**Source: SA4 SQ SWG Chair[[1]](#footnote-1)**

**Title: 3GPP SA4 SQ SWG report at SA4#116-e**

**Document for: Approval**

**Agenda item: 13.4**

**3GPP SA4 #116-e Speech Quality Sub-Working Group**

The SQ SWG during SA4#116-e (21 participants) was held in four telcos (1-hour time slots). The SQ SWG e-mail discussions during the meeting can be tracked here:

<https://list.etsi.org/scripts/wa.exe?A0=3GPP_TSG_SA_WG4_SQ>

**Executive summary**

The meeting handled 14 documents including 4 output documents. The meeting outcome is summarized below:

* **ATIAS (Terminal Audio quality performance and Test methods for Immersive Audio Services)**: No Tdoc at this meeting.
* **HaNTE (Handsets Featuring Non-Traditional Earpieces)**: Initial draft CRs on HaNTE have been reviewed, revised, and then noted. New tests (RFR at max level, privacy, variation with fork positions) have been proposed, there are diverging views on whether they are needed or validated, and there are concerns on proposed changes impacting not just HaNTE UEs but also traditional UEs. The HaNTE time plan in S4-211633 has been agreed, with one extra meeting cycle and one AH telco (see below); a CR to TR 26.801 documenting findings (round robin results, subjective experiment) was eventually not submitted, it is expected to be provided by the next meeting.
* **HInT (Extension for headset interface tests of UE)**: Two Rel-17 CRs on HInT, S4-211631 on TS 26.131 and S4-211632 on TS 26.132, have been agreed. HiNT is 100% completed. A work item summary in S4-211634 has been endorsed.

**Agreed adhoc conference call post SA4#116-e:**

AH telco on HaNTE, Dec. 3, 2021, 16:00-17:00 CET (host: HEAD acoustics), submission deadline: Dec 2, 2021, 23:59 CET

**A.I. 10.1 Opening of the session**

The SQ Chair opens the session at 16:00 CET on November 11. He shows the agenda including the Tdoc allocation and displays the meeting schedule.

**A.I. 10.2 Registration of documents**

The allocation of input Tdocs as shown in the agenda is approved (see Annex A for the latest version of the agenda).

**A.I. 10.3 Liaison Statements**

No Tdoc in this A.I.

**A.I. 10.4 CRs to Features in Release 16 and earlier, and other contributions on terminal acoustics**

No Tdoc in this A.I.

**A.I. 10.5 ATIAS (Terminal Audio quality performance and Test methods for Immersive Audio Services)**

No Tdoc in this A.I.

**A.I. 10.6 HaNTE (Handsets Featuring Non-Traditional Earpieces)**

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| [**S4-211535**](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_116-e/Docs/S4-211535.zip) | Test methods for HaNTE | Orange, Qualcomm Incorporated |

**Presenter:** Andre Schevciw

UEs featuring non-traditional earpieces pose challenges for handset mode acoustic testing. For example, a UE may exclusively use a vibrating display to produce sound when operating in handset mode, offering no clearly identifiable centre of an earpiece to position the headset for testing. Additionally, such UE could have its acoustic response affected by the choice of handset positioner mechanism.

This dCR brings the following changes:

* Update 3GPP TS 26.132 with reference to the appropriate version of ITU-T P.64 that addresses HaNTE devices
* Establish guidelines for mounting of HaNTE devices to ensure a repeatable and reproducible measurement method in 3GPP TS 26.132
* Add privacy test method
* Add testing of receive frequency response at maximum volume setting
* Add testing for robustness to fork positions (in particular this provides an easy way to diagnose a device with unwanted vibration)

**Comments / questions:**

Tomas: I have editorial comments on several places

Andre: if editorial can handle offline?

Stéphane: may be beneficial to take them

Tomas: in clause 5.1.1, parts on HaNTE or non HaNTE are mixed, how to determine ECRP, why is it in a note?

