Technical Specification Group Services and System Aspects
Meeting #10, Bangkok, Thailand, 11-14 December 2000

TSGS#10(00)0574

Source: **TSG-SA WG4**

Title: **CRs to TS 06.93 & 26.093**

Document for: **Approval**

Agenda Item: **7.4.3**

The following CRs were agreed at SA WG4 meetings #13 and/or #14 and are presented to TSG SA #10 for approval.

Spec	CR	Rev	Phase	Subject	Cat	Ver	WG	Meeting	S4 doc
06.93	A010		R98	Re-scheduling of stolen SID_UPDATE frames by SID_FIRST frames for AMR Clarification of Hangover period after Handover	F	7.4.0	S4	S4-13	S4-000529
26.093	005		R99	Re-scheduling of stolen SID_UPDATE frames by SID_FIRST frames for AMR Clarification of Hangover period after Handover	A	3.2.0	S4	S4-13	S4-000530
26.093	006		Rel4	Re-scheduling of stolen SID_UPDATE frames by SID_FIRST frames for AMR Clarification of Hangover period after Handover	A	3.2.0	S4	S4-13	S4-000531
06.93	A009	1	R98	Re-scheduling of stolen SID_UPDATE frames for AMR (Part 2)	F	7.4.0	S4	S4-13	S4-000533
26.093	003	1	R99	Re-scheduling of stolen SID_UPDATE frames for AMR (Part 2)	A	3.2.0	S4	S4-13	S4-000534
26.093	004		Rel4	Re-scheduling of stolen SID_UPDATE frames for AMR (Part 2)	A	3.2.0	S4	S4-13	S4-000535

3GPP TSG SA WG4 Meeting#13
Osaka, Japan, 23-27 Oct 2000

Document S4 (00)0529
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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GSM 06.93 **CR** **A010** Current Version: 7.4.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSG-SA#10 for approval [X] strategic [ ] *(for SMG use only)*
list expected approval meeting # here ↑ for information [ ] non-strategic [X]

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: TSG-SA WG4 **Date:** 11-Dec-2000

Subject: Re-scheduling of stolen SID_UPDATE frames by SID_FIRST frames for AMR
Clarification of Hangover period after Handover

Work item: AMR

Category: *(only one category shall be marked with an X)*

F	Correction	[F]	**Release:**	Phase 2	[ ]
A	Corresponds to a correction in an earlier release	[ ]		Release 96	[ ]
B	Addition of feature	[ ]		Release 97	[ ]
C	Functional modification of feature	[ ]		Release 98	[X]
D	Editorial modification	[ ]		Release 99	[ ]
				Release 00	[ ]

Reason for change: This CR aims to clarify the frame re-scheduling when SID_UPDATE frames are stolen by re-scheduled SID_FIRST frame in the Half rate channel mode.
Moreover, this CR brings clarification to how the DTX TX handler must handle the SPEECH frames at Handover.

Clauses affected: 5.1.1 et 5.1.2.2

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

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<--------- double-click here for help and instructions on how to create a CR.

In order to ensure TX/RX DTX handler synchronisation at handover, the uplink TX DTX handler in the MS shall accept messages from TX RSS with control parameter NSYNC, resulting in the following operation during a period of the next NSYNC frames:

- The TX DTX handler shall send SID_UPDATE instead of NO_DATA frames to the TX RSS.
- If, however, during this period of NSYNC frames, VAD flag is equal to 1 at least for one speech frame, TX DTX handler shall send SPEECH frames for the rest of the period of the NSYNC frames. Note the TX DTX handler shall send SPEECH frames at least for the duration of the hangover period.~~Whenever, during that period VAD flag = 1, the TX DTX handler shall continue to produce SPEECH frames for at least the rest of the period and, in addition, the hangover period.~~

5.1.2 Functions of the TX Radio Subsystem

The TX Radio Subsystem has the following overall functionality. The radio transmission is cut after the transmission of a SID_FIRST frame when the speaker stops talking. During speech pauses the transmission is resumed at regular intervals for transmission of one SID_UPDATE frame, in order to update the generated comfort noise on the RX side (and to improve the measurement of the link quality by the RSS). Note that the transcoder knows what frames to send. In the case when nothing is to be transmitted it outputs frames marked with TX_TYPE = ”NO_DATA”.

Within the TX Radio Subsystem the TX_TYPE Monitoring unit controls the operation of the Channel Encoder (as specified in GSM 05.03) and the Transmission of the frame. Control input to the TX_TYPE Monitoring unit is the TX_TYPE. Control output and input to the Channel Encoder are indicators specifying the frame format. These frame format indicators are defined in GSM 05.03, they are different for TCH/AFS and TCH/AHS.

5.1.2.1 Functions of the TX Radio Subsystem for TCH/AFS

The TX Radio Subsystem operates in the following way regarding DTX (without TFO):

- all frames marked with TX_TYPE = " SPEECH_GOOD " are scheduled for normal channel coding and transmission. The frame format for CHE operation shall be SPEECH. If, however, the previous frame was not of TX_TYPE = “SPEECH_GOOD”, an ONSET frame format followed by SPEECH_GOOD shall be signalled to the CHE;
- for frames marked with TX_TYPE = “SID_FIRST” a SID_FIRST frame format is signalled to the CHE;
- frames marked with TX_TYPE = “SID_UPDATE” are scheduled for SID_UPDATE frame channel coding and transmission. The frame format signalled to CHE is SID_UPDATE;
- for frames marked with TX_TYPE = “NO_DATA” no processing or transmission is carried out.

If a SID_FIRST frame or the first SID_UPDATE frame after a SID_FIRST frame, is stolen for Fast Associated Control Channel (FACCH) signalling purposes, then the subsequent frame shall be scheduled for transmission of the SID_FIRST or SID_UPDATE frame (whichever applies) instead.

SPEECH frames shall override possible SID_FIRST or SID_UPDATE frames in exceptional cases.

At handover, TX/RX DTX handler synchronisation shall be initiated. At the time instant before the MS starts sending to the new base station, a message shall be sent to the uplink TX DTX handler with the parameter NSYNC = 12.

