Source: TSG CN WG4

Title: Corrections on CSSPLIT

Agenda item: 7.8

Document for: APPROVAL

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
23.205	041		N4-030530	Rel-4	Clarification of handling of DTMF	F	4.6.0
23.205	042		N4-030531	Rel-5	Clarification of handling of DTMF	A	5.4.0
29.232	058		N4-030534	Rel-4	Clarification of handling of DTMF in split architecture – DTMF timing	F	4.7.0
29.232	059		N4-030535	Rel-5	Clarification of handling of DTMF in split architecture – DTMF timing	A	5.5.0
23.205	043	1	N4-030615	Rel-4	Clarification of handling of DTMF timing	F	4.6.0
23.205	044	1	N4-030616	Rel-5	Clarification of handling of DTMF timing	A	5.4.0

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CHANGE REQUEST

⌘   **23.205** CR **041**   ⌘**rev** **-** ⌘   Current version: **4.6.0** ⌘

For HELP on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps⌘ ☐   ME ☐   Radio Access Network ☐   Core Network **X**

Title: ⌘	Clarification of handling of DTMF	
Source: ⌘	CN4	
Work item code: ⌘	CSSPLIT	***Date:*** ⌘ 6/5/2003
Category: ⌘	**F**	***Release:*** ⌘ Rel-4

Use one of the following categories:
  F *(correction)*
  A *(corresponds to a correction in an earlier release)*
  B *(addition of feature),*
  C *(functional modification of feature)*
  D *(editorial modification)*
Detailed explanations of the above categories can
be found in 3GPP TR 21.900.

Use one of the following releases:
  2   *(GSM Phase 2)*
  R96   *(Release 1996)*
  R97   *(Release 1997)*
  R98   *(Release 1998)*
  R99   *(Release 1999)*
  Rel-4 *(Release 4)*
  Rel-5 *(Release 5)*
  Rel-6 *(Release 6)*

Reason for change: ⌘	**This is an essential correction.** Handling of DTMF in split architecture with inband and Out-of-band procedures do not clarify how digits shall be controlled between these planes. The method of transmission/reception cannot be fixed end to end as changes may occur during the call. Digits must not be sent in both inband tones and Out-of band signals otherwise duplication of digits can occur.
Summary of change: ⌘	Clarify handling of DTMF when supporting OoB DTMF signalling.
Consequences if not approved: ⌘	Faulty implementation for DTMF handling in the CN resulting in duplication of digits and hence user identification/controlled procedures would fail.

Clauses affected: ⌘	14.4

	Y	N	
Other specs affected: ⌘		X	Other core specifications ⌘
		X	Test specifications
		X	O&M Specifications

Other comments: ⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

14.4 DTMF

DTMF information can be transported either inband or out of band. In order to minimise the interworking between out of band and in band DTMF signalling, the general principle is to use the DTMF signalling method of the preceding node whenever possible. A node supporting OoB DTMF shall also be able to receive inband DTMF digits, but no DTMF digits shall be duplicated, i.e. any detected digit shall either be sent forward by inband or out-of-band, but never by both methods. Transitions between inband and out-of-band may occur due to changes to an ongoing call (Explicit Call Transfer for example) but digits shall not be sent both inband and OoB for the same link.

If out-of-band transcoder control is applied for a speech call, it shall be performed in accordance with 3GPP TS 23.153 [3]

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CHANGE REQUEST

| ⌘ | **23.205** CR **042** | ⌘**rev** | **-** | ⌘ | Current version: | **5.4.0** | ⌘ |

For HELP on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps⌘ ☐   ME ☐ Radio Access Network ☐ Core Network **X**

Title: ⌘	Clarification of handling of DTMF	
Source: ⌘	CN4	
Work item code: ⌘	CSSPLIT	**Date:** ⌘ 6/5/2003
Category: ⌘ **A**		**Release:** ⌘ Rel-5

Use *one* of the following categories:
F (correction)
A (corresponds to a correction in an earlier release)
B (addition of feature),
C (functional modification of feature)
D (editorial modification)
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use *one* of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change: ⌘	Handling of DTMF in split architecture with inband and Out-of-band procedures do not clarify how digits shall be controlled between these planes. The method of transmission/reception cannot be fixed end to end as changes may occur during the call. Digits must not be sent in both inband tones and Out-of band signals otherwise duplication of digits can occur.
Summary of change: ⌘	Clarify handling of DTMF when supporting OoB DTMF signalling.
Consequences if not approved: ⌘	Faulty implementation for DTMF handling in the CN resulting in duplication of digits and hence user identification/controlled procedures would fail.

