Q.767 Gateway IMT's messages mapped to the PTS signaling protocols**

when the Q.767 Gateway IMT sends these messages:	the PTS signaling protocols responds with these actions:
ACM	overlap sending
ANM	receives answer message
IAM	sends a seized message and, after it receives all the address digits, then receives a wink
REL	receives on-hook message
SAM	overlap sending

Figure 24, “The Q.767 Gateway IMT’s messages interworked to the FGB/PTS FGD trunk agencies,” shows the flow of messages from the Q.767 Gateway IMT to the FGB/PTS FGD trunk agencies.

Figure 25, “The Q.767 Gateway IMT’s messages interworked to the DAL-TIE trunk agent,” shows the flow of messages from the Q.767 Gateway IMT to the DAL-TIE trunk agent.

**Figure 24 The Q.767 Gateway IMT's messages interworked to the FGB/PTS FGD trunk agencies**



**Figure 25 The Q.767 Gateway IMT's messages interworked to the DAL-TIE trunk agent**

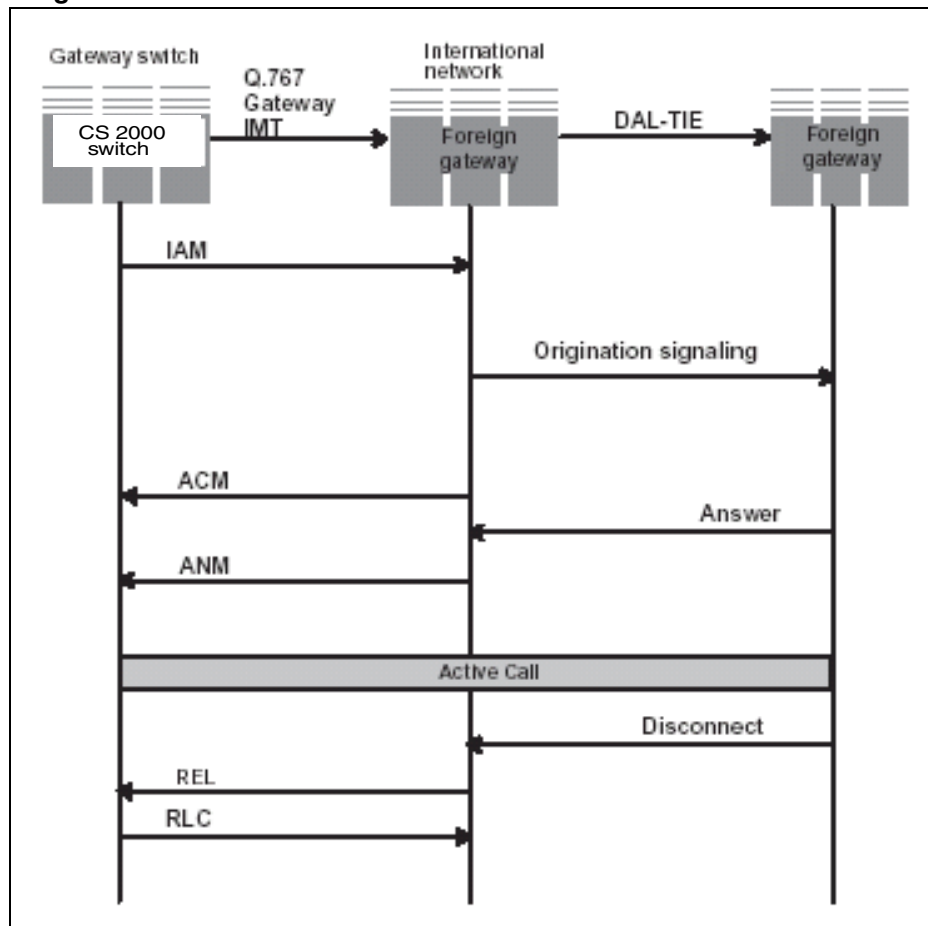


Table 131, “The Q.767 Gateway IMT’s ACM message’s backward call indicator’s field mapped to the PTS signaling protocol,” gives the default values of the backward call indicator (BCI) in the ACM for the Q.767 Gateway IMT interworked to the PTS signaling protocol.

**Table 131 The Q.767 Gateway IMT's ACM message's backward call indicator's field mapped to the PTS signaling protocol**

<b>these Q.767 Gateway IMT BCI fields:</b>	<b>map to these PTS signaling protocol's values:</b>
charge indicator	10 "Charge"
called party's status	no indication (00)
called party's category	no indication (00)
End-End_Method indicator	no end-end method available (00)
interworking indicator	interworking encountered (1)
end-end information indicator	no end to end information available (0)
ISUP indicator	ISUP not used all the way (0)
holding indicator	holding not requested (0)
ISDN access indicator	terminating access non ISDN (0)
echo control device indicator	incoming half echo control device not included (0)
SCCP method indicator	No SCCP indication (00)

### **The PTS signaling protocol mapped to the Q.767 Gateway IMT's messages**

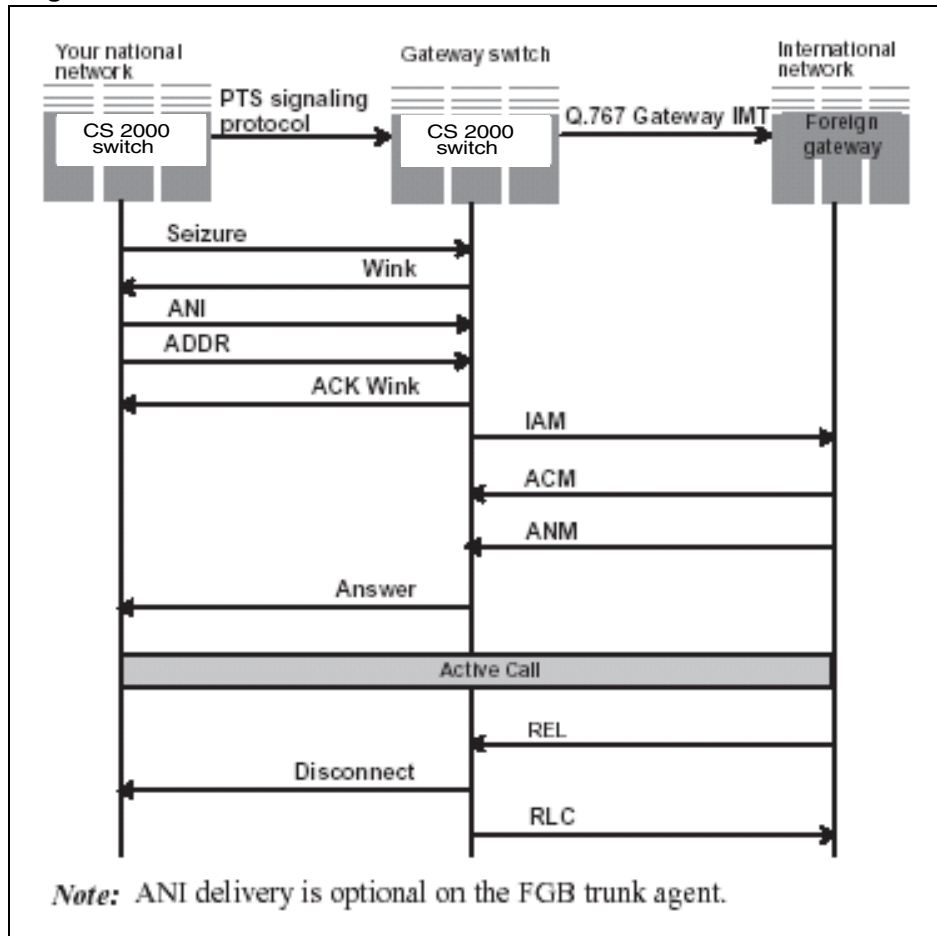
When the Q.767 Gateway IMT receives origination signaling from the PTS signaling protocol, it places specific values from the PTS signaling protocol into fields of the following parameters:

- called party number (CPN)
- calling party category (CPC)
- forward call indicator (FCI)
- nature of connection (NOC)
- transmission medium requirement (TMR)
- user service information (USI)

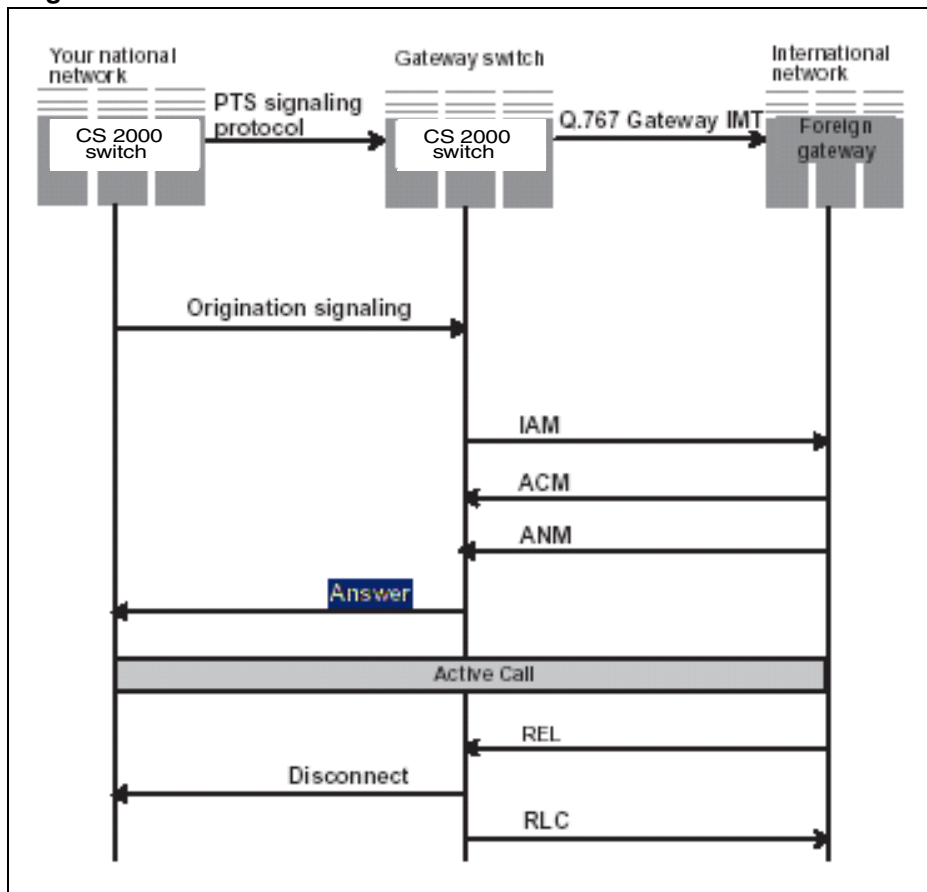
Tables 132 through 138 show the mapping of the PTS signaling protocol's origination signaling to the Q.767 Gateway IMT's messages' parameters.

Figure 25, "The Q.767 Gateway IMT's messages interworked to the DAL-TIE trunk agent," shows the flow of messages from the FGB/PTS FGD trunk agencies to the Q.767 Gateway IMT. Figure 26, "DAL-TIE messages interworking to the Q.767 Gateway IMT's messages," shows the flow of messages from the DAL-TIE trunk agent to the Q.767 Gateway IMT.

**Table 132 FGB/PTS FGD messages interworking to the Q.767 Gateway IMT's messages**



**Figure 26 DAL-TIE messages interworking to the Q.767 Gateway IMT's messages**



When the Q.767 Gateway IMT receives messages from the PTS signaling protocol, it takes some of the values from the messages' parameters.



**Table 133 The PTS signaling protocol's origination signaling mapped to the Q.767 Gateway IMT's called party number parameter**

these PTS signaling protocol's values:	map to these Q.767 Gateway IMT's called party number parameter's fields:
national number (0000011)	nature of address
<b>Note:</b> The value of this parameter depends on the translation system used in the call.	
ISDN (telephony) Numbering Plan (Recommendation E.164) (001)	numbering plan indicator
odd (1) – if odd number of digits in the called party, even (0) - if even number of digits in called party	odd/even indicator

**Table 134 The PTS signaling protocol's origination signaling mapped to the Q.767 Gateway IMT's calling party category parameter**

this PTS signaling protocol's value:	map to this Q.767 Gateway IMT's calling party number parameter's fields:
ordinary subscriber (00001010)	calling party category

**Table 135 The PTS signaling protocol's origination signaling mapped to the Q.767 Gateway IMT's forward call indicator parameter**

<b>these PTS signaling protocol's value:</b>	<b>map to these Q.767 Gateway IMT's forward call indicator parameter's fields:</b>
call to be treated as national (0)	national/international call indicator
no end-to-end method available (00)	end-to-end method indicator
interworking encountered (1)	interworking indicator
no end to end information available (0)	end to end information indicator
ISDN User Part not used all the way (0)	ISDN User Part indicator
ISDN User Part not required all the way (01)	ISDN User Part Preference Indicator
Originating access non-ISDN (0)	ISDN access indicator
Number_Not_Translated	Trans_called_Num_Ind
No_routing_attempt (0000000)	Routing_attempt_Ind

**Table 136 The PTS signaling protocol's origination signaling mapped to the Q.767 Gateway IMT's nature of connection indicator parameter**

<b>these PTS signaling protocol's value:</b>	<b>map to these Q.767 Gateway IMT's nature of connection parameter's fields:</b>
value depends on the data in the SAT field of table TRKSGRP	satellite indicator
value depends on the data in the CONTCHK field of table TRKS-GRP	continuity check indicator
datafill dependent	echo control device indicator

**Table 137 The PTS signaling protocol's origination signaling mapped to the Q.767 Gateway IMT's transmission medium requirement parameter**

these PTS signaling protocol's value:	map to these Q.767 Gateway IMT's transmission medium requirement parameter's fields:
3.1 Khz audio (00000011)	transmission medium requirement
<i>Note:</i> This field's value depends on the value in the BCNAME field of table TRKGRP.	

**Table 138 The PTS signaling protocol's origination signaling mapped to the Q.767 Gateway IMT's user service information parameter**

these PTS signaling protocol's value:	map to these Q.767 Gateway IMT's transmission medium requirement parameter's fields:
CCITT (00) coding standards	coding standards
64_KBits/s (10000)	information transfer rate
circuit mode (00)	information transfer mode
3.1 Khz audio (10000)	information transfer capability
Layer1_G711_ALaw (00011)	layer1 identification
User rate nil (00000)	User rate
synchrone (0)	synchronization
Negot_not_inband (0)	negotiation



---

## Appendix F: Q.767 Gateway IMT and UCP ISUP signaling protocol interworking

---

This appendix describes the interworking between the Q.767 Gateway IMT and the UCP ISUP signaling. It contains two sections:

- “The Q.767 Gateway IMT’s messages mapped to the messages”
- “UCP ISUP signaling protocol’s messages interworked to the Q.767 Gateway IMT’s messages”

These sections are divided according to the messages they describe.

The UCP ISUP signaling protocol is used on three trunk agencies that interwork with the Q.767 Gateway IMT:

- the SS7 UCP (inter) IMT
- the SS7 UCP (intra) IMT
- the SS7 FGD (UCP)

When this appendix refers to the UCP ISUP signaling protocol, you can assume it is referring to the three supported trunk agencies with that signaling protocol.

### **The Q.767 Gateway IMT’s messages mapped to the messages**

The CS 2000 switch interworks the following Q.767 Gateway IMT messages to UCP ISUP messages:

- address complete message (ACM)
- answer message (ANM)
- call progress (CPG) message
- connect (CON) message
- continuity (COT) message
- forward transfer (FOT) message
- initial address message (IAM)
- release (REL) message

- suspend/resume (SUS/RES) message

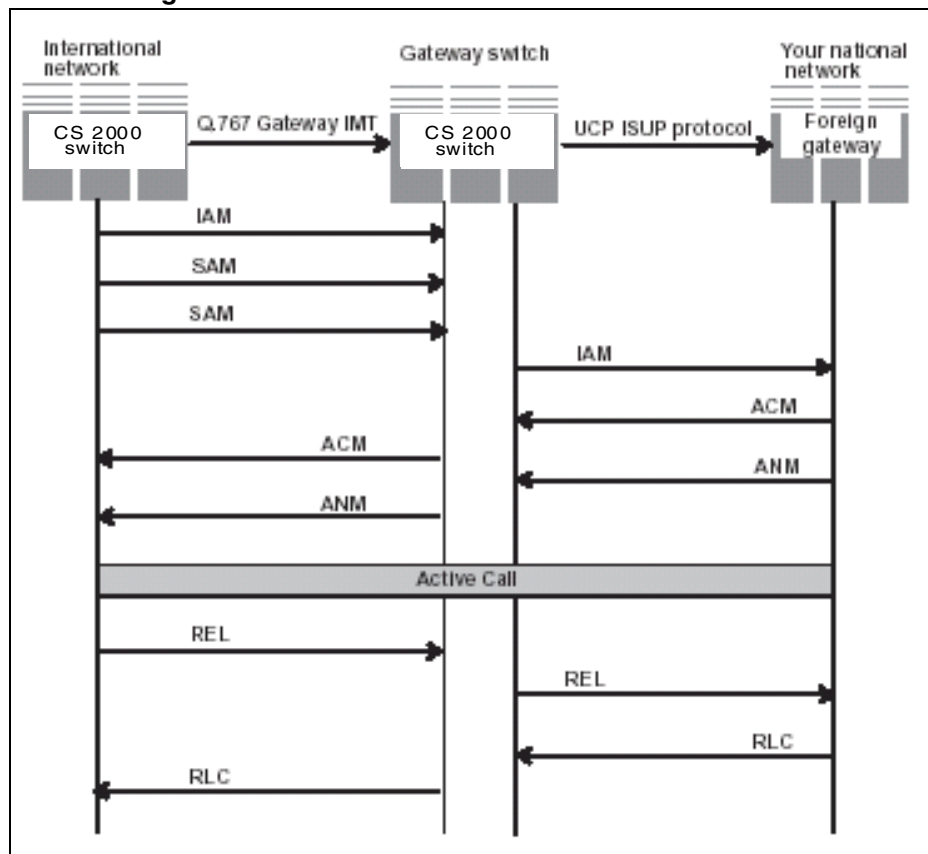
Figure 27, “Q.767 Gateway IMT messages interworked to UCP ISUP signaling protocol message,” shows how the CS 2000 switch interworks the Q.767 messages to the UCP ISUP messages.

The CS 2000 switch receives the address in en bloc format over the Q.767 Gateway IMT. It can receive overlap sending. Overlap sending allows the CS 2000 switch to receive subsequent address messages (SAMs) until it has received the complete address.

The UCP ISUP signaling protocol only supports the address in en bloc format. It receives the SAM messages, then sends the complete address in the IAM.

*Note:* For more information on overlap sending, see Appendix A: “Gateway IMT features.”

**Figure 27 Q.767 Gateway IMT messages interworked to UCP ISUP signaling protocol message**



**ACM parameters mapped from Q.767 Gateway IMT to UCP ISUP**

Table 139, “CS 2000 switch actions on ACM parameters,” shows whether the CS 2000 switch tandems, processes, or discards the Q.767 Gateway IMT’s ACM’s parameters to interwork with the UCP ISUP signaling protocol.

**Table 139 CS 2000 switch actions on ACM parameters**

<b>on these Q.767 Gateway IMT ACM parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
backward call indicators (F)	process
access transport (O)	tandem
cause indicators (O)	tandem
optional backward call indicators (O)	tandem
user-to-user indicators (O)	tandem
user-to-user information (O)	tandem
end of optional parameters (O)	tandem

Table 140, “CS 2000 switch actions on ACM parameters,” shows whether the CS 2000 switch tandems, processes, or discards the parameters in the ACM message under the following conditions:

- the Q.767 Gateway IMT is the originating trunk agency
- the UCP ISUP protocol is used by the terminating trunk agency
- the SOC NSER0003 is active
- the ACTIVATE\_INTER\_INTRA\_UNANS\_CALL office parameter in table OFCVAR is set to Y

**Table 140 CS 2000 switch actions on ACM parameters**

<b>on these Q.767 Gateway IMT ACM parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
backward call indicators (F)	process
access transport (O)	tandem
cause indicators (O)	tandem

<b>on these Q.767 Gateway IMT ACM parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
optional backward call indicators (O)	discard
user-to-user indicators (O)	tandem
user-to-user information (O)	tandem
end of optional parameters (O)	tandem



---

## ANM parameters mapped from Q.767 Gateway IMT to UCP ISUP

Table 141, “CS 2000 switch actions on ANM parameters,” shows whether the CS 2000 switch tandems, processes, or discards the parameters in the ANM message.

**Table 141 CS 2000 switch actions on ANM parameters**

<b>on these Q.767 Gateway IMT ANM parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
access transport (O)	tandem
backward call indicators (F)	tandem
connected number (O)	tandem
user-to-user information (O)	tandem
end of optional parameters (O)	tandem

**CPG parameters mapped from Q.767 Gateway IMT to UCP ISUP**

Table 142, “CS 2000 switch actions on CPG parameters,” shows whether the CS 2000 switch tandems, processes, or discards the Q.767 Gateway IMT’s CPG’s parameters to interwork with the UCP ISUP signaling protocol.

**Table 142 CS 2000 switch actions on CPG parameters**

<b>on these Q.767 Gateway IMT CPG parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
event information (F)	tandem
access transport (O)	tandem
backward call indicators (F)	tandem
optional backward call indicators (O)	tandem
user-to-user information (O)	tandem
end of optional parameters (O)	tandem

## CON parameters mapped from Q.767 Gateway IMT to UCP ISUP

The UCP ISUP signaling protocol does not support the CON message. Table 143, “CS 2000 switch actions on CON parameters,” shows whether the CS 2000 switch tandems, maps, or discards CON parameters while sending an ANM when the originating trunk agency is a Q.767 Gateway IMT and the terminating trunk agency uses the UCP ISUP signaling protocol.

**Table 143 CS 2000 switch actions on CON parameters**

<b>on these Q.767 Gateway IMT CON parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	mapped
backward call indicators (F)	tandem
user-to-user indicators (O)	tandem
user-to-user information (O)	tandem
access transport (O)	tandem
connected number (O)	discard
end of optional parameters (O)	tandem

**COT parameters mapped from Q.767 Gateway IMT to UCP ISUP**

Table 144, “CS 2000 switch actions on COT parameters,” shows whether the CS 2000 switch tandems, processes, or discards the Q.767 Gateway IMT’s COT’s parameters to interwork with the UCP ISUP signaling protocol.

**Table 144 CS 2000 switch actions on COT parameters**

<b>on these Q.767 Gateway IMT COT parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	mapped
continuity indicators (F)	tandem

**FOT parameters mapped from Q.767 Gateway IMT to UCP ISUP**

Table 145, “CS 2000 switch actions on FOT parameters,” shows whether the CS 2000 switch tandems, processes, or discards the Q.767 Gateway IMT’s FOT’s parameters to interwork with the UCP ISUP signaling protocol.

**Table 145 CS 2000 switch actions on FOT parameters**

<b>on these Q.767 Gateway IMT COT parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
end of optional parameters (O)	tandem

## IAM parameters mapped from Q.767 Gateway IMT to UCP ISUP

Table 146, “The Q.767 Gateway IMT’s IAM message’s parameters mapped to the UCP ISUP signaling protocol’s IAM message’s parameters,” shows the mapping of the IAM’s parameters from the Q.767 Gateway IMT to the UCP ISUP signaling protocol. Table 148, “CS 2000 switch actions on IAM parameters,” shows whether the CS 2000 switch tandems, processes, maps, or discards IAM parameters when the originating trunk agency is a Q.767 Gateway IMT and the terminating trunk agency uses the UCP ISUP signaling protocol.

