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SPECIFICATIONS OF SIGNALLING SYSTEM No. 7

STAGE 3 DESCRIPTION FOR CALL OFFERING SUPPLEMENTARY SERVICES USING SIGNALLING SYSTEM No. 7

CLAUSE 2 – CALL DIVERSION SERVICES

ITU-T Recommendation Q.732

(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.732, clause 2, was revised 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 Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector.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 THE CALL OFFERING SUPPLEMENTARY SERVICES USING SS No. 7

(Helsinki, 1993)

Clauses 2 to 5: Call diversion services

Clause 2: Call forwarding busy

Clause 3: Call forwarding no reply

Clause 4: Call forwarding unconditional

Clause 5: Call deflection

2.1 Definition

The **diversion supplementary services** comprise the following services:

- Call forwarding unconditional (CFU)
- Call forwarding busy (CRB)
- Call forwarding no reply (CFNR)
- Call deflection (CD)

The **call forwarding unconditional (CFU) supplementary service** permits a served user to have the network send all incoming calls, or just those associated with a specific basic service, addressed to the served user's ISDN number to another number. The served user's originating service is unaffected. If this service is activated, calls are forwarded no matter what the condition of the termination.

The **call forwarding busy (CFB) supplementary service** permits a served user to have the network send all incoming calls, or just those associated with a specific basic service, which meet busy and are addressed to the served user's ISDN number to another number. The served user's originating service is unaffected. The busy condition may be either network determined or user determined.

The **call forwarding no reply (CFNR) supplementary service** permits a served user to have the network send all incoming calls, or just those associated with a specific basic service, which meet no reply and are addressed to the served user's ISDN number to another number. The served user's originating service is unaffected.

The **call deflection (CD) supplementary service** allows the served user to respond to an incoming call offered by the network by requesting redirection of that call to another number specified in the response. This redirection is only allowed before the called user has answered the call. It may occur immediately as a response to the DSS 1 set up message of the access or during the alerting phase.

2.2 Description

2.2.1 General description

For a given ISDN number, the diversion supplementary services (including options) may be subscribed to for each basic service to which the user(s) of the number subscribes, or collectively for all the basic services to which the user(s) subscribes.

The served user can request a different diverted-to number for each basic service subscription parameter value and call diversion supplementary service to which he has subscribed.

The deflection functions are implemented in the network and they are invoked by the terminal on a call by call basis.

A terminating exchange that determines that call diversion may occur will not discard the set up information until the exchange determines that call diversion will not occur in this particular instance.

The served users originating service is unaffected.

The stage 1 descriptions of the call diversion supplementary services are given in Recommendations I.252.2, I.252.3, I.252.4 and I.252.5. The stage 2 descriptions are given in Recommendations Q.82.2 and Q.82.3.

The stage 3 DSS 1 description is given in Recommendations Q.952.2 to Q.952.5. This stage 3 description of call diversion supplementary services uses the ISDN user part protocol as defined in Recommendations Q.761-Q.764 and Q.730.

2.2.2 Specific terminology

Served user – The user of a particular ISDN number requesting calls to that number to be diverted. This user may also be referred to as the forwarding, deflecting or diverting user or the called user. This user shall have subscribed to the specific call diversion supplementary service requested.

Forwarded-to user – The user to which a call is to be forwarded. All procedures at the forwarded-to user are provided as part of the basic service; the forwarded-to user need not have subscribed to any specific call forwarding supplementary service (e.g. CFU, CFB, CFNR).

Deflected-to user – The user, to which the call shall be deflected.

Calling user – The user who initiated the call that is diverted. All procedures at the calling user are provided as part of the basic service; the calling user need not have subscribed to any specific diversion supplementary service.

Call forwarding may occur indicator – Information sent in the backward direction indicating that call forwarding may occur, depending on the response received (or lack thereof) from the called party.

Network determined user busy (NDUB) is specified:

(see 3.1.4/I.221)

– if all the appropriate user-network interface information channels are busy and either the network does not support the offering of additional calls beyond the number of appropriate channels, or the maximum number of such additional calls has been reached; or,

– if the maximum number of total calls supported at the given subscriber's interface(s) has been reached.

User determined user busy (UDUB) is specified for the case that the network offers the call to the subscriber and if no compatible terminal responds "positively" but one or more compatible terminals respond "user busy". This condition will be determined when the response-to-call offering timeout occurs.

Notification subscription option – Information sent in the backward direction indicating the subscription options of the served user according to the notification wanted to be given to the calling user.

Redirecting reason – Information sent in either direction indicating, in the case of calls undergoing multiple redirections, the reason why the call has been redirected.

Redirecting indicator – Information sent in either direction indicating whether the call has been diverted or rerouted and whether or not presentation of redirection information to the calling party is restricted.

Redirection counter – Information sent in either direction indicating the number of redirections which have occurred on a call.

Redirecting number – Information sent in the forward direction when a call is diverted, indicating the number from which the call was last diverted.

Redirection number – Information sent in the backward direction indicating the number towards which the call must be rerouted or has been diverted.

Redirection number restriction indicator – Information sent in the backward direction indicating whether the diverted-to user allows the presentation of his number.

ISUP ISDN user part

CFU Call forwarding unconditional

CFB Call forwarding busy

CFNR Call forwarding no reply

CD Call deflection

2.2.3 Qualification on the applicability to telecommunication services

See Recommendations I.252.2, I.252.3, I.252.4 and I.252.5.

2.2.4 State definitions

No specific state definitions are required.

2.3 Operational requirements

2.3.1 Provision/withdrawal

Call forwarding unconditional, call forwarding busy, call forwarding no reply and call deflection shall be provided after pre-arrangement with the service provider.

Each diversion supplementary service can be withdrawn separately by the service provider at the subscriber's request or for administrative reasons.

The four supplementary services can be offered separately with subscription options. Options apply separately to each basic service subscribed to on each ISDN number. For each subscription option, only one value can be selected. These subscription options form part of the call diversion profile for the served user.

- The subscription options for the CFU supplementary service are included in Recommendation I.252.4.
- The subscription options for the CFB supplementary service are included in Recommendation I.252.2.
- The subscription options for the CFNR supplementary service are included in Recommendation I.252.3.
- The subscription options for the CD supplementary service are included in Recommendation I.252.5.

These requirements are summarized in Table 2-1.

TABLE 2-1/Q.732

Subscription options for call diversion supplementary services

Subscription options	Value	Applicability
Served user receives notification that a call has been forwarded	No _____ Yes	CFU CFB CFNR
Calling user receives notification that his call has been diverted (forwarded or deflected)	No _____ Yes, with diverted-to user number _____ Yes, without diverted-to user number	CFU CFB CFNR CD
Served user receives reminder notification on outgoing calls that forwarding is currently activated	No _____ Yes	CFU CFB CFNR
Served user releases his/her number to diverted-to user	Do not release diverting number information _____ Release diverting number information	CFU CFB CFNR CD

The following network provider options are available for the supplementary services.

- The network provider options for the CFU supplementary service are included in Recommendation I.252.4.
- The network provider options for the CFB supplementary service are included in Recommendation I.252.2.
- The network provider options for the CFNR supplementary service are included in Recommendation I.252.3.
- The network provider options for the CD supplementary service are included in Recommendation I.252.5.

These requirements are summarized in Table 2-2.

TABLE 2-2/Q.732

Network provider options for call diversion supplementary services

Network provider option	Value	Applicability
Served user call retention on invocation of diversion (forwarding or deflection)	Retain call to the served user until alerting begins at the diverted-to user (option A) _____ Clear call to the served user on invocation of call diversion (option B)	CFNR CD
Served user call retention when forwarding is rejected at forwarded-to user	Continue to alert the forwarding user (Note 1) _____ No action at the forwarding user (Note 2)	CFNR
Served user call retention when deflection is rejected	Continue to alert the deflecting user (Note 3) _____ No action at the deflecting user (Note 4)	CD
Total number of all diversions for each call	Maximum number of diverted connections (with an upper limit of 5)	CFU CFB CFNR CD
Call forwarding on no reply timer	Timer duration shall be a service provider option	CFNR
NOTES 1 This applies to the retention of the call at invocation of call forwarding. 2 This applies to the clearing call option on invocation of call forwarding. 3 This option shall only be used for deflection after alerting has began. 4 This applies to the clearing call option on invocation of call deflection.		

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

Recommendation Q.763 defines the messages and parameters for this supplementary service. The following messages and parameters are used to support the call diversion supplementary service.

The generic notification indicator, the redirection number restriction indicator and the call diversion information parameter are accompanied by the parameter compatibility information parameter. The procedures for the compatibility are defined in Recommendation Q.764.

2.4.1 Messages

Address complete message

Optional backward call indicators

Generic notification indicators

Redirection number

Redirection number restriction indicator

Call diversion information

Answer message

Redirection number

Redirection number restriction indicator

Call progress message

Optional backward call indicators

Event indicator

Generic notification indicator

Call diversion information

Redirection number

Redirection number restriction indicator

Connect message

Redirection number

Redirection number restriction indicator

Initial address message

Redirecting number

Redirection information

Original called number

2.4.2 Parameters

The following parameter fields and codes are used to support the call diversion supplementary service.

Event information

Bits GFEDCBA:	0000001	ALERTING	
.	0000010	PROGRESS	
	0000100	CFB	(Note)
	0000101	CFNR	(Note)
	0000110	CFU	(Note)
Bit H:	0	No indication	
	1	Presentation restricted (Note)	

NOTE – These codes are used in national networks and can be used on the international interface on bilateral agreement. If these codes are used and conflicting information is received compared to the generic notification indicator and the call diversion information parameter, the latter takes priority.

Optional backward call indicators

Bit B:	Call diversion may occur	
	0	No indication
	1	Call diversion may occur

Redirection information

Bits CBA:	Redirecting indicator	
	011	Call diverted
	100	Call diverted, all redirection info presentation restricted
Bits HGFE:	Original redirection reasons	
	0000	Unknown
Bits KJI:	Redirection counter	
Bit L:	Reserved for national use	
Bits PONM:	Redirecting reason	
	0000	Unknown/not available
	0001	User busy
	0010	No reply
	0011	Unconditional
	0100	Deflection during alerting
	0101	Deflection immediate response
	0110	Mobile subscriber not reachable

Redirecting number

Redirection number

Redirection number restriction indicator

BA bits:	Presentation Restriction indicator	
	00	Presentation allowed
	01	Presentation restricted
	10	Spare
	11	Spare
HGFEDC bits		Spare

Generic notification indicator

Bits GFEDCBA: 1111011 Call is diverting

Call diversion information

H	G	F	E	D	C	B	A

Bits CBA: Notification subscription option

000 Unknown

001 Presentation not allowed

010 Presentation allowed with redirection Nb

011 Presentation allowed without redirection Nb

Bits GFED: Redirecting reason

0000 Unknown/not available

0001 User busy

0010 No reply

0011 Unconditional

0100 Deflection during alerting

0101 Deflection immediate response

0110 Mobile subscriber not reachable

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

2.5.2.1.1 Normal operation

When call diversion has occurred on the served user side, the originating local exchange will receive an ACM message containing the call diversion information, the generic notification indicator and the redirection number.

