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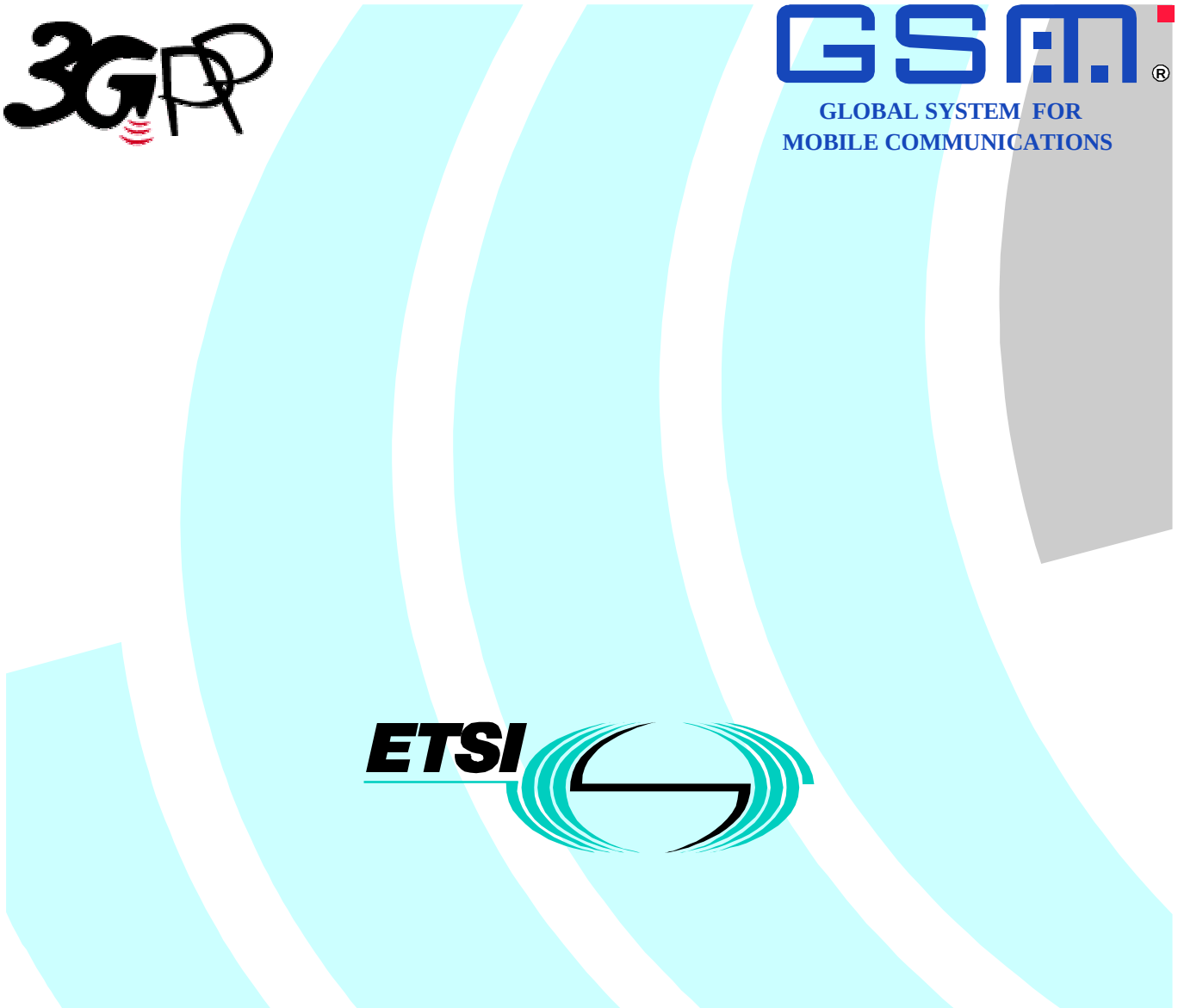
Technical Specification

Digital cellular telecommunications system (Phase 2+);
Customised Applications for Mobile network Enhanced Logic (CAMEL);
Service definition - Stage 1
(3GPP TS 02.78 version 6.5.0 Release 1997)



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Foreword

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Contents

Foreword

This ETSI Technical Specification (TS) has been produced by the Special Mobile Group (SMG) of the European Telecommunications Standards Institute (ETSI).

This TS defines the stage 1 description for the first phase of the CAMEL feature (Customised Applications for Mobile network Enhanced Logic) which provides the mechanisms to support services consistently independently of the serving network within the digital cellular telecommunications system.

The contents of this TS are subject to continuing work within SMG and may change following formal SMG approval. Should SMG modify the contents of this TS it will then be republished by ETSI with an identifying change of release date and an increase in version number as follows:

Version 6.x.y

where:

6 indicates GSM Release 1997 of Phase 2+

x the second digit is incremented for changes of substance, i.e. technical enhancements, corrections, updates, etc.;

y the third digit is incremented when editorial only changes have been incorporated in the specification.

Introduction

The present document includes references to features which are not part of the Phase 2+ Release 96 of the GSM Technical specifications. All subclauses which were changed as a result of these features contain a marker (see table below) relevant to the particular feature.

The following table lists all features that were introduced after Release 96.

Feature	Designator
CAMEL Phase 2	$(CAMEL2)$

1 Scope

This standard specifies the stage 1 description for the first and the second phase of the CAMEL feature (Customised Applications for Mobile network Enhanced Logic) which provides the mechanisms to support services consistently independently of the serving network. The CAMEL features shall facilitate service control of operator specific services external from the serving PLMN. The CAMEL feature is a network feature and not a supplementary service. It is a tool to help the network operator to provide the subscribers with the operator specific services even when roaming outside the HPLMN.

CAMEL is developed in phases. The following phases exist:

- CAMEL phase 1. This is the default phase in this specification. Sections that are only aplicable to phase 1 are characterised with the formal designator - $(CAMEL1$)
- CAMEL phase 2. It is characterised where necessary with the formal designation - $(CAMEL2$) and sometimes with an indication of CAMEL phase 2. - $(CAMEL2$)

A VPLMN or IPLMN supporting CAMEL phase 2 shall also support CAMEL phase 1. -$(CAMEL2$).

The CAMEL feature is applicable

- to mobile originated and mobile terminated call related activities;
- and, as a CAMEL phase 2 function, to supplementary service invocations - $(CAMEL2$)

The mechanism described addresses especially the need for information exchange among the VPLMN, HPLMN and the CAMEL Service Environment (CSE) for support of such operator specific services. Any user procedures for operator specific services are outside the scope of this standard.

This specification describes the interactions between the functions of the VPLMN, HPLMN, IPLMN and the CSE.