**Table 146 The Q.767 Gateway IMT’s IAM message’s parameters mapped to the UCP ISUP signaling protocol’s IAM message’s parameters**

these Q.767 Gateway IMT IAM parameters:	map to these UCP ISUP IAM parameters:
nature of connection indicator (F)	nature of connection indicator (F)
forward call indicator (F)	forward call indicator (F)
calling party category (F)	calling party category (F)
transmission medium requirement (F)	user service information (V)
<p><b>Note:</b> If the Q.767 receives user service information (USI) parameter, it sends the USI parameter to the UCP ISUP. The UCP ISUP encodes its IAM message based on this USI parameter. If the Q.767 does not receive a USI parameter, it sends the TMR parameter to the UCP ISUP. The UCP ISUP uses this parameter to encode the USI parameter.</p>	
called party number (V)	called party number (V)
transit network selection (O)	None
calling party number (O)	calling party number (O)
<p><b>Note:</b> The calling party number is only valid if the calling party number incomplete indicator is set to “complete;” otherwise, it is invalid and discarded.</p>	
user service information (O)	user service information (V)

**Note:** The USI parameter is mandatory in the UCP ISUP IAM, but it is optional in the Q.767 IAM. The USI parameter is mapped from the TMR and USI parameters in the Q.767 IAM to the UCP ISUP IAM. Table 147, “The Q.767 Gateway IMT’s TMR parameter mapped to the UCP ISUP signaling protocol’s USI parameter,” shows how the TMR parameter in the Q.767 IAM is mapped to the USI parameter in the UCP ISUP IAM.

**Table 147 The Q.767 Gateway IMT’s TMR parameter mapped to the UCP ISUP signaling protocol’s USI parameter**

these Q.767 Gateway IMT TMR parameters:	map to these UCP ISUP USI parameters:
none	coding standard: CCITT standardized coding (default)
transmission medium requirement: <ul style="list-style-type: none"> <li>• speech</li> <li>• 64 kbit/s unrestricted</li> <li>• 3.1 kHz audio</li> </ul>	information transfer capability: <ul style="list-style-type: none"> <li>• speech</li> <li>• 64 kbit/s unrestricted digital info</li> <li>• 3.1 kHz audio</li> </ul>
none	transfer mode: circuit mode (default)
none	information transfer rate: 64 kbit/s (default)
none	user layer 1 protocol information (default)

**Table 148 CS 2000 switch actions on IAM parameters**

<b>these Q.767 Gateway IMT IAM parameters:</b>	<b>map to these CS 2000 parameters:</b>
message type (F)	tandem
nature of connection indicators (F)	process
forward call indicators (F)	process
calling party's category (F)	process
transmission medium requirement (F)	mapped
called party number (V)	process
access transport (O)	tandem
calling party number (O)	process
closed user group inter-lock code (O)	tandem
optional forward call indicators (O)	tandem
user service information (O)	process
user-to-user information (O)	tandem
end of optional parameters (O)	tandem

**REL parameters mapped from Q.767 Gateway IMT to UCP ISUP**

Table 149, “CS 2000 switch actions on REL parameters,” shows whether the CS 2000 switch tandems, processes, or discards the parameters in the REL message under the following conditions:

- the Q.767 Gateway IMT is the originating trunk agency
- the UCP ISUP protocol is used by the terminating trunk agency
- the cause value Normal Call Clearing is received by the CS 2000 switch

**Table 149 CS 2000 switch actions on REL parameters**

<b>on these Q.767 Gateway IMT REL parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
cause indicators (V)	process
automatic congestion level (O)	discard
user-to-user information (O)	tandem
end of optional parameters (O)	tandem

Table 150, “CS 2000 switch actions on REL parameters,” shows whether the CS 2000 switch tandems, processes, or discards the parameters in the REL message under the following conditions:

- the Q.767 Gateway IMT is the originating trunk agency
- the UCP ISUP protocol is used by the terminating trunk agency
- a cause value other than Normal Call Clearing is received by the CS 2000 switch



**Table 150 CS 2000 switch actions on REL parameters**

<b>on these Q.767 Gateway IMT REL parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
cause indicators (V)	process
automatic congestion level (O)	discard
user-to-user information (O)	discard
end of optional parameters (O)	tandem

**SUS/RES parameters mapped from Q.767 Gateway IMT to UCP ISUP**

Table 151, “CS 2000 switch actions on SU/RES parameters,” shows whether the CS 2000 switch tandems, processes, or discards the Q.767 Gateway IMT’s SUS/RES parameters to interwork with the UCP ISUP signaling protocol.

**Table 151 CS 2000 switch actions on SU/RES parameters**

<b>on these Q.767 Gateway IMT SU/RES parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
suspend/resume indicators (F)	tandem
end of optional parameters (O)	tandem

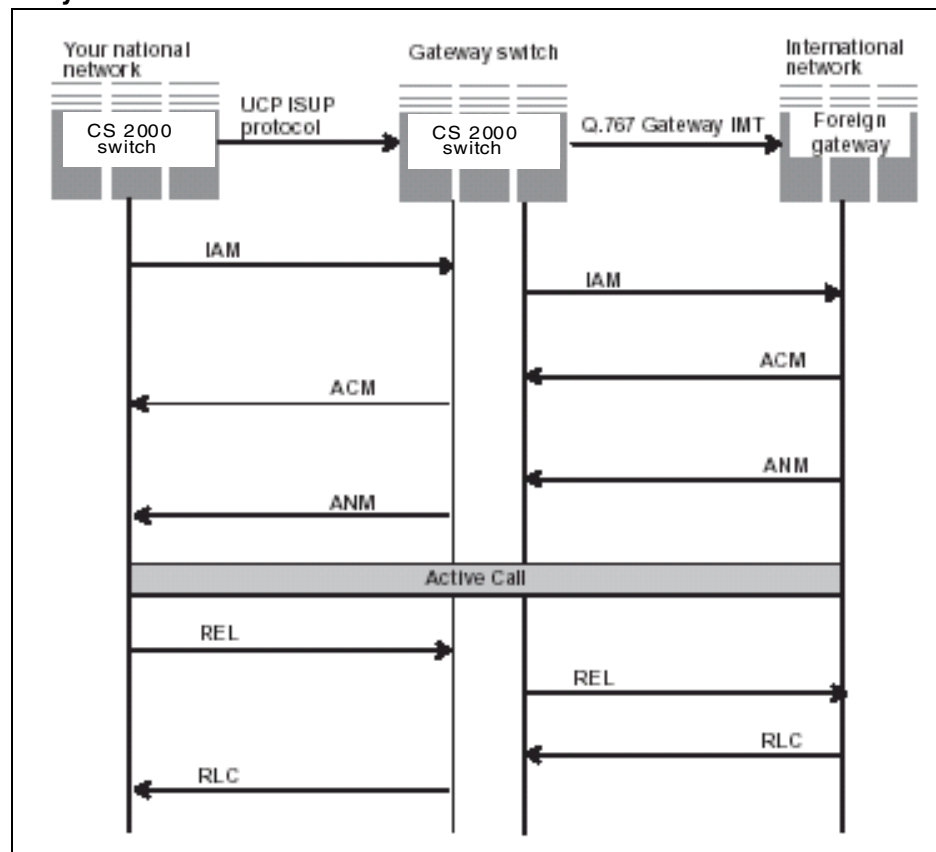
## UCP ISUP signaling protocol's messages interworked to the Q.767 Gateway IMT's messages

The CS 2000 switch interworks the following UCP ISUP messages to the Q.767 Gateway IMT messages:

- address complete message (ACM)
- answer message (ANM)
- call progress (CPG) message
- initial address message (IAM)
- pass along message (PAM)
- release (REL) message
- suspend/resume (SUS/RES) message

See Figure 28, “UCP ISUP signaling protocol messages interworking to the Q.767 Gateway IMT.”

**Figure 28 UCP ISUP signaling protocol messages interworking to the Q.767 Gateway IMT**



### ACM parameters mapped from UCP ISUP to Q.767 Gateway IMT

Table 152, “CS 2000 switch actions on ACM parameters,” shows whether the CS 2000 switch tandems, processes, or discards the UCP ISUP signaling protocol’s ACM parameters to interwork with the Q.767 Gateway IMT.

**Table 152 CS 2000 switch actions on ACM parameters**

on these UCP ISUP ACM parameters:	the CS 2000 switch performs these actions:
message type (F)	tandem
backward call indicator (F)	process
call reference (O)	discard
cause indicators (O)	tandem
network-specific information (O)	tandem
user-to-user indicators (O)	tandem
user-to-user information (O)	tandem
end of optional parameters (O)	tandem

Table 153, “CS 2000 switch actions on ACM parameters” shows whether the CS 2000 switch tandems, processes, or discards the parameters in the ACM message under the following conditions:

- the UCP ISUP protocol is used by the originating trunk agency
- the Q.767 Gateway IMT is the terminating trunk agency
- the SOC NSER0003 is active
- the ACTIVATE\_INTER\_INTRA\_UNANS\_CALL office parameter in table OFCVAR is set to Y

**Table 153 CS 2000 switch actions on ACM parameters**

<b>on these UCP ISUP ACM parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
backward call indicator (F)	process
call reference (O)	discard
cause indicators (O)	tandem
network-specific information (O)	discard
user-to-user indicators (O)	tandem
user-to-user information (O)	tandem
end of optional parameters (O)	tandem

**ANM parameters mapped from UCP ISUP to Q.767 Gateway IMT**

Table 154, “CS 2000 switch actions on ANM parameters,” shows whether the CS 2000 switch tandem, processes, or discards the UCP ISUP signaling protocol’s ANM parameters to interwork with the Q.767 Gateway IMT.

**Table 154 CS 2000 switch actions on ANM parameters**

<b>on these UCP ISUP ANM parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
call reference (O)	discard
carrier selection (O)	discard
inter-network-specific ANM (O)	discard
intra-network-specific ANM (O)	discard
network-specific information (O)	discard
multiple business group (network information) (O)	discard
operator information (O)	discard
user-to-user indicators (O)	discard
user-to-user information (O)	tandem
end of optional parameters (O)	tandem

## CPG parameters mapped from UCP ISUP to Q.767 Gateway IMT

Table 155, “CS 2000 switch actions on CPG parameters,” shows whether the CS 2000 switch tandems, processes, or discards the UCP ISUP signaling protocol’s CPG parameters to interwork with the Q.767 Gateway IMT.

**Table 155 CS 2000 switch actions on CPG parameters**

on these UCP ISUP CPG parameters:	the CS 2000 switch performs these actions:
message type (F)	tandem
event information (F)	tandem
cause indicators (O)	discard
user-to-user indicators (O)	discard
user-to-user information (O)	tandem
end of optional parameters (O)	tandem

### IAM parameters mapped from UCP ISUP to Q.767 Gateway IMT

Table 156, “IAM message parameters mapped from UCP ISUP to the Q.767 Gateway IMT,” shows the mapping of the IAM’s parameters from the UCP ISUP signaling protocol to the Q.767 Gateway IMT. Table 158, “CS 2000 switch actions on IAM parameters,” shows whether the CS 2000 switch tandem, processes, or discards the UCP ISUP signaling protocol’s IAM’s parameters to interwork with the Q.767 Gateway IMT.

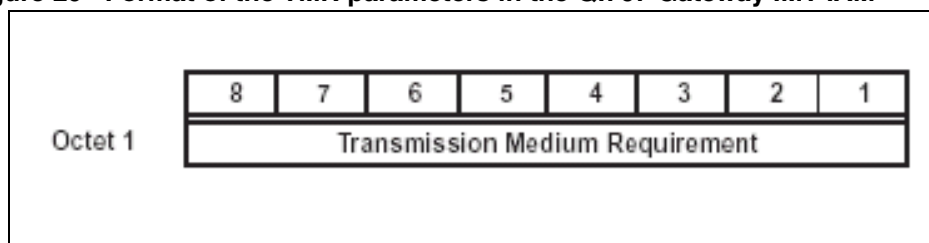
**Table 156 IAM message parameters mapped from UCP ISUP to the Q.767 Gateway IMT**

these UCP ISUP IAM parameters:	map to these Q.767 Gateway IMT IAM parameters:
nature of connection indicator (F)	nature of connection indicator (F)
<b>Note:</b> The satellite indicator in the NOC parameter is not checked.	
called party number (V)	called party number (V)
calling party number (O)	calling party number (O)
<b>Note:</b> The calling party number is valid only if the calling party incomplete indicator is set to “complete;” otherwise, the calling party number is discarded.	
charge number (O)	
<b>Note:</b> Charge number is an invalid parameter.	
transit network selection (O)	
carrier identification parameter (O)	
forward call indicator (F)	forward call indicator (F)
calling party category (F)	calling party category (F)
user service information (V)	transmission medium requirement (F) user service information (O)

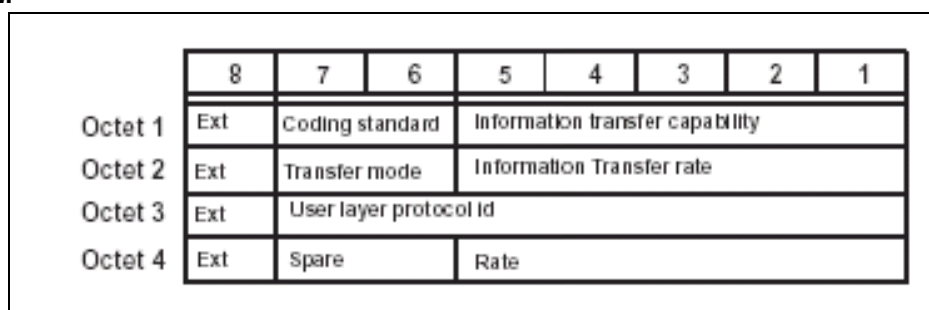


**Note:** The user service information (USI) parameter is a mandatory parameter in the UCP ISUP IAM, but it is optional in the Q.767 IAM. The USI parameter is mapped from the UCP ISUP IAM to the TMR and USI parameters in the Q.767 IAM. See Figure 29, “Format of the TMR parameters in the Q.767 Gateway IMT IAM,” and Figure 30, “Format of the USI parameters in the UCP ISUP signaling protocol IAM,” for the formats of the TMR and USI parameters in the Q.767 IAM.

**Figure 29 Format of the TMR parameters in the Q.767 Gateway IMT IAM**



**Figure 30 Format of the USI parameters in the UCP ISUP signaling protocol IAM**



See Table 157, “Information transfer rate field of the USI parameter mapped to the TMR parameter”.

**Table 157 Information transfer rate field of the USI parameter mapped to the TMR parameter**

Information transfer rate field of the USI parameter	TMR parameter
3.1 kHz audio	3.1 kHz audio
video	3.1 kHz audio
7 kHz audio	3.1 kHz audio

**Note:** If you fail to datafill the mapping in table BCCOMPAT, the call will receive bearer incompatibility treatment.

Information transfer rate field of the USI parameter	TMR parameter
15 kHz audio	<p><b>Note:</b> If you fail to datafill the mapping in table BCCOMPAT, the call will receive bearer incompatibility treatment.</p> 3.1 kHz audio
56 Kbit/s adapted	<p><b>Note:</b> If you fail to datafill the mapping in table BCCOMPAT, the call will receive bearer incompatibility treatment.</p> 64 Kbit/s unrestricted with USI parameter tandemed

Table 158 CS 2000 switch actions on IAM parameters

on these UCP ISUP IAM parameters:	the CS 2000 switch performs these actions:
message type (F)	tandem
nature of connection indicators (F)	process
forward call indicators (F)	process
calling party's category (F)	process
user service information (F)	mapped
called party number (V)	process
calling party number (O)	process
carrier identification (O)	discard
carrier selection (O)	discard
charge number (O)	discard
channel assignment map (O)	discard

<b>on these UCP ISUP IAM parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
generic address (O)	discard
generic digits (O)	discard
jurisdiction information (O)	discard
multiple business group (network information) (O)	discard
network-specific facilities (O)	discard
network-specific IAM (O)	discard
operator information (O)	discard
operator service indicator (O)	discard
originating line information (O)	discard
remote operations (O)	discard
supplementary line information (O)	discard
transit network selection (O)	discard
user service information (mandatory variable length parameter in UCP protocol) (O)	process
user-to-user information (O)	tandem
end of optional parameters (O)	tandem

### **PAM parameters mapped from UCP ISUP to Q.767 Gateway IMT**

Table 159, “CS 2000 switch actions on PAM parameters,” shows whether the CS 2000 switch tandems, processes, or discards the UCP ISUP signaling protocol’s PAM parameters to interwork with the Q.767 Gateway IMT.

**Table 159 CS 2000 switch actions on PAM parameters**

<b>on these UCP ISUP PAM parameter</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem

## REL parameters mapped from UCP ISUP to Q.767 Gateway IMT

Table 160, “CS 2000 switch actions on REL parameters,” shows whether the CS 2000 switch tandems, processes, or discards the parameters in the REL message under the following conditions:

- the UCP ISUP protocol is used by the originating trunk agency
- the Q.767 Gateway IMT is the terminating trunk agency
- the cause value Normal Call Clearing is received by the CS 2000 switch

**Table 160 CS 2000 switch actions on REL parameters**

on these UCP ISUP REL parameters:	the CS 2000 switch performs these actions:
message type (F)	tandem
cause indicators (V)	process
user-to-user information (O)	tandem
user-to-user indicators (O)	discard
end of optional parameters (O)	tandem

Table 161, “CS 2000 switch actions on REL parameters,” shows whether the CS 2000 switch tandems, processes, or discards the parameters in the REL message under the following conditions:

- the UCP ISUP protocol is used by the originating trunk agency
- the Q.767 Gateway IMT is the terminating trunk agency
- a cause value other than Normal Call Clearing is received by the CS 2000 switch

**Table 161 CS 2000 switch actions on REL parameters**

<b>on these UCP ISUP REL parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
cause indicators (V)	process
user-to-user information (O)	tandem
user-to-user indicators (O)	discard
end of optional parameters (O)	tandem

---

## SUS/RES parameters mapped from UCP ISUP to Q.767 Gateway IMT

Table 162, “CS 2000 switch actions on SU/RES parameters,” shows whether the CS 2000 switch tandem, processes, or discards the UCP ISUP signaling protocol’s SUS/RES parameters to interwork with the Q.767 Gateway IMT.

**Table 162 CS 2000 switch actions on SU/RES parameters**

<b>on these UCP ISUP REL parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
suspend/resume indicators (F)	tandem
end of optional parameters (O)	tandem





---

## Appendix G: ISUP'92 Gateway IMT messages

---

Table 163, “ISUP'92 international messages,” has two functions:

- it lists the ISUP'92 international messages the CS 2000 switch recognizes
- it shows what the CS 2000 switch does with the messages

Table 164, “ISUP'92 international messages the CS 2000 switch discards,” has two functions:

- it lists the ISUP'92 international messages that the switch recognizes
- it shows if the CS 2000 switch discards and sends a confusion message to the originator

**Table 163 ISUP'92 international messages**

Message's name	Message's acronym	sends	receives	processes	tandems
address complete message	ACM	X	X	X	
answer message	ANM	X	X	X	
blocking	BLO	X	X	X	
blocking acknowledgement	BLA	X	X	X	
call progress	CPG	X	X		X
circuit group blocking	CGB		X	X	

Message's name	Message's acronym	sends	receives	processes	tandems
circuit group blocking acknowledgement	CGBA	X		X	
circuit group reset	GRS	X	X	X	
circuit group reset acknowledgement	GRA	X	X	X	
circuit group unblocking	CGU		X	X	
circuit group unblocking acknowledgement	CGUA	X		X	
connect	CON	X	X	X	
continuity	COT	X	X	X	
confusion	CFN	X	X	X	
continuity check request	CCR	X	X	X	
forward transfer	FOT	X	X		X
initial address message	IAM	X	X	X	
information request	INR	X			X
<b>Note:</b> The CS 2000 switch does not perform call processing on this message; it tandems the message. The CS 2000 switch delivers the CLI in en bloc format. If an incomplete CLI is received, the CS 2000 switch does not generate an INR message, instead it discards the message.					
release	REL	X	X	X	

Message's name	Message's acronym	sends	receives	processes	tandems
release complete	PLC	X	X	X	
reset circuit	RSC	X	X	X	
<p><b>Note:</b> If the resume indicator in the RES message is set to network initiated and the message is received on the terminator after the ANM message, the message is tandemed; otherwise, the message is discarded.</p>					
resume	RES	X	X		X
<p><b>Note:</b> The CS 2000 switch does not perform call processing for this message. It sends an information not available message (INF) in the backward direction. The CS 2000 switch delivers the CLI in en bloc format. If it receives an incomplete CLI, it does not create a INR message; instead, it discards the calling party category.</p>					
subsequent address message	SAM	X	X	X	
suspend	SUS	X	X		X
<p><b>Note:</b> If the suspend indicator in the SUS message is set to network initiated and the message is received on the terminator after the ANM, the message is tandemed; otherwise, it is discarded.</p>					
unblocking	UBL	X	X	X	
unblocking acknowledgement	UBA	X	X	X	

**Table 164 ISUP'92 international messages the CS 2000 switch discards**

Message's name	Message's acronym	receives	discards	sends confusion message
facility accept	FAA		X	X
facility request	FAR	X	X	
<b>Note:</b> If the CS 2000 switch receives the FAR message, it discards the message and sends a facility reject (FRJ) message.				
facility reject	FRJ		X	X
User-to-user information	USR		X	

---

## Appendix H: ISUP'92 Gateway IMT messages and parameters

---

This appendix lists all the messages the ISUP'92 Gateway IMT supports. Each message begins on a new page in this appendix. Below each message's name and acronym are two tables:

- The first table shows if the Q.767 Gateway IMT sends and receives the message and if it processes or tandems the message. These tables appear without labels.
- The second table lists the message's parameters and tells what type of parameters they are, what type of action the Q.767 Gateway IMT takes with the parameters, and any notes regarding the parameter. These tables are labeled Tables 165 through 188.

**Note 1:** The note "ISUP'92 minimum set" in the notes column refers to the recommended minimum set of parameters for each supported message based on ITU-T Recommendation Q.761 White Book version table 4 for international use.

**Note 2:** All parameters not listed in Tables 165 through 188 are subject to the rules of the parameter compatibility parameter. See "Parameter compatibility parameter processing" in Chapter 4: "ISUP'92 Gateway IMT."

In general, when the CS 2000 switch generates a release (REL) or confusion (CFN) message, the location field of the cause parameter is set to "International Network." If the REL message is generated using table TMTMAP, the location field of the cause parameter is taken from the location field of the table entry. For more information, see "cause value handling" in Appendix A: "Gateway IMT features."

