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SPECIFICATIONS OF SIGNALLING SYSTEM No. 7

STAGE 3 DESCRIPTION FOR CALL COMPLETION SUPPLEMENTARY SERVICES USING SS No. 7

CLAUSE 2 – CALL HOLD (HOLD)
CLAUSE 4 – TERMINAL PORTABILITY (TP)

ITU-T Recommendation Q.733

(Previously "CCITT Recommendation")

FOREWORD

The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the International Telecommunication Union. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, established the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

ITU-T Recommendation Q.733, clauses 2 and 4 was prepared by the ITU-T Study Group XI (1988-1993) and was approved by the WTSC (Helsinki, March 1-12, 1993).

NOTES

1 As a consequence of a reform process within the International Telecommunication Union (ITU), the CCITT ceased to exist as of 28 February 1993. In its place, the ITU Telecommunication Standardization Sector (ITU-T) was created as of 1 March 1993. Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector.

In order not to delay publication of this Recommendation, no change has been made in the text to references containing the acronyms "CCITT, CCIR or IFRB" or their associated entities such as Plenary Assembly, Secretariat, etc. Future editions of this Recommendation will contain the proper terminology related to the new ITU structure.

2 In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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STAGE 3 DESCRIPTION FOR CALL COMPLETION SUPPLEMENTARY SERVICES USING SS No. 7

(Helsinki, 1993)

2 Call Hold (HOLD)

2.1 Definition

The **Call Hold (HOLD) supplementary service**, allows a user to interrupt communications on an existing call and then subsequently, if desired, re-establish communications.

2.2 Description

This clause is specific to Signalling System No.7 protocol for the ISDN User Part. Stage 3 identifies the protocol procedures and switching functions needed to support a telecommunications service.

2.2.1 General description

A call may be placed on hold by the calling user, at any time after the call has been answered or additionally as a service provider option:

1) after alerting has commenced, or

2) after the calling user has provided all of the information necessary for processing the call.

A call may be placed on hold by the called user, at any time after the call has been answered and before call clearing has begun.

The Call Hold service includes the Retrieve operation which re-establishes communication on a B-channel between the served user and the held party.

The stage 1 definitions for the HOLD supplementary service are given in Recommendation I.253.2. The stage 2 descriptions are given in Recommendation Q.83.2.

The stage 3 DSS 1 description is given in Recommendation Q.953.2.

This stage 3 description of Call Hold supplementary service uses the ISDN User Part protocol as defined in Recommendations Q.761-Q.764.

2.2.2 Specific terminology

For the purposes of this Recommendation, the following definitions apply:

User A: User A is a terminal equipment which invokes the HOLD supplementary service for a given call. User A is the served user.

User B: User B is a terminal equipment engaged in the given call to user A which invokes the HOLD supplementary service. User B is the non-served user.

2.2.3 Qualification on the applicability to telecommunication services

See 2.3/I.253.2.

2.2.4 State definitions

No specific state definitions are required.

2.3 Operational requirements

2.3.1 Provision/withdrawal

See 2.3.1/I.253.2.

2.3.2 Requirements on the originating network side

Not applicable.

2.3.3 Requirements in the network

No specific requirements are needed in the network.

2.3.4 Requirements on the terminating network side

Not applicable.

2.4 Coding requirements

For the HOLD supplementary service, the Call Progress message containing the Generic notification indicator parameter, shall be used to send the appropriate notification towards the remote party.

The Event indicator is set to “Progress”.

The following notification descriptions are used:

- Remote-hold
- Remote-retrieval

The Generic notification indicator parameter field shall be coded as shown in Table 2-1.

TABLE 2-1/Q.733

Coding of the Generic notification indicator parameter

Bits 7 6 5 4 3 2 1	Description
1 1 1 1 0 0 1 1 1 1 1 0 1 0	Remote hold Remote retrieval

The Generic notification indicator parameter is accompanied by the parameter compatibility information parameter. The procedures for the compatibility are defined in 2.9.5/Q.764.

2.5 Signalling requirements

2.5.1 Activation/deactivation/registration

Not applicable.