The second phase of CAMEL enhance the capabilities of phase 1 and are included in this standard. Following new topics are added:

- New event detection points were defined.
- It is possible to interact with a user using announcements, voice prompting and information collection via in band interaction or USSD interaction.
- It is possible to control the call duration and to transfer e-values from a serving node to the mobile station.
- The CSE can be informed about the invocation of GSM supplementary services (ECT, CD, MPTY).
- For easy post processing, charging information from a serving node can be integrated in normal call records.

Detailed information can be found in the respective sections.

2 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] GSM 02.93: "Digital cellular telecommunication system (Phase 2+); "Completion of Calls to Busy Subscriber (CCBS); Service description, Stage 1".

[2] GSM 02.79: "Digital cellular telecommunication system (Phase 2+); "Support of Optimal Routeing (SOR); Service definition (Stage 1)".

[3] GSM 02.30: "Digital cellular telecommunication system (Phase 2+); "Man-machine Interface (MMI) of the Mobile Station (MS) (Stage 1)".

[4] GSM 02.90: "Digital cellular telecommunication system (Phase 2+); "Stage 1 Decision of Unstructured Supplementary Service Data (USSD)".

[5] GSM 02.97: "Digital cellular telecommunication system (Phase 2+); "Multiple Subscriber Profile (MSP); Service definition (Stage 1)".

3 Definitions and abbreviations

Operator Specific Service (OSS): Any service offered on a PLMN that is not standardised by the GSM specifications.

Interrogating PLMN (IPLMN): This is the PLMN that performs the interrogation of the HPLMN for information on the treatment of a terminating call.

CAMEL Service Environment (CSE): A CSE is a logical entity which processes activities related to Operator Specific Services (OSS).

Service event: A specific event of a GSM process that may be used as part of an operator specific service.

Service procedure: A part of the CAMEL feature to be used to detect a specific CAMEL service event.

CAMEL Subscription Information (CSI): The CSI identifies that CAMEL support is required for the subscriber and the identities of the CSEs to be used for that support. The CSI also contains information related to the OSS of the subscriber, e.g. Service Key.

Location Information: The location information shall be an identification of the location of the served subscriber.

The following location information should be sent to the CSE (if available):

- **Geographical information** (longitude and latitude)when Cell ID or Location Area Code is known) this may be calculated as the nominal central point of the cell or of the location area; alternative mechanisms for determining latitude and longitude may also be supported. The resolution and accuracy of the indicated location information may also be provided.

- **Cell ID** indicates the global identity of the current or last cell which the subscriber is using or has used. The VPLMN shall update the stored Cell ID at establishment of every radio connection and whenever the subscriber is handed over between cells.

- **VLR number** is the number of the serving VLR stored in the HPLMN.

- **Location status** indicates whether or not the location information has been confirmed by radio contact. If the location information has not been confirmed by radio contact a time stamp is sent indicating the time elapsed since the last radio contact with the subscriber.

- **Location number** is the number received on the incoming circuit (for an incoming call) or to be sent on the outgoing circuit (for an outgoing call).

$(begin$(CAMEL2$)

NA (North American): CAMEL information items prefixed by the term NA are normally applicable only to North American PLMNs and their subscribers. Transfer of these items to or from a CSE is normally required only when the HPLMN of the subscriber and either the VPLMN (for a mobile originated or forwarded call) or IPLMN (for a mobile terminated or forwarded call) are both North American. However, as an option, transfer of these items to or from a CSE may be supported for a mobile originated or forwarded call at a North American VPLMN when the HPLMN of the CAMEL subscriber is not North American.

$(end$(CAMEL2$)

Service Key: An identifier of the OSS which shall be transparent to the IPLMN/VPLMN.

Subscriber Status: An indication of the status of a subscriber, determined by the state of the subscriber's MS. The subscriber status can take one of three values:

- **CAMEL-busy**: the MS is engaged in a mobile-originated or mobile-terminated circuit-switched call.
- **Network determined not reachable**: the network can determine from its internal data that the MS is not reachable. This includes detached and purged mobile stations.
- **Assumed idle**: any MS that is not CAMEL-busy or network determined not reachable.

4 Description

The CAMEL network feature enables the use of Operator Specific Services (OSS) by a subscriber even when roaming outside the HPLMN.

4.1 Provision of CAMEL

The CAMEL Subscription Information (CSI) is provided by the HPLMN operator by administrative means.

The CSI may include the Translation Information Flag (TIF-CSI). If present for a subscriber the network will apply special handling of the call forwarding supplementary service. For details refer to section 12.3 $(CAMEL2$).

4.2 General Procedures

Each GSM process is made up of a series of telecommunication events, some of which are service events. At a service event, the IPLMN or VPLMN may suspend the process and make contact with a CSE to ask for instructions or to send a notification. At this time the IPLMN or VPLMN shall send to the CSE the information listed in this specification. All information sent to the CSE relates to the served CAMEL subscriber unless otherwise stated. The initial service events, and the corresponding CSE identity, which can initiate contact with the CSE is defined in the CAMEL Subscription Information.

The CAMEL feature is applicable in a PLMN if the CSI is received from the HPLMN.

The CSE shall be capable of responding to the CAMEL request with instructions on how to resume the suspended GSM process. It shall be possible for the CSE to instruct the IPLMN or VPLMN to:

- Activate further service events for potential invocation. These events shall remain active only for the life-time of the telecommunication service;
- Alter information relating to the suspended process;
- Alter information relating to the parties involved in the process;
- Indicate which of the possible parts of the process should occur next (e.g. terminate the call);
- Perform Charging activities -$(CAMEL2$);
- Order in band user interaction -$(CAMEL2$).

CAMEL features shall form an integral part of the following GSM processes:

- MT call;
- MO call (forwarded calls are treated as MO calls);
- supplementary service invocation -$(CAMEL2$);

- USSD user interaction. The of service codes for CAMEL services can be allocated on subscriber basis or globally for all subscribers of the HPLMN. -$(CAMEL2$).

As part of an OSS it shall be possible for the CSE to interrogate for information about a particular subscriber at any time.

4.3 Applicability of CAMEL to Basic Services

CAMEL procedures are applicable to all circuit switched Basic Services without distinction (except Emergency calls).

5 Procedures for Mobile Originated Calls and Forwarded Calls

NOTE: Other information elements not listed in the following subclauses may be necessary to meet some Stage 1 service requirements. Refer to the Stage 2 specification GSM 03.78 for complete information element lists.

NOTE: The Call Set-up Request event (TDP) and the Service events (EDP's) described in this chapter, can occur both in the VPLMN (in case of Mobile Originated calls) and in the IPLMN (in case of Mobile Forwarded calls).

5.1 Criteria for contact with the CSE $(CAMEL2$)

It shall be possible for the HPLMN to specify criteria which must be satisfied before the CSE is contacted.

The following criteria may be defined:

- Criteria on the dialled number consist of:

  - The contents of the dialled number (a list of up to 10 dialled number strings may be defined in the criteria. Each dialled number string may be in "unknown" or "international" format.);

  - The length of the dialled number (a list of up to three lengths may be defined.).