Andre: preferably normative

(*Andre makes online edits to remove the note style*)

Tomas: in clause 5.1.6, typo in ‘definiition’

(*Andre corrects this typo online*)

Tomas: in change 5, there could be a collision with a button in the bottom

Andre: the text is from the round robin, buttons were at the top, but there is no reason not to have a button at the bottom

Tomas: same as top, but in opposite direction

(*Andre makes online corrections*)

Tomas: in figure 15b2, red and orange are close in color

(*Andre corrects one color to green*)

Jan: in clause 5.11, same comment as Tomas, not a note, would make them in order, separating HaNTE and non HANTE cases, could make a proposal, subjective method is not that precise, could suggest an objective method

(*Andre makes online edits*)

Jan: could use wording ‘if provided’, the objective test could be in a new Annex, can share text for this method

Stéphane: with Orange hat, on behalf of Alain, the subjective determination of ECRP may not be very practical or reproducible between labs, need to check if needed

Andre: can be used to identify one point

Stéphane: correct, in the end, the point used for measurement is unique and documented, suggest move the sentence below the bullet points

(*Andre makes further online edits*)

Jan: in clause 5.1.6, we have another dCR on HInT that will create also 5.1.6

Stéphane: good point, can ask guidance from Jayeeta

(*Naotaka shares in the chat windows: if two CRs are trying to create two clause, we should align the order of them*)

Jayeeta: checked the cover page for this CR and it is OK, will check the issue between 1501 and 1535, and send an email

Jan: see loudness rating results in the report, abusing loudness rating measure, if phone is very good, we have noise and determine loudness rating from noise. It is more accurate to use level in absolute measure. Later for requirement have to see if should/shall is used. Should have an absolute measure. If a phone is soft, this device could fail.

Andre: rationale is that if phone is louder, far field should be louder, we are trying to penalize a loud phone. With respect to RLR, don’t know if P.700 loudness data is available

Jan: I sent you the results

Andre: what is the conclusion? would that work?

Jan: can show results, issue is to find requirements, P.700 loudness is something like ISO loudness, it is highly correlated with the ISO loudness and very similar to dB(A) SPL

Andre: good to have loudness instead of RLR, agree that RLR is not designed for low levels, loudness is more optimized in this case

Stéphane: one may insert an editor’s note that RLR could be replaced by loudness?

Andre: if no objection, can add a comment

Stéphane: any objection to replace RLR by P.700 loudness in privacy tests?

**Answer: none**

Antero: comment on cover page, consequences if not approved. We have done the round robin which was quite extensive testing. Had many different DUTs, HaNTE is not one specific technology, a DUT like DUT3 can pass requirements. Purpose of round robin was to see if current methods and equipments can be used. We learned that when device integration is correct, a HaNTE phone can be tested and pass. Subjective testing was also done by Qualcomm and the outcome is that phones preferred subjectively are also good objectively. I personally used on a daily basis DUT3, we learned in the round robin that it can be used with current methods, but there was also lots of differences in quality for DUTs. HaNTE is an early technology. I would not agree with the text in the section ‘consequences if not approved’

Stéphane: could make an alternative proposal?

Antero: current methods can be used, other additional metrics can be informative, this shoudl be different

Andre: at minimum, need to defined how to determine ECRP

Antero: traditional phones are not measured from the ear piece hole, the manufacturer will specific positioning, same here, the manufacturer will tell

Andre: if not provided, could not test

Stéphane: invite suggestions to change ‘consequences if not approved’ in next version

Fabrice: more fundamental comment, thanks for preparing the dCR, the changes define test methods for HaNTE, but some changes affect all devices, this is beyond the scope of this study. All devices will have to report fork positions, etc. In clause 7.1.4.2 (NB), all handsets should be tested at nominal and maximum volume, this is changing quite a lot the testing of current devices. Similarly, privacy would apply to all devices. Need to make sure that changes are for HaNTE decvices, if there are more changes, it should be clear. I am concerned that there are more tests for all devices.