5.1.2.2 Functions of the TX Radio Subsystem for TCH/AHS

The TX Radio Subsystem operates in the following way regarding DTX:

- all frames marked with TX_TYPE = " SPEECH_GOOD " are scheduled for normal channel coding and transmission. The frame format for CHE operation shall be SPEECH. However, if the previous frame was of TX_TYPE = “SID_FIRST”, a SID_FIRST_INH frame format followed by SPEECH_GOOD shall be signalled to the CHE. If the previous frame was of TX_TYPE = “SID_UPDATE”, a SID_UPDATE_INH frame format followed by SPEECH_GOOD shall be signalled to the CHE. If the previous frame was of TX_TYPE “NO_DATA”, an ONSET frame format followed by SPEECH_GOOD shall be signalled to the CHE;

- for frames marked with TX_TYPE = “SID_FIRST” a SID_FIRST_P1 frame format is signalled to the CHE. Note: All 4 TDMA frames carrying the bits of this frame shall be transmitted. The Mode Indication received with the frame is stored for potential use in the next frame;

- for frames marked with TX_TYPE = “SID_UPDATE” a SID_UPDATE frame format is signalled to the CHE. All 4 TDMA frames carrying the bits of this frame shall be transmitted;

- for frames marked with TX_TYPE = “NO_DATA”, no processing or transmission is carried out. However, if the preceding frame was marked with TX_TYPE = “SID_FIRST”, a SID_FIRST_P2 frame format is signalled to CHE. Note: The 2 TDMA frames carrying bits of this frame shall be transmitted. If, depending on the current frame number, the Mode Indication is to be transmitted with these TDMA frames, the Mode Indication shall be used that was stored during the processing of the preceding SID_FIRST frame.

If a SID_FIRST frame or a SID_UPDATE frame is affected by Fast Associated Control Channel (FACCH) signalling purposes, then the SID_FIRST or SID_UPDATE frame (whichever applies) shall be re-scheduled for transmission immediately after the FACCH signalling.

Note: a SID_FIRST or a SID_UPDATE frame is considered as stolen when this frame must be replaced by a FACCH frame, or by a RATSCCH frame, or when this frame is replaced by another re-scheduled SID_FIRST frame.

SPEECH frames shall override possible SID_FIRST or SID_UPDATE frames in exceptional cases.

At handover, TX/RX DTX handler synchronisation shall be initiated. At the time instant before the MS starts sending to the new base station, a message shall be sent to the uplink TX DTX handler with the parameter NSYNC = 12.

5.1.2.3 Functions of the Downlink TX Radio Subsystem for TFO

The TX Radio Subsystem in the BTS shall in addition operate in the following way regarding DTX, if TFO is ongoing (see GSM 08.62):

- Frames with TX_TYPE = SPEECH_GOOD, SID_FIRST and SID_UPDATE shall be handled as usual in DTX, regardless whether DTX in downlink is requested or not. Also NO_DATA shall be handled as usual, if DTX is requested.

- Frames with TX_TYPE = NO_DATA shall be replaced by SID_FILLER frames, if DTX in downlink is not requested. By this the radio transmission continues in downlink, although no parameters are transmitted in speech pauses on the Abis interface. The MS generates Comfort Noise in these speech pauses.

- Frames with TX_TYPE = SPEECH_DEGRADED shall be handled exactly like SPEECH_GOOD frames.

- For frame with TX_TYPE = SPEECH_BAD and SID_BAD the CHE shall perform its regular processing, but then shall invert the six, respectively 14 CRC bits before convolutional encoding and transmitting the frames on the air interface. By this the error concealment mechanism in the MS is triggered to handle these corrupted frames.

- ONSET frames may be ignored by the TX Radio Subsystem and need not to be processed.

Definition: SID_FILLER frames are like SID_BAD frames, but with all information bits set to “1”. The 14 CRC bits shall artificially be inverted by the CHE before convolutional encoding and transmission.

5.1.2.4 Functions of the TX Radio Subsystem for RATSCCH

During regular speech transmission (in the middle of a speech burst)RATSCCH replaces (steals) one (TCH/AFS) respectively two (TCH/AHS) speech frames (see GSM 05.09). Also in all non speech cases the RATSCCH shall be handled like speech. The respective RATSCCH frame formats (RATSCCH in case of TCH/AFS, respectively RATSCCH_MARKER and RATSCCH_DATA in case of TCH/AHS) shall be signalled to the CHE.

If RATSCCH has to be sent during a speech pause in DTX, then first an ONSET frame shall be signalled to the CHE, followed by the RATSCCH frame(s) and finally by the respective SID_FIRST frame(s).

If a SID_UPDATE frame is affected by RATSCCH signalling, then the SID_UPDATE frame shall be re-scheduled for transmission immediately after the RATSCCH signalling.

FACCH should be handled in the same way as a RATSCCH, i.e. like a short speech burst.

3GPP TSG SA WG4 Meeting#13
Osaka, Japan, 23-27 Oct 2000

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e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

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3G 26.093	**CR**	**005**	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG-SA#10	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	X	

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio	X	Core Network	

Source: TSG-SA WG4 **Date:** 11-Dec-2000

Subject: Re-scheduling of stolen SID_UPDATE frames by SID_FIRST frames for AMR
Clarification of Hangover period after Handover

Work item: AMR

Category: *(only one category shall be marked with an X)*				**Release:**		
	F	Correction			Phase 2	
	A	Corresponds to a correction in an earlier release	X		Release 96	
	B	Addition of feature			Release 97	
	C	Functional modification of feature			Release 98	
	D	Editorial modification			Release 99	X
					Release 00	

Reason for change: This CR aims to clarify the frame re-scheduling when SID_UPDATE frames are stolen by re-scheduled SID_FIRST frame in the Half rate channel mode.
Moreover, this CR brings clarification to how the DTX TX handler must handle the SPEECH frames at Handover.

