TTC STANDARD

JJ-90.10

Inter-Carrier Interface based on ISUP

(English Edition)

7.1 Edition

September 5, 2006

THE TELECOMMUNICATION TECHNOLOGY COMMITTEE

Introduction

This document provides the TTC original Standard formulated by the TTC Signaling Working Group.

The working group translated JJ-90.10 Japanese 7.1 Edition (September 5, 2006) into English, and issued JJ-90.10 English 7.1 Edition on September 5, 2006.

In case of dispute, the original to be referred is the Japanese Edition of the text.

September 5, 2006

TTC Signaling Working Group

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1. Relations for International Recommendations

There are no International Recommendations for this Standard.

2. Update History

Edition Number	Established Date	Contents of Updates
The first edition	1998.11.26	Established
The second edition	1999.01.22	Carrier information transfer parameter (POI level information) was added for IAM, ACM and CPG message and signals of interconnection access charge settlement system were for CPG message. Overwriting conditions in which backward signals of interconnection access charge settlement system are sent in several times from succeeding network and call release procedure of called party disconnect first in case of analog terminal termination are clarified.
The third edition	1999.11.25	The signal overlap transfer function was added to the IAM signal. The overlap transfer of the ACM, CPG, and ANM signals are to be considered later.
The fourth edition	2000.04.20	The procedure for announcing the name of a carrier selected by the selected-carrier name on presubscription in the priority connection was added. Mobile (IMT-2000) was add to the additional party category parameters.
The fifth edition	2001.11.27	Parameter handling of the redirecting carrier's network was added. Information elements for the original called number parameter and the redirecting number parameter were added, and descriptions were modified for addition of mobile telephone number.
The sixth edition	2003.4.23	Descriptions were modified for addition of IP telephone number.
The seventh edition	2005.8.25	Redirection parameters were added to the ISUP Reference Table for Local Number Portability and Mobile Number Portability implementation.
7.1 edition	2006.9.5	Modified No.**3.100** mistranslation as follows c)Performing redirect indicator → Invoking redirect reason d)Performing redirect reason → Extension indicator

3. Industrial Property Rights

TTC's Web site is providing the information of submissions of "Confirmation of IPR Licensing Condition".

4. Others

(1) In this Standard, no item is ahead of other TTC Standards.

5. Responsible working group

Signaling Working Group

1. Overview

This TTC (Telecommunication Technology Committee) standard specifies the ICI (inter-carrier interface) between telecommunications carriers within Japan.

1.1 Scope of specifications

This standard specifies connection conditions for inter-network interfaces (referred to below as “ICI”) with the aim of achieving smooth interconnections between telecommunications carriers. It specifies basic service functions and leaves the specification of advanced service functions as a topic for future study.

The specifications herein aim to provide:

- An implementable standard by stipulating connection conditions that can be interpreted in a consistent manner;
- A standard that can be applied in common to interconnections between telecommunications carriers each of which provide various types of communication services (international, national transit, mobile, PHS, etc.); and
- A standard that includes those items necessary for performing smooth interconnection in inter-network interfaces in terms of connection conditions as opposed to signaling conditions.

1.2 Target of specifications

This standard specifies the inter-network interface covering basic service functions. In terms of the interface itself, specifications target items required for interconnection including those related to ISUP and MTP. In terms of basic functions, specification target is as follows.

- Connection conditions and billing conditions related to telephone and ISDN call connections
- Supplementary-service-information transfer and service-processing conditions in the inter-network interface

Also, for the inter-network interface with the IP based network*1, the specification target is items required for interconnection including those related to ISUP and MTP.

For reference purposes, items associated with operational conditions in interconnections are described in the appendices to this standard.

*1 This is a voice communication network utilizing the IP (Internet Protocol) technology in the whole or a part of network. It provides the following two categories of IP telephone.

- IP telephone to which the number “0A - J” is assigned (referred to below as “IP telephone (Category A)”)
- IP telephone to which the number 0A0 is assigned (referred to below as “IP telephone (Category B)”)

2. Connection Configurations

2.1 Basic connection configuration

Telecommunications carriers who provide an ICI are considered to be “comprehensive” telecommunications carriers (telecommunications carriers that either provide or have the capability of providing a wide range of services like international, national transit, mobile, PHS, and fixed telephone (0ABCDEFGHJ) simultaneously), and they can connect with other comprehensive telecommunications carriers. The basic connection configuration is shown in Fig. 2-1/JJ-90.10.

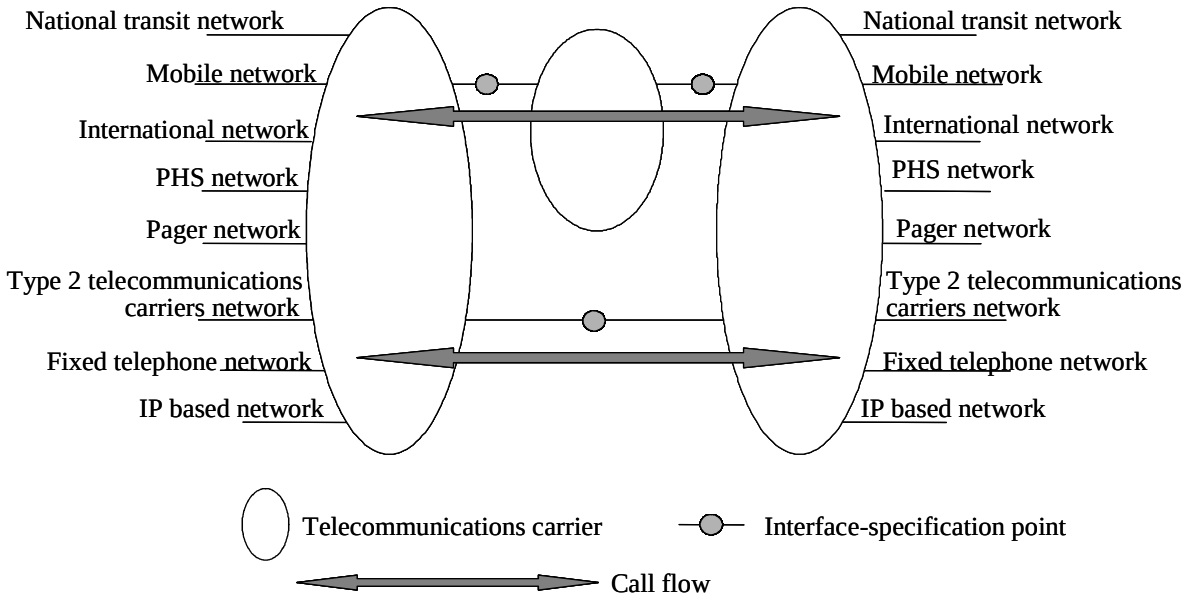


Figure 2-1/JJ-90.10 Basic Connection Configuration

2.2 Scope of ICI specification

Connection pattern is shown in Table 2-1/JJ-90.10.

Table 2-1/JJ-90.10 Connection Pattern

Terminating (Transit) Network / Calling (Transit) Network	Carrier Network Providing ICI	Carrier Network not Providing ICI
Carrier network providing ICI	○	—
Carrier network not providing ICI	—	—

○: Targeted connection pattern —: Non-targeted connection pattern

3. Numbering System

3.1 Basic configuration of calling-user dial numbers

(1) Dialing number for international and national transit calls

$00X_1X_2$ ＋ connection number,
$002Y_1Y_2$ ＋ connection number,
or
connection number

$00X_1X_2/002Y_1Y_2$: carrier identification number (X_1 excludes 0, 2, and 9)
Connection number: international number[*1], national number, or supplementary service number

*1 The international prefix (010) may be included.

(2) Dialing number for mobile-connection calls

0A0 + CDE + connection number

0A0: mobile-service identification number (080, 090)
CDE: carrier identification code (C excludes 0)
Connection number: subscriber number or supplementary service number

(3) Dialing number for PHS-connection calls

0A0 + CDE + connection number

0A0: PHS-service identification number (070)
CDE: carrier identification code (C excludes 0)
Connection number: subscriber number or supplementary service number

(4) Dialing number for pager-connection calls where the calling side is charged for the call

0A0 + CDE + connection number

0A0: pager-service identification number (020)
CDE: carrier identification code (C excludes 0)
Connection number: subscriber number or supplementary service number

(5) Dialing number for calls connecting with Type 2 telecommunications carriers

0091 + N_1N_2 + connection number
or
connection number

0091: Type-2 telecommunications-carrier connection identification number
N_1N_2: carrier identification code
Connection number: international number[*1], national number, etc.

*1 The international prefix (010) may be included.

(6) Dialing number for fixed-telephone and IP telephone(Category A)(0A to J) connection calls

Connection number (fixed-telephone number)

Connection number: area code + local exchange number + subscriber number

(7) Dialing number for IP telephone(Category B) connection calls

0A0 + CDEF + connection number

0A0: IP-telephone-service identification number (050)
CDEF: carrier identification code (C excludes 0)
Connection number: subscriber number

3.2 Functions related to dialing number in the calling network

(1) Number identification

In principal, the calling carrier network does not perform special processing to identify the connection number.

(2) Valid number of received digits

The calling carrier network can register what number of received digits is considered valid (from a minimum number to a maximum number of received digits); if a number has less digits than the minimum, a switch can detect it as invalid and treat it as a BT (Busy Tone) or talkie connection, or as a disconnection of the call (with initiating REL).

(3) Activating condition

The calling carrier network can activate a call by the time between dialed digits if the number of received digits is less than the specified maximum number but within the valid number of received digits. Activation by fixed digits can also be performed for each individual number.

4. Signaling System

4.1 Signaling system between carrier networks

CCS No.7 protocol is applied to the signaling system between connecting carriers. The speed of common channel signaling links is either 4.8 kbit/s or 48 kbit/s, and the mode of signaling between carriers is either associated mode or quasi-associated mode. Which speed to use for common channel signaling links is decided by the connecting carriers in question taking equipment conditions into account.

4.1.1 Other matters required for connecting

Other matters required for establishing connection, such as installation and adding/subtracting unit of communication circuits and common channel signaling links, and method of assigning common channel signaling point codes, circuit numbers, and circuit group identification numbers, are to be decided by discussion between the carriers in question.

4.2 MTP specifications

MTP specifications conform to "TTC Standard, Inter-network Interface, Inter-network Signaling System (ISDN Inter-network Signaling System)". Version numbers of referenced TTC standards are as follows.

JT-Q701	Version 2	Established Nov. 28,1990
JT-Q702	Version 1	Established April 28,1987
JT-Q703	Version 3	Established April 27,1994
JT-Q704	Version 4	Established May 30,2002
JT-Q707	Version 2	Established Nov. 28,1990

4.3 ISUP specifications

ISUP specifications also conform to "TTC Standard, Inter-network Interface, Inter-network Signaling System (ISDN Inter-network Signaling System)". Version numbers of referenced TTC standards are as follows.

JT-Q761	Version 7	Established April 19,2001
JT-Q762	Version20	Established May 30,2002
JT-Q763	Version21.1	Established September 5,2006
JT-Q764	Version12	Established May 30,2002
JT-Q769.1	Version 2	Established November 30,2000
JT-Q850	Version 2	Established November 27,1996

Messages and codes of the ISDN user part specified by this standard are shown in the ISUP reference table (see Table 4-1/JJ-90.10), which uses JT-Q763 as a base document. Please see the JT-Q73X series for ISDN user part protocol elements providing supplementary services.

Table 4-1/JJ-90.10 ISUP Reference Table

JT-Q763 Referenced Paragraphs		Inter-network Specifications	Comments
No.	Item		
1.	General		
1.0	Scope of this standard, references, definitions, and abbreviations and acronyms	According to base document	
1.0.1	Scope of this standard		
1.0.2	References		
1.0.3	Terminology and definitions		
1.0.4	Abbreviations and acronyms		
1.0.5	Overview of the coding conventions		
1.1	Routing label		
1.2	Circuit identification code	CIC-setting field shall be 13 bits. Most significant bit shall be guaranteed to be "0" when connected with local switch.	
1.3	Message type code	According to base document	
1.4	Formatting principles		
1.5	Mandatory fixed part		
1.6	Mandatory variable part	The Starting pointer of the optional part shall be set to all 0's even for message types having no optional part. However, normal processing is performed even if this pointer is not set in message types having no optional part.	
1.7	Optional part	According to base document	
1.8	End of optional parameters octet		
1.9	Order of transmission		
1.10	Coding of spare bits	Spare bits shall be set to "0" when sending and ignored when receiving.	
1.11	National message types and parameters	According to base document	
1.12	Assignment of message type codes and parameter codes		
1.13	Meanings of spare codes and reserve codes		
2.	Parameter codes		
2.1	Message type codes	According to base document	
2.2	Coding of the length indicator		
2.3	Coding of the pointers		

JT-Q763 Referenced Paragraphs		Inter-network Specifications	Comments
No.	Item		
3.	ISDN User Part parameters		
3.1	Parameter names	According to base document	
3.3	Access transport	According to base document	
3.5	Backward call indicators		
	bits BA: Charge indicator	Uses ”00, 01, 10” in ACM. Uses ”01, 10” in ANM.	In ACM, "00:no-indication" may be set if unsure. In ANM, "01:no-charge" or "10:charge" must be set.
	bits DC: Called party’s status indicator(CLS)	Uses “00, 01”.	
	bits FE: Called party’s category indicator	Uses “00, 01, 10”.	
	bits HG: End-to-end method indicator	Uses “00”.	
	bit I: Interworking indicator	According to base document	
	bit J: End-to-end information indicator (for national use)	Uses “0”.	
	bit K:ISDN User Part indicator	According to base document	
	bit L: Holding indicator (for national use)	Uses “0”.	
	bit M:ISDN access indicator (IAI)	According to base document	
	bit N: Echo control device indicator		
	bits PO: SCCP method indicator	Uses “00”.	
3.9	Called party number	(Address signal shall be a maximum of 26 digits)	
	a) Odd/even indicator	According to base document	
	b) Nature of address indicator	Uses “0000011, 1111110”.	
	c) Inside network number indicator (INN indicator)	Uses “0”.	
	d) Numbering plan indicator	Uses “001”.	
	e) Address signal	Uses “0000～1001”.	
	f) Filler	According to base document	
3.10	Calling party number	(Address signal shall be a maximum of 16 digits)	
	a) Odd/even indicator	According to base document	
	b) Nature of address indicator	Uses “0000011, 0000100, 1111110”.	
	c) Calling party number incomplete indicator	Uses “0”.	
	d) Numbering plan indicator	Uses “001”.	
	e) Address presentation restricted (Pres. Restric.) indicator	Uses “00, 01”.	
	f) Screening indicator	Uses “01, 11”.	

JT-Q763 Referenced Paragraphs		Inter-network Specifications	Comments
No.	Item		
	g) Address signal	Uses “0000～1001”.	
	h) Filler	According to base document	
3.11	Calling party’s category	Uses “00001001, 00001010, 00001011, 00001101, 00001111”.	
3.12	Cause indicators		
	a) Extension indicator	According to base document	
	b) Coding standard		
	c) Spare		
	d) Location	Uses “0000, 0011, 0100, 0101, 0111, 1010”.	
	e) Extension indicator	According to base document	
	f) Cause value	Uses "0000001 ～ 0000101, 0010000 ～ 0010111, 0011011 ～ 0011101, 0011111, 0100010, 0100110, 0101001 ～ 0101100, 0101111, 0110010, 0111001, 0111010, 0111111, 1000001, 1000101, 1000110, 1001111, 1011000, 1011011, 1011111, 1100001, 1100011, 1100110, 1100111, 1101111,1111111".	
	g) Diagnostic	According to base document	Differs according to cause value.
3.14	Circuit state indicator (for national use)	Options shall be used to support version 1; otherwise, according to base document.	
3.20	End of optional parameters	According to base document.	
3.21	Event information		
3.23	Forward call indicators		
	bit A: National/international call indicator	Uses “0, 1”.	
	bits CB: End-to-end method indicator	Uses “00”.	
	bit D: Interworking indicator	According to base document	
	bit E: End-to-end information indicator(for national use)	Uses “0”.	
	bit F: ISDN User Part indicator	According to base document	
	bit HG: ISDN user part preference indicator	Uses “00, 01, 10”.	For a connection requiring ISUP-MF inter-working, the calling carrier network (chosen inter-exchange carrier network in the case of a chosen inter-exchange call) shall be set to "00" or "01".
	bit I: ISDN access indicator	According to base document	
	bits KJ: SCCP method indicator	Uses “00”.	
	bit L:Spare	According to base document	
	bits P-M: Reserved for national use		

JT-Q763 Referenced Paragraphs		Inter-network Specifications	Comments
No.	Item		
3.26	Generic number	(Address signal shall be a maximum of 16 digits)	
	a) Number qualifier indicator	Uses “00000110, 00000111”.	
	b) Odd/even indicator	According to base document	
	c) Nature of address indicator	Uses “0000011”.	
	d) Number incomplete indicator	Uses “0”.	
	e) Number plan indicator	Uses “001”.	
	f) Address presentation restricted indicator	Uses “00, 01”.	
	g) Screening indicator	Uses “01, 11”.	
	h) Address signal	Uses “0000～1001”.	
	i) Filler	According to base document	
3.35	Nature of connection indications		
	bits BA: Satellite indicator	Uses “00, 01, 10”.	
	bits DC: Continuity check indicator	Uses “00”.	
	bit E: Echo control device indicator	According to base document	
	bits H-F: Spare		
3.37	Optional backward call indicators		
	bit A: In-band information indicator	Uses “0, 1”.	
	bit B: Call diversion may occur indicator	Uses “0”.	
	bit C: Simple segmentation indicator	Uses “0”.	
	bit D: MLPP user indicator	Not used.	
	bits H-E Reserved for national use	According to base document	
3.38	Optional forward call indicators		
	bits BA: Closed user group call indicator	Uses “00”.	
	bit C: Simple segmentation indicator	Uses “1”.	
	bits G-D: Spare	Not used.	
	bit H: Connected line identity request indicator	Uses “0”.	
3.39	Original called number	(Address signal shall be a maximum of 16 digits)	Set when initiating call transfer.
	a) Odd/even indicator	According to base document	
	b) Nature of address indicator	Uses “0000011 , 0000100”.	
	c) Numbering plan indicator	Uses “001”.	
	d) Address presentation restricted indicator	Uses “00, 01”.	