  The criteria on the dialled number may be collectively defined to be either "enabling" triggering criteria or "inhibiting" triggering criteria (see below). The HPLMN may also choose not to define any criteria on the dialled number.

- A criterion on the basic service: this consists of a list of basic service codes for individual basic services or basic service groups (the list shall be able to contain at least 5 basic service codes). The HPLMN may also choose not to define any criterion on the basic service.

- A criteria on the type of call: this consists of defining whether or not the call must be a forwarded call.

  A call is treated as forwarded in this respect either when either a GSM forwarding supplementary service applies or when the call is forwarded as a result of a terminating CAMEL based service. The HPLMN may also choose not to define any criterion on the type of call.

If the criteria on dialled number are "enabling" then the dialled number criteria are satisfied if:

- the dialled number matches a dialled number string defined in the criteria; or

- the length of the dialled number matches a dialled number length defined in the criteria.

If the criteria on the dialled number are "inhibiting" then the dialled number criteria are satisfied if:

- the dialled number does not match any of the dialled number strings defined in the criteria; and

- the length of the dialled number is not the same as any dialled number length defined in the criteria.

In these tests the dialled number matches one of the dialled number strings if:

- the two numbers are in the same format (unknown or international); and
- the dialled number is at least as long as the dialled number string in the criteria; and
- all the digits in the dialled number string in the criteria match the leading digits of the dialled number.

If no criterion on the dialled number is specified then the dialled number criteria are satisfied.

Note: Service designers should note that the MS can send dialled numbers to the network in other formats besides “international” or “ unknown”. If triggering criteria rely on the MS sending only “international” or “unknown” format numbers, the service behaviour will be unexpected if the MS sends a number which is not in “international” or “unknown” format.

The criterion on the basic service is satisfied if the basic service used for the call corresponds to any basic service code defined in the criterion or if no basic service criterion is specified.

The criterion on the type of call is satisfied if the type of the call is the same as the type defined in the criterion or if no call type criterion is specified.

The criteria on the call setup event procedure are satisfied if:

- the criteria on the dialled number are satisfied; and
- the criterion on the basic service is satisfied; and
- the criterion on the type of call is satisfied.

5.2 Call set-up request procedure

The purpose of this procedure is to detect a call set-up request and 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 shall suspend call processing, make contact with the CSE and await further instructions.

For mobile originated calls the following information shall be provided to the CSE if available:

- Event met;
- IMSI;
- Calling Party’s Number;
- Calling Party’s Category;
- Service Key;
- Location information of the calling subscriber;
- ISDN Bearer Capability;
- High Layer Compatibility;
- Basic Service Code;
- Called Party BCD Number. - Call identification information;
- Time and Time Zone information. -$(CAMEL2$)
- NA Carrier Identification Code $(CAMEL2$);

- NA Carrier Selection Information $(CAMEL2$).

For forwarded calls the following information shall be provided to the CSE if available:

- Event met;
- IMSI;
- Calling Party's Number;
- Calling Party's Category;
- Service Key;
- ISDN Bearer Capability;
- High Layer Compatibility;
- Basic Service Code;
- Called Party Number
- Additional Calling Party Number;
- Original Called Party Number
- Redirecting Party Number;
- Redirection Information;
- call identification information;
- Time and Time Zone information. -$(CAMEL2$)
- NA Carrier Identification Code $(CAMEL2$);
- NA Carrier Selection Information $(CAMEL2$).

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; $(CAMEL2$);
- 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:
    - Called party connection;
    - Call disconnection;
    - Calling party abandon -$(CAMEL2$);
    - Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer - $(CAMEL2$);
  - 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. $(CAMEL2$).

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 following information:
  - Called Party Number;
  - Calling Party's Category;
  - Additional Calling Party's Number;
  - Original Called Party Number;
  - Redirection Party Number;
  - Redirection Information.
  - NA Carrier Identification Code $(CAMEL2$).;
  - NA Carrier Selection Information $(CAMEL2$);
  - NA Originating Line Identification $(CAMEL2$);
  - NA Charge Number $(CAMEL2$).

5.3 Calling party abandon $(CAMEL2$)

The purpose of this procedure is to manage an outgoing call set-up at the time it is terminated by the calling party before the call is established.

If the CSE has activated this service event for this call and the calling party abandon event occurs the VPLMN shall:

- notify the CSE and continue.

The following information shall be provided to the CSE:

- Event met;
- Type of monitoring;

5.4 Unsuccessful call establishment $(CAMEL2$)

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

If the CSE has activated this service event for this call and the unsuccessful call establishment event 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;
  - Cause for unsuccessful call establishment:
    - not reachable
    - busy
    - no answer

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:
    - Called party connection;
    - Call disconnection;
    - Calling party abandon;
    - Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer;
  - 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 following information:
  - Called Party Number;
  - Calling Party's Number;
  - Calling Party's Category;
  - Additional Calling Party's Number;
  - Original Called Party Number;
  - Redirection Party Number;
  - Redirection Information.
- release call

5.5 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 service event for this call and the called party connection event 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 (only Called party applicable);
- Type of monitoring.

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);
  - 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).

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;

5.6 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 service event for this call and the call disconnection event 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;
- Disconnection reason.

$(begin$(CAMEL2$)

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:
    - Called party connection;
    - Call disconnection;
    - Calling party abandon;
    - Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer;
  - 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.

$(end$(CAMEL2$)

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;

$(begin$(CAMEL2$)

- allow the call processing with modified information. The CSE shall have the possibility to send the following information:
  - Called Party Number;
  - Calling Party's Category;
  - Additional Calling Party's Number;
  - Original Called Party Number;
  - Redirection Party Number;
  - Redirection Information.

$(end$(CAMEL2$)

5.7 CSE initiated call release procedure

Following the CAMEL processing of the Call set-up request procedure it shall be possible for the CSE to initiate a call release at any moment of the call.

To use this procedure the CSE shall previously have activated any of these service events (with "Type of monitoring" set to control.)

6 Procedures for Mobile Terminated Calls

NOTE: Other information elements not listed in the following subclauses may be necessary to meet some Stage 1 service requirements. Refer to the Stage 2 specification GSM 03.78 for complete information element lists.

6.1 Criteria for contact with the CSE $(CAMEL2$)

It shall be possible for the HPLMN to specify criteria which must be satisfied before the CSE is contacted.

The following criterion may be defined:

- A criterion on the basic service: this consists of a list of basic service codes for individual basic services or basic service groups (the list shall be able to contain at least 5 basic service codes). The HPLMN may also choose not to define any criterion on the basic service.

The criterion on the basic service is satisfied if the basic service used for the call corresponds to any basic service code defined in the criterion or if no basic service criterion is specified.

On the incoming call request event procedure the CSE shall be contacted ifthe criterion on the basic service is satisfied.

6.2 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 shall suspend call processing, make contact with the CSE and await further instructions.