Clauses affected: A.5.1.1 and A.5.1.2.2

Other specs affected:			
Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

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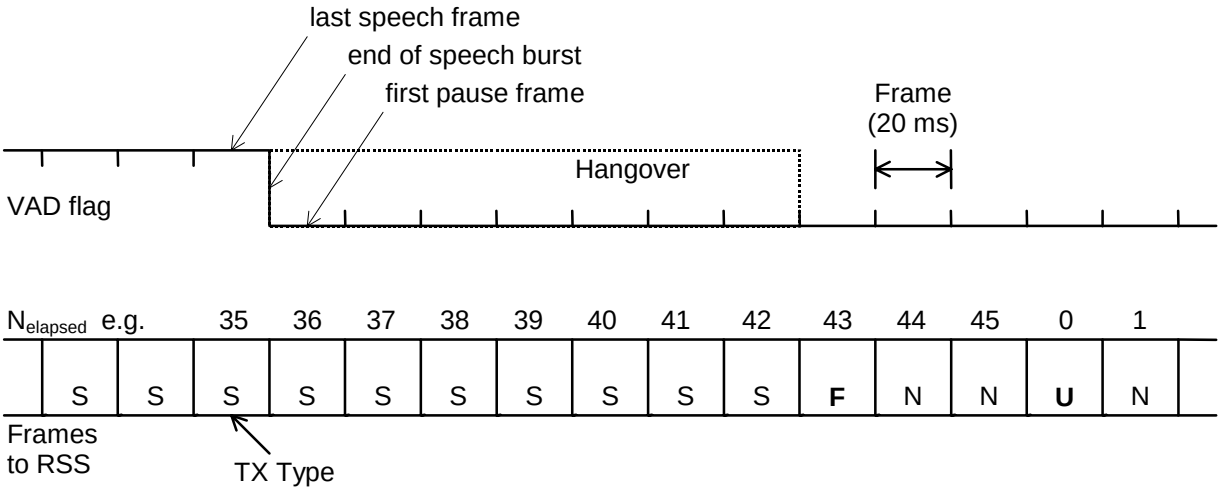

TX Types: “S” = SPEECH; “F” = SID_FIRST; “U” = “SID_UPDATE; “N” = NO DATA
$N_{elapsed}$: No. of elapsed frames since last SID_UPDATE

Figure 6: Normal hangover procedure ($N_{elapsed}$ > 23)

If, however, at the end of the speech burst, less than 24 frames have elapsed since the last SID_UPDATE frame was computed and passed to the RSS, then this last analysed SID_UPDATE frame shall repeatedly be passed to the RSS whenever a SID_UPDATE frame is to be produced, until a new updated SID analysis is available (8 consecutive frames marked with VAD flag ="0").This reduces the activity on the air in cases where short background noise spikes are taken for speech, by avoiding the "hangover" waiting for the SID frame computation.

Once the first SID analysis after the end of a speech burst has been computed and the SID_FIRST frame has been passed to the Radio Subsystem, the TX DTX handler shall at regular intervals compute and pass updated SID_UPDATE (Comfort Noise) frames to the Radio Subsystem (RSS) as long as VAD flag = "0". SID_UPDATE frames shall be generated every 8th frame. The first SID_UPDATE shall be sent as the third frame after the SID_FIRST frame.

The speech encoder is operated in full speech modality if TX_TYPE = " SPEECH_GOOD " and otherwise in a simplified mode, because not all encoder functions are required for the evaluation of comfort noise parameters and because comfort noise parameters are only to be generated at certain times.

In order to ensure TX/RX DTX handler synchronisation at handover, the uplink TX DTX handler in the MS shall accept messages from TX RSS with control parameter NSYNC, resulting in the following operation during a period of the next NSYNC frames:

- The TX DTX handler shall send SID_UPDATE instead of NO_DATA frames to the TX RSS.
- If, however, during this period of NSYNC frames, VAD flag is equal to 1 at least for one speech frame, TX DTX handler shall send SPEECH frames for the rest of the period of the NSYNC frames. Note the TX DTX handler shall send SPEECH frames at least for the duration of the hangover period.~~Whenever, during that period VAD flag = 1, the TX DTX handler shall continue to produce SPEECH frames for at least the rest of the period and, in addition, the hangover period.~~

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The TX Radio Subsystem has the following overall functionality. The radio transmission is cut after the transmission of a SID_FIRST frame when the speaker stops talking. During speech pauses the transmission is resumed at regular intervals for transmission of one SID_UPDATE frame, in order to update the generated comfort noise on the RX side (and to improve the measurement of the link quality by the RSS). Note that the transcoder knows what frames to send. In the case when nothing is to be transmitted it outputs frames marked with TX_TYPE = ”NO_DATA”.

Within the TX Radio Subsystem the TX_TYPE Monitoring unit controls the operation of the Channel Encoder (as specified in 3G TS 25.003) and the Transmission of the frame. Control input to the TX_TYPE Monitoring unit is the TX_TYPE. Control output and input to the Channel Encoder are indicators specifying the frame format. These frame format indicators are defined in 3G TS 25.003, they are different for TCH/AFS and TCH/AHS.

A.5.1.2.1 Functions of the TX Radio Subsystem for TCH/AFS

The TX Radio Subsystem operates in the following way regarding DTX (without TFO):

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for frames marked with TX_TYPE = “SID_FIRST” a SID_FIRST frame format is signalled to the CHE;

frames marked with TX_TYPE = “SID_UPDATE” are scheduled for SID_UPDATE frame channel coding and transmission. The frame format signalled to CHE is SID_UPDATE;

for frames marked with TX_TYPE = “NO_DATA” no processing or transmission is carried out.

If a SID_FIRST frame or a SID_UPDATE frame is stolen for Fast Associated Control Channel (FACCH) signalling purposes, then the subsequent frame shall be scheduled for transmission of the SID_FIRST or SID_UPDATE frame (whichever applies) instead.

SPEECH frames shall override possible SID_FIRST or SID_UPDATE frames in exceptional cases.

At handover, TX/RX DTX handler synchronisation shall be initiated. At the time instant before the MS starts sending to the new base station, a message shall be sent to the uplink TX DTX handler with the parameter NSYNC = 12.

A.5.1.2.2 Functions of the TX Radio Subsystem for TCH/AHS

The TX Radio Subsystem operates in the following way regarding DTX:

all frames marked with TX_TYPE = " SPEECH_GOOD " are scheduled for normal channel coding and transmission. The frame format for CHE operation shall be SPEECH. However, if the previous frame was of TX_TYPE = “SID_FIRST”, a SID_FIRST_INH frame format followed by SPEECH_GOOD shall be signalled to the CHE. If the previous frame was of TX_TYPE = “SID_UPDATE”, a SID_UPDATE_INH frame format followed by SPEECH_GOOD shall be signalled to the CHE. If the previous frame was of TX_TYPE “NO_DATA”, an ONSET frame format followed by SPEECH_GOOD shall be signalled to the CHE;

for frames marked with TX_TYPE = “SID_FIRST” a SID_FIRST_P1 frame format is signalled to the CHE. Note: All 4 TDMA frames carrying the bits of this frame shall be transmitted. The Mode Indication received with the frame is stored for potential use in the next frame;

for frames marked with TX_TYPE = “SID_UPDATE” a SID_UPDATE frame format is signalled to the CHE. All 4 TDMA frames carrying the bits of this frame shall be transmitted;

for frames marked with TX_TYPE = “NO_DATA”, no processing or transmission is carried out. However, if the preceding frame was marked with TX_TYPE = “SID_FIRST”, a SID_FIRST_P2 frame format is signalled to CHE. Note: The 2 TDMA frames carrying bits of this frame shall be transmitted. If, depending on the current frame number, the Mode Indication is to be transmitted with these TDMA frames, the Mode Indication shall be used that was stored during the processing of the preceding SID_FIRST frame.