Andre: can agree with this concern, not fair if a problem affects HaNTE and non-HaNTE to discriminante and test only HaNTE, tests should be for all devices. On fork positions, could have assumption that traditional phones do not have issues, so the test could be only for HaNTE, assuming the design has not flimsy plastic, etc. On max volume, will do it for non HaNTE, traditional phones may have problems, we can discuss if it’s not too much testing. If this is out of scope then we could remove it.

Antero: same concern as Fabrice. From a consumer point of view, one would expect similar quality evaluation for all phones, we should not overcomplicate the specification, and we should make tests for all handsets.

Andre: could have middle ground, with some tests informative or recommended

Stéphane: with Orange hat, on behalf of Alain, there are examples of HaNTE phones that can pass requirements in nominal but have bad quality at maximum volume, and this results in consumer complaints, should address this

Antero: it may be rare, if Alain can share data showing the issue, to see if there is really a problem, this should go into testing. The requirement can be a different, maximum volume is normally in noisy conditions, etc.

Andre: in HaNTE the problem is more severe, there can be severe distortion, max volume is a problem, not exclusive, but it is unfair to say only HaNTE have a problem

Stéphane: have to stop discussion as only 5 mn left, can allocate a Tdoc number for a revision to capture online edits, and Andre will be tasked to trigger an email discussion

**Decision:** S4-211535 is revised to S4-211629

Andre is tasked to share the outcome of the online editing and trigger an email discussion to help drafting S4-211629 in preparation for the editing in the Tuesday slot

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| [**S4-211534**](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_116-e/Docs/S4-211534.zip) | Requirements for HaNTE | Orange, Qualcomm Incorporated |

**Presenter:** Andre Schevciw

UEs featuring non-traditional earpieces pose challenges for handset mode acoustic testing. For example, a UE may exclusively use a vibrating display to produce sound when operating in handset mode, offering no clearly identifiable centre of an earpiece to position the headset for testing. Additionally, such UE could have its acoustic response affected by the choice of handset positioner mechanism.

This dCR brings the following changes:

* Add privacy requirements
* Add requirement for receive frequency response at maximum volume setting
* Add requirement for robustness to fork positions

**Comments / questions:**

Andre: P.700 loudness can be used for privacy, for requirement could expect tolerance based on delta with frequency responses

Stéphane: time to close discussion, will also allocate a Tdoc number for a revision, please share draft revision to trigger email discussions

**Decision:** S4-211534 is revised to S4-211630

Andre is tasked to trigger an email discussion to help drafting S4-211630 in preparation for the editing in the Tuesday slot

Andre: as Rapporteur, can produce documents, objective is to come to final CRs, see if compromise

Stéphane: Andre, can you summarize the situation based on email discussions?

Andre: opened up discussion over reflector to collect views, orthogonal positions, some companies may prefer not to change, needs to progress, don’t know if possible

Stéphane: what about updates to TR 26.801? cover this at SA4#117-e?

Andre: yes, target next meeting

Jan: what about time plans?

Stéphane: no time plan needed if a work item is finalized at this meeting, otherwise the Rapporteur(s) have to prepare a time plan update

if can finalize dCRs on HanTE at this meeting to close the work item with 80 or 90% completion, a CR to 26.801 could be taken afterwards

Fabrice: if output of HaNTE is CR to TR 26.801, this will be at next meeting, not sure can take this ouput after the work item is closed

Stéphane: any extra slot or offline?

Jan: could be available for a slot on Thursday

Stéphane: we can this discussion and see if we can make progress in the wrap-up

See email discussion:

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| [Re: HaNTE way forward](https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_SA_WG4_SQ;41122d89.2111C&S=) | Andre Schevciw | Tue, 16 Nov 2021 15:15:44 +0000 |
| [Re: HaNTE way forward](https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_SA_WG4_SQ;55f00538.2111C&S=) | Antero Tossavainen | Tue, 16 Nov 2021 12:36:36 +0000 |
| [Re: HaNTE way forward](https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_SA_WG4_SQ;5c7e9c.2111C&S=) | Andre Schevciw | Mon, 15 Nov 2021 19:16:22 +0000 |
| [Re: HaNTE way forward](https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_SA_WG4_SQ;9f9e5092.2111C&S=) | Alain Curti | Mon, 15 Nov 2021 13:20:09 +0000 |
| [HaNTE way forward](https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_SA_WG4_SQ;4e732132.2111B&S=) | Andre Schevciw | Sat, 13 Nov 2021 14:54:02 +0000 |