NOTE – As a national option, the CPG message may be received.

Call diversion may occur on the served user's side after the ACM has been sent in the following cases:

– Call forwarding on no reply

– Call deflection during alerting

– Call forwarding user determined user busy when the early ACM method is used

– Call deflection immediate response when the early ACM method is used.

In these cases the ACM will contain an optional backward call indicator set to "call diversion may occur".

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 pass all information related to call diversion to the preceding or 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 checks the following number parameters received in the IAM:

- calling party number;
- original called number;
- redirecting number.

The procedures for the calling party number are as specified for the CLIP/CLIR services.

The same procedures are also applicable for the original called number and the redirecting number.

An outgoing international gateway exchange checks the redirection number parameter if contained in the ACM or CPG message according to the procedures for the connected number in the COLP/COLR services.

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 checks the following number parameters received in the IAM:

- calling party number;
- original called number.

The procedures for the calling party number are as specified for the CLIP/CLIR services.

The same procedures are also applicable for the original called number.

An incoming international gateway exchange checks the redirection number parameter if contained in the ACM or CPG message according to the procedures for the connected number in the COLP/COLR services.

If a network supports the CPG as the first backward message, then the incoming international gateway exchange has to map the CPG into an ACM and the following ACM into CPG.

If the national network supports CPG with event information indicating CFB, CFNR or CFU (see Note in 2.4.2), then when the incoming international gateway exchange receives such a CPG without either the generic notification indicator or the call diversion information, it will generate the missing parameters using the event information. If the received CPG is then mapped into a CPG on the international side, then the event information will be set to indicate progress unless bilateral agreements exist permitting the call forwarding codes in event information to be passed (see Note in 2.4.2).

2.5.2.4.2 Exceptional procedures

No exceptional procedures are identified.

2.5.2.5 Actions at the destination local exchange

2.5.2.5.1 Normal operation

2.5.2.5.1.1 Action at the destination exchange where the diverted-to user is located

When a destination local exchange receives a diverted call, the called user is alerted. When the called user answers the call, the destination exchange shall include in the address complete, call progress, answer or connect message the redirection number restriction indicator set according to the COLR supplementary service of the called user.

2.5.2.5.1.2 Actions at the destination exchange performing the diversion

a) *Checking of the diversion limits*

When an exchange determines that it must divert a call, it first checks if diverting the call exceeds the number of diversions allowed within the network.

b) *Setting of the diversion parameters*

The second action that needs to be undertaken, given that the limit was not exceeded, is the setting of the parameters that would be used in an initial address message for the diverted call. Even if the diversion is intra-exchange this parameter information is set and retained. The reason for the retention is that, if subsequent diversion occurs, the information is required to guarantee that the diversion completes correctly. Finally the exchange attempts to set up the diverted call.

Table 2-3 shows which parameters are modified in a diversion exchange.

When this is the first diversion the call has undergone, there are five parameters to be set; the redirection information, the called party number, the original called number, the redirecting number and the ISUP preference indicator. Their values are set as follows:

1) The redirection information – The redirection counter is set to one. The redirection reason and redirecting indicator are set according to the diversion conditions.

2) The original called number – This is equal to the number that was called.

3) The called party number – This is equal to the number that the call is to be diverted to.

4) The redirecting number – This is equal to the number that is doing the diversion and is in this case equal to the original called number.

5) The ISUP preference indicator – If the value “ISDN user part not required all the way” was received the ISUP preference indicator is modified to “ISUP preferred all the way”. Otherwise the ISUP preference indicator is left unchanged.

When this is the second or greater diversion the call has undergone, there are three parameters to be set; the redirection information, the called party number and the redirecting number. Their values are set as follows:

1) The redirection information – The redirection counter is increased by one. The redirecting reason and redirecting indicators are set according to the diversion conditions.

2) The redirecting number – This is equal to the number that is doing the redirection.

3) The called party number – This is equal to the number that the call is to be diverted to.

When multiple diversions occur the parameters are set as in Table 2-3.

c) *Diversion procedures at the diverting exchange*

The diverting exchange continues the call depending on the service that is causing the diversion.

If during the establishment of the forwarded leg the total propagation delay of the connection exceeds the value where echo control is necessary, echo control devices should be included. The echo control procedures as defined in the basic call control procedures apply.

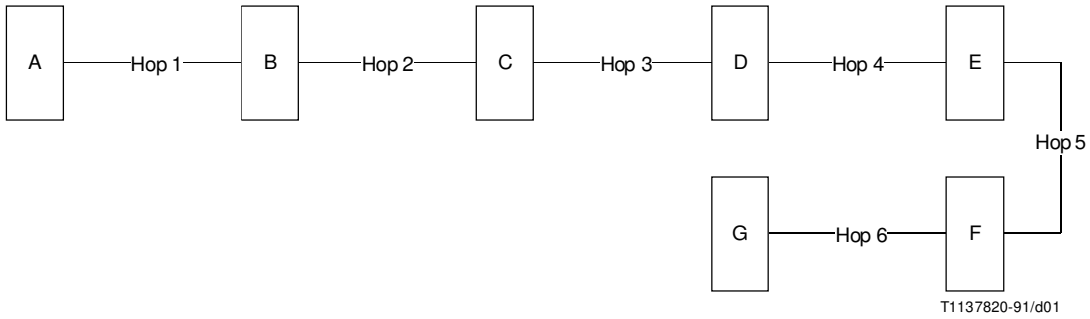
i) Call forwarding unconditional or network determined user busy

The exchange continues in the following manner:

If the number that the call is to be diverted to resides at another exchange, an initial address message is sent to continue the call on to that exchange. The incoming circuit or line is connected to the chosen outgoing circuit in both directions immediately. The initial address message includes the parameter information as shown in Table 2-3.

TABLE 2-3/Q.732

Parameter information for multiple redirection



A originally calls B:
Information carried in the initial address message:

	Hop 1	Hop 2	Hop 3	Hop 4	Hop 5	Hop 6
Number information						
Called party number	B	C	D	E	F	G
Redirecting number		B	C	D	E	F
Original called number		B	B	B	B	B
Redirection information						
Redirection counter		1	2	3	4	5
Redirecting indicator		V	V	V	V	V
Redirecting reason		W	W	W	W	W

V Value = (call diversion) or (call diversion all redirection info presentation restricted)

W Value = (user busy) or (no reply) or (unconditional) or (deflection during alerting) or (deflection immediate response)

ii) Call forwarding no reply and call deflection during alerting

An address complete message with an optional backward call indicator with the indication "call diversion may occur" is returned to the originating exchange. When the no reply timer expires or when call deflection is invoked:

Option A: The exchange continues in the following manner:

If the number that the call is to be diverted to resides at another exchange, an initial address message is sent. The incoming circuit or line is not connected to the chosen outgoing circuit yet as it could result in confusing sequences of in band tones or announcements (e.g. ringing going to busy). The initial address message includes the parameter information as shown in Figure 2-3.

If the exchange receives an alerting indication it connects the incoming circuit or line to the outgoing circuit, in at least the backward direction. If the exchange receives an answer or connect indication it connects in both directions. If the exchange receives a release indication – called party busy for instance – the incoming connection is simply left intact, until awaiting answer timer expiry or calling user disconnect.

If the original called user answers prior to receipt of alerting indication from the diverted-to exchange, this user is awarded the call and the connection toward the diverted-to exchange is released.

Option B: The exchange continues in the following manner:

If the number that the call is to be diverted to resides at another exchange, an initial address message is sent. The incoming circuit or line is connected to the chosen outgoing circuit in both directions immediately. The initial address message includes the parameter information as shown in Table 2-3.

The connection to the diverting user is released.

iii) Call forwarding user determined busy or call deflection immediate response

The call is offered to the served user. When the late ACM method is used the exchange waits until the user responds.

When the early ACM method is used an address complete message is returned to the originating exchange including an optional backward call indicator with the indication "call diversion may occur".

The exchange continues in the following manner:

If the number that the call is to be diverted to resides at another exchange, an initial address message is sent. The incoming circuit or line is connected to the chosen outgoing circuit in both directions immediately. The initial address message includes the parameter information as shown in Table 2-3.

If the exchange receives a release indication from the diverted-to exchange – called party busy for instance – a release message is sent on the incoming circuit.

d) *Notification procedures*

In case of

– call forwarding unconditional;

– call forwarding network determined busy;

– call forwarding user determined user busy when the late ACM method is used;

– call deflection immediate response when the late ACM method is used,

when call diversion occurs the diverting exchange shall send an address complete message containing the call diversion information and the redirection number in the backward direction. The call diversion information is set according to the notification subscription option of the served user and the redirecting reason. The generic notification indicator is set to "call is diverting".

In case of

– call forwarding on no reply;

– call deflection during alerting;

– call forwarding user determined user busy when the early ACM method is used;

– call deflection immediate response when the early ACM method is used,

an address complete message is returned to the originating exchange with an optional backward call indicator with the indication "call diversion may occur".

When call diversion occurs the diverting exchange shall send a call progress message containing the call diversion information and the redirection number in the backward direction. The call diversion information is set according to the notification subscription option of the served user and the redirecting reason. The generic notification indicator is set to "call is diverting".

e) *Handling of messages and parameters in a diverting exchange*

i) Receipt of address complete, call progress or connect message

If an address complete message is received in a diverting exchange, the parameters of the received ACM are transferred in a call progress message. Table 2-4 shows the correct mapping of the information.

In case of CFNR and CD during alerting (option A), if the received ACM contains diversion information, then the information contained in the received ACM is not mapped into CPG but stored until a CPG without diversion information is received. It is then passed on in a CPG.

TABLE 2-4/Q.732

Mapping of information received in an ACM

ACM	CPG
Called party's status indicator "subscriber free"	Event information "alerting"
Optional backward call indicator "in-band information or an appropriate pattern is now available"	Even information "in-band information or an appropriate pattern is now available"
Called party's status indicator "no indication"	Event information "progress"
Other parameters are transferred transparently (Note)	
NOTE – The echo control information parameter is not transferred into the CPG message. These procedures are according to 2.7.2.2.2.1 of the basic call.	

If a call progress message is received in a diverting exchange, the action to be taken depends on the service causing the diversion:

1) In case of CFU, CFB, CD immediate response and in case of CFNR (option B) and CD during alerting (option B), the call progress message is passed on.

2) In case of CFNR and CD during alerting (option A), the information contained in the CPG is stored until an ACM or CPG without diversion information is received. If subsequent CPG messages are received, the previous stored redirection reason is overridden. The notification subscription option field is analysed and the most severe restriction is retained.

A connect message is mapped into an answer message.

ii) Handling of received parameters

If a diverting exchange receives information which is not supplementary services related, it is either passed on unchanged (e.g. interworking indicator, transmission medium requirement, cause indicators) or modified required as for the basic call in transit exchanges (e.g. continuity check

indicator, satellite indicator, automatic congestion level). However, information dealing with supplementary services (e.g. call diversion related parameters) is not transferred transparently under all circumstances.

Table 2-5 lists the parameters and indicators which are handled differently in a diverting exchange compared to a normal transit exchange.