If a SID_FIRST frame or the first SID_UPDATE frame after a SID_FIRST frame, is affected by Fast Associated Control Channel (FACCH) signalling purposes, then the SID_FIRST or SID_UPDATE frame (whichever applies) shall be re-scheduled for transmission immediately after the FACCH signalling.

Note: a SID_FIRST or a SID_UPDATE frame is considered as stolen when this frame must be replaced by a FACCH frame, or by a RATSCCH frame, or when this frame is replaced by another re-scheduled SID_FIRST frame.

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3GPP TSG SA WG4 Meeting#13
Osaka, Japan, 23-27 Oct 2000

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e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

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3G 26.093	**CR**	**006**	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG-SA#10	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	X	

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio	X	Core Network	

Source: TSG-SA WG4 **Date:** 24-Oct-2000

Subject: Re-scheduling of stolen SID_UPDATE frames by SID_FIRST frames for AMR
Clarification of Hangover period after Handover

Work item: AMR

Category: *(only one category shall be marked with an X)*

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release	X		Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	
				Release 00	X

Reason for change: This CR aims to clarify the frame re-scheduling when SID_UPDATE frames are stolen by re-scheduled SID_FIRST frame in the Half rate channel mode.
Moreover, this CR brings clarification to how the DTX TX handler must handle the SPEECH frames at Handover.

Clauses affected: A.5.1.1 and A.5.1.2.2

Other specs affected:

Other 3G core specifications		→ List of CRs:	
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O&M specifications		→ List of CRs:	

Other comments:

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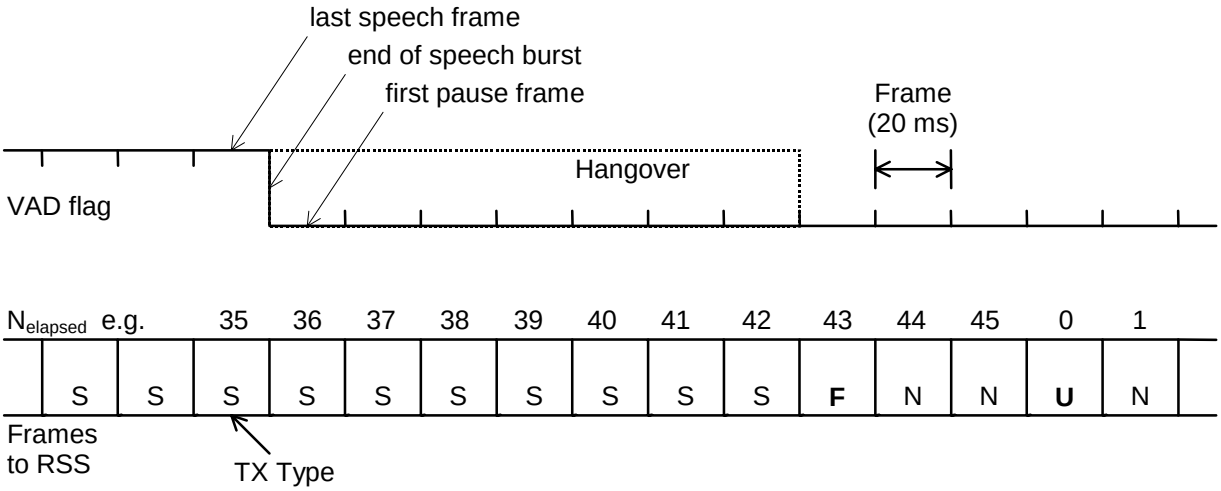

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for frames marked with TX_TYPE = “SID_FIRST” a SID_FIRST frame format is signalled to the CHE;

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for frames marked with TX_TYPE = “SID_FIRST” a SID_FIRST_P1 frame format is signalled to the CHE. Note: All 4 TDMA frames carrying the bits of this frame shall be transmitted. The Mode Indication received with the frame is stored for potential use in the next frame;

for frames marked with TX_TYPE = “SID_UPDATE” a SID_UPDATE frame format is signalled to the CHE. All 4 TDMA frames carrying the bits of this frame shall be transmitted;

for frames marked with TX_TYPE = “NO_DATA”, no processing or transmission is carried out. However, if the preceding frame was marked with TX_TYPE = “SID_FIRST”, a SID_FIRST_P2 frame format is signalled to CHE. Note: The 2 TDMA frames carrying bits of this frame shall be transmitted. If, depending on the current frame number, the Mode Indication is to be transmitted with these TDMA frames, the Mode Indication shall be used that was stored during the processing of the preceding SID_FIRST frame.

If a SID_FIRST frame or the first SID_UPDATE frame after a SID_FIRST frame, is affected by Fast Associated Control Channel (FACCH) signalling purposes, then the SID_FIRST or SID_UPDATE frame (whichever applies) shall be re-scheduled for transmission immediately after the FACCH signalling.

Note: a SID_FIRST or a SID_UPDATE frame is considered as stolen when this frame must be replaced by a FACCH frame, or by a RATSCCH frame, or when this frame is replaced by another re-scheduled SID_FIRST frame.

SPEECH frames shall override possible SID_FIRST or SID_UPDATE frames in exceptional cases.

At handover, TX/RX DTX handler synchronisation shall be initiated. At the time instant before the MS starts sending to the new base station, a message shall be sent to the uplink TX DTX handler with the parameter NSYNC = 12.

3GPP TSG SA WG4 Meeting#13
Osaka, Japan, 23-27 Oct 2000

***Document* S4 (00)0533**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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GSM 06.93 **CR** **A009 rev1** Current Version: 7.4.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSG-SA#10 *list expected approval meeting # here ↑*

for approval [X]
for information [ ]

strategic [ ]
non-strategic [ ]
(for SMG use only)

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]

Source: TSG-SA WG4 **Date:** 11-Dec-2000

Subject: Re-scheduling of stolen SID_UPDATE frames for AMR (Part 2)

Work item: AMR

Category: *(only one category shall be marked with an X)*

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

Release:

Phase 2	[ ]
Release 96	[ ]
Release 97	[ ]
Release 98	[X]
Release 99	[ ]
Release 00	[ ]

Reason for change:

This CR has the same reason as an earlier CR (A008). In A008 only section 5.1.2.2 was changed, while section 5.1.2.1 was forgotten to change.