The online discussion resumes at the wrap-up session:

Stéphane: draft versions of S4-211629 and S4-211630 are not yet available, we may resume the discussion on S4-211535 and the email discussion

Antero: talking about whether we need a different test method in 26.131 and 26.132, there are different views if HaNTE phones would be properly tested, existing methods can be used and a phone can pass objective metrics, subjective testing by Qualcomm was backing this view. More evidence is needed to be collected if consider new tests.

Stéphane: there are two changes for 26.132: the reference to the correct version of P.64 to be able to define the positioning of HaNTE phones, and test methods, maybe some changes are still needed?

Alain: see email exchange, I encountered a sample phone that could pass existing tests but later consumer complaints motivated us to investigate why the phone was reported to have bad quality, if a handset is not properly done, the current tests are not enough to indicate if a phone is OK or not. At least RFR at max volume is needed, this is a small test, this would be enough to indicate which handsets are as good as expected

Lasse: to clarify, you refer to a small test to be performed, in the summary of changes which test is it?

Alain: RFR at max level, it takes just one minute, this is an extra measurement on top of the RLR test at max level

Antero: Nominal level has more focus in 3GPP tests, when soft background. Max level is for loud environments, where there is lots of background noise, e.g; outside, or in cafeteria, current tests are found to have good balance between quality and test load. We want to create a consistent quality, not have different tests, user user should not care about type of transducers

Alain: regarding situation at max level, true that max level can be used in noisy cases, but there are also older people that use max level, older people take care of quality, regarding specific tests restricted to HaNTE handsets, I have in my tests one handset that is declared as traditional but has issues with max level, if the test is limited to non traditional UEs I will not be able to do the tests. If a handset is good, it is no problem, if it’s a good HaNTE phone, same. We need a test to identify a bad hanset.

Antero: my understanding is that current approach is working well, good compromise between evaluation and test load, operators are not limited, can have tests on top of 3GPP

Alain: other tests can be done to deliver better quality, but for this type of extra tests when you talk to a manufacturer they do not accept such a test, because it’s not specified in 3GPP, hard to discuss, consumers complained about HaNTE phone and we could not have a bad phone in market, because the test at max level is not normative, we could not remove this from our catalogue

Stéphane: have to stop discussion here, seems will have to extend HaNTE by one meeting cycle, can ask Andre to produce a time plan offline

Andre: at high level, there are 3 options: 1) tests with shall, new tests, 2) do nothing, 3) middle ground, test methods informative with a type of should. See if there can be a possible compromise. With Qualcomm hat, one issue here is that only one device was performing well in the round robin and could meet the current requirements, someone may tune the fork positions etc to pass but the entire may not perform well, so there may be something to do.

Stéphane: we will need an extra slot for the SQ SWG to finalize the status of documents

allocate S4-211633 for time plan, and please make the updated dCRs in S4-211629 and S4-211630 and this time plan available

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| [**S4-211629**](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_116-e/Docs/S4-211535.zip) | Test methods for HaNTE | Orange, Qualcomm Incorporated |

**Presenter:** Andre Schevciw

To come up with middle ground, this dCR is just from Qualcomm.

In change 1: reference to P.700 added

In change 3: what was discussed before, privacy test

In change 5: unchanged

In change 6: main change

In change 7: instead of delta RLR, delta loudness with P.700

**Comments / questions:**

Jan: now changed measure from RLR to loudness, improvement, still evaluating loudness difference, there were reasons to look at absolute value

Andre: if absolute level is what matters, people could artificially cap maximum loudness level, not desired, could have high loudness but ambient noise could mask, leak is metric of interest

Stéphane: may consider to report both absolute level and difference?

