



**Digital cellular telecommunications system (Phase 2+) (GSM);
Universal Mobile Telecommunications System (UMTS);
LTE;
Study of Customised Alerting Tone (CAT) requirements
(3GPP TR 22.982 version 15.0.0 Release 15)**

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Foreword

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1 Scope

The objective of this study item is to study requirements and potential new capabilities in 3GPP that need to be standardized for the CAT service, especially additional features for roaming and interoperability support.

The present document specifies the requirements and technical implements for Customized Alerting Tone (CAT) service in CS domain and the developments in PS domain.

Basically this TR is considering voice services, though interaction with MITE [2] services will be studied. Also Multi-media CAT will be taken into consideration, so the CAT user may experience favourable songs, multi-media clips or other customized alerting tones.

2 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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 22.173: "IP Multimedia Core Network Subsystem (IMS) Multimedia Telephony Service and supplementary services; Stage 1".
- [3] 3GPP TS 22.240: "Service requirements for 3GPP Generic User Profile (GUP); Stage 1".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply.

Alerting Tone: An indication that is played to the calling subscriber during establishment of a call or during an established call session indicating one of the following:

- that the called subscriber is being alerted.
- the progress of communication request (Call Forward, Call Wait etc.)
- any alerting event during a call session

Customized Alerting Tone: An Alerting Tone that is customized by the called subscriber or the calling subscriber. A Customized Alerting Tone (CAT) may e.g. be a piece of recorded or composed music, greeting words, voice, advertisement or video.

Customized Alerting Tone Service: A Customized Alerting Tone Service (CAT service) is an operator specific service by which an operator enables the subscriber to customize his alerting tone.

CAT Inter-action: is the interaction of the CAT service with other services, e.g. Multiple Services Inter-actioninteraction with Call Forwarding.

CAT Inter-working : Multiple Domains Inter-workings is the interworking of a CAT service over different domains or subsystems (CS or IMS) as well as between PLMNs.

CAT content provider: A service provider that provides a set of Alerting Tones for use as CAT for subscribers of the CAT service. A 3GPP operator may be a CAT content provider.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

CAT	Customized Alerting Tone
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4 Suggested CAT service requirements

4.1 Basic functionality of the CAT service

The Customized Alerting Tone Service (CAT service) is an operator specific service by which an operator enables the subscriber to customize the alerting tone which is played to the calling party. CAT service should not negatively affect the conversation between calling and called parties.

The CAT service should at least be able to fulfil the following requirements:

- The service user can easily subscribe the CAT service, activate the CAT service, and update the settings, e.g. to change his active CAT.
- The calling party can experience the CAT set by the called party.
- The calling party can experience the CAT set by the calling party.
- The calling party's operator should be able to configure which CAT should have priority, the one set by the called or calling party. The calling party's operator shall be able to take into account the calling party's preferences.
- The CAT shall override the default alerting tone towards the calling subscriber.
- Each CAT subscriber has a personal CAT library to store all his CATs. The CAT can be chosen from the CAT library according to rules such as time, calling party's location, called party's location, the identity of the calling and called party.
- It shall be possible to inform the user about changes in his CAT service, e.g. close expiry date for the CAT service or a particular CAT content.
- The user whose CAT service is active will be charged according to a specified charging mode.
- When the called party answers the call, the call channel is set up and the CAT stops. Alternatively, as an operator option the content of the CAT may continue to play during the conversation.
- When the called party is notified about an incoming call, the called party can send an indication to the CAT service which CAT to play to the calling party.
- When the CAT is playing, the calling party can stop it for instance by pressing a specific button, then he shall experience the default alerting tone.
- When the CAT is playing, the called party can stop it for instance by pressing a specific button, the calling party shall experience another CAT.
- It shall be possible for a CAT subscriber to select a CAT, which content is provided by a CAT content provider, which does not have to be the service provider.

Note: the CAT implementation for PLMN based Networks may have a number of issues (CAT unidirectional channel, charging for Early Media, negotiation of early H.324M during the alerting phase, etc.) that should be a subject for Stage 2 standardization

4.2 Normal procedures with successful outcome

4.2.1 Provisioning and Withdrawal

The CAT Service can be provisioned and withdrawn by the operator per subscriber. Procedures for provisioning and withdrawal are out of scope of standardisation

4.2.2 Activation and Deactivation and Update

4.2.2.1 General

The service subscriber can activate, de-activate his CAT service. For activation and de-activation, the service subscriber may e.g. employ operator specific USSD commands, SMS, IVR or other means (e.g. customer self-administration via a web-site).

4.2.2.2 Activation

When a subscriber activates his CAT Service he needs to specify, which CAT a calling user should experience.