2.5.2 Invocation and operation

2.5.2.1 Actions at the originating local exchange

The originating local exchange is the exchange where the service is controlled. The originating local exchange for this description is not necessarily the originating exchange for the basic call.

2.5.2.1.1 Normal operation

2.5.2.1.1.1 Hold request

When a call is placed on hold, or when a hold notification is received from the access signalling system, a notification is conveyed in a CPG message towards the remote user, indicating that the call has been placed on hold.

The CPG message shall only be sent after the ACM has been received.

2.5.2.1.1.2 Retrieve request

When a call that was placed on hold is retrieved, or when a retrieve notification is received from the access signalling system, a notification is conveyed in a CPG message towards the remote user, indicating that the call has been retrieved.

2.5.2.1.2 Exceptional procedures

No exceptional procedures are identified.

2.5.2.2 Actions at the transit exchange

2.5.2.2.1 Normal operation

A transit exchange shall transfer the notification indication to the succeeding exchange.

2.5.2.2.2 Exceptional procedures

No exceptional procedures are identified.

2.5.2.3 Actions at the outgoing international gateway exchange

2.5.2.3.1 Normal operation

An outgoing international gateway exchange shall transfer the notification indication to the succeeding exchange.

2.5.2.3.2 Exceptional procedures

No exceptional procedures are identified.

2.5.2.4 Actions at the incoming international gateway exchange

2.5.2.4.1 Normal operation

An incoming international gateway exchange shall transfer the notification indication to the succeeding exchange.

2.5.2.4.2 Exceptional procedures

No exceptional procedures are identified.

2.5.2.5 Actions at the destination local exchange

The destination local exchange for this description is not necessarily the destination exchange for the basic call.

2.5.2.5.1 Normal operation

At the exchange where user B is connected, the notification indication contained in the CPG message is passed on to the access signalling system of user B.

2.5.2.5.2 Exceptional procedures

No exceptional procedures are identified.

2.6 Interactions with other supplementary services

2.6.1 Call waiting (CW)

No impact on ISUP.

2.6.2 Call transfer services

No applicable interaction at this time.

2.6.3 Connected line identification presentation (COLP)

No impact on ISUP.

2.6.4 Connected line identification restriction (COLR)

No impact on ISUP.

2.6.5 Calling line identification presentation (CLIP)

No impact on ISUP.

2.6.6 Calling line identification restriction (CLIR)

No impact on ISUP.

2.6.7 Closed user group (CUG)

No impact on ISUP.

2.6.8 Conference calling (CONF)

No impact on ISUP.

2.6.9 Direct dialling in (DDI)

No impact on ISUP.

2.6.10 Call diversion services (CDIV)

No impact on ISUP.

2.6.10.1 Call forwarding busy (CFB)

No impact on ISUP.

2.6.10.2 Call forwarding no reply (CFNR)

No impact on ISUP.

2.6.10.3 Call forwarding unconditional (CFU)

No impact on ISUP.

2.6.10.4 Call deflection (CD)

No impact on ISUP.

2.6.11 Line hunting (LH)

No impact on ISUP.

2.6.12 Three Party service (3PTY)

No impact on ISUP.

2.6.13 User-to-user signalling (UUS)

No impact on ISUP.

2.6.13.1 User-to-user signalling service 1 (UUS 1)

No impact on ISUP.

2.6.13.2 User-to-user signalling service 2 (UUS 2)

No impact on ISUP.

2.6.13.3 User-to-user signalling service 3 (UUS 3)

No impact on ISUP.

2.6.14 Multiple subscriber number (MSN)

No impact on ISUP.

2.6.15 Call hold (HOLD)

Not applicable.

2.6.16 Advice of charge (AOC)

No impact on ISUP.

2.6.17 Sub-addressing (SUB)

No impact on ISUP.

2.6.18 Terminal portability (TP)

No impact on ISUP.

2.6.19 Completion of calls to busy subscriber (CCBS)

No applicable interaction at this time.

2.6.20 Malicious call identification (MCID)

No impact on ISUP.