**Address complete message (ACM)**

Message	sends	receives	processes	tandems
address complete	X	X	X	

**Table 165 ACM message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set
Backward call indicator	F	process	ISUP'92 minimum set
optional backward call indicator	O	process	ISUP'92 minimum set
Cause indicator	O	tandem	ISUP'92 minimum set
User-to-user indicators	O	tandem	ISUP'92 minimum set
User-to-user information	O	tandem	ISUP'92 minimum set
Access transport	O	tandem	ISUP'92 minimum set
Generic notification indicator	O	tandem	ISUP'92 minimum set
Transmission medium used	O	tandem	ISUP'92 minimum set
Echo control information	O	tandem	ISUP'92 minimum set
Access delivery information	O	tandem	ISUP'92 minimum set
Redirection number	O	tandem	ISUP'92 minimum set

---

<b>Parameter</b>	<b>Type</b>	<b>Action</b>	<b>Notes</b>
Parameter compatibility indicator	O	tandem	ISUP'92 minimum set
Call diversion indicator	O	tandem	ISUP'92 minimum set
Redirection number restriction	O	tandem	ISUP'92 minimum set
End of optional parameters	O	tandem	ISUP'92 minimum set
Call reference	O	discard	for national use only
Network specific facility	O	discard	for national use only
Remote operations	O	discard	for national use only
Service activation	O	discard	for national use only

**Answer message (ANM)**

Message	sends	receives	processes	tandems
answer	X	X	X	

**Table 166 ANM message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set
Backward call indicator	O	tandem	ISUP'92 minimum set
Optional backward call indicator	O	tandem	ISUP'92 minimum set
User-to-user indicators	O	tandem	ISUP'92 minimum set
User-to-user information	O	tandem	ISUP'92 minimum set
Connected number	O	tandem	ISUP'92 minimum set
Access transport	O	tandem	ISUP'92 minimum set
Access delivery information	O	tandem	ISUP'92 minimum set
Generic notification indicator	O	tandem	ISUP'92 minimum set
Parameter compatibility indicator	O	tandem	ISUP'92 minimum set
Call history information	O	tandem	ISUP'92 minimum set
Generic number	O	tandem	ISUP'92 minimum set
Transmission medium used	O	tandem	ISUP'92 minimum set



---

<b>Parameter</b>	<b>Type</b>	<b>Action</b>	<b>Notes</b>
Redirection number	O	tandem	ISUP'92 minimum set
Echo control information	O	tandem	ISUP'92 minimum set
Redirection number restriction	O	tandem	ISUP'92 minimum set
End of optional parameters	O	tandem	ISUP'92 minimum set
Call reference	O	discard	for national use only
Network specific facility	O	discard	for national use only
Remote operations	O	discard	for national use only
Service activation	O	discard	for national use only

**Blocking acknowledgement (BLA) message**

Message	sends	receives	processes	tandems
blocking acknowledgement	X	X	X	

**Table 167 BLA message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set

---

## Blocking (BLO) message

Message	sends	receives	processes	tandems
blocking	X	X	X	

**Table 168** BLO message's parameters

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set

## Call progress (CPG) message

Message	sends	receives	processes	tandems
call progress	X	X		X

**Table 169 CPG message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set
Event information	F	process	ISUP'92 minimum set
Backward call indicator	O	tandem	ISUP'92 minimum set
Optional backward call indicator	O	tandem	ISUP'92 minimum set
Cause indicators	O	tandem	ISUP'92 minimum set
User-to-user indicators	O	tandem	ISUP'92 minimum set
User-to-user information	O	tandem	ISUP'92 minimum set
Access transport	O	tandem	ISUP'92 minimum set
Redirection number	O	tandem	ISUP'92 minimum set
Transmission medium used	O	tandem	ISUP'92 minimum set
Access delivery information	O	tandem	ISUP'92 minimum set
Generic notification indicator	O	tandem	ISUP'92 minimum set

---

<b>Parameter</b>	<b>Type</b>	<b>Action</b>	<b>Notes</b>
Parameter compatibility indicator	O	tandem	ISUP'92 minimum set
Call diversion information	O	tandem	ISUP'92 minimum set
Redirection number restriction	O	tandem	ISUP'92 minimum set
End of optional parameters	O	tandem	ISUP'92 minimum set
Call reference	O	discard	for national use only
Network specific facility	O	discard	for national use only
Remote operations	O	discard	for national use only
Service activation	O	discard	for national use only

-

**Circuit group reset acknowledgement (GRA) message**

Message	sends	receives	processes	tandems
circuit group reset acknowledgement	X	X	X	

**Table 170 GRA message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set
Range and status	V	process	ISUP'92 minimum set

## Circuit group reset (GRS) message

Message	sends	receives	processes	tandems
circuit group reset	X	X	X	

**Table 171 GRS message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set
Range and status	V	process	ISUP'92 minimum set

**Circuit group block acknowledgement (CGBA) message**

Message	sends	receives	processes	tandems
circuit group blocking acknowledgement	X		X	

**Table 172 CGBA message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set
Circuit group supervision message type indicator	F	process	ISUP'92 minimum set
Range and status	V	process	ISUP'92 minimum set



## Circuit group block (CGB) message

Message	sends	receives	processes	tandems
circuit group blocking			X	

**Table 173 CGB message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set
Circuit group supervision message type indicator	F	process	ISUP'92 minimum set
Range and status	V	process	ISUP'92 minimum set

**Circuit group unblocking acknowledgement (CGUA) message**

Message	sends	receives	processes	tandems
circuit group unblocking acknowledgement	X		X	

**Table 174 CGUA message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set
Circuit group supervision message type indicator	F	process	ISUP'92 minimum set
Range and status	V	process	ISUP'92 minimum set

## Circuit group unblocking (CGU) message

Message	sends	receives	processes	tandems
circuit group unblocking		X	X	

**Table 175 CGU message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set
Circuit group supervision message type indicator	F	process	ISUP'92 minimum set
Range and status	V	process	ISUP'92 minimum set

**Confusion (CFN) message**

Message	sends	receives	processes	tandems
confusion	X	X	X	

**Table 176 CFN message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set
Cause indicators	V	process	ISUP'92 minimum set
End of optional parameters	O	process	ISUP'92 minimum set

## Connect (CON) message

Message	sends	receives	processes	tandems
connect	X	X	X	

**Table 177 CON message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set
Backward call indicator	F	process	ISUP'92 minimum set
Optional backward call indicator	O	tandem	ISUP'92 minimum set
User-to-user indicator	O	tandem	ISUP'92 minimum set
User-to-user information	O	tandem	ISUP'92 minimum set
Access transport	O	tandem	ISUP'92 minimum set
Generic notification indicator	O	tandem	ISUP'92 minimum set
Parameter compatibility indicator	O	tandem	ISUP'92 minimum set
Call history information	O	tandem	ISUP'92 minimum set
Generic number	O	tandem	ISUP'92 minimum set
Transmission medium used	O	tandem	ISUP'92 minimum set
Redirection number	O	tandem	ISUP'92 minimum set
Echo control information	O	tandem	ISUP'92 minimum set

<b>Parameter</b>	<b>Type</b>	<b>Action</b>	<b>Notes</b>
Redirection number restriction	O	tandem	ISUP'92 minimum set
Access delivery information	O	tandem	ISUP'92 minimum set
Connected number	O	tandem	ISUP'92 minimum set
End of optional parameters	O	tandem	ISUP'92 minimum set
Call reference	O	discard	for national use only
Network specific facility	O	discard	for national use only
Remote operations	O	discard	for national use only
Service activation	O	discard	for national use only

---

## Continuity check request (CCR) message

Message	sends	receives	processes	tandems
continuity check request	X	X	X	

**Table 178 CCR message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set

## Continuity (COT) message

Message	sends	receives	processes	tandems
continuity	X	X	X	

**Table 179 COT message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set
Continuity indicators	F	tandem	ISUP'92 minimum set



**Facility Accept (FAA) and Facility Request (FAR) messages**

On an ISUP'92 Gateway IMT, the CS 2000 switch discards FAA messages and send a confusion (CFN) message. If the CS 2000 switch receives a FAR message, it discards the FAR message and sends a facility reject (FRJ) message.

### **Facility Reject (FRJ) message**

On an ISUP'92 Gateway IMT, the CS 2000 switch discards the FRJ message and sends a confusion message with cause value 97 and with FRJ as the diagnostic information.

## Forward transfer (FOT) message

Message	sends	receives	processes	tandems
forward transfer	X	X		X

**Table 180 FOT message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set
End of optional parameters	O	tandem	ISUP'92 minimum set
Call reference	O	discard	for national use only

**Initial address message (IAM)**

Message	sends	receives	processes	tandems
initial address message	X	X	X	

**Table 181 IAM message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set
Nature of connection indicators	F	process	ISUP'92 minimum set
Forward call indicators	F	process	ISUP'92 minimum set
Calling Party's Category	F	process	ISUP'92 minimum set
Transmission medium requirement (TMR)	F	process	ISUP'92 minimum set supported values: <ul style="list-style-type: none"> <li>• speech</li> <li>• 64 Kbit/s unrestricted</li> <li>• 3.1 Khz audio</li> </ul>
Called party number	V	process	ISUP'92 minimum set
Access transport	O	tandem	ISUP'92 minimum set
Closed user group interlock code	O	tandem	ISUP'92 minimum set
Calling party number	O	process	ISUP'92 minimum set
Connection request	O	discard	

Parameter	Type	Action	Notes
End of optional parameters	O	process	ISUP'92 minimum set
User-to-user information	O	tandem	ISUP'92 minimum set
Generic notification indicator	O	discard	
Generic number	O	discard	
Generic reference	O	discard	
Location number	O	discard	
MLPP precedence	O	discard	
Optional forward call indicators	O	tandem	ISUP'92 minimum set
Original called number	O	tandem	ISUP'92 minimum set
Origination ISC point code	O	discard	
Parameter compatibility information	O	discard	
Propagation delay counter	O	discard	
Redirecting number	O	tandem	ISUP'92 minimum set
Redirection information	O	tandem	ISUP'92 minimum set

Parameter	Type	Action	Notes
Transmission medium requirement prime	O	discard	
User service information	O	discard	
User service information prime	O	discard	
User teleservice information	O	discard	
User-to-user indicators	O	tandem	ISUP'92 minimum set
Call reference	O	discard	for national use only
Generic digit	O	discard	for national use only
Network specific facility	O	discard	for national use only
Remote operations	O	discard	for national use only
Service activation	O	discard	for national use only
Transit network selection	O	discard	for national use only

## Release complete (RLC) message

Message	sends	receives	processes	tandems
release complete	X	X	X	

**Table 182 RLC message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set
Cause indicators	O	none <b>Note:</b> RLC is a point to point message	ISUP'92 minimum set
End of optional parameters	O	none <b>Note:</b> RLC is a point to point message	ISUP'92 minimum set

## Release (REL) message

Message	sends	receives	processes	tandems
release	X	X	X	

**Table 183 REL message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set
Cause indicators	F	process	ISUP'92 minimum set
Automatic congestion level	O	discard	See note below.
<b>Note:</b> The CS 2000 switch handles this parameter on a link-by-link basis. If received, the parameter is removed from the message and not transited.			
User-to-user indicators	O	tandem	ISUP'92 minimum set
User-to-user information	O	tandem	ISUP'92 minimum set
Access transport	O	tandem	ISUP'92 minimum set
Parameter compatibility information	O	tandem	ISUP'92 minimum set
Redirection number restriction	O	tandem	ISUP'92 minimum set
Access delivery information	O	tandem	ISUP'92 minimum set
End of optional parameters	O	tandem	ISUP'92 minimum set
Network specific facility	O	discard	for national use only



---

<b>Parameter</b>	<b>Type</b>	<b>Action</b>	<b>Notes</b>
Signaling point code	O	discard	for national use only
Redirection number	O	discard	for national use only
Redirection information	O	discard	for national use only

**Reset circuit (RSC) message**

Message	sends	receives	processes	tandems
reset circuit	X	X	X	

**Table 184 RSC message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set

## Subsequent address message (SAM)

Message	sends	receives	processes	tandems
subsequent address message	X	X	X	

**Table 185 SAM message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set
Subsequent number	V	process	ISUP'92 minimum set
End of optional parameters	O	process	ISUP'92 minimum set

## Suspend (SUS) and Resume (RES) Messages

Message	sends	receives	processes	tandems
Suspend (SUS) and Resume (RES) messages	X	X	X	

**Table 186 SAM message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set
Suspend/Resume indicators	F	Tandem/ Discard <sup>a</sup>	ISUP'92 minimum set
End of optional parameters	O	process	ISUP'92 minimum set
Call reference	O	process	National Use only

a. If the Suspend/ Resume indicator (in the SUS/RES message) is set to network initiated and the message is received on the terminator after the ANM, the message is Tandemed. For all other cases it is Discarded.

## Unblock acknowledged (UBA) message

Message	sends	receives	processes	tandems
unblocking acknowledgement	X	X	X	

**Table 187 UBA message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set

**Unblock (UBL) message**

Message	sends	receives	processes	tandems
unblocking	X	X	X	

**Table 188 UBL message's parameters**

Parameter	Type	Action	Notes
Message type	F	process	ISUP'92 minimum set

**User-to-User Information (USR) message**

On an ISUP'92 Gateway IMT, the CS 2000 switch discards USR messages and sends a confusion message.





---

## Appendix I: CS 2000ISUP'92 Gateway and PRI interworking

---

This appendix describes the interworking between the ISUP'92 Gateway IMT and the PRI trunk agent. It contains two sections:

- “The ISUP'92 Gateway IMT's messages mapped to the PRI's messages”
- “The PRI's message mapped to the ISUP'92 Gateway IMT's messages”

The section “The ISUP'92 Gateway IMT's messages mapped to the PRI's messages” is divided into seven additional sub-sections:

- “Backward call indicator”
- “Calling party number parameter”
- “Cause indicator parameter”
- “Forward call indicator”
- “Bearer capability of a 56K datacall mapped to the user service information parameter”
- “Bearer capability of a 64K data call”
- “Voice calls (3.1 kHz audio calls or speech calls)”

The section “The PRI's message mapped to the ISUP'92 Gateway IMT's messages” is divided into six additional sub-sections:

- “Calling party number parameter”
- “Cause indicator”
- “Forward call indicator”
- “Bearer capability of a 56K datacall mapped to the user service information parameter”
- “Bearer capability of a 64K data call”
- “Voice calls (3.1 kHz audio calls or speech calls)”

### The ISUP'92 Gateway IMT's messages mapped to the PRI's messages

Four ISUP'92 Gateway IMT messages interwork to the PRI's messages:

- address complete message (ACM)
- answer message (ANM)
- initial address message (IAM)
- release message (REL)

Table 189, “The ISUP'92 Gateway IMT's messages mapped to the PRI's messages,” shows the mapping of the ISUP'92 Gateway IMT's messages to the PRI's messages.

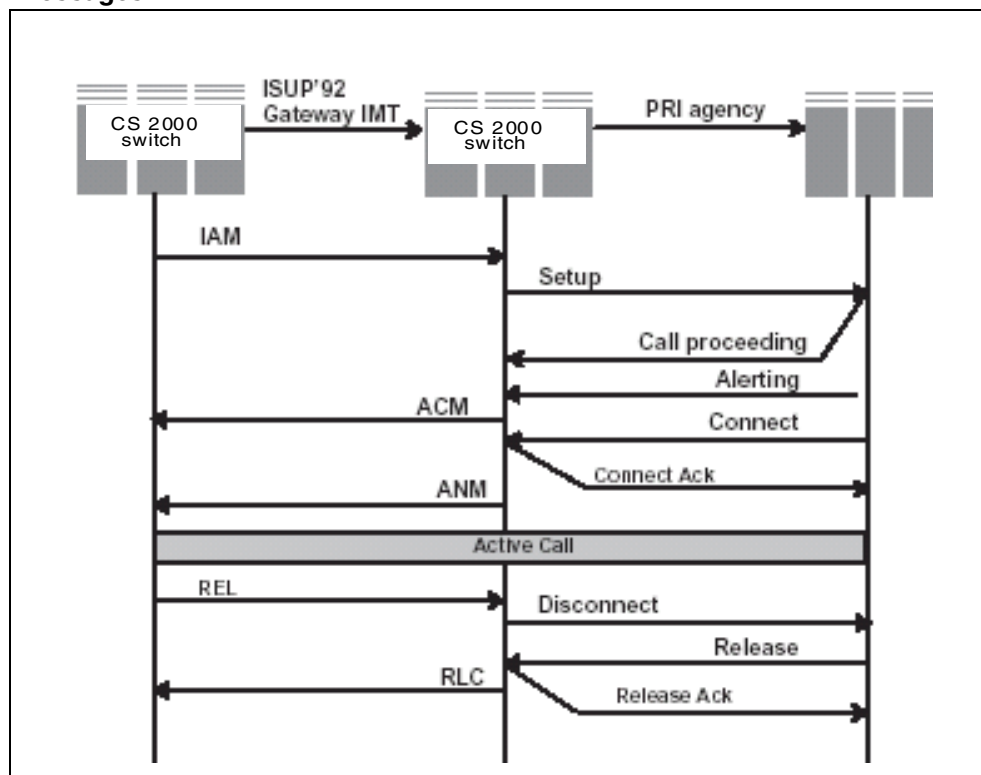
Tables 190 through 193 show the mapping of the ISUP'92 Gateway IMT's messages to the PRI's messages.

**Table 189 The ISUP'92 Gateway IMT's messages mapped to the PRI's messages**

these ISUP'92 Gateway IMT messages:	map to these PRI messages:
ACM	ALERT (if Backward Call Indicator bit is set to “no interworking encountered”)  PROGRESS (if Backward Call Indicator is set to “interworking encountered”)
ANM	CONNECT
IAM	SETUP
REL	DISCONNECT/RELEASE

See Figure 31, “The ISUP'92 Gateway IMT's messages interworked to the PRI's messages,” on page 275.

**Figure 31 The ISUP'92 Gateway IMT's messages interworked to the PRI's messages**



**Table 190 The ISUP'92 Gateway IMT's ACM message's parameter mapped to the PRI's ALERT or PROGRESS message's parameter**

this ISUP'92 Gateway IMT ACM parameter:	map to these PRI ALERT or PROGRESS parameter:
Backward call indicator (F)	no mapping
user to user information (O)	
<p><b>Note:</b> User to user information mapping only takes place during an ACM to ALERT message exchange because user to user information mapping is defined only for non-interworking scenarios.</p>	

**Table 191 The ISUP'92 Gateway IMT's ANM message's parameter mapped to the PRI's CONNECT messageS**

<b>this ISUP'92 Gateway IMT ANM parameter:</b>	<b>map to these PRI CONNECT parameter:</b>
user to user information (O)	user to user information

**Table 192 The ISUP'92 Gateway IMT's IAM message's parameter mapped to the PRI's SETUP message's parameter**

<b>this ISUP'92 Gateway IMT IAM parameter:</b>	<b>map to these PRI SETUP parameter:</b>
transmission medium requirement (V)	bearer capability
user service information (O)	bearer capability
called party number (V)	called party number
access transport (O)	access transport parameter contains one or more of: HLC, LLC, Called party subaddress, calling party subaddress, display, facility. These are inserted in the setup message in accordance with UCS PRI encoding rules.
calling party number (O)	calling party number
forward call indicator (F)	progress indicator
user to user information (O)	user to user information

**Table 193 The ISUP'92 Gateway IMT's IAM message's parameter mapped to the PRI's SETUP message's parameter**

<b>this ISUP'92 Gateway IMT IAM parameter:</b>	<b>map to these PRI SETUP parameter:</b>
cause indicator (V)	cause
<b>Note:</b> If the cause indicator parameter has a cause value other than CI_NORMAL_CLEARING or if the call goes to treatment then the tables TMT-MAP and CSEMAP are used and the mappings are done as per the datafill in these tables.	

## Backward call indicator

See Table 194, “The ISUP’92 Gateway IMT’s ACM message’s backward call indicator’s field mapped indicator’s field mapped to the PRI.”

**Table 194 The ISUP’92 Gateway IMT’s ACM message’s backward call indicator’s field mapped indicator’s field mapped to the PRI**

this ISUP’92 Gateway IMT BCI fields:	map to these PRI values:
Charge indicator	charge
Called party status indicator	subscriber free
called party category indicator	ordinary subscriber
end-to-end method indicator	no end-to-end method available
interworking indicator	<p>If the PRI agency sends an ALERTING message, the interworking indicator in the BCI is set to no interworking and the ISUP indicator is set to ISUP all the way.</p> <p>If a PROGRESS message comes from the PRI side, the Interworking indicator in the BCI is set to Interworking encountered and the ISUP indicator is set to Not ISUP all the way.</p>
End-to-end information indicator	no end-to-end information available
ISUP indicator	<p>If the PRI agency sends an ALERTING message, the interworking indicator in the BCI is set to no interworking and the ISUP indicator is set to ISUP all the way.</p> <p>If a PROGRESS message comes from the PRI side, the Interworking indicator in the BCI is set to Interworking encountered and the ISUP indicator is set to Not ISUP all the way.</p>
Reverse holding indicator	not required
ISDN access indicator	access ISDN

<b>this ISUP'92 Gateway IMT BCI fields:</b>	<b>map to these PRI values:</b>
echo control device indicator	echo control device not included
SCCP method indicator	connectionless and connection-oriented methods available

## Calling party number parameter

Table 195 shows the mapping of the ISUP'92 Gateway IMT's CPN parameter's octets to the PRI's CPN parameter's octets.

**Table 195 The ISUP'92 Gateway IMT's calling party number (CPN) parameter's octets mapped to the PRI's CPN parameter's octets**

these ISUP'92 Gateway IMT CPN parameter's octets:	map to these PRI CPN parameter's octets:
Nature of Address Indicator, Octet 1	Type of Address, Octet 3
0000100 International Number	001 International Number
Incomplete Indicator (NI), Octet 2	
0 Complete	Not mapped
1 Incomplete	CPN discarded
Numbering Plan Indicator, Octet 2	Numbering Plan Identification, Octet 3
001 ISDN/Telephony Numbering Plan	0001 ISDN/Telephony numbering plan
Address Presentation, Octet 2	Address Presentation, Octet 3a
00 Presentation allowed	00 Presentation allowed
01 Presentation restricted	01 Presentation restricted
others	01 Presentation restricted
Screening Indicator, Octet 2	Screening Indicator, Octet 3a
01 User provided, verified and passed	01 User provided, verified and passed
11 Network provided	11 Network provided

<b>these ISUP'92 Gateway IMT CPN parameter's octets:</b>	<b>map to these PRI CPN parameter's octets:</b>
Calling number digits	Calling number
others	00 User provided, not screened



## Cause indicator parameter

Table 196 shows the mapping of the ISUP'92 Gateway IMT's cause indicator's octets to the PRI's cause indicator's octets.

**Table 196 The ISUP'92 Gateway IMT's cause indicator's octets mapped to the PRI's cause indicator's octets**

these ISUP'92 Gateway IMT cause indicator's octets:	map to these PRI cause indicator's octets:
Location, Octet 1 0111 International Network	Location, Octet 3 based on the data in the Location field of table TRKSGRP
Coding Standard, Octet 1 00 CCITT Standard (default)	Coding Standard, Octet 3 00 CCITT Standard (default)
Diagnostics, Octet 3 - n not mapped	Diagnostics, Octet 5 - 5b, not mapped
<p><b>Note:</b> If the cause indicator parameter has a cause value other than CI_NORMAL_CLEARING or if the call goes to treatment, then the tables TMT-MAP (treatment to cause mapping) and CSEMAP (cause to treatment mapping) are used and the mappings are done as per the datafill in these tables.</p>	

### Forward call indicator

Table 197 shows the mapping of the ISUP'92 Gateway IMT's forward call indicator to the PRI's forward call indicator.

**Table 197 The ISUP'92 Gateway IMT's forward call indicator mapped to the PRI's progress indicators**

<b>this ISUP'92 Gateway IMT forward call indicator:</b>	<b>map to this PRI progress indicator:</b>
Interworking indicator	Progress description
Interworking encountered	call is not end to end ISDN
<b>Note:</b> If there is no Progress indicator then the Interworking indicator is set to No interworking encountered.	

Table 198, shows the default values for the FCI when the terminating trunk agent has the option ISDNXFER selected in table TRKGRP. When this option is selected the terminating trunk agent can tandem the ISDN optional parameters, which carry ISDN services.

Table 199, shows the default values for the FCI when the terminating trunk agent does not have the option ISDNXFER selected in table TRKGRP.

**Table 198 The default values of forward call indicator, when ISDNXFER option is selected, for interworking between the ISUP'92 Gateway IMT and the PRI**

<b>this forward call indicator:</b>	<b>has this default value:</b>
National/ international call indicator	depends on the call type
End to end method indicator	No end to end method available
Interworking indicator	No interworking encountered
End to end information indicator	No end to end information available
ISDN user part indicator	ISDN user part used all the way
ISDN user part preference indicator	ISDN user part preferred all the way
ISDN access indicator	Originating access ISDN
SCCP method indicator	No indication

**Table 199 The default values of forward call indicator, when ISDNXFER option is not selected, for interworking between the ISUP'92 Gateway IMT and the PRII**

<b>this forward call indicator:</b>	<b>has this default value:</b>
National/ international call indicator	depends on the call type
End to end method indicator	No end to end method available
Interworking indicator	Interworking encountered
End to end information indicator	No end to end information available
ISDN user part indicator	ISDN user part not used all the way
ISDN user part preference indicator	ISDN user part not required
ISDN access indicator	Originating access non ISDN
SCCP method indicator	No indication

**Bearer capability of a 56K datacall mapped to the user service information parameter**

The following mapping for bearer capability (BC) and user service information is based on different call scenarios. It is not mapped octet by octet, because the octet contents may affect the other octet's existence.

See Table 200, "The ISUP'92 Gateway IMT's TMR parameter's octet mapped to the PRI's bearer capability's octet," and Table 201, "The ISUP'92 Gateway IMT's USI parameter's octets mapped to the PRI's bearer capability's octets."

