

Source: TSG SA1

Title: CRs to 22.078 on mid call event (R5)

Document for: Approval

Agenda Item: 7.1.3

Spec	CR	Rev	Phase	Cat	Subject	Vers	New Vers	SA1 Doc. No.
22.078	068		R5	B	Enhancement to the Mid Call event to include out band information	5.0.0	5.1.0	S1-000783
22.078	073		R5	C	Criteria for the Mid-Call event detection point	5.0.0	5.1.0	S1-000754

3GPP TSG-S1 CAMEL Ad Hoc
Paris, France, 30th - 31st October 2000

S1C000067

3G CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

22.078 CR 068

Current Version: **5.0.0**

3G specification number ?

? CR number as allocated by 3G support team

For submission to TSG **SA #10** for approval (only one box should be marked with an X)
List TSG meeting no. here ? for information

Form: 3G CR cover sheet, version 1.0 The latest version of this form is available from: <ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf>

Proposed change affects: USIM ME UTRAN Core Network
(at least one should be marked with an X)

Source: SA1 **Date:** 17/11/2000

Subject: Enhancement to the Mid Call event to include out band information

3G Work item: CAMEL Phase 4

Category: (only one category shall be marked with an X)	F Correction	<input type="checkbox"/>	Release:	Phase 2	<input checked="" type="checkbox"/>
	A Corresponds to a correction in a 2G specification	<input type="checkbox"/>		Release 96	
	B Addition of feature	<input checked="" type="checkbox"/>		Release 97	
	C Functional modification of feature	<input type="checkbox"/>		Release 98	
	D Editorial modification	<input type="checkbox"/>		Release 99	
		<input type="checkbox"/>		Release 4	
	<input type="checkbox"/>	Release 5			

Reason for change:

At the recent SA#9 meeting held between 25-28th September 2000, a change request to 3G TS 22.078 was approved that introduced the mid call event in both originating and terminating calls. This change request, available in SP-000425 (S1-000514) limits the detection of mid call events to DTMF signals.

This change requests proposes further enhancements to the mid call event detection point by including the ability for out-band (e.g. the Facility Information Flow) detection of the mid call event. This is proposed as part of CAMEL Phase 4.

The rationale for including the detection of the out-band information, in particular for a MT

- Flexible service handling will also be allowed for CSE since out-band information may carry additional information in it (e.g. FACILITY info).
- Call by call interaction between the MT and a network (CSE) will add more user controllability on the particular call (e.g. with the CLIP, a user can instruct the CSE to transfer of a call to the voice storage unit since the user would not like to communicate with the caller at that moment.)

Clauses affected:

Other specs affected:

Other 3G core specifications	<input type="checkbox"/>	? List of CRs:
Other 2G core specifications	<input type="checkbox"/>	? List of CRs:
MS test specifications	<input type="checkbox"/>	? List of CRs:
BSS test specifications	<input type="checkbox"/>	? List of CRs:
O&M specifications	<input type="checkbox"/>	? List of CRs:

Other

comments:



*****First Modified Section*****

5.3.1 Procedure when dialled digits have been collected

The purpose of this procedure is to detect a call set-up request at the point where digits have been collected but not analysed, and to allow the CSE to modify the handling of the call set-up request.

If (according to the CSI):

- the subscriber is provisioned with a CAMEL based originating service; and
- the call set-up request occurs; and
- the criteria are satisfied \$(CAMEL2\$).

Then the VPLMN/IPLMN shall suspend call processing, make contact with the CSE and await further instructions.

For mobile originated calls the information listed in table: A-1 (Call set-up request procedure 1) shall be provided to the CSE if available.

For forwarded calls the information listed in table: A-1 (Call set-up request procedure 2) shall be provided to the CSE if available.

When the VPLMN/IPLMN has made contact with the CSE, the CSE shall be able to instruct the VPLMN to act as described below.