TABLE 2-5/Q.732

Handling of parameters in a diverting exchange

Parameter – Sub-parameter or indicator	Handling in a diverting exchange on receipt
Access transport – Called party's sub-address	Discarded or replaced: see 2.6.17
Backward call indicator – Charge indicator	National matter
Called party's number – Odd/even indicator – Nature of address indicator – Internal network number indicator – Numbering plan indicator – Address signals	Generated: see 2.5.2.5.1.2 b)
Event information – Event indicator	Generated: 2.5.2.5.1.2 d) possibly modified: see 2.5.2.5.1.2 e)
Forward call indicators – ISUP preference indicator	Possibly modified: see 2.5.2.5.1.2 b)
Redirecting number – Odd/even indicator – Nature of address indicator – Numbering plan indicator – Address presentation restricted indicator – Address signals	Generated: see 2.5.2.5.1.2 b)
Generic notification indicator	Generated: see 2.5.2.5.1.2 d)
Call diversion information	Generated: see 2.5.2.5.1.2 d)
Redirection information – Redirecting indicator – Redirection counter – Redirection reason	Generated: see 2.5.2.5.1.2 b)
User-to-user information	Discarded or passed on: see Recommendation Q.737.1
Original called number	Generated: see 2.5.2.5.1.2 b)
Optional backward call ind.	Generated: see 2.5.2.5.1.2 d)

2.5.2.5.2 Exceptional procedures

2.5.2.5.2.1 Actions at the destination exchange where the forwarded-to user is located

No exceptional procedures are identified.

2.5.2.5.2.2 Actions at the destination exchange performing the diversion

If the call has already undergone diversion, the redirection counter is examined to see if another diversion would take the counter above the network specified limit of five diversions.

In Option A: If it would, the call is cleared in case of call forwarding unconditional, call forwarding (user or network determined) busy and call deflection immediate response. In case of call forwarding no reply and call deflection during alerting the call is not cleared but ringing continues.

In Option B: If it would, the call is cleared.

The cause value used in the release message depends upon which of the call diversion supplementary services it is that would take the call over the limit.

The mapping is as follows:

a) call forwarding busy, the cause value "user busy" is used;

b) call forwarding no reply, the cause value "no answer from user" is used (option B only);

c) call forwarding unconditional, the cause value "call rejected" is used;

d) call deflection, the cause value "no user responding" is used (option B only).

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)

A connected number parameter and the generic number (additional connected number, if present) received in a diverting exchange in either an answer or connect message is passed on unmodified. The originating exchange is responsible for the interpretation of the presentation restriction of the connected number.

The same setting of the presentation indicator is also used for the redirection number.

2.6.4 Connected line identification restriction (COLR)

A connected number parameter received in a diverting exchange in either an answer or connect message is passed on unmodified. The originating exchange is responsible for the interpretation of the presentation restriction of the connected number.

The same setting of the presentation indicator is also used for the redirection number.

2.6.5 Calling line identification presentation (CLIP)

No impact on ISUP.

NOTE – A diverting exchange shall divert the calling party number and the generic number (additional connected number, if present).

2.6.6 Calling line identification restriction (CLIR)

No impact on ISUP.

2.6.7 Closed user group (CUG)

Closed user group restrictions must be met between the calling user, the diverted-to user and every intermediate diverting user.

The closed user group information sent to the diverted-to destination is the same closed user group information that was sent from the originating exchange.

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

Not applicable.

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)

2.6.13.1 User-to-user signalling, service 1 (UUS1)

No impact on ISUP.

2.6.13.2 User-to-user signalling, service 2 (UUS2)

No impact on ISUP.

2.6.13.3 User-to-user signalling, service 3 (UUS3)

No impact on ISUP.

2.6.14 Multiple subscriber number (MSN)

No impact on ISUP.

2.6.15 Call hold (HOLD)

No impact on ISUP.

2.6.16 Advice of charge (AOC)

No impact on ISUP.

2.6.17 Sub-addressing (SUB)

If a called party sub-address is included in the access transport parameter of the received IAM, the received called party sub-address is not diverted. If provided by the served user at call diversion activation, a new called party sub-address is included in the access transport parameter of the IAM.

The calling party sub-address in the initial address message and the connected party sub-address in the answer or connect message are transferred transparently in the diverting exchange.

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 Interactions with other networks

In case of interaction with networks which do not provide any notification of the call diversion or call redirection information (e.g. redirection counter) in the signalling system, the call continues according to the basic call procedures.

2.8 Signalling flows

Figures 2-1 to 2-8 give successful diversion scenarios in case of late ACM procedures.

Figures 2-9 to 2-16 give the scenarios for unsuccessful diversion with late ACM.

Figures 2-17 to 2-24 give successful diversion scenarios in case of early ACM procedures.

Figures 2-25 to 2-32 give the scenarios for unsuccessful diversion with early ACM.

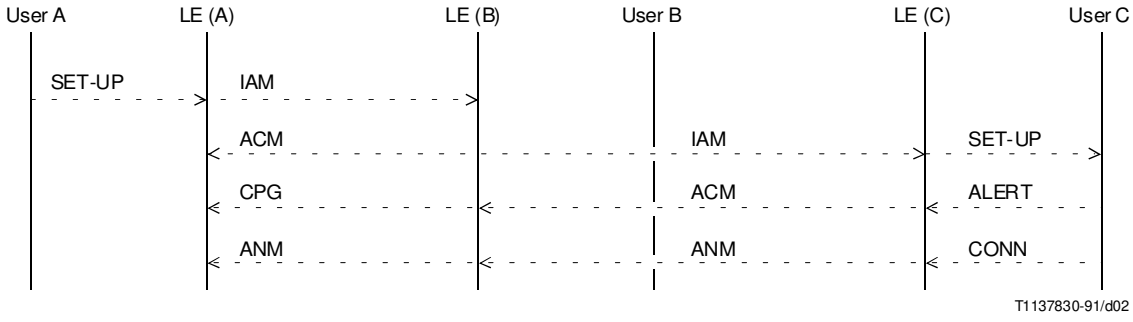


FIGURE 2-1/Q.732

Call forwarding unconditional

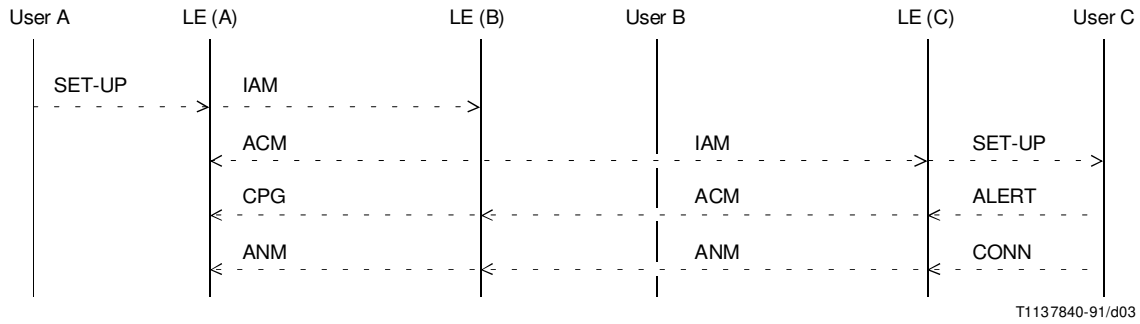


FIGURE 2-2/Q.732

Call forwarding (network determined) busy

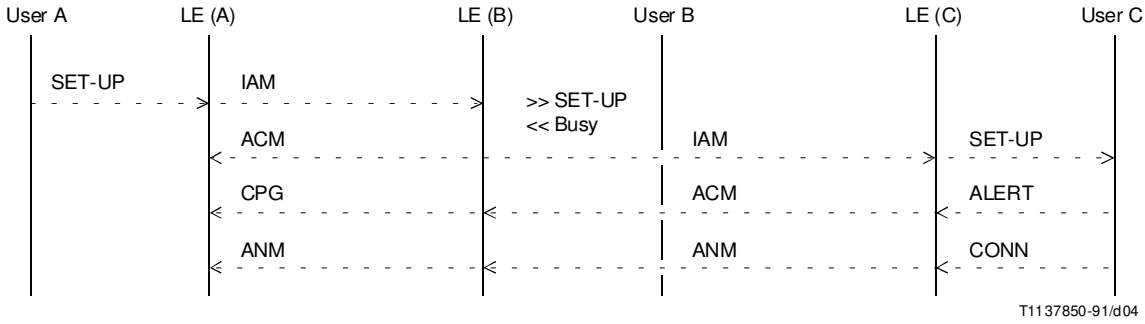
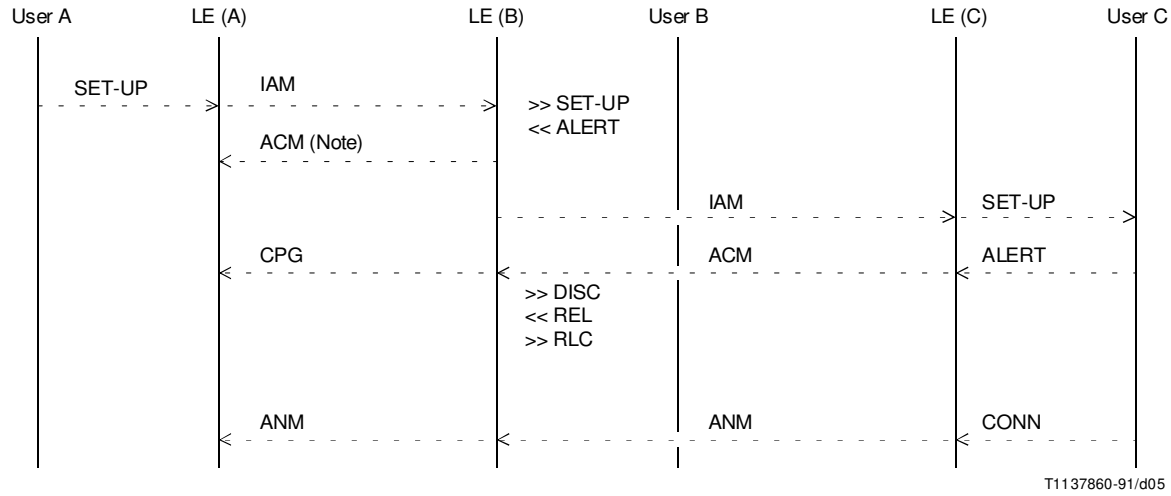


FIGURE 2-3/Q.732

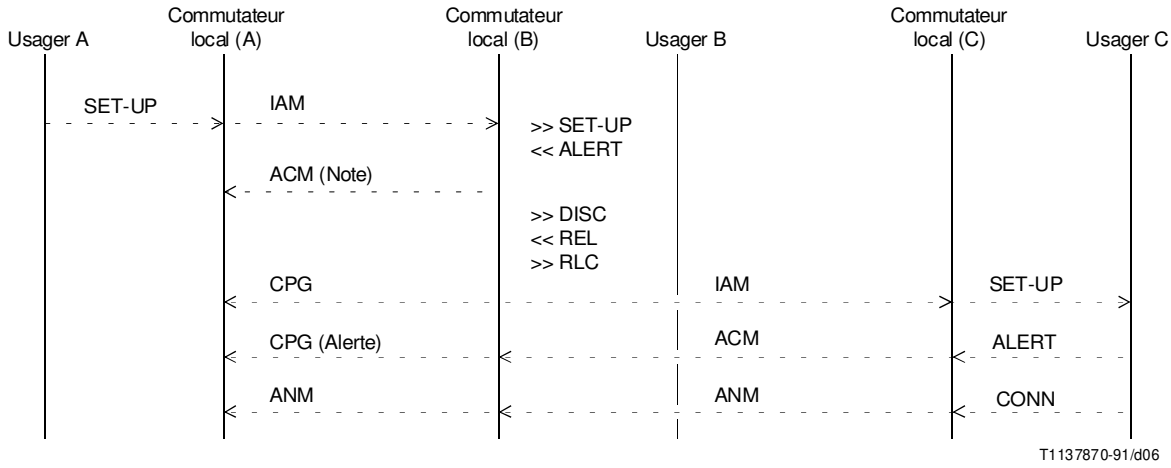
Call forwarding (user determined) busy



NOTE – The ACM contains the optional backward call indicator set to "call diversion may occur".