2.6.21 Reverse charging (REV)

No applicable interaction at this time.

2.6.22 Multi-level precedence and preemption (MLPP)

No impact on ISUP.

2.6.23 Private numbering plan (PNP)

No applicable interaction at this time.

2.6.24 International telecommunication charge card

No applicable interaction at this time.

2.7 Interaction with other networks

In the case of interaction with PSTN, it is a network provider option to supply the remote user with an in-band indication.

In the case of interactions with networks which do not provide the notification procedure, the interworking exchange will discard the CPG message containing the notification indication. The call will then be completed according to the basic call procedure as described in Q.764.

2.8 Signalling flows

Examples of information flow for the CALL HOLD supplementary service are shown in Figure 2-1 and Figure 2-2.

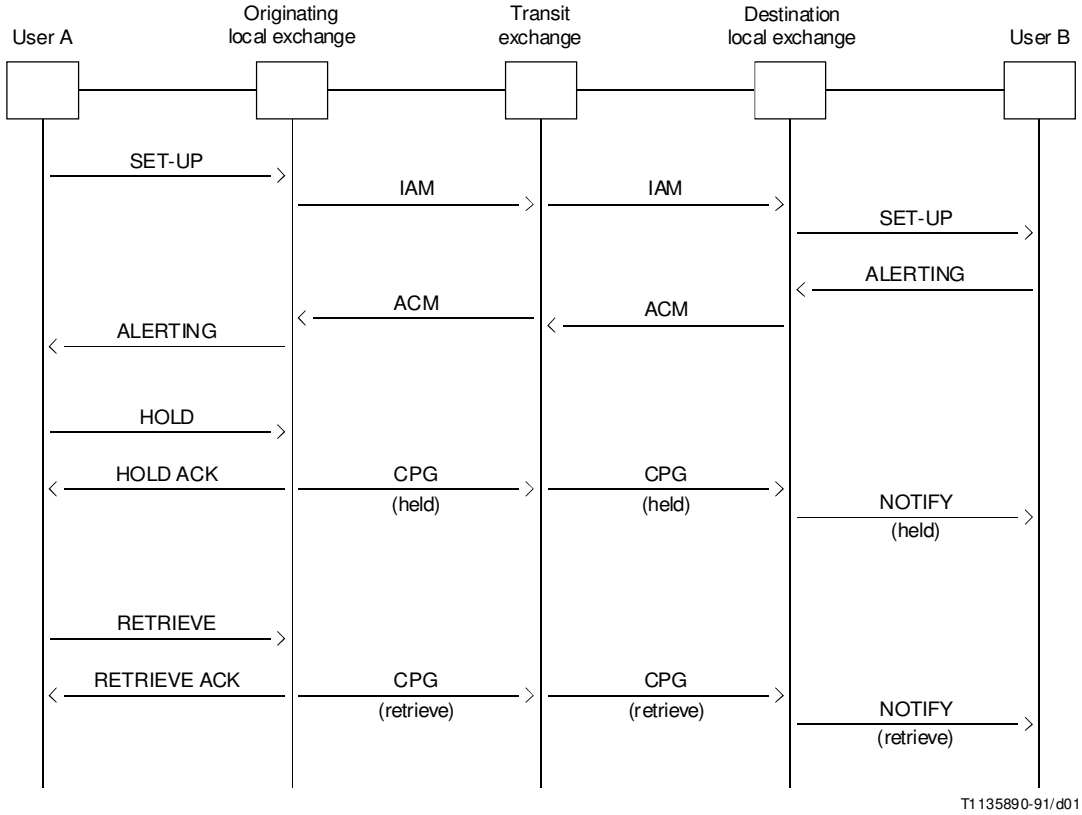
2.9 Parameter values (timers)

No specific timers are required.

NOTE – In the case of Hold during waiting for answer, if Tg (the Awaiting Answer Timer, see Annex A/Q.764) expires, the call will be released according to the basic call procedure.

2.10 Dynamic description

No dynamic descriptions (SDLs) are required.