Clauses affected: ⌘	14.4

Other specs affected: ⌘	Y	N		⌘	
		X	Other core specifications	⌘	
		X	Test specifications		
		X	O&M Specifications		

Other comments: ⌘	

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downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

14.4   DTMF

DTMF information can be transported either inband or out of band. In order to minimise the interworking between out of band and in band DTMF signalling, the general principle is to use the DTMF signalling method of the preceding node whenever possible. A node supporting OoB DTMF shall also be able to receive inband DTMF digits, but no DTMF digits shall be duplicated, i.e. any detected digit shall either be sent forward by inband or out-of-band, but never by both methods. Transitions between inband and out-of-band may occur due to changes to an ongoing call (Explicit Call Transfer for example) but digits shall not be sent both inband and OoB for the same link.

If out-of-band transcoder control is applied for a speech call, it shall be performed in accordance with 3GPP TS 23.153 [3]

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CHANGE REQUEST

| ⌘ | **23.205** CR **043** | ⌘ **rev** **1** | ⌘ | Current version: | **4.6.0** | ⌘ |

For HELP on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps⌘ ☐   ME ☐ Radio Access Network ☐ Core Network **X**

Title: ⌘	Clarification of handling of DTMF timing	
Source: ⌘	CN4	
Work item code: ⌘	CSSPLIT	**Date:** ⌘ 6/5/2003
Category: ⌘ **F**		**Release:** ⌘ Rel-4

Use one of the following categories:
F (correction)
A (corresponds to a correction in an earlier release)
B (addition of feature),
C (functional modification of feature)
D (editorial modification)
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change: ⌘	Timing for DTMF digits is defined by TS 23.014 – in R99 this is performed by the MSC and the timing is defined in 24.008 (references TS 23.014) however for the split architecture it is not specified where the control of the minimum duration and minimum gap for DTMF digits is controlled. The MGW is generating the DTMF tones and if ON/OFF signalling is performed it should wait for the DTMF_OFF message from the MSC. However the timing of this message cannot be accurate due to possible OoB timing problems and also congestion on the Mc interface-ON message could be delayed. Thus the MGW should ensure the TS 23.014 timing requirements are met (if the DTMF_OFF is received early). Further as in this TS the maximum duration may be controlled but is left to operator configuration – this should also be ensured (if required) by the MGW – not the MSC Server. The same principle applies also for the DTMF pause intervall timing. The MGW shall ensure that the minimal gap between two consecutive DTMF tones is ensured. **This is an essential correction**
Summary of change: ⌘	Clarify that DTMF timing is performed by the MGW
Consequences if not approved: ⌘	Interworking not defined and if timing is performed by MSC then due to signalling delays the timing could be faulty.

Clauses affected: ⌘	2, 14.4

	Y	N		
Other specs ⌘	X		Other core specifications	⌘ CR on TS 29.232-058

affected:		X	Test specifications	
		X	O&M Specifications	

Other comments:	⌘	

How to create CRs using this form:

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2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

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 23.002: "Network Architecture".

[3]   3GPP TS 23.153: "Out of Band Transcoder Control; Stage 2".

[4]   3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols; Stage 3".

[5]   ITU-T Recommendation H.248: "Gateway Control Protocol".

[6]   3GPP TS 29.232: "Media Gateway Controller (MGC); Media Gateway (MGW) interface; Stage 3".

[7]   3GPP TS 29.415: "Core Network Nb User Plane Protocols; Stage 3".

[8]   3GPP TS 23.009: "Handover procedures".