**Table 200 The ISUP'92 Gateway IMT's TMR parameter's octet mapped to the PRI's bearer capability's octet**

<b>this ISUP'92 Gateway IMT TMR parameter's octet:</b>	<b>maps to this PRI bearer capability's octet:</b>
00000010 unrestricted digital info	Information Transfer Capability: 010000 unrestricted digital info

**Table 201 The ISUP'92 Gateway IMT's USI parameter's octets mapped to the PRI's bearer capability's octets**

<b>this ISUP'92 Gateway IMT USI parameter's octet:</b>	<b>maps to this PRI bearer capability's octet:</b>
Octet 1, Coding Standard 00 CCITT	Octet 3, Coding Standard 00 CCITT
Octet 1 Information Transfer Capability 01000 unrestricted digital info	Octet 3, Information Transfer Capability 01000 unrestricted digital info
Octet 2, Transfer Mode 00 Circuit Mode	Octet 4, Transfer Mode 00 Circuit Mode
Octet 2, Information Transfer Rate 10000 64 kbits/s	Octet 4, Information Transfer Rate 10000 64 kbits/s
Octet 3, User Information layer 1 protocol 00001 Layer 1 Rate Adaption	Octet 5, Bearer Capability Multiplier 00001 CCITT Standardized rate adaption
Octet 3a, User Rate 01111 56 kbits/s	Octet 5a, Access Data Rate 01111 56 kbits/s
<b>Note:</b> For all calls, the CS 2000 switch performs BC screening to ensure that trunks send only supported BC values.	

### Bearer capability of a 64K data call

The following mapping for bearer capability (BC) and user service information is based on different call scenarios. It is not mapped octet by octet, because the octet contents may affect the other octet's existence.

See Table 202, "The ISUP'92 Gateway IMT's TMR parameter's octet mapped to the PRI's bearer capability's octet," and Table 203, "The ISUP'92 Gateway IMT's USI parameter's octets mapped to the PRI's bearer capability's octets."

**Table 202 The ISUP'92 Gateway IMT's TMR parameter's octet mapped to the PRI's bearer capability's octet**

<b>this ISUP'92 Gateway IMT TMR parameter's octet:</b>	<b>maps to this PRI bearer capability's octet:</b>
00000010 unrestricted digital info	Information Transfer Capability: 01000 unrestricted digital info

**Table 203 The ISUP'92 Gateway IMT's USI parameter's octets mapped to the PRI's bearer capability's octets**

<b>these ISUP'92 Gateway IMT USI parameter's octet:</b>	<b>maps to these PRI bearer capability's octet:</b>
Octet 1, Coding Standard 00 CCITT	Octet 3, Coding Standard 00 CCITT
Octet 1 Information Transfer Capability 01000 unrestricted digital info	Octet 3, Information Transfer Capability 01000 unrestricted digital info
Octet 2, Transfer Mode 00 Circuit Mode	Octet 4, Transfer Mode 00 Circuit Mode
Octet 2, Information Transfer Rate 10000 64 kbits/s	Octet 4, Information Transfer Rate 10000 64 kbits/s

### Voice calls (3.1 kHz audio calls or speech calls)

This section shows the mapping of the octets of the following parameters:

- transmission medium requirement (TMR) parameter
- user service information (USI) parameter

Table 204 and Table 205 show the mapping of the ISUP'92 Gateway IMT's TRM and USI parameters' octets to the PRI's bearer capability's octets.

**Table 204 The ISUP'92 Gateway IMT's TMR parameter's octet mapped to the PRI's bearer capability's octet**

<b>this ISUP'92 Gateway IMT TMR parameter's octet:</b>	<b>maps to this PRI bearer capability's octet:</b>
	Octet 3, Information Transfer Capability:
00000000 Speech	00000 Speech
00000011 3.1 kHz Audio	10000 3.1 kHz Audio

**Table 205 The ISUP'92 Gateway IMT's USI parameter's octets mapped to the PRI's bearer capability's octets**

<b>this ISUP'92 Gateway IMT USI parameter's octet:</b>	<b>maps to this PRI bearer capability's octet:</b>
Octet 1, Coding Standard 00 CCITT	Octet 3, Coding Standard 00 CCITT
Octet 1 Information Transfer Capability 00000 Speech  10000 3.1 kHz audio	Octet 3, Information Transfer Capability based on the TMR value
Octet 2, Transfer Mode 00 Circuit Mode	Octet 4, Transfer Mode 00 Circuit Mode
Octet 2, Information Transfer Rate 10000 64 kbits/s	Octet 4, Information Transfer Rate 10000 64 kbits/s
Octet 3, User information layer 1 protocol 00010 Recommendation G.711 A-law	Octet 5, User Information Layer 1 Protocol 00010 Recommendation G.711 Mu-law Speech



---

## The PRI's message mapped to the ISUP'92 Gateway IMT's messages

Eight PRI messages interwork to the ISUP'92 Gateway IMT's messages:

- alerting (ALERT)
- connect (CONN)
- disconnect (DISC)
- progress (PROG)
- release (REL)
- release complete (REL COM)
- restart (RESTART)
- setup (SETUP)

See Table 206, “The PRI's messages mapped to the ISUP'92 Gateway IMT's messages.”

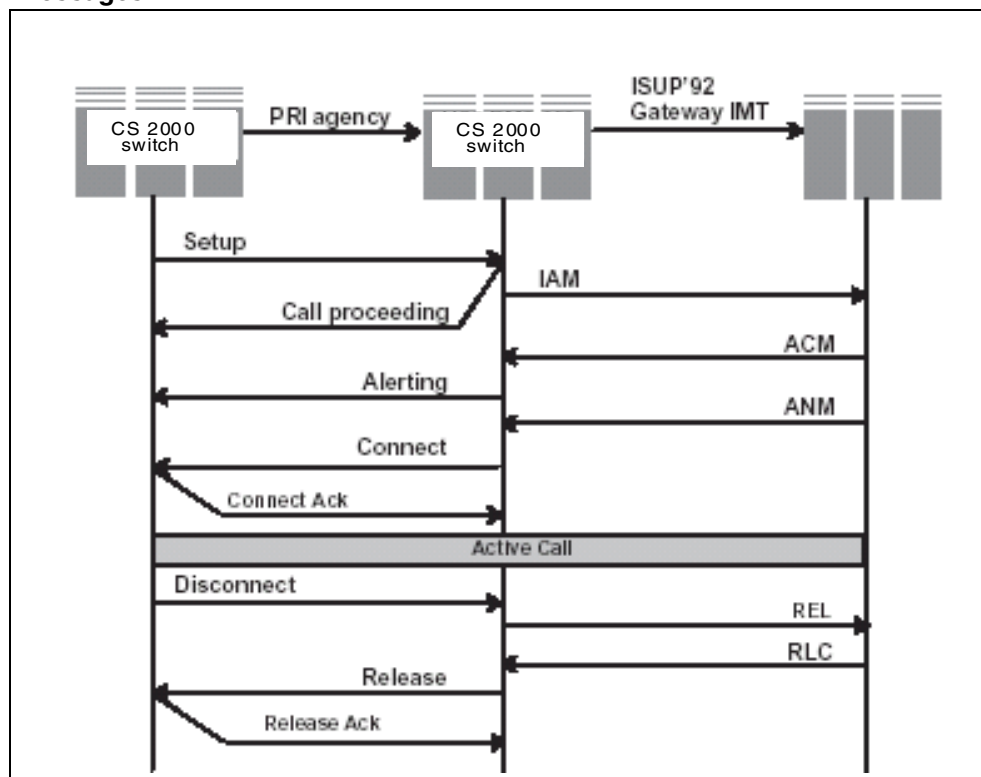
Tables 207 through 213 show the mapping of the PRI's messages to the ISUP'92 Gateway IMT's messages.

**Table 206 The PRI's messages mapped to the ISUP'92 Gateway IMT's messages**

these PRI messages:	map to these ISUP'92 Gateway IMT messages:
ALERTING	ACM
<i>Note:</i> If the ALERT message is received, the interworking indicator of BCI in the ACM is set to "no interworking encountered."	
CONNECT	CON (if ACM has not been sent) ANM (if ACM has been sent)
DISCONNECT	REL
PROGRESS	ACM
<i>Note:</i> If the PROGRESS message is received, the interworking indicator of BCI in the ACM is set to "interworking encountered."	
RELEASE	REL
RELEASE COMPLETE	REL
RESTART	REL
SETUP	IAM
<i>Note:</i> The table TRKGRP ISDNXFER option for the terminating ISUP agency controls the support of the ISDN services when the originating trunk agency is a PRI trunk. It is recommended to use this option when the entire call path is predetermined to be all the way ISDN user part (all the way ISDN and SS7). If the entire call path is not ISUP all the way, then this option need not be selected.	

Figure 32 "The PRI's messages interworking to the ISUP'92 Gateway IMT's messages" shows the signal flow for a call originating from a PRI agency and terminating on an ISUP'92 agency.

**Figure 32 The PRI's messages interworking to the ISUP'92 Gateway IMT's messages**



**Note:** When the originating trunk agency is a PRI agency and the terminating trunk agency is an ISUP'92 Gateway IMT trunk agency, the ISDNXFER option of table TRKGRP controls the support of ISDN services.

**Table 207 The PRI's ALERT message's parameters mapped to the ISUP'92 Gateway IMT's ACM message's parameters**

these PRI ALERT message's parameters:	map to these ISUP'92 Gateway IMT ACM message's parameters:
progress indicator (O)	no mapping
user to user information (O)	user to user information

**Note:** If an ALERT message is received, an ACM with BCI set to no interworking required and ISUP all the way is sent on the ISUP side.

**Table 208 The PRI's CONNECT message's parameter mapped to the ISUP'92 Gateway IMT's ANM or CON message's parameter**

<b>this PRI CONNECT message's parameters:</b>	<b>maps to this ISUP'92 Gateway IMT ANM or CON message's parameters:</b>
user to user information (O)	user to user information

**Table 209 The PRI's DISCONNECT message's parameters mapped to the ISUP'92 Gateway IMT's REL message's parameters**

<b>these PRI DISCONNECT message's parameters:</b>	<b>map to these ISUP'92 Gateway IMT REL message's parameters:</b>
cause (V)	cause indicator
<b>Note:</b> The cause parameter is mandatory in the first call clearing message.	
User to User information (O)	User to User information

**Table 210 The PRI's PROGRESS message's parameter mapped to the ISUP'92 Gateway IMT's ACM message's parameter**

<b>this PRI PROGRESS message's parameters:</b>	<b>maps to this ISUP'92 Gateway IMT ACM message's parameters:</b>
progress indicator (F)	no mapping
<b>Note:</b> If a PROGRESS message is received, an ACM with BCI set to interworking required and Not ISUP all the way is sent on the ISUP side.	

**Table 211 The PRI's RELEASE message's parameters mapped to the ISUP'92 Gateway IMT's REL message's parameters**

these PRI RELEASE parameters:	map to these ISUP'92 Gateway IMT REL parameters:
cause (O)	cause indicator
<b>Note:</b> The cause parameter is mandatory in the first call clearing message.	
user to user information (O)	user to user information
<b>Note:</b> If the cause indicator parameter has a cause value other than CI_NORMAL_CLEARING or if the call goes to treatment then the tables TMTMAP and CSEMAP are used and the mappings are done as per the datafill in these tables.	

**Table 212 The PRI's RELEASE COMPLETE message's parameters mapped to the ISUP'92 Gateway IMT's REL message's parameters**

these PRI RELEASE COMPLETE parameters:	map to these ISUP'92 Gateway IMT REL message's parameters:
cause (O)	cause indicator
<b>Note:</b> The cause parameter is mandatory in the first call clearing message.	
user to user information (O)	user to user information
<b>Note:</b> If the cause indicator parameter has a cause value other than CI_NORMAL_CLEARING or if the call goes to treatment then the tables TMTMAP and CSEMAP are used and the mappings are done as per the datafill in these tables.	

**Table 213 The PRI's SETUP message's parameter mapped to the ISUP'92 Gateway IMT's IAM message's parameters**

<b>these PRI SETUP message's parameters:</b>	<b>map to these ISUP'92 Gateway IMT IAM message's parameters:</b>
bearer capability (M)	user service info/ transmission medium requirement
called party number (M)	called party number
called party subaddress (O)	access transport
<b>Note:</b> The IAM message contains only one access transport parameter, which contains the UCS PRI IEs. The access transport parameter mapping depends on the data in table ISDNPARM.	
calling party number (O)	calling party number
calling party subaddress (O)	access transport
low layer compatibility (O)	access transport
high layer compatibility (O)	access transport
progress indicator (O)	forward call indicators
user to user information (O)	user to user information

## Calling party number parameter

Table 214 shows the mapping of the PRI calling party number (CPN) parameters' octets to the ISUP'92 Gateway IMT's octets.

**Table 214 The PRI's CPN parameter's octets mapped to the ISUP'92 Gateway IMT's CPN parameter's octets**

these PRI CPN parameter's octets:	map to these ISUP'92 Gateway IMT CPM parameter's octets:
Type of Address, Octet 3	Nature of Address, Octet 1
001 International Number	0000100 International Number
010 National Number	0000100 International Number
Numbering Plan Identification, Octet 3	Numbering Plan Indicator, Octet 2
0001 ISDN/Telephony numbering plan	001 ISDN/Telephony Numbering Plan
others	001 ISDN/Telephony Numbering Plan
Presentation Indicator, Octet 3a	Address Presentation, Octet 2
00 Presentation allowed	00 Presentation allowed
01 Presentation restricted	01 Presentation restricted
10 Number not available due to interworking	00 Presentation allowed
Screening Indicator, Octet 3a	Screening Indicator, Octet 2
11 network provided	11 network passed
Calling number digits	
<p><b>Note:</b> When the originating trunk agency is a PRI agency and the terminating trunk agency is an ISUP'92 Gateway IMT, the ISDNXFER option of table TRKGRP is required for the delivery of the CPN; otherwise, the CPN parameter is not send in the outgoing IAM.</p>	

these PRI CPN parameter's octets:	map to these ISUP'92 Gateway IMT CPM parameter's octets:
others	CPN discarded
<b>Note:</b> If the CPN is received with screening indicator as User provided, not screened (00); user provided, verified and passed (01); or user provided, verified and failed (10), then the CPN is not mapped.	
<b>Note:</b> When the originating trunk agency is a PRI agency and the terminating trunk agency is an ISUP'92 Gateway IMT, the ISDNXFER option of table TRKGRP is required for the delivery of the CPN; otherwise, the CPN parameter is not send in the outgoing IAM.	



## Cause indicator

Table 215 shows the mapping of these PRI's cause indicator's octets to the ISUP'92 Gateway IMT's octets.

**Table 215 The PRI's cause indicator's octets mapped to the ISUP'92 Gateway IMT's cause indicator's octets**

these PRI cause indicator's octets:	map to these ISUP'92 Gateway IMT cause indicator's octets:
Location, Octet 1	Location, Octet 3
0000 User	0111 International Network
0001 Local Private Network	
0010 Local Network	
0011 Transit Network (default)	
0100 Public Network serving the remote user	
0101 Private Network serving the remote user	
0111 International Network	
Coding Standard, Octet 1	Coding Standard, Octet 3
00 CCITT Standard (default)	00 CCITT Standard (default)
10 National Standard	
Diagnostics, Octet 3-n not mapped	Diagnostics, Octet 5-5b not mapped

### Forward call indicator

Table 216 shows the mapping of the PRI progress indicator to the ISUP'92 Gateway IMT's forward call indicator.

**Table 216 The ISUP'92 Gateway IMT's forward call indicator mapped to the PRI's progress indicator**

these PRI progress indicator:	map to these ISUP'92 Gateway IMT forward call indicator:
Progress description	Interworking indicator
call is not end to end ISDN	Interworking encountered
<b>Note:</b> If there is no Progress indicator then the Interworking indicator is set to No interworking encountered.	

Table 217, "The default values of forward call indicator, when ISDNXFER option is selected, for interworking between the ISUP'92 Gateway IMT and the PRI," shows the default values for the FCI when the terminating trunk agent has the option ISDNXFER selected in table TRKGRP. When this option is selected the terminating trunk agent can tandem the ISDN optional parameters, which carry ISDN services.

Table 218, "The default values of forward call indicator, when ISDNXFER option is not selected, for interworking between the ISUP'92 Gateway IMT and the PRI," shows the default values for the FCI when the terminating trunk agent does not have the option ISDNXFER selected in table TRKGRP.

**Table 217 The default values of forward call indicator, when ISDNXFER option is selected, for interworking between the ISUP'92 Gateway IMT and the PRI**

<b>this forward indicator:</b>	<b>has this default value:</b>
National/ international call indicator	depends on the call type
End to end method indicator	No end to end method available
Interworking indicator	No interworking encountered
End to end information indicator	No end to end information available
ISDN user part indicator	ISDN user part used all the way
ISDN user part preference indicator	ISDN user part preferred all the way
ISDN access indicator	Originating access ISDN
SCCP method indicator	No indication

**Note:** When the originating trunk agent is a PRI trunk agent, the ISDNXFER option in table TRKGRP is required to be present for the support of ISDN services. Otherwise, the PRA-ISUP call supports only the mandatory parameters and the forward call indicator's default values are as shown in Table 218.

**Table 218 The default values of forward call indicator, when ISDNXFER option is not selected, for interworking between the ISUP'92 Gateway IMT and the PRI**

<b>this forward indicator:</b>	<b>has this default value:</b>
National/ international call indicator	depends on the call type
End to end method indicator	No end to end method available
Interworking indicator	Interworking encountered
End to end information indicator	No end to end information available
ISDN user part indicator	ISDN user part not used all the way
ISDN user part preference indicator	ISDN user part not required
ISDN access indicator	Originating access non ISDN
SCCP method indicator	No indication

## Bearer capability of a 56K datacall mapped to the user service information parameter

The following mapping for bearer capability (BC) and user service information is based on different call scenarios. It is not mapped octet by octet, because the octet contents may affect the other octet's existence.

See Table 219, "The PRI's bearer capability octets mapped to the ISUP'92 Gateway IMT's TMR parameter's octets," and Table 220, "The PRI's bearer capability's octets mapped to the ISUP'92 Gateway IMT's USI parameter's octets."

**Table 219 The PRI's bearer capability octets mapped to the ISUP'92 Gateway IMT's TMR parameter's octets**

these PRI bearer capability's octets:	map to these ISUP'92 Gateway IMT TMR parameter's octets:
Information Transfer Capability:	
010000 unrestricted digital info	00000010 unrestricted digital info
01001 restricted digital info	00000010 unrestricted digital info

**Table 220 The PRI's bearer capability's octets mapped to the ISUP'92 Gateway IMT's USI parameter's octets**

these PRI bearer capability's octets:	map to these ISUP'92 Gateway IMT USI parameter's octets:
Octet 3, Coding Standard 00 CCITT	Octet 1, Coding Standard 00 CCITT
Octet 3, Information Transfer Capability 01000 unrestricted digital info	Octet 1 Information Transfer Capability 01000 unrestricted digital info
Octet 4, Transfer Mode 00 Circuit Mode	Octet 2, Transfer Mode 00 Circuit Mode
Octet 4, Information Transfer Rate 10000 64 kbits/s	Octet 2, Information Transfer Rate 10000 64 kbits/s

<b>these PRI bearer capability's octets:</b>	<b>map to these ISUP'92 Gateway IMT USI parameter's octets:</b>
Octet 5, Bearer Capability Multiplier 00001 CCITT Standardized rate adaption	Octet 3, User Information layer 1 protocol 00001 Layer 1 Rate Adaption
Octet 5a, Access Data Rate 01111 56 kbits/s	Octet 3a, User Rate 01111 56 kbits/s

## Bearer capability of a 64K data call

The following mapping for bearer capability (BC) and user service information is based on different call scenarios. It is not mapped octet by octet, because the octet contents may affect the other octet's existence.

See Table 221, "The PRI's bearer capability's octet mapped to the ISUP'92 Gateway IMT's TMR parameter's octet," and Table 222, "The PRI bearer capability's octets mapped to the ISUP'92 Gateway IMT's USI parameter's octets."

**Table 221 The PRI's bearer capability's octet mapped to the ISUP'92 Gateway IMT's TMR parameter's octet**

<b>this PRI bearer capability's octet:</b>	<b>maps to this ISUP'92 Gateway IMT TMR parameter's octet</b>
Octet 3, Information Transfer Capability: 01000 unrestricted digital info	00000010 unrestricted digital info

**Table 222 The PRI bearer capability's octets mapped to the ISUP'92 Gateway IMT's USI parameter's octets**

<b>these PRI bearer capability's octet:</b>	<b>maps to these ISUP'92 Gateway IMT USI parameter's octet</b>
Octet 3, Coding Standard 00 CCITT	Octet 1, Coding Standard 00 CCITT
Octet 3, Information Transfer Capability 01000 unrestricted digital info	Octet 1 Information Transfer Capability 01000 unrestricted digital info
Octet 4, Transfer Mode 00 Circuit Mode	Octet 2, Transfer Mode 00 Circuit Mode
Octet 4, Information Transfer Rate 10000 64 kbits/s	Octet 2, Information Transfer Rate 10000 64 kbits/s

**Voice calls (3.1 kHz audio calls or speech calls)**

This section shows the mapping of the octets of the following parameters:

- transmission medium requirement (TMR) parameter
- user service information (USI) parameter

Tables 223 and 224 show the mapping of the PRI TMR and USI parameters' octets to the ISUP'92 Gateway IMT's octets.

**Table 223 The PRI bearer capability's octet mapped to the ISUP'92 Gateway IMT's TMR parameter's octet**

these PRI bearer capability's octets:	map to these ISUP'92 Gateway IMT TMR parameter's octets:
Octet 3, Information Transfer Capability: 00000 Speech	00000000 Speech
10000 3.1 kHz Audio	00000011 3.1 kHz Audio

**Table 224 The PRI bearer capability's octets mapped to the ISUP'92 Gateway IMT's USI parameter's octets**

these PRI bearer capability's octets:	map to these ISUP'92 Gateway IMT USI parameter's octets:
Octet 3, Coding Standard 00 CCITT	Octet 1, Coding Standard 00 CCITT
Octet 3, Information Transfer Capability 00000 Speech	Octet 1 Information Transfer Capability 00000 Speech
10000 3.1 kHz Audio	10000 3.1 kHz Audio
Octet 4, Transfer Mode 00 Circuit Mode	Octet 2, Transfer Mode 00 Circuit Mode



---

<b>these PRI bearer capability's octets:</b>	<b>map to these ISUP'92 Gateway IMT USI parameter's octets:</b>
Octet 4, Information Transfer Rate 10000 64 kbits/s	Octet 2, Information Transfer Rate 10000 64 kbits/s
Octet 5, User Information Layer 1 Protocol 00010 Recommendation G.711 Mu-law Speech	Octet 3, User Information Layer 1 Protocol 00010 Recommendation G.711 A-law



---

## Appendix J: ISUP'92 Gateway and PTS signaling protocol interworking

---

This appendix describes the interworking between the ISUP'92 Gateway IMT and the PTS signaling protocol. It contains two sections:

- “ISUP'92 Gateway IMT's messages interworked to the PTS signaling protocol's messages”
- “The PTS signaling protocol mapped to the ISUP'92 Gateway IMT's messages”

The PTS agencies that can interwork with the ISUP'92 Gateway IMT are

- PTS FGD
- FGB
- DAL-TIE

When this appendix refers to the PTS signaling protocol, you can assume it is referring to the three supported trunk agencies with that signaling protocol.