- perform charging activities; \$(CAMEL2\$);
- activate subsequent control service events for the call. The CSE shall have the possibility to send the following information:
 - The subsequent service event which shall be detected and reported:
 - Called party connection;
 - Call disconnection;
 - Calling party abandon -\$(CAMEL2\$);
 - Unsuccessful call establishment. In the case of no answer the CSE may provide a no answer timer - \$(CAMEL2\$);
 - Mid call event (DTMF or Out band information). The CSE shall specify the digit string(s) or the out-band information for which the instruction is valid. Out-band information may be detected during alerting phase of the call.
 - The party in the call for which the event shall be detected and reported (calling or called party);
 - The type of monitoring (control or notification).
- order in-band user interaction. \$(CAMEL2\$).
- request charging notifications. \$(CAMEL4\$).

There shall be no restriction regarding the order of the above instructions or the number of times each of the above instructions can be repeated. Once the CSE has concluded issuing the above instructions, it shall issue one and only one of the following instructions:

- bar the call (i.e. release the call prior to connection);
- allow the call processing to continue unchanged;
- allow the call processing with modified information. The CSE shall have the possibility to send the information listed in table: A-2 (Call set up request procedure 1).

*****Next Modified Section*****

5.5 Unsuccessful call establishment

The purpose of this procedure is to manage an outgoing call set-up at the time when the call establishment is unsuccessful.

If no control relationship for the given call exists and

- the unsuccessful call establishment procedure is defined as an initial service event (according to the CSI); and
- the call attempt is unsuccessful; and
- the triggering criteria are satisfied .

Then the VPLMN/IPLMN shall suspend call processing, make contact with the CSE and await further instructions.

If a relationship for the given call already exists and the CSE has activated this subsequent service event for this call and the unsuccessful call establishment event occurs the VPLMN/IPLMN shall:

- suspend call processing, notify the CSE and await further instructions, or
- notify the CSE and continue call processing.

In both cases above the following information shall be provided to the CSE:

- Event met;
- Type of monitoring;
- Cause for unsuccessful call establishment:
 - not reachable
 - busy
 - no answer
 - route select failure

If the unsuccessful call procedure is armed as an initial service event, the information listed in table: A-1 (Unsuccessful call establishment (MO)) shall be provided to the CSE additionally if available. A new relationship is opened only if triggering criteria are fulfilled and no relationship exists already for the same CSI.

When the VPLMN/IPLMN has made contact with the CSE, the CSE shall be able to instruct the VPLMN/IPLMN to act as described below:

- perform charging activities;
- activate subsequent control service events for the call. The CSE shall have the possibility to send the following information:
 - The subsequent service event which shall be detected and reported:
 - Called party connection;
 - Call disconnection;
 - Calling party abandon;
 - Unsuccessful call establishment. In the case of no answer the CSE may provide a no answer timer;
 - Mid call event (DTMF or out-band information). The CSE shall specify the digit string(s) or the out-band information for which the instruction is valid. Out-band information may be detected during alerting phase of the call. The detection of the mid call event shall be limited to the VPLMN. ;
 - The party in the call for which the event shall be detected and reported (calling or called party);
 - The type of monitoring (control or notification).
- order in-band user interaction.

- request charging notifications. \$(CAMEL4\$).

There shall be no restriction regarding the order of the above instructions or the number of times each of the above instructions can be repeated. Once the CSE has concluded issuing the above instructions, it shall issue one and only one of the following instructions:

- allow the call processing to continue unchanged;
- allow the call processing with modified information. The CSE shall have the possibility to send the following information listed in table: A-2 (Unsuccessful call establishment (MO)).
- release call

|

5.6 Called party connection procedure

The purpose of this procedure is to manage an outgoing call set-up at the time when the called party answers and the call is successfully established.

If the CSE has activated this subsequent service event for this call and the called party connection event occurs the VPLMN/IPLMN shall:

- suspend call processing, notify the CSE and await further instructions, or
- notify the CSE and continue call processing.

The following information shall be provided to the CSE:

- Event met;
- The party in the call for which the event is reported (only Called party applicable);
- Type of monitoring.

When the VPLMN/IPLMN has made contact with the CSE, the CSE shall be able to instruct the VPLMN to act as described below.