JT-Q763 Referenced Paragraphs		Inter-network Specifications	Comments
No.	Item		
	e) Address signal	Uses “0000～1001”.	
	f) Filler	According to base document	
3.43	Range and status		
	a) Range	Uses ”1～11” for GRS and GRA, and ”0～31” for CQM and CQR.	
	b) Status	Used only for GRA	
3.44	Redirecting number	(Address signal shall be a maximum of 16 digits)	Set when initiating call transfer.
	a) Odd/even indicator	According to base document	
	b) Nature of address indicator	Uses “0000011 , 0000100”.	
	c) Numbering plan indicator	Uses “001”.	
	d) Address presentation restricted indicator	Uses “00, 01”.	
	e) Address signal	Uses “0000～1001”.	
	f) Filler	According to base document	
3.45	Redirection information		Set when initiating call transfer.
	bits CBA: Redirecting indicator	Uses “011, 100”.	
	bit D: Spare	According to base document	
	bits HGFE: Original redirection reason	Uses “0001, 0010, 0011, 0100, 0101, 0110”.	
	bits KJI: Redirection counter	According to base document	
	bit L: Reserved for national use		
	bits PONM: Redirection reason	Uses “0001, 0010, 0011, 0100, 0101, 0110”.	
3.46	Redirection number	(Address signal shall be a maximum of 16 digits)	Set when call redirection.
	a) Odd/even indicator	According to base document	
	b) Nature of address indicator	Uses “0000011”.	
	c) Internal network number indicator	Uses “0”.	
	d) Numbering plan indicator	Uses “001”.	
	e) Address signal	Uses “0000～1001”.	
	f) Filler	According to base document	
3.52	Suspend/Resume indicators	According to base document	
	bit A: Suspend/Resume indicator		
	bits B-H: Spare		
3.53	Transit network selection (for national use)		Do not set for a redirected call at a call transfer.
	a) Odd/even indicator	According to base document	

JT-Q763 Referenced Paragraphs		Inter-network Specifications	Comments
No.	Item		
	b) Network indication type	Uses “010”.	
	c) Network indication plan	Uses “0001”.	
	d) Network indicator	According to base document	
3.54	Transmission medium requirement	Uses “00000000, 00000010, 00000011”.	
3.57	User service information	According to base document	
3.60	User-to-user indicators		
	bit A: Type	Uses “1”.	
	bits CB: Service 1	Uses “00”.	
	bits D-G: Service 2 and Service 3	Uses “0000”.	
	bit H: Network discard indicator	Uses “1”.	
3.61	User-to-user information	According to base document	
3.86	Called directory number		Set in the case of local number portability or mobile number portability
	a) Odd/even indicator	According to base document	
	b) Nature of address indicator	Uses “0000011”	
	c) Numbering plan indicator	Uses “001”	
	d) Internal network number indicator (INN)	Uses “1”	
	e) Address signal	Uses “0000－1001”	
	f) filler	According to base document	
3.96	Redirection capability (for national use)		Set when initiating redirection.
	bits CBA: Redirection possible indicator	Uses “001”.	
	bits G-D: Reserved	According to base document	
	bit H: Extension indicator		
3.97	Number of redirections (for national use)		Set when initiating redirection.
	bits E-A: Number of redirections	Uses “00000～11111”.	
	bits H-F: Reserved	According to base document	
3.99	Redirect forward information (national use)		Set in the case of local number portability or mobile number portability
	a)Information type tag	Uses “00000011”	
	b)Information type length	According to base document	

JT-Q763 Referenced Paragraphs		Inter-network Specifications	Comments
No.	Item		
	c)Performing redirect indicator		
	d)Extension indicator	Uses “1”	
	e)Performing redirect reason	Uses “1111110”	
	f)Redirect possible indicator at performing exchange	Uses “001”	
3.100	Redirect backward information (national use)		Set in the case of local number portability or mobile number portability
	a) Information type tag	Uses “00000011”	
	b) Information type length	According to base document	
	c) Invoking redirect reason		
	d) Extension indicator	Uses “1”	
	e) Invoking redirect reason	Uses “1111110”	
3.103	Charge area information		Must be set in IAM except for terminal calls from an international network or satellite system.
	a) Odd/even indicator	According to base document	Must be set in ACM/CHG/CPG except for terminal calls from an international network or satellite system.
	b) Information discrimination indicator	Uses only ”0000001”.	
	c) Charge area information	According to base document	
	d) Filler		
3.104	Charge information		
	a) Unit rate indicator	Uses “11111100, 11111101, 11111110”.	
	b) Extension indicator	According to base document	
	c) Charging rate information category	Uses “1111100, 1111101, 1111110”.	
	d) Charging rate information length	According to base document	
	e) Charging rate information		
3.105	Charge information type	Uses “11111110”.	
3.106	Contractor number	(Address signal shall be a maximum of 16 digits; not used if the number information set is the same as calling party number)	
	a) Odd/even indicator	According to base document	

JT-Q763 Referenced Paragraphs		Inter-network Specifications	Comments
No.	Item		
	b)Type of number	Uses only “0000011”.	
	c) Numbering plan indicator	Uses “001”.	
	d) Address information	According to base document	
	e) Filler		
3.109	Personal station number	(Address signal shall be a maximum of 16 digits)	Set PHS number when PHS roaming.
	a) Odd/even indicator	According to base document	
	b) Nature of address indicator	Uses “0000011”.	
	c) Numbering plan indicator	Uses “001”.	
	d) Address information	According to base document	
	e) Filler		
3.110	Cause of no ID		
	a) Extension indicator	Uses “1”.	
	b) Cause of no ID	Uses “0000001, 0000010, 0000011”.	
3.111	National redirection reason		
	bits G-A: Redirection reason	Uses “1111110”.	
	bit H: Spare	According to base document	
3.112	Additional party's category		
	a) Additional party's category name	Uses “11111100, 11111101, 11111110”.	
	b) PSTN additional party's category 1	Uses “00000001, 00000010”.	
	c) Mobile additional party's category 1	Uses “00000001, 00000010, 00000011, 00000100”.	
	d) Mobile additional party's category 2	Uses “00000001, 00000010, 00000011, 00000100, 00000101, 00000110, 00000111, 00001000”.	
	e) Mobile additional party's category 3	Not used.	
3.113	Charge information delay	Uses “11111101, 11111110”.	
3.114	Carrier information transfer		
	a) Transit carrier indicator	According to base document	
	b) Carrier information name	Uses “11111011, 11111100, 11111101, 11111110”.	
	c) Carrier information sub-parameter name	Uses “11111101, 11111110”.	
	d) Carrier identification code	According to base document	
	e) POI charging area information		

JT-Q763 Referenced Paragraphs		Inter-network Specifications	Comments
No.	Item		
	f) OLEC information		Always set in IAM. POI level information is set when plural POI levels exist. Consider " Level 1" to be "local switch interconnection" and " Level 2" to be "transit switch interconnection" in POI level information.
	g) TLEC information		Always set in ACM or CPG. POI level information treatment is the same as f) OLEC information.
	h) Chosen inter-exchange carrier information		Set when selecting carrier by inter-exchange-carrier selection number. POI level information treatment is the same as f) OLEC information.
	i) Transit carrier information		Set according to contents of transit carrier indicator. POI level information treatment is the same as f) OLEC information.
	j) SCP carrier information		Not used.
	k) Original SCP carrier information		Not used.
	l) Terminal SCP carrier information		Not used.
4	ISDN user part messages and codes	According to base document	

JT-Q763 Referenced Paragraphs		Inter-network Specifications	Comments
Item No	Message Type		
Table 4-1	ACM	Uses message type, backward call indicator, optional backward call indicator, cause indicators, user-to-user indicators, user-to-user information, access transport, charge area information, charge information, charge information type, additional party's category, charge information delay, carrier information transfer, and end-of-optional-parameters indicator.	
Table 4-2	ANM	Uses message type, backward call indicator, user-to-user information, access transport, charge area information, and end-of-optional-parameters indicator.	
Table 4-3	CPG	Uses message type, event information, cause indicators, backward call indicator, access transport, user-to-user indicators, user-to-user information, charge area information, charge information, charge information type, additional party's category, charge information delay, carrier information transfer and end-of-optional-parameters indicator.	
Table 4-4	CQR	According to base document	
Table 4-5	GRA	According to base document	
Table 4-12	IAM	Uses message type, nature of connection indicators, forward call indicator, calling party's category, transit network selection, transmission medium requirement, called party number, calling party number, optional forward call indicator, redirecting number, redirection information, original called number, user-to-user information, access transport, user service information, generic number, charge area information, contractor number, personal station number, cause of no ID, national redirection reason, additional party's category, carrier information transfer, redirection capability, called directory number, number of redirections, redirect forward information and end-of-optional-parameters indicator.	
Table 4-13	REL	Uses message type, cause indicators, redirection number, user-to-user information, national redirection reason, redirect backward information, redirect counter and end-of-optional-parameters indicator.	
Table 4-14	RLC	Uses only message type.	
Table 4-18	SUS, RES	Used only message type and suspend/resume indicators.	
Table 4-19	BLO, BLA, RSC, UBL, UBA	CCR, LPA, OLM, and UCIC are not used. Parameters follow base document.	
Table 4-21	GRS, CQM	According to base document	
Table 4-29	SGM	Uses message type, access transport, user-to-user information, generic number, and end-of-optional-parameters indicator.	Use SGM during the overlap transfer of the IAM message.
Table 4-34	CHG	According to base document	

Note 1: Only necessary parameters should be used.
Note 2: Receiving of unnecessary parameters does not, however, hurt the call.
Note 3: In principle, an inter-exchange carrier relays received information in a transparent manner; a chosen inter-exchange carrier, however, may have to make changes to received information.

4.3.1 Handling of non-specified signals

The sending of non-specified signals shall be managed by the connecting carriers.

4.3.2 Typical transfer information

(1) Calling carrier

The calling carrier shall send as much of the following information (like "calling party number" and "calling charging area code") as possible regardless of the connecting carrier, connection number, etc. The calling carrier shall also accept information like "called charging area code" and "TLEC information" returned from the connecting carrier. "Charging rate information," however, shall only be accepted for a call in which the calling carrier is performing user charging. Examples of typical transfer information for a calling carrier are given in Table 4-2/JJ-90.10.

Table 4-2/JJ-90.10 Examples of Typical Transfer Information for a Calling Carrier

<table>
<tr><td>Signal Direction</td><td colspan="8">Transfer Information</td></tr>
<tr><td rowspan="2">Forward direction</td><td>Calling party number</td><td colspan="2">Contractor number</td><td>Calling charging area code</td><td>OLEC information</td><td>Transit carrier indicator</td><td>Additional party's category</td><td>Called party number</td></tr>
<tr><td colspan="2">○*1</td><td colspan="2">△*2</td><td>○*6</td><td>○</td><td>○*3</td><td>△*4</td><td>○*5</td></tr>
<tr><td rowspan="2">Backward direction</td><td rowspan="2">Called charging area code</td><td rowspan="2">TLEC informa-tion</td><td rowspan="2">Chosen inter-exchange carrier informa-tion*12</td><td rowspan="2">Transit carrier informa-tion*12</td><td colspan="3">Charging rate information*8</td></tr>
<tr><td>Unit rate indicator</td><td>Charging rate information category</td><td>Charging rate</td></tr>
<tr><td>△*6</td><td>○</td><td>△*7</td><td>△</td><td>△*9</td><td>△*10</td><td colspan="2">△*11</td></tr>
</table>

Legend: ○: Information that is always sent
△: Information that is sent only under certain conditions

*1 Not always set for an originating call from an international network

*2 If the calling party number and the contractor number are the same, the contractor number is not sent.
If the calling party number and the contractor number are different, both are sent.

*3 Actual setting contents are agreed upon by the carriers in conference.

*4 PSTN additional party's category 1: pink public telephone, train public telephone
Mobile additional party's category 1: mobile (automobile and portable phone service), mobile (maritime telephone service), mobile (in-flight telephone service)
Mobile additional party's category 2: mobile (analog), mobile (N/J-TACS), mobile (PDC 800 MHz), mobile (PDC 1.5 GHz), mobile (N-STAR satellite), mobile (cdmaOne 800 MHz), mobile (Iridium satellite) , mobile (IMT-2000)

*5 If a carrier identification number is dialed, it shall be placed at the beginning of transfer information.

*6 The calling charging area code is not always set for an originating call from an international network, satellite-system terminal, etc., and the called charging area code is not always set for an incoming call to an international network, satellite-system terminal, etc.

*7 Set only when a chosen inter-exchange carrier network is selected.

*8 Limited to connecting calls that allow transfer of charging rate information.

*9 "10 yen" / "100 yen"

*10 "Ordinary" / "pay phone"

*11 Initial lump-call rate: "none" / 1 - 15 charging units
Flexible charging rate (ordinary): 2.5 sec - 499.5 sec (0.5 sec increments)
Flexible charging rate (pay phone): 4.5 sec - 499.5 sec (0.5 sec increments)
Both ordinary and pay-phone charging rates are transferred for a call made from a pink telephone.

*12 Whether to transfer or not depends on the transit carrier indicator.

(2) Terminating carrier

The terminating carrier shall, in principle, accept transfer information like "calling party number," "contractor number," and "calling charging area code" sent from the connecting carrier. In addition, as a terminating carrier, it shall return information like "called charging area code" and "TLEC information." Examples of typical transfer information for a terminating carrier are given in Table 4-3/JJ-90.10.

Table 4-3/JJ-90.10 Examples of Typical Transfer Information for a Terminating Carrier

Signal Direction	Transfer Information								
Forward direction	Calling party number	Contractor number	Calling charging area code	OLEC information	Transit carrier indicator	Transit carrier information	Chosen inter-exchange carrier information	Additional party's category	Called party number
	○*1	△*2	○*3	○	○*4	△	△*5	△*2	○
Backward direction	Called charging area code		TLEC information						
	○*3		○						

Legend: ○: Information that is always sent
△: Information that is sent only under certain conditions

*1 Carrier identification number is not set.
Not always set for an incoming call from an international network.

*2 Transferred if the calling carrier has set the contractor number.

*3 The calling charging area code is not always set for an outgoing call from an international network, satellite-system terminal, etc., and the called charging area code is not always set for a terminating call to an international network, satellite-system terminal, etc.

*4 Whether to transfer or not depends on the transit carrier indicator.

*5 Set when a chosen inter-exchange carrier network is selected.

(3) Inter-exchange carriers and chosen inter-exchange carriers

Basically speaking, an inter-exchange carrier relays all transfer information in a transparent manner. In addition, whether or not to transfer transit carrier information and chosen inter-exchange carrier information depends on the transit carrier indicator.

For a chosen inter-exchange call (*), the chosen inter-exchange carrier always sends chosen inter-exchange carrier information to the subsequent network. A chosen inter-exchange carrier may also have to make necessary changes to received information.

(*) A call in which a calling user or carrier chooses an inter-exchange carrier by an inter-exchange carrier selection number.

(4) Setting of address information

Address information transferred between connecting carriers conforms to Table 4-4/JJ-90.10.

Table 4-4/JJ-90.10 Address Information Setting

Parameter Name	Nature of Address Indicator	Address Information	Use
Calling party number	Country code	Country code + national number	International network (overseas) calling*2
	National number	A0CDEFGHJK	Portable telephone, PHS IP telephone (Category B) calling
	National number	ABCDEFGHJ	wired-telephone IP telephone (Category A)call origination
	Network specific number	Arbitrary *1	Operator calling, etc.
Called party number	National number	A0CDEFGHJK	Portable telephone , PHS and IP telephone (Category B) terminating, Mobile number portability (ported carrier) terminating
	National number	ABCDEFGHJ	Fixed-region telephone and IP telephone (Category A) terminating, Local number portability (ported carrier) terminating
	National number	AB0～, A0～	Service-call terminating
	Network specific number	00XY～	International network (overseas) terminating, National inter-exchange connection

*1 "00XY", etc., for operator calling

*2 Not always set for an outgoing call from an international network.

5. Connection Conditions

5.1 Connection control

When connections must be barred by connection destination, connection number, etc., they shall be done so, in principle, on the calling-carrier network (on the network of the chosen inter-exchange carrier for a chosen inter-exchange call).

Note: Does not apply to connection control associated with calling terminal type, supplementary services, and the like.

5.2 Bearer capability usage conditions

Usable bearer capability shall be 3.1 kHz audio, speech or 64 kbit/s unrestricted digital information. However, if 64 kbit/s unrestricted digital information transmission cannot be provided, the carrier that cannot do so shall bar the transmission.

6. Connection Sequences

6.1 Basic concepts

(1) Connection sequences are specified here between the calling network and the terminating network.

(2) Sequences between a terminal and a network are indicated by broken lines as an aid to interpreting the inter-network sequence.

(3) Because various patterns exist for incomplete sequences and quasi-normal sequences, only some examples are given here.

(4) Terminals are assumed to be of analog type or ISDN (digital) type, and may be either wired terminals or wireless terminals like portable, automobile, PHS, etc.

(5) Timer values indicated in the connection sequences refer to JT-Q764.

(6) For simplicity, descriptions of the signal overlap function are omitted from those of the connection sequences.

6.2 Typical connection sequences

Typical connection sequences are listed in Table 6-1/JJ-90.10 and described below.

Table 6-1/JJ-90.10 Typical Connection Sequences

No	Terminal Type (Calling/Terminating)	Sequence Category*2*5
1	Analog Terminal Calling→Analog Terminal Terminating	Basic connection
2	Analog Terminal Calling→ISDN Terminal Terminating	Basic connection
3	ISDN Terminal Calling→Analog Terminal Terminating	Basic connection
4	ISDN Terminal Calling→ISDN Terminal Terminating	Basic connection
5	ISDN Terminal Calling→ISDN Terminal Terminating	Basic connection (64 kbit/s unrestricted digital information)
6	Analog Terminal Calling	Basic connection (incomplete-sequence example) *1
7	ISDN Terminal Calling	Basic connection (incomplete-sequence example) *1
8	ISDN Terminal Calling	Basic connection (incomplete-sequence example) (64 kbit/s unrestricted digital information)
9	Analog Terminal Calling→Analog Terminal Terminating	In-band supplement dial *3
10	Analog Terminal Calling→ISDN Terminal Terminating	In-band supplement dial *3
11	ISDN Terminal Calling→Analog Terminal Terminating	In-band supplement dial
12	ISDN Terminal Calling→ISDN Terminal Terminating	In-band supplement dial
13	Analog Terminal Calling	In-band supplement dial (incomplete-sequence example)
14	ISDN Terminal Calling	In-band supplement dial (incomplete-sequence example)
15	Analog Terminal Calling→Analog Terminal Terminating	Charging rate transfer *4
16	Analog Terminal Calling→ISDN Terminal Terminating	Charging rate transfer*4
17	ISDN Terminal Calling→Analog Terminal Terminating	Charging rate transfer*4
18	ISDN Terminal Calling→ISDN Terminal Terminating	Charging rate transfer*4
19	ISDN Terminal Calling→ISDN Terminal Terminating	Charging rate transfer (64 kbit/s unrestricted digital information) *4
20	Analog Terminal Calling	Charging rate transfer (incomplete-sequence example) *1*4
21	ISDN Terminal Calling	Charging rate transfer (incomplete-sequence example) *1*4
22	ISDN Terminal Calling	Charging rate transfer (incomplete-sequence example) (64 kbit/s unrestricted digital information) *4
23	ISDN Terminal Calling→ISDN Terminal Terminating	Basic connection (number portability redirection)*6*7

*1 Connection is made to a "talkie trunk for not-used number" for a REL reason indicator of "#1 (not-used number)" in an incomplete call.

*2 In the case of categories for which call type is not specified (other than 64 kbit/s unrestricted digital information), the call is "3.1-kHz audio/speech" for Analog Terminal Calling and "3.1-kHz audio/speech" for ISDN Terminal Calling.

*3 In the case of an analog-public-telephone outgoing call, no SDT is returned from the calling network to the calling terminal.

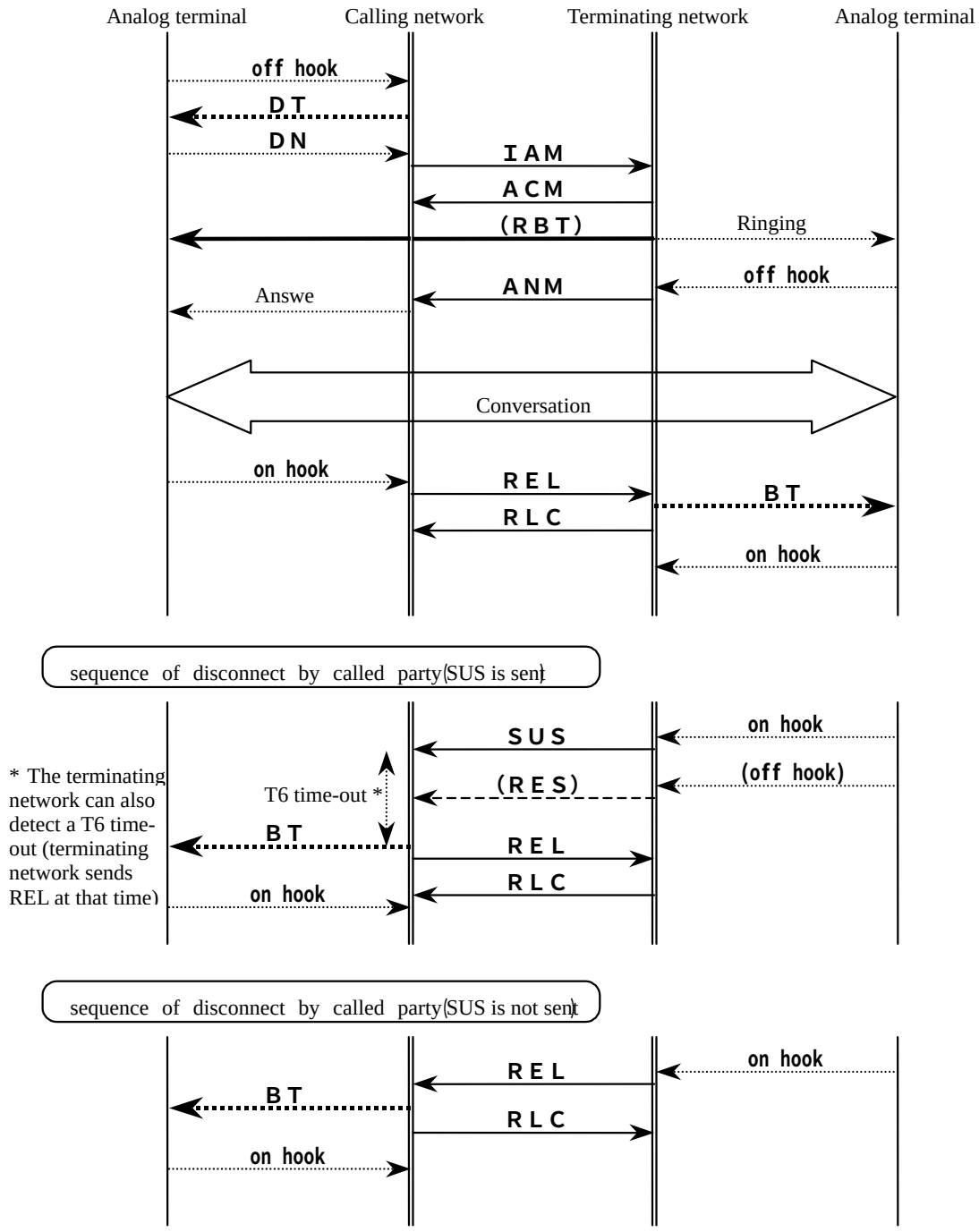
*4 Charging rate transfer is in principle performed by ACM, but will be done by CHG if application of the former is difficult.

