Technical Specification Group Services and System Aspects **TSGS#12(01)0304** Meeting #12, Stockholm, Sweden, 18-21 June 2001**

Source: TSG-SA WG4

Title: CRs to TS 06.12 and TS 46.012 on Corrections of the formula for

averaging Xmax (from Phase 2 to Release 4)

Document for: Approval

Agenda Item: 7.4.3

The following CRs, agreed at the TSG-SA WG4 meeting #17, are presented to TSG SA #12 for approval.

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
06.12	A001		2	Corrections of the formula for averaging Xmax	F	4.0.4	S4	TSG-SA WG4#17	S4-010297
06.12	A002		R96	Corrections of the formula for averaging Xmax	Α	5.0.1	S4	TSG-SA WG4#17	S4-010298
06.12	A003		R97	Corrections of the formula for averaging Xmax	А	6.0.1	S4	TSG-SA WG4#17	S4-010299
06.12	A004		R98	Corrections of the formula for averaging Xmax	А	7.0.1	S4	TSG-SA WG4#17	S4-010300
06.12	A005		R99	Corrections of the formula for averaging Xmax	Α	8.0.1	S4	TSG-SA WG4#17	S4-010301
46.012	001		REL-4	Corrections of the formula for averaging Xmax	А	4.0.0	S4	TSG-SA WG4#17	S4-010302

			(CHAN	IGE	RE	EQI	JE:	ST				CR-Form-v3
20								_			_		- 00
#	0	6.12	CR	A001		₩ r	ev	-	Ħ	Current	ersion:	4.0.4	X
For <u>HELP</u> on using this form, see bottom of this page or look at the pop-up text over the % symbols.													
Proposed change	affec	ts: #	(U)	SIM	ME	UE Z	X	Radi	o Ac	cess Net	work X	Core No	etwork
Title:	Co	rrectio	n of the	e formula	a for a	/erag	ing >	(max	(
Source:	TS	G-SA	WG4										
Work item code: #	GS GS	M mai	ntenar	nce						Date	: ¥ <mark>08</mark>	3-June-200)1
Category:	ß F									Release	: ¥ 2		
	Deta	F (ess A (cor B (Add C (Fui D (Edi iled ex	respondition of the control of the c	owing cate or rection, do to a conference of feature), and offication of the TR 21.900	orrection tion of t n) above	n in ar	e)		lease	2	(GS (Rei (Rei (Rei (Rei -4 (Rei	iollowing rel M Phase 2) lease 1996) lease 1997) lease 1998) lease 1999) lease 5)	
Reason for chang	e: #	The	formul	a for ave	raving	the >	(max	c par	ame	ters is no	comple	etely correc	ct.
Summary of chan	ge: Ж				Ū			•		ters is co			
Consequences if not approved:	#	Inco	rrect fo	ormula, w	vill cau	se co	nfus	ion a	and c	uestions.			
Clauses affected:	مه	2.1											
Clauses affected:	Ж	2.1											
Other specs affected:	*	Te	est spe	ore speci ecification ecification	ns	าร	\mathbf{H}						
Other comments:	æ												

How to create CRs using this form:

- 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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

The comfort noise evaluation algorithm uses the unquantized block amplitude and Log Area Ratio (LAR) parameters of the full rate speech encoder, defined in section 4.2.15 and 4.2.6 of GSM 06.10. These parameters give information on the level and the spectrum of the background noise, respectively.

The evaluated comfort noise parameters are encoded into a special frame, called a SID (Silence Descriptor) frame, for transmission to the receive side.

The SID frame also serves to initiate the comfort noise generation on the receive side, as a SID frame is always sent at the end of a speech burst, ie before the radio transmission is cut.

The scheduling of SID or speech frames on the radio path is described in GSM 06.31.

2.1 Background acoustic noise evaluation

The comfort noise parameters to be encoded into a SID frame are calculated over N=4 consecutive frames marked with VAD=0, as follows:

The Log Area Ratio parameters shall be averaged according to the equation:

mean (LAR(i)) =
$$1/N$$
 SUM [n=1 to N] LAR[j-n](i) i = 1,2..8

where LAR[j](i) is the i'th Log Area Ratio coefficient of the current frame j and j-n indicates the previous frames.