FIGURE 2-4/Q.732

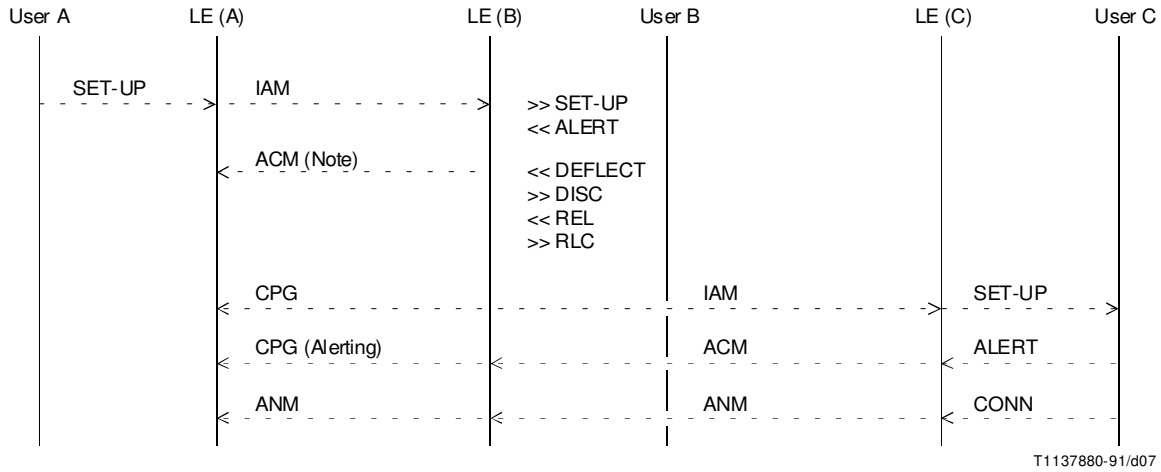
Call forwarding no reply (option A, late release)



NOTE – L'ACM contient l'indicateur d'appel arrière optionnel mis à «transfert d'appel possible».

FIGURE 2-5/Q.732

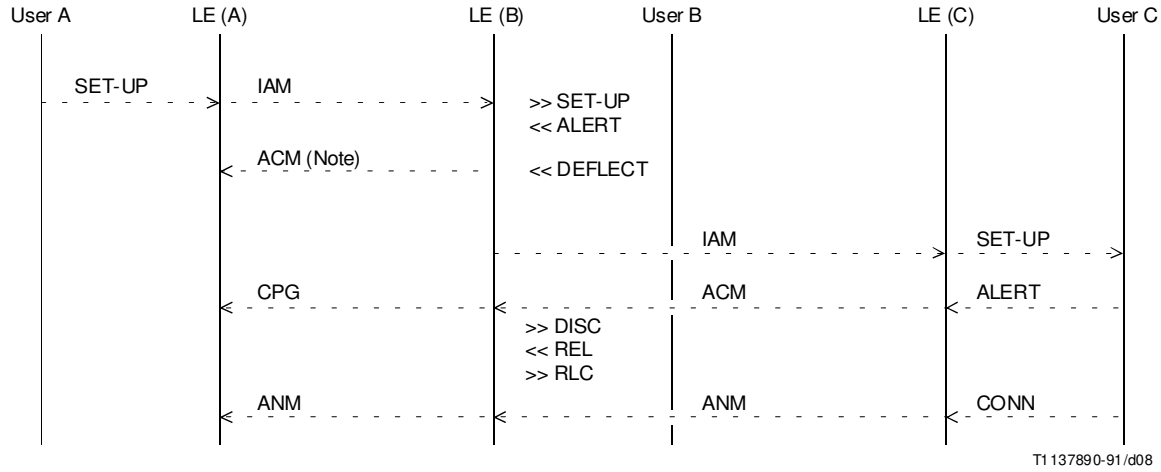
Renvoi d'appel sur non-réponse (option B, libération immédiate)



NOTE – The ACM contains the optional backward call indicator set to "call diversion may occur".

FIGURE 2-6/Q.732

Call deflection during alerting (option B, immediate release)



NOTE – The ACM contains the optional backward call indicator set to "call diversion may occur".

FIGURE 2-7/Q.732

Call deflection during alerting (option A, late release)

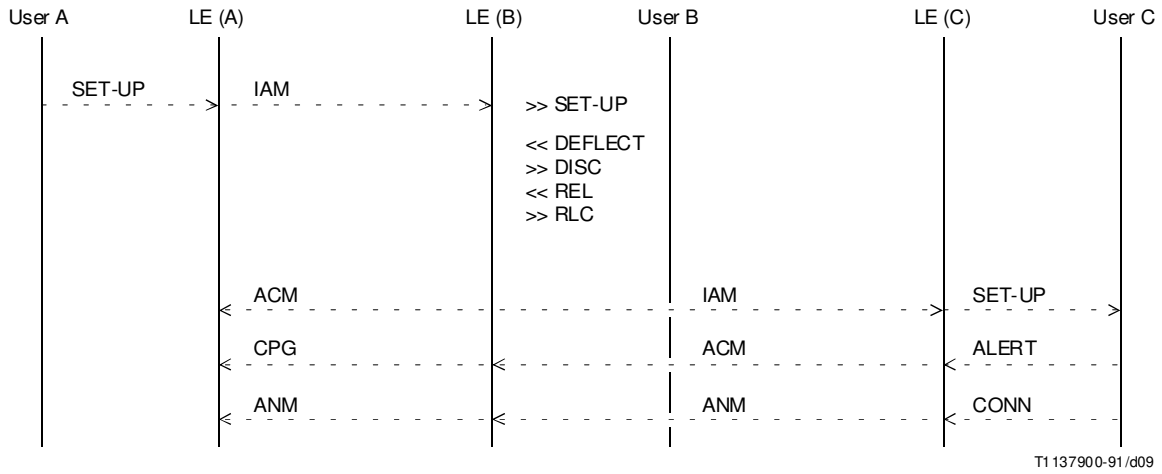


FIGURE 2-8/Q.732

Call deflection immediate response (option B, immediate release)