### **ISUP'92 Gateway IMT's messages interworked to the PTS signaling protocol's messages**

The following ISUP'92 messages are interworked to PTS signaling protocol:

- address complete message (ACM)
- answer message (ANM)
- initial address message (IAM)
- release message (REL)
- subsequent address message (SAM)

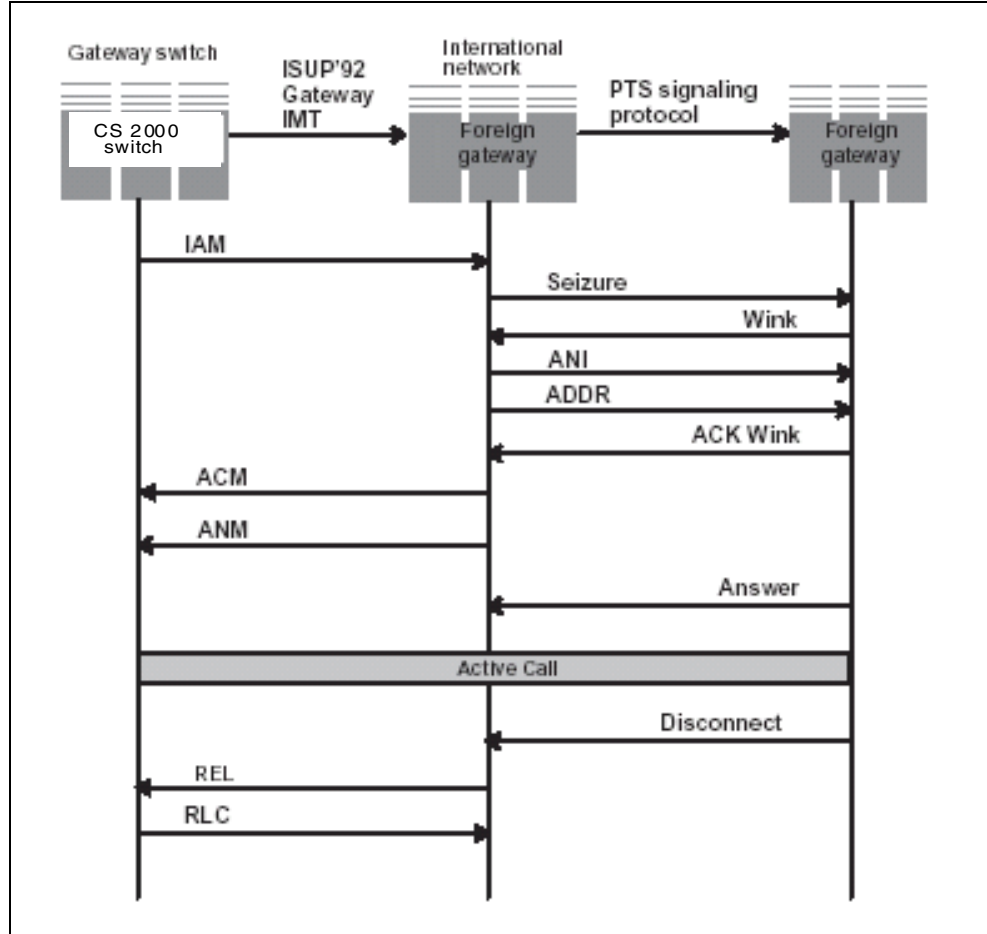
Table 225, “The ISUP'92 Gateway IMT's messages mapped to the PTS signaling protocol,” shows the mapping of the ISUP'92 Gateway IMT's messages to the PTS signaling protocol.

**Table 225 The ISUP'92 Gateway IMT's messages mapped to the PTS signaling protocol**

<b>when the ISUP'92 Gateway IMT sends these messages:</b>	<b>the PTS signaling protocol responds with these messages:</b>
ACM	overlap sending
ANM	receives answer message
IAM	sends a seized message and, after it receives all the address digits, then receives a wink
REL	receives on-hook message
SAM	overlap sending

Figure 33 shows the flow of messages from the ISUP'92 Gateway IMT to the FGB/PTS FGD trunk agencies. Figure 34 shows the flow of messages from the ISUP'92 Gateway IMT to the DAL-TIE trunk agent.

**Figure 33 The ISUP'92 Gateway IMT's messages interworking to the PTS signaling protocol**



**Figure 34 The ISUP'92 Gateway IMT's messages interworking to the DAL-TIE signaling protocol**

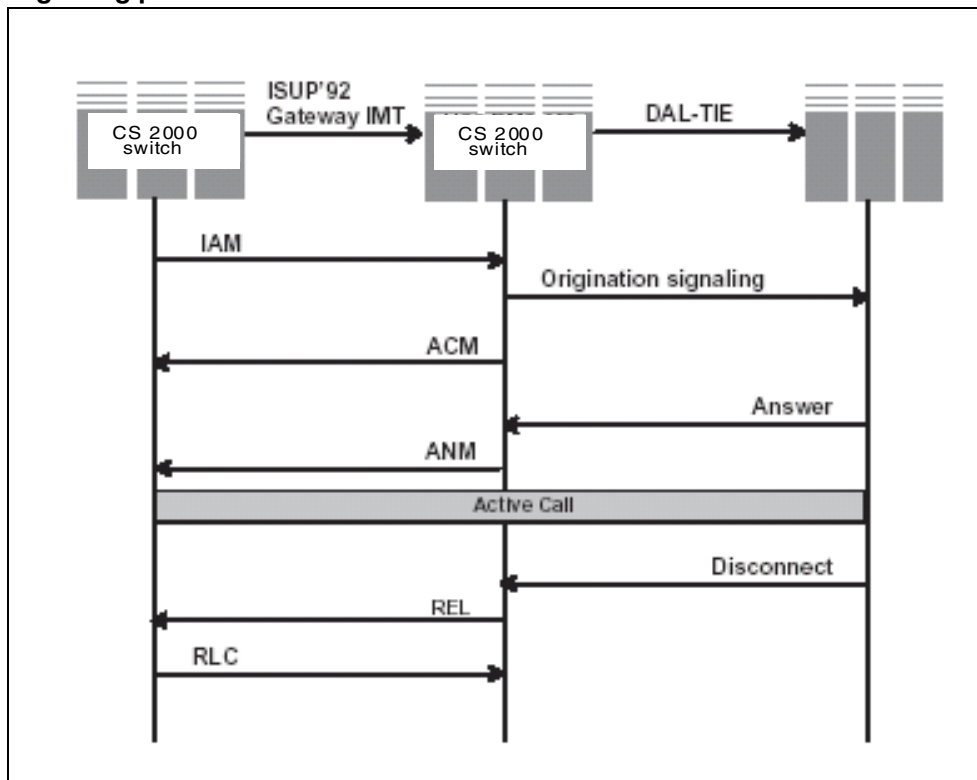


Table 226, “The ISUP'92 Gateway IMT's ACM message's backward call indicator's field mapped to the PTS signaling protocol,” gives the default values of the backward call indicator (BCI) in the ACM for the ISUP'92 Gateway IMT interworked to the PTS signaling protocol.

**Table 226 The ISUP'92 Gateway IMT's ACM message's backward call indicator's field mapped to the PTS signaling protocol**

<b>these ISUP'92 Gateway IMT BCI fields:</b>	<b>map to these PTS signaling protocol values:</b>
charge indicator	10 "Charge"
called party's status	no indication (00)
called party's category	no indication (00)
End-End_Method indicator	no end-end method available (00)
interworking indicator	interworking encountered (1)
end-end information indicator	no end to end information available (0)
ISUP indicator	ISUP not used all the way (0)
holding indicator	holding not requested (0)
ISDN access indicator	terminating access non ISDN (0)
echo control device indicator	incoming half echo control device not included (0)
SCCP method indicator	No SCCP indication (00)

### **The PTS signaling protocol mapped to the ISUP'92 Gateway IMT's messages**

When the ISUP'92 Gateway IMT receives origination signaling from the PTS signaling protocol, it places specific values from the PTS signaling protocol into fields of the following parameters:

- called party number (CPN)
- calling party category (CPC)
- forward call indicator (FCI)
- nature of connection (NOC)
- transmission medium requirement (TMR)
- user service information (USI)

Tables 227 through 232 show the mapping of the PTS signaling protocol's origination signaling to the ISUP'92 Gateway IMT's messages' parameters.

Figure 35, "FGB/PTS FGD interworking to the ISUP'92 Gateway IMT's messages," shows the flow of messages from the FGB/PTS FGD trunk agencies to the ISUP'92 Gateway IMT. Figure 36, "The DAL-TIE signaling protocol interworking to the ISUP'92 Gateway IMT's messages," shows the flow of messages from the DAL-TIE trunk agent to the ISUP'92 Gateway IMT.



**Figure 35 FGB/PTS FGD interworking to the ISUP'92 Gateway IMT's messages**

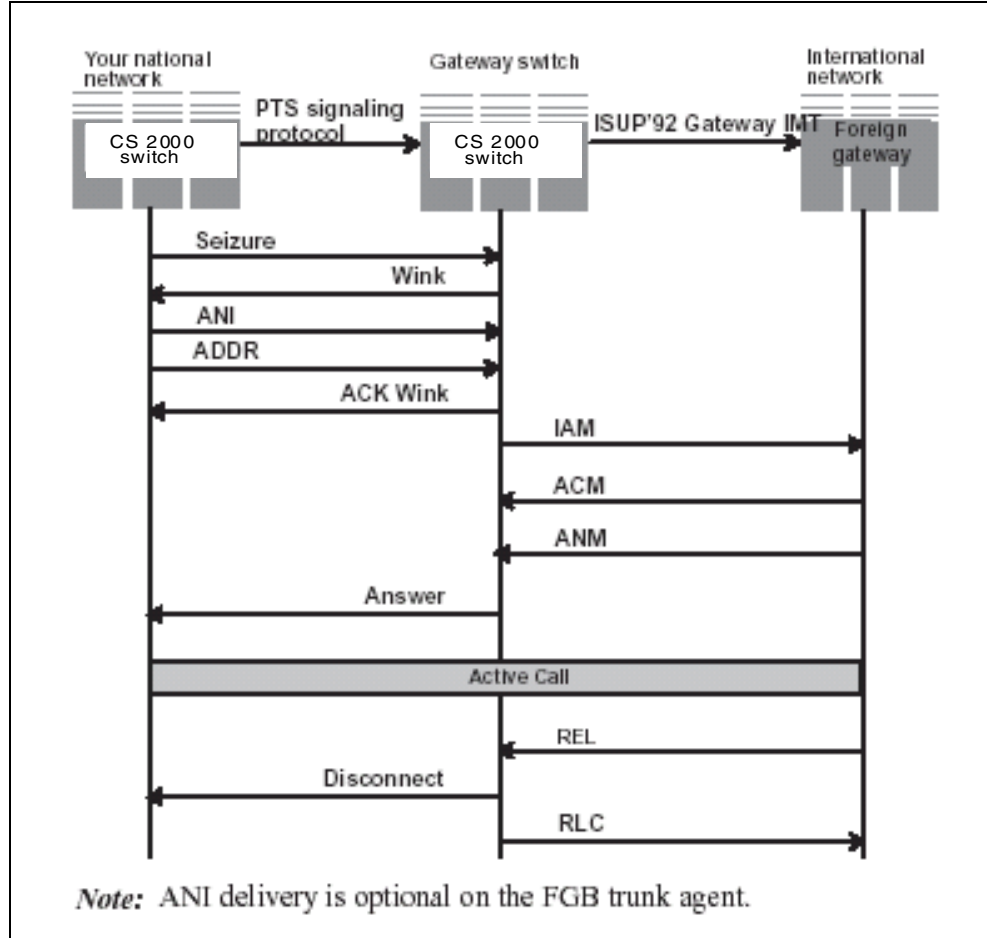
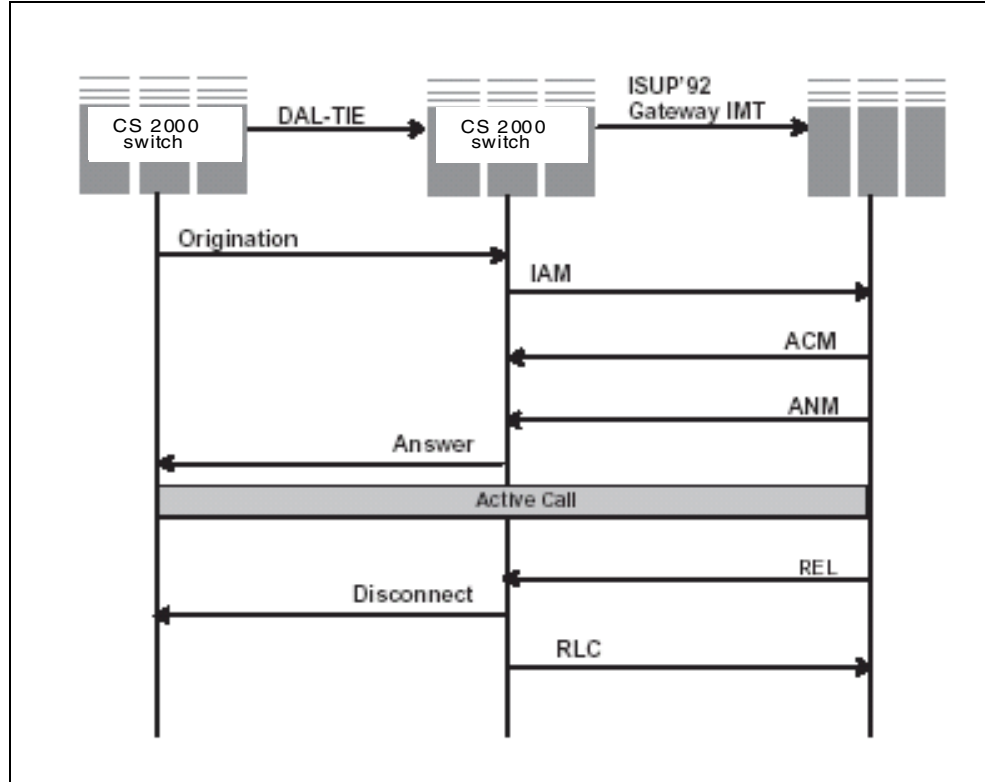


Figure 36 The DAL-TIE signaling protocol interworking to the ISUP'92 Gateway IMT's messages



**Table 227 The PTS signaling protocol's origination signaling mapped to the ISUP'92 Gateway IMT's called party number parameter**

these PTS signaling protocol's values:	map to these ISUP'92 Gateway IMT's called party number parameter's fields:
national number (0000011)	nature of address
<p><b>Note:</b> The value of this parameter depends on the translation system used in the call.</p>	
ISDN (telephony) Numbering Plan (Recommendation E.164) (001)	numbering plan indicator
odd (1) – if odd number of digits in the called party, even (0) - if even number of digits in called party	odd/even indicator

**Table 228 The PTS signaling protocol's origination signaling mapped to the ISUP'92 Gateway IMT's calling party category parameter**

this PTS signaling protocol's values:	map to this ISUP'92 Gateway IMT's calling party number parameter's fields:
ordinary subscriber (00001010)	calling party category

**Table 229 The PTS signaling protocol's origination signaling mapped to the ISUP'92 Gateway IMT's forward call indicator parameter**

<b>these PTS signaling protocol's values:</b>	<b>map to these ISUP'92 Gateway IMT's forward call indicator parameter's fields:</b>
call to be treated as national (0)	national/international call indicator
no end-to-end method available (00)	end-to-end method indicator
interworking encountered (1)	interworking indicator
no end to end information available (0)	end to end information indicator
ISDN User Part not used all the way (0)	ISDN User Part indicator
ISDN User Part not required all the way (01)	ISDN User Part Preference Indicator
Originating access non-ISDN (0)	ISDN access indicator
Number_Not_Translated	Trans_called_Num_Ind
No_routing_attempt (0000000)	Routing_attempt_Ind

**Table 230 The PTS signaling protocol's origination signaling mapped to the ISUP'92 Gateway IMT's nature of connection indicator parameter**

these PTS signaling protocol's values:	map to these ISUP'92 nature of connection parameter's fields:
value depends on the data in the SAT field of table TRKSGRP	satellite indicator
value depends on the data in the CONTCHK field of table TRKSGRP	continuity check indicator
datafill dependent	echo control device indicator

**Table 231 The PTS signaling protocol's origination signaling mapped to the ISUP'92 Gateway IMT's nature of connection indicator parameter**

this PTS signaling protocol's values:	map to this ISUP'92 Gateway IMT's transmission medium requirement parameter's fields:
3.1 KHz audio (00000011)	transmission medium requirement
<b>Note:</b> This field's value depends on the value in the BCNAME field of table TRKGRP.	

**Table 232 The PTS signaling protocol's origination signaling mapped to the ISUP'92 Gateway IMT's user service information parameter**

<b>these PTS signaling protocol's values:</b>	<b>map to these ISUP'92 Gateway IMT's user service information parameter's fields:</b>
CCITT (00)	coding standards
64_KBits/s (10000)	information transfer rate
circuit mode (00)	information transfer mode
3.1 Khz audio (10000)	information transfer capability
Layer1_G711_ALaw (00011)	layer 1 identification
User rate nil (00000)	User rate
synchrone (0)	synchronization
Negot_not_inband (0)	negotiation

---

## Appendix K: ISUP'92 Gateway and UCP ISUP signaling protocol interworking

---

This appendix describes the interworking between the ISUP'92 Gateway IMT and the UCP ISUP signaling protocol. It contains two sections:

- “The ISUP'92 Gateway IMT's messages mapped to the UCP ISUP signaling protocol's messages”
- “UCP ISUP signaling protocol's messages mapped to the ISUP'92 Gateway IMT's messages”

These sections are divided according to the messages they describe. The UCP ISUP signaling protocol is used on three trunk agencies that interwork with the ISUP'92 Gateway IMT:

- the SS7 FGD (UCP)
- the UCP (inter) IMT
- the UCP (intra) IMT

When this appendix refers to the UCP ISUP signaling protocol, you can assume it is referring to the three supported trunk agencies with that signaling protocol.

### The ISUP'92 Gateway IMT's messages mapped to the UCP ISUP signaling protocol's messages

The CS 2000 switch interworks the following ISUP'92 Gateway IMT messages to UCP ISUP messages:

- address complete message (ACM)
- answer message (ANM)
- call progress (CPG) message
- connect (CON) message
- continuity (COT) message
- forward transfer (FOT) message
- initial address message (IAM)
- release (REL) message
- suspend/resume (SUS/RES) message

Figure 37, "ISUP'92 Gateway IMT messages interworking to the UCP ISUP signaling protocol messages," shows how the CS 2000 switch interworks the ISUP'92 messages to the UCP ISUP messages.

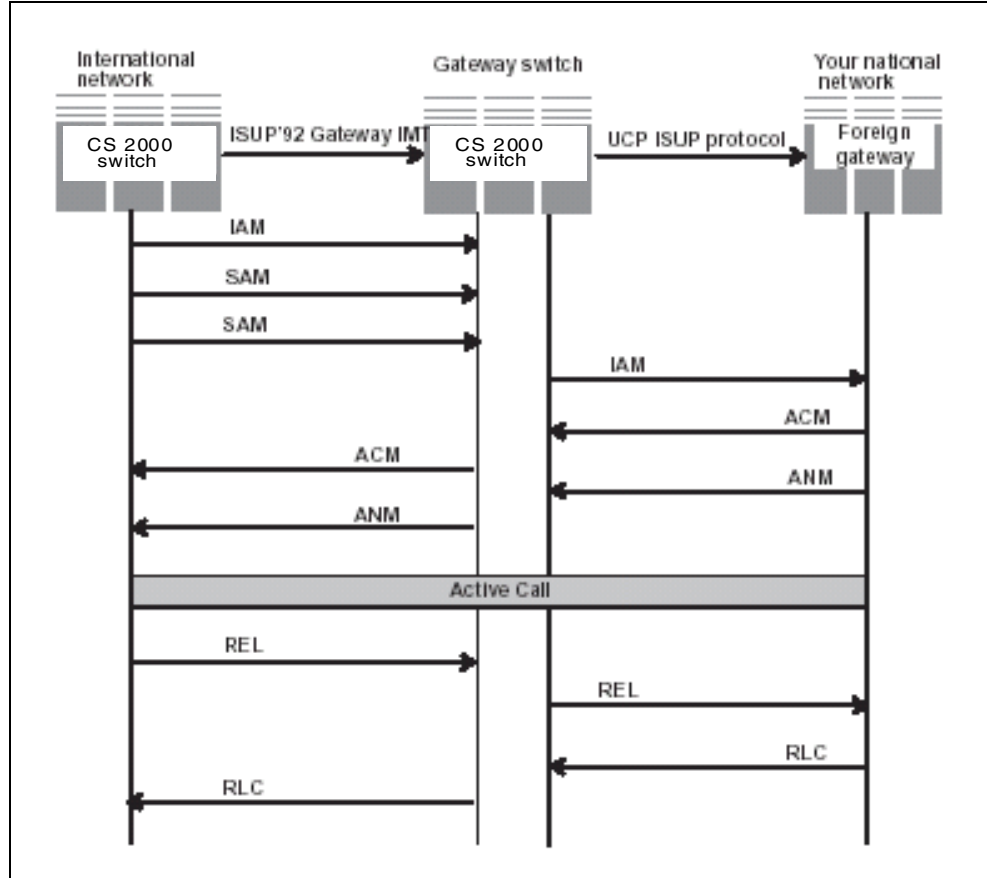
The CS 2000 switch receives the address in en bloc format over the ISUP'92 Gateway IMT. It can receive overlap sending. Overlap sending allows the CS 2000 switch to receive subsequent address messages (SAMs) until it has received the complete address.

The UCP ISUP signaling protocol only supports the address in en bloc format. It receives the SAM messages, then sends the complete address in the IAM.

**Note:** For more information on overlap sending, see Appendix A: "Gateway IMT features."



**Figure 37 ISUP'92 Gateway IMT messages interworking to the UCP ISUP signaling protocol messages**



**ACM parameters mapped from ISUP'92 Gateway IMT to UCP ISUP**

Table 233, "CS 2000 switch actions on ACM parameters," shows whether the CS 2000 switch tandems, processes, or discards the ISUP'92 Gateway IMT's ACM's parameters to interwork with the UCP ISUP signaling protocol.

**Table 233 CS 2000 switch actions on ACM parameters**

<b>on these ISUP'92 Gateway IMT ACM parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
backward call indicators (F)	process
access transport (O)	tandem
access delivery information (O)	tandem
call diversion information (O)	tandem
cause indicators (O)	tandem
echo control information (O)	tandem
generic notification indicator (O)	tandem
optional backward call indicators (O)	tandem
parameter compatibility information (O)	tandem
redirection number (O)	tandem
redirection number restriction (O)	tandem
transmission medium used (O)	tandem
user-to-user indicators (O)	tandem
user-to-user information (O)	tandem
end of optional parameters (O)	tandem

Table 234, “CS 2000 switch actions on ACM parameters,” shows whether the CS 2000 switch tandems, processes, or discards the parameters in the ACM message under the following conditions:

- the ISUP’92 Gateway IMT is the originating trunk agency
- the UCP ISUP protocol is used by the terminating trunk agency
- the SOC NSER0003 is active
- the ACTIVATE\_INTER\_INTRA\_UNANS\_CALL office parameter in table OFCVAR is set to Y

**Table 234 CS 2000 switch actions on ACM parameters**

<b>on these ISUP'92 Gateway IMT ACM parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
backward call indicators (F)	process
access transport (O)	tandem
access delivery information (O)	tandem
call diversion information (O)	tandem
cause indicators (O)	tandem
echo control information (O)	tandem
generic notification indicator (O)	tandem
optional forward call indicators (O)	tandem
user service information (O)	process
user-to-user information (O)	tandem
original called number (O)	tandem
redirecting number (O)	tandem
redirection information (O)	tandem
user-to-user indicators (O)	tandem
user-to-user information (O)	tandem
end of optional parameters (O)	tandem

## ANM parameters mapped from ISUP'92 Gateway IMT to UCP ISUP

Table 235, “CS 2000 switch actions on ANM parameters,” shows whether the CS 2000 switch tandems, processes, or discards ANM parameters when the originating trunk agency is an ISUP'92 Gateway IMT and the terminating trunk agency uses the UCP ISUP signaling protocol.

**Table 235 CS 2000 switch actions on ANM parameters**

<b>on these ISUP'92 Gateway IMT ANM parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
access delivery information (O)	discard
access transport (O)	tandem
backward call indicators (F)	tandem
call history information (O)	discard
connected number (O)	tandem
echo control information (O)	discard
generic notification indicator (O)	discard
generic address (O)	discard
optional backward call indicators (O)	discard
parameter compatibility information (O)	discard
redirection number (O)	tandem
redirection number restriction (O)	tandem
transmission medium used (O)	discard
user-to-user indicators (O)	tandem

<b>on these ISUP'92 Gateway IMT</b>	<b>the CS 2000 switch performs these actions:</b>
<b>ANM parameters:</b>	
user-to-user information (O)	tandem
end of optional parameters (O)	tandem

## CPG parameters mapped from ISUP'92 Gateway IMT to UCP ISUP

Table 236, “CS 2000 switch actions on CPG parameters,” shows whether the CS 2000 switch tandems, processes, or discards CPG parameters when the originating trunk agency is an ISUP'92 Gateway IMT and the terminating trunk agency uses the UCP ISUP signaling protocol.