*5 In each sequence, called area information is transferred in principle by ACM, but can also be done by CHG if application of the former is difficult.

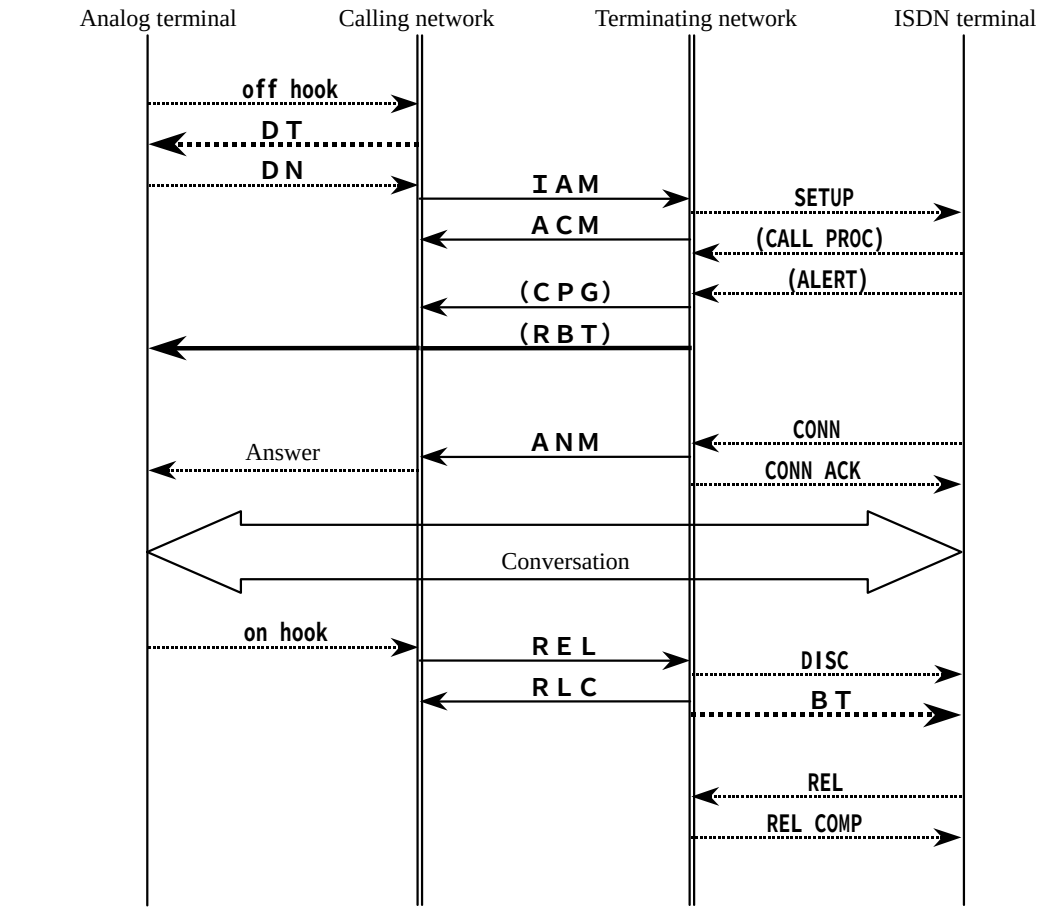
*6 This sequence is applied for analogue terminal and ISDN terminal with calling/terminating terminal type. The sequences between the each type of terminal and network are described in the basic connection No.1 – 4.

*7 In the case of charging rate transfer, the sequence between original network and terminal network are described in the sequence No.15 – 19.

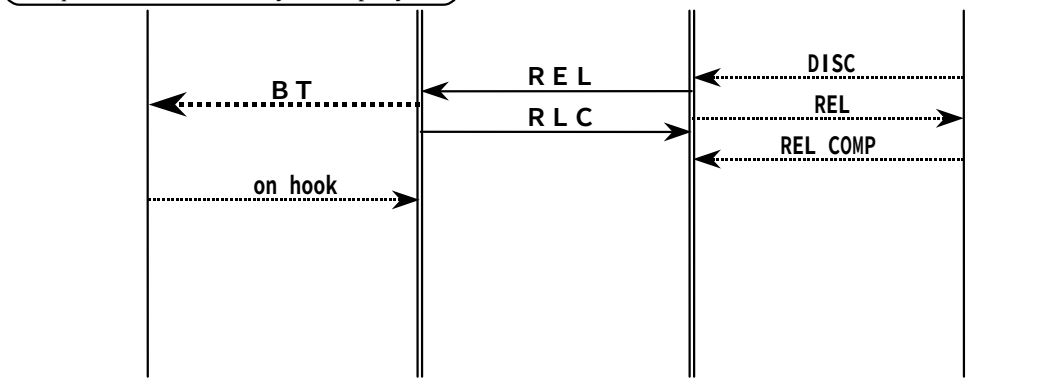
No	1	Type	Analog Terminal Calling →Analog Terminal Terminating	Category	Basic connection



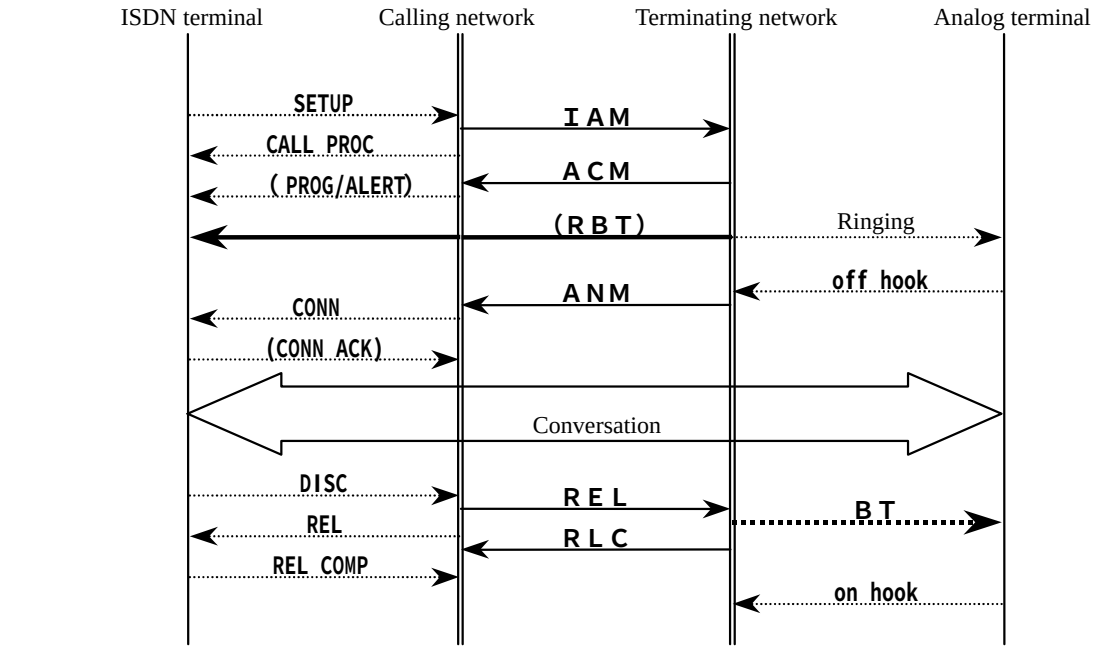
No	2	Type	Analog Terminal Calling →ISDN Terminal Terminating	Category	Basic connection



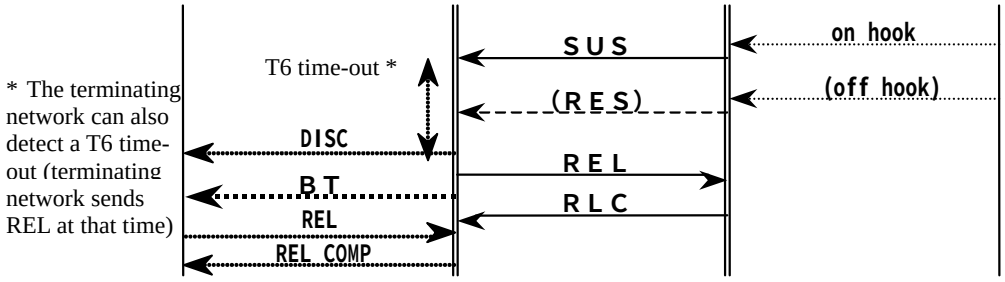
sequence of disconnect by called party first



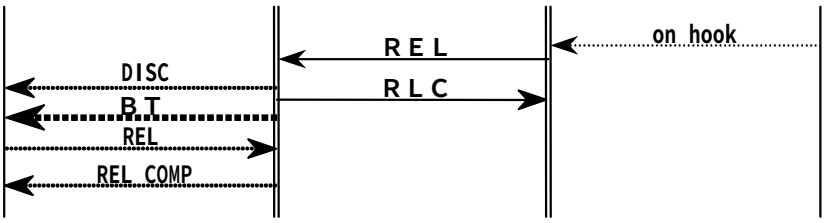
No	3	Type	ISDN Terminal Calling →Analog Terminal Terminating	Category	Basic connection



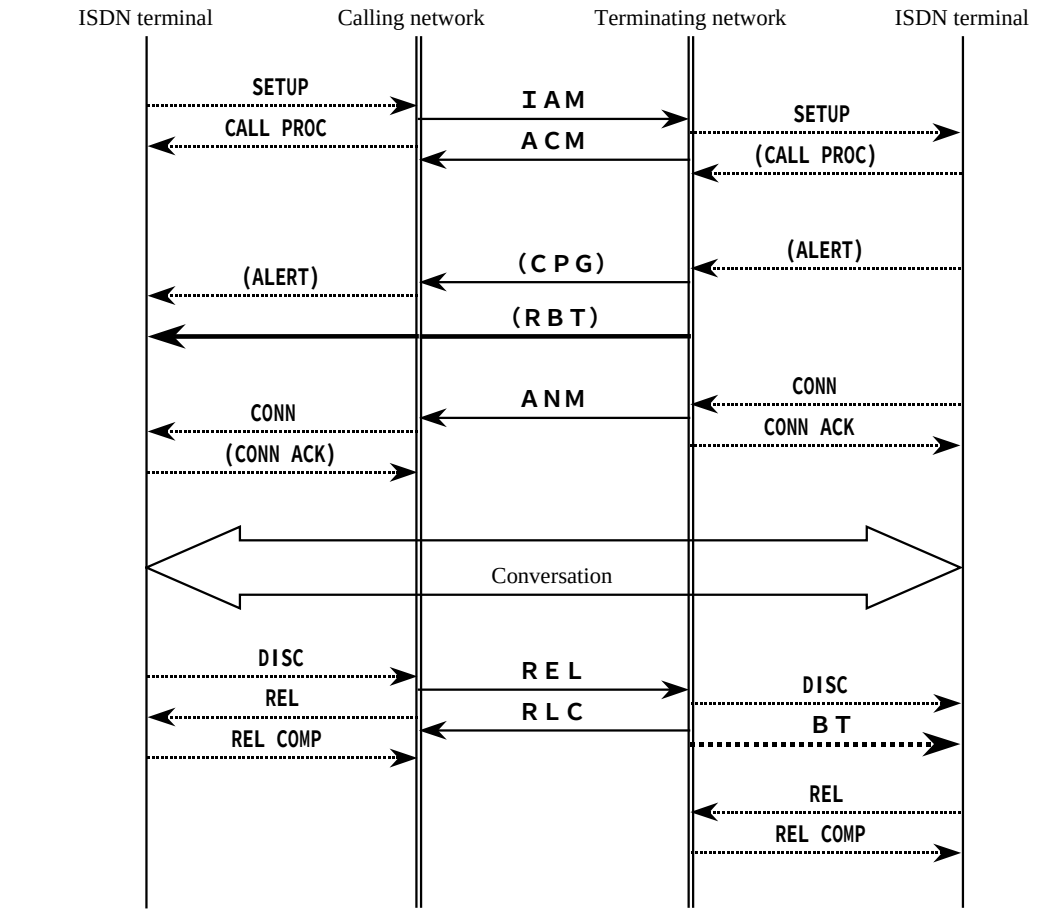
sequence of disconnect by called party (SUS is sent)



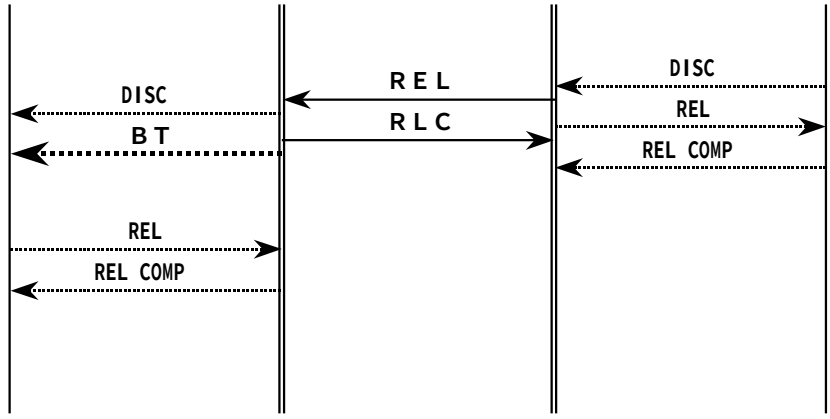
sequence of disconnect by called party (SUS is not sent)



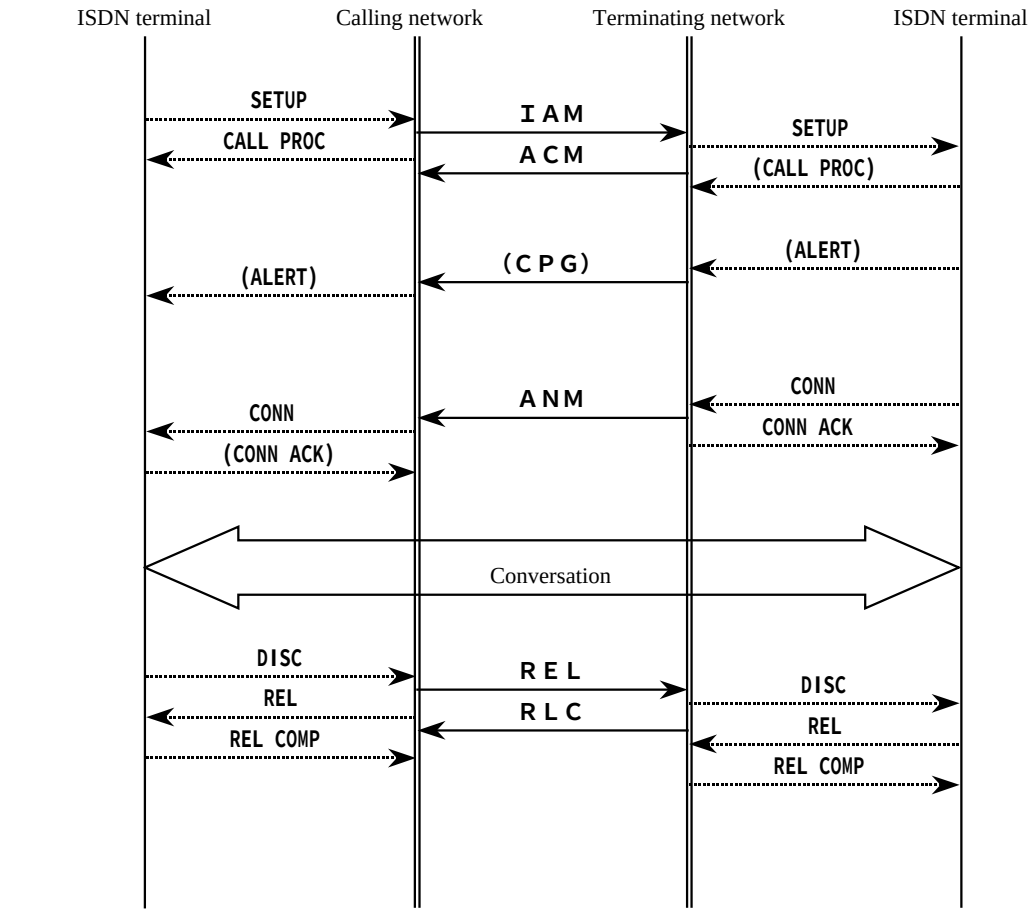
No	4	Type	ISDN Terminal Calling →ISDN Terminal Terminating	Category	Basic connection



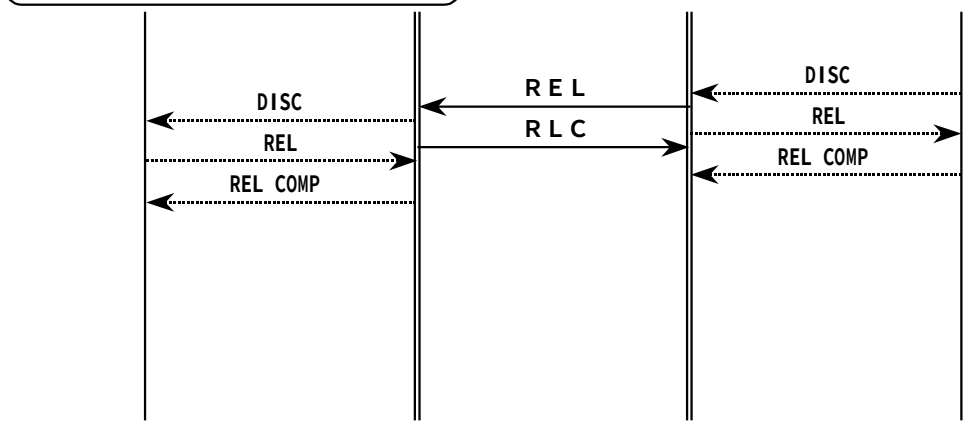
sequence of disconnect by called party first