The block amplitude parameter shall be averaged according to the equation:

```
mean (xmax) = 1/(4N) SUM [n=1 to N] SUM [i=1 to 4] xmax[j-n](i) \frac{i=1,2,...8}{1}
```

where xmax[j](i) is the block amplitude in subsegment i of the current frame. The SID frame containing these averaged parameters is passed to the Radio Subsystem instead of frame number j.

2.2 SID-frame encoding

The SID-frame encoding algorithm exploits the fact that only some of the 260 bits in a frame are needed to code the comfort noise parameters. The other bits can then be used to mark the SID-frame by means of a fixed bit pattern, called the SID code word.

The log area ratio coefficients are replaced by the mean (LAR(i)) values defined above and encoded as described in GSM 06.10.

The block amplitude values are replaced by the mean (xmax) value defined above, repeated four times inside the frame and encoded as described in GSM 06.10.

The SID code word consists of 95 bits which are all zero. The bits of the SID code word are inserted in the SID field defined as the positions of those 95 bits of the encoded RPE-pulses Xmc, which are in the error protection class I (see GSM 05.03, table 2).

			(CHAI	NGE	ERE	ΕQ	UE	ST	•				CR-Forr	n-v3
*	0	6.12	CR	A002	2	% 1	rev	-	ж	Current	t vers	sion:	5.0.1	¥	
For <u>HELP</u> on using this form, see bottom of this page or look at the pop-up text over the % symbols.															
Proposed change	affec	ts: #	(U)\$	SIM	ME	/UE	X	Radi	io Ac	cess Ne	etwor	k X	Core N	Network	
Title: 3	Co.	rection	n of the	e formul	a for a	veraç	ging	Xmax	Κ						
Source:	tS TS	G-SA \	WG4												
Work item code: 9	g GS	M mai	ntenan	ice						Dat	te: #	08-	-June-20	01	
Category:	ß A									Releas	e: #	R9	6		
	Deta	F (ess A (cor B (Add C (Fui D (Edi iled exp	ential correspond dition of nctional itorial molanatio	owing ca orrection ds to a ca feature, modifica- nodification ins of the FR 21.90	n) orrectic), ation of on) e above	on in a	re)		elease	2 e) R9 R9 R9 R9 RE	16 7 18	(GSN (Rele (Rele (Rele (Rele (Rele	ollowing re M Phase 2 ease 1996 ease 1997 ease 1998 ease 4) ease 5)	2) 5) 7) 3)	
Reason for chang	e: #	The	formula	a for av	eraving	g the	Xma	ıx par	ame	ters is n	ot co	mplet	tely corre	ect.	
Summary of chan	ge:#	The	formula	a for av	eravin	g the	Xma	ıx par	ame	ters is c	orrec	ted.			
Consequences if not approved:	ж	Inco	rrect fo	rmula, v	will cau	use co	onfus	sion a	and c	questions	S.				
Clauses affected:	ж	5.1													
Other specs affected:	ж	Te	est spe	re spec cificatio ecificati	ns	ons	ж								
Other comments:	ж														

How to create CRs using this form:

- 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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

The comfort noise evaluation algorithm uses the unquantized block amplitude and Log Area Ratio (LAR) parameters of the full rate speech encoder, defined in subclauses 4.2.15 and 4.2.6 of GSM 06.10 [3]. These parameters give information on the level and the spectrum of the background noise, respectively.

The evaluated comfort noise parameters are encoded into a special frame, called a SID (Silence Descriptor) frame, for transmission to the receive side.

The SID frame also serves to initiate the comfort noise generation on the receive side, as a SID frame is always sent at the end of a speech burst, i.e. before the radio transmission is cut.

The scheduling of SID or speech frames on the radio path is described in GSM 06.31 [4].

5.1 Background acoustic noise evaluation

The comfort noise parameters to be encoded into a SID frame are calculated over N=4 consecutive frames marked with VAD=0, as follows:

The Log Area Ratio parameters shall be averaged according to the equation:

mean(LAR(i))=
$$\frac{1}{N}\sum_{n=1}^{N}LAR[j-n](i)$$
 i = 1,2..8

where LAR[j](i) is the i'th Log Area Ratio coefficient of the current frame j and j-n indicates the previous frames.

The block amplitude parameter shall be averaged according to the equation:

mean(
$$x_{\text{max}}$$
)= $\frac{1}{(4N)} \sum_{n=1}^{N} \sum_{i=1}^{4} x_{\text{max}} [j-n](i)$ _______i = 1,2,..8

where $x_{max}[j](i)$ is the block amplitude in sub-segment i of the current frame. The SID frame containing these averaged parameters is passed to the Radio Subsystem instead of frame number j.