**Table 236 CS 2000 switch actions on CPG parameters**

<b>on these ISUP'92 Gateway IMT CPG parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
event information (F)	tandem
access delivery information (O)	tandem
access transport (O)	tandem
backward call indicators (F)	tandem
call diversion information (O)	tandem
cause indicators (O)	tandem
generic notification indicator (O)	tandem
optional backward call indicators (O)	tandem
parameter compatibility information (O)	tandem
redirection number (O)	tandem
redirection number restriction (O)	tandem
transmission medium used (O)	tandem
user-to-user indicators (O)	tandem

<b>on these ISUP'92 Gateway IMT CPG parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
user-to-user information (O)	tandem
end of optional parameters (O)	tandem



## CON parameters mapped from ISUP'92 Gateway IMT to UCP ISUP

The UCP ISUP signaling protocol does not support the CON message. Table 237, "CS 2000 switch actions on CON parameters," shows whether the CS 2000 switch tandem, maps, or discards CON parameters while sending an ANM when the originating trunk agency is an ISUP'92 Gateway IMT and the terminating trunk agency uses the UCP ISUP signaling protocol.

**Table 237 CS 2000 switch actions on CON parameters**

<b>on these ISUP'92 Gateway IMT CON parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	mapped
backward call indicators (F)	tandem
access delivery information (O)	discard
access transport (O)	tandem
call history information (O)	discard
connected number (O)	tandem
echo control information (O)	discard
generic notification indicator (O)	discard
generic address (O)	discard
optional backward call indicators (O)	discard
parameter compatibility information (O)	discard
redirection number (O)	tandem
redirection number restriction (O)	tandem
transmission medium used (O)	discard

<b>on these ISUP'92 Gateway IMT CON parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
user-to-user indicators (O)	tandem
end of optional parameters (O)	tandem

## COT parameters mapped from ISUP'92 Gateway IMT to UCP ISUP

Table 238, “CS 2000 switch actions on COT parameters,” shows whether the CS 2000 switch tandems, processes, or discards COT parameters when the originating trunk agency is an ISUP'92 Gateway IMT and the terminating trunk agency uses the UCP ISUP signaling protocol.

**Table 238 CS 2000 switch actions on COT parameters**

<b>on these ISUP'92 Gateway IMT COT parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
continuity indicators (F)	tandem

**FOT parameters mapped from ISUP'92 Gateway IMT to UCP ISUP**

Table 239, “CS 2000 switch actions on FOT parameters,” shows whether the CS 2000 switch tandems, processes, or discards FOT parameters when the originating trunk agency is an ISUP'92 Gateway IMT and the terminating trunk agency uses the UCP ISUP signaling protocol.

**Table 239 CS 2000 switch actions on FOT parameters**

<b>on these ISUP'92 Gateway IMT FOT parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
end of optional parameters (O)	tandem

## IAM parameters mapped from ISUP'92 Gateway IMT to UCP ISUP

Table 240, “The ISUP'92 Gateway IMT's IAM message's parameters mapped to the UCP ISUP signaling protocol's IAM message's parameters,” show the mapping of the IAM's parameters from the ISUP'92 Gateway IMT to the UCP ISUP signaling protocol. Table 242, “CS 2000 switch actions on IAM parameters,” shows whether the CS 2000 switch tandems, processes, maps, or discards IAM parameters when the originating trunk agency is an ISUP'92 Gateway IMT and the terminating trunk agency uses the UCP ISUP signaling protocol.

**Table 240 The ISUP'92 Gateway IMT's IAM message's parameters mapped to the UCP ISUP signaling protocol's IAM message's parameters**

these ISUP'92 Gateway IMT IAM parameters:	map to these UCP ISUP IAM parameters:
nature of connection indicator (F)	nature of connection indicator (F)
forward call indicator (F)	forward call indicator (F)
calling party category (F)	calling party category (F)
transmission medium requirement (F)	user service information (V)
<p><b>Note:</b> If the ISUP'92 receives user service information (USI) parameter, it sends the USI parameter to the UCP ISUP. The UCP ISUP encodes its IAM message based on this USI parameter. If the ISUP'92 does not receive a USI, it sends the TMR parameter to the UCP ISUP. The UCP ISUP uses this parameter to encode the USI parameter.</p>	
called party number (V)	called party number (V)
transit network selection (O)	none
calling party number (O)	calling party number (O)
<p><b>Note:</b> The calling party number is only valid if the calling party number incomplete indicator is set to “complete;” otherwise, it is invalid and discarded.</p>	
user service information (O)	user service information (V)

**Note:** The USI parameter is mandatory in the UCP ISUP IAM, but it is optional in the ISUP'92 IAM. The USI parameter is mapped from the TMR

and USI parameter in the ISUP'92 IAM to the UCP ISUP IAM. Table 241, "The ISUP'92 Gateway IMT's TMR parameter mapped to the UCP ISUP signaling protocol's USI parameter," shows how the TMR parameter in the ISUP'92 IAM is mapped to the USI parameter in the UCP ISUP IAM.

**Table 241 The ISUP'92 Gateway IMT's TMR parameter mapped to the UCP ISUP signaling protocol's USI parameter**

these ISUP'92 Gateway IMT TMR parameters:	map to these UCP ISUP USI parameters:
none	coding standard: <ul style="list-style-type: none"> <li>• CCITT standardized coding (default)</li> </ul>
transmission medium requirement: <ul style="list-style-type: none"> <li>• speech</li> <li>• 64K unrestricted</li> <li>• 3.1 kHz audio</li> </ul>	information transfer capability: <ul style="list-style-type: none"> <li>• speech</li> <li>• 64K unrestricted digital info</li> <li>• 3.1 kHz audio</li> </ul>
none	transfer mode: <ul style="list-style-type: none"> <li>• circuit mode (default)</li> </ul>
none	information transfer rate: <ul style="list-style-type: none"> <li>• 64K (default)</li> </ul>
none	user layer 1 protocol information (default)

**Table 242 CS 2000 switch actions on IAM parameters**

on these ISUP'92 Gateway IMT IAM parameters:	the CS 2000 switch performs these actions:
message type (F)	tandem
nature of connection indicators (F)	process
forward call indicators (F)	process
calling party's category (F)	process

on these ISUP'92 Gateway IMT IAM parameters:	the CS 2000 switch performs these actions:
transmission medium requirement (F)	mapped
called party number (V)	process
access transport (O)	tandem
calling party number (O)	process
closed user group inter-lock code (O)	tandem
optional forward call indicators (O)	tandem
user service information (O)	process
user-to-user information (O)	tandem
original called number (O)	tandem
redirecting number (O)	tandem
redirection information (O)	tandem
user-to-user indicators (O)	tandem
end of optional parameters (O)	tandem

**REL parameters mapped from ISUP'92 Gateway IMT to UCP ISUP**

Table 243, "CS 2000 switch actions on REL parameters," shows whether the CS 2000 switch tandem, processes, or discards the parameters in the REL message under the following conditions:

- the ISUP'92 Gateway IMT is the originating trunk agency
- the UCP ISUP protocol is used by the terminating trunk agency
- the cause value Normal Call Clearing is received by the CS 2000 switch

**Table 243 CS 2000 switch actions on REL parameters**

<b>these ISUP'92 Gateway IMT REL parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
cause indicators (V)	process
access delivery information (O)	tandem
access transport (O)	tandem
calling party number (O)	process
automatic congestion level (O)	discard
parameter compatibility information (O)	tandem
redirection number restriction (O)	tandem
user-to-user information (O)	tandem
user-to-user indicators (O)	tandem
end of optional parameters (O)	tandem



Table 244, “CS 2000 switch actions on REL parameters,” shows whether the CS 2000 switch tandem, processes, or discards the parameters in the REL message under the following conditions:

- the ISUP’92 Gateway IMT is the originating trunk agency
- the UCP ISUP protocol is used by the terminating trunk agency
- a cause value other than Normal Call Clearing is received by the CS 2000 switch

**Table 244 CS 2000 switch actions on REL parameters**

<b>on these ISUP’92 Gateway IMT REL parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
cause indicators (V)	process
access delivery information (O)	discard
access transport (O)	discard
automatic congestion level (O)	discard
parameter compatibility information (O)	discard
redirection number restriction (O)	discard
user-to-user information (O)	discard
user-to-user indicators (O)	discard
end of optional parameters (O)	tandem

**SUS/RES parameters mapped from ISUP'92 Gateway IMT to UCP ISUP**

Table 245, “CS 2000 switch actions on SUS/RES parameters,” shows whether the CS 2000 switch tandems, processes, or discards SUS/RES parameters when the originating trunk agency is an ISUP'92 Gateway IMT and the terminating trunk agency uses the UCP ISUP signaling protocol.

**Table 245 CS 2000 switch actions on SUS/RES parameters**

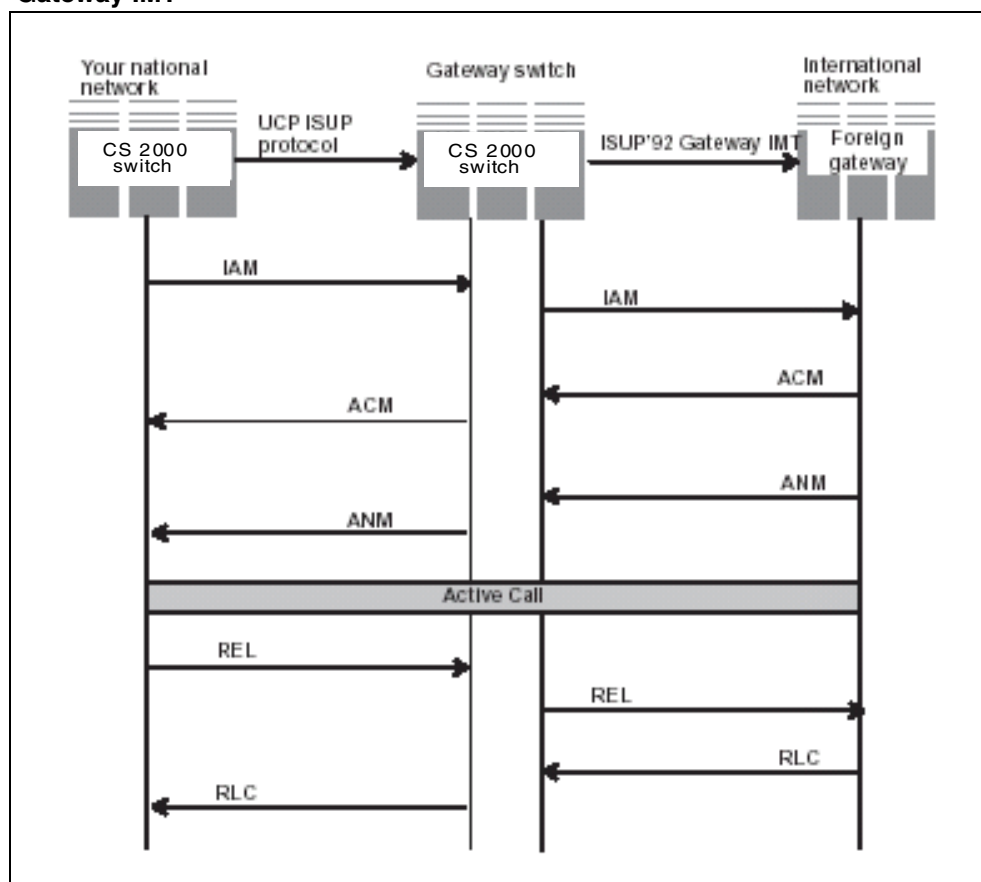
<b>on these ISUP'92 Gateway IMT SUS/RES parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
suspend/resume indicators (F)	tandem
end of optional parameters (O)	tandem

## UCP ISUP signaling protocol's messages mapped to the ISUP'92 Gateway IMT's messages

The CS 2000 switch interworks the following UCP ISUP messages to the ISUP'92 Gateway IMT:

- address complete message (ACM)
- answer message (ANM)
- call progress (CPG) message
- continuity (COT) message
- initial address message (IAM)
- pass along message (PAM)
- release (REL) message
- suspend/resume (SUS/RES) message

**Figure 38 UCP ISUP signaling protocol messages interworking to the ISUP'92 Gateway IMT**



See Table 251, “IAM message parameters mapped from the UCP ISUP signaling protocol to the ISUP'92 Gateway IMT.”

**ACM parameters mapped from UCP ISUP to ISUP'92 Gateway IMT**

Table 246, "CS 2000 switch actions on ACM parameters," shows whether the CS 2000 switch tandems, processes, or discards the UCP ISUP signaling protocol's ACM's parameters to interwork with the ISUP'92 Gateway IMT.

**Table 246 CS 2000 switch actions on ACM parameters**

<b>on these UCP ISUP ACM parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
backward call indicators (F)	process
call reference (O)	discard
cause indicators (O)	tandem
network specific facility (O)	discard
user-to-user indicators (O)	tandem
user-to-user information (O)	tandem
end of optional parameters (O)	tandem

Table 247, “CS 2000 switch actions on ACM parameters,” shows whether the CS 2000 switch tandem, processes, or discards the parameters in the ACM message under the following conditions:

- the UCP ISUP protocol is used by the originating trunk agency
- the ISUP’92 Gateway IMT is the terminating trunk agency
- the SOC NSER0003 is active
- the ACTIVATE\_INTER\_INTRA\_UNANS\_CALL office parameter in table OFCVAR is set to Y

**Table 247 CS 2000 switch actions on ACM parameters**

<b>on these UCP ISUP ACM parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
backward call indicators (F)	process
call reference (O)	discard
cause indicators (O)	tandem
network specific facility (O)	discard
user-to-user indicators (O)	tandem
user-to-user information (O)	tandem
end of optional parameters (O)	tandem

**ANM parameters mapped from UCP ISUP to ISUP'92 Gateway IMT**

Table 248, "CS 2000 switch actions on ANM parameters," shows whether the CS 2000 switch tandem, processes, or discards the UCP ISUP signaling protocol's ANM's parameters to interwork with the ISUP'92 Gateway IMT.

**Table 248 CS 2000 switch actions on ANM parameters**

<b>on these UCP ISUP ANM parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
call reference (O)	discard
carrier selection (O)	discard
inter-network-specific ANM (O)	discard
intra-network-specific ANM (O)	discard
network specific facility (O)	discard
multiple business group (network information) (O)	discard
operator information (O)	discard
user-to-user indicators (O)	discard
user-to-user information (O)	tandem
end of optional parameters (O)	tandem

## CPG parameters mapped from UCP ISUP to ISUP'92 Gateway IMT

Table 249, “CS 2000 switch actions on CPG parameters,” shows whether the CS 2000 switch tandems, processes, or discards the UCP ISUP signaling protocol’s CPG’s parameters to interwork with the ISUP’92 Gateway IMT.

**Table 249 CS 2000 switch actions on CPG parameters**

<b>on these UCP ISUP CPG parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
event information (F)	tandem
cause indicators (O)	discard
user-to-user indicators (O)	discard
user-to-user information (O)	tandem
end of optional parameters (O)	tandem

**COT parameters mapped from UCP ISUP to ISUP'92 Gateway IMT**

Table 250, “CS 2000 switch actions on COT parameters,” shows whether the CS 2000 switch tandems, processes, or discards the UCP ISUP signaling protocol’s COT’s parameters to interwork with the ISUP'92 Gateway IMT.

**Table 250 CS 2000 switch actions on COT parameters**

<b>on these UCP ISUP COT parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
continuity indicators (F)	tandem



## IAM parameters mapped from UCP ISUP to ISUP'92 Gateway IMT

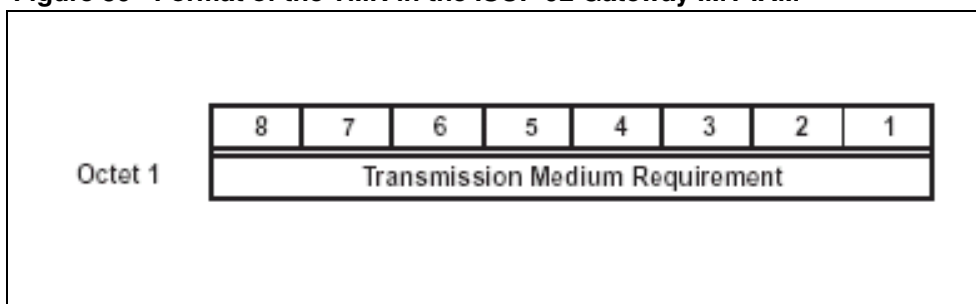
Table 251, “IAM message parameters mapped from the UCP ISUP signaling protocol to the ISUP'92 Gateway IMT,” shows the mapping of the IAM's parameters from the UCP ISUP signaling protocol to the ISUP'92 Gateway IMT. Table 253, “CS 2000 switch actions on IAM parameters,” shows whether the CS 2000 switch tandems, processes, or discards the UCP ISUP signaling protocol's IAM's parameters to interwork with the ISUP'92 Gateway IMT.

**Table 251 IAM message parameters mapped from the UCP ISUP signaling protocol to the ISUP'92 Gateway IMT**

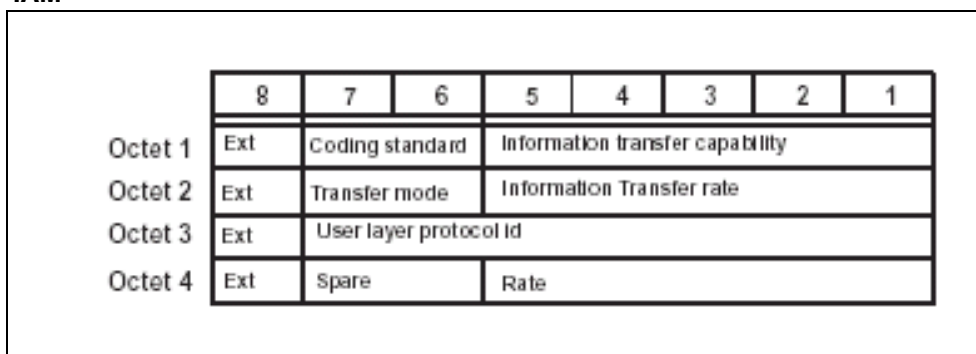
these UCP ISUP IAM parameters:	map to these ISUP'92 Gateway IMT IAM parameters:
nature of connection indicator (F)	nature of connection indicator (F)
<b>Note:</b> The satellite indicator in the NOC parameter is not checked.	
called party number (V)	called party number (V)
calling party number (O)	calling party number (O)
<b>Note:</b> The calling party number is valid only if the calling party incomplete indicator is set to “complete;” otherwise, the calling party number is discarded.	
charge number (O)	
<b>Note:</b> Charge number is an invalid parameter.	
transit network selection (O)	
carrier identification parameter (O)	
forward call indicator (F)	forward call indicator (F)
calling party category (F)	calling party category (F)
user service information (V)	transmission medium requirement (F) user service information (O)

**Note:** The user service information (USI) parameter is a mandatory parameter in the UCP ISUP IAM, but it is optional in the ISUP'92 IAM. The USI parameter is mapped from the UCP ISUP IAM to the TMR and USI parameters in the ISUP'92 IAM. See Figure 39 “Format of the TMR in the ISUP'92 Gateway IMT IAM,” and Figure 40 “Format of the USI parameter in the UCP ISUP signaling protocol IAM,” for the formats of the TMR and USI parameters in the ISUP'92 IAM.

**Figure 39 Format of the TMR in the ISUP'92 Gateway IMT IAM**



**Figure 40 Format of the USI parameter in the UCP ISUP signaling protocol IAM**



See Table 252, “Information transfer rate field of the USI parameter mapped to the TMR parameter.”

**Table 252 Information transfer rate field of the USI parameter mapped to the TMR parameter**

these information transfer rate fields:	map to these TMR parameters:
speech	speech
64K unrestricted digital info.	64K unrestricted
64K restricted digital info.	64K restricted
3.1 kHz audio	3.1 kHz audio
	<b>Note:</b> If you fail to datafill the mapping in table BCCOMPAT, the call will receive bearer incompatibility treatment.
15 kHz audio	3.1 kHz audio
	<b>Note:</b> If you fail to datafill the mapping in table BCCOMPAT, the call will receive bearer incompatibility treatment.

**Table 253 CS 2000 switch actions on IAM parameters**

on these UCP ISUP IAM parameters:	the CS 2000 switch performs these actions:
message type (F)	tandem
nature of connection indicators (F)	process
forward call indicators (F)	process
calling party's category (F)	process
user service information (F)	mapped
called party number (V)	process
calling party number (O)	process
carrier identification (O)	discard

<b>on these UCP ISUP IAM parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
carrier selection (O)	discard
charge number (O)	discard
channel assignment map (O)	discard
generic address (O)	discard
generic digits (O)	discard
jurisdiction information (O)	discard
multiple business group (network information) (O)	discard
network-specific facilities (O)	discard
network-specific IAM (O)	discard
operator information (O)	discard
operator service indicator (O)	discard
originating line information (O)	discard
remote operations (O)	discard
supplementary line information (O)	discard
transit network selection (O)	discard
user service information (mandatory variable length parameter in UCP protocol) (O)	process
user-to-user information (O)	tandem
end of optional parameters (O)	tandem

---

**PAM parameters mapped from UCP ISUP to ISUP'92 Gateway IMT**

Table 254, “CS 2000 switch actions on PAM parameters,” shows whether the CS 2000 switch tandems, processes, or discards the UCP ISUP signaling protocol’s PAM’s parameters to interwork with the ISUP’92 Gateway IMT.

**Table 254 CS 2000 switch actions on PAM parameters**

on these UCP PAM parameters:	the CS 2000 switch performs these actions:
message type (F)	tandem

**REL parameters mapped from UCP ISUP to ISUP'92 Gateway IMT**

Table 255, "CS 2000 switch actions on REL parameters," shows whether the CS 2000 switch tandems, processes, or discards the parameters in the REL message under the following conditions:

- the UCP ISUP protocol is used by the originating trunk agency
- the ISUP'92 Gateway IMT is the terminating trunk agency
- the cause value Normal Call Clearing is received by the CS 2000 switch

**Table 255 CS 2000 switch actions on REL parameters**

<b>on these UCP ISUP REL parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
cause indicators (V)	process
user-to-user information (O)	tandem
user-to-user indicators (O)	discard
end of optional parameters (O)	tandem

Table 256, “CS 2000 switch actions on REL parameters,” shows whether the CS 2000 switch tandem, processes, or discards the parameters in the REL message under the following conditions:

- the UCP ISUP protocol is used by the originating trunk agency
- the ISUP’92 Gateway IMT is the terminating trunk agency
- a cause value other than Normal Call Clearing is received by the CS 2000 switch

**Table 256 CS 2000 switch actions on REL parameters**

<b>on these UCP ISUP REL parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
cause indicators (V)	process
user-to-user information (O)	tandem
user-to-user indicators (O)	discard
end of optional parameters (O)	tandem

**SUS/RES parameters mapped from UCP ISUP to ISUP'92 Gateway IMT**

Table 257, “CS 2000 switch actions on SUS/RES parameters,” shows whether the CS 2000 switch tandem, processes, or discards the UCP ISUP signaling protocol’s SUS/RES parameters to interwork with the ISUP'92 Gateway IMT.

**Table 257 CS 2000 switch actions on SUS/RES parameters**

<b>on these UCP ISUP SUS/REL parameters:</b>	<b>the CS 2000 switch performs these actions:</b>
message type (F)	tandem
suspend/resume indicators (F)	tandem
end of optional parameters (O)	tandem



---

## Appendix L: Q.767 Gateway IMT and ISUP'92 Gateway IMT interworking

---

This appendix describes the interworking between the Q.767 signaling protocol and the ISUP'92 signaling protocol.

The Q.767 Gateway IMT interworks all ISUP'92 Gateway IMT messages except the following:

- confusion (CFN) message
- facility request (FAR) message
- facility reject (FRJ) message
- facility accept (FAA) message
- user to user information (UUI) message

The Q.767 Gateway IMT discards all unrecognized messages without disrupting the call. It does not produce logs for unrecognizable messages.