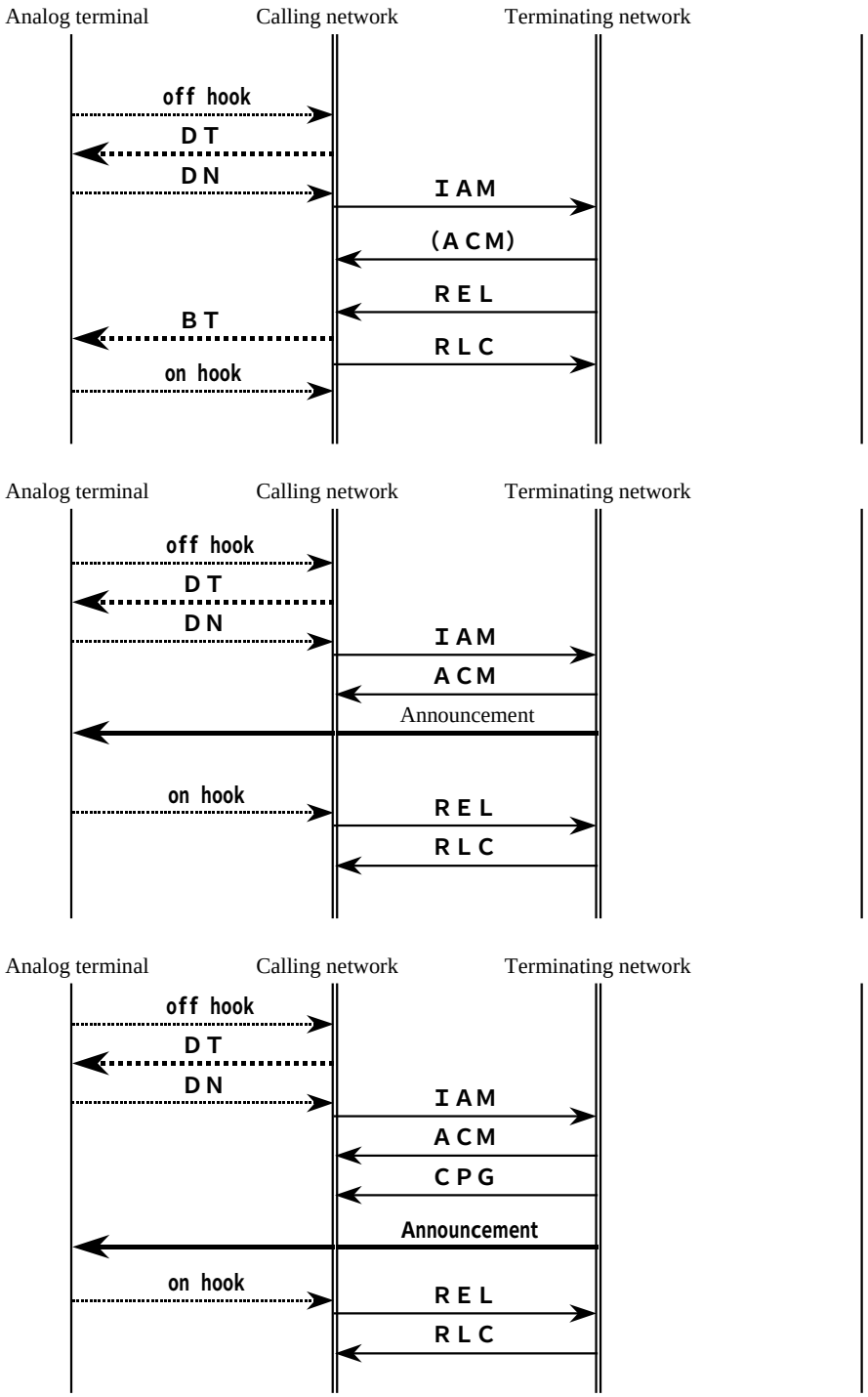
No	5	Type	ISDN Terminal Calling →ISDN Terminal Terminating	Category	Basic connection (64 kbit/s unrestricted digital information)



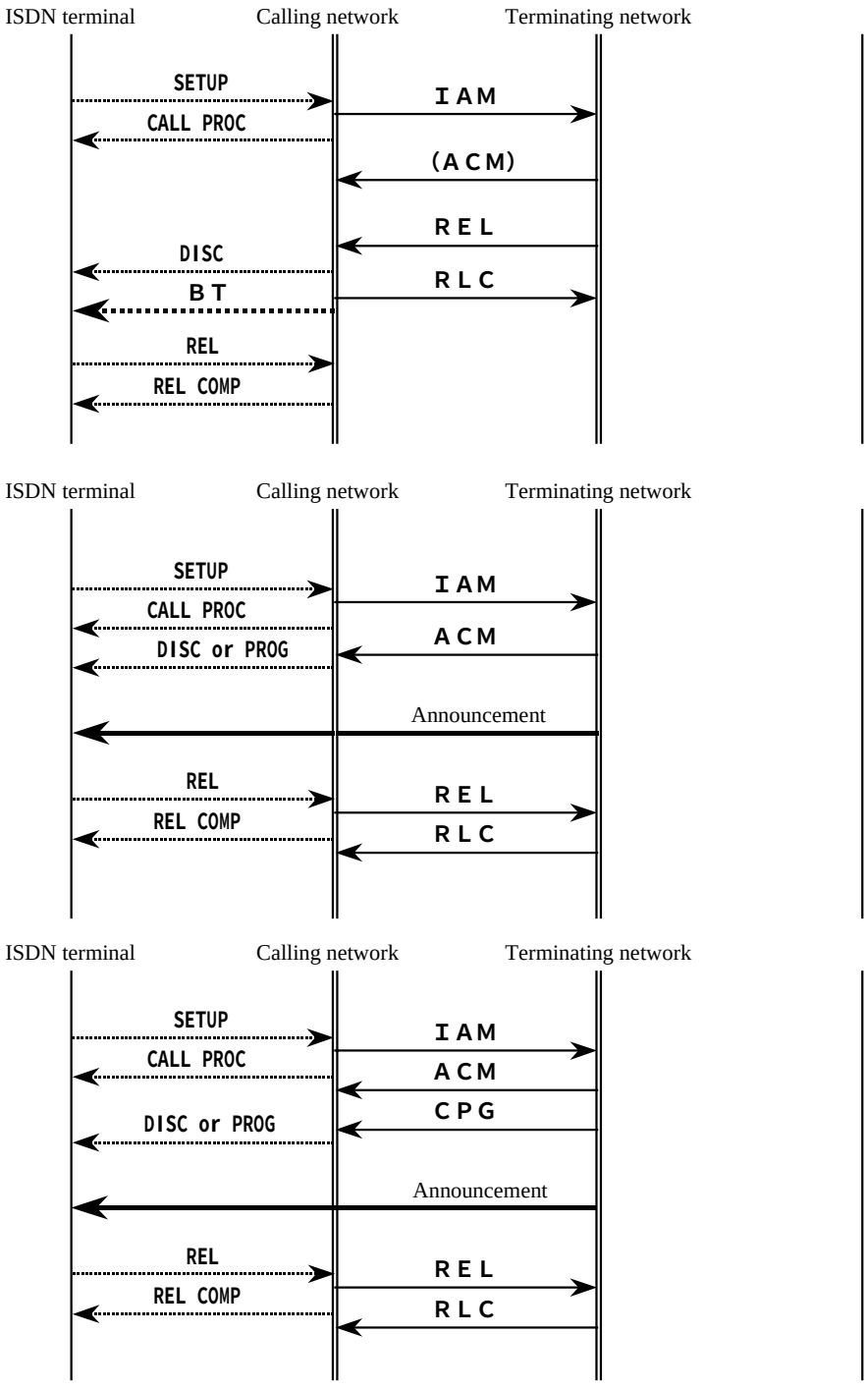
sequence of disconnect by called party first



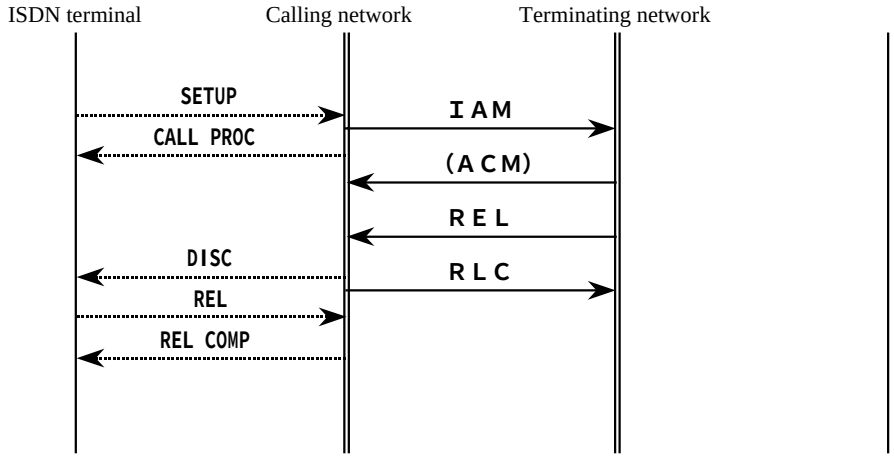
No	6	Type	Analog Terminal Calling	Category	Basic connection (incomplete-sequence example)



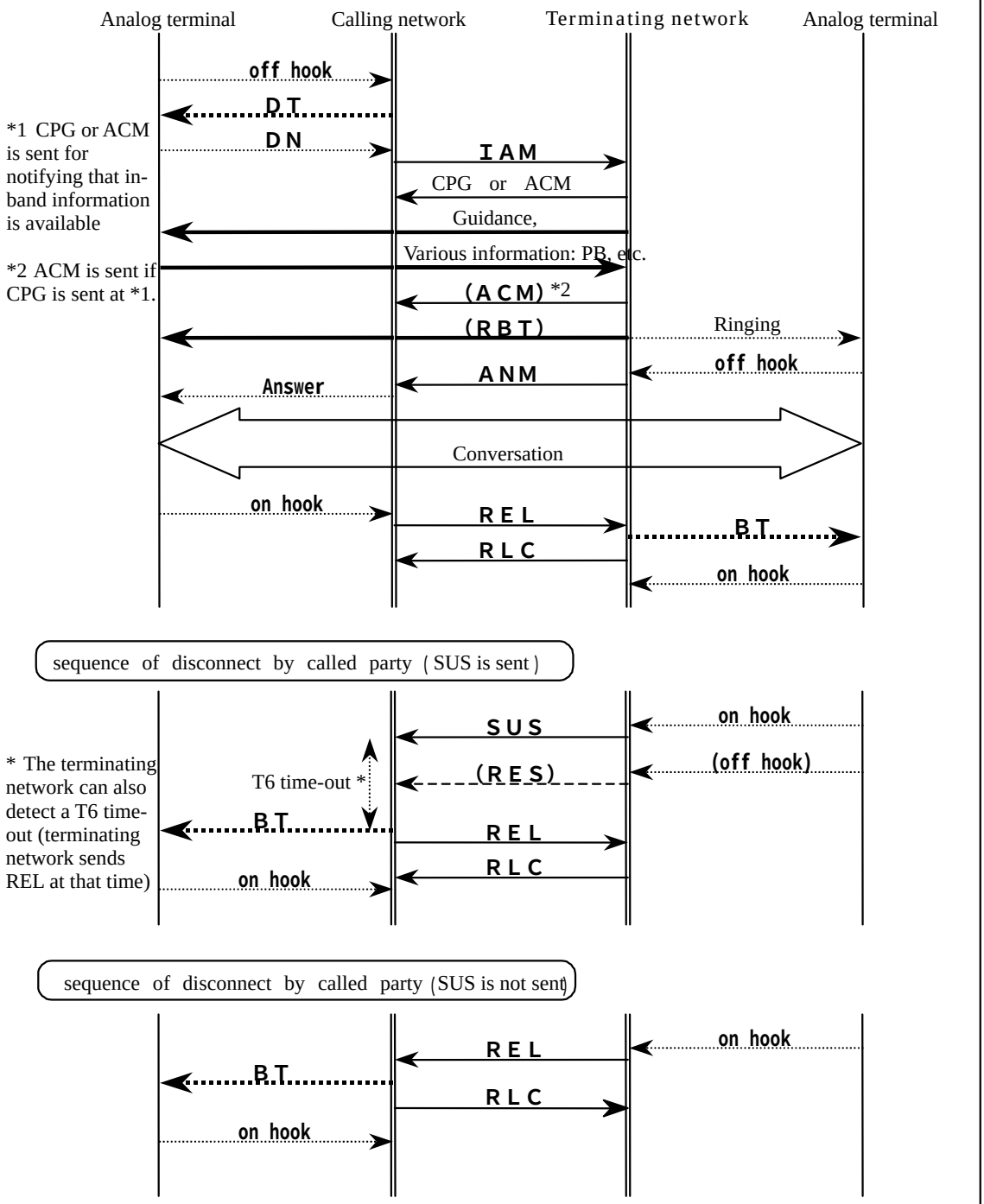
No	7	Type	ISDN Terminal Calling	Category	Basic connection (incomplete-sequence example)



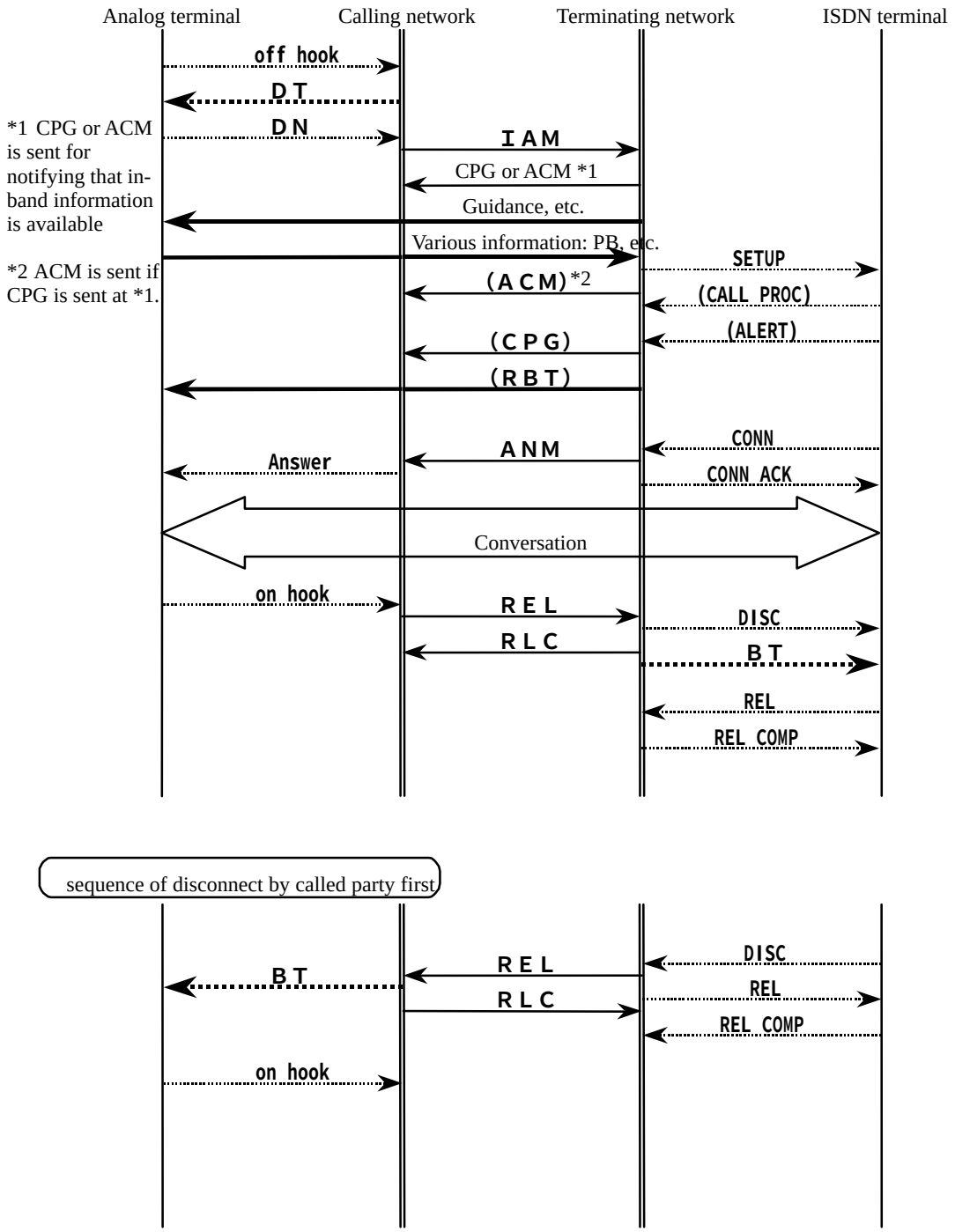
No	8	Type	ISDN Terminal Calling	Category	Basic connection (incomplete-sequence example) (64 kbit/s unristricted digital infomration)



No	9	Type	Analog Terminal Calling →Analog Terminal Terminating	Category	In-band supplement dial

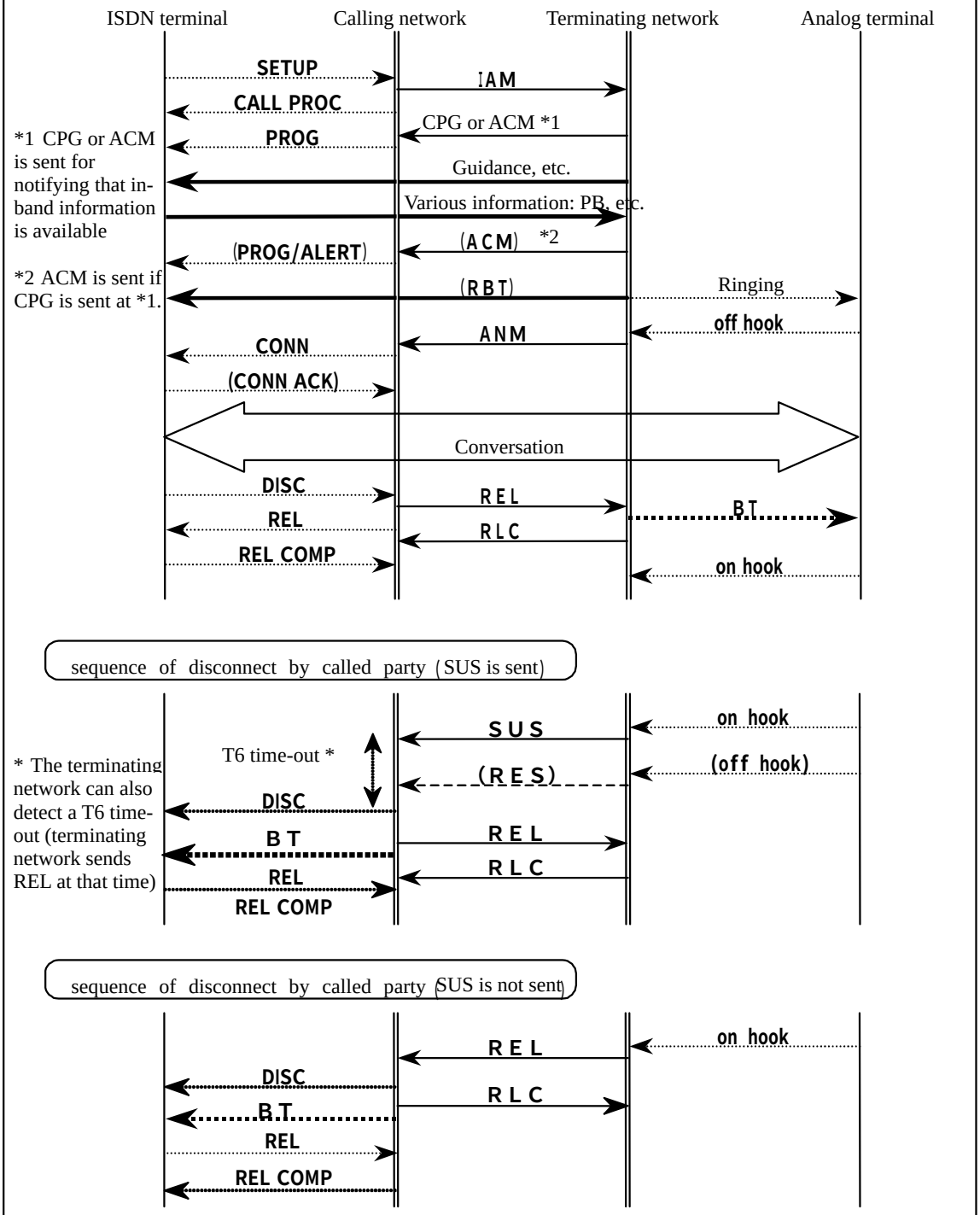


No	10	Type	Analog Terminal Calling →ISDN Terminal Terminating	Category	In-band supplement dial