5.2 SID-frame encoding

The SID-frame encoding algorithm exploits the fact that only some of the 260 bits in a frame are needed to code the comfort noise parameters. The other bits can then be used to mark the SID-frame by means of a fixed bit pattern, called the SID code word.

The log area ratio coefficients are replaced by the mean (LAR(i)) values defined above and encoded as described in GSM 06.10 [3].

The block amplitude values are replaced by the mean (x_{max}) value defined above, repeated four times inside the frame and encoded as described in GSM 06.10 [3].

The SID code word consists of 95 bits which are all zero. The bits of the SID code word are inserted in the SID field defined as the positions of those 95 bits of the encoded RPE-pulses Xmc, which are in the error protection class I (see GSM 05.03 [2], table 2).

			(CHAI	NGE	ERI	EQ	UE	ST	•				CR-Form-v3
*	0	6.12	CR	A003	3	ж	rev	-	ж	Current	t vers	sion:	6.0.1	¥
For <u>HELP</u> on using this form, see bottom of this page or look at the pop-up text over the % symbols.														
Proposed change	affec	ts: #	(U)\$	SIM	ME	/UE	X	Radi	io Ac	cess Ne	etwor	k X	Core N	Network
Title: 3	Co.	rection	n of the	formul	a for a	averaç	ging	Xmax	Κ					
Source:	tS TS	G-SA \	WG4											
Work item code: 9	g GS	M mai	ntenan	ce						Dat	te: #	08-	June-20	01
Category:	ß A									Releas	e: #	R9	7	
	Deta	F (ess A (cor B (Add C (Fui D (Edi iled exp	ential correspond dition of nctional itorial molanatio	owing ca orrectior ds to a c feature, modification odifications of the FR 21.90	n) orrectic), ation of on) e above	on in a	re)		elease	2 R9 R9 R9 R9 RE	16 17 18	(GSN (Rele (Rele (Rele (Rele (Rele	ollowing re M Phase 2 Pase 1996 Pase 1997 Pase 1998 Pase 4) Pase 5)	2) 5) 7) 3)
Reason for chang	e: #	The	formula	a for av	eraving	g the	Xma	ıx par	ame	ters is n	ot co	mplet	tely corre	ect.
Summary of chan	ge:#	The	formula	a for av	eravin	g the	Xma	ıx par	ame	ters is c	orrec	ted.		
Consequences if not approved:	ж	Inco	rrect fo	rmula, v	will cau	use co	onfus	sion a	and c	questions	S.			
Clauses affected:	ж	5.1												
Other specs affected:	ж	Te	est spe	re spec cificatio ecificati	ns	ons	ж							
Other comments:	ж													

How to create CRs using this form:

- 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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

The comfort noise evaluation algorithm uses the unquantized block amplitude and Log Area Ratio (LAR) parameters of the full rate speech encoder, defined in subclauses 4.2.15 and 4.2.6 of GSM 06.10 [3]. These parameters give information on the level and the spectrum of the background noise, respectively.

The evaluated comfort noise parameters are encoded into a special frame, called a SID (Silence Descriptor) frame, for transmission to the receive side.

The SID frame also serves to initiate the comfort noise generation on the receive side, as a SID frame is always sent at the end of a speech burst, i.e. before the radio transmission is cut.

The scheduling of SID or speech frames on the radio path is described in GSM 06.31 [4].

5.1 Background acoustic noise evaluation

The comfort noise parameters to be encoded into a SID frame are calculated over N=4 consecutive frames marked with VAD=0, as follows:

The Log Area Ratio parameters shall be averaged according to the equation:

$$mean(LAR(i)) = \frac{1}{N} \sum_{n=1}^{N} LAR[j-n](i)$$
 $i = 1,2...8$

where LAR[j](i) is the i'th Log Area Ratio coefficient of the current frame j and j-n indicates the previous frames.

The block amplitude parameter shall be averaged according to the equation:

$$mean(x_{max}) = \frac{1}{(4N)} \sum_{n=1}^{N} \sum_{i=1}^{4} x_{max} [j-n](i) - i = 1,2,...8$$

where $x_{max}[j](i)$ is the block amplitude in sub-segment i of the current frame. The SID frame containing these averaged parameters is passed to the Radio Subsystem instead of frame number j.