The Q.767 Gateway IMT interworks all ISUP'92 Gateway IMT parameters except the following:

- redirecting number
- redirection information
- redirection number
- parameter compatibility information
- message compatibility information
- call diversion information

The Q.767 Gateway IMT discards all unrecognizable parameters without disrupting the call.

See “cause value handling” in Appendix A: “Gateway IMT features” to learn how cause values are mapped on the Gateway IMT. See “How does the ISUP'92 Gateway IMT handle unrecognizable and unexpected messages and parameters?” in Chapter 4: “ISUP'92 Gateway IMT” to learn how the ISUP'92 Gateway IMT handles unrecognizable messages and parameters.



---

## Appendix M: Gateway IMT call flowchart

---

This appendix contains the Gateway IMT call flowchart, which explains Gateway IMT originations and terminations through the CS 2000 switch. The shaded areas indicate Gateway IMT functionality.

Figure 41 Gateway IMT call flowchart

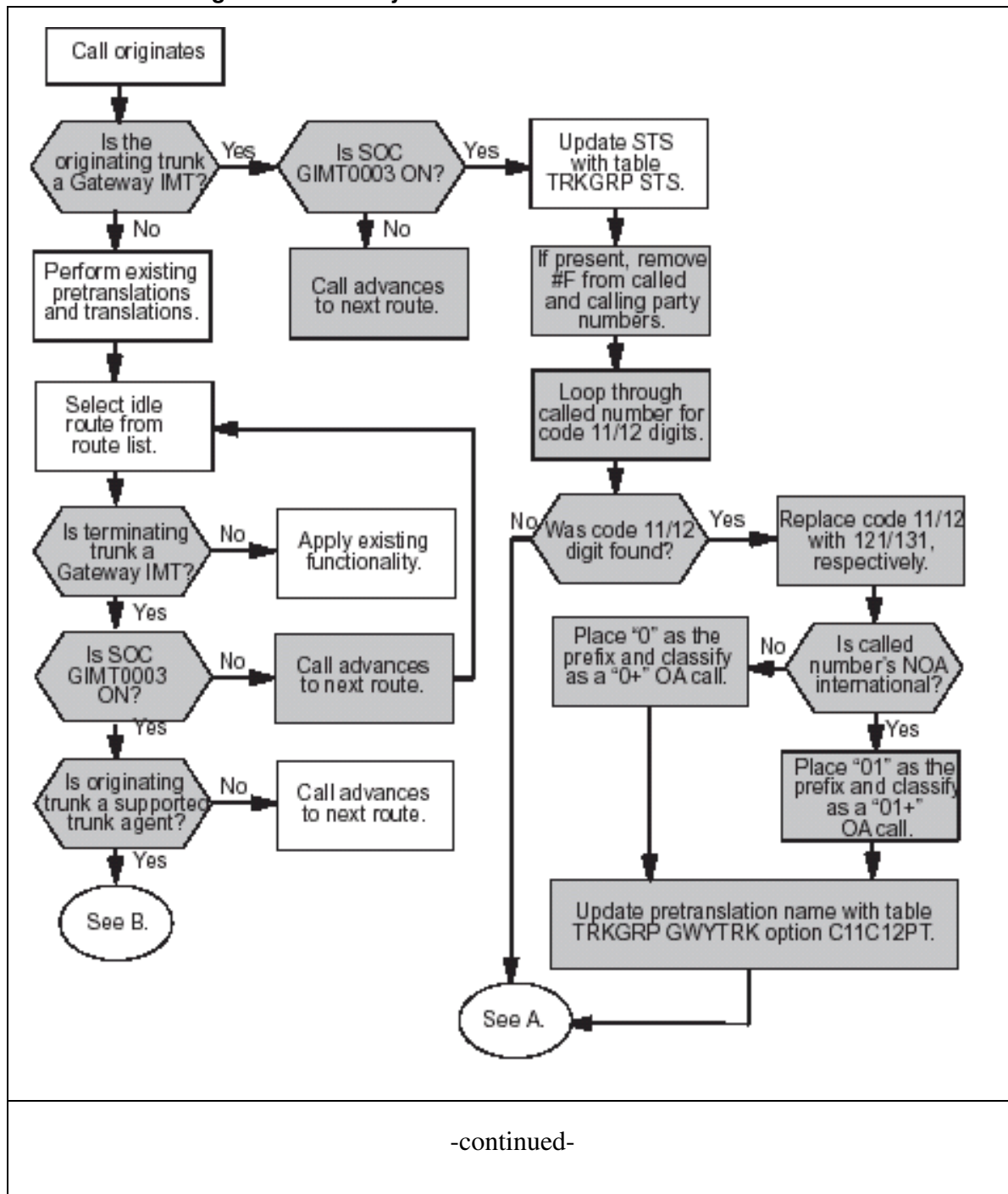


Figure 42 Gateway IMT call flowchart, continued

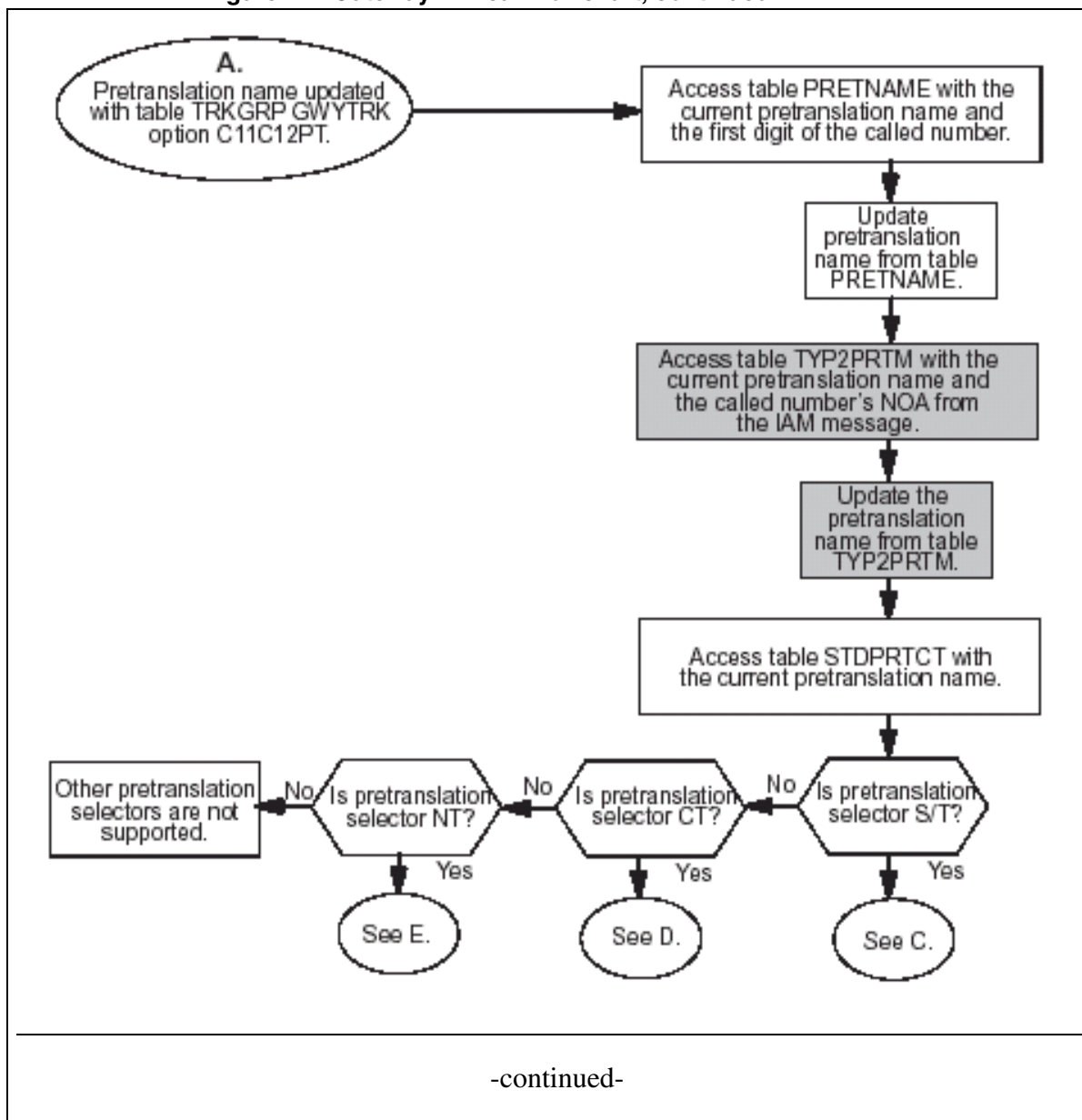


Figure 43 Gateway IMT call flowchart, continued

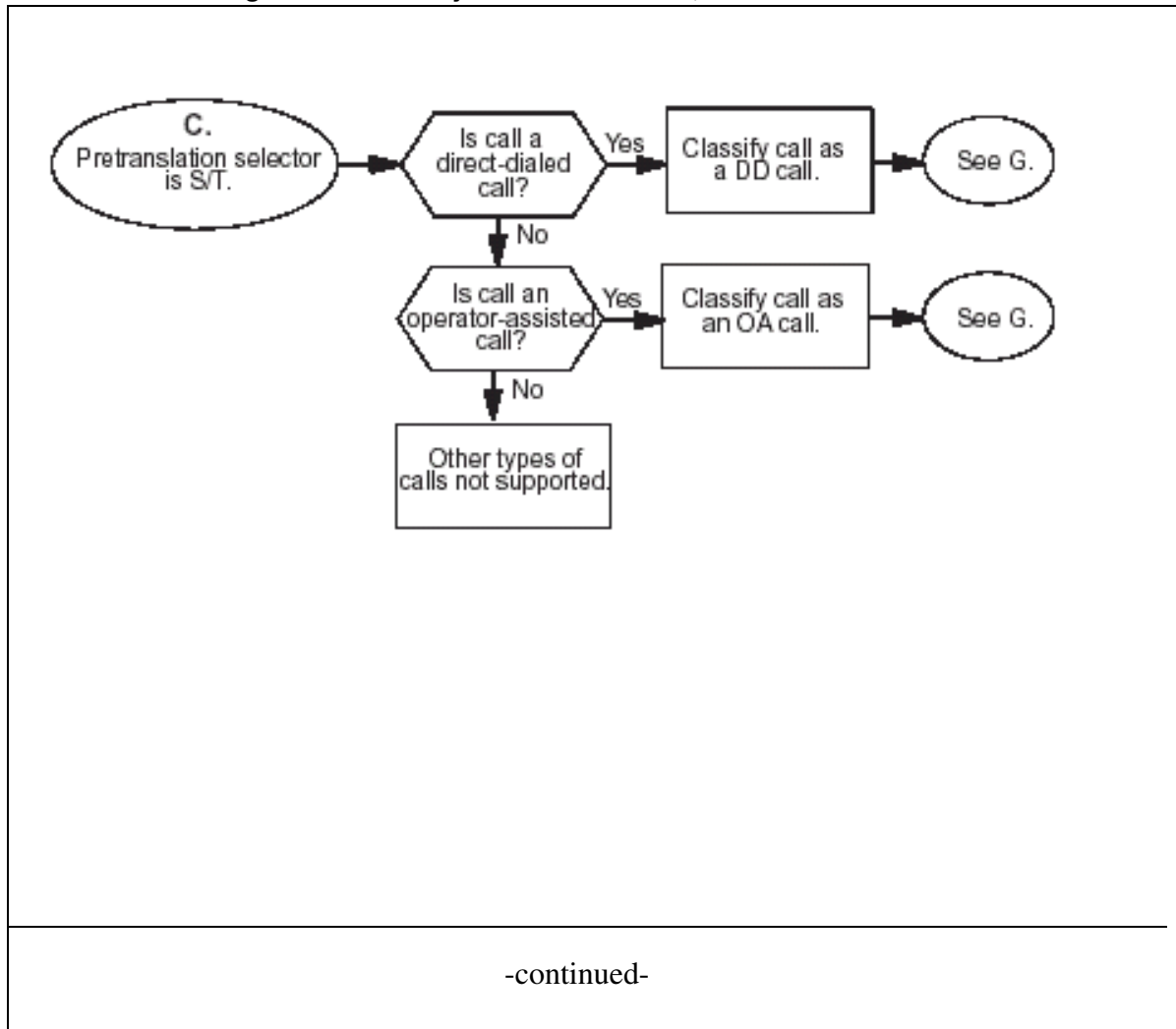


Figure 44 Gateway IMT call flowchart, continued

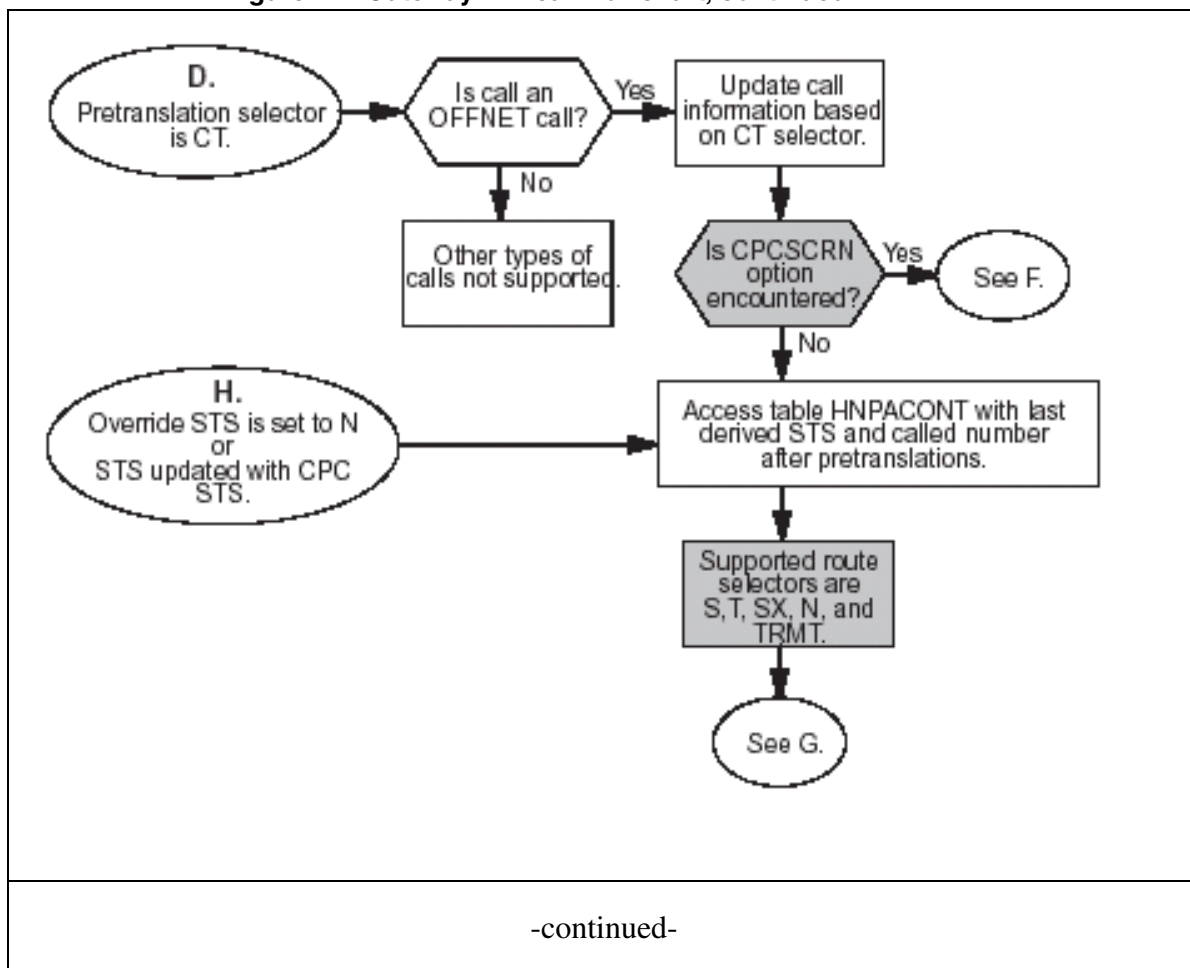


Figure 45 Gateway IMT call flowchart, continued

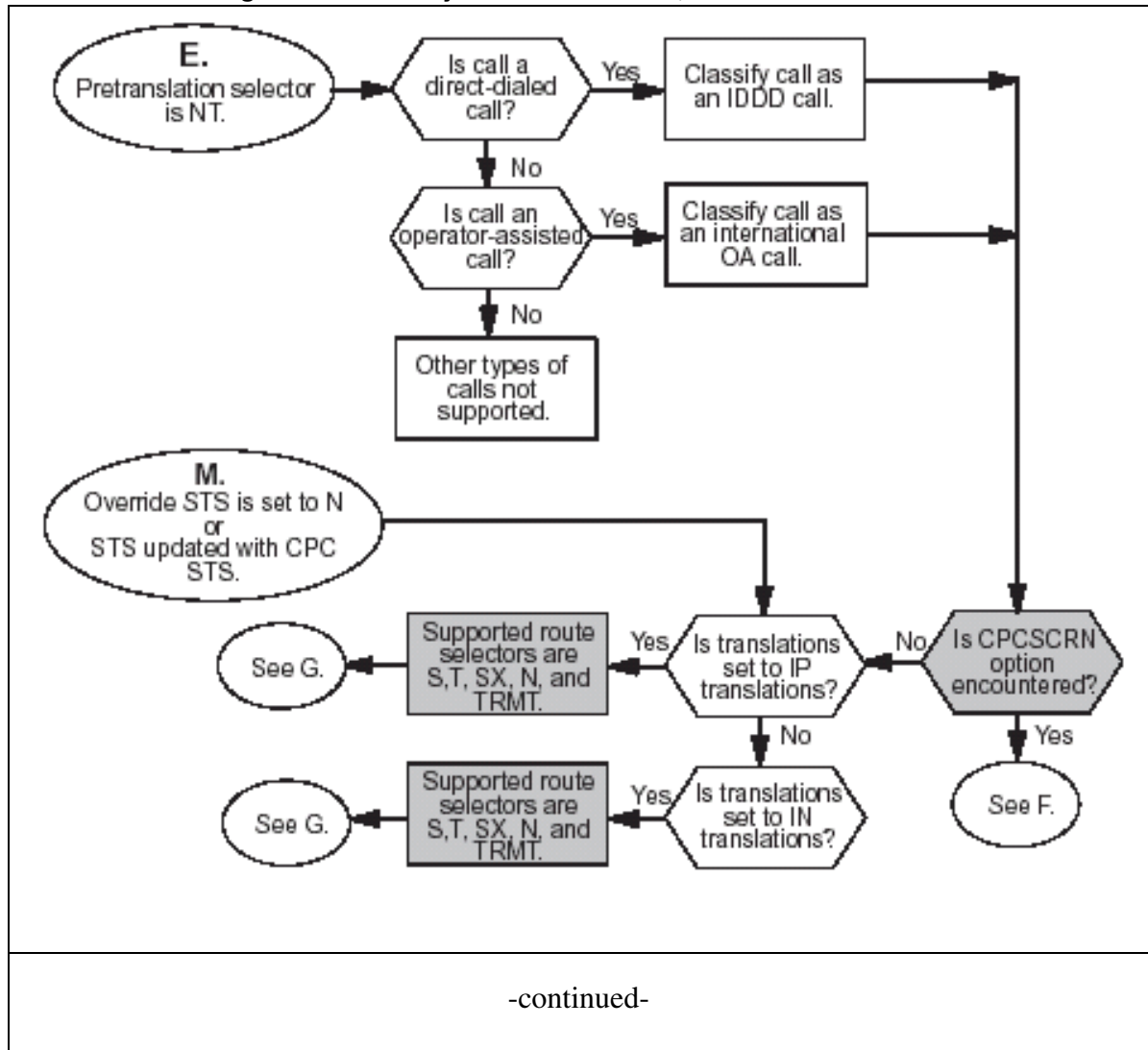




Figure 46 Gateway IMT call flowchart, continued

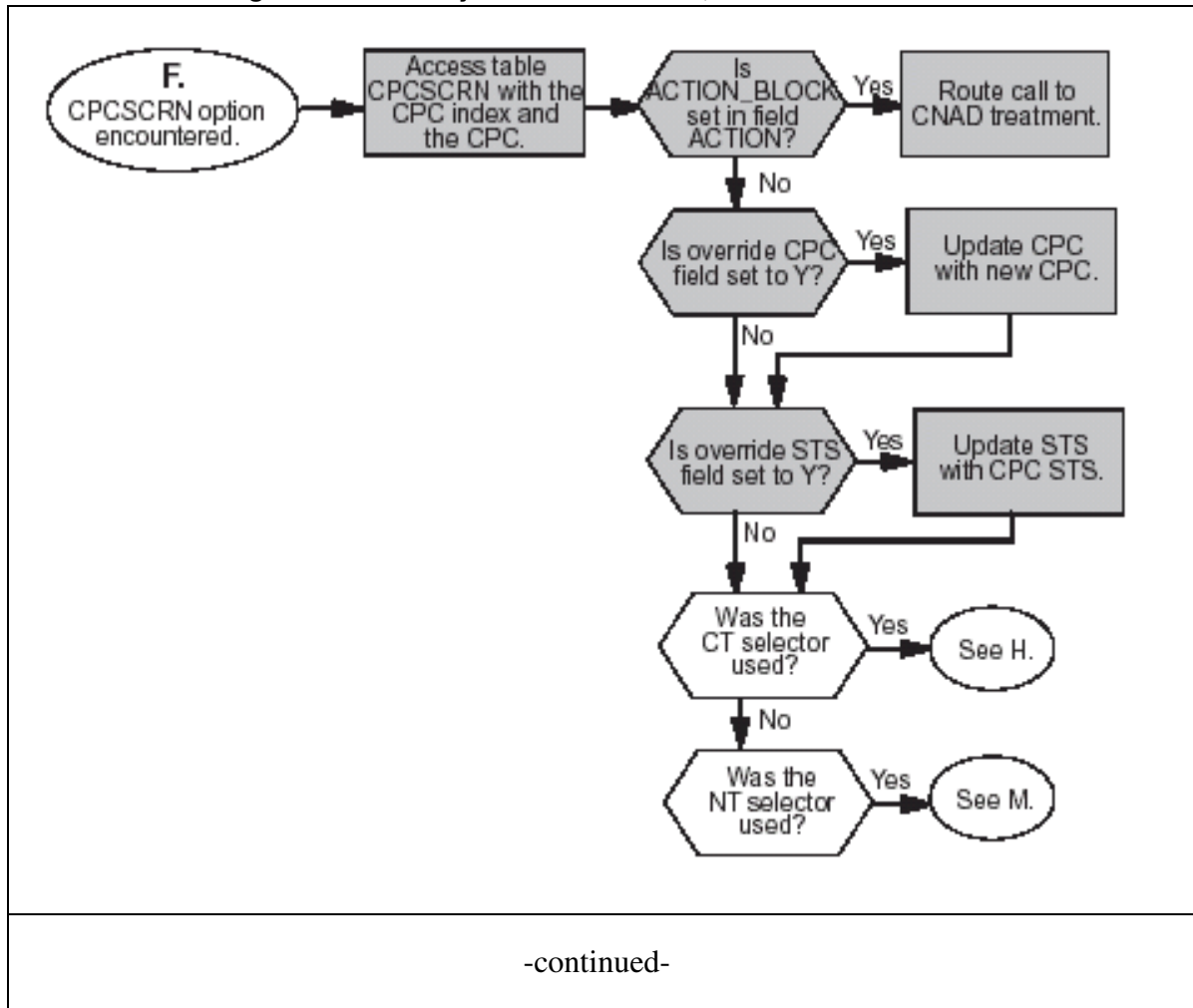


Figure 47 Gateway IMT call flowchart, continued

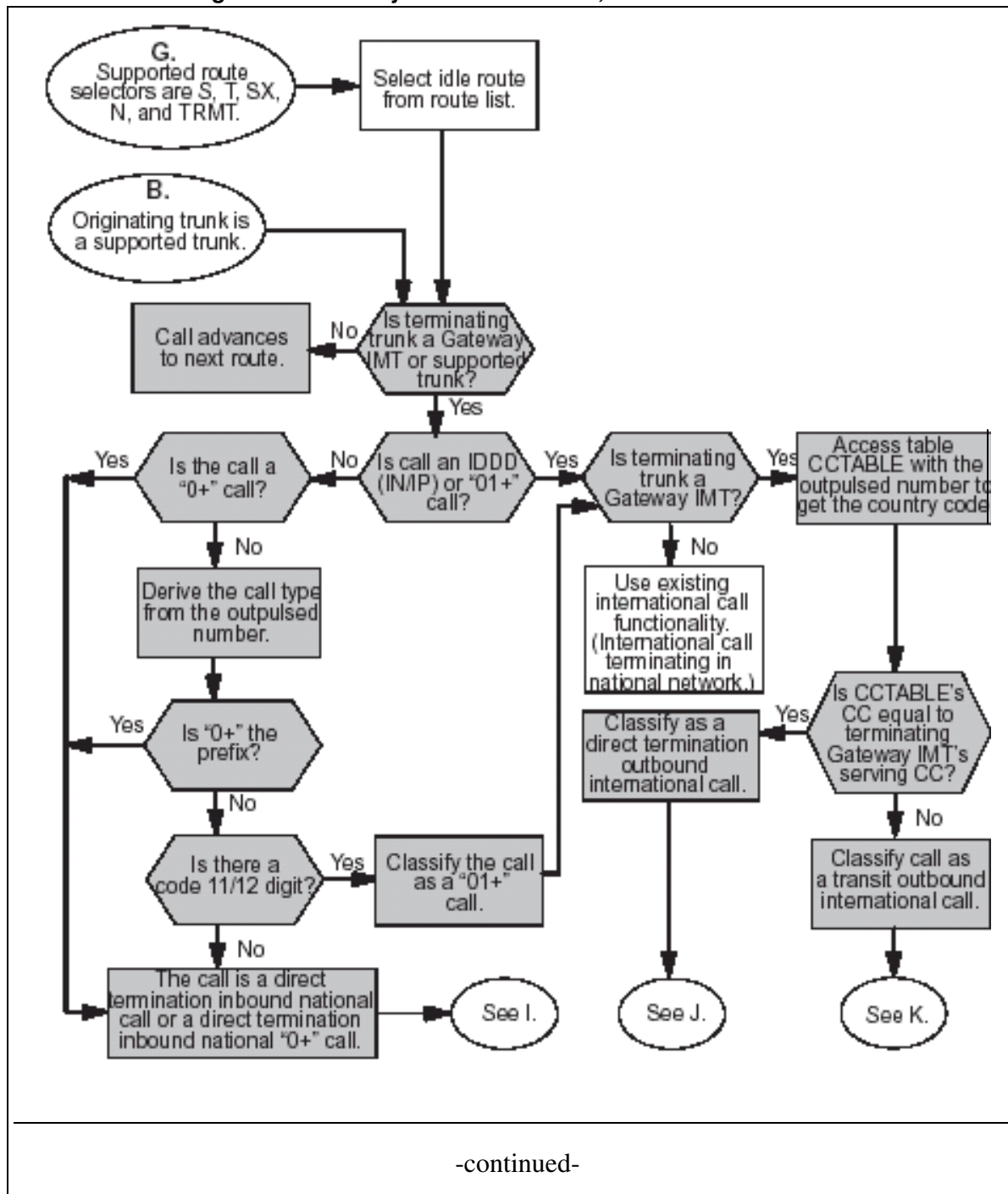


Figure 48 Gateway IMT call flowchart, continued

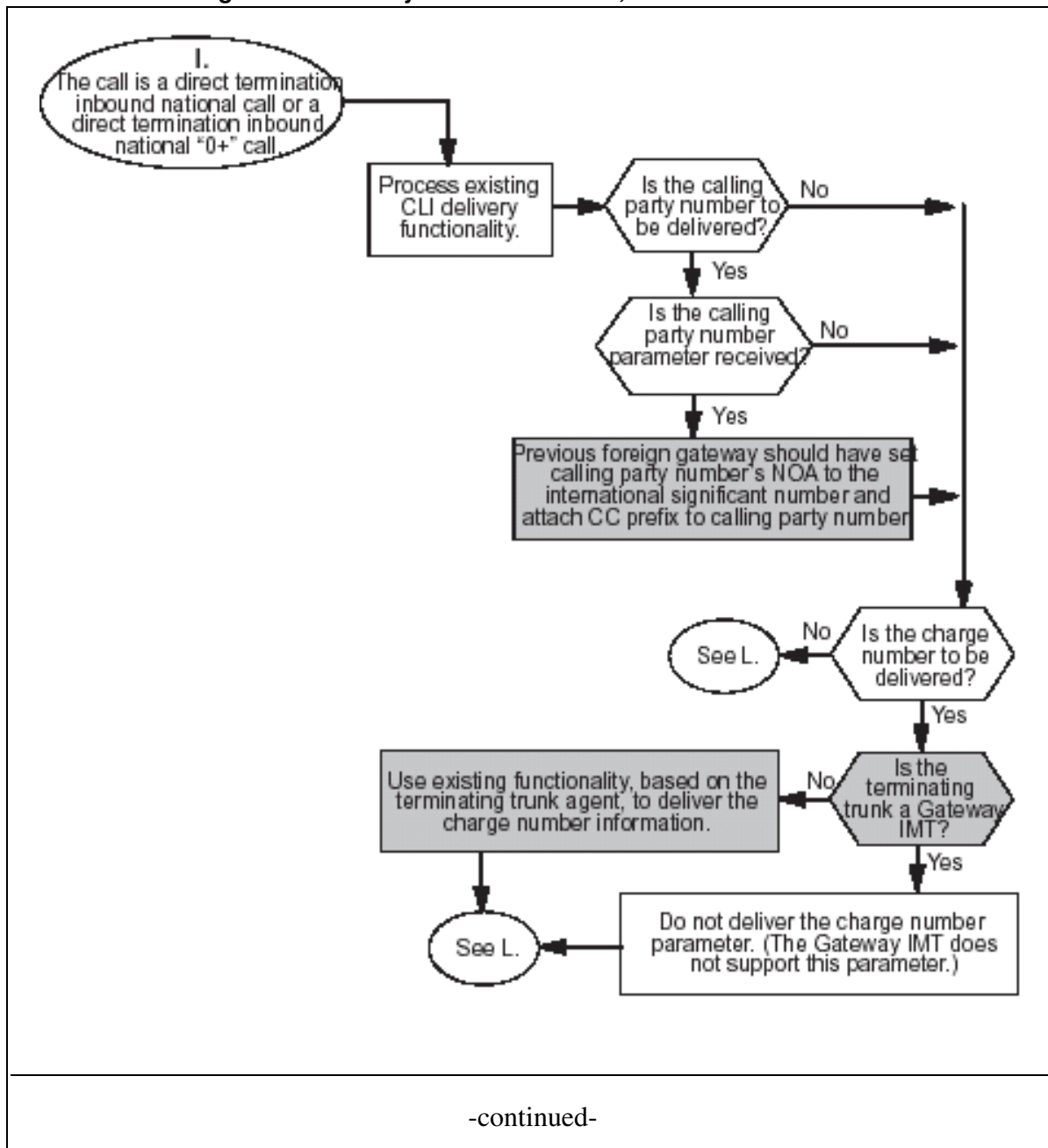


Figure 49 Gateway IMT call flowchart

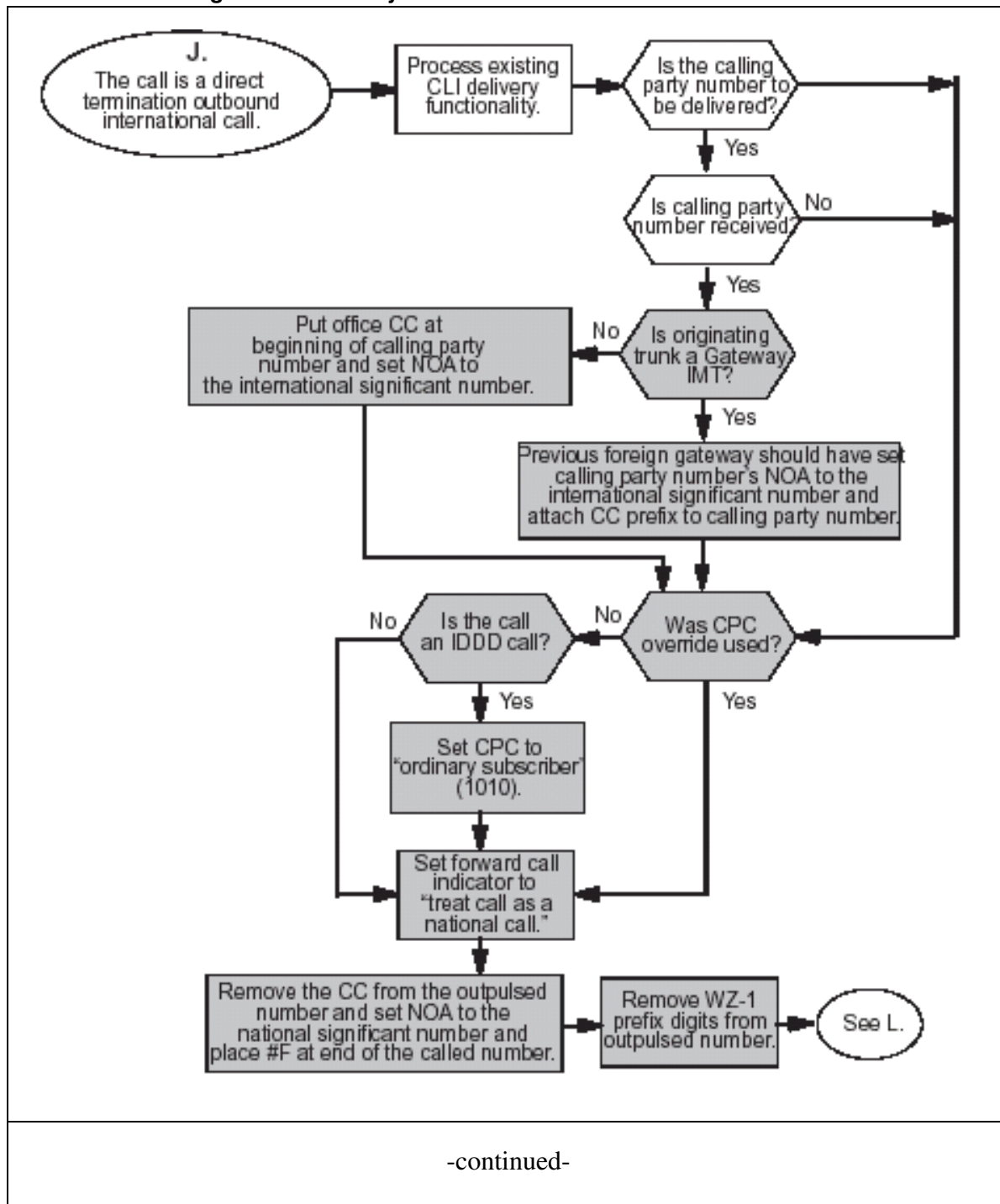


Figure 50 Gateway IMT call flowchart, continued

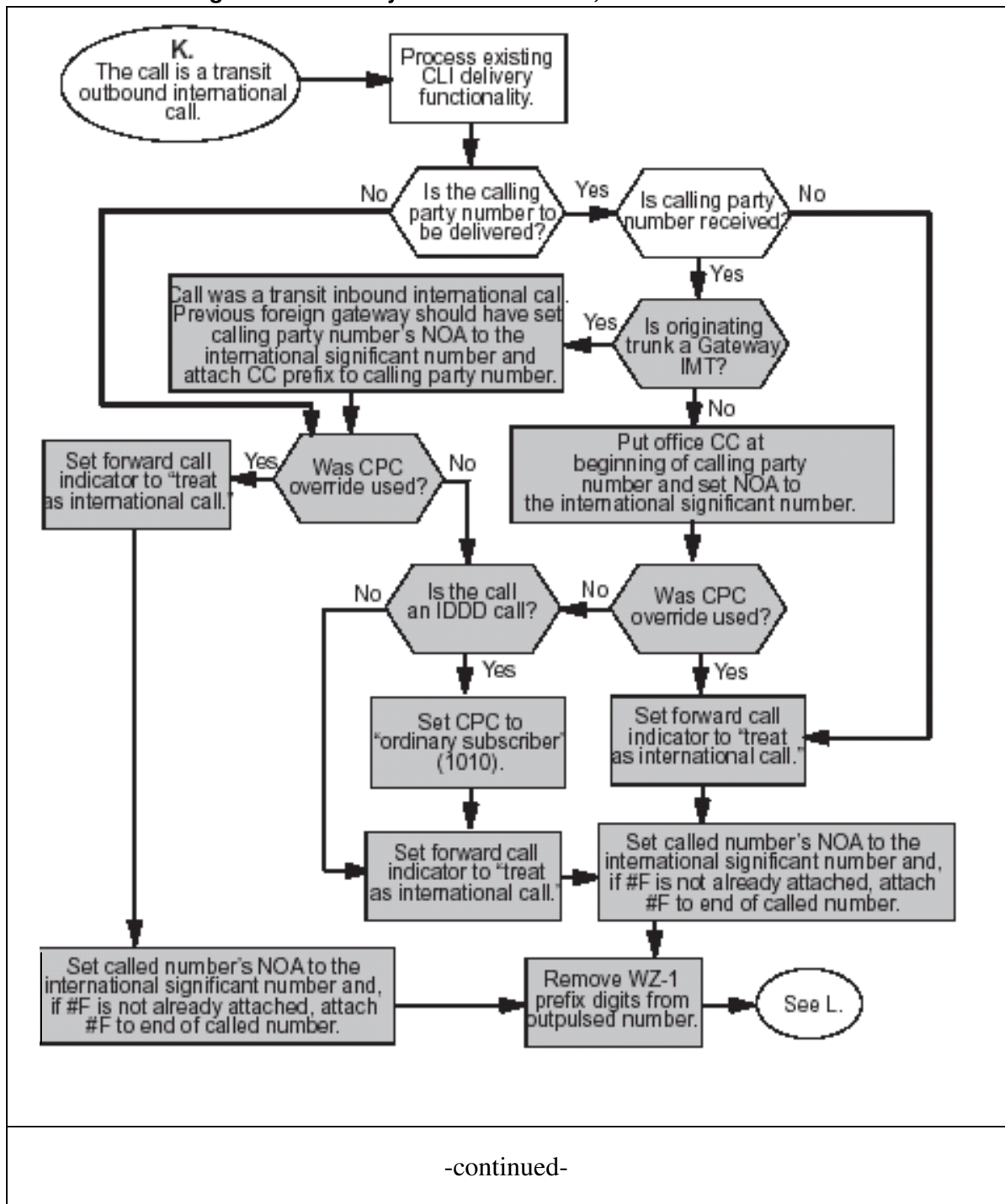
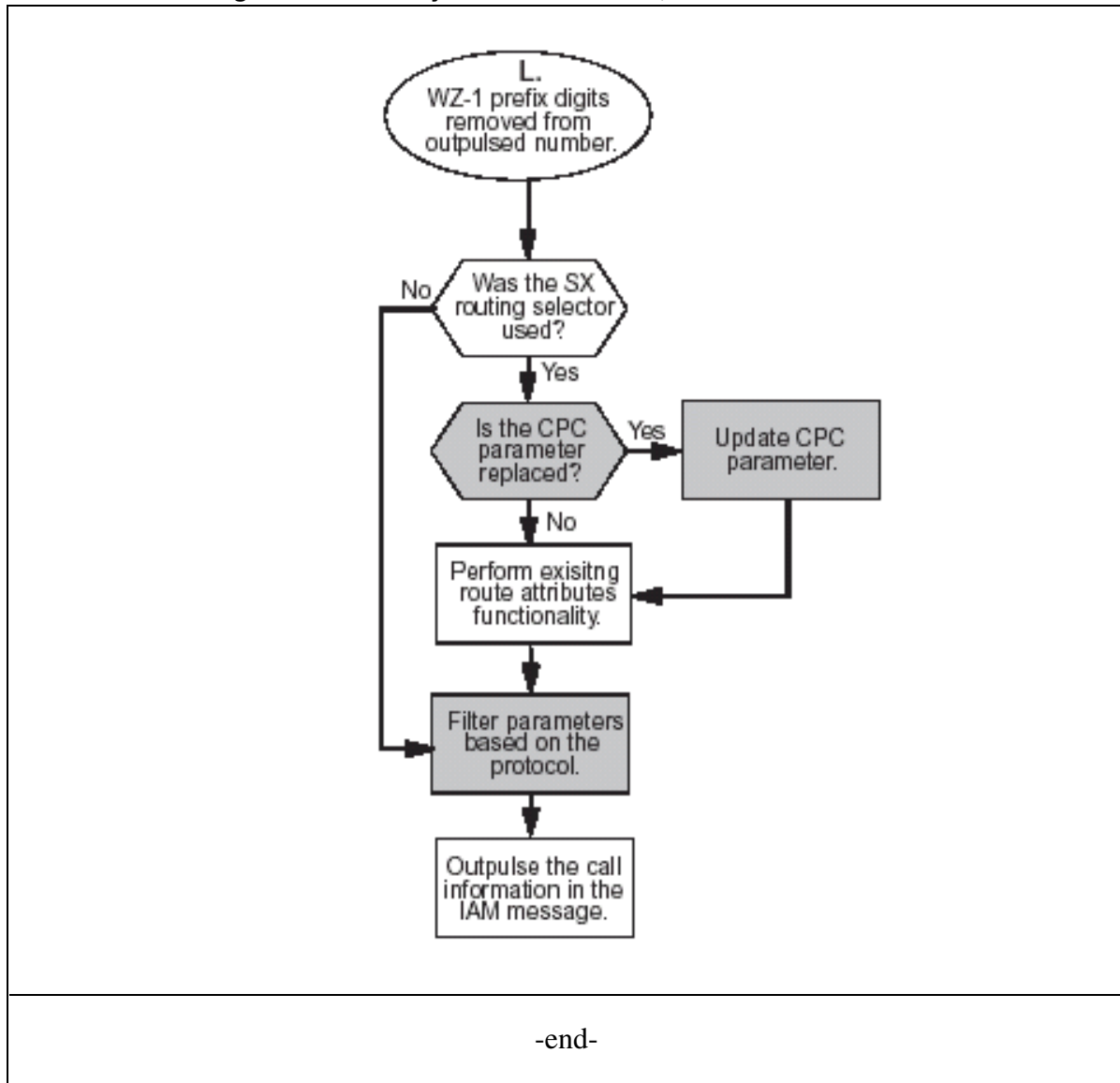


Figure 51 Gateway IMT call flowchart, continued



---

## List of terms

---

**#F**

end-of-digit

**Ack**

acknowledge

**ACM**

address complete message

**ADDR**

address message for a PTS FGD or FGB trunk

**ANI**

automatic number identification

**ANM**

answer message

**ATT**

automatic trunk testing

**BCI**

backward call indicator

**BLA**

block acknowledged message

**BLO**

blocking message

**BS SKIP**

bearer service skip

**BSS**

bearer service selection

**CCR**

continuity check request message

**CDR**

call detail report

**CFN**

confusion message

**CGB**

circuit group blocking message

**CGBA**

circuit group block acknowledged message

**CGU**

circuit group unblocking message

**CGUA**

circuit group unblock acknowledged message

**CLI**

calling line identifier

**CMR**

call modification request message

**CON**

connect message

**CONN**

connect message for a PRI agency



---

<b>COS</b>	class of service
<b>COT</b>	continuity message
<b>CNAD</b>	call not allowed
<b>CPC</b>	calling party category
<b>CPG</b>	call progress message
<b>CS 2000</b>	communication server 2000t
<b>DAL-TIE</b>	dedicated access line inter-exchange trunk
<b>DCME</b>	digit circuit multiplication equipment
<b>DDD</b>	direct dialed digits
<b>DISC</b>	disconnect message for a PRI agency
<b>DLC</b>	dynamic load control
<b>DSI</b>	digit speech interpolation
<b>DTC/DTC+</b>	digital trunk controller/digital trunk controller+

**DTCI/DTCI+**

digital trunk controller international/digital trunk controller international+

**DTCO+**

digital trunk controller overseas+

**DTMF**

dual-tone multi-frequency

**EDP**

end-path-delay

**FGB**

feature group B trunk

**FGD**

feature group D trunk

**FGD PTS**

feature group D per-trunk signaling trunk

**FGD SS7**

feature group D signaling system 7 trunk

**FOT**

forward transfer message

**GNCT**

generalized no circuit treatment