IAM Initial address message
ACM Address complete message
CPG Call progress message

FIGURE 2-1/Q.733

Hold and retrieve during waiting for answer

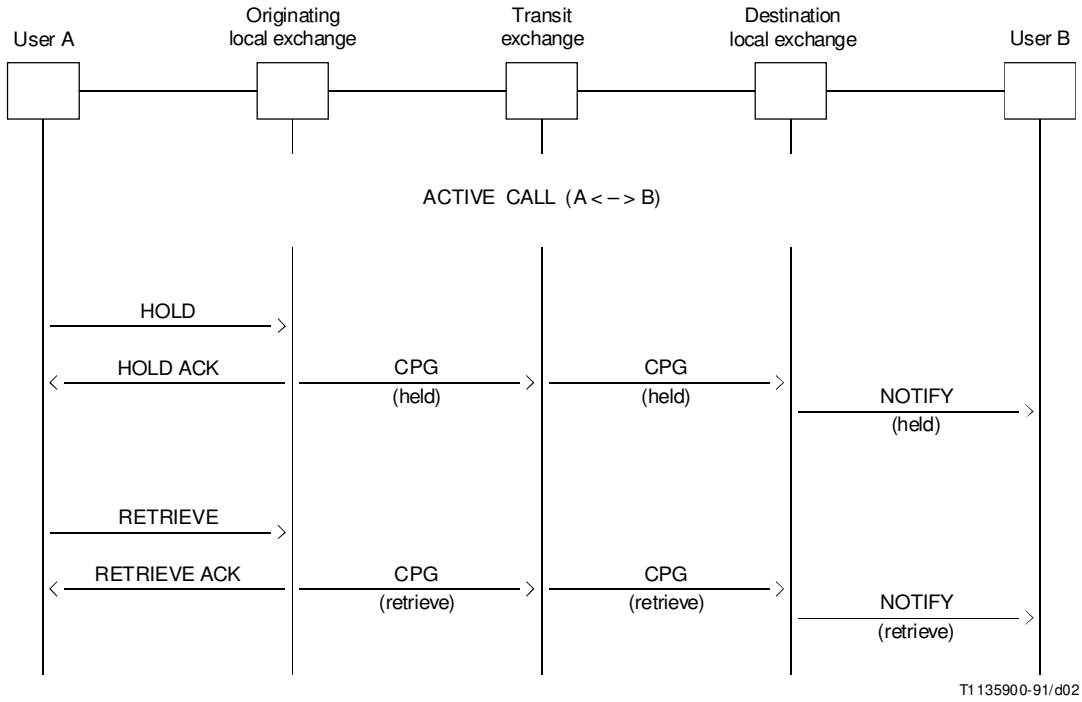


FIGURE 2-2/Q.733

Hold and retrieve during active phase

4 Terminal Portability (TP)

4.1 Definition

The **Terminal Portability supplementary service** allows a user to move a terminal from one socket to another within one given basic access during the active state of the call. It also allows a user to move a call from one terminal to another terminal within one given basic access during the active phase of the call.

4.2 Description

4.2.1 General description

By requesting a Suspend/Resume procedure the calling as well as the called user is enabled to move the terminal by means of unplugging and reconnecting it.

In addition to that it is possible to replace the terminal by another compatible one or to suspend and resume a call without changing the terminal or the socket.

The stage 1 definition for the Terminal Portability supplementary service is given in Recommendation I.253.4. The stage 2 description is given in Recommendation Q.85.4. The stage 3 DSS 1 description is given in Recommendation Q.953.4. This stage 3 description of terminal portability supplementary service uses the ISDN User Part protocol as defined in Recommendations Q.761-Q.764 and Q.766.

4.2.2 Specific terminology

Served user: The user sending Suspend and Resume.

Suspend: Message sent to suspend a call.

Resume: Message sent to resume a call.

4.2.3 Qualification on the applicability to telecommunication services

See Recommendation I.253.4.

4.2.4 State definitions

No specific state definitions are required.

4.3 Operational requirements

4.3.1 Provision/withdrawal

See Recommendation I.253.4.