It is proposed to handle the re-scheduling of SID_UPDATE frames in the same way in case of frame stealing for FACCH and RATSCCH signalling purposes. Every stolen SID_UPDATE frame shall be re-scheduled for transmission.

Clauses affected: 5.1.2.1

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

In order to ensure TX/RX DTX handler synchronisation at handover, the uplink TX DTX handler in the MS shall accept messages from TX RSS with control parameter NSYNC, resulting in the following operation during the next NSYNC frames:

- The TX DTX handler shall send SID_UPDATE instead of NO_DATA frames to the TX RSS.
- Whenever, during that period VAD flag = 1, the TX DTX handler shall continue to produce SPEECH frames for at least the rest of the period and, in addition, the hangover period.

5.1.2 Functions of the TX Radio Subsystem

The TX Radio Subsystem has the following overall functionality. The radio transmission is cut after the transmission of a SID_FIRST frame when the speaker stops talking. During speech pauses the transmission is resumed at regular intervals for transmission of one SID_UPDATE frame, in order to update the generated comfort noise on the RX side (and to improve the measurement of the link quality by the RSS). Note that the transcoder knows what frames to send. In the case when nothing is to be transmitted it outputs frames marked with TX_TYPE = ”NO_DATA”.

Within the TX Radio Subsystem the TX_TYPE Monitoring unit controls the operation of the Channel Encoder (as specified in GSM 05.03) and the Transmission of the frame. Control input to the TX_TYPE Monitoring unit is the TX_TYPE. Control output and input to the Channel Encoder are indicators specifying the frame format. These frame format indicators are defined in GSM 05.03, they are different for TCH/AFS and TCH/AHS.

5.1.2.1 Functions of the TX Radio Subsystem for TCH/AFS

The TX Radio Subsystem operates in the following way regarding DTX (without TFO):

- all frames marked with TX_TYPE = " SPEECH_GOOD " are scheduled for normal channel coding and transmission. The frame format for CHE operation shall be SPEECH. If, however, the previous frame was not of TX_TYPE = “SPEECH_GOOD”, an ONSET frame format followed by SPEECH_GOOD shall be signalled to the CHE;
- for frames marked with TX_TYPE = “SID_FIRST” a SID_FIRST frame format is signalled to the CHE;
- frames marked with TX_TYPE = “SID_UPDATE” are scheduled for SID_UPDATE frame channel coding and transmission. The frame format signalled to CHE is SID_UPDATE;
- for frames marked with TX_TYPE = “NO_DATA” no processing or transmission is carried out.

If a SID_FIRST frame or a ~~the first~~ SID_UPDATE frame ~~after a SID_FIRST frame,~~ is stolen for Fast Associated Control Channel (FACCH) signalling purposes, then the subsequent frame shall be scheduled for transmission of the SID_FIRST or SID_UPDATE frame (whichever applies) instead.

SPEECH frames shall override possible SID_FIRST or SID_UPDATE frames in exceptional cases.

At handover, TX/RX DTX handler synchronisation shall be initiated. At the time instant before the MS starts sending to the new base station, a message shall be sent to the uplink TX DTX handler with the parameter NSYNC = 12.

5.1.2.2 Functions of the TX Radio Subsystem for TCH/AHS

The TX Radio Subsystem operates in the following way regarding DTX:

- all frames marked with TX_TYPE = " SPEECH_GOOD " are scheduled for normal channel coding and transmission. The frame format for CHE operation shall be SPEECH. However, if the previous frame was of TX_TYPE = “SID_FIRST”, a SID_FIRST_INH frame format followed by SPEECH_GOOD shall be signalled to the CHE. If the previous frame was of TX_TYPE = “SID_UPDATE”, a SID_UPDATE_INH frame format followed by SPEECH_GOOD shall be signalled to the CHE. If the previous frame was of TX_TYPE “NO_DATA”, an ONSET frame format followed by SPEECH_GOOD shall be signalled to the CHE;
- for frames marked with TX_TYPE = “SID_FIRST” a SID_FIRST_P1 frame format is signalled to the CHE. Note: All 4 TDMA frames carrying the bits of this frame shall be transmitted. The Mode Indication received with the frame is stored for potential use in the next frame;

- for frames marked with TX_TYPE = “SID_UPDATE” a SID_UPDATE frame format is signalled to the CHE. All 4 TDMA frames carrying the bits of this frame shall be transmitted;

- for frames marked with TX_TYPE = “NO_DATA”, no processing or transmission is carried out. However, if the preceding frame was marked with TX_TYPE = “SID_FIRST”, a SID_FIRST_P2 frame format is signalled to CHE. Note: The 2 TDMA frames carrying bits of this frame shall be transmitted. If, depending on the current frame number, the Mode Indication is to be transmitted with these TDMA frames, the Mode Indication shall be used that was stored during the processing of the preceding SID_FIRST frame.

If a SID_FIRST frame or a SID_UPDATE frame is affected by Fast Associated Control Channel (FACCH) signalling purposes, then the SID_FIRST or SID_UPDATE frame (whichever applies) shall be re-scheduled for transmission immediately after the FACCH signalling.

SPEECH frames shall override possible SID_FIRST or SID_UPDATE frames in exceptional cases.

At handover, TX/RX DTX handler synchronisation shall be initiated. At the time instant before the MS starts sending to the new base station, a message shall be sent to the uplink TX DTX handler with the parameter NSYNC = 12.

5.1.2.3 Functions of the Downlink TX Radio Subsystem for TFO

The TX Radio Subsystem in the BTS shall in addition operate in the following way regarding DTX, if TFO is ongoing (see GSM 08.62):

- Frames with TX_TYPE = SPEECH_GOOD, SID_FIRST and SID_UPDATE shall be handled as usual in DTX, regardless whether DTX in downlink is requested or not. Also NO_DATA shall be handled as usual, if DTX is requested.

- Frames with TX_TYPE = NO_DATA shall be replaced by SID_FILLER frames, if DTX in downlink is not requested. By this the radio transmission continues in downlink, although no parameters are transmitted in speech pauses on the Abis interface. The MS generates Comfort Noise in these speech pauses.