- perform charging activities;
- activate subsequent control service events for the call. The CSE shall have the possibility to send the following information:
 - The subsequent service event which shall be detected and reported:
 - Call disconnection;
 - Mid call event (DTMF or out-band information). The out-band information may be detected during alerting phase. The detection of the mid call event shall be limited to VPLMN only;
 - The party in the call for which the event shall be detected and reported (calling or called party);
 - The type of monitoring (control or notification).
- Order in-band user interaction.

There shall be no restriction regarding the order of the above instructions or the number of times each of the above instructions can be repeated. Once the CSE has concluded issuing the above instructions, it shall issue one and only one of the following instructions:

- release the call;
- allow the call processing to continue unchanged;

5.7 Mid call procedure

When the CSE instructs the VPLMN to arm the mid-call event it shall specify a criterion against which digits entered by the originating subscriber using the DTMF procedure shall be matched. [The CSE shall not specify any criteria against a pattern of out-band information.](#)

The [DTMF](#) criterion consists of a list of up to 3 entries. Each entry is either a digit string or a definition of a range. A range definition consists of a lower bound followed by an upper bound. The lower bound and the upper bound are each digit strings. A digit string shall be at least 1 digit and at most 6 digits. Each digit shall be taken from the ordered set (0 - 9, *, #, A, B, C, D).

When collecting digits, the VPLMN shall consider a digit which follows the first digit of the string to be part of the string only if the interval between successive digits does not exceed 4 seconds.

The criterion for the mid-call DP is satisfied if the digits collected from the subscriber match the digits in a digit string in the criterion, or if the digits collected from the subscriber are included in a range defined in the criterion. Triggering of the mid-call event shall occur immediately after the criterion has been satisfied. Once the triggering occurs the VPLMN shall disarm the mid-call event.

Digits collected from the subscriber shall be relayed as DTMF towards the destination subscriber independent of any CAMEL processing.

If the CSE has activated this service event for the served subscriber and a mid-call event (as determined by the criterion for the mid-call procedure being satisfied) occurs the VPLMN shall:

- suspend call processing, notify the CSE and await further instructions, or
- notify the CSE and continue call processing.

The following information shall be provided to the CSE:

- Event met;
- Type of monitoring;
- event specific data:
 - received DTMF digits [or the received out-band information.](#)

When the VPLMN has made contact with the CSE, the CSE shall be able to instruct the VPLMN to act as described below:

- perform charging activities
- activate other control service events for the call. The CSE shall have the possibility to send the following information:
 - The service event which shall be detected and reported:
 - Call disconnection;
 - Mid call event (DTMF [or out-band information.](#));
 - The party in the call for which the event shall be detected and reported (calling or a called party);
 - The type of monitoring (control or notification).
- order in-band user interaction

There shall be no restriction regarding the order of the above instructions or the number of times each of the above instructions can be repeated. Once the CSE has concluded issuing the above instructions, it shall issue one and only one of the following instruction:

- allow the call processing to continue unchanged;
- allow the call processing with modified information;
- release the call;

5.8 Call disconnection procedure

The purpose of this procedure is to manage the actions on disconnection of an established call. This procedure is applicable to the calling party and to the called party.

If the CSE has activated this subsequent service event for this call and the call disconnection event occurs the VPLMN/IPLMN shall:

- suspend call processing, notify the CSE and await further instructions, or
- notify the CSE and continue call processing.

The following information shall be provided to the CSE:

- Event met;
- The party in the call for which the event is reported;
- Type of monitoring;
- Disconnection reason.

When the VPLMN/IPLMN has made contact with the CSE, the CSE shall be able to instruct the VPLMN/IPLMN to act as described below:

- perform charging activities
- activate subsequent control service events for the call. The CSE shall have the possibility to send the following information:
 - The subsequent service event which shall be detected and reported:
 - Called party connection;
 - Call disconnection;
 - Calling party abandon;
 - Unsuccessful call establishment. In the case of no answer the CSE may provide a no answer timer;
 - Mid call event (DTMF [or out-band information](#)). The CSE shall specify the digit string(s) [or the out-band information](#) for which the instruction is valid.
 - The party in the call for which the event shall be detected and reported (calling or called party);
 - The type of monitoring (control or notification).
- order in-band user interaction.
- request charging notifications. \$(CAMEL4\$).