For mobile terminated calls the following information shall be provided to the CSE if available:

- Event met;
- Service Key;
- ISDN Bearer Capability;
- High Layer Compatibility;
- Basic Service Code
- Called Party Number;
- Redirecting Number;
- Redirecting Information;
- IMSI;
- Location Number of the calling subscriber (note: the location information of the calling subscriber is not available due to signalling constraints);
- Location information of the called subscriber;
- Calling Party Number;
- Calling Party's Category;
- Additional Calling Party Number;
- Original Called Party Number;
- Subscriber State of the called subscriber. ;
- call identification information;
- Time and Time Zone information. -$(CAMEL2$)
- . NA Carrier Identification Code $(CAMEL2$);
- NA Carrier Selection Information $(CAMEL2$).

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

- perform charging activities; -$(CAMEL2$)
- 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:
    - Called party connection;
    - Call disconnection;
    - Calling party abandon -$(CAMEL2$);
    - Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer $(CAMEL2$);
  - 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.

  $(begin$(CAMEL1$)

  This is only applicable when the called party number is unchanged by the CSE.

  $(end$(CAMEL1$)

- order in-band user interaction.$(CAMEL2$)

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 following information:

  - Called Party Number;

  - Calling Party's Category;

  - Additional Calling Party's Number;

  - Original Called Party Number;

  - Redirection Party Number;

  - Redirection Information,

  - Alerting Pattern-$(CAMEL2$).

  - NA Carrier Identification Code $(CAMEL2$);

  - NA Carrier Selection Information $(CAMEL2$);

  - NA Originating Line Identification $(CAMEL2$);

  - NA Charge Number $(CAMEL2$).

In the case the CSE instructs the IPLMN 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 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.

$(begin$(CAMEL2$)

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.

$(end$(CAMEL2$)

6.3 Calling party abandon $(CAMEL2$)

The purpose of this procedure is to manage an incoming call set-up at the time it is terminated by the calling party before the call is established.

If the CSE has activated this service event for this call and the calling party abandon event occurs the IPLMN shall:

- notify the CSE and continue.

The following information shall be provided to the CSE:

- Event met;
- Type of monitoring;

6.4 Unsuccessful call establishment $(CAMEL2$)

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

If the CSE has activated this service event for this call and the unsuccessful call establishment event occurs the 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;
- Type of monitoring;
- Cause for unsuccessful call establishment:
  - not reachable;
  - busy;
  - no answer.

When the IPLMN has made contact with the CSE, the CSE shall be able to instruct the IPLMN 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:
    - Called party connection;
    - Call disconnection;
    - Calling party abandon;
    - Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer;
  - 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 following information:
  - Called Party Number;

  - Calling Party's Number;
  - Calling Party's Category;
  - Additional Calling Party's Number;
  - Original Called Party Number;
  - Redirection Party Number;
  - Redirection Information.
- release call

6.5 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 service event for this call and the called party connection event occurs, the 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 IPLMN has made contact with the CSE, the CSE shall be able to instruct the IPLMN to act as described below.

- perform charging activities; $(CAMEL2$)
- 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);
  - 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).

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;

6.6 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 service event for this call and the call disconnection event occurs the 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.

$(begin$(CAMEL2$)

When the IPLMN has made contact with the CSE, the CSE shall be able to instruct the IPLMN 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:
        - Called party connection;
        - Call disconnection;
        - Calling party abandon;
        - Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer;
    - 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.

$(end$(CAMEL2$)

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;

$(begin$(CAMEL2$)

- allow the call processing with modified information. The CSE shall have the possibility to send the following information:
    - Called Party Number;
    - Calling Party's Category;
    - Additional Calling Party's Number;
    - Original Called Party Number;
    - Redirection Party Number;
    - Redirection Information.

$(end$(CAMEL2$)

6.7 CSE initiated call release procedure

Following the CAMEL processing of the incoming call request procedure it shall be possible for the CSE to initiate a call release at any moment of the call.

To use this procedure the CSE shall previously have activated at least one of these service events. [with "Type of monitoring" set to control.]

7 Any time interrogation

It shall be possible for the CSE (as part of an OSS, including special handling of mobile terminating calls) to interrogate for information about a particular subscriber, for which it is entitled to do so (e.g. the subscriber belongs to the same HPLMN as the CSE).

This may be information from the list below:

- subscriber status;
- location information.

The HPLMN shall have the possibility to reject any interrogation from any CSE.

8 Subscriber interactions with the CSE

8.1 Announcement and tones insertion $(CAMEL2$)

As a part of the call set-up request procedure, unsuccessful call establishment procedure, call disconnection procedure and incoming call request procedure it shall be possible for the CSE to order the playing of announcements or tones towards the calling subscriber.

The HPLMN operator is responsible for the administration of announcements. In case of bilateral agreements also the VPLMN operator may administrate announcements.

8.2 Voice prompting and information collection $(CAMEL2$)

As a part of the call set-up request procedure, unsuccessful call establishment procedure, call disconnection procedure and incoming call request procedure it shall be possible for the CSE to order voice prompting and information collection towards the calling subscriber.

8.3 Subscriber interaction by using USSD $(CAMEL2$)

It shall be possible for the CSE to initiate a USSD towards the served subscriber at any time. It shall be possible for the CSE to receive a served subscriber initiated USSD at any time (see GSM 02.30 [3] and GSM 02.90 [4]).

It shall also be possible for the CSE to handle USSD strings from subscribers who have not subscribed to any CAMEL based service.

9 Charging Activities $(CAMEL2$)

The following general principles are valid for CAMEL based charging aspects:

- calls may be divided into call periods for the purpose to control the call duration;
- the management and the control of a tariff switch which applies to subscriber charging is under the responsibility of the HPLMN. The time at which the tariff switches applies shall be the same for the control of e-values and for the control of the call duration;
- the tariff switch time is indicated to the network in form of a relative time to the reception of the instruction.

9.1 CSE controlled e-values

If the subscriber is provisioned with a CAMEL based service and if a contact exists between the IPLMN/VPLMN and the CSE, the CSE shall be able to send e-values for the Advice of Charge supplementary service.

For the purpose of charge indication on the MS even when one (or more) tariff switch occurs during the call, several sets of e-values may be sent by the CSE to the IPLMN/VPLMN and transmitted in sequence to the Mobile Station.

Before the call is answered, the CSE may send either one set or two set of e-values :

- If one set is sent, then the set of e-values is applicable from the beginning of the call, that is from the time the call is answered;
- If two sets are sent, then:
  - a tariff switch time when the second set becomes valid must also be sent;
  - the first set of e-values is applicable from the beginning of the call except in the case where the tariff switch time occurs before the call is answered, then the second set of e-values is applicable at the beginning of the call.

During the call, the CSE may send a new set of e-values either to be transmitted directly to the mobile station or stored until the next tariff switch is reached. The tariff switch time is sent together with the new set of e-values.

