Source   **TSG-SA WG4**

Title   **4 CRs to 3G TS 26.131**

S4 Tdoc.	Spec.	Ver.	CR	Rev.	Cat.	Rel.	Subject
S4-000335	26.131	3.0.0	001	2	B	R99	CR on Addition of a chapter pointing to ITU-T Recommendations for extended parameters
S4-000292	26.131	3.0.0	002		C	R99	CR on Listener side tone (LSTR) and talker side tone (STMR) requirements
S4-000310	26.131	3.0.0	003	1	F	R99	CR on Change of Handset and headset UE receiving sensitivity/frequency characteristic mask
S4-000311	26.131	3.0.0	004	1	F	R99	CR on Acoustic requirements for Handheld-type hands-free user equipment

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

26.131	CR	**001rev.2**	Current Version:	v.3.0.0

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

For submission to: **3GPP SA#8**

list expected approval meeting # here
↑

for approval	**X**	strategic		*(for SMG*
for information		non-strategic		*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: (U)SIM [ ]   ME **X**   UTRAN / Radio [ ]   Core Network [ ]
(at least one should be marked with an X)

Source:	TSG-SA WG4		**Date:**	26 June 2000

Subject:	Addition of a chapter pointing to ITU-T Recommendations for extended parameters.

Work item:	3GPP SA4 WI 5 (Acoustic Specification for 3G terminals)

Category: F   Correction
                              A   Corresponds to a correction in an earlier release
(only one category   B   Addition of feature
shall be marked   C   Functional modification of feature
with an X)   D   Editorial modification

B: **X**

Release:
Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	**X**
Release 00	

Reason for change:	TS 26.131 and TS 26.132 cover all types of 3G terminals including hands-free terminals. It can be expected that nearly all terminals will include non linear and/or time variant signal processing, e.g. voice switching, echo cancellation, background noise reduction. The purpose of this change request is to provide sources for additional measurements and performance requirements: ITU-T Recommendations P.340, P.501 and P.502.

Clauses affected:	Addition of new Clause 5.10

Other specs affected:

Other 3G core specifications	**X**	→ List of CRs:	TS 26.132
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:	

5.10   Information on other Parameters (not normative)

Information about additional parameters relevant to speech quality e.g. for terminals where signal processing is used can be found in ITU-T Recommendations P.340, P.501 and P.502.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

26.131 CR **002** Current Version: v.3.0.0

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

For submission to: 3GPP SA#8   for approval **X**   strategic ☐   *(for SMG*
list expected approval meeting # here   for information ☐   non-strategic ☐   *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: (U)SIM ☐   ME **X**   UTRAN / Radio ☐   Core Network ☐
(at least one should be marked with an X)

Source:	TSG-SA WG4	**Date:**	26 June 2000
Subject:	Listener sidetone (LSTR) and talker sidetone (STMR) requirements for further study.		
Work item:	3GPP SA4 WI 5 (Acoustic Specification for 3G terminals)		

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

Reason for change:	Further study is required to determine suitable parameters for measuring and specifying limits for STMR and LSTR over the air interface.
Clauses affected:	Clauses 5.5.1 and 5.5.2.

Other specs affected: Other 3G core specifications **X** → List of CRs: TS 26.132
                          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:

5.5 Sidetone characteristics (handset and headset UE)

5.5.1 Sidetone loss

~~A sidetone requirement is appropriate for UE using handsets and headsets. There are separate requirements for listener sidetone (LSTR) and talker sidetone (STMR). The listener sidetone performance is considered as the major parameter affecting the user perception of the system, although talker sidetone is important to give the user some comfort in using the equipment.~~
~~The value of the listener sidetone rating (LSTR) shall not be less than 15 dB. Where a user-controlled receiving volume control is provided, the LSTR shall meet the requirement given above at the setting where the RLR is equal to the nominal value.~~
~~Compliance of the LSTR requirement shall be checked by the relevant test described in TS 26.132.~~
~~The nominal value of the sidetone masking rating (STMR) shall be 13 dB +/- 5 dB. Where a user-controlled receiving volume control is provided, the STMR shall meet the requirement given above at the setting where the RLR is equal to the nominal value.~~
~~Compliance of STMR requirement shall be checked by the relevant test described in TS 26.132.~~
~~It is recommended that the STMR is independent of the volume control.~~The requirements for listener sidetone (LSTR) and talker sidetone (STMR) are for further study.