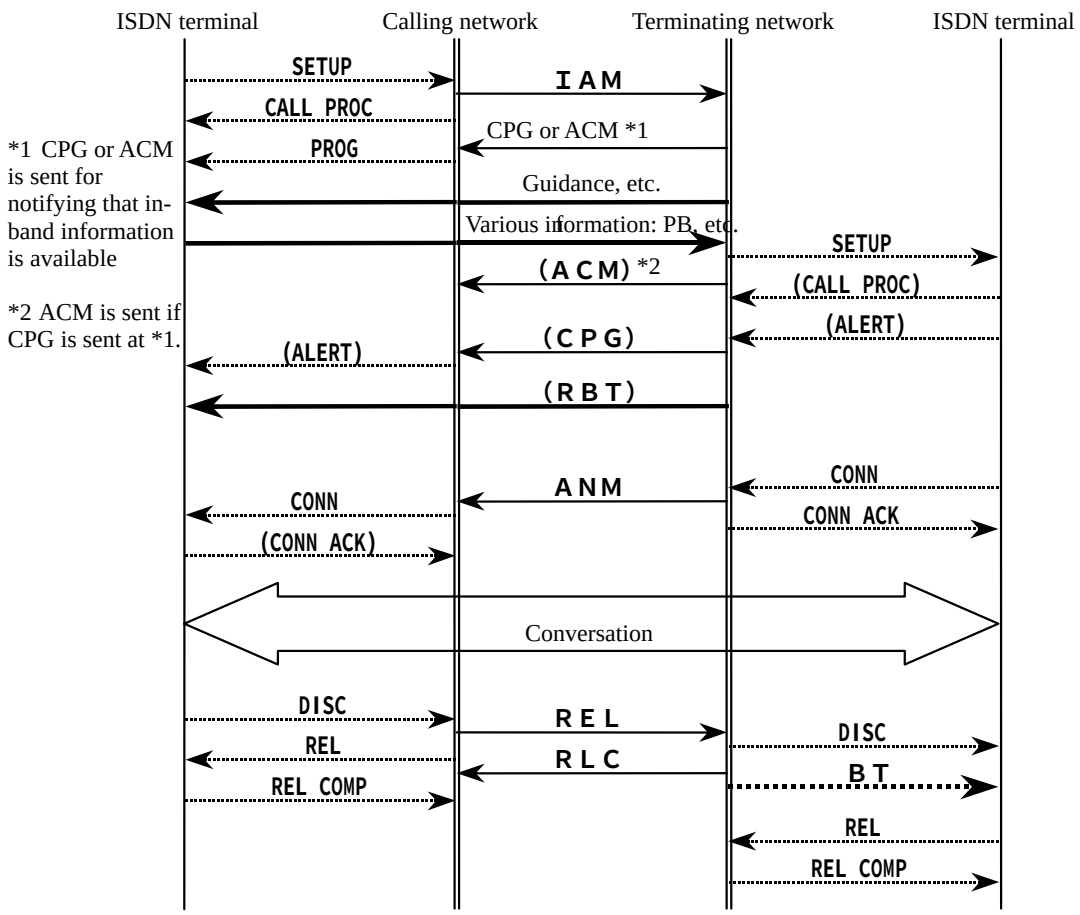


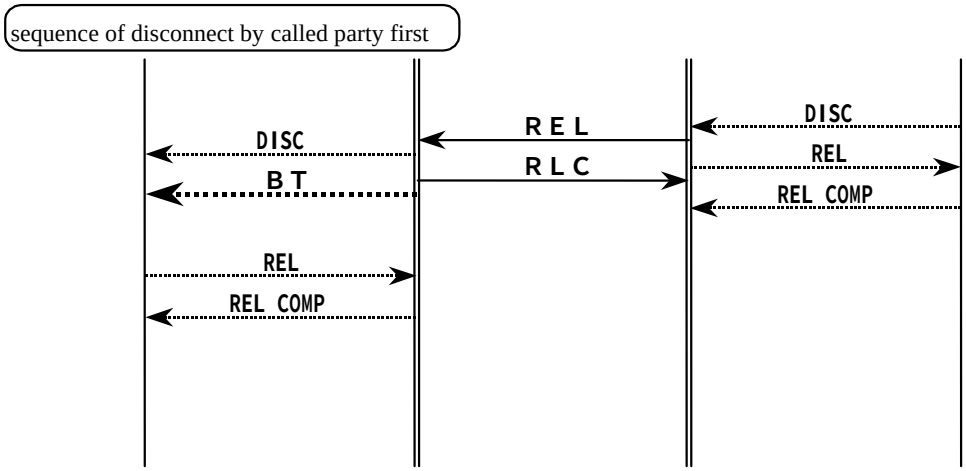
sequence of disconnect by called party first

No 11	Type	ISDN Terminal Calling →Analog Terminal Terminating	Category	In-band supplement dial

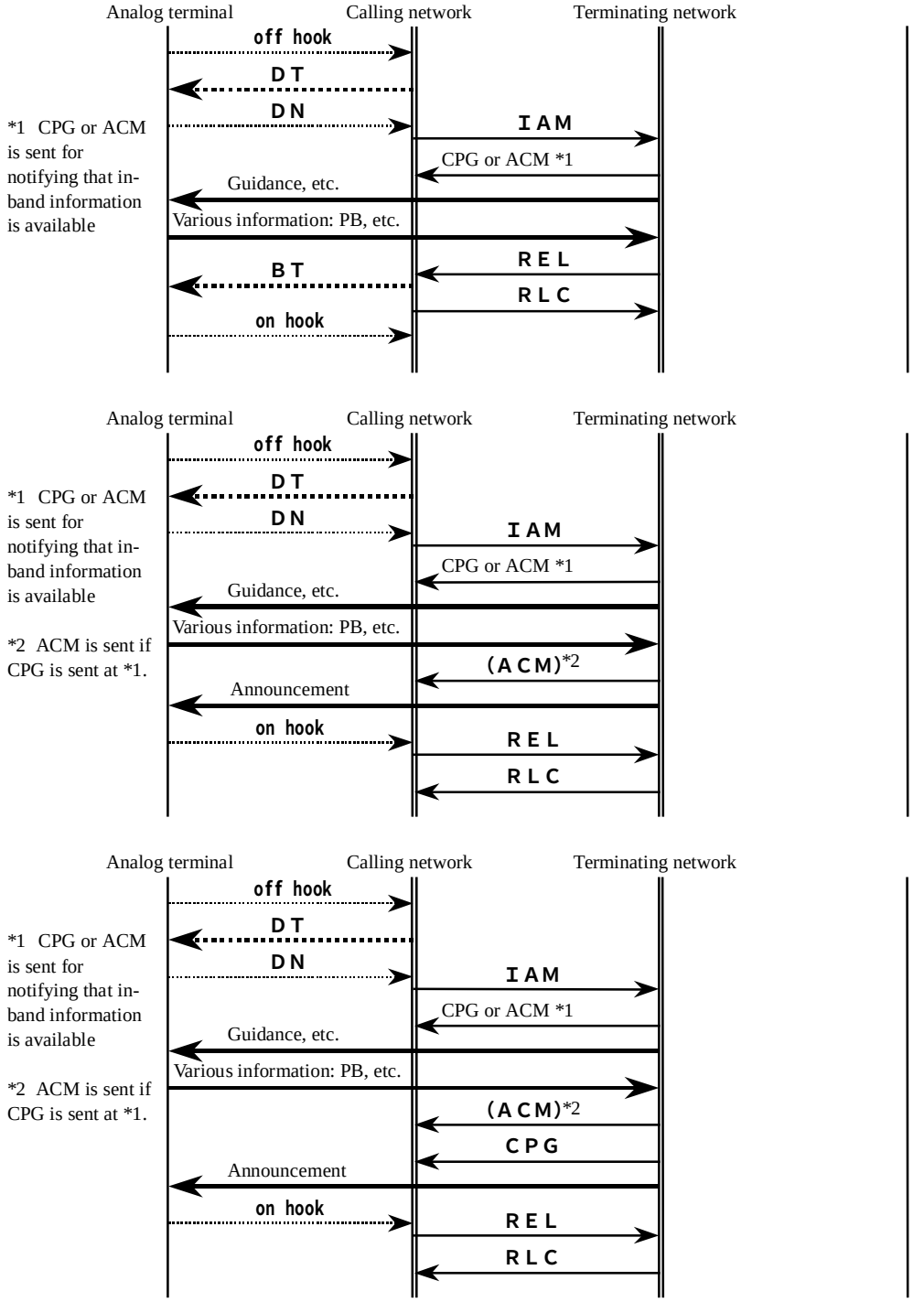


No	12	Type	ISDN Terminal Calling →ISDN Terminal Terminating	Category	In-band supplement dial

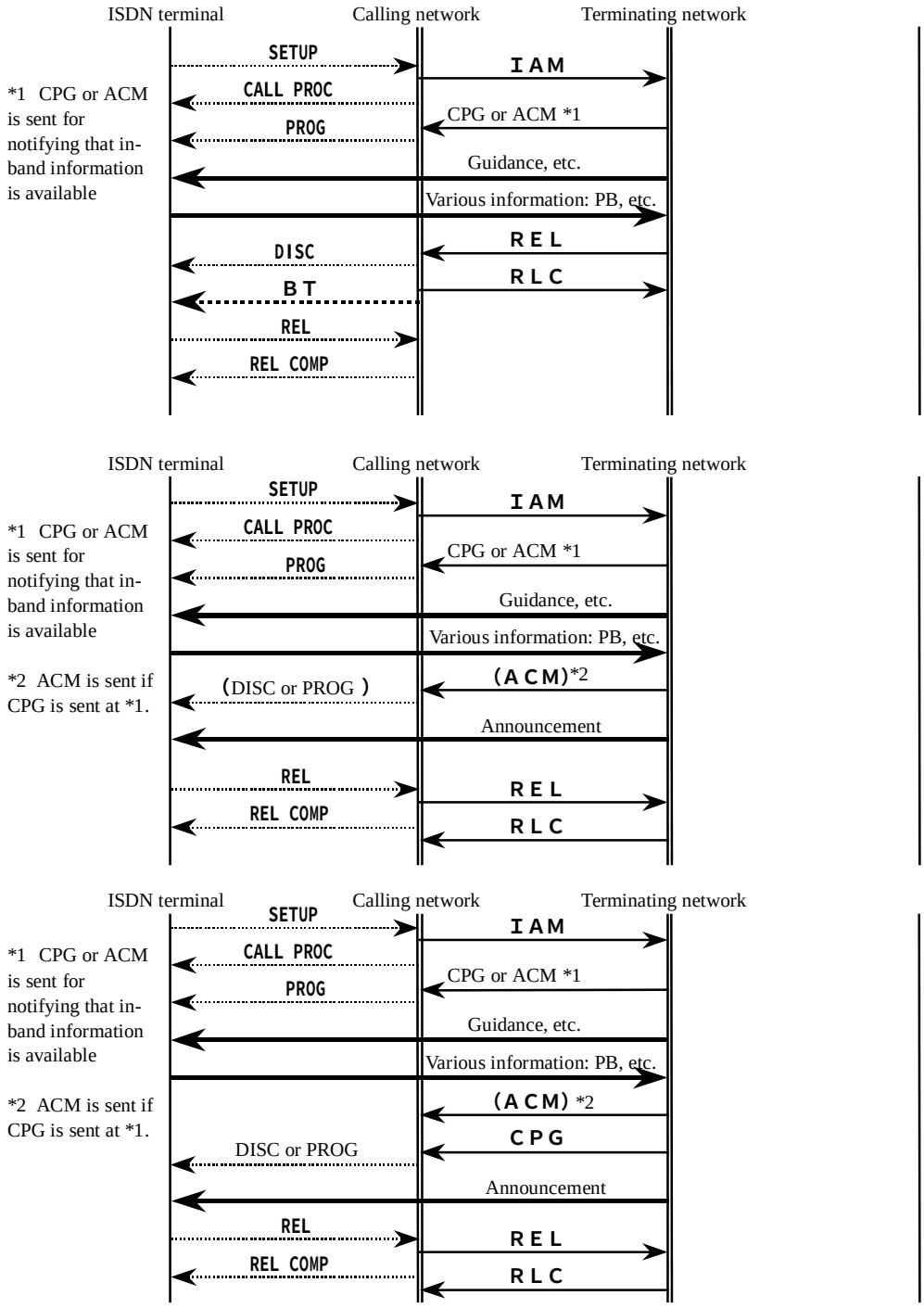




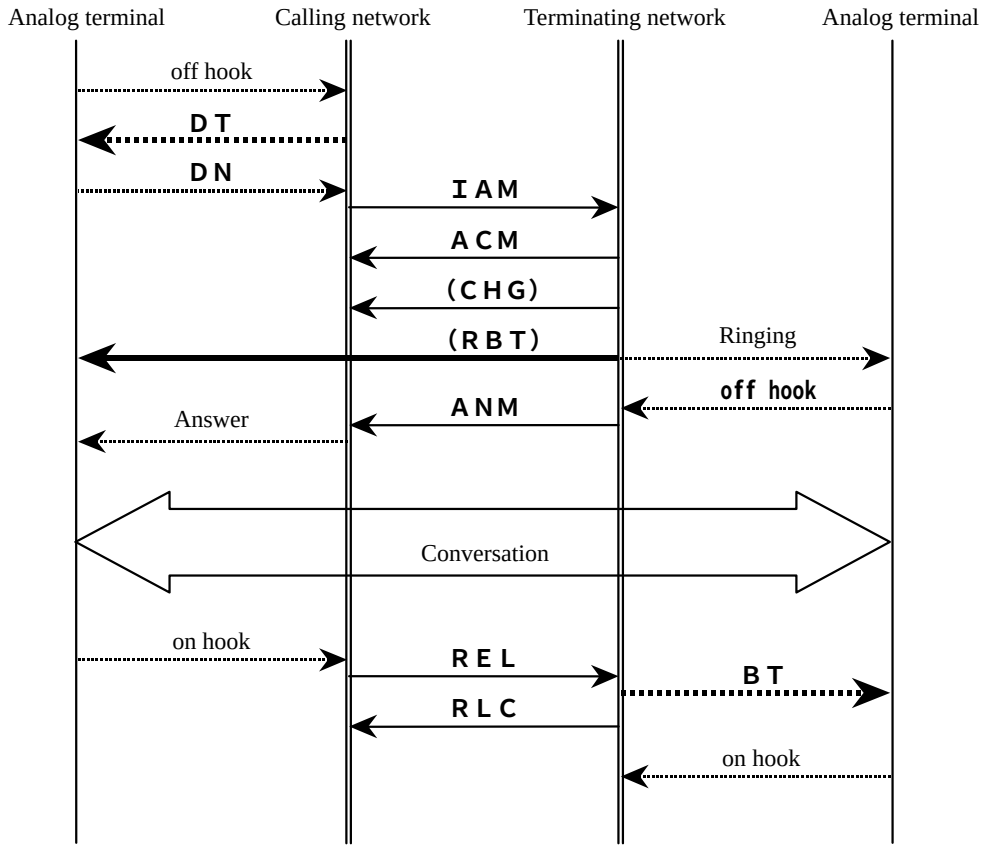
No	13	Type	Analog Terminal Calling	Category	In-band supplement dial (incomplete-sequence example)



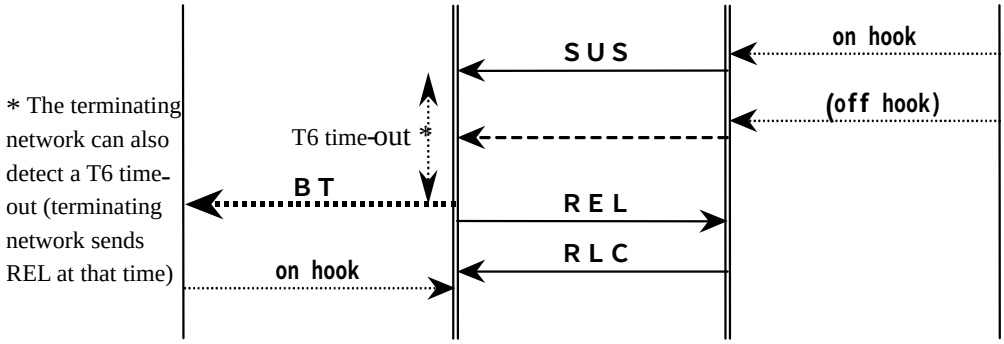
No	14	Type	ISDN Terminal Calling	Category	In-band supplement dial (incomplete-sequence example)



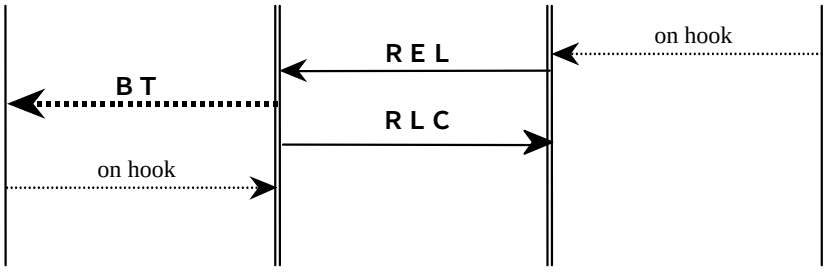
No	15	Type	Analog Terminal Calling → Analog Terminal Terminating	Category	Charging rate transfer



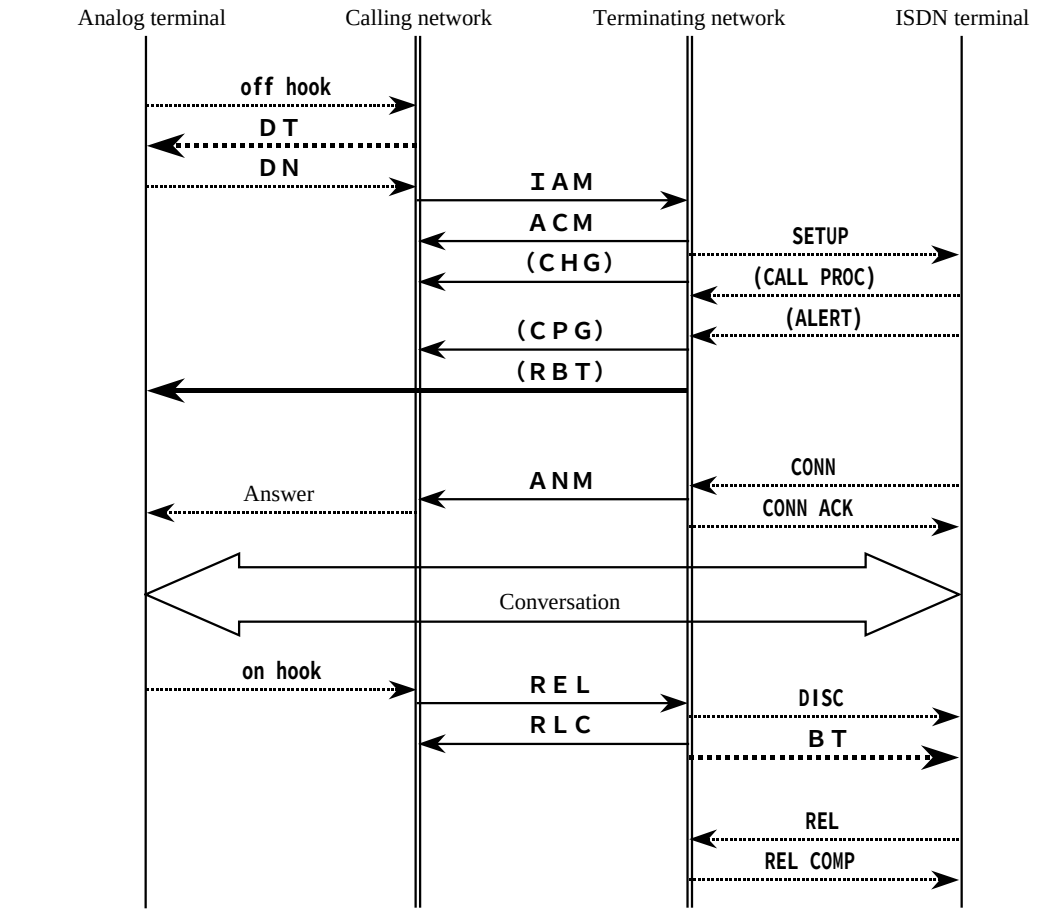
sequence of disconnect by called party first (SUS is sent)



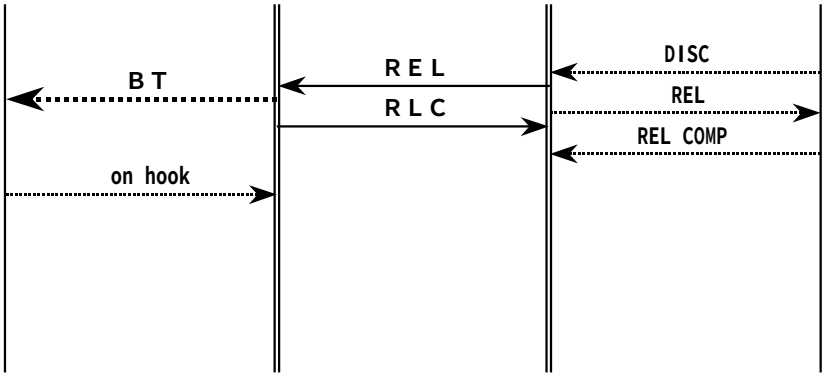
sequence of disconnect by called party first (SUS is not sent)