When the tariff switch time is reached, the stored set of e-values is sent immediately to the mobile station, if available.

9.2 Inclusion in charging records of information received from the CSE

The CSE shall be able at one or several active service events to download free-format charging information to be transparently output to the call record available at the IPLMN/VPLMN depending on the call scenario.

The maximum length of the information to be sent by the CSE and to be stored in the final call record is 40 bytes.

9.3 Support of additional charging information to the CSE

It shall be possible for the CSE to request from the VPLMN/IPLMN a call information report to be delivered at the end of the call. The report shall contain call duration and release cause.

9.4 CSE control of call duration

The purpose of this procedure is to allow the CSE to monitor and influence the call duration.

If the subscriber is provisioned with a CAMEL based service and a contact between the IPLMN/VPLMN and the CSE exists, the CSE shall be able to instruct the IPLMN/VPLMN , at the beginning of the call or during the monitoring of the call, to act as described below:

a) receive a maximum call period duration time from the CSE;

b) receive a switch time until the next tariff switch applies;

c) receive sets of e-values (for the purpose of AoC controlled by the CSE).

The following combinations of the instructions are allowed:

- (a) or (a and b) or (b and c) or (a and b and c) or (c).

In case a.) the CSE shall be able to instruct the IPLMN/VPLMN on how to proceed when the maximum call period duration time is expired, i.e. release the call or report to the CSE. The CSE shall also be able to instruct the IPLMN/VPLMN of a tone to be played before the maximum call period duration time is expired, and of the time when the tone shall be played.

When the instruction sent by the CSE is received at the IPLMN/VPLMN as a result of the call set up request procedure before the call is established, the IPLMN/VPLMN shall immediately set the reference point for the next tariff switch, if available.

When the call is answered, the IPLMN/VPLMN shall:

- start the timer for the first call period;
- send e-values, if available:
  - If one set is sent, then the set of e-values is applicable from the beginning of the call, that is from the time the call is answered;
  - If two sets are sent, then:
    - a tariff switch time when the second set becomes valid must be also sent;
    - the first set of e-values is applicable from the beginning of the call except in the case where the tariff switch time occurs before the call is answered, then the second set of e-values is applicable at the beginning of the call.

When the reference point for the tariff switch is reached, the stored set of e-values is sent immediately to the mobile station, if available.

When the end of a call period is reached, the IPLMN/VPLMN shall report to the CSE:

- if no tariff switch has occurred since the call is answered:
  - report the elapsed time since the call is answered to the CSE,
- if a tariff switch has occurred since the call is answered:
  - report the elapsed time since the last tariff switch has applied,
  - report the elapsed time from when the call is answered, or from when the previous tariff switch occurred to the time when the most recent tariff switch occurred.

When the IPLMN/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);
  - 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).

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;

At the end of a call period and after the relevant information was sent to the CSE, the IPLMN/VPLMN may receive instructions applicable to for the next call period :

- The timing of the new call period shall start as soon as the previous call period is ended.
- The timing since the call was answered or the last tariff switch occurred shall keep on running
- If the instruction contains an indication for a new tariff switch during the call period, the IPLMN/VPLMN shall set the reference point for the next tariff switch and store the new set of e-values, if available.

When the reference point for the tariff switch is reached, the stored set of e-values is sent immediately to the mobile station, if available.

When the call is released, the IPLMN/VPLMN shall report to the CSE:

- if no tariff switch has occurred since the call is answered:
  - report the elapsed time since the call is answered to the CSE.
- if a tariff switch has occurred since the call is answered:
  - report the elapsed time since the last tariff switch has applied,
  - report the elapsed time from when the call is answered, or from when the previous tariff switch occurred to the time when the most recent tariff switch occurred.

In addition, the report to the CSE shall always contain:

- the state whether the call is ongoing or released.

The following figure explains the distinction of a call into separate call periods and shows when and which information is sent from the IPLMN/VPLMN to the CSE.

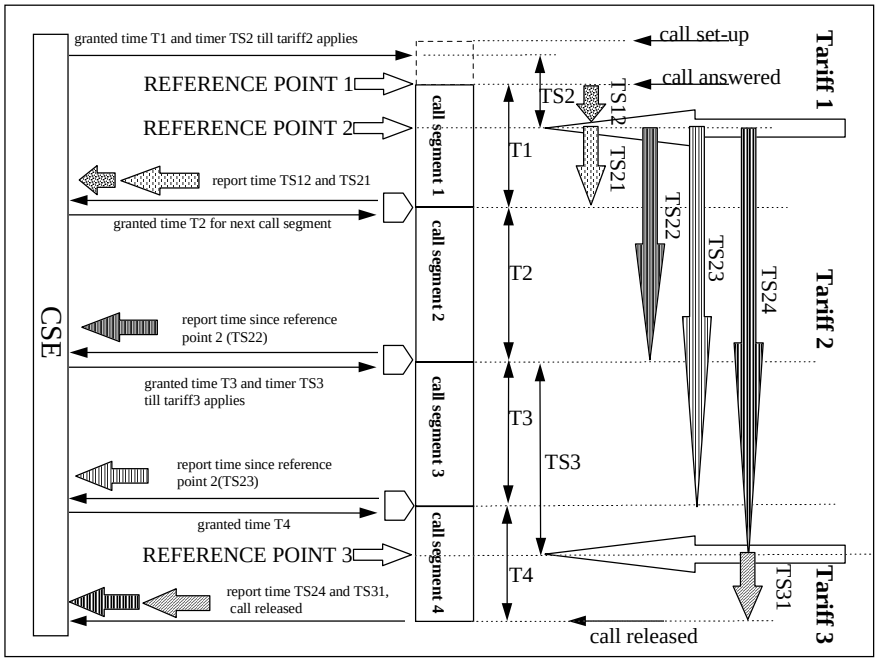

Figure 1: CSE control of call duration

Reference Point 1: when the call is answered, tariff 1 applies
Reference Point 2: the point in time when tariff 2 applies
Reference Point 3: the point in time when tarif f 3 applies
A call period is a certain time part of an ongoing call. The duration of a call period is limited by the granted time from the CSE.
Timers indicating the maximum duration (or granted time) for the call periods are called Tx (x is the number of the call period).
Timers indicating the duration untill the next tariff applies are called TSx (x is the number of the tariff).
Timers indicating the elapsed time in a certain tariff are called TSxy (x is the number of the tariff and y is the elapsed time since the previous reference point).
When a call period is ended, the elapsed time in each tariff is reported towards the CSE.

At the end of the call period any timer indicating the duration until the next tariff switch and any stored e-values are discarded.

If the report is not confirmed by the CSE within a specified time, the IPLMN/VPLMN shall release the call.

The procedure may be repeated sequentially, i.e. when a report is sent to the CSE, the CSE may instruct the IPLMN/VPLMN to monitor the call for a further period.