- Frames with TX_TYPE = SPEECH_DEGRADED shall be handled exactly like SPEECH_GOOD frames.

- For frame with TX_TYPE = SPEECH_BAD and SID_BAD the CHE shall perform its regular processing, but then shall invert the six, respectively 14 CRC bits before convolutional encoding and transmitting the frames on the air interface. By this the error concealment mechanism in the MS is triggered to handle these corrupted frames.

- ONSET frames may be ignored by the TX Radio Subsystem and need not to be processed.

Definition: SID_FILLER frames are like SID_BAD frames, but with all information bits set to “1”. The 14 CRC bits shall artificially be inverted by the CHE before convolutional encoding and transmission.

5.1.2.4 Functions of the TX Radio Subsystem for RATSCCH

During regular speech transmission (in the middle of a speech burst) RATSCCH replaces (steals) one (TCH/AFS) respectively two (TCH/AHS) speech frames (see GSM 05.09). Also in all non speech cases the RATSCCH shall be handled like speech. The respective RATSCCH frame formats (RATSCCH in case of TCH/AFS, respectively RATSCCH_MARKER and RATSCCH_DATA in case of TCH/AHS) shall be signalled to the CHE.

If RATSCCH has to be sent during a speech pause in DTX, then first an ONSET frame shall be signalled to the CHE, followed by the RATSCCH frame(s) and finally by the respective SID_FIRST frame(s).

If a SID_UPDATE frame is affected by RATSCCH signalling, then the SID_UPDATE frame shall be re-scheduled for transmission immediately after the RATSCCH signalling.

FACCH should be handled in the same way as a RATSCCH, i.e. like a short speech burst.

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Osaka, Japan, 23-27 Oct 2000

Document S4 (00)0534
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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3G 26.093	CR	003 rev1	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSG-SA#10	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑	for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: TSG-SA WG4 **Date:** 11-Dec-2000

Subject: Re-scheduling of stolen SID_UPDATE frames for AMR (Part 2)

Work item: AMR

Category: *(only one category shall be marked with an X)*

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release	X		Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change:
This CR has the same reason as an earlier CR (002). In CR 002 only section A.5.1.2.1 was changed, while section A.5.1.2.2 was forgotten to change.

It is proposed to handle the re-scheduling of SID_UPDATE frames in the same way in case of frame stealing for FACCH and RATSCCH signalling purposes. Every stolen SID_UPDATE frame shall be re-scheduled for transmission.

Clauses affected: A.5.1.2.2

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

(Comfort Noise) frames to the Radio Subsystem (RSS) as long as VAD flag = "0". SID_UPDATE frames shall be generated every 8th frame. The first SID_UPDATE shall be sent as the third frame after the SID_FIRST frame.

The speech encoder is operated in full speech modality if TX_TYPE = " SPEECH_GOOD " and otherwise in a simplified mode, because not all encoder functions are required for the evaluation of comfort noise parameters and because comfort noise parameters are only to be generated at certain times.

In order to ensure TX/RX DTX handler synchronisation at handover, the uplink TX DTX handler in the MS shall accept messages from TX RSS with control parameter NSYNC, resulting in the following operation during the next NSYNC frames:

- The TX DTX handler shall send SID_UPDATE instead of NO_DATA frames to the TX RSS.
- Whenever, during that period VAD flag = 1, the TX DTX handler shall continue to produce SPEECH frames for at least the rest of the period and, in addition, the hangover period.

A.5.1.2 Functions of the TX Radio Subsystem

The TX Radio Subsystem has the following overall functionality. The radio transmission is cut after the transmission of a SID_FIRST frame when the speaker stops talking. During speech pauses the transmission is resumed at regular intervals for transmission of one SID_UPDATE frame, in order to update the generated comfort noise on the RX side (and to improve the measurement of the link quality by the RSS). Note that the transcoder knows what frames to send. In the case when nothing is to be transmitted it outputs frames marked with TX_TYPE = ”NO_DATA”.

Within the TX Radio Subsystem the TX_TYPE Monitoring unit controls the operation of the Channel Encoder (as specified in 3G TS 25.003) and the Transmission of the frame. Control input to the TX_TYPE Monitoring unit is the TX_TYPE. Control output and input to the Channel Encoder are indicators specifying the frame format. These frame format indicators are defined in 3G TS 25.003, they are different for TCH/AFS and TCH/AHS.

A.5.1.2.1 Functions of the TX Radio Subsystem for TCH/AFS

The TX Radio Subsystem operates in the following way regarding DTX (without TFO):

all frames marked with TX_TYPE = " SPEECH_GOOD " are scheduled for normal channel coding and transmission. The frame format for CHE operation shall be SPEECH. If, however, the previous frame was not of TX_TYPE = “SPEECH_GOOD”, an ONSET frame format followed by SPEECH_GOOD shall be signalled to the CHE;

for frames marked with TX_TYPE = “SID_FIRST” a SID_FIRST frame format is signalled to the CHE;

frames marked with TX_TYPE = “SID_UPDATE” are scheduled for SID_UPDATE frame channel coding and transmission. The frame format signalled to CHE is SID_UPDATE;

for frames marked with TX_TYPE = “NO_DATA” no processing or transmission is carried out.

If a SID_FIRST frame or a SID_UPDATE frame is stolen for Fast Associated Control Channel (FACCH) signalling purposes, then the subsequent frame shall be scheduled for transmission of the SID_FIRST or SID_UPDATE frame (whichever applies) instead.

SPEECH frames shall override possible SID_FIRST or SID_UPDATE frames in exceptional cases.

At handover, TX/RX DTX handler synchronisation shall be initiated. At the time instant before the MS starts sending to the new base station, a message shall be sent to the uplink TX DTX handler with the parameter NSYNC = 12.