There shall be no restriction regarding the order of the above instructions or the number of times each of the above instructions can be repeated. Once the CSE has concluded issuing the above instructions, it shall issue one and only one of the following instruction:

- allow the call processing to continue unchanged, i.e. to release the call;
- allow the call processing with modified information. The CSE shall have the possibility to send the information listed in table: A-2 (Call disconnection procedure (MO)):

*****Next Modified Section*****

6.3 Incoming call request procedure

The purpose of this procedure is to detect an incoming call request and allow the CSE to modify the handling of the

incoming call.

If (according to the CSI):

- the subscriber is provisioned with a CAMEL based terminating service; and
- the incoming call request event occurs

Then the IPLMN/VPLMN shall suspend call processing, make contact with the CSE and await further instructions.

For mobile terminated calls the following information listed in table: A-1 (Incoming call request procedure) shall be provided to the CSE if available.

When the IPLMN/VPLMN has made contact with the CSE, the CSE shall be able to instruct the IPLMN to act as described below.

- perform charging activities;
- activate subsequent control service events for the call. The CSE shall have the possibility to send the following information:
 - The subsequent service event which shall be detected and reported:
 - Called party connection;
 - Call disconnection;
 - Calling party abandon;
 - Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer.
 - Mid call event (DTMF or out-band information). The CSE shall specify the digit string(s) or the out-band information for which the instruction is valid.
 - The party in the call for which the event shall be detected and reported (calling or called party);
 - The type of monitoring (control or notification).
- suppress tones and announcements which may be played to the calling party, if an unsuccessful call establishment occurs.
- order in-band user interaction.

There shall be no restriction regarding the order of the above instructions or the number of times each of the above instructions can be repeated. Once the CSE has concluded issuing the above instructions, it shall issue one and only one of the following instructions:

- bar the call (i.e. release the call prior to connection);
- allow the call processing to continue unchanged;
- allow the call processing with modified information. The CSE shall have the possibility to send the information listed in table: A-2 (Incoming call request procedure).

In the case the CSE instructs the IPLMN/VPLMN to allow the call processing with a changed called party number, the CSE shall indicate whether the resulting call shall be treated by the IPLMN/VPLMN as a forwarded call or not. Any forwarded call resulting from a CSE Call Forwarding service may cause an invocation of any mobile originated CAMEL based service in the IPLMN/VPLMN.

In the case the CSE instructs the IPLMN to allow the call processing with modified information, the CSE may send to the IPLMN an alerting pattern in order to alert the called subscriber in a specific manner. This alerting pattern shall be transferred to the VPLMN.

6.5 Unsuccessful call establishment

The purpose of this procedure is to manage an incoming call set-up at the time when the call establishment is unsuccessful.

If no relationship for the given call exists and

- the unsuccessful call establishment procedure is defined as an initial service event (according to the CSI); and
- the call attempt is unsuccessful; and
- the triggering criteria are satisfied ,

then the VPLMN/IPLMN shall suspend call processing, make contact with the CSE and await further instructions.

If a relationship for the given call already exists and the CSE has activated this subsequent service event for this call and the unsuccessful call establishment event occurs the VPLMN/IPLMN shall:

- suspend call processing, notify the CSE and await further instructions, or
- notify the CSE and continue call processing.

In both cases above the following information shall be provided to the CSE:

- Event met;
- Type of monitoring;
- Cause for unsuccessful call establishment:
 - not reachable;
 - busy;
 - no answer
 - Forwarding notification.

If the unsuccessful call establishment procedure is armed as an initial service event, information listed in table: A.1 (Unsuccessful call establishment (MT)) shall be provided to the CSE additionally if available.

When the IPLMN/VPLMN has made contact with the CSE, the CSE shall be able to instruct the IPLMN to act as described below.