[9]   3GPP TS 23.072: "Call Deflection (CD) supplementary service; Stage2".

[10]   3GPP TS 23.078: "Customized Applications for Mobile network Enhanced Logic (CAMEL) - Phase 3; Stage 2".

[11]   3GPP TS 23.079: "Support of Optimal Routeing (SOR); Technical Realisation".

[12]   3GPP TS 23.082: "Call Forwarding (CF) Supplementary Services; Stage 2".

[13]   3GPP TS 23.083: "Call Waiting (CW) and Call Hold (HOLD) Supplementary Services; Stage 2".

[14]   3GPP TS 23.084: "Digital cellular telecommunications system (Phase 2+); Multi Party (MPTY) Supplementary Service; Stage 2".

[15]   3GPP TS 23.091: "Explicit Call Transfer (ECT) Supplementary Service; Stage 2".

[16]   3GPP TS 23.093: "Technical realisation of Completion of Calls to Busy Subscriber (CCBS); Stage 2".

[17]   3GPP TS 23.135: "Multicall supplementary service; Stage 2".

[18]   3GPP TS 23.108: "Mobile radio interface layer 3 specification; Core Network Protocols; Stage 2".

[19]   GSM TS 02.32: "Immediate Service Termination (IST); Service Description; Stage 1".

[20]   3GPP TS 25.415: "UTRAN Iu Interface User Plane Protocols".

[21]   3GPP TS 29.414: "Core Network Nb Data Transport and Transport Signalling".

[22]   3GPP TS 29.205: "Application of Q.1900 Series to Bearer Independent circuit-switched core network architecture; Stage 3".

[23]   3GPP TS 29.010: "Information element mapping between Mobile Station - Base Station System (MS - BSS) and Base Station System - Mobile-services Switching Centre (BSS - MSC); Signalling procedures and the Mobile Application Part (MAP)".

[24]   GSM TS 03.45: "Technical realization of facsimile group 3 transparent".

[25]   3GPP TS 23.146: "Technical realization of facsimile group 3 non-transparent".

[26]   3GPP TS 25.413: "UTRAN Iu Interface RANAP Signalling"

[27]   3GPP TS 48.008: "Mobile-services Switching Centre – Base Station System (MSC – BSS) interface; layer 3 specification"

[x]   3GPP TS 23.014: "Technical Specification Group Core Network; Support of Dual Tone Multi-Frequency (DTMF) signalling".

14.4   DTMF

DTMF information can be transported either inband or out of band. In order to minimise the interworking between out of band and in band DTMF signalling, the general principle is to use the DTMF signalling method of the preceding node whenever possible.

If out-of-band transcoder control is applied for a speech call, it shall be performed in accordance with 3GPP TS 23.153 [3]

14.4.1   DTMF Tone Generation

14.4.1.1   Inband DTMF Tone Generation

This option uses inband signalling to transport DTMF digits in the core network.

The DTMF tone generation shall be performed in accordance with 3GPP TS 23.108 [18]. The following paragraphs describe the additional requirements for the bearer independent CS core network.

Start DTMF

When the MSC server receives the Start DTMF message from the UE, it uses the Send DTMF procedure to request the MGW to modify the bearer termination to play a tone for the pressed digit. The result of the tone sending by the bearer termination will be received by the MSC server and sent to the UE (bullet 1 in figure 14.3).

Stop DTMF

When the MSC server receives the Stop DTMF message from the UE, it uses the Stop DTMF procedure to request the MGW to modify the bearer termination to stop digit playing. When the response is received from the MGW, the MSC server will acknowledge the Stop DTMF (bullet 2 in figure 14.3).

 The MGW shall check the minimum duration and minimum interval in accordance with the DTMF timing defined in TS 23.014 [x].