A.5.1.2.2 Functions of the TX Radio Subsystem for TCH/AHS

The TX Radio Subsystem operates in the following way regarding DTX:

all frames marked with TX_TYPE = " SPEECH_GOOD " are scheduled for normal channel coding and transmission. The frame format for CHE operation shall be SPEECH. However, if the previous frame was of TX_TYPE = “SID_FIRST”, a SID_FIRST_INH frame format followed by SPEECH_GOOD shall be signalled to the CHE. If the previous frame was of TX_TYPE = “SID_UPDATE”, a SID_UPDATE_INH frame format

followed by SPEECH_GOOD shall be signalled to the CHE. If the previous frame was of TX_TYPE "NO_DATA", an ONSET frame format followed by SPEECH_GOOD shall be signalled to the CHE;

for frames marked with TX_TYPE = "SID_FIRST" a SID_FIRST_P1 frame format is signalled to the CHE. Note: All 4 TDMA frames carrying the bits of this frame shall be transmitted. The Mode Indication received with the frame is stored for potential use in the next frame;

for frames marked with TX_TYPE = "SID_UPDATE" a SID_UPDATE frame format is signalled to the CHE. All 4 TDMA frames carrying the bits of this frame shall be transmitted;

for frames marked with TX_TYPE = "NO_DATA", no processing or transmission is carried out. However, if the preceding frame was marked with TX_TYPE = "SID_FIRST", a SID_FIRST_P2 frame format is signalled to CHE. Note: The 2 TDMA frames carrying bits of this frame shall be transmitted. If, depending on the current frame number, the Mode Indication is to be transmitted with these TDMA frames, the Mode Indication shall be used that was stored during the processing of the preceding SID_FIRST frame.

If a SID_FIRST frame or a ~~the first~~ SID_UPDATE frame ~~after a SID_FIRST frame,~~ is affected by Fast Associated Control Channel (FACCH) signalling purposes, then the SID_FIRST or SID_UPDATE frame (whichever applies) shall be re-scheduled for transmission immediately after the FACCH signalling.

SPEECH frames shall override possible SID_FIRST or SID_UPDATE frames in exceptional cases.

At handover, TX/RX DTX handler synchronisation shall be initiated. At the time instant before the MS starts sending to the new base station, a message shall be sent to the uplink TX DTX handler with the parameter NSYNC = 12.

A.5.1.2.3 Functions of the Downlink TX Radio Subsystem for TFO

The TX Radio Subsystem in the BTS shall in addition operate in the following way regarding DTX, if TFO is ongoing (see 3G TS 28.062):

- Frames with TX_TYPE = SPEECH_GOOD, SID_FIRST and SID_UPDATE shall be handled as usual in DTX, regardless whether DTX in downlink is requested or not. Also NO_DATA shall be handled as usual, if DTX is requested.
- Frames with TX_TYPE = NO_DATA shall be replaced by SID_FILLER frames, if DTX in downlink is not requested. By this the radio transmission continues in downlink, although no parameters are transmitted in speech pauses on the Abis interface. The MS generates Comfort Noise in these speech pauses.
- Frames with TX_TYPE = SPEECH_DEGRADED shall be handled exactly like SPEECH_GOOD frames.
- For frame with TX_TYPE = SPEECH_BAD and SID_BAD the CHE shall perform its regular processing, but then shall invert the six, respectively 14 CRC bits before convolutional encoding and transmitting the frames on the air interface. By this the error concealment mechanism in the MS is triggered to handle these corrupted frames.
- ONSET frames may be ignored by the TX Radio Subsystem and need not to be processed.

Definition: SID_FILLER frames are like SID_BAD frames, but with all information bits set to "1". The 14 CRC bits shall artificially be inverted by the CHE before convolutional encoding and transmission.

A.5.1.2.4 Functions of the TX Radio Subsystem for RATSCCH

During regular speech transmission (in the middle of a speech burst) RATSCCH replaces (steals) one (TCH/AFS) respectively two (TCH/AHS) speech frames (see 3G TS 25.009). Also in all non speech cases the RATSCCH shall be handled like speech. The respective RATSCCH frame formats (RATSCCH in case of TCH/AFS, respectively RATSCCH_MARKER and RATSCCH_DATA in case of TCH/AHS) shall be signalled to the CHE.

If RATSCCH has to be sent during a speech pause in DTX, then first an ONSET frame shall be signalled to the CHE, followed by the RATSCCH frame(s) and finally by the respective SID_FIRST frame(s).

If a SID_UPDATE frame is affected by RATSCCH signalling, then the SID_UPDATE frame shall be re-scheduled for transmission immediately after the RATSCCH signalling.

FACCH should be handled in the same way as a RATSCCH, i.e. like a short speech burst.

3GPP TSG SA WG4 Meeting#13
Osaka, Japan, 23-27 Oct 2000

Document S4 (00)0535
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

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3G 26.093	**CR**	**004**	Current Version:	3.2.0.

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG-SA#10	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: TSG-SA WG4 **Date:** 11-Dec-2000

Subject: Re-scheduling of stolen SID_UPDATE frames for AMR (Part 2)

Work item: AMR

Category: *(only one category shall be marked with an X)*

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release	X		Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	
				Rel-4	X

Reason for change:
This CR has the same reason as an earlier CR (002). In CR 002 only section A.5.1.2.1 was changed, while section A.5.1.2.2 was forgotten to change.

It is proposed to handle the re-scheduling of SID_UPDATE frames in the same way in case of frame stealing for FACCH and RATSCCH signalling purposes. Every stolen SID_UPDATE frame shall be re-scheduled for transmission.

Clauses affected: A.5.1.2.2

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

(Comfort Noise) frames to the Radio Subsystem (RSS) as long as VAD flag = "0". SID_UPDATE frames shall be generated every 8th frame. The first SID_UPDATE shall be sent as the third frame after the SID_FIRST frame.

The speech encoder is operated in full speech modality if TX_TYPE = " SPEECH_GOOD " and otherwise in a simplified mode, because not all encoder functions are required for the evaluation of comfort noise parameters and because comfort noise parameters are only to be generated at certain times.

In order to ensure TX/RX DTX handler synchronisation at handover, the uplink TX DTX handler in the MS shall accept messages from TX RSS with control parameter NSYNC, resulting in the following operation during the next NSYNC frames:

- The TX DTX handler shall send SID_UPDATE instead of NO_DATA frames to the TX RSS.
- Whenever, during that period VAD flag = 1, the TX DTX handler shall continue to produce SPEECH frames for at least the rest of the period and, in addition, the hangover period.

A.5.1.2 Functions of the TX Radio Subsystem

The TX Radio Subsystem has the following overall functionality. The radio transmission is cut after the transmission of a SID_FIRST frame when the speaker stops talking. During speech pauses the transmission is resumed at regular intervals for transmission of one SID_UPDATE frame, in order to update the generated comfort noise on the RX side (and to improve the measurement of the link quality by the RSS). Note that the transcoder knows what frames to send. In the case when nothing is to be transmitted it outputs frames marked with TX_TYPE = ”NO_DATA”.