- perform charging activities;
- activate subsequent control service events for the call. The CSE shall have the possibility to send the following information:
 - The subsequent service event which shall be detected and reported:
 - Called party connection;
 - Call disconnection;
 - Calling party abandon;
 - Unsuccessful call establishment. In the case of no answer the CSE may provide a no answer timer;
 - Mid call event (DTMF or Out band information). The CSE shall specify the digit string(s) or the out-band information for which the instruction is valid.
 - The party in the call for which the event shall be detected and reported (calling or called party);
 - The type of monitoring (control or notification).
- order in-band user interaction.

There shall be no restriction regarding the order of the above instructions or the number of times each of the above

instructions can be repeated. Once the CSE has concluded issuing the above instructions, it shall issue one and only one of the following instructions:

- allow the call processing to continue unchanged;
- allow the call processing with modified information. The CSE shall have the possibility to send the information listed in table: A-2 (Unsuccessful call establishment (MT)).
- release call

6.6 Called party connection procedure

The purpose of this procedure is to manage an incoming call set-up at the time when the called party answers and the call is successfully established.

If the CSE has activated this subsequent service event for this call and the called party connection event occurs, the IPLMN/VPLMN shall:

- suspend call processing, notify the CSE and await further instructions, or
- notify the CSE and continue call processing.

The following information shall be provided to the CSE:

- Event met;
- The party in the call for which the event is reported (only Called party applicable);
- Type of monitoring.

When the IPLMN/VPLMN has made contact with the CSE, the CSE shall be able to instruct the IPLMN/VPLMN to act as described below.

- perform charging activities;
- activate subsequent control service events for the call. The CSE shall have the possibility to send the following information:
 - The subsequent service event which shall be detected and reported:
 - (Call disconnection);
 - Mid call event (DTMF for out-band information). Detection of the mid call event shall be limited to the VPLMN. Out-band information may be detected during alerting phase of the call.;
 - The party in the call for which the event shall be detected and reported (calling or called party);
 - The type of monitoring (control or notification).
- order in-band user interaction;

There shall be no restriction regarding the order of the above instructions or the number of times each of the above instructions can be repeated. Once the CSE has concluded issuing the above instructions, it shall issue one and only one of the following instructions:

- release the call;
- allow the call processing to continue unchanged;

6.7 Mid Call procedure

When the CSE instructs the VPLMN to arm the mid-call event it shall specify a criterion against which digits entered by the terminating subscriber using the DTMF procedure shall be matched. The CSE shall not specify any criteria against a pattern of out-band information.

The criterion for DTMF digits consists of a list of up to 3 entries. Each entry is either a digit string or a definition of a range. A range definition consists of a lower bound followed by an upper bound. The lower bound and the upper bound are each digit strings. A digit string shall be at least 1 digit and at most 6 digits. Each digit shall be taken from the ordered set (0 - 9, *, #, A, B, C, D).

When collecting digits, the VPLMN shall consider a digit which follows the first digit of the string to be part of the string only if the interval between successive digits does not exceed 4 seconds.

The criterion for the mid-call DP is satisfied if the digits collected from the subscriber match the digits in a digit string in the criterion, or if the digits collected from the subscriber are included in a range defined in the criterion. Triggering of the mid-call event shall occur immediately after the criterion has been satisfied. Once the triggering occurs the VPLMN shall disable all entries from the criterion list.

Digits collected from the subscriber shall be relayed as DTMF towards the destination subscriber independent of any CAMEL processing.

If the CSE has activated this service event for this call and a mid call event (as determined by the criterion for the mid-call procedure being satisfied) occurs the VPLMN shall:

- suspend call processing, notify the CSE and await further instructions, or
- notify the CSE and continue call processing.

The following information shall be provided to the CSE:

- Event met;
- The party in the call for which the event is reported;
- Type of monitoring;
- event specific data:
 - received DTMF digits or the out band information.