Example

Figure 14.3 shows an example where out-of-band signalling of DTMF information is not supported by the call control protocol. When the UE sends Start DTMF and Stop DTMF messages , the MSC server uses resources in the MGW to generate tones by modifying the bearer termination.
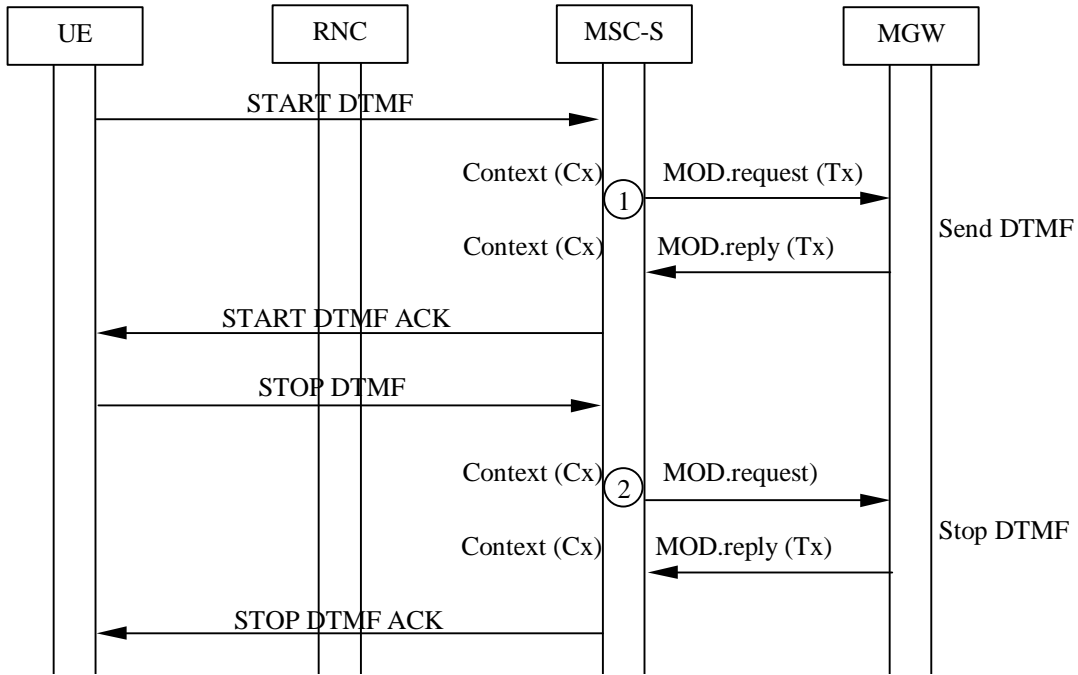
Figure 14.3 Inband DTMF generation (message sequence chart)

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CHANGE REQUEST

| ⌘ | **23.205** CR **044** | ⌘**rev** **1** ⌘ | Current version: | **5.4.0** | ⌘ |

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐   ME ☐   Radio Access Network ☐   Core Network **X**

Title: ⌘	Clarification of handling of DTMF timing	
Source: ⌘	CN4	
Work item code: ⌘	CSSPLIT	***Date:*** ⌘ 6/5/2003

Category: ⌘ **A**		***Release:*** ⌘ Rel-5
	Use one of the following categories:	*Use one of the following releases:*
	F *(correction)*	2 *(GSM Phase 2)*
	A *(corresponds to a correction in an earlier release)*	R96 *(Release 1996)*
	B *(addition of feature),*	R97 *(Release 1997)*
	C *(functional modification of feature)*	R98 *(Release 1998)*
	D *(editorial modification)*	R99 *(Release 1999)*
	Detailed explanations of the above categories can	Rel-4 *(Release 4)*
	be found in 3GPP TR 21.900.	Rel-5 *(Release 5)*
		Rel-6 *(Release 6)*

Reason for change: ⌘	Timing for DTMF digits is defined by TS 23.014 – in R99 this is performed by the MSC and the timing is defined in 24.008 (references TS 23.014) however for the split architecture it is not specified where the control of the minimum duration and minimum gap for DTMF digits is controlled. The MGW is generating the DTMF tones and if ON/OFF signalling is performed it should wait for the DTMF_OFF message from the MSC. However the timing of this message cannot be accurate due to possible OoB timing problems and also congestion on the Mc interface-ON message could be delayed. Thus the MGW should ensure the TS 23.014 timing requirements are met (if the DTMF_OFF is received early). Further as in this TS the maximum duration may be controlled but is left to operator configuration – this should also be ensured (if required) by the MGW – not the MSC Server. The same principle applies also for the DTMF pause intervall timing. The MGW shall ensure that the minimal gap between two consecutive DTMF tones is ensured.
Summary of change: ⌘	Clarify that DTMF timing is performed by the MGW
Consequences if not approved: ⌘	Interworking not defined and if timing is performed by MSC then due to signalling delays the timing could be faulty.