5.2 SID-frame encoding

The SID-frame encoding algorithm exploits the fact that only some of the 260 bits in a frame are needed to code the comfort noise parameters. The other bits can then be used to mark the SID-frame by means of a fixed bit pattern, called the SID code word.

The log area ratio coefficients are replaced by the mean (LAR(i)) values defined above and encoded as described in GSM 06.10 [3].

The block amplitude values are replaced by the mean (x_{max}) value defined above, repeated four times inside the frame and encoded as described in GSM 06.10 [3].

The SID code word consists of 95 bits which are all zero. The bits of the SID code word are inserted in the SID field defined as the positions of those 95 bits of the encoded RPE-pulses Xmc, which are in the error protection class I (see GSM 05.03 [2], table 2).

			C	AHC	NGE	R	ΞQ	UE	ST	ı				CR-Form-v3
*	0	6.12	CR	A004		% 1	rev	-	¥	Current	vers	sion:	7.0.1	¥
For <u>HELP</u> on using this form, see bottom of this page or look at the pop-up text over the # symbols.														
Proposed change	affec	ts: #	(U)S	SIM	ME	/UE	X	Radi	io Ac	cess Ne	twor	k X	Core N	letwork
Title:	Co	rection	n of the	formula	a for a	veraç	ging	Xmax	Κ					
Source:	TS	G-SA \	NG4											
Work item code: #	g GS	M mai	ntenan	ce						Dat	te: #	08-	-June-20	01
Category:	B A									Releas	e: #	R9	8	
	Deta	F (ess A (cor B (Add C (Fui D (Edi iled exp	ential corespond dition of actional torial mo planation	wing cate orrection, desired to a confeature), modifications of the TR 21.90	orrection ation of above	n in a	re)		elease	2 R9 R9 R9 R9 RE	6 7 8	(GSN (Rele (Rele (Rele (Rele (Rele	ollowing re M Phase 2 Pase 1996 Pase 1997 Pase 1998 Pase 4) Pase 5)	?) ?) ?)
Reason for chang	e: #	The	formula	a for ave	eraving	the 1	Xma	x par	ame	ters is n	ot co	mplet	tely corre	ect.
Summary of chan	ge: Ж							·				cted.		
Consequences if not approved:	#	Inco	rect for	rmula, w	vill cau	ise co	onfus	sion a	and c	uestions	S.			
Clauses affected:	×	5.1												
Other specs affected:	ж	Te	est spe	re speci cification ecification	ns	ns	ж							
Other comments:	ж													

How to create CRs using this form:

- 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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

The comfort noise evaluation algorithm uses the unquantized block amplitude and Log Area Ratio (LAR) parameters of the full rate speech encoder, defined in subclauses 4.2.15 and 4.2.6 of GSM 06.10 [3]. These parameters give information on the level and the spectrum of the background noise, respectively.

The evaluated comfort noise parameters are encoded into a special frame, called a SID (Silence Descriptor) frame, for transmission to the receive side.

The SID frame also serves to initiate the comfort noise generation on the receive side, as a SID frame is always sent at the end of a speech burst, i.e. before the radio transmission is cut.

The scheduling of SID or speech frames on the radio path is described in GSM 06.31 [4].

5.1 Background acoustic noise evaluation

The comfort noise parameters to be encoded into a SID frame are calculated over N=4 consecutive frames marked with VAD=0, as follows:

The Log Area Ratio parameters shall be averaged according to the equation:

$$mean(LAR(i)) = \frac{1}{N} \sum_{n=1}^{N} LAR[j-n](i)$$
 $i = 1,2...8$

where LAR[j](i) is the i'th Log Area Ratio coefficient of the current frame j and j-n indicates the previous frames.

The block amplitude parameter shall be averaged according to the equation:

$$mean(x_{max}) = \frac{1}{(4N)} \sum_{n=1}^{N} \sum_{i=1}^{4} x_{max} [j-n](i) - i = 1,2,...8$$

where $x_{max}[j](i)$ is the block amplitude in sub-segment i of the current frame. The SID frame containing these averaged parameters is passed to the Radio Subsystem instead of frame number j.

5.2 SID-frame encoding

The SID-frame encoding algorithm exploits the fact that only some of the 260 bits in a frame are needed to code the comfort noise parameters. The other bits can then be used to mark the SID-frame by means of a fixed bit pattern, called the SID code word.