4.3.2 Requirements on the originating network side

Not applicable.

4.3.3 Requirements in the network

No specific requirements are needed in the network.

4.3.4 Requirements on the terminating network side

Not applicable.

4.4 Coding requirements

For the Terminal Portability supplementary service the Suspend and Resume messages containing the Suspend/Resume indicators set to "ISDN subscriber initiated" are used.

4.5 Signalling requirements

4.5.1 Activation/deactivation/registration

Not applicable.

4.5.2 Invocation and operation

4.5.2.1 Actions at the originating local exchange

4.5.2.1.1 Normal operation

The Suspend message indicates a temporary cessation of communication without releasing the call. It can only be accepted during the conversation/data phase. A Suspend message can be generated in response to a Suspend request from the calling or called party.

A Resume message indicates a request to recommence communication. A request to release the call received from the calling or called party will override the Suspend/Resume sequence and the procedure for normal call release as described in 2.3/Q.764 will be followed.

a) *Terminal Portability requested by the calling party*

On receipt of a suspend request from the calling party, the originating local exchange sends a Suspend message to the succeeding exchange.

Because the suspend controlling exchange is always located in the network of the Suspend initiating user the originating local exchange is the Suspend controlling exchange for this case and starts Timer T2 to ensure the receipt of a Resume request.

On receipt of a Resume request from the calling party the exchange sends a Resume message to the succeeding exchange and stops Timer T2.

b) *Terminal Portability requested by the called party*

On receipt of a Suspend message from the preceding exchange, the originating local exchange informs the calling party that a Suspend has been requested.

On receipt of a Resume message from the preceding exchange, the originating local exchange informs the calling party that a Resume has been requested.

4.5.2.1.2 Exceptional procedures

In case of expiry of timer T2 which is supervising the receipt of a Resume request in the suspend controlling exchange the call is released using cause No. 102 (recovery on timer expiry).

4.5.2.2 Actions at the transit exchange

4.5.2.2.1 Normal operation

a) *Terminal Portability requested by the calling party*

On receipt of a Suspend message from the preceding exchange the transit exchange sends a Suspend message to the succeeding exchange.

On receipt of a Resume message from the preceding exchange the transit exchange sends a Resume message to the succeeding exchange.

b) *Terminal Portability requested by the called party*

On receipt of a Suspend message from the succeeding exchange the transit exchange sends a Suspend message to the preceding exchange.

On receipt of a Resume message from the succeeding exchange the transit exchange sends a Resume message to the preceding exchange.

4.5.2.2.2 Exceptional procedures

No exceptional procedures are identified.

4.5.2.3 Actions at the outgoing international gateway exchange

4.5.2.3.1 Normal operation

If Terminal Portability is supported in the succeeding national network, the outgoing international gateway exchange acts like a transit exchange (see 4.5.2.2.1).

4.5.2.3.2 Exceptional procedures

If Terminal Portability is not supported in the succeeding national network, the outgoing international gateway exchange discards the Suspend and Resume messages. No notification is given.

4.5.2.4 Actions at the incoming international gateway exchange

4.5.2.4.1 Normal operation

If Terminal Portability is supported in the national network, the incoming international gateway exchange acts like a transit exchange (see 4.5.2.2.1).

4.5.2.4.2 Exceptional procedures

If Terminal Portability is not supported in the national network, the incoming international gateway exchange discards the Suspend and Resume messages. No notification is given.

4.5.2.5 Actions at the destination local exchange

4.5.2.5.1 Normal operation

a) *Terminal Portability requested by the calling party*

On receipt of a Suspend message from the preceding exchange, the destination exchange informs the called party that a suspend has been requested.

On receipt of a Resume message from the preceding exchange, the destination exchange informs the called party that a Resume has been requested.

b) *Terminal Portability requested by the called party*

On receipt of a Suspend request from the called party, the destination local exchange sends a Suspend message to the preceding exchange.

Because the suspend controlling exchange is always located in the network of the Suspend initiating user the destination local exchange is the Suspend controlling exchange for this case and starts Timer T2 to ensure the receipt of a Resume request.