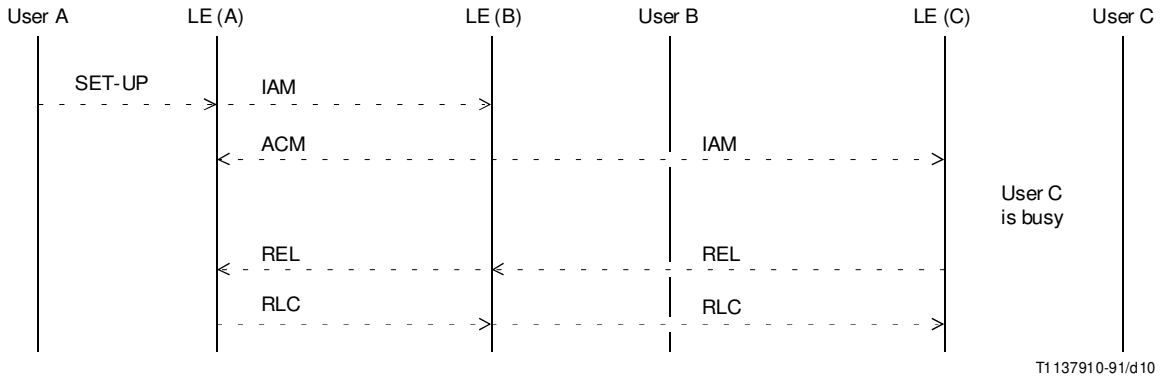


FIGURE 2-9/Q.732

Call forwarding unconditional – unsuccessful

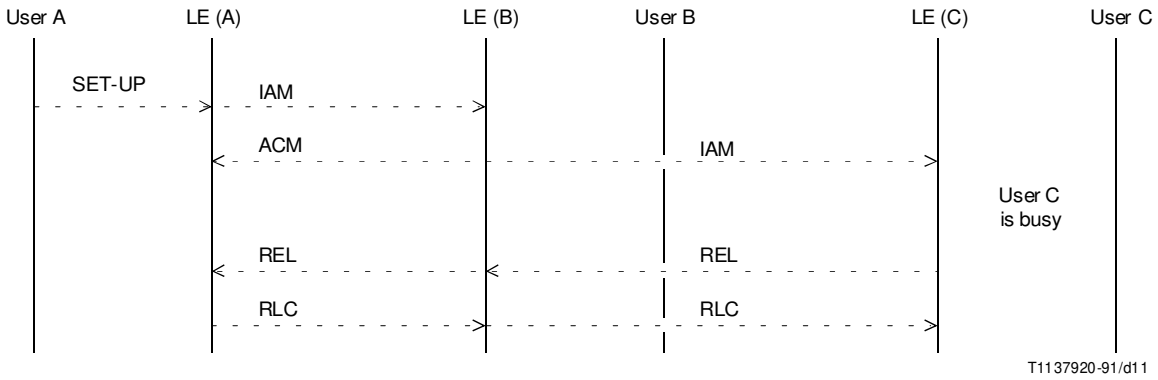


FIGURE 2-10/Q.732

Call forwarding (network determined) busy – unsuccessful

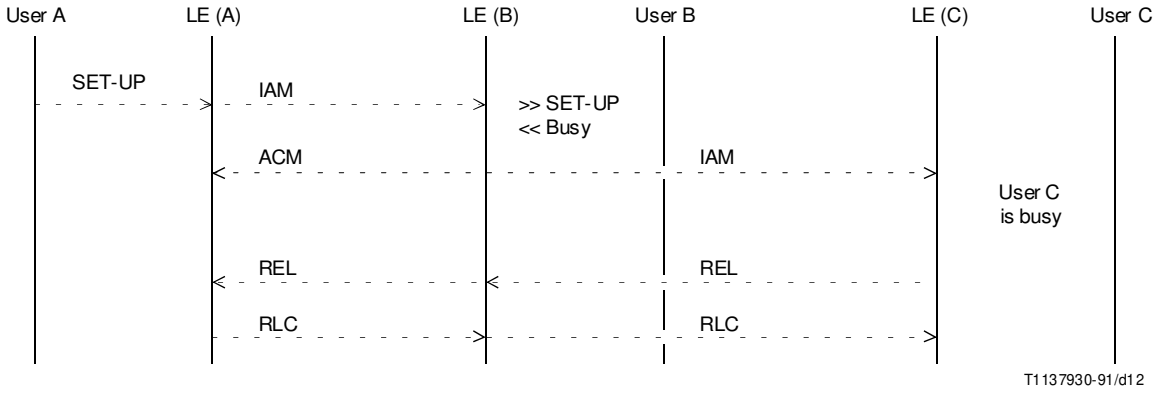


FIGURE 2-11/Q.732

Call forwarding (user determined) busy – unsuccessful

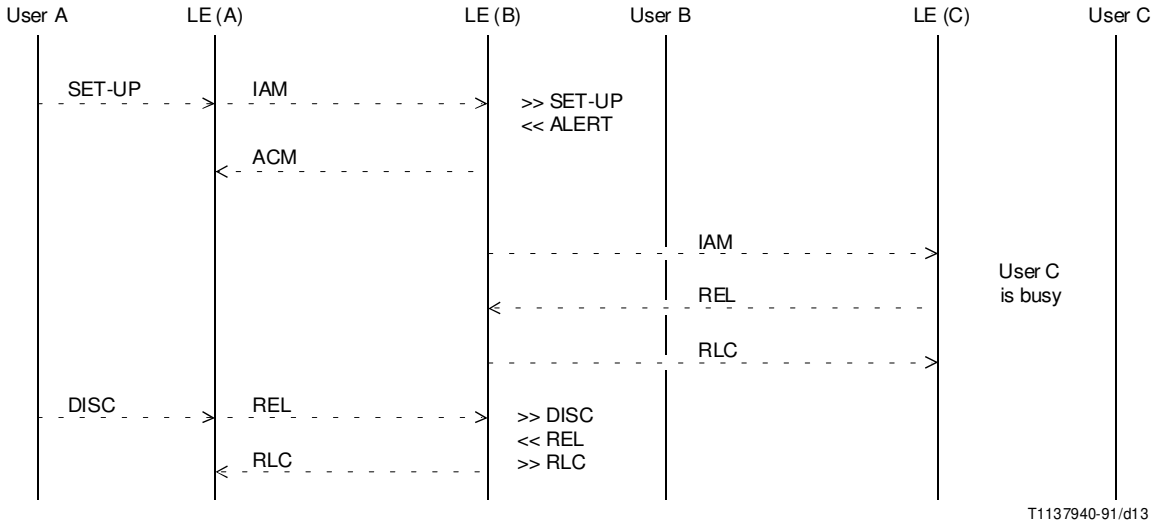


FIGURE 2-12/Q.732

Call forwarding no reply (option A, late release) – unsuccessful

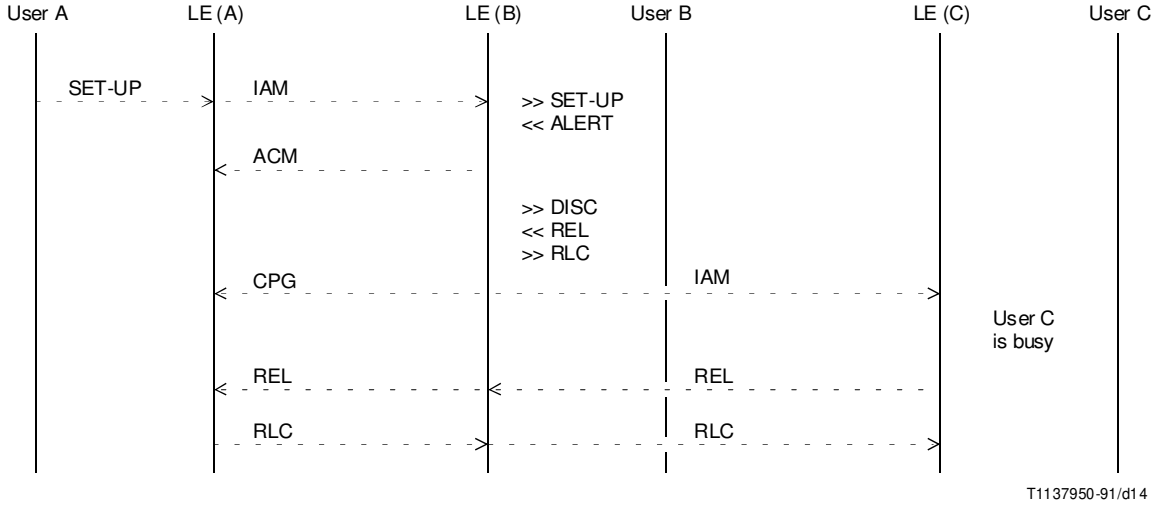


FIGURE 2-13/Q.732

Call forwarding no reply (option B, immediate release) – unsuccessful

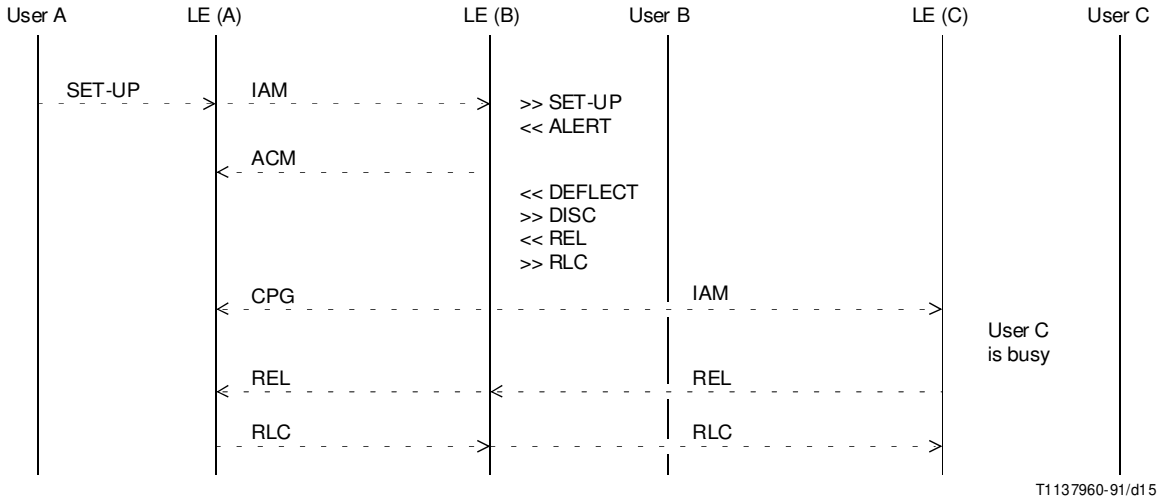


FIGURE 2-14/Q.732

Call deflection during alerting (option B, immediate release) – unsuccessful

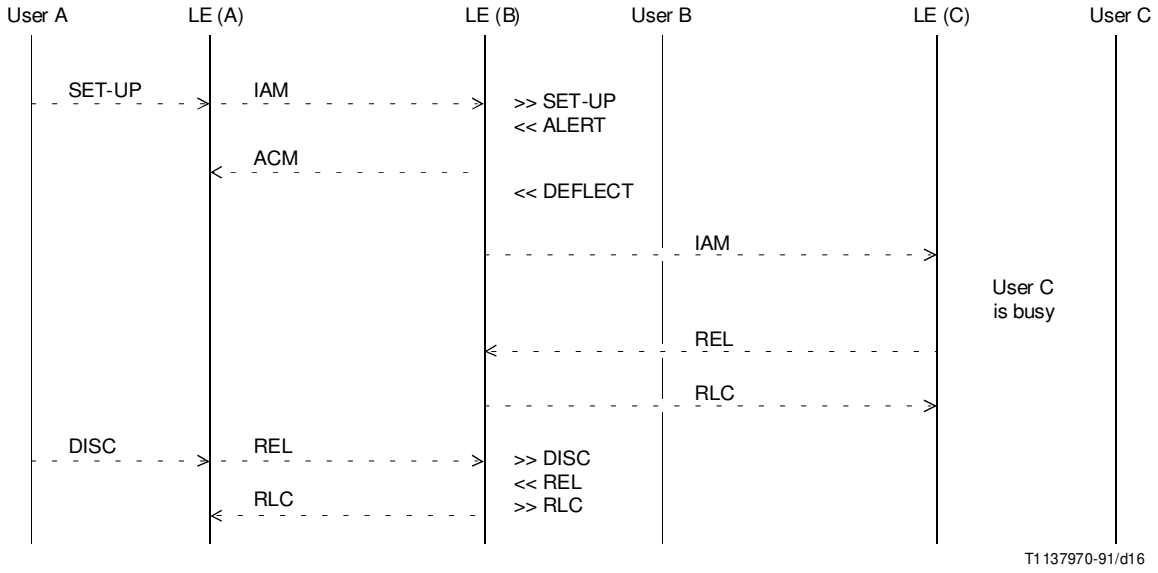


FIGURE 2-15/Q.732

Call deflection during alerting (option A, late release) – unsuccessful

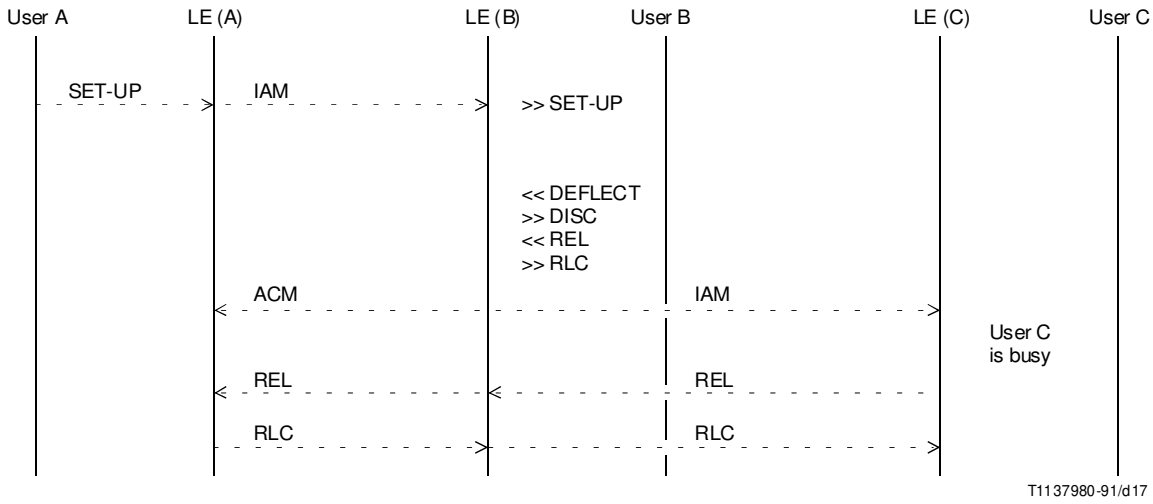