5.5.2 Sidetone distortion

~~The third harmonic distortion generated by the terminal equipment shall not be greater than 10 %.~~
~~Compliance shall be checked by the relevant test described in TS 26.132.~~The requirements for sidetone distortion are for further study.

5.6 Stability loss

The stability loss presented to the PSTN by the 3G network at the POI should meet the principles of the requirements in clauses 2 and 3 of ITU-T Recommendation G.122. These requirements will be met if the attenuation between the digital input and digital output at the POI is at least 6 dB at all frequencies in the range 200 Hz to 4 kHz under the worst case acoustic conditions at the UE (any acoustic echo control should be enabled). For the normal case of digital connection between the Air Interface and the POI, the stability requirement can be applied at the Air Interface.
The worst case acoustic conditions will be as follows (with any volume control set to maximum):

Handset UE: the handset lying on, and the transducers facing, a hard surface with the ear-piece uncapped.

Handsfree UE: no requirement other than echo loss.

NOTE: The test procedure must take into account the switching effects of echo control and discontinuous transmission (DTX).

3GPP/SMG Meeting S4#11
Versailles, France, 5-9 June 2000

Tdoc 310/00,
Document **CR 003**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

26.131 CR **003 rev1** Current Version: v.3.0.0

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

For submission to:	3GPP SA#8		for approval	X		strategic		*(for SMG*
list expected approval meeting # here			for information			non-strategic		*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: (U)SIM ☐   ME **X**   UTRAN / Radio ☐   Core Network ☐
(at least one should be marked with an X)

Source:	TSG-SA WG4		**Date:**	26 June 2000

Subject: Change of Handset and headset UE receiving sensitivity/frequency characteristic mask.

Work item: 3GPP SA4 WI 5 (Acoustic Specification for 3G terminals)

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

(only one category shall be marked with an X)

Release:
Phase 2 ☐
Release 96 ☐
Release 97 ☐
Release 98 ☐
Release 99 **X**
Release 00 ☐

Reason for change: During various discussions in ITU-T and ETSI the use of artificial ears type 3.2. 3.3 and 3.4 was discussed. One result of this discussion was a change of the receiving tolerance mask in order to take into account the low frequency roll off at lower frequencies when using artificial ears providing an acoustical leak and the different frequency response at higher frequencies due to the different ear impedance when using ERP devices (types 3.2, 3.3 and 3.4). For this purpose a tolerance mask was developed which is wider than the traditional tolerance scheme in GSM 11.10 but more realistic since the acoustical leak is taken into account.

Clauses affected: 5.4.2

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:

5.4.2   Handset and headset UE receiving

The sensitivity/frequency characteristics shall be as follows:
The receiving sensitivity frequency response, measured either from the digital interface to the ERP or from the SS audio input (analogue or digital input of the reference speech encoder of the SS) to the ERP, shall be within a mask, which can be drawn with straight lines between the breaking points in table 2 on a logarithmic (frequency) - linear (dB sensitivity) scale. The values in table 2 are provisional and are for further study.

Table 2: Receiving sensitivity/frequency mask

Frequency (Hz)	Upper limit	Lower limit
~~100~~70	[-12] -10	[-] -
200	[0] 2	[-] -
300	[2]	[7] -9
500	(see note 2)	[5] (see note 2)
1 000	[0] (see note 2)	[5] -7
3 000	[2]	[5] (see note 2)
3 400	[2]	[10] –12
4 000	[2] 2	[-] -

NOTE 1:   All sensitivity values are expressed in dB on an arbitrary scale.
NOTE 2:   The limit at intermediate frequencies lies on a straight line drawn between the given
               values on a log (frequency) - linear (dB) scale.

Compliance shall be checked by the relevant test described in TS 26.132.