Clauses affected: ⌘	2, 14.4

	Y	**N**	
Other specs ⌘	**X**		Other core specifications ⌘ CR on TS 29.232 #059
affected:		**X**	Test specifications
		X	O&M Specifications

Other comments:	⌘	

How to create CRs using this form:

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

2   References

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- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

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[5]   ITU-T Recommendation H.248: "Gateway Control Protocol".

[6]   3GPP TS 29.232: "Media Gateway Controller (MGC); Media Gateway (MGW) interface; Stage 3".

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[9]   3GPP TS 23.072: "Call Deflection (CD) supplementary service; Stage2".

[10]   3GPP TS 23.078: "Customized Applications for Mobile network Enhanced Logic (CAMEL) - Phase 3; Stage 2".

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[16]   3GPP TS 23.093: "Technical realisation of Completion of Calls to Busy Subscriber (CCBS); Stage 2".

[17]   3GPP TS 23.135: "Multicall supplementary service; Stage 2".

[18]   3GPP TS 23.108: "Mobile radio interface layer 3 specification; Core Network Protocols; Stage 2".

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[20]   3GPP TS 25.415: "UTRAN Iu Interface User Plane Protocols".

[21]   3GPP TS 29.414: "Core Network Nb Data Transport and Transport Signalling".

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[23]   3GPP TS 29.010: "Information element mapping between Mobile Station - Base Station System (MS - BSS) and Base Station System - Mobile-services Switching Centre (BSS - MSC); Signalling procedures and the Mobile Application Part (MAP)".

[24]   GSM TS 03.45: "Technical realization of facsimile group 3 transparent".

[25]   3GPP TS 23.146: "Technical realization of facsimile group 3 non-transparent".

[26]   3GPP TS 25.413: "UTRAN Iu Interface RANAP Signalling"

[27]   3GPP TS 48.008: "Mobile-services Switching Centre – Base Station System (MSC – BSS) interface; layer 3 specification"

[28]   3GPP TS 23.226: "Global Text Telephony (GTT); Stage 2"

[29]   3GPP TS 43.051: " GSM/EDGE Radio Access Network (GERAN) overall description; Stage 2;"

[30]   3GPP TS 25.412: "UTRAN Iu interface signalling transport".

[31]   3GPP TS 25.410: "UTRAN Iu Interface: General Aspects and Principles".

[32]   3GPP TS 25.414: "UTRAN Iu interface data transport and transport signalling".

[x]   3GPP TS 23.014: "Technical Specification Group Core Network; Support of Dual Tone Multi-Frequency (DTMF) signalling".

14.4   DTMF

DTMF information can be transported either inband or out of band. In order to minimise the interworking between out of band and in band DTMF signalling, the general principle is to use the DTMF signalling method of the preceding node whenever possible.

If out-of-band transcoder control is applied for a speech call, it shall be performed in accordance with 3GPP TS 23.153 [3]

14.4.1   DTMF Tone Generation

14.4.1.1   Inband DTMF Tone Generation

This option uses inband signalling to transport DTMF digits in the core network.

The DTMF tone generation shall be performed in accordance with 3GPP TS 23.108 [18]. The following paragraphs describe the additional requirements for the bearer independent CS core network.

Start DTMF

When the MSC server receives the Start DTMF message from the UE, it uses the Send DTMF procedure to request the MGW to modify the bearer termination to play a tone for the pressed digit. The result of the tone sending by the bearer termination will be received by the MSC server and sent to the UE (bullet 1 in figure 14.3).