After a subscriber has activated his CAT Service a calling user should experience the CAT, that was chosen by the subscriber.

4.2.2.3 Deactivation

After a subscriber has deactivated his CAT Service a calling user should experience the default alerting tone.

4.2.3 Basic scenarios

In the following scenarios, contained in table 1, it is assumed that the called party (B) has activated his CAT Service. Calling party (A) is calling B. The calling party has not subscribed and/or activated the CAT service.

The Customized Alerting Tone of B is CAT-B.

Table 1: Normal Operation Scenarios

	Called party B (condition)	Forwarded-to-party	Expected behaviour
4	B, ringing		A experiences CAT-B
5	B, busy		A experiences busy indication.
6	B, no answer		First A experiences CAT-B and then the 'no answer' indication after B's 'no answer' timer has expired
7	B, not reachable		A experiences 'not reachable' indication

In the following scenarios, contained in table 2, it is assumed that only the calling party (A) has activated his CAT Service. Calling party (A) is calling B. The called party has not subscribed and/or activated the CAT service.

The Customized Alerting Tone of A is CAT-A,

Table 2: Normal Operation Scenarios

	Called party B (condition)	Forwarded-to-party	Expected behaviour
4	B, ringing		Depending on A settings, subscriber A will experience either CAT-A or the default alerting tone.
5	B, busy		Depending on A settings, subscriber A will experience either CAT-A or the default busy tone.
6	B, no answer		Depending on A settings, subscriber A will experience either CAT-A or the default alerting tone and then the 'no answer' indication after B's 'no answer' timer has expired
7	B, not reachable		A experiences 'not reachable' indication

In the following scenarios, contained in table 3, it is assumed that both the calling party (A) and called party (B) have activated the CAT Service. Calling party (A) is calling B.

The Customized Alerting Tone of B is CAT-B, the Customized Alerting Tone for A is CAT-A.

Table 3: Normal Operation Scenarios

	Called party B (condition)	Forwarded-to-party	Expected behaviour
4	B, ringing		Depending on A settings, A experiences CAT-A, CAT-B or the default alerting tone.
5	B, busy		Depending on A settings, subscriber A will experience either CAT-A or the default busy tone.
6	B, no answer		Depending on A settings, subscriber A will experience either CAT-A, CAT-B or the default alerting tone and then the 'no answer' indication after B's 'no answer' timer has expired
7	B, not reachable		A experiences 'not reachable' indication

4.2.4 Interaction with Supplementary Services

Additionally, for call-forwarding scenarios, it is assumed that Forwarded-to-party (C) has activated his CAT Service. The Customized Alerting Tone of C is called CAT-C. The Customized Alerting Tone of D is called CAT-D. The calling party has not subscribed and/or activated the CAT service. If applicable, the CAT experienced by the calling user should be the one customized for the user by the connected-to-party

In the following table, all the CATs that A experiences in the column "Expected behaviour" may be replaced by CAT-B, if the operator wants to deploy so.

Table 1: Supplementary Service Interaction Scenarios

	Called party B (condition)	Forwarded-to-party (condition)	Expected behaviour
8	B has activated call waiting and B is engaged in an active or held call.		Depending on A settings, subscriber A will experience either CAT-B or the default call waiting tone.
9	B has activated Call Forwarding Unconditional (CFU) to C and A's call is forwarded to C	C, ringing	A experiences CAT-C
10	B has activated Call Forwarding on Busy (CFB) to C, B is busy and A's call is forwarded to C	C, ringing	A experiences CAT-C
11	B has activated Call Forwarding on No Reply (CFNRy) to C and A's call is forwarded to C	C, ringing	A experiences CAT-B until B's CFNRy timer has expired. Then experiences CAT-C.
12	B has activated Call Forwarding on Not Reachable (CFNRc) to C and A's call is forwarded to C	C, ringing	A experiences CAT-C
13	B has activated a Call Forwarding to C and C has activated a Call Forwarding to D so A's call is forwarded to D	Tandem Forwarding: C has activated a Call Forwarding to D and A's call is forwarded to D.	A experiences CAT-D

- As a configurable option it shall be possible to distinguish between different call states (from call status) and provide the caller with different CAT
- It should be possible to configure each specific action (CAT) as a result of a sequence of specific rolls (Date, Time, Call status etc.) for instance as an XML table

4.3 CAT service configuration

- A service subscriber, that has activated his CAT service, shall be able to select and update his CAT settings - i.e. select a different CAT than the current one. It should be possible to charge the subscriber for selection / update of the CAT settings.
- The calling user should be able to 'copy' the last CAT that was experienced in the ongoing call, as his own CAT.

Note 1: DRM issues should be covered in order to make sure that copyrights are not infringed.

Note 2: One solution could for instance be to use DTMF signalling.