FIGURE 2-16/Q.732

Call deflection immediate response (option B, immediate release) – unsuccessful

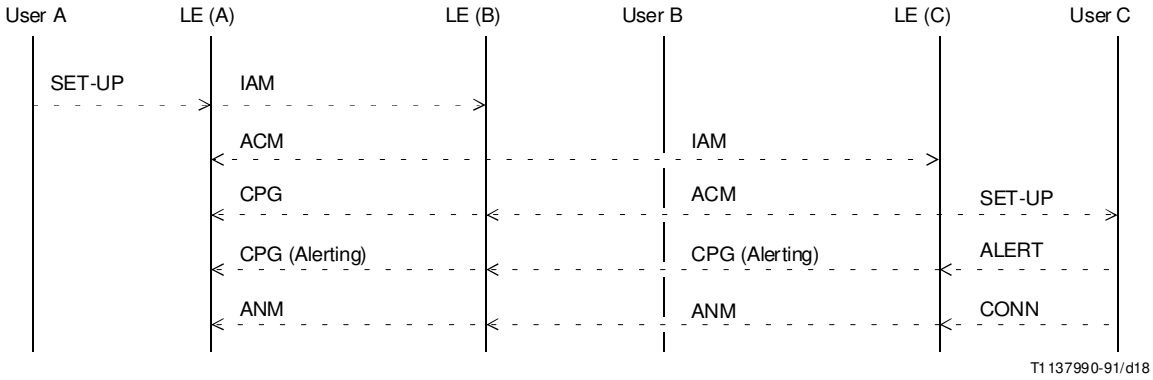


FIGURE 2-17/Q.732

Call forwarding unconditional

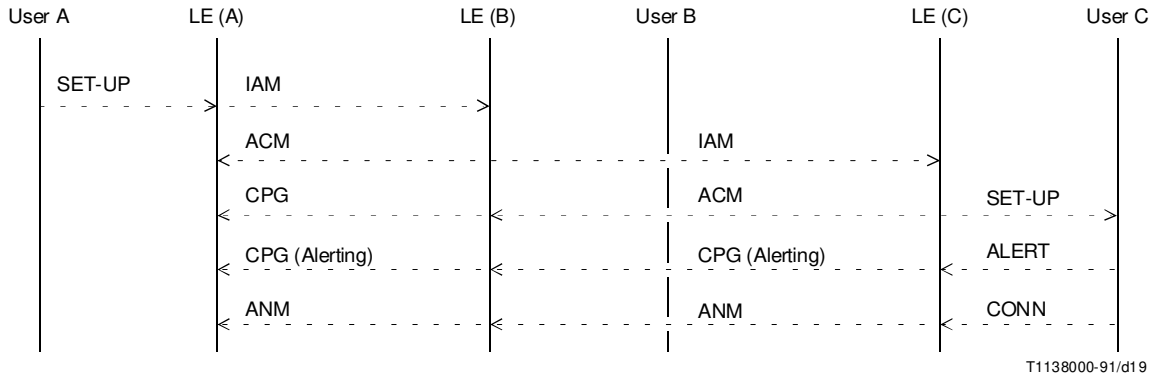
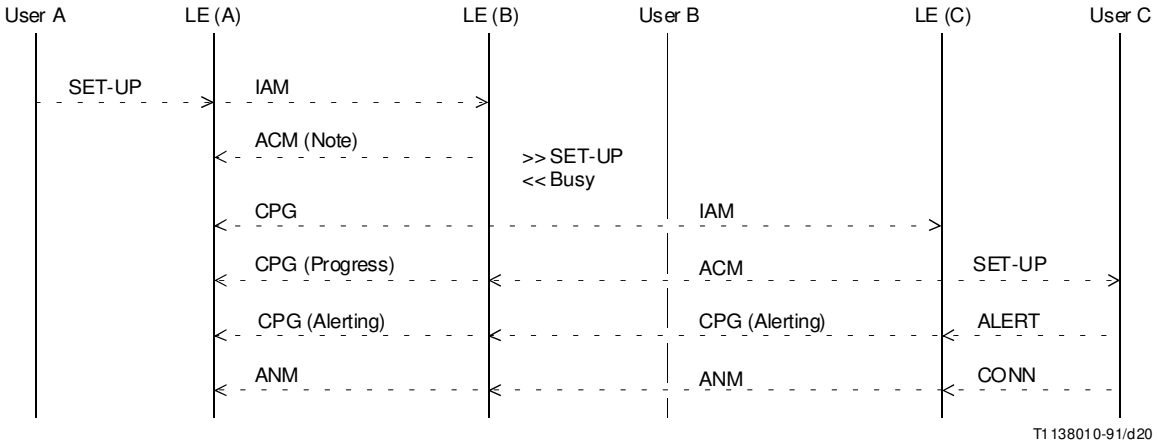


FIGURE 2-18/Q.732

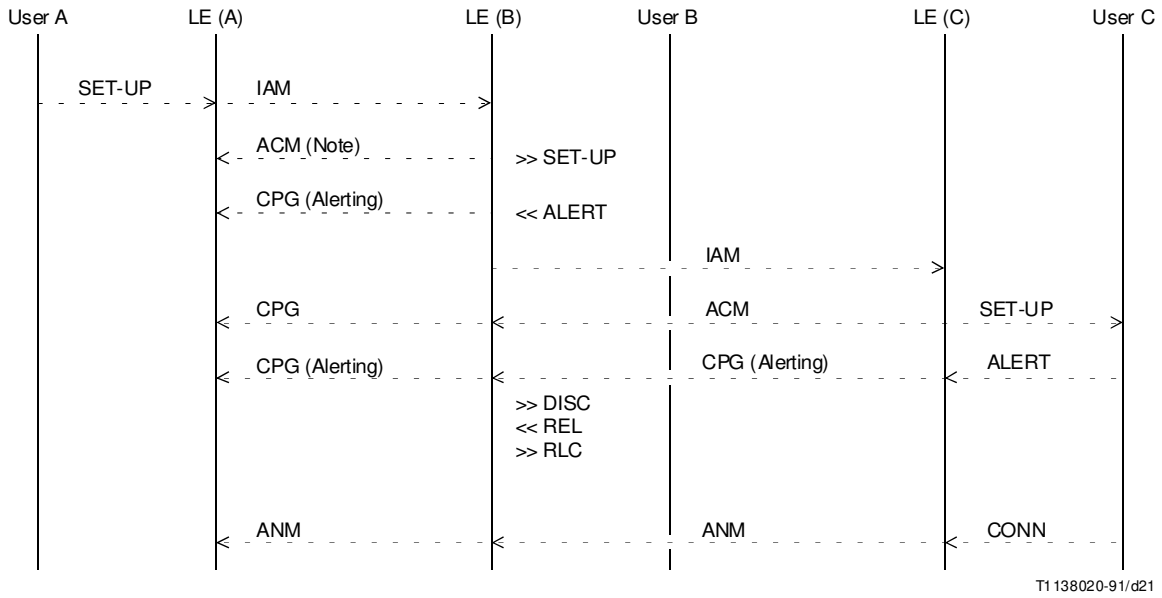
Call forwarding (network determined) busy



NOTE – The ACM contains the optional backward call indicator set to "call diversion may occur".

FIGURE 2-19/Q.732

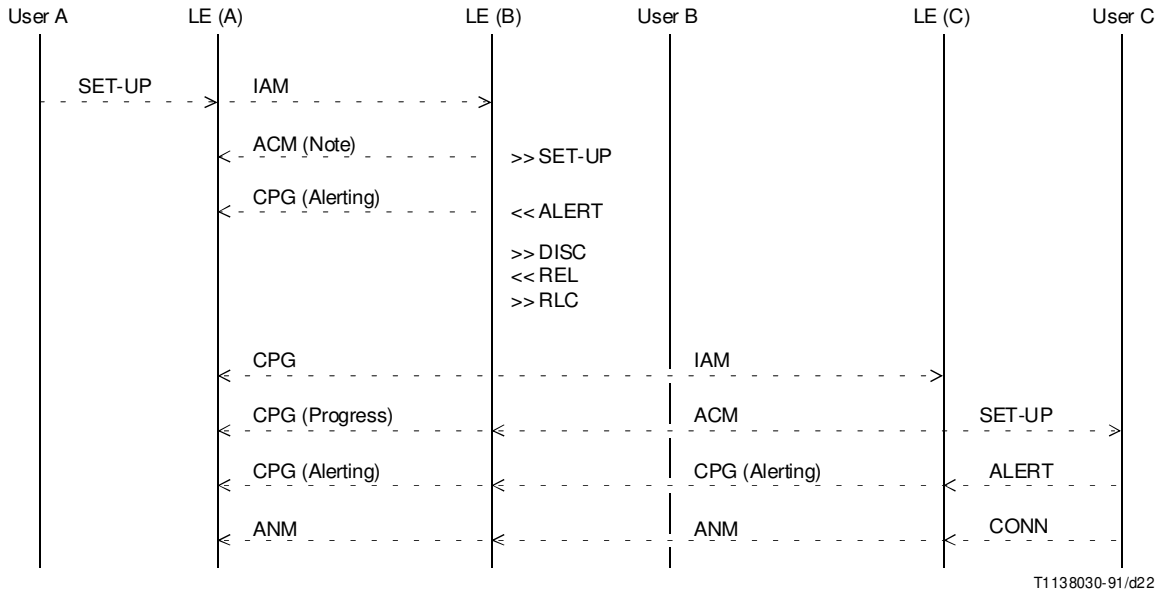
Call forwarding (user determined) busy



NOTE – The ACM contains the optional backward call indicator set to "call diversion may occur".

FIGURE 2-20/Q.732

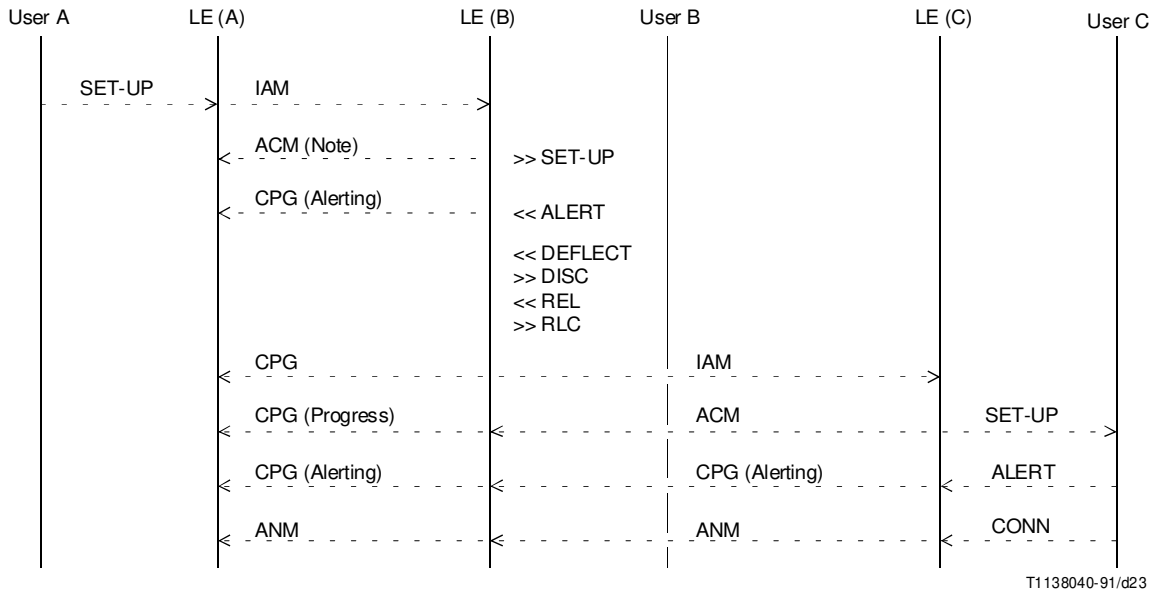
Call forwarding no reply (option A, late release)



NOTE – The ACM contains the optional backward call indicator set to "call diversion may occur".