10 Supplementary service invocation notification to CSE $(CAMEL2$)

It shall be possible to mark for a subscriber that a notification shall be sent to the CSE when any of the following GSM supplementary services are invoked:

- ECT
- CD
- MPTY

11 Exceptional procedures or unsuccessful outcome

11.1 Roaming in non-supporting networks

The HPLMN shall control handling of roaming, when a CAMEL subscriber attempts to register in a network not supporting CAMEL without relying on extra functionality in network entities not supporting CAMEL. The HPLMN shall have the possibility to decide on a per subscriber basis whether to allow or to deny MO calls and/or MT calls (e.g. applying ODB, denying location up-date).

If the HPLMN allows MO calls, the originating OSSs are not supported for the roaming subscriber.

If the HPLMN allows MT calls, the terminating OSSs are not always (fully) supported for the roaming subscriber.

11.2 Call Set-up from a non-supporting interrogating PLMN

In case the CAMEL feature is not supported in the IPLMN the following will happen:

- Mobile originating calls:

  Not applicable.

- Mobile terminating calls:

  Mobile terminating OSSs are not supported (in the IPLMN).

11.3 Roaming in a VPLMN which supports only CAMEL phase 1 $(CAMEL2$)

If a CAMEL subscriber attempts to register in a VPLMN which supports CAMEL, the VPLMN shall indicate in the registration request to the HPLMN the phase of CAMEL which the VPLMN supports. If the VPLMN supports only CAMEL phase 1 the HPLMN shall take such action (including denying the registration request or transferring to the VPLMN subscription information appropriate to CAMEL phase 1) as may be decided by the HPLMN operator.

11.4 Call setup from a VPLMN which supports only CAMEL phase 1 $(CAMEL2$)

If the served subscriber requests an MO call which requires the VPLMN to contact the CSE, the VPLMN shall indicate to the CSE which phase of CAMEL the VPLMN supports. If the VPLMN supports only CAMEL phase 1 and the CSE determines that as a consequence a service which is provisioned for the subscriber will not operate correctly, the CSE

shall take such action (including denying the call request or handling the call using only CAMEL phase 1 capabilities) as may be decided by the CSE operator.

11.5 Call setup from an IPLMN which supports only CAMEL phase 1 $(CAMEL2$)

When the IPLMN contacts the CSE for instructions to handle an MT call, the IPLMN shall indicate to the CSE which phase of CAMEL it supports. If the IPLMN supports only CAMEL phase 1 and the CSE determines that as a consequence a service which is provisioned for the subscriber will not operate correctly, the CSE shall take such action (including denying the call request or handling the call using only CAMEL phase 1 capabilities) as may be decided by the CSE operator.

12 Interactions with supplementary services

12.1 General

This subclause defines the interaction between GSM supplementary services and the CAMEL feature. However, it should be noted that the most effective way to control those service interactions is through managing the provisioning of services. Where possible, subscribers provisioned with services using the CAMEL feature shall not be provisioned with GSM services having an adverse interaction with the CAMEL based services. GSM supplementary services shall not have any knowledge of CAMEL based services.

In general, call independent supplementary service operations (registration, erasure, activation, deactivation and interrogation) are not modified by CAMEL. The exceptions to this for CAMEL phase 2 are the call forwarding services, described in subclause 12.3.1.

12.2 Line Identification

12.2.1 Calling Line Identification Presentation (CLIP)

The CSE shall be able to create or modify an additional calling line identity (additional calling party number) which is presented to the called subscriber via the CLIP supplementary service. There shall be no restriction to the format of the additional calling line identity determined by the CSE.

The CSE shall not be able to modify the calling line identity (calling party number).

12.2.2 Calling Line Identification Restriction (CLIR)

No interaction. The CSE is not able to change the presentation indicator given to the called subscriber via the CLIP supplementary service.

12.2.3 Connected Line Identification Presentation (COLP)

No interaction. The CSE is not able to change the connected line identity.

12.2.4 Connected Line Identification Restriction (COLR)

No interaction. The CSE is not able to change the presentation indicator given to the calling subscriber via the COLP supplementary service.

12.3 Call Forwarding

$(begin$(CAMEL2$)

For the registration of call forwarding supplementary services the network shall accept any forwarded to number for a subscriber provided with a TIF-CSI. In this case the HPLMN shall treat the forwarded-to number transparently at the time of registration, i.e. it shall not perform validity checks or translations of the format of the number. The forwarding PLMN shall treat the forwarded-to number transparently when the call forwarding service is invoked. The CSE may modify the forwarded-to number within the MO CAMEL Service provided for the subscriber when the call forwarding service is invoked.

NOTE: Network operators should ensure that the TIF-CSI is provided only to subscribers who are provided with an MO CAMEL service which is capable of translating the registered forwarded-to number.

If the forwarding PLMN does not support CAMEL phase 2, the HPLMN shall consider the call forwarding service as not registered if the forwarded-to number is not stored in international format.

NOTE: If the served subscriber requires invocation of call forwarding services even when the forwarding PLMN does not support CAMEL phase 2, she has to register a forwarded-to number in E.164 international format.

NOTE: Network operators should be aware that unpredictable service behaviour could be experienced if the detection points for 'Busy', 'Not Reachable' or 'No Answer' are armed when the corresponding 'conditional' GSM call forwarding supplementary service is active.

$(end$(CAMEL2$)

12.3.1 Call Forwarding Unconditional (CFU)

The Call Forwarding Unconditional service will be invoked after any terminating CAMEL based service. Any forwarded call resulting from a GSM Call Forwarding supplementary service may cause invocation of any mobile originated CAMEL based services.

12.3.2 Call Forwarding Busy (CFB)

As for Call Forwarding Unconditional (see subclause 12.3.1).

12.3.3 Call Forwarding on No Reply (CFNRy)

As for Call Forwarding Unconditional (see subclause 12.3.1).

12.3.4 Call Forwarding on Not Reachable (CFNRc)

As for Call Forwarding Unconditional (see subclause 12.3.1).

12.4 Call Completion

12.4.1 Call Hold (CH)

No interaction. For terminating calls, the Call Hold service is invoked after the CAMEL feature is invoked. A call created when a call has been put on hold may be subject to the CAMEL feature in the same way as a normal mobile originating call.

12.4.2 Call Waiting (CW)

No interaction. Incoming, waiting calls are treated by the CSE as any other mobile terminating calls which encounter an idle subscriber.

12.5 Multi Party (MPTY)

No interaction. A multi party call may include one or more calls subject to CAMEL based services.

12.6 Closed User Group (CUG)

The Closed User Group supplementary service shall be invoked before any originating or terminating CAMEL based service.

When a terminating call with CUG information is received for a CAMEL marked subscriber and if the terminating CAMEL based service attempts to modify the called party number:

- the IPLMN shall release the call towards the calling party when the called subscriber subscribes to CUG;
- the IPLMN shall continue the call establishment towards the modified called party number when the called subscriber does not subscribe to CUG.