On receipt of a Resume request from the called party the exchange sends a Resume message to the preceding exchange and stops Timer T2.

4.5.2.5.2 Exceptional procedures

In case of expiry of timer T2 which is supervising the receipt of a resume request in the suspend controlling exchange the call is released using cause value No. 102 (recovery on timer expiry).

4.6 Interactions with other supplementary services

4.6.1 Call Waiting (CW)

Incoming waiting calls are not possible whilst Terminal Portability is active.

4.6.2 Call Transfer services

No applicable interaction at this time.

4.6.3 Connected Line Identification Presentation (COLP)

No impact on ISUP.

4.6.4 Connected Line Identification Restriction (COLR)

No impact on ISUP.

4.6.5 Calling Line Identification Presentation (CLIP)

No impact on ISUP.

4.6.6 Calling Line Identification Restriction (CLIR)

No impact on ISUP.

4.6.7 Closed User Group (CUG)

No impact on ISUP.

4.6.8 Conference Calling (CONF)

No impact on ISUP.

4.6.9 Direct Dialling-In (DDI)

No impact on ISUP.

4.6.10 Call Diversion Services (CDIV)

4.6.10.1 Call Forwarding Busy (CFB)

No impact on ISUP.

4.6.10.2 Call Forwarding No Reply (CFNR)

No impact on ISUP.

4.6.10.3 Call Forwarding Unconditional (CFU)

No impact on ISUP.

4.6.10.4 Call Deflection (CD)

No impact on ISUP.

4.6.11 Line Hunting (LH)

No impact on ISUP.

4.6.12 Three Party Service (3PTY)

No impact on ISUP.

4.6.13 User-to-User Signalling (UUS)

4.6.13.1 User-to-User Signalling, service 1 (UUS 1)

No impact on ISUP.

4.6.13.2 User-to-User Signalling, service 2 (UUS 2)

No impact on ISUP.

4.6.13.3 User-to-User Signalling, service 3 (UUS 3)

User-to-user Service 3 cannot be invoked whilst Terminal Portability is active. The UUS 3 request will be rejected by the suspend controlling exchange.

4.6.14 Multiple Subscriber Number (MSN)

No impact on ISUP.

4.6.15 Call Hold (HOLD)

No impact on ISUP.

4.6.16 Advice Of Charge (AOC)

No impact on ISUP.

4.6.17 Sub-addressing (SUB)

No impact on ISUP.

4.6.18 Terminal Portability (TP)

Not applicable.

4.6.19 Completion of Calls to Busy Subscriber (CCBS)

No applicable interaction at this time.

4.6.20 Malicious Call Identification (MCID)

No impact on ISUP.

4.6.21 Reverse Charging (REV)

No applicable interaction at this time.

4.6.22 Multi-level Precedence and Preemption (MLPP)

No impact on ISUP.

4.6.23 Private Numbering Plan (PNP)

No applicable interaction at this time.

4.6.24 International Telecommunication Charge Card

No applicable interaction at this time.

4.7 Interactions with other networks

In case of interactions with networks not supporting Terminal Portability, the interworking exchange will discard the user initiated Suspend/Resume messages. No notification will be given.

4.8 Signalling flows

The signalling flows are given in Figure 4-1 and Figure 4-2.

4.9 Parameter values (timers)

Timer T2 as defined in Annex A/Q.764.

4.10 Dynamic description

No dynamic descriptions (SDLs) are required.