When the VPLMN has made contact with the CSE, the CSE shall be able to instruct the VPLMN to act as described below:

- perform charging activities
- activate other control service events for the call. The CSE shall have the possibility to send the following information:
 - The service event which shall be detected and reported:
 - Call disconnection;
 - Mid call event (DTMF).
 - received out-band information.
 - The party in the call for which the event shall be detected and reported (calling or a called party);
 - The type of monitoring (control or notification).
- order in-band user interaction

There shall be no restriction regarding the order of the above instructions or the number of times each of the above instructions can be repeated. Once the CSE has concluded issuing the above instructions, it shall issue one and only one of the following instruction:

- allow the call processing to continue unchanged, or;

- release the call

6.8 Call disconnection procedure

The purpose of this procedure is to manage the actions on disconnection of an established call.

If the CSE has activated this subsequent service event for this call and the call disconnection event occurs the IPLMN/VPLMN shall:

- suspend call processing, notify the CSE and await further instructions, or
- notify the CSE and continue call processing.

The following information shall be provided to the CSE:

- Event met;
- The party in the call for which the event is reported;
- Type of monitoring;
- Disconnection reason.

When the IPLMN/VPLMN has made contact with the CSE, the CSE shall be able to instruct the IPLMN/VPLMN to act as described below.

- perform charging activities;
- activate subsequent control service events for the call. The CSE shall have the possibility to send the following information:
 - The service subsequent event which shall be detected and reported:
 - Called party connection;
 - Call disconnection;
 - Calling party abandon;
 - Unsuccessful call establishment. In the case of no answer the CSE may provide a no answer timer;
 - Mid call event (DTMF or Out band information). The CSE shall specify the digit string(s) or out band information for which the instruction is valid;
 - The party in the call for which the event shall be detected and reported (calling or called party);
 - The type of monitoring (control or notification).
- order in-band user interaction.

There shall be no restriction regarding the order of the above instructions or the number of times each of the above instructions can be repeated. Once the CSE has concluded issuing the above instructions, it shall issue one and only one of the following instruction:

- allow the call processing to continue unchanged, i.e. to release the call;
- allow the call processing with modified information. The CSE shall have the possibility to send the information listed in table: A-2 (Call disconnection procedure (MT)).

TSG-SA WG 1 (Services) meeting #10
Orlando, USA 13th to 17th November 2000

TSG S1 (00) 754
Agenda Item: 6.6

3GPP TSG-SA1 CAMEL ad hoc #4
Paris, France, 30th – 31st Oct 2000

S1C00 0081
Update of S1C00 0069

CHANGE REQUEST

22.078 CR 073

Current Version: 5.0.0

For submission to: TSG-SA #10

for approval
for information

strategic
non-strategic

Proposed change affects: (U)SIM ME UTRAN / Radio Core Network

Source: SA1

Date: 17/11/00

Subject: Criteria for the Mid-Call event detection point

Work item: CAMEL Phase 4

Category:

F Correction
A Corresponds to a correction in an earlier release
B Addition of feature
C Functional modification of feature
D Editorial modification

Release:

Phase 2
Release 96
Release 97
Release 98
Release 99
Release 4
Release 5

Reason for change:

Vodafone and Ericsson believe that this criterion is very limiting. We would prefer to re-use the principles of the criterion for Prompt and Collect User Information.

In this proposal, when the CSE arms the Mid-call event detection point, the following information shall be sent to the VPLMN:

- ? Minimum number of digits to be collected;
- ? Maximum number of digits to be collected;
- ? The maximum delay between successive digits.

The CSE may also provide the following information:

- ? Digit(s) used to indicate the start of the input;
- ? Digit(s) used to indicate the end of the input;
- ? Digit(s) used to indicate that the input shall be cancelled.

Clauses affected: 5.7 and 6.7

Other specs affected:

Other 3G core specifications ? List of CRs:
Other GSM core specifications ? List of CRs:
MS test specifications ? List of CRs:
BSS test specifications ? List of CRs:

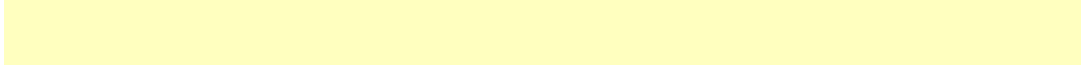
O&M specifications



? List of CRs:



**Other
comments:**



*** First Modified Section ***

5.7 Mid call procedure

When the CSE instructs the VPLMN to arm the mid-call event it shall specify a criterion against which digits entered by the originating subscriber using the DTMF procedure shall be matched.