Antero: why did you choose max volume for privacy? trying to find a use case where a person is concerned by privacy, would use max volume?

Andre: for example, in noisy environment, one could use max level, most audible, if you test at low volume, you start having a problem with noisy environment

Antero: difficult to say from round robin results, same labs has quite low signal levels, depending on test chamber. If privacy leakage, think about use case and volume that people choose when making a call.

Andre: you have better SNR at max volume

Antero: how does this align with subjective evaluations and intelligibility of leaked signal, would this be correlated, test is reliable?

Andre: one could consider Speech Intelligibility Index, but we don’t need to go that far, the literature has many examples on how loudness is related to intelligibility

Antero: not convinced, we need to get data, so the mapping with a subjective problem, and how an objective method can sort out devices, we need devices with no problem in the use case, and other with the problem

Fabrice: general comment, I am really uneasy with the process, the work item is about HaNTE, new targets will be targeting HaNTE, the proposal will affect traditional UEs, it”s overloading the specification with a WI that was specific, I am very concerned about this proposal. If tests apply for all handsets, we need a general work item

Andre: not introducing requirements

Alain: on the issue of HaNTE or not, it is difficult to know if a device is HaNTE or not, one provider can declare a phone is HaNTE or not, a new requirement shoudl apply to all devices, not only to HaNTE devices

Antero: see email discussion, want to relate to end user quality, I don’t want to make a distinction of traditional vs HaNTE, the same tests should apply

Andre: I have sympathy with this argument, the test method should not discriminate the type of terminal, but there is a dependency on how you mount the phone. If we have no distinction between HaNTE and non HaNTE this avoids the difficult definition of what is a HaNTE phone.

Alain: one comment on optional RFR at max volume, you have a requirement inside the test method.

Stéphane: 20 mn left, suggest taking S4-211630

(*the discussion resumes on S4-211629*)

Antero: use case is important for privacy test, if user is concerned by privacy, it will not use maximum level, the phone would be less loud to prevent leaky signal. Other concern is that the proposal is not validated. When we develop a new test, one should start with a subjective challenge, taking phones without the problem and phones with the problem, and check that the method works. We need the mapping with the subjective data. Need to see if phones are really better than others on privacy, and find what is acceptable for leakage, especially on intelligibility.

Andre: The problem was identified during the study phase. So we documented it as part of the work item.

Antero: You did not do any subjective test, looking at data, not sure what to show, there is no mapping with subjective experience, is leakage intelligible?

Andre: can look at phones and conclusions from round robin. There is a reference device, probably all phones could pass

Stéphane: have to stop discussion here, seems cannot agree on this proposal, it is fair to note this Tdoc based on comments

**Decision:** S4-211629 is noted

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| **S4-211630** | Requirements for HaNTE | Orange, Qualcomm Incorporated |

**Presenter:** Andre Schevciw

No requirements, rather recommendations.

**Comments / questions:**

Stéphane: RFR at maximum volume and variation of fork positions are not there anymore

Andre: just recommendation on privacy test, difference in setup

Stéphane: 10 mn left in extra slot, based on discussion on S4-211629, it seems difficult to seek agreement on this one, suggest noting

**Decision:** S4-211630 is noted

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| **S4-211633** | Proposals for data collection of HaNTE – test methods | Qualcomm Inc (Editor) |

**Presenter:** Andre Schevciw

See draft in Drafts/SQ folder

**Comments / questions:**

Stéphane: any telco needed?