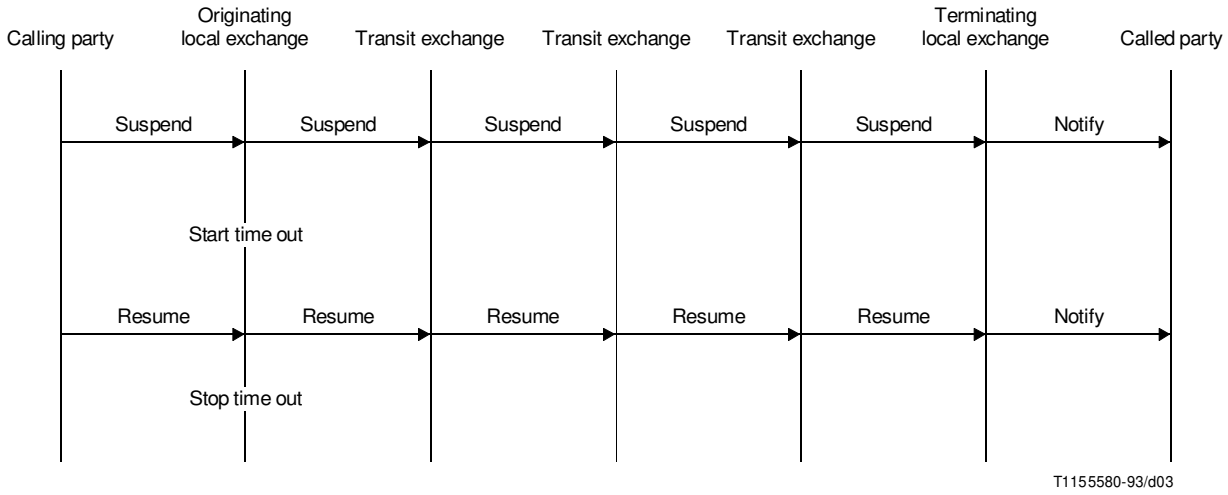
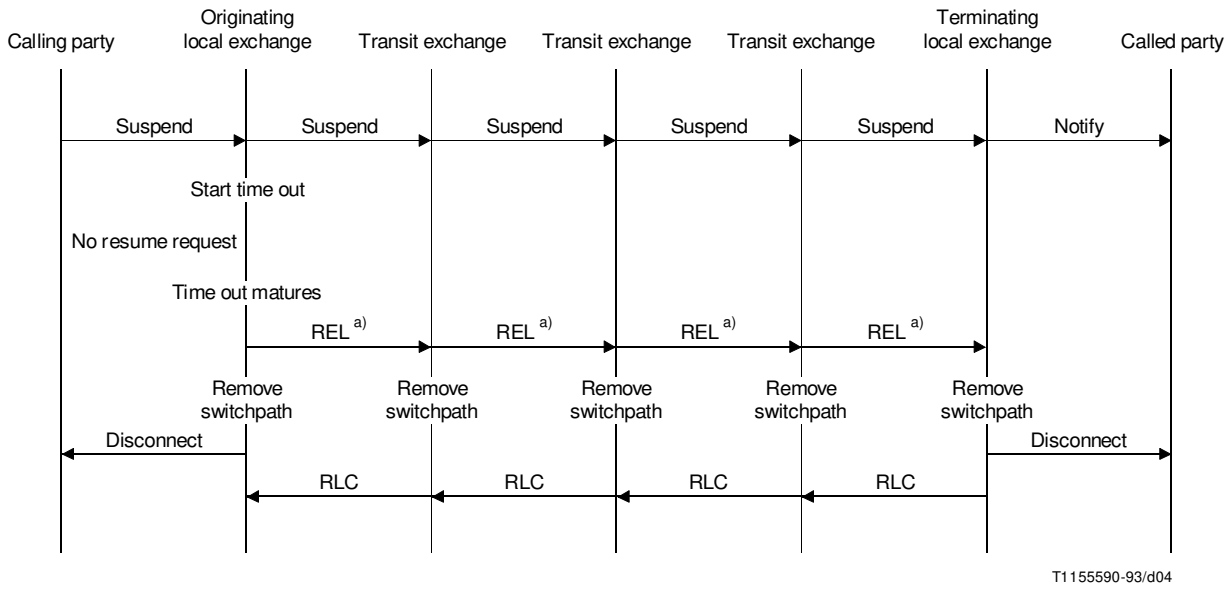


FIGURE 4-1/Q.733

Suspend request and resume



a) Release with cause No. 102.

FIGURE 4-2/Q.733

Suspend request without resume request