Stop DTMF

When the MSC server receives the Stop DTMF message from the UE, it uses the Stop DTMF procedure to request the MGW to modify the bearer termination to stop digit playing. When the response is received from the MGW, the MSC server will acknowledge the Stop DTMF (bullet 2 in figure 14.3).

The MGW shall check the minimum duration and minimum interval in accordance with the DTMF timing defined in TS 23.014 [x].

Example

Figure 14.3 shows an example where out-of-band signalling of DTMF information is not supported by the call control protocol. When the UE sends Start DTMF and Stop DTMF messages , the MSC server uses resources in the MGW to generate tones by modifying the bearer termination.
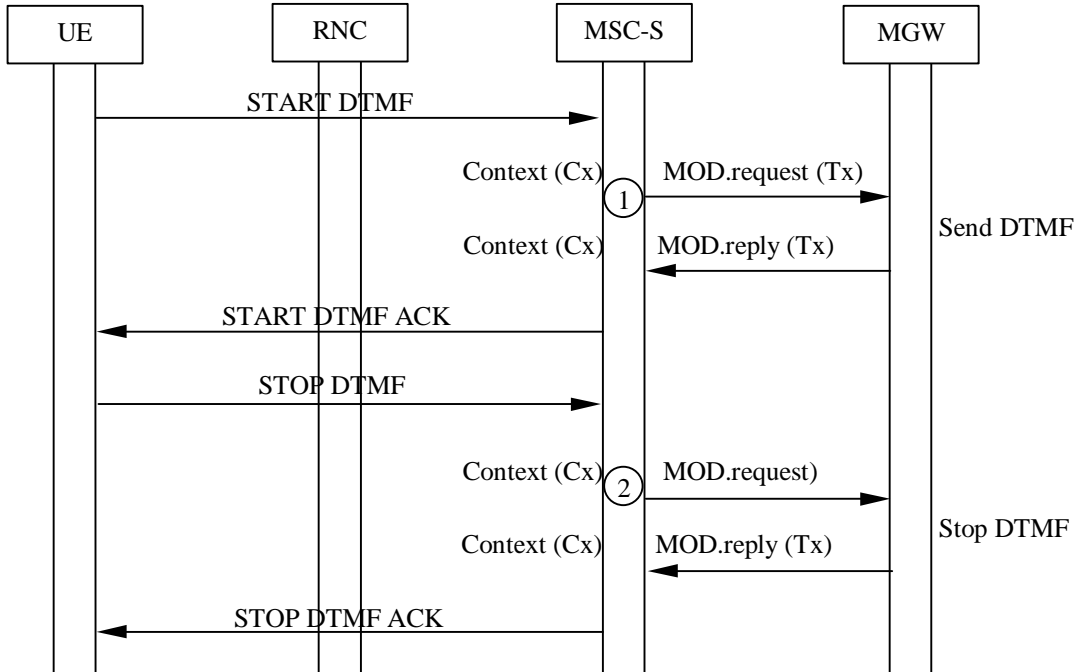

Figure 14.3 Inband DTMF generation (message sequence chart)

N4-030534

CR-Form-v7

CHANGE REQUEST

| ⌘ | **29.232** CR **058** | ⌘**rev** | **-** | ⌘ | Current version: | **4.7.0** | ⌘ |

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐   ME ☐   Radio Access Network ☐   Core Network **X**

Title: ⌘	Clarification of handling of DTMF in split architecture – DTMF timing	
Source: ⌘	CN4	
Work item code:⌘	CSSPLIT	***Date:*** ⌘ 6/5/2003
Category: ⌘	**F**	***Release:*** ⌘ Rel-4

	Use one of the following categories:		*Use one of the following releases:*
	F *(correction)*		2 *(GSM Phase 2)*
	A *(corresponds to a correction in an earlier release)*		R96 *(Release 1996)*
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	Detailed explanations of the above categories can		Rel-4 *(Release 4)*
	be found in 3GPP TR 21.900.		Rel-5 *(Release 5)*
			Rel-6 *(Release 6)*