3GPP/SMG Meeting S4#11
Versaiiles, France, 5-9 June 2000

Tdoc 311/00,
Document **CR 004**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

| **26.131** | **CR** | **004 rev1** | Current Version: | **v.3.0.0** |

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

For submission to: **3GPP SA#8**   for approval **X**   strategic ☐   *(for SMG*
list expected approval meeting # here   for information ☐   non-strategic ☐   *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: (U)SIM ☐   ME **X**   UTRAN / Radio ☐   Core Network ☐
(at least one should be marked with an X)

| **Source:** | TSG-SA WG4 | | **Date:** | 26 June 2000 |

Subject: New hands-free equipment categories; requirements for hands-free categories.

Work item: 3GPP SA4 WI 5 (Acoustic Specification for 3G terminals)

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

Reason for change: It was agreed during the May 3rd Ad-hoc acoustics drafting session that requirements for hands-free user equipment would be defined for three separate categories of hands-free equipment. This is because, among other reasons, handheld 3G terminals will have hands-free functionality in addition to fixed-mounted equipment in vehicle and desktop environments. Due to the limited size available in handheld devices, the full frequency range specified in ITU-T Recommendation P. 340 can not be achieved. Experience has shown a narrower frequency range can produce suitable speech intelligibility. The necessary changes in nomenclature and requirements in TS 26.131 for 'Desktop and Vehicle-Mounted' and 'Handheld' hands-free equipment are given.

Clauses affected: 5.2.3, 5.2.4, 5.4.3, 5.4.4, 5.4.5, 5.4.6, 5.7.2, 5.7.3.

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: The necessary changes to TS 26.132 for these hands-free equipment categories have already been made.

5.2.3 Connections with ~~external~~ Desktop and Vehicle-mounted ~~handsfree~~hands-free UE

The nominal values of SLR/RLR to/from the POI shall be:

SLR = 13 +/- 4 dB;

RLR = 2 +/- 4 dB.

Compliance shall be checked by the relevant tests described in TS 26.132.
Where a user controlled volume control is provided, the RLR shall meet the nominal value at one setting of the control. It is recommended that a volume control giving at least 15 dB increase from the nominal RLR (louder) is provided for ~~handsfree~~hands-free units intended to work in the vehicle environment. This is to allow for the increased noise volume in a moving vehicle.

5.2.4 Connections with ~~integrated~~ handheld ~~handsfree~~hands-free UE

~~For further study.~~
The nominal values of SLR/RLR to/from the POI shall be:

SLR = 13 +/- 4 dB;

RLR = 6 +12 / - 4 dB.

Compliance shall be checked by the relevant tests described in TS 26.132.
Where a user controlled volume control is provided, the RLR shall meet the nominal value at one setting of the control.

5.4 Sensitivity/frequency characteristics

5.4.3 Desktop and Vehicle-mounted ~~External~~ hands-free UE sending

The sending sensitivity frequency response from the MRP to the SS audio output (digital output of the reference speech decoder of the SS) shall be as follows:
The sending sensitivity frequency response shall be within the mask which can be drawn with straight lines between the breaking points in table 3 on a logarithmic (frequency) - linear (dB sensitivity) scale.

Table 3: ~~Handsfree~~Hands-free sending sensitivity/frequency response

Frequency (Hz)	Upper limit	Lower limit
200	0	
250	0	
315	0	-14
400	0	-13
500	0	-12
630	0	-11
800	0	-10
1 000	0	-8
1 300	2	-8
1 600	3	-8
2 000	4	-8
2 500	4	-8
3 100	4	-8
4 000	0	

NOTE: All sensitivity values are expressed in dB on an arbitrary scale.

Compliance shall be checked by the relevant test described in TS 26.132.

5.4.4 ~~External~~ Desktop and Vehicle-mounted hands-free UE receiving

The receiving sensitivity frequency response from the SS audio input (analogue or digital input of the reference speech encoder of the SS) to the ERP shall be as follows:
The receiving sensitivity frequency response shall be within the mask which can be drawn with straight lines between the breaking points in table 4 on a logarithmic (frequency) - linear (dB sensitivity) scale.