Within the TX Radio Subsystem the TX_TYPE Monitoring unit controls the operation of the Channel Encoder (as specified in 3G TS 25.003) and the Transmission of the frame. Control input to the TX_TYPE Monitoring unit is the TX_TYPE. Control output and input to the Channel Encoder are indicators specifying the frame format. These frame format indicators are defined in 3G TS 25.003, they are different for TCH/AFS and TCH/AHS.

A.5.1.2.1 Functions of the TX Radio Subsystem for TCH/AFS

The TX Radio Subsystem operates in the following way regarding DTX (without TFO):

all frames marked with TX_TYPE = " SPEECH_GOOD " are scheduled for normal channel coding and transmission. The frame format for CHE operation shall be SPEECH. If, however, the previous frame was not of TX_TYPE = “SPEECH_GOOD”, an ONSET frame format followed by SPEECH_GOOD shall be signalled to the CHE;

for frames marked with TX_TYPE = “SID_FIRST” a SID_FIRST frame format is signalled to the CHE;

frames marked with TX_TYPE = “SID_UPDATE” are scheduled for SID_UPDATE frame channel coding and transmission. The frame format signalled to CHE is SID_UPDATE;

for frames marked with TX_TYPE = “NO_DATA” no processing or transmission is carried out.

If a SID_FIRST frame or a SID_UPDATE frame is stolen for Fast Associated Control Channel (FACCH) signalling purposes, then the subsequent frame shall be scheduled for transmission of the SID_FIRST or SID_UPDATE frame (whichever applies) instead.

SPEECH frames shall override possible SID_FIRST or SID_UPDATE frames in exceptional cases.

At handover, TX/RX DTX handler synchronisation shall be initiated. At the time instant before the MS starts sending to the new base station, a message shall be sent to the uplink TX DTX handler with the parameter NSYNC = 12.

A.5.1.2.2 Functions of the TX Radio Subsystem for TCH/AHS

The TX Radio Subsystem operates in the following way regarding DTX:

all frames marked with TX_TYPE = " SPEECH_GOOD " are scheduled for normal channel coding and transmission. The frame format for CHE operation shall be SPEECH. However, if the previous frame was of TX_TYPE = “SID_FIRST”, a SID_FIRST_INH frame format followed by SPEECH_GOOD shall be signalled to the CHE. If the previous frame was of TX_TYPE = “SID_UPDATE”, a SID_UPDATE_INH frame format

followed by SPEECH_GOOD shall be signalled to the CHE. If the previous frame was of TX_TYPE "NO_DATA", an ONSET frame format followed by SPEECH_GOOD shall be signalled to the CHE;

for frames marked with TX_TYPE = "SID_FIRST" a SID_FIRST_P1 frame format is signalled to the CHE. Note: All 4 TDMA frames carrying the bits of this frame shall be transmitted. The Mode Indication received with the frame is stored for potential use in the next frame;

for frames marked with TX_TYPE = "SID_UPDATE" a SID_UPDATE frame format is signalled to the CHE. All 4 TDMA frames carrying the bits of this frame shall be transmitted;

for frames marked with TX_TYPE = "NO_DATA", no processing or transmission is carried out. However, if the preceding frame was marked with TX_TYPE = "SID_FIRST", a SID_FIRST_P2 frame format is signalled to CHE. Note: The 2 TDMA frames carrying bits of this frame shall be transmitted. If, depending on the current frame number, the Mode Indication is to be transmitted with these TDMA frames, the Mode Indication shall be used that was stored during the processing of the preceding SID_FIRST frame.

If a SID_FIRST frame or a ~~the first~~ SID_UPDATE frame ~~after a SID_FIRST frame,~~ is affected by Fast Associated Control Channel (FACCH) signalling purposes, then the SID_FIRST or SID_UPDATE frame (whichever applies) shall be re-scheduled for transmission immediately after the FACCH signalling.

SPEECH frames shall override possible SID_FIRST or SID_UPDATE frames in exceptional cases.

At handover, TX/RX DTX handler synchronisation shall be initiated. At the time instant before the MS starts sending to the new base station, a message shall be sent to the uplink TX DTX handler with the parameter NSYNC = 12.

A.5.1.2.3 Functions of the Downlink TX Radio Subsystem for TFO

The TX Radio Subsystem in the BTS shall in addition operate in the following way regarding DTX, if TFO is ongoing (see 3G TS 28.062):

- Frames with TX_TYPE = SPEECH_GOOD, SID_FIRST and SID_UPDATE shall be handled as usual in DTX, regardless whether DTX in downlink is requested or not. Also NO_DATA shall be handled as usual, if DTX is requested.
- Frames with TX_TYPE = NO_DATA shall be replaced by SID_FILLER frames, if DTX in downlink is not requested. By this the radio transmission continues in downlink, although no parameters are transmitted in speech pauses on the Abis interface. The MS generates Comfort Noise in these speech pauses.
- Frames with TX_TYPE = SPEECH_DEGRADED shall be handled exactly like SPEECH_GOOD frames.
- For frame with TX_TYPE = SPEECH_BAD and SID_BAD the CHE shall perform its regular processing, but then shall invert the six, respectively 14 CRC bits before convolutional encoding and transmitting the frames on the air interface. By this the error concealment mechanism in the MS is triggered to handle these corrupted frames.
- ONSET frames may be ignored by the TX Radio Subsystem and need not to be processed.

Definition: SID_FILLER frames are like SID_BAD frames, but with all information bits set to "1". The 14 CRC bits shall artificially be inverted by the CHE before convolutional encoding and transmission.

A.5.1.2.4 Functions of the TX Radio Subsystem for RATSCCH

During regular speech transmission (in the middle of a speech burst) RATSCCH replaces (steals) one (TCH/AFS) respectively two (TCH/AHS) speech frames (see 3G TS 25.009). Also in all non speech cases the RATSCCH shall be handled like speech. The respective RATSCCH frame formats (RATSCCH in case of TCH/AFS, respectively RATSCCH_MARKER and RATSCCH_DATA in case of TCH/AHS) shall be signalled to the CHE.

If RATSCCH has to be sent during a speech pause in DTX, then first an ONSET frame shall be signalled to the CHE, followed by the RATSCCH frame(s) and finally by the respective SID_FIRST frame(s).

If a SID_UPDATE frame is affected by RATSCCH signalling, then the SID_UPDATE frame shall be re-scheduled for transmission immediately after the RATSCCH signalling.

FACCH should be handled in the same way as a RATSCCH, i.e. like a short speech burst.