Reason for change: ⌘	**This is on essential correction.** Timing for DTMF digits is defined by TS 23.014 – in R99 this is performed by the MSC and the timing is defined in 24.008 (references TS 23.014) however for the split architecture it is not specified where the control of the minimum duration and minimum gap for DTMF digits is controlled. The MGW is generating the DTMF tones and if ON/OFF signalling is performed it should wait for the DTMF_OFF message from the MSC. However the timing of this message cannot be accurate due to possible OoB timing problems and also congestion on the Mc interface-ON message could be delayed. Thus the MGW should ensure the TS 23.014 timing requirements are met (if the DTMF_OFF is received early). Further as in this TS the maximum duration may be controlled but is left to operator configuration – this should also be ensured (if required) by the MGW – not the MSC Server. The same principle applies also for the DTMF pause intervall timing. The MGW shall ensure that the minimal gap between two consecutive DTMF tones is ensured.
Summary of change: ⌘	Clarify that DTMF timing is performed by the MGW
Consequences if not approved: ⌘	Interworking not defined and if timing is performed by MSC then due to signalling delays the timing could be faulty.

Clauses affected: ⌘	14.4

		Y	N	
Other specs	⌘	X		Other core specifications ⌘ 23.205-043

affected:		**X**	Test specifications	
		X	O&M Specifications	
Other comments:	⌘			

2   References

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

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[1]   3GPP TS 23.153: "3rd Generation Partnership Project; Technical Specification Group Core Network; Out of Band Transcoder Control - Stage 2"

[2]   3GPP TS 23.205: "3rd Generation Partnership Project; Technical Specification Group Core Network; Bearer Independent CS Core Network – Stage 2"

[3]   3GPP TS 24.008: "3rd Generation Partnership Project; Technical Specification Group Core Network; Mobile radio interface layer 3 specification"

[4]   3GPP TS 25.415: "3rd Generation Partnership Project; Technical Specification Group Radio Access Network; UTRAN Iu interface user plane protocols".

[5]   3GPP TS 28.062: "3rd Generation Partnership Project; Technical Specification Group Services & System Aspects; In-band Tandem Free Operation (TFO) of Speech Codecs; Stage 3 – Service Description"

[6]   3GPP TS 29.007: "3rd Generation Partnership Project; Technical Specification Group Core Network; General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)"

[7]   3GPP TS 29.205: "3rd Generation Partnership Project; Technical Specification Group Core Network; Application of Q.1900 series to Bearer Independent CS Network architecture; Stage 3"

[8]   3GPP TS 29.415: "3rd Generation Partnership Project; Technical Specification Group Core Network; CN Nb interface user plane protocols".

[9]   3GPP TS 48.008: "3rd Generation Partnership Project; Technical Specification Group GSM EDGE Radio Access Network; Mobile-services Switching Centre - Base Station System (MSC - BSS) interface; Layer 3 specification".

[10]   ITU-T Recommendation H.248 (06/00): "Media Gateway Control Protocol"

[11]   ITU-T Recommendation Q.2210 (07/96): "Message transfer part level 3 functions and messages using the services of ITU-T Recommendation Q.2140"

[12]   RFC 2960 "Stream Control Transmission Protocol"

[13]   3G TS 29.202: "SS7 signalling transport in core network"

[14]   ITU-U Recommendation H.248 Annex L, "Error Codes and Service Change Reason Description"

[x]   3GPP TS 23.014: "Technical Specification Group Core Network; Support of Dual Tone Multi-Frequency (DTMF) signalling".

14.2.13   Send DTMF

This procedure is the same as that defined in the subclause "Media Content Insertion" - "Insert Digit" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).The MGW shall ensure the minimum duration timing and minimum interval timing is achieved in accordance with the DTMF timing defined in TS 23.014 [x]. Maximum duration shall also be controlled by the MGW if required by the network.

14.2.25   Stop DTMF

This procedure is the same as that defined in the subclause "Media Content Insertion" - "Insert Digit" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]). The signal descriptor shall not include any signal. The MGW shall ensure the minimum duration timing and minimum interval timing is achieved in accordance with the DTMF timing defined in TS 23.014 [x]. Maximum duration shall also be controlled by the MGW if required by the network.