~~The criterion consists of a list of up to 3 entries. Each entry is either a digit string or a definition of a range. A range definition consists of a lower bound followed by an upper bound. The lower bound and the upper bound are each digit strings. A digit string shall be at least 1 digit and at most 6 digits.~~

~~In the following, Each digit shall be taken from the ordered set (0 - 9, *, #, A, B, C, D).~~

~~The criterion consists of a list defining:~~

- ~~- The minimum number of digits to be collected, and~~
- ~~- The maximum number of digits to be collected, and~~
- ~~- The maximum delay between successive digits, and optionally~~
- ~~- The digit(s) used to indicate the start of the input, and optionally~~
- ~~- The digit(s) used to indicate the end of the input, and optionally~~
- ~~- The digit(s) used to indicate that the input shall be cancelled.~~

~~When collecting digits, the VPLMN shall consider a digit which follows the first digit of the string to be part of the string only if the interval between successive digits does not exceed 4 seconds.~~

~~A digit string has been cancelled if:~~

- ~~- The CSE has specified digit(s) used to indicate that the input shall be cancelled, and~~
- ~~- The specified digit(s) has/have been received from the user.~~

~~If the CSE has specified digit(s) used to indicate the start of the input, then the input has started if:~~

- ~~- The specified digit(s) has/have been received from the user, and~~
- ~~- The digit string has not been cancelled.~~

~~If the CSE has not specified digit(s) used to indicate the start of the input, then the input has started if:~~

- ~~- At least one digit has been received from the user, and~~
- ~~- The digit string has not been cancelled.~~

~~If the CSE has specified digit(s) used to indicate the end of the input, then the input has ended if:~~

- ~~- The specified digit(s) has/have been received from the user, or~~
- ~~- The maximum number of digits has been received, or~~
- ~~- The maximum delay between successive digits has been exceeded.~~

~~If the CSE has not specified digit(s) used to indicate the end of the input, then the input has ended if:~~

- ~~- The maximum number of digits has been received, or~~
- ~~- The maximum delay between successive digits has been exceeded.~~

~~A digit string satisfies the criterion for the Mid call detection point if:~~

- ~~- The input has started, and~~
- ~~- The digit string contains at least the minimum number of digits, and~~
- ~~- The input has ended.~~

The criterion for the mid-call DP is satisfied if the digits collected from the subscriber match the digits in a digit string in the criterion, or if the digits collected from the subscriber are included in a range defined in the criterion. Triggering of the mid-call event shall occur immediately after the criterion has been satisfied. Once the triggering occurs the VPLMN shall disarm the mid-call event.

Digits collected from the subscriber shall be relayed as DTMF towards the destination subscriber independent of any CAMEL processing.

If the CSE has activated this service event for the served subscriber and a mid-call event (as determined by the criterion for the mid-call procedure being satisfied) occurs the VPLMN shall:

- ~~S~~suspend call processing, notify the CSE and await further instructions, or
- ~~N~~otify the CSE and continue call processing.

The following information shall be provided to the CSE:

- Event met;
- Type of monitoring;
- ~~E~~vent specific data:
 - ~~R~~eceived DTMF digits.

When the VPLMN has made contact with the CSE, the CSE shall be able to instruct the VPLMN to act as described below:

- ~~P~~perform charging activities
- ~~A~~ctivate other control service events for the call. The CSE shall have the possibility to send the following information:
 - The service event which shall be detected and reported:
 - Call disconnection;
 - Mid call event (DTMF);~~;~~
 - The party in the call for which the event shall be detected and reported (calling or a called party);
 - The type of monitoring (control or notification).
- ~~O~~rder in-band user interaction

There shall be no restriction regarding the order of the above instructions or the number of times each of the above instructions can be repeated. Once the CSE has concluded issuing the above instructions, it shall issue one and only one of the following instruction:

- ~~A~~llow the call processing to continue unchanged;
- ~~A~~llow the call processing with modified information;
- ~~R~~elease the call;~~;~~

***** Last Modified Section *****

6.7 Mid Call procedure

When the CSE instructs the VPLMN to arm the mid-call event it shall specify a criterion against which digits entered by the terminating subscriber using the DTMF procedure shall be matched.