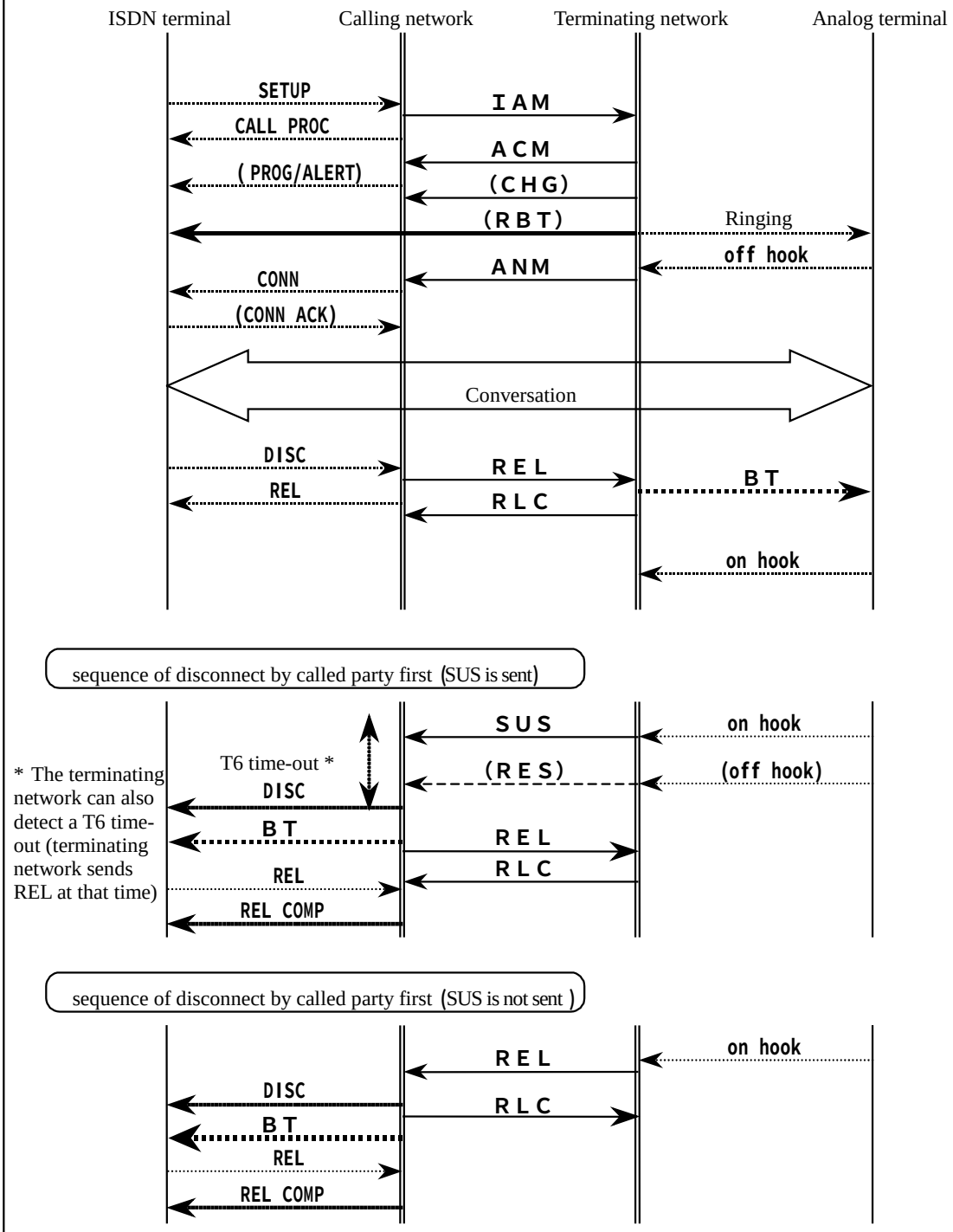
No	16	Type	Analog Terminal Calling →ISDN Terminal Terminating	Category	Charging rate transfer



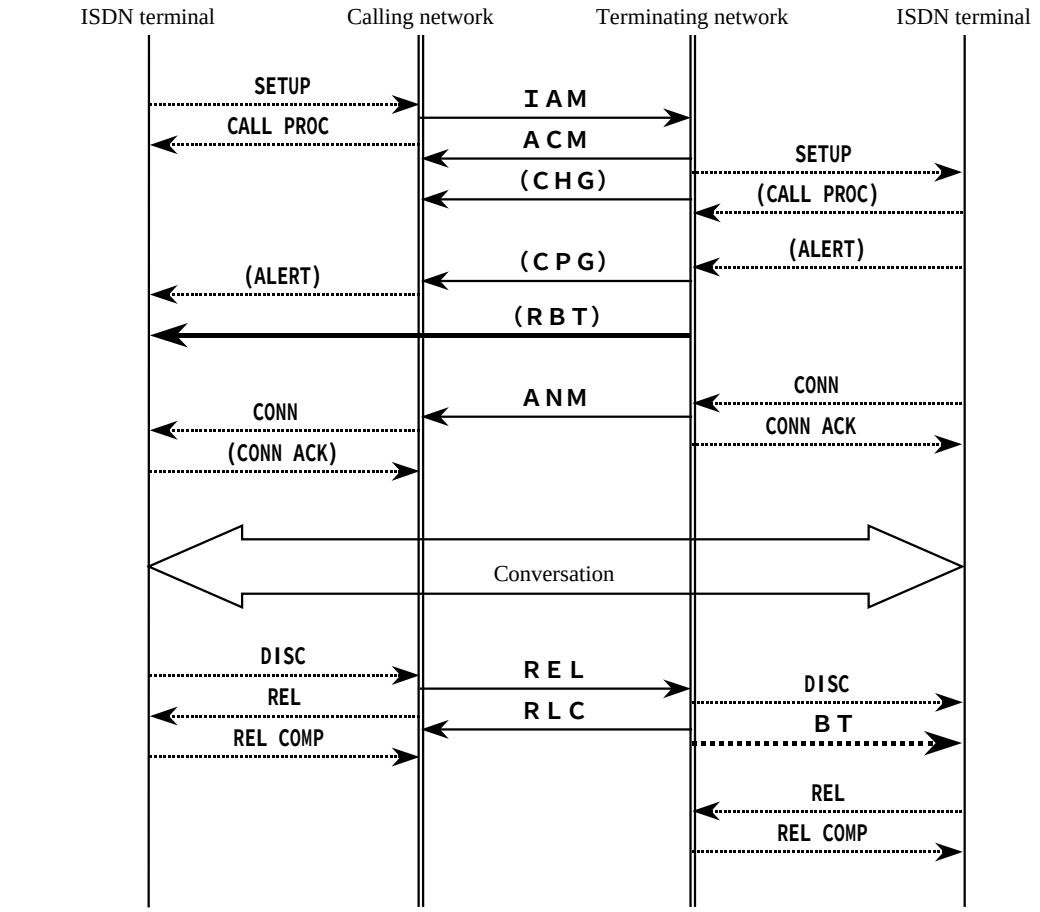
sequence of disconnect by called party first



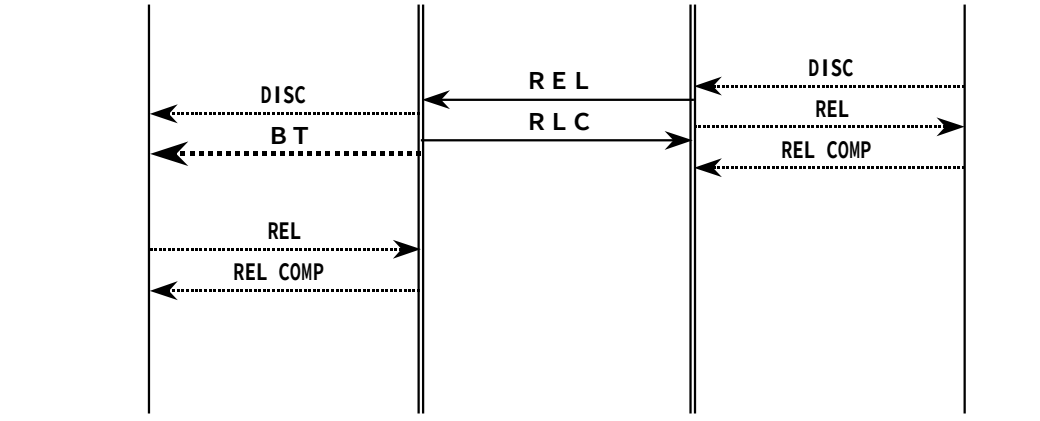
No	17	Type	ISDN Terminal Calling → Analog Terminal Terminating	Category	Charging rate transfer



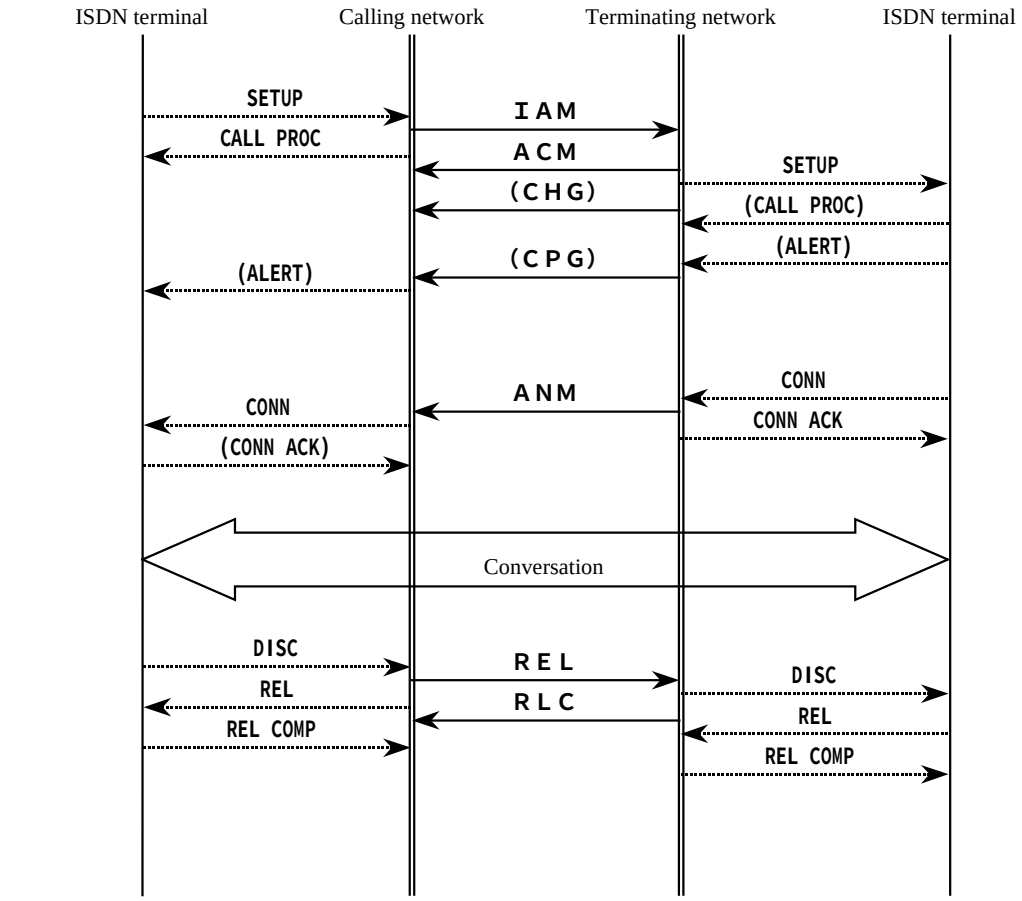
No	18	Type	ISDN Terminal Calling →ISDN Terminal Terminating	Category	Charging rate transfer



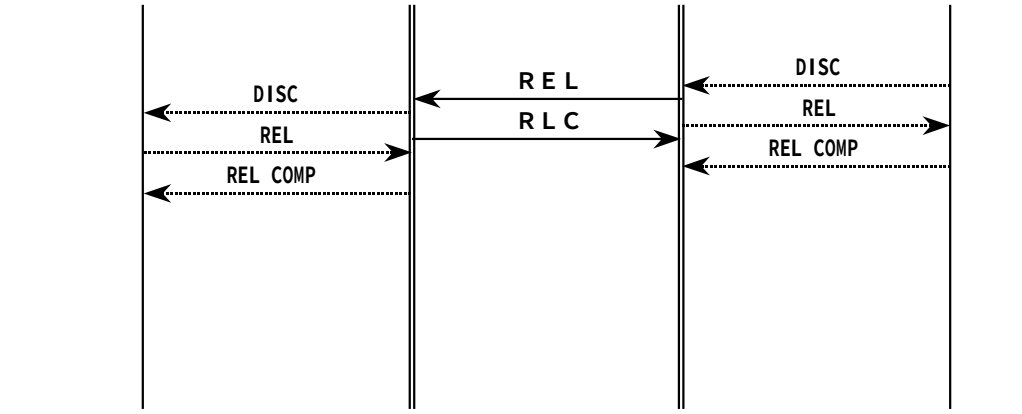
sequence of disconnect by called party first



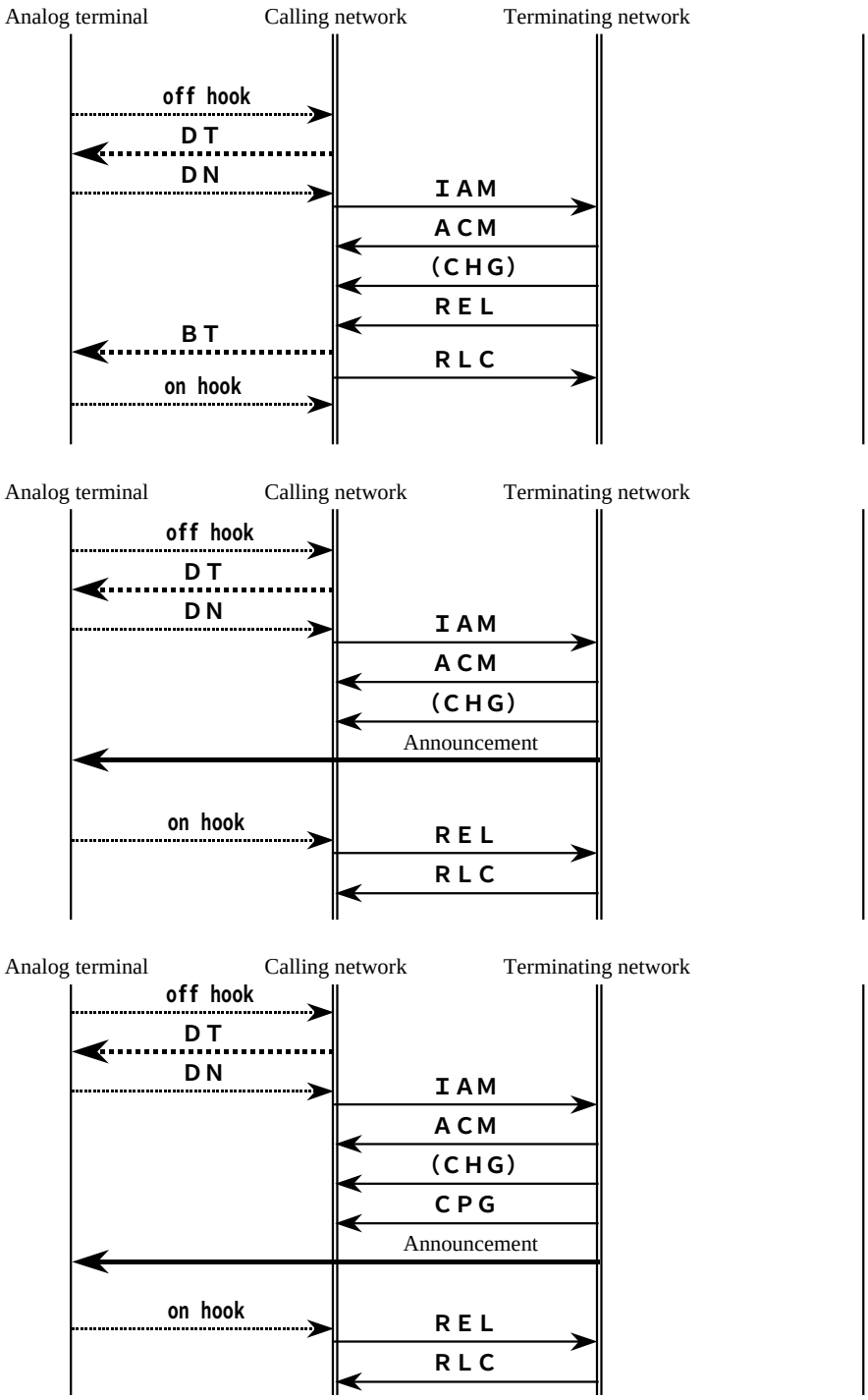
No	19	Type	ISDN Terminal Calling →ISDN Terminal Terminating	Category	Charging rate transfer (64 kbit/s unrestricted digital information)



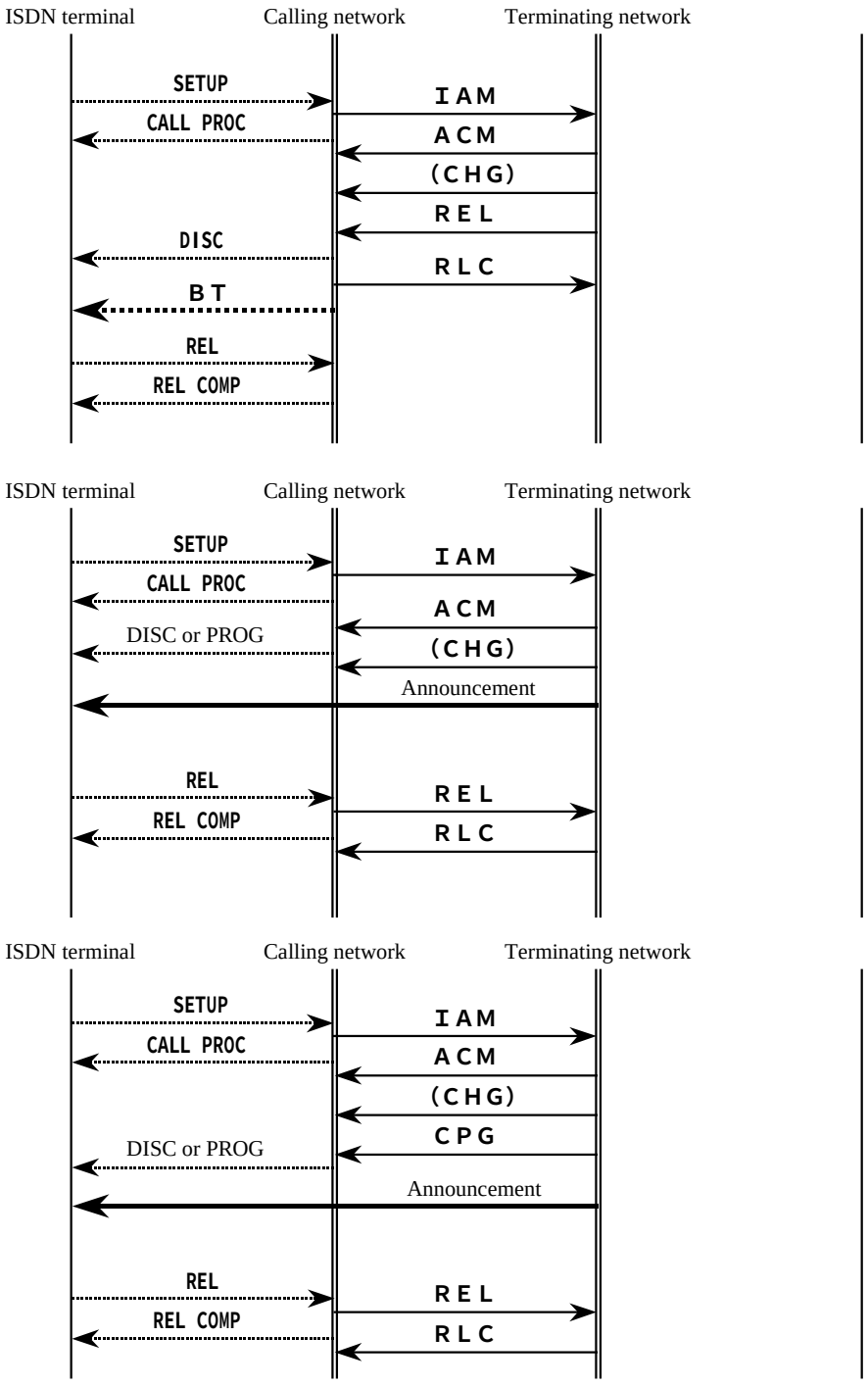
sequence of disconnect by called party first