FIGURE 2-21/Q.732

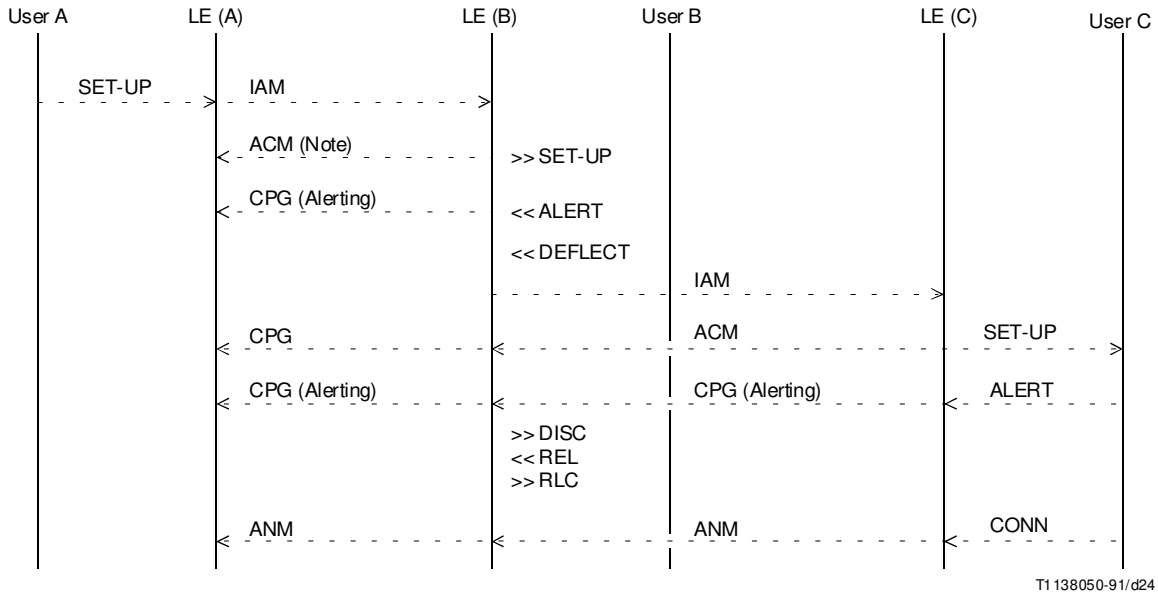
Call forwarding no reply (option B, immediate release)



NOTE – The ACM contains the optional backward call indicator set to "call diversion may occur".

FIGURE 2-22/Q.732

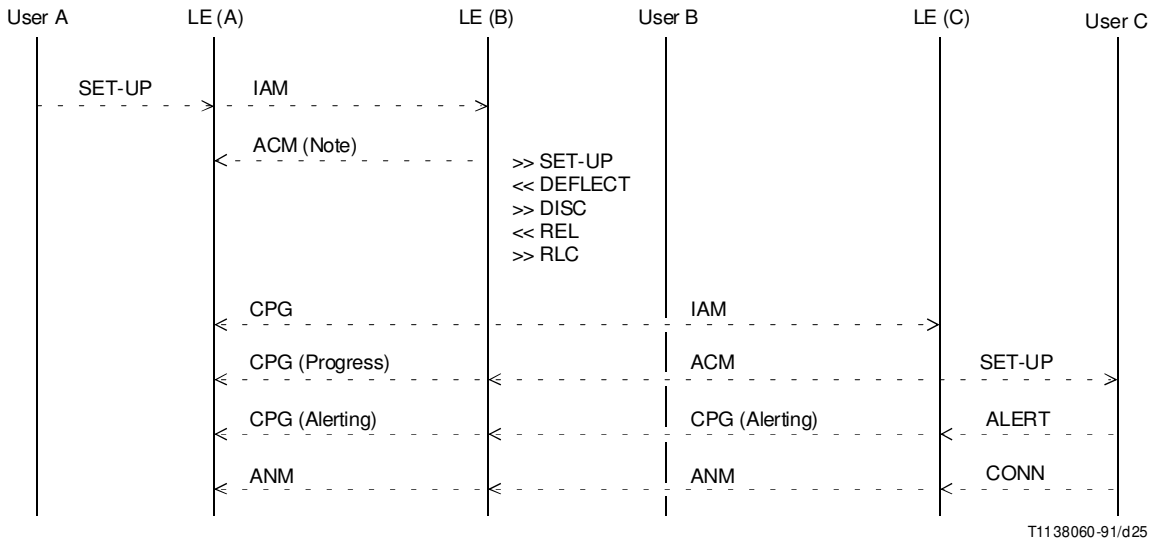
Call deflection during alerting (option B, immediate release)



NOTE – The ACM contains the optional backward call indicator set to "call diversion may occur".

FIGURE 2-23/Q.732

Call deflection during alerting (option A, late release)



NOTE – The ACM contains the optional backward call indicator set to "call diversion may occur".

FIGURE 2-24/Q.732

Call deflection immediate response (option B, immediate release)