Table 4: HandsfreeHands-free receiving sensitivity/frequency response

Frequency (Hz)	Upper limit	Lower limit
200	0	
250	0	
315	0	-15
400	0	-12
500	0	-12
630	0	-12
800	0	-12
1 000	0	-12
1 300	0	-12
1 600	0	-12
2 000	0	-12
2 500	0	-12
3 100	0	-12
4 000	0	

NOTE: All sensitivity values are expressed in dB on an arbitrary scale.

Compliance shall be checked by the relevant test described in TS 26.132.

5.4.5   Integrated Handheld hands-free UE sending

For further study.
The sending sensitivity frequency response from the MRP to the SS audio output (digital output of the reference speech decoder of the SS) shall be as follows:
The sending sensitivity frequency response shall be within the mask which can be drawn with straight lines between the breaking points in table 5 on a logarithmic (frequency) - linear (dB sensitivity) scale.

Table 5: HandsfreeHands-free sending sensitivity/frequency response

Frequency (Hz)	Upper limit	Lower limit
200	0	
250	0	
315	0	-14
400	0	-13
500	0	-12
630	0	-11
800	0	-10
1 000	0	-8
1 300	2	-8
1 600	3	-8
2 000	4	-8
2 500	4	-8
3 100	4	-8
4 000	0	

NOTE: All sensitivity values are expressed in dB on an arbitrary scale.

Compliance shall be checked by the relevant test described in TS 26.132.

5.4.6   IntegratedHandheld hands-free UE receiving

For further study.
The receiving sensitivity frequency response from the SS audio input (analogue or digital input of the reference speech encoder of the SS) to the ERP shall be as follows:
The receiving sensitivity frequency response shall be within the mask which can be drawn with straight lines between the breaking points in table 6 on a logarithmic (frequency) - linear (dB sensitivity) scale.

Table 6: ~~Handsfree~~Hands-free receiving sensitivity/frequency response

Frequency (Hz)	Upper limit	Lower limit
200	0	
250	0	
315	0	
400	0	
500	0	
630	0	
800	0	-12
1 000	0	-12
1 300	0	-12
1 600	0	-12
2 000	0	-12
2 500	0	-12
3 100	0	-12
4 000	0	

NOTE: All sensitivity values are expressed in dB on an arbitrary scale.

Compliance shall be checked by the relevant test described in TS 26.132.

5.7 Acoustic echo control

5.7.1 General

The echo loss (EL) presented by the 3G network at the POI should be at least 46 dB during single talk. This value takes into account the fact that UE is likely to be used in a wide range of noise environments.
The use of acoustic echo control is not mandated for 3G networks and the connection between the UE and the POI is zero loss. Therefore the acoustic echo control provided in UE should provide a TCLw of at least 46 dB at the POI over the likely range of acoustic end delays.
If acoustic echo control is provided by voice switching, comfort noise should be injected. This comfort noise shall operate in the same way to that used in DTX.

5.7.2 Acoustic echo control in an ~~external~~ Desktop and Vehicle-mounted ~~handsfree~~hands-free UE

The TCLw for the hands-free UE shall be 40 dB at the nominal setting of the volume control in quiet background conditions and 33 dB at the maximum user selectable volume control setting. If acoustic echo control is provided using some form of echo cancellation technique, the cancellation algorithm should be designed to cope with the expected reverberation and dispersion. In the case of the ~~handsfree~~hands-free UE, this reverberation and dispersion may be time variant. Compliance with this requirement shall be checked by the relevant test described in TS 26.132.

5.7.3 Acoustic echo control in an ~~integrated~~ handheld ~~handsfree~~hands-free UE

~~For further study.~~
The TCLw for the hands-free UE shall be 40 dB at the nominal setting of the volume control in quiet background conditions and 33 dB at the maximum user selectable volume control setting. If acoustic echo control is provided using some form of echo cancellation technique, the cancellation algorithm should be designed to cope with the expected reverberation and dispersion. In the case of the ~~handsfree~~hands-free UE, this reverberation and dispersion may be time variant. Compliance with this requirement shall be checked by the relevant test described in TS 26.132.