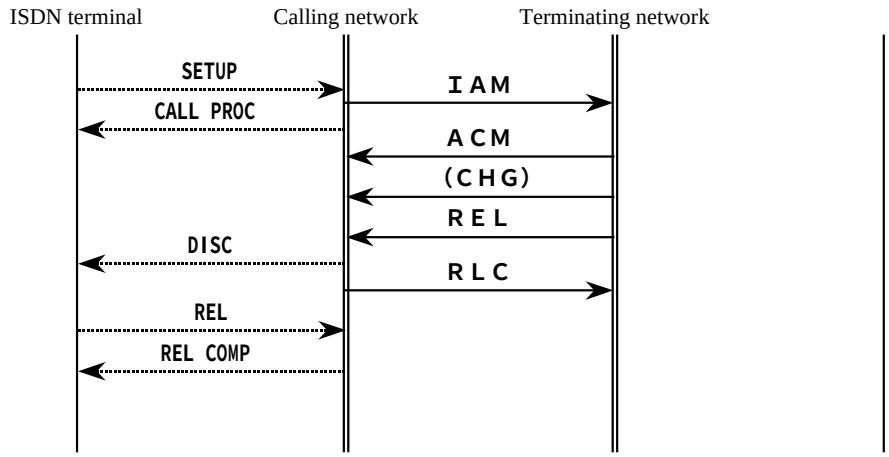
No	20	Type	Analog Terminal Calling	Category	Charging rate transfer (incomplete-sequence example)



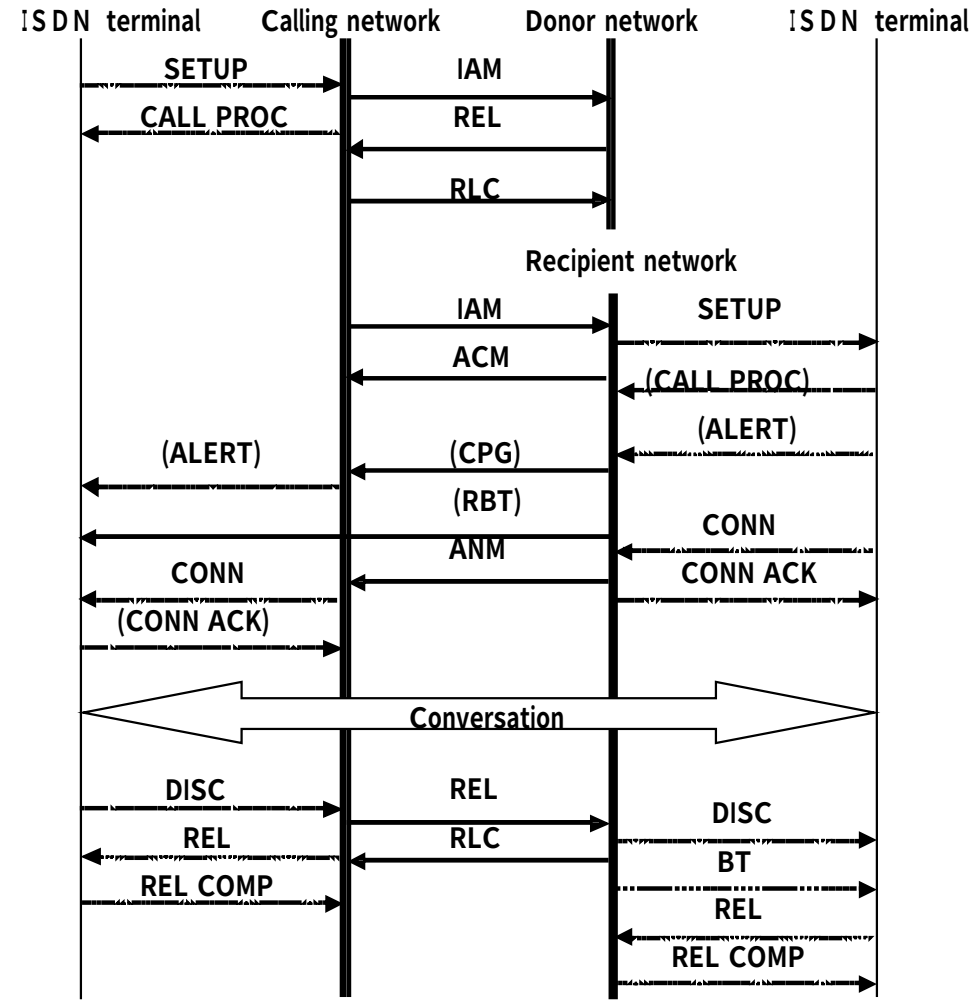
No	21	Type	ISDN Terminal Calling	Category	Charging rate transfer (incomplete-sequence example)



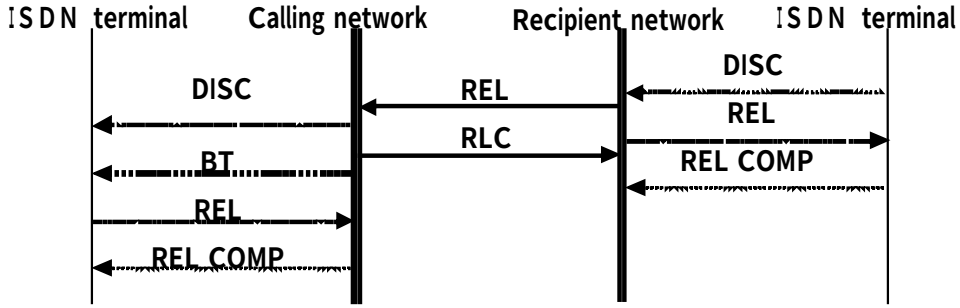
No	22	Type	ISDN Terminal Calling	Category	Charging rate transfer (incomplete-sequence example) (64 kbit/s unrestricted digital informaition)



No	23	Type	ISDN Terminal Calling →ISDN Terminal Terminating	Category	Basic connection (Number portability redirection)



Sequence of disconnect by terminal party first



7. Billing System

This section describes the user billing system and the interconnection-access-charge settlement system associated with the connection of basic calls. Connecting carriers shall hold discussions to determine an actual billing system based on the principles described here.

7.1 Using the charge indicator

In paragraph 3.4 of JT-Q763, the BA bits (charge indicator) of the backward-call-indicator parameter shall be used as a signal specifying billing (or no billing) for the end user to the preceding network. Rules for setting the charge indicator are as follows.

(1) "Charge" is sent to instruct the preceding network to bill the end user, and "no-charge" is sent to instruct no billing of the end user.

(2) When not instructing the preceding network to bill the end user, "charge" is sent out on the terminating network and the transit network relays the signal transparently.

(3) When billing the end user by the transit network, "charge" is converted to "no-charge" and sent to the preceding network.

(4) If billing or no-billing of the end user has been established at the time of ACM reply, correct information shall be set (charge or no-charge).

(5) "No-indication" shall be set only if "charge" or "no-charge" cannot be established by ACM.

7.2 Charge indicator and user billing system

The user billing system for each connecting carrier is described below.

(1) Calling carrier

1) The calling carrier establishes end-user prices

i) The calling carrier independently establishes end-user prices and bills calling users.

2) The calling carrier does not establish end-user prices but receives instructions on billing the end user from the subsequent network.

i) If the end user is not to be billed, the subsequent network sets the charge indicator in the backward call indicator to "no-charge" and sets the charge-information-type and charge information parameters as follows. In this case, the calling carrier does not bill (which, for a call made from a public pay telephone, means collecting coins or adjusting telephone card balance) the calling user.

(a) Charge information type: "charging rate transfer"

Unit rate indicator of charge information: "no-indication"

Charging rate information category of charge information is set to "no flexible charging rate information".

or

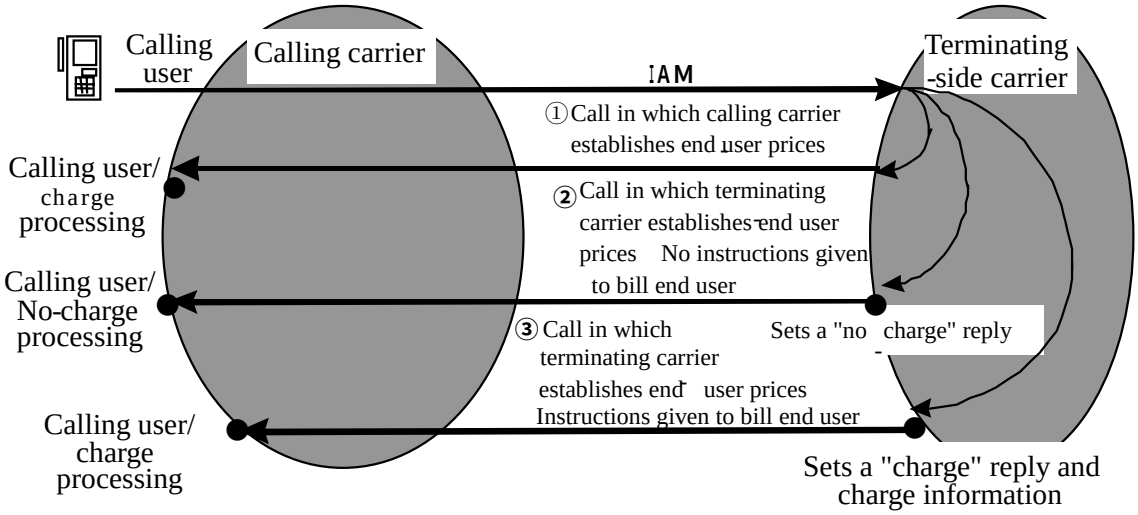
(b) The charge-information-type and charge information parameters are not set.

ii) If the end user is to be billed, the subsequent network sets the charge indicator in the backward call indicator to "charge" and sets charging rate information. In this case, the calling carrier bills (which, for a call made from a public pay telephone, means collecting coins or adjusting telephone card balance) the calling user according to

this charging rate information.

iii) Situations other than i) and ii) above are not permitted for the sake of protecting the calling user.

A conceptual diagram of the relationship between the charge indicator and the user billing system is shown in Fig. 7-1/JJ-90.10.



Note: Here, "terminating-side carrier" means either an inter-exchange carrier or terminating carrier.

Figure 7-1/JJ-90.10 Charge Information and End-user Billing

(2) Terminating carrier

For a call in which the terminating carrier establishes end-user prices, it returns the charge indicator as "charge" to instruct the preceding network to bill the end user or as "no-charge" to instruct the preceding network to bill. On the other hand, for a call in which the terminating carrier does not establish end-user prices, it returns the charge indicator as "charge".

(3) Inter-exchange carrier

For a call in which the inter-exchange carrier establishes end-user prices, it returns the charge indicator as "charge" to instruct the preceding network to bill the end user or as "no-charge" to instruct the preceding network to bill. For a call in which the inter-exchange carrier does not establish end-user prices, it will, in principle, transparently relay the charge indicator set by the subsequent network.

7.3 Charging rate information

Charging rate information is passed on as follows.

Unit rate : 10 yen/100 yen (only 10 yen for a call from a pink public telephone)

Initial lump-call rate: "none" / 1 - 15 message units (only "none" for calls from a pay phone/pink public telephone)

Flexible charging rate (ordinary): 2.5 sec - 499.5 sec (0.5 sec increments)

Flexible charging rate (pay phone): 4.5 sec - 499.5 sec (0.5 sec increments)

Both ordinary and pay-phone charging rates are transferred for a call made from a pink public telephone. At this time, the subscriber is billed according to the "ordinary" charging rate and the coin collection message is sent to the pink public telephone according to the "pay phone" charging rate.

An example of time periods for setting charging rates are shown in Table 7-1/JJ-90.10.

Table 7-1/JJ-90.10 Time Periods for Setting Charging Rates

Charging Interval Information	Time Period
1st charging interval	Daytime: 8:00 AM - 7:00 PM
2nd charging interval	Evening: 7:00 PM - 11:00 PM (includes "daytime" on Saturdays, Sundays, holidays)
3rd charging interval	Late-night/early-morning: 11:00 PM - 8:00 AM
4th charging interval	Reserved: Sets the lowest rate of 1st to 3rd charging intervals

Note 1:Charging rates must be set for all charging intervals (1st to 4th) even if the same.
Note 2: The charging rate for the 4th charging interval is used during abnormal clock operation on a switch.

7.4 Access charge

For a call in which a connecting carrier does not establish end-user prices, an access charge is calculated separately and billed to the other connecting carrier as agreed upon by discussion.

(1) Billing start/stop for access charges

Start: When the answer message (ANM) is detected

Stop: When the release message (REL, etc.) is detected

(2) Calls targeted for billing of access charges

All calls other than those below are targeted for billing of access charges regardless of charge indicator settings ("charge/no-charge").

1) Test calls

2) Calls for which connections could not be made (unsuccessful calls, etc.)

Appendix A

Inter-carrier Test System

1. Basic Concepts

(1) Purpose of test system includes preventive maintenance, failure search in the event of fault occurrence, restoration confirmation, and functional checks when installing new equipment.
(2) Depending on the type of test, each carrier shall set up an Automatic Answer Trunk (AAT) and/or a Loop Trunk (LPT) at the gateway switch to enable interconnection tests to be performed by other carriers.
(3) In principle, each carrier shall be responsible for testing its own equipment (a carrier shall not perform tests on another carrier's equipment).
(4) Tests are generally performed between adjacent carriers. Even in the case of connection among multiple carriers, basic connection verification shall be performed between adjacent carriers.
(5) Test calls are distinguished by calling-user-type "test-call" of an IAM signal.

2. Types of Tests

(1) Manual connection test (mandatory function)

Each carrier shall set up an Automatic Answer Trunk (AAT) in the gateway switch and provide the following manual connection test function.

(a) No charging rate, AAT connection

(2) Manual connection test (optional functions)

Carriers providing any of the following functions shall set up an Automatic Answer Trunk (AAT) or Loop Trunk (LPT) in the gateway switch and provide the corresponding manual connection

(b) 64K unrestricted digital call connection	With no charging rate, LPT connection
(c) harging rate information transfer	With charging rate, AAT connection, no CHG
(d) Same as (c) using CHG	With charging rate, AAT connection, with CHG
(e) Same as (c) with no CHG, 64K unrestricted digital call connection	With charging rate, LPT connection, no CHG
(f) Same as (c) with CHG, 64K unrestricted digital call connection	With charging rate, LPT connection, with CHG

AAT incoming calls are distinguished from LPT incoming calls by the transmission medium requirement (connects to LPT in the case of 64K unrestricted digital calls).

(3) Circuit matching test

A circuit matching test shall be provided to verify circuit names, circuit numbers, and quality of the connection between the calling-side test functions. switch and terminal-side switch using voice confirmation when circuits are connected.

(4) Common channel test

A function to verify the normality of signal links by manual signal route test and a circuit-reference-test function shall be provided.

3. Inter-network Numbering Configuration for Manual Connection Tests

(1) Testing by PSTN(Public Switched Telephone Network and IP telephone (Category A)) number

Testing with a carrier switch having PSTN and IP telephone (Category A) numbers shall be performed, in principle, with the following number format.

area code + local exchange number + XXXX

area code: Typical area code used by carrier

XXXX: subscriber number for inter-network test allocated for each circuit group to be connected (ex: 0060)

Note that a separate subscriber number (ex: 2599) must be allocated for intra-network routing tests.

(2) Testing by carrier-chosen numbers

Testing with a carrier switch having carrier-chosen numbers shall be performed, in principle, with either of the following number formats.

$00X_1X_2 + Y_1Y_2 + 1 + 12Z$
$00X_1X_2 + 010 + Y_1Y_2 + 1 + 12Z$

Y_1Y_2: two arbitrary digits with Y_1 other than 0 (exs: 81, 99)
Z: test category code
1 (with no charging rate), 6 (with charging rate, with no CHG), 7 (with charging rate, with CHG)

(3) Testing by portable-phone, PHS, and pager service identification numbers

Testing with a carrier switch having portable-phone, PHS, and pager service identification numbers shall be performed, in principle, with the following number format.

A0 + CDE + 12Z

A: 2 (pager), 7 (PHS), 8 or 9 (portable-phone)
CDE: carrier identification code (one required for each carrier, and C exculudes 0)
Z: test category code
1 (with no charging rate), 6 (with charging rate, with no CHG), 7 (with charging rate, with CHG)

(4) Testing by Type II Telecommunications Carrier connection numbers

Testing with a carrier switch having Type II Telecommunications Carrier connection numbers shall be performed, in principle, with the following number format.

$0091 + N_1N_2 + Y_1Y_2 + 1$

N_1N_2: carrier identification code (one required for each carrier)
Y_1Y_2: two arbitrary digits with Y_1 other than 0 (exs: 81, 99)

(5) Testing by IP telephone (Category B) service identification numbers

Testing with a carrier switch having IP telephone (Category B) service identification numbers shall be performed, in principle, with the following number format.

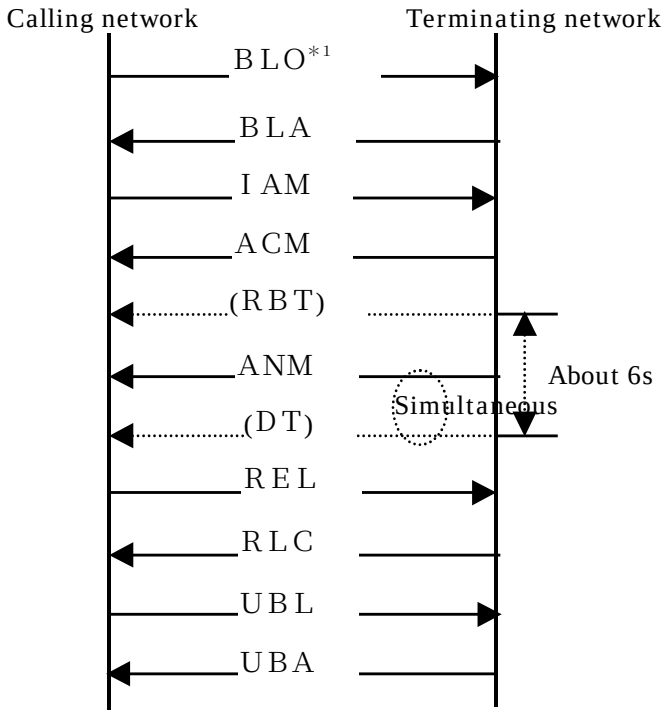
50 + CDEF + XXXX

CDEF: carrier identification code (one required for each carrier, and C excludes 0)
XXXX: subscriber number for inter-network test allocated for each circuit group to be connected

4. Signal Sequences for Inter-network Testing

4.1 AAT terminating test

The following sequence is shown in Figure A-1/JJ-90.10.
(a) No charging rate, AAT connection, and
(c) With charging rate, AAT connection, no CHG

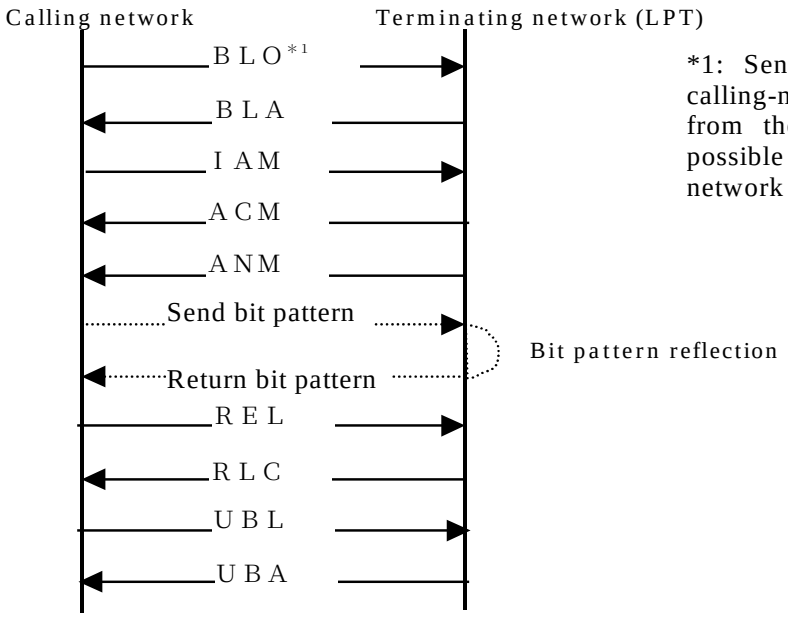


*1: Send BLO when testing by calling-network lock out; testing from the calling network is not possible in the case of terminating-network lock out.