~~The criterion consists of a list of up to 3 entries. Each entry is either a digit string or a definition of a range. A range definition consists of a lower bound followed by an upper bound. The lower bound and the upper bound are each digit strings. A digit string shall be at least 1 digit and at most 6 digits. In the following, each digit shall be taken from the ordered set (0 - 9, *, #, A, B, C, D).~~

~~The criterion consists of a list defining:~~

- ~~The minimum number of digits to be collected, and~~
- ~~The maximum number of digits to be collected, and~~
- ~~The maximum delay between successive digits, and optionally~~
- ~~The digit(s) used to indicate the start of the input, and optionally~~
- ~~The digit(s) used to indicate the end of the input, and optionally~~
- ~~The digit(s) used to indicate that the input shall be cancelled.~~

~~When collecting digits, the VPLMN shall consider a digit which follows the first digit of the string to be part of the string only if the interval between successive digits does not exceed 4 seconds.~~

~~A digit string has been cancelled if:~~

- ~~The CSE has specified digit(s) used to indicate that the input shall be cancelled, and~~
- ~~The specified digit(s) has/have been received from the user.~~

~~If the CSE has specified digit(s) used to indicate the start of the input, then the input has started if:~~

- ~~The specified digit(s) has/have been received from the user, and~~
- ~~The digit string has not been cancelled.~~

~~If the CSE has not specified digit(s) used to indicate the start of the input, then the input has started if:~~

- ~~At least one digit has been received from the user, and~~
- ~~The digit string has not been cancelled.~~

~~If the CSE has specified digit(s) used to indicate the end of the input, then the input has ended if:~~

- ~~The specified digit(s) has/have been received from the user, or~~
- ~~The maximum number of digits has been received, or~~
- ~~The maximum delay between successive digits has been exceeded.~~

~~If the CSE has not specified digit(s) used to indicate the end of the input, then the input has ended if:~~

- ~~The maximum number of digits has been received, or~~
- ~~The maximum delay between successive digits has been exceeded.~~

~~A digit string satisfies the criterion for the Mid call detection point if:~~

- ~~The input has started, and~~
- ~~The digit string contains at least the minimum number of digits, and~~
- ~~The input has ended.~~

~~The criterion for the mid-call DP is satisfied if the digits collected from the subscriber match the digits in a digit string in the criterion, or if the digits collected from the subscriber are included in a range defined in the criterion. Triggering of the mid-call event shall occur immediately after the criterion has been satisfied. Once the triggering occurs the VPLMN shall disable all entries from the criterion list.~~

Digits collected from the subscriber shall be relayed as DTMF towards the destination subscriber independent of any CAMEL processing.

If the CSE has activated this service event for this call and a mid call event (as determined by the criterion for the mid-call procedure being satisfied) occurs the VPLMN shall:

- ~~S~~uspend call processing, notify the CSE and await further instructions, or
- ~~N~~otify the CSE and continue call processing.

The following information shall be provided to the CSE:

- Event met;
- The party in the call for which the event is reported;
- Type of monitoring;
- ~~E~~vent specific data:
 - ~~R~~eceived DTMF digits.

When the VPLMN has made contact with the CSE, the CSE shall be able to instruct the VPLMN to act as described below:

- ~~P~~perform charging activities
- ~~A~~ctivate other control service events for the call. The CSE shall have the possibility to send the following information:
 - The service event which shall be detected and reported:
 - Call disconnection;
 - Mid call event (DTMF).
 - The party in the call for which the event shall be detected and reported (calling or a called party);
 - The type of monitoring (control or notification).
- ~~Q~~uery in-band user interaction

There shall be no restriction regarding the order of the above instructions or the number of times each of the above instructions can be repeated. Once the CSE has concluded issuing the above instructions, it shall issue one and only one of the following instruction:

- ~~A~~llow the call processing to continue unchanged, or;
- ~~R~~elease the call

****** End of Document ******