Andre: could have one

Jan: could suggest an Annex for dCR on 26.132, with a description of test method, if there is a call before SA4#117-e

(*after some discussion, Dec. 3, 16:00-17:00 CET is identified*)

Jan: can host it

Stéphane: the Tdoc is agreed with the addition of one telco (with the usual deadline that is one day earlier):

**AH telco on HaNTE, Dec. 3, 2021, 16:00-17:00 CET (host: HEAD acoustics), submission deadline: Dec 2, 2021, 23:59 CET**

**Decision:** S4-211633 is agreed with one AH telco on HaNTE

**A.I. 10.7 HInT (Extension for headset interface tests of UE)**

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| [**S4-211501**](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_116-e/Docs/S4-211501.zip) | DraftCR TS26.132 (update) | HEAD acoustics GmbH |

**Presenter:** Jan Reimes

This is a continuously revised dCR, this version is taken from the Oct 10 telco. It is a resubmission of the same document.

* A reference is added to the HFP Bluetooth profile, this is needed for transparency tests.
* One open item in clause 4.4 is which electrical interface to test.
* In clause 5.1.6.1 (test setup for analogue interface), the if-then-else structure is unchanged, the proposal is to remove brackets based on results from initial tests.
* In clause 5.1.6.2, one change is for measurement with Bluetooth, a digital headset may perform signal processing (echo cancellation, noise reduction...). We want to see the performance of the UE. Lots of Bluetooth headsets provide their own processing, in this case we want the UE to behave as a transparent audio gateway.
* The proposal is to have a new Annex G. This is derived from ITU-T P.383, tests results show that transparency tests are needed. Only a subset of P.383 is proposed. In G.2, the value is now compensated for JLR and bandwidth is limited due to 7 kHz for SWB/SWB due to lack of support for SWB in Bluetooth. In G.3, the value is also compensated for JLR and the extra delay of 20ms may be skipped.

**Comments / questions:**

Stéphane: We will have limited time to cover all four input Tdocs on HiNT in the first slot, there will be editing on the Tuesday slot.

On reference 57, should there be a version number for the HFP profile?

Jan: there is the issue of the SWB codec that is not yet in HFP, did not want to exclude that

Stéphane: this can be later corrected by a CR to put a new version number

Jan: the same comment on missing version number/date applies to other references?

Stéphane: yes

Stefan D: comment on bandwidth for annex G, for SWB use 100Hz to 7kHz, also due to SWB codec? or other reason?

Jan: the test could be done only in NB, important issue is to have a stationary noise to try to trigger noise reduction, the bandwidth does not matter, we could leave it to 7 kHz, the part between 7 kHz and 14 kHz is not relevant

Stéphane: a note could be added to explain the reason to limit the bandwidth to 7 kHz for SWB

Stefan D: wondering if this is related to another limitation

Andre: on testng with USB-C example, the example refers to a USB-C version, if they change the version periodically, wonder if we can change the text to make it long lasting

Jan: we refer to USB-C explicitly, this is similar for USB-C and Bluetooth, it is fair to give a reference, the Audio Adapter Accessory Mode is accurately described in Annex A of reference 56, USB-C has several issues

Andre: USB-C is an example here

Jan: we can use analog, see if-then-else

Stéphane: will have to stop the discussion here, to cover other documents, suggest we trigger an email discussion (not agreement) based on thie

**Decision:** S4-2111501 is revised to S4-211627

Jan is tasked to trigger an email discussion to help drafting S4-211627 in preparation for the editing in the Tuesday slot

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| [**S4-211536**](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_116-e/Docs/S4-211536.zip) | dCR 26.131 Extension for headset interface tests of UE | Orange |

**Presenter:** Stéphane Ragot

This dCR is the same as the previously agreed version and it was already seen in the Oct 29 telco. The only changes are the CR form (now 12.1) and the alignment to the core specification (17.0.0) including changes on frequency masks figures and editorial fixes agreed at SA4#115-e

**Comments / questions:**

None.

Stéphane: similar to S4-2111501, can trigger an email discussion (not agreement) to prepare editing

**Decision:** S4-211536 is revised to S4-211628

Stéphane is tasked to trigger an email discussion to help drafting S4-211628 in preparation for the editing in the Tuesday slot

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| [**S4-211537**](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_116-e/Docs/S4-211537.zip) | Proposals on frequency masks for HInT | Orange |

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**Presenter:** Alain Curti

In the current dCR to TS 26.131 on HInT, frequency masks for the electrical interface are left undefined; examples from ITU-T P.381 are provided for information as Editor’s Notes.