Figure A-1/JJ-90.10 Signal Sequence for AAT Terminating Test

4.2 LPT terminating test

The following sequence is shown in Figure A-2/JJ-90.10.
(b) No charging rate, LPT connection, and
(e) With charging rate, LPT connection, no CHG

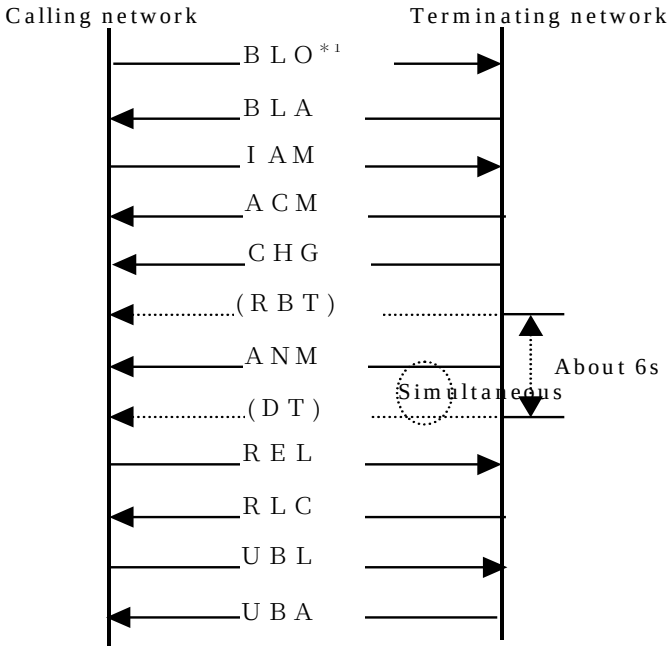


*1: Send BLO when testing by calling-network lock out; testing from the calling network is not possible in the case of terminating-network lock out.

Figure A-2/JJ-90.10 Signal Sequence for LPT Terminating Test

4.3 AAT terminating test, with CHG

The following sequence is shown in Figure A-3/JJ-90.10
(d) With charging rate, AAT connection, with CHG

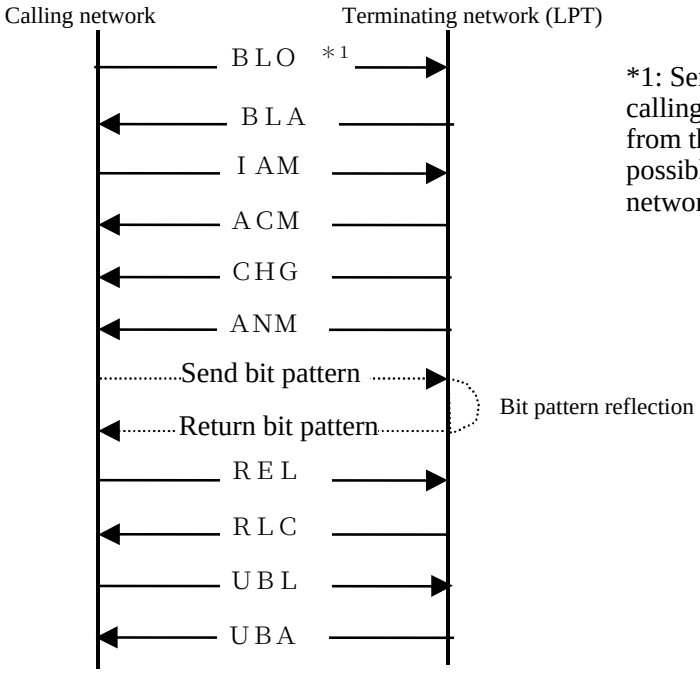


*1: Send BLO when testing by calling-network lock out; testing from the calling network is not possible in the case of terminating-network lock out.

Figure A-3/JJ-90.10 Signal Sequence for AAT Terminating Test, with CHG

4.4 LPT terminating test, with CHG

The following sequence is shown in Figure A-4/JJ-90.10.
(f) With charging rate, LPT connection, with CHG



*1: Send BLO when testing by calling-network lock out; testing from the calling network is not possible in the case of terminating-network lock out.

Figure A-4/JJ-90.10 Signal Sequence for LPT Terminating Test, with CHG

Appendix B

Inter-carrier Congestion Control System

1. Basic Principles

(1) Control is performed based on the "ordinary calling subscriber", "calling subscriber with priority", "payphone", and "test call" in "calling party's category" parameter in the IAM message.

(2) Control also depends on the circuit reservation function for priority-calling party and circuit reservation function for both-way trunks.

2. Control by Circuit Reservation Functions

(1) At each end of a circuit group, the number of available circuits (a value for determining whether to allow or deny use of a circuit according to circuit reservation control for both-way trunks when both-way traffic is high), the number of reserved both-way trunks (number of circuits to reserve for traffic of the other party when one-way traffic is high), and the number of reserved circuits for priority-calling parties (number of circuits to reserve for traffic of priority-calling parties when ordinary-calling-user traffic is high) are set, and circuit seizure is either allowed or prohibited according to the following conditions.

<table>
<tr><th>Calling Party's Category</th><th colspan="2">Allowance or Prohibition for Circuit Seizure</th></tr>
<tr><td>Calling subscriber with priority payphone</td><td colspan="2">Allow circuit seizure if there are idle circuits</td></tr>
<tr><td rowspan="4">Other than above</td><td rowspan="2">In case that the number of circuits used by outgoing calls exceeds the number of available circuits.</td><td>If the number of idle circuits is greater than the sum of the number of reserved both-way trunks and the number of reserved circuits for priority-calling parties, allow circuit seizure in the calling network.</td></tr>
<tr><td>If the number of idle circuits is less than the sum of the number of reserved both-way trunks and the number of reserved circuits for priority-calling parties, prohibit circuit seizure in the calling network.</td></tr>
<tr><td rowspan="2">In case that the number of circuits used by outgoing calls is less than the number of available circuits.</td><td>If the number of idle circuits is greater than the number of reserved circuits for priority-calling parties, allow circuit seizure in the calling network.</td></tr>
<tr><td>If the number of idle circuits is less than the number of reserved circuits for priority-calling parties, prohibit circuit seizure in the calling network.</td></tr>
</table>

(2) Whether or not to perform circuit reservation control for priority-calling party and circuit reservation control for both-way trunks is to be decided by the connecting carriers.

(3) The connecting carriers will decide on specific values for the number of available circuits, the number of reserved both-way trunks, and the number of reserved circuits for priority-calling parties.

Appendix C

1. Answer Signal to Terminals

When a calling carrier receives a terminal-answer signal from a terminal equipment on the side of a terminating carrier connected by an Inter Carrier Interface (ICI), an answer signal (in the case of a calling analog terminal, a supervisory signal sent out by reversing signal polarity) shall always be returned to terminal equipment on the calling side.

Appendix D

Overwriting Logic in Receiving Backward Interconnection Access Charge Settlement Information in Several Times

1. Overwriting Logic for Backward Interconnection Access Charge Settlement Information

Overwriting logic at receiving side regarding interconnection access charge settlement information (each parameter of "charge area information", " charge information", "charge information type", "additional party's category", "charge information delay", "carrier information transfer") set in ACM, CHG, CPG, ANM is shown in Table D-1/JJ-90.10. Note that this overwriting logic is not applied for any information sent in IAM from an originating network.

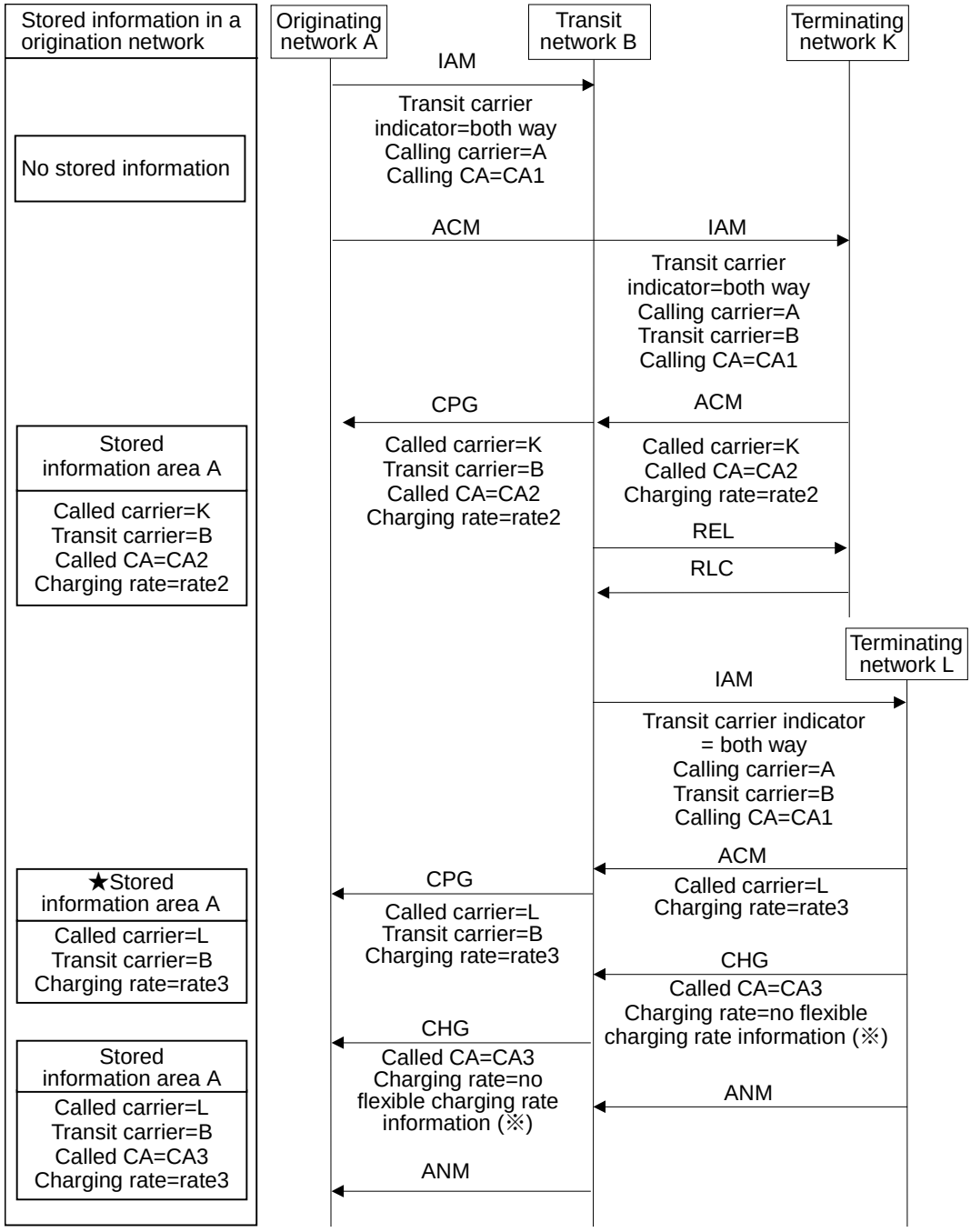
TableD-1/JJ-90.10 Conditions to Overwrite Interconnection Access Charge Settlement Information Parameters

In case that a carrier information transfer parameter (except for SCP carrier information) is set	In case that a carrier information transfer parameter (except for SCP carrier information) is not set
All stored information of interconnection access charge settlement information (except for SCP carrier information) are cleared and those are overwritten by the received one.	The stored information are overwritten by the only received ones. Note that "charge information type" and "charge information" should not be overwritten when "unit rate indicator" is set as "no indication" or "Charging rate information category" is set as "no flexible charging rate information".

2. Example of Overwriting Logic when Re-routing Occurred

Example of overwriting logic an originating network is shown below. Note that all pattern is not included.

(a) Example of overwriting logic by receiving carrier information transfer (except for SCP carrier information) in several times

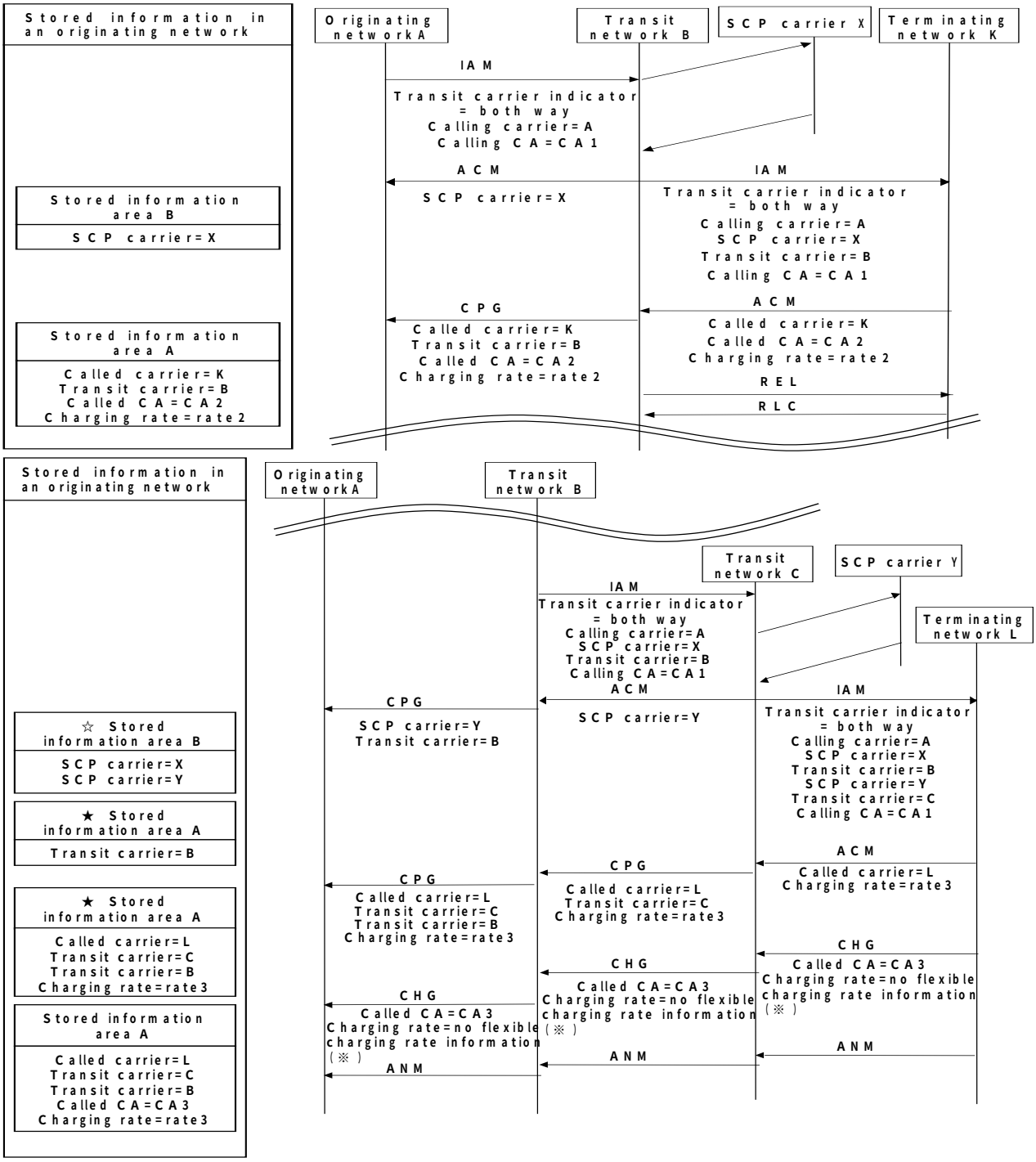


★: Clear all stored information and set the received information.

※: "Unit rate indicator = no indication" and "charging rate information category is no flexible charging rate information" are set in a charge information parameter as mandatory parameter.

Stored information area A: Memory in which objective overwriting informations are temporary stored.

(b) Example of overwriting logic by receiving carrier information transfer (with SCP carrier information) in several times



★: Clear all stored information and set the received information.

☆: "SCP carrier = Y" may not be stored.

※: "Unit rate indicator = no indication" and "charging rate information category is no flexible charging rate information" are set in a charge information parameter as mandatory parameter.

Stored information area A: Memory in which objective overwriting informations are temporary stored.

Stored information area B: Memory in which nonobjective overwriting informations are temporary stored.

Appendix E

Parameter handling of the redirecting carrier's network at the time of redirection between networks

1.Precondition

(1)Redirection at the terminal is taken as the outside of an object.
(2)Backward signal makes "mapping of ACM to ACM" the outside of an object for " mapping of ACM to CPG" or "mapping of CPG to CPG" a premise "TTC-Standard JT-Q732".
(3)Since the redirecting carrier network generates all parameters, early ACM of a backward signal is taken as the outside of a specific object.

2. Parameter setting conditions

Handling of parameters of redirecting carrier's network is shown in Table E-1, E-2/JJ-90.10. In addition, the meaning of "discard" and "generate" of a table is as follows.

・"generate" : When redirecting carrier's network sets a new value as the parameter field of a transmitting message
・"discard" : When redirecting carrier's network does not sets a new value as the parameter field of a transmitting message

Table E-1/JJ-90.10 Handling of Forward Parameters

Parameter	Field	Handling at the Redirecting Carrier's Network	Remarks *1
Forward call indicators	National/international call indicator	Generate	Condition when used for customer charge / ICBS
	ISDN access indicator	Generate	Condition when used for customer charge / ICBS
Calling party category		Generate	Condition when used for customer charge / ICBS
Transmission medium requirement		Generate *2	Condition when used for customer charge / ICBS
Called party number		Generate	
Calling party number		Generate *3	Condition when used for customer charge / ICBS
User-to-user information		Discard	Condition when used for customer charge / ICBS
Access transport	(Calling sub address)	Generate or discard	Condition when used for customer charge / ICBS
User service information		Generate	Condition when used for customer charge / ICBS
Charge area information		Generate	
Contractor number		Generate or discard *3	
Additional party's category		Generate or discard	
Carrier information transfer		Generate	
Redirecting number		Generate or discard *3	Condition when used for customer charge / ICBS

Table E-2/JJ-90.10　Handling of Backward Parameters

Parameter	Field	Handling at the Redirecting Carrier's Network	Remarks*1
Backward call indicators	Charge indicator	Generate	
	ISDN access indicator	Generate	Condition when used for customer charge / ICBS
User-to-user information		Discard	Condition when used for customer charge / ICBS
User-to-user indicators		Generate or discard	Condition when used for customer charge / ICBS
Charge information		Generate or discard	
Charge information type		Generate or discard	
Charge information delay		Generate or discard	
Additional user category		Generate or discard	
Carrier information transfer		Generate or discard	
Charge area information		Generate or discard	

*1:Re the parameter/field for which it says "Condition when used for customer charge / ICBS", in case the preceding and subsequent carrier's network that receives such parameter/field doesn't use it for customer charge / ICBS, the action taken by the redirecting carrier's network is not specified.

*2:When generating, no impact should be given to end-to-end call connection.

*3:In case of a call chargeable to the calling party where the forwarded-to carrier (IEC or TLEC) has the tariff-setting rights and where the forwarded-to carrier collects the customer charges, the charged customer in general is identified according to Contractor number parameter, Redirecting number parameter, and Calling party number parameter in order of precedence (Redirecting number parameter is used in some cases to identify the charged customer but not in other cases). In such a case, Redirecting carrier's network should act as follows:

- If Contractor number parameter is used to identify the charged customer, Redirecting carrier's network must generate Contractor number parameter (Refer to the example: Figure E-1).
- If Redirecting number parameter is used to identify the charged customer, Redirecting carrier's network must discard Contractor number parameter and generate Redirecting number parameter.
- If Calling party number parameter is used to identify the charged customer, Redirecting carrier's network must discard Contractor number parameter and Redirecting number parameter, and generate Calling party number parameter.

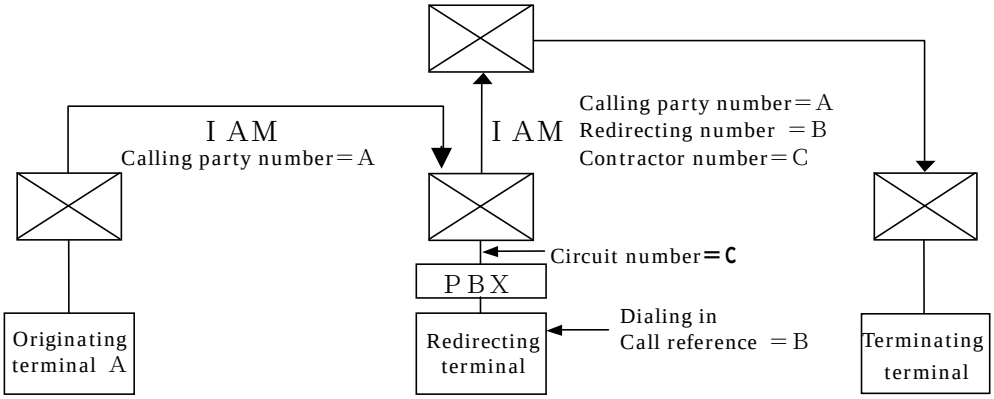


Figure E-1/JJ-90.10　Example of a forwarded call in case Contractor number parameter is used to identify the charged customer

Inter Carrier Interface
based on ISUP

(English Edition)

TTC Standard
[JJ-90.10]
7.1 Edition

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