12.7 Advice of Charge (AoC)

Advice of Charge is not guaranteed to operate correctly for calls subject to CAMEL phase 1 based services. It is recommended that subscribers are not provisioned with Advice of Charge and any CAMEL based service for which there is an adverse interaction.

$(begin$(CAMEL2$)

If CAMEL phase 2 is supported and the phase 2 charging function "CSE controlled e-values" is used, the VPLMN shall use the received e-values from the CSE for the purpose of the AoC supplementary service. Once the VPLMN has received e-values from the CSE, only CSE provided e-values are applicable for this call. The e-values shall only be sent by the VPLMN to the MS if the served subscriber is provided with the AoC supplementary service according to GSM 02.86.

$(end$(CAMEL2$)

12.8 Call Barring

$(begin$(CAMEL2$)

NOTE: CAMEL may be used to establish forwarded-legs and CAMEL based re-routing-legs that violate conditional GSM outgoing call barring and ODB services. Network operators should take care to avoid problems that may arise because of this interaction.

$(end$(CAMEL2$)

12.8.1 Barring of all outgoing calls

No interaction. The Barring of all outgoing calls supplementary service will be invoked. Thus, originating CAMEL based services will not be invoked.

12.8.2 Barring of outgoing international calls

12.8.2.1 Mobile originated calls

No interaction. Any originating CAMEL based services shall be invoked before the Barring of outgoing international calls supplementary service.

12.8.2.2 Forwarded Calls

No interaction. The interaction between call forwarding and call barring is not be modified by CAMEL. This means that the interaction is applied prior to the invocation of call forwarding. When call forwarding is invoked (possibly with originating CAMEL services in the forwarding leg) then the VPLMN or IPLMN shall not apply outgoing call barring services.

$(begin$(CAMEL2$)

If the served subscriber is provided with a TIF-CSI the network shall not perform the interaction of call forwarding services with this barring program, i.e.

- the registration request is accepted even if this barring program is active and operative;
- the activation of this barring program is accepted even if a call forwarding supplementary service is active.

When call forwarding is invoked(possibly with originating CAMEL services in the forwarding leg) the VPLMN or IPLMN shall not invoke outgoing call barring services.

$(end$(CAMEL2$)

$(begin$(CAMEL1$)

NOTE: This behaviour means that CAMEL may be used to establish forwarded-legs that violate conditional GSM outgoing call barring and ODB services. Network operators should take care to avoid problems that may arise because of this interaction.

$(end$(CAMEL1$)

12.8.3 Barring of outgoing international calls except those directed to the HPLMN country

As for Barring of outgoing international calls (see subclause 12.8.2).

12.8.4 Barring of all incoming calls

No interaction. The Barring of all incoming calls supplementary service shall be invoked. Thus, terminating CAMEL based services will not be invoked.

12.8.5 Barring of incoming calls when roaming

Same as Barring of all incoming calls (see subclause 12.8.4).

12.9 Explicit Call Transfer (ECT)

No interaction. A ECT call may include one or both calls subject to CAMEL based services.

12.10 Completion of Call to Busy Subscriber (CCBS)

See GSM 02.93 [1].

12.11 Multiple Subscriber Profile (MSP)

See GSM 02.97 [5].

13 Interactions with Operator Determined Barring (ODB)

13.1 Barring of all outgoing calls

Same principle as for subclause 12.8.1.

13.2 Barring of all outgoing international calls

Same principle as for subclause 12.8.2.

13.3 Barring of all outgoing international calls except those directed to the home PLMN country

Same principle as for subclause 12.8.3.

13.4 Barring of outgoing calls when roaming outside the home PLMN country

If the subscriber is outside her home PLMN country the Barring of outgoing calls when roaming outside the home PLMN country service will be invoked. Thus, originating CAMEL based services will not be invoked.

13.5 Barring of outgoing premium rate calls

Same principle as for subclause 13.3. The handling will be the same both for Premium rate information and Premium rate entertainment.

13.6 Barring of incoming calls

Same principle as for subclause 12.8.4.

13.7 Barring of incoming calls when roaming outside the home PLMN country

Same principle as for subclause 12.8.4.

13.8 Operator Specific Barring

No interaction. Any originating or terminating CAMEL based services shall be invoked before Operator Specific Barring of type 1,2,3,4. Operator Specific Barring is only applicable when registered in HPLMN.

NOTE: Operators should be aware of this interaction when defining Operator Specific ODB categories.

13.9 Barring of Supplementary Services Management

No interaction.

14 Interactions with Optimal Routing (OR)

Invocation of OR shall not have any impact of any CAMEL based service.

If OR is applied to a late Call Forward then the interrogating PLMN shall invoke a mobile originated CAMEL based service, if required for the served subscriber.

$(begin$(CAMEL2$)

If OR of a basic mobile-to-mobile call is invoked, mobile originating services based on CAMEL phase 2 which rely on the destination of the MO call leg being determined by the dialled number (in particular, prepayment services) will not necessarily operate correctly.

If OR of late call forwarding is invoked from an IPLMN which is also the forwarding subscriber's HPLMN, then mobile terminating services based on CAMEL phase 2 which rely on the destination of the leg from the IPLMN being determined by the MSRN (in particular, prepayment services) will not necessarily operate correctly.

$(end$(CAMEL2$)

Specific interaction is described in GSM 02.79 [2].

15 Cross Phase compatibility with future Phases of CAMEL

Where different entities support different phases of CAMEL they shall operate at the highest common phase. CAMEL phase 1 is the lowest common phase.