The log area ratio coefficients are replaced by the mean (LAR(i)) values defined above and encoded as described in GSM 06.10 [3].

The block amplitude values are replaced by the mean (x_{max}) value defined above, repeated four times inside the frame and encoded as described in GSM 06.10 [3].

The SID code word consists of 95 bits which are all zero. The bits of the SID code word are inserted in the SID field defined as the positions of those 95 bits of the encoded RPE-pulses Xmc, which are in the error protection class I (see GSM 05.03 [2], table 2).

			(CHAI	NGE	ERE	EQ	UE	ST	•				CR-Form-v3
æ	0	6.12	CR	A005		¥	rev	-	ж	Curren	t vers	sion:	8.0.1	¥
For <u>HELP</u> on using this form, see bottom of this page or look at the pop-up text over the \$\mathbb{X}\$ symbols.														
Proposed change	affec	ts: #	(U)\$	SIM	ME	/UE	X	Radi	io Ac	cess Ne	etwor	k X	Core N	letwork
Title:	Coi	rection	n of the	formul	a for a	veraç	ging	Xmax	X					
Source: #	TS	G-SA \	NG4											
Work item code: ₩	GS	M mai	ntenan	ce						Da	te: #	08-	June-20	01
Category: #	A									Releas	se: #	R9	9	
	Deta	F (ess A (cor B (Add C (Fui D (Edi iled exp	ential corespond dition of actional ditorial modernation	owing cast orrection ds to a co feature) modification odifications of the FR 21.90	orrectic orrectic ation of on) above	on in a featui	re)		elease	2 R9 R9 R9 R9	96 97 98	(GSN (Rele (Rele (Rele (Rele (Rele	ollowing real Phase 2 Pase 1996 Pase 1997 Pase 1998 Pase 1999 Pase 4)	?) 5) 7) 8)
Reason for chang	e: #	The	formula	a for ave	eraving	g the	Xma	ax par	rame	ters is n	ot co	mplet	tely corre	ect.
Summary of chang	ge:₩	The	formula	a for ave	eravinç	g the	Xma	ıx par	ame	ters is c	orrec	cted.		
Consequences if not approved:	¥	Inco	rect fo	rmula, v	will cau	use co	onfu	sion a	and c	question	S.			
Clauses affected:	ж	5.1												
Other specs affected:	*	Te	est spe	re spec cificatio ecificati	ns	ons	ж							
Other comments:	¥													

How to create CRs using this form:

- 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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

The comfort noise evaluation algorithm uses the unquantized block amplitude and Log Area Ratio (LAR) parameters of the full rate speech encoder, defined in clauses 4.2.15 and 4.2.6 of GSM 06.10 [3]. These parameters give information on the level and the spectrum of the background noise, respectively.

The evaluated comfort noise parameters are encoded into a special frame, called a SID (Silence Descriptor) frame, for transmission to the receive side.

The SID frame also serves to initiate the comfort noise generation on the receive side, as a SID frame is always sent at the end of a speech burst, i.e. before the radio transmission is cut.

The scheduling of SID or speech frames on the radio path is described in GSM 06.31 [4].

5.1 Background acoustic noise evaluation

The comfort noise parameters to be encoded into a SID frame are calculated over N=4 consecutive frames marked with VAD=0, as follows:

The Log Area Ratio parameters shall be averaged according to the equation:

$$mean(LAR(i)) = \frac{1}{N} \sum_{n=1}^{N} LAR[j-n](i)$$
 $i = 1,2...8$

where LAR[j](i) is the i'th Log Area Ratio coefficient of the current frame j and j-n indicates the previous frames.

The block amplitude parameter shall be averaged according to the equation:

$$mean(x_{max}) = \frac{1}{(4N)} \sum_{n=1}^{N} \sum_{i=1}^{4} x_{max} [j-n](i)$$
 $i = 1,2,...8$

where $x_{max}[j](i)$ is the block amplitude in sub-segment i of the current frame. The SID frame containing these averaged parameters is passed to the Radio Subsystem instead of frame number j.

5.2 SID-frame encoding

The SID-frame encoding algorithm exploits the fact that only some of the 260 bits in a frame are needed to code the comfort noise parameters. The other bits can then be used to mark the SID-frame by means of a fixed bit pattern, called the SID code word.