CR-Form-v7

CHANGE REQUEST

| ⌘ | **29.232** CR **059** | ⌘**rev** | **-** | ⌘ | Current version: | **5.5.0** | ⌘ |

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network **X**

Title: ⌘	Clarification of handling of DTMF in split architecture – DTMF timing	
Source: ⌘	LM Ericsson	
Work item code: ⌘	CSSPLIT	***Date:*** ⌘ 6/5/2003
Category: ⌘ **A**		***Release:*** ⌘ Rel-5

Use one of the following categories:
F (correction)
A (corresponds to a correction in an earlier release)
B (addition of feature),
C (functional modification of feature)
D (editorial modification)
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change: ⌘	Timing for DTMF digits is defined by TS 23.014 – in R99 this is performed by the MSC and the timing is defined in 24.008 (references TS 23.014) however for the split architecture it is not specified where the control of the minimum duration and minimum gap for DTMF digits is controlled. The MGW is generating the DTMF tones and if ON/OFF signalling is performed it should wait for the DTMF_OFF message from the MSC. However the timing of this message cannot be accurate due to possible OoB timing problems and also congestion on the Mc interface- ON message could be delayed. Thus the MGW should ensure the TS 23.014 timing requirements are met (if the DTMF_OFF is received early). Further as in this TS the maximum duration may be controlled but is left to operator configuration – this should also be ensured (if required) by the MGW – not the MSC Server. The same principle applies also for the DTMF pause intervall timing. The MGW shall ensure that the minimal gap between two consecutive DTMF tones is ensured.
Summary of change: ⌘	Clarify that DTMF timing is performed by the MGW
Consequences if not approved: ⌘	Interworking not defined and if timing is performed by MSC then due to signalling delays the timing could be faulty.

Clauses affected: ⌘	14.4

	Y	N		
Other specs affected: ⌘	X		Other core specifications ⌘	23.205-044
		X	Test specifications	
		X	O&M Specifications	

Other comments:	⌘	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

2   References

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[13]   3G TS 29.202: "SS7 signalling transport in core network"

[14]   ITU-U Recommendation H.248 Annex L, "Error Codes and Service Change Reason Description"

[15]   ITU-U Recommendation H.248 (Annex M.2): "Media gateway resource congestion handling package".

[16]   3GPP TS 26.103: "Speech codec list for GSM and UMTS".

[17]   ITU-U Recommendation H.248 (Annex F): "Facsimile, text conversation and call discrimination packages".

[18]   3GPP TS 26.226: "Cellular text telephony; Transport of text in the voice channel".

[19]   ITU-T Recommendation T.140: "Protocol for multimedia application text conversation".

[20]   3GPP TS 25.413: "UTRAN Iu interface RANAP signalling".

[21]   3GPP TS 25.414: "UTRAN Iu interface data transport and transport signalling".

[22]   3GPP TS 23.078: "Customized Applications for Mobile network Enhanced Logic (CAMEL); Stage 2".

[23]   ITU-T Recommendation Q.1950: "Bearer independent call bearer control protocol".

[24]   ITU-T Recommendation Q.765.5: "Signalling system No. 7 - Application transport mechanism: Bearer Independent Call Control (BICC)".

[25]   ITU-T Recommendation G.711: "Pulse code modulation (PCM) of voice frequencies".

[26]   3GPP TS 26.102: "3rd Generation Partnership Project; Mandatory speech codec; AMR speech codec; Interface to Iu, Uu and Nb"

[x]   3GPP TS 23.014: "Technical Specification Group Core Network; Support of Dual Tone Multi-Frequency (DTMF) signalling".

14.2.13 Send DTMF

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14.2.25 Stop DTMF

This procedure is the same as that defined in the subclause "Media Content Insertion" - "Insert Digit" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]). The signal descriptor shall not include any signal. The MGW shall ensure the minimum duration timing and minimum interval timing is achieved in accordance with the DTMF timing defined in TS 23.014 [x]. Maximum duration shall also be controlled by the MGW if required by the network.