Annex A (informative): Change history

Change history					
SMG No.	**TDoc. No.**	**CR. No.**	**Section affected**	**New version**	**Subject/Comments**
SMG#19	365/96	None		2.0.0	Submitted for approval (Approved)
SMG#20		A001 A002r1 A003 A004r1 A005 A006 A007 A008 A009	5.1, 5.2, 5.3, 6.1, 6.2, 6.3 2,3,4.1,5.2,6.1, 6.2,9.2,12 10.2.2 5.3,6.3,5.4,6.4 10.1, 10.3.1, 10.8.2 3, 7 5.1, 5.3, 6.1 6.3 5.1,6.1 4.2	5.1.0	Information exchanged between the CSE and the IPLMN/VPLMN Editorial enhancements and clarifications Interaction between CLIR and CAMEL CSE initiated call release procedure Interaction of CAMEL and Call Forwarding Subscriber Status Editorial change for inclusion of CAMEL charging information Ambiguity of the current stage 1 Information provided about the served subscriber
SMG#21	168/97	A010	10.2.1	5.1.1	Clarification of CAMEL interaction with CLIP
SMG#22	313/97	A011	3, Location Information	5.2.0	Introduce Age of Location Information MSC/VLR allowed to actualize location information whenever appropriate.
SMG#22	303/97	A012	Sections 2 and 5.1	5.2.0	Add reference to GSM 02.30 on MMI Add Control sequences (* and #) at Call Set-up
SMG#23	652/97	A013r4	Over all	5.3.0	Update to Include Phase 2 Release 97
SMG#24	977/97	A014	Overall	5.4.0	The specification is affected in various areas. Some changes are purely editorial and apply to both, CAMEL R96 and R97, and result from re-organisation of the previous text or editorial improvements. No technical changes to the CAMEL phase 1 are introduced
SMG#25	70/98	A015	Page 16, chapter 6.2:	5.5.0	Do make a efficient use of the new Detection Points, such as a not reachable called subscriber, it should be possible to suppress announcements even when the called party number has been changed by the CSE. This could happen in the case of One Number services.
SMG#25	70/98	A016	Chapter 6.2	5.5.0	As a part of "network's indication of alerting in the MS" work item, the stage 2 and stage 3 of CAMEL Phase 2 allow the CSE to send an alerting pattern to the IPLMN during the incoming call request procedure. The IPLMN can then forward this information to the VPLMN.
SMG#25	70/98	A017	Page 10, chapter 5.1	5.5.0	Similar treatment of CSE and GSM forwarding calls.
SMG#25	70/98	A018	5.4, 5.6 , 6.4, 6.6	5.5.0	Removal of the restriction on the number of Follow-on calls and/or call re-attempts that are allowed, in order to align with the stage 2 and stage 3 of CAMEL phase 2.
SMG#25	70/98	A019	Section 9	5.5.0	Editorial change of „call segment“ to „call period“ due to different meaning in ITU-T standards.
SMG#25				6.0.0	Conversion to version 6.0.0 Draft TS
Post SMG#25				6.0.1	Correction of SMG#25 Tdoc # to 070 from 105(incorrect)
SMG#26	98-0323	A020	1 and 6.2	6.1.0	Correction of misinterpretation of CR A16 of SMG#25.
SMG#26	98-0323	A021	12.8	6.1.0	Health warning of CAMEL interworking with Call Barring.
SMG#26	98-0323	A022	12.3	6.1.0	Correction and enhancement of CAMEL interworking with Call Forwarding. Following LS c394 from SMG3, PT SMG SMG1 secretary has added, following Camel “Phase 2” .
SMG#28	99-029	A025		6.2.0	Clarification of handling of request & notification service events

SMG#28	99-029	A026	1	6.2.0	Correction of scope section: Mismatch between Stage 1 and 2!
SMG#28	99-029	A027 r1	14	6.2.0	Interactions between CAMEL and SOR: The current text does not indicate that CAMEL-based prepayment services will not necessarily operate correctly for optimally routed calls
SMG#28	99-029	A028 r2	4.1, 12.3, 12.8. 2.2	6.2.0	Clarification of Camel interaction with Call Forwarding: For the CAMEL interaction with Call Forwarding a more detailed description was necessary. Subscription parameter TIF-CSI is introduced. If provided with TIF-CSI the network shall not modify the forwarded-to number registerd by the served subscriber.
SMG#28	99-029	A029	5.3; 6.3	6.2.0	Functional alignment with stage 2 and 3
SMG#28	99-029	A030	9.4, Fig. 1	6.2.0	Tariff Switch Control In current implementation there are uncertainties regarding to tariff switch timer in gsmSSF for the first call period. The reason is, that call can be answered in two minutes after connection establishment. This means that for the first call period tariff switch time has to be sent to gsmSSF if tariff switch is applicable in the first call period length + 2 minutes for answering the call. If the call is answered promptly and call periods are e.g. 50 sec than tariff switch timer is running into 3rd call period thus binding unnecessarily resources in both gsmSSF, that has to run it, and on gsmSCF that has to remember it to be synchronised. In SMG3-WPC meeting in Gothenburg, it was agreed to stop tariff switch timer at the end of each call period. This provides for clear situation on gsmSSF and allows thus for straightforward and efficient implementation on gsmSCF – determine call period length, look if there is tariff switch during next call period and if so, send it out as well. The problem is, that 02.78 explicitly allows timer TS3 to run over the end of 3rd call period.
SMG#28	99-029	A031	5.2, 5.6, 6.2 and 6.6	6.2.0	Alignment to CAP: During the implementation of CAMEL some changes were made to CAP that were partly caused by INAP changes: deletion of CallingPartyNumber from CONNECT (09.78-A019), use of CalledPartyNumber only for CF and MT and CalledPartyBCDNumber for MO only (09.78-A022), introduction of mscAddress (03.78-A014r1, 03.78-A002r1) for call and charging ticket correlation and the introduction of Time and TimeZone.
SMG#28	99-029	A032	**5.1**, 5.2, 6.1	6.2.0	Criteria for contacting the CSE:
SMG#28	99-029	A033	**5.1**	6.2.0	CSI - More flexible interpretation of a criterion
SMG#28	99-029	A034	8.3	6.2.0	Handling of subscribed (U-CSI) and dialled (UG-CSI) USSD Strings It was intended to create a method to trigger for ”DIALLED USSD STRINGS” to all subscribers of a network.
SMG#28	99-029	A036	12.2 Line Identification	6.2.0	Correction of the CLIR interaction section: According to ITU-T Q.699 the presentation indicator of the additional calling party number is not evaluated for the purposes of the CLIP supplementary service. This rule is applied for the GSM access as well. Therefore the CSE is not able to change the presentation indicator given to the called subscriber. GSM 02.78 is corrected accordingly. Furthermore the terms used in the CLIP, CLIR and COLR interaction sections are aligned with the definitions in GSM 02.81
SMG#28	99-029	A037	5	6.2.0	TDP and EDP’s in IPLMN.: The wording in the stage 1 document of CAMEL Phase 2 suggests that the O_TDP (Collected Info) and O_EDP’s (O_Busy, O_Disconnect etc) can only occur in the VPLMN. They can however also occur in the IPLMN (in case of Forwarded Calls).

SMG#28	99-315	A038 r1	3, 5.2, 6.2	6.2.0	Addition of North American Carrier related Information to CAMEL Phase 2: North American carrier related information is needed in CAMEL phase 2 to enable PCS1900 network operators and their subscribers to choose a suitable long distance carrier for originating, terminating and forwarded long distance calls whenever a CAMEL service is invoked. In addition to choosing the carrier, the network operator or subscriber can also choose the charge number that is provided to the carrier.
SMG#29	P-99-366	A040	5	6.3.0	The wording in the stage 1 document of CAMEL Phase 2 suggests that the O_TDP (Collected Info) and O_EDP's (O_Busy, O_Disconnect etc) can only occur in the VPLMN. They can however also occur in the IPLMN (in case of Forwarded Calls).
SMG#30		A041	5.1	6.4.0	Introduction of a "Health Warning" on type of numbers sent by the mobile other than "unknown" or "international" CR
SP-10	SP-000536	A042	1	6.5.0	Support of CAMEL Phase 1 and 2

History

Document history		
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