The log area ratio coefficients are replaced by the mean (LAR(i)) values defined above and encoded as described in GSM 06.10 [3].

The block amplitude values are replaced by the mean (x_{max}) value defined above, repeated four times inside the frame and encoded as described in GSM 06.10 [3].

The SID code word consists of 95 bits which are all zero. The bits of the SID code word are inserted in the SID field defined as the positions of those 95 bits of the encoded RPE-pulses Xmc, which are in the error protection class I (see GSM 05.03 [2], table 2).

			CHA	ANGE	ERE	Q	UE	ST				CR-Form-v3
ж	46	.012	CR 001		₩ r	ev	-	¥	Current ve	rsion:	4.0.0	H
For <u>HELP</u> on using this form, see bottom of this page or look at the pop-up text over the % symbols.												
Proposed change	affec	ts: #	(U)SIM	ME	/UE	X	Radio	o Ac	cess Netwo	ork X	Core No	etwork
Title:	Co	rection	n of the form	ula for a	verag	ing)	(max					
Source:	TS	G-SA V	WG4									
Work item code: ₩	GS	M mai	ntenance						Date:	80	-June-200	1
Category: អ	A								Release:	₩ RE	L-4	
	Deta	F (ess A (cor B (Add C (Fui D (Edi iled exp	the following of the properties of the control of t	ion) correction re), cation of ation) che above	on in an	e)		lease	2	(GSI (Rele (Rele (Rele (Rele	ollowing relem Phase 2) Pease 1996) Pease 1997) Pease 1998) Pease 1999) Pease 4) Pease 5)	
Reason for chang	e: #	The	formula for a	averaving	g the >	(max	x para	ame	ters is not o	omple	tely correc	ot.
Summary of change	_									ected.		
Consequences if not approved:	Ж	Inco	rrect formula	i, will cat	ise co	nius	ion a	na q	uestions.			
Clauses affected:	ж	5.1										
Other specs affected:	*	Te	ther core spe est specificat &M Specificat	tions	ns	*						
Other comments:	¥											

How to create CRs using this form:

- 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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

The comfort noise evaluation algorithm uses the unquantized block amplitude and Log Area Ratio (LAR) parameters of the full rate speech encoder, defined in clauses 4.2.15 and 4.2.6 of GSM 06.10 [3]. These parameters give information on the level and the spectrum of the background noise, respectively.

The evaluated comfort noise parameters are encoded into a special frame, called a SID (Silence Descriptor) frame, for transmission to the receive side.

The SID frame also serves to initiate the comfort noise generation on the receive side, as a SID frame is always sent at the end of a speech burst, i.e. before the radio transmission is cut.

The scheduling of SID or speech frames on the radio path is described in GSM 06.31 [4].

5.1 Background acoustic noise evaluation

The comfort noise parameters to be encoded into a SID frame are calculated over N=4 consecutive frames marked with VAD=0, as follows:

The Log Area Ratio parameters shall be averaged according to the equation:

$$mean(LAR(i)) = \frac{1}{N} \sum_{n=1}^{N} LAR[j-n](i)$$
 $i = 1,2...8$

where LAR[j](i) is the i'th Log Area Ratio coefficient of the current frame j and j-n indicates the previous frames.

The block amplitude parameter shall be averaged according to the equation:

$$mean(x_{max}) = \frac{1}{(4N)} \sum_{n=1}^{N} \sum_{i=1}^{4} x_{max} [j-n](i)$$
 $i = 1,2,...8$

where $x_{max}[j](i)$ is the block amplitude in sub-segment i of the current frame. The SID frame containing these averaged parameters is passed to the Radio Subsystem instead of frame number j.

5.2 SID-frame encoding

The SID-frame encoding algorithm exploits the fact that only some of the 260 bits in a frame are needed to code the comfort noise parameters. The other bits can then be used to mark the SID-frame by means of a fixed bit pattern, called the SID code word.

The log area ratio coefficients are replaced by the mean (LAR(i)) values defined above and encoded as described in GSM 06.10 [3].

The block amplitude values are replaced by the mean (x_{max}) value defined above, repeated four times inside the frame and encoded as described in GSM 06.10 [3].

The SID code word consists of 95 bits which are all zero. The bits of the SID code word are inserted in the SID field defined as the positions of those 95 bits of the encoded RPE-pulses Xmc, which are in the error protection class I (see GSM 05.03 [2], table 2).