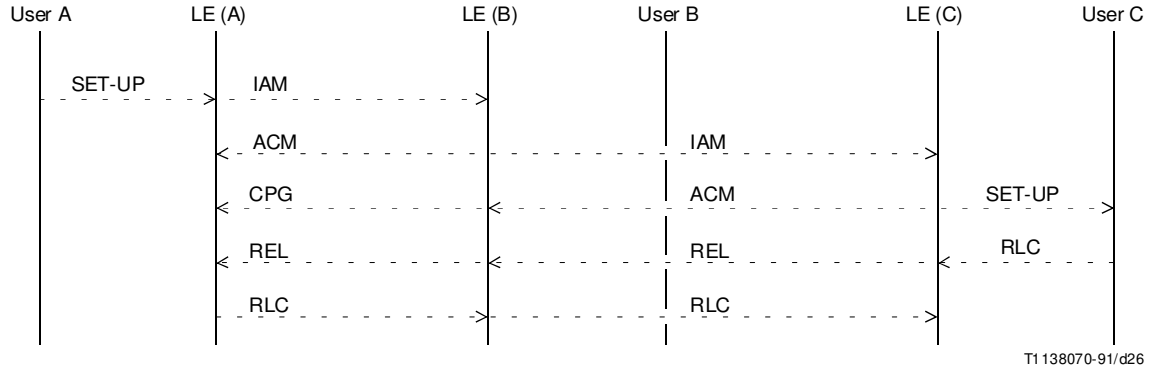


FIGURE 2-25/Q.732

Call forwarding unconditional – unsuccessful

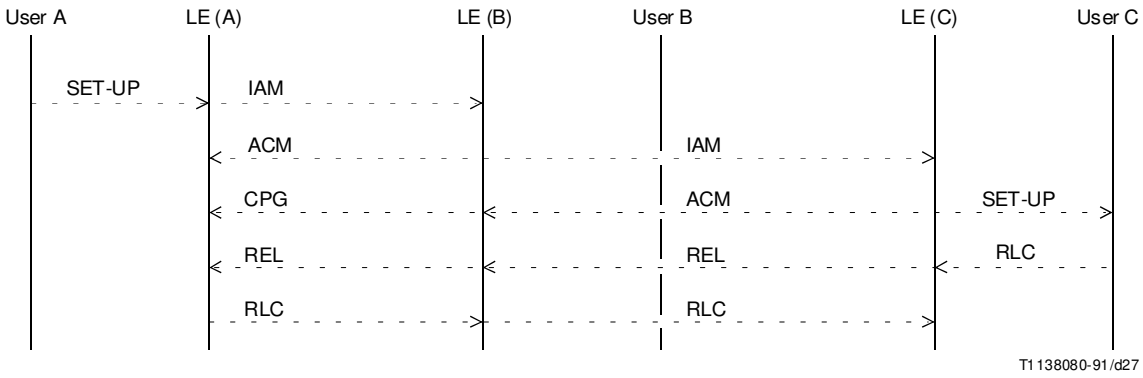


FIGURE 2-26/Q.732

Call forwarding (network determined) busy – unsuccessful

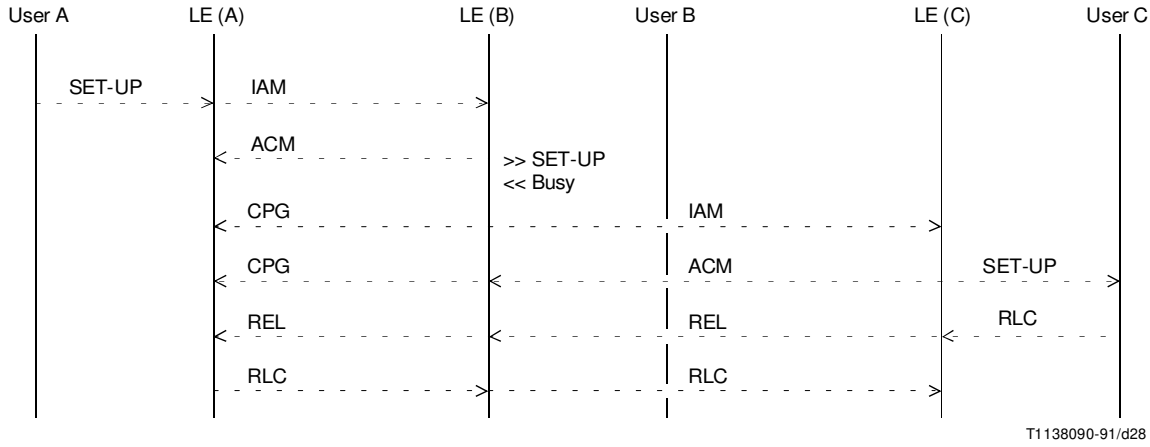


FIGURE 2-27/Q.732

Call forwarding (user determined) busy – unsuccessful

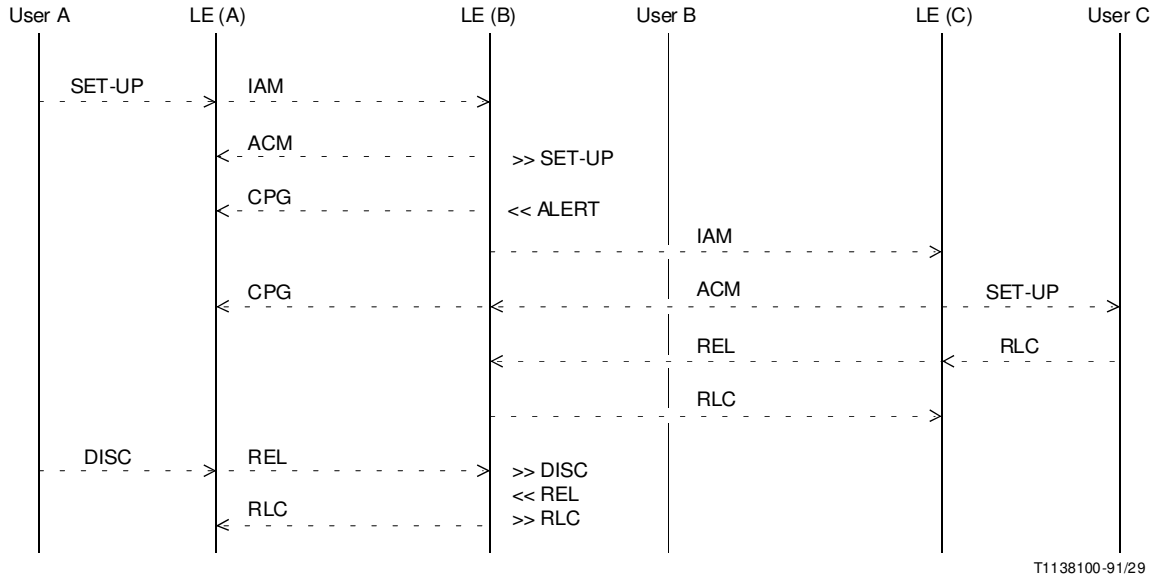


FIGURE 2-28/Q.732

Call forwarding no reply (option A, late release) – unsuccessful

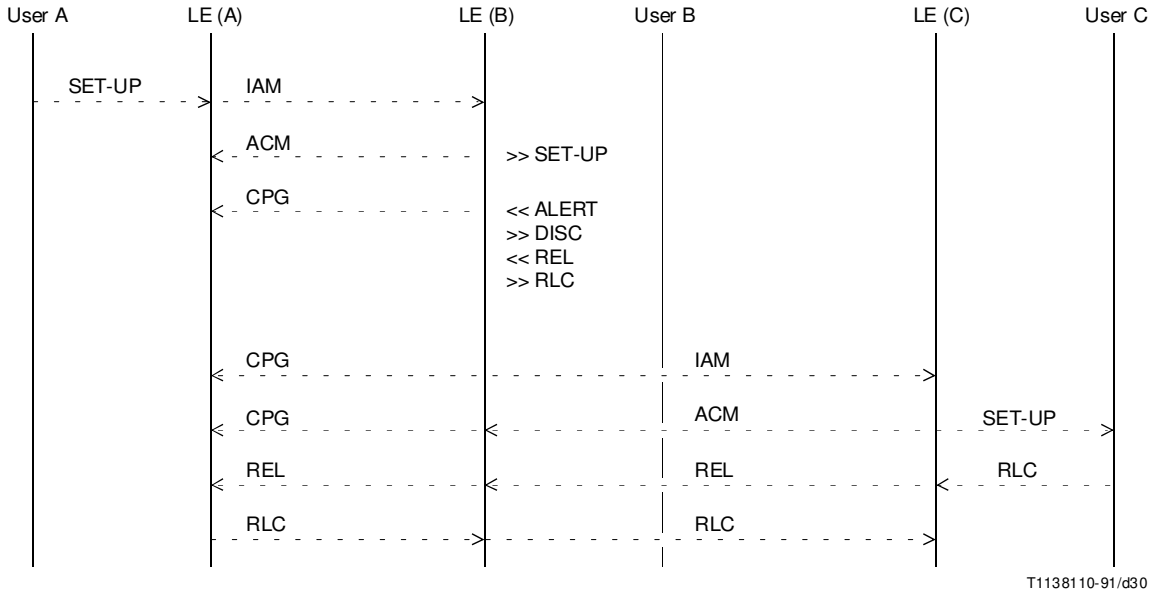


FIGURE 2-29/Q.732

Call forwarding no reply (option B, immediate release) – unsuccessful

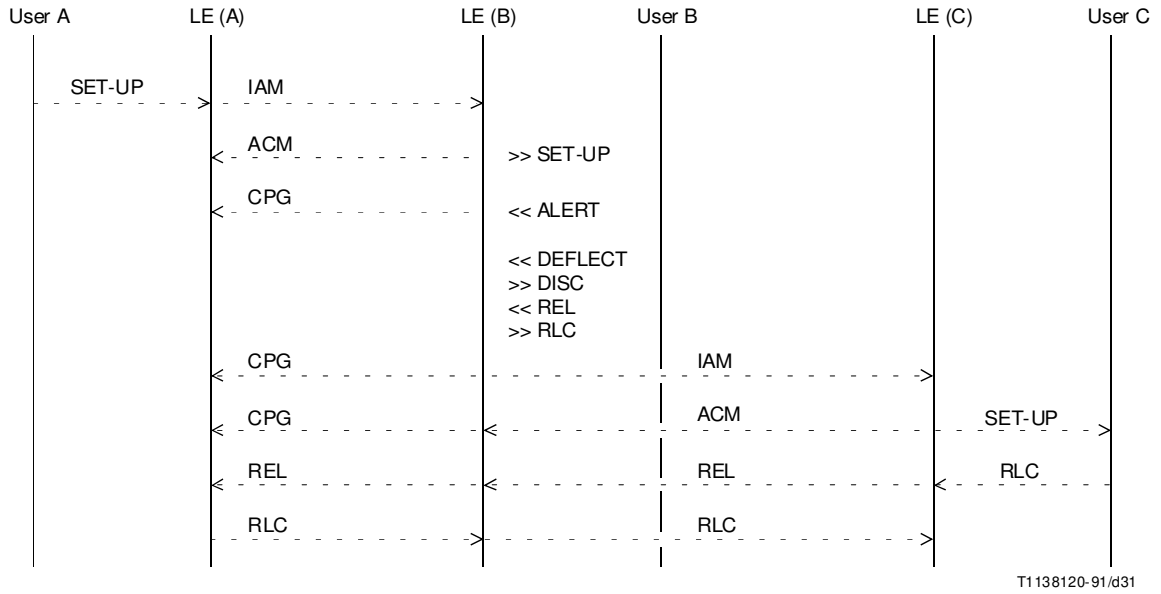


FIGURE 2-30/Q.732

Call deflection during alerting (option B, immediate release) – unsuccessful

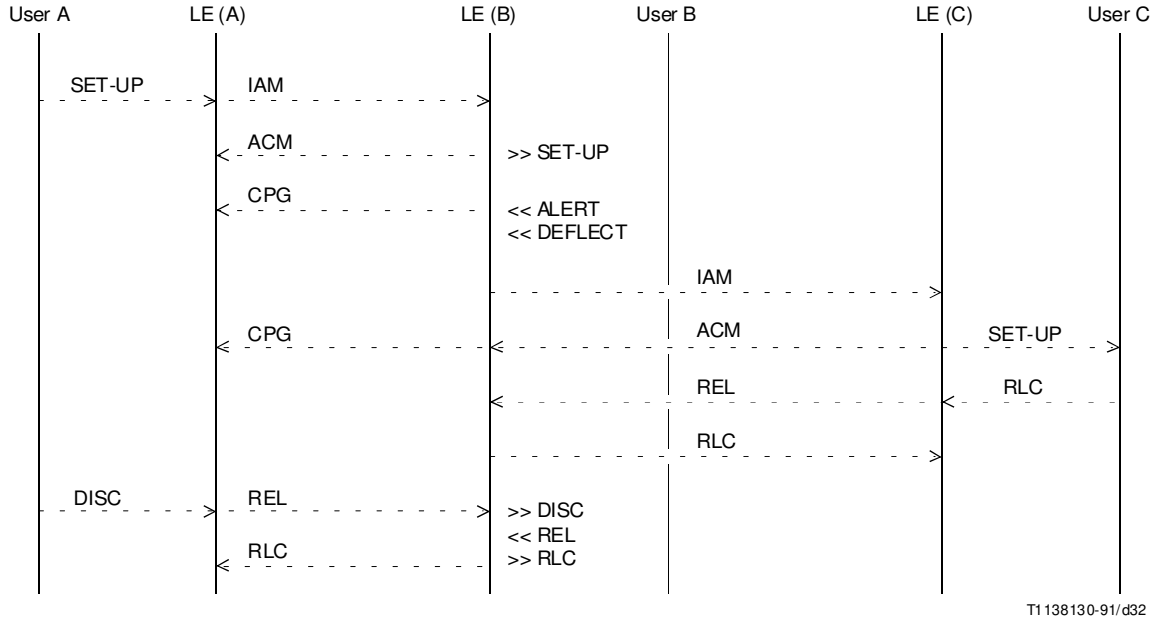


FIGURE 2-31/Q.732

Call deflection during alerting (option A, late release) – unsuccessful

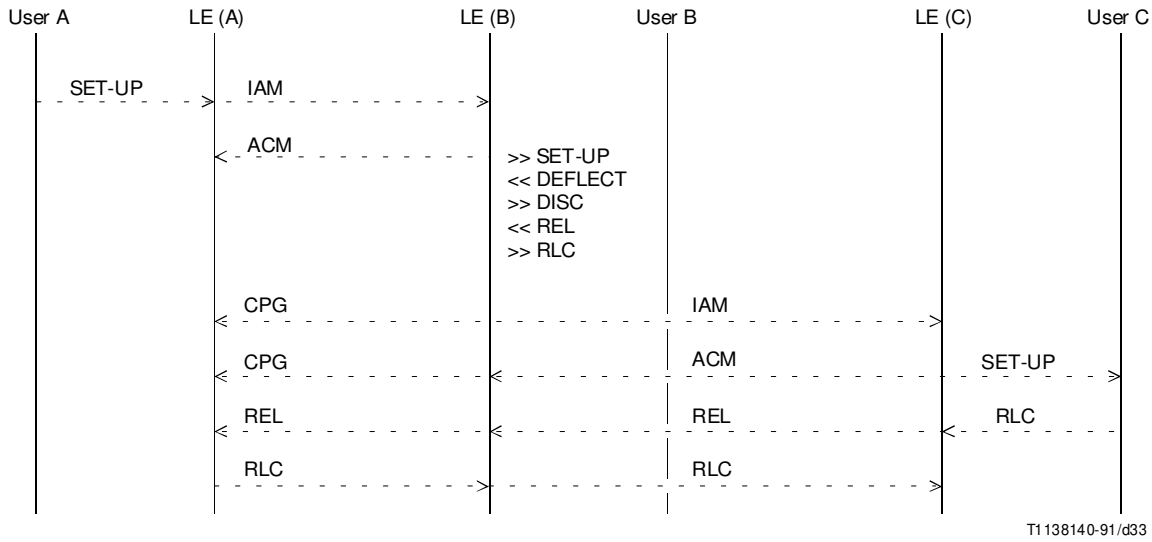


FIGURE 2-32/Q.732

Call deflection immediate response (option B, immediate release) – unsuccessful

2.9 Parameter values (timers)

No new timers identified.

2.10 Dynamic description

3 Call forwarding no reply (CFNR)

Refer to subclauses 2.1 to 2.10.

4 Call forwarding unconditional (CFU)

Refer to subclauses 2.1 to 2.10.

5 Call deflection (CD)

Refer to subclauses 2.1 to 2.10.