**GRA**

circuit group reset acknowledge message

**GRS**

circuit group reset message

**IAM**

initial address message

---

<b>IDDD</b>	international direct dialed digits
<b>IMT</b>	inter-machine trunk
<b>IN</b>	international translations
<b>IP</b>	international partitioned translations
<b>ITC</b>	information transfer capability
<b>LRE</b>	low rate encoding
<b>MAJEQUIP</b>	major external equipment
<b>MCP</b>	message compatibility parameter
<b>MINEQUIP</b>	minor external equipment
<b>NOA</b>	nature of address
<b>NOC</b>	nature of connection
<b>OA</b>	operator-assisted
<b>OFFNET</b>	off the network

**ONNET**

on the network

**PCM**

pulse code modulation

**PCP**

parameter compatibility parameter

**PRI**

primary rate interface trunk

**PROG**

progress message

**PTS**

per-trunk signaling

**REL**

release message

**RES**

resume message

**RLC**

release complete message

**RSC**

reset circuit message

**SAM**

subsequent address message

**SCP**

service control point

**SCUN**

service currently unavailable

---

<b>SOC</b>	software optionality control
<b>SS7</b>	signaling system 7
<b>STS</b>	serving translation scheme
<b>SUS</b>	suspend message
<b>TLT</b>	test line test
<b>TMR</b>	transmission medium requirement
<b>TRM</b>	transmission resource management signal
<b>TTP</b>	manual test call
<b>TUT</b>	trunk under test
<b>UBA</b>	unblock acknowledged message
<b>UBL</b>	unblock message
<b>UCP</b>	universal carrier protocol
<b>UCP ISUP</b>	universal carrier protocol ISDN user part

**UCS**

universal carrier services

**USI**

user service information

**WZ-1**

world zone-1

---

## Ordering Information

---

Use the following table for ordering Nortel NTPs (Northern Telecom Publications) and Product Computing-Module Loads (PCLs):

Type of product	Source	Phone	Cost
Technical documents (paper or CD-ROM)	Nortel Product Documentation	1-800-NT-I-CARE (1-800-684-2273)	Yes
Individual NTPs (paper)	Merchandising Order Service	1-800-347-4850	Yes
Marketing documents	Sales and Marketing Information Center (SMIC)	1-800-4NORTEL (1-800-466-7835) * ESN 444-5930	No
PCL software	Nortel	Consult your Nortel sales representative  * Employee	Yes

### When ordering publications on CD

Please have the CD number and software version available, for example, **HLM-2631-001 02.02**.

### When ordering individual paper documents

Please have the document number and name available, for example, **297-2631-001, UCS DMS-250 Master Index of Publications**.

**When ordering software**

Please have the eight-digit ordering code, for example, **UCSE0009**, as well as the ordering codes for the features you wish to purchase. Contact your Nortel representative for assistance.





DMS-100 Family  
**Gateway IMT (GIMT)**  
User's Guide

Product Documentation—Dept. 3423  
Nortel Networks  
P.O. Box 13010  
RTP, NC 27709 1-800-684-2273  
(1-800-NTI-CARE)

Copyright © 2004 Nortel Networks  
All rights reserved

**NORTEL NETWORKS CONFIDENTIAL:** The information contained in this document is the property of Nortel Networks. Except as specifically authorized in writing by Nortel Networks, the holder of this document shall keep the information contained herein confidential and shall protect same in whole or in part from disclosure and dissemination to third parties and use same for evaluation, operation, and maintenance purposes only.

Information is subject to change without notice. Nortel Networks reserves the right to make changes in design or components as progress in engineering and manufacturing may warrant.

DMS, DMS SuperNode, and MAP are trademarks of Nortel Networks.  
Publication number: 297-2621-902  
Product release: SN07  
Document release: Standard  
Date: October 2004  
Printed in the United States of America