In the present contribution, we present some initial measurements for HInT and make initial proposals on NB, WB and SWB frequency masks in sending and receiving.

This contribution is an update of S4aQ210172. A compromise on frequency masks is suggested based on feedback received at the SQ SWG AH telco on Oct. 29, 2021.

**Comments / questions:**

Stéphane: any comments on the first part with test results?

**Answer: none**

Stéphane: any comments on the Annex?

**Answer: none**

Stéphane: it is not appropriate to agree on this document, as it contains some test results. Can be agree on the annex?

**Answer: yes**

Stéphane: suggest noting the document and concluding that the annex is agreed

**Decision:** S4-211537 is noted. The Annex is agreed and will be integrated in S4-211628.

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| [**S4-211500**](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_116-e/Docs/S4-211500.zip) | Updated measurement results for HInT | HEAD acoustics GmbH |

**Presenter:** Jan Reimes

For testing the performance of electrical (headset) interface according to the latest draft CR to TS 26.131/132 and latest proposals, a comprehensive set of results were obtained in a test series with several recent mobile phones.

The most relevant measurements were evaluated, reviewed and available results were reported. The preliminary agreed setup and test descriptions seem to work as expected. Also, the provisional requirements are already in a reasonable range, only some values of the tolerance masks of send frequency response should be adapted. Frequency response results with a proposal of modified tolerance masks are given in Annex A.

Finally, also test results for the transparency checks were shown. These are important for the usage of Bluetooth electrical interface in combination with headsets providing their own signal processing capabilities.

Updated results with 10 DUTs. Some devices do not accept other headsets that the provided reference headset.

**Comments / questions:**

Stéphane: just few minutes left, any comment/question?

**Answer: none**

**Decision:**  S4-211500 is noted

Results will be used in discussions related to the drafting of S4-211627 and S4-211628

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| **S4-211628** | dCR 26.131 Extension for headset interface tests of UE | Orange |

**Presenter:** Stéphane Ragot

A draft version of this document has been shared.

See email discussion

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| [Re: S4-211628 draftCR 26.131 (HInT)](https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_SA_WG4_SQ;3fc484d7.2111C&S=) | Stephane Ragot | Wed, 17 Nov 2021 08:22:31 +0000 |
| [Re: S4-211628 draftCR 26.131 (HInT)](https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_SA_WG4_SQ;f4e9e91c.2111C&S=) | Fabrice Plante | Tue, 16 Nov 2021 16:01:59 -0800 |
| [Re: S4-211628 draftCR 26.131 (HInT)](https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_SA_WG4_SQ;66ad710b.2111C&S=) | Stephane Ragot | Tue, 16 Nov 2021 23:47:27 +0000 |
| [Re: S4-211628 draftCR 26.131 (HInT)](https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_SA_WG4_SQ;60281cdd.2111C&S=) | Stephane Ragot | Mon, 15 Nov 2021 13:48:04 +0000 |
| [Re: S4-211628 draftCR 26.131 (HInT)](https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_SA_WG4_SQ;e80dfcf6.2111C&S=) | Reimes, Jan | Mon, 15 Nov 2021 09:20:32 +0000 |
| [Re: S4-211628 draftCR 26.131 (HInT)](https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_SA_WG4_SQ;eace46bd.2111B&S=) | Stephane Ragot | Sat, 13 Nov 2021 14:31:33 +0000 |
| [Re: S4-211628 draftCR 26.131 (HInT)](https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_SA_WG4_SQ;9309946f.2111B&S=) | Fabrice Plante | Fri, 12 Nov 2021 09:53:31 -0800 |
| [S4-211628 draftCR 26.131 (HInT)](https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_SA_WG4_SQ;4bc7f385.2111B&S=) | Stephane Ragot | Fri, 12 Nov 2021 14:42:29 +0000 |

**Comments / questions:**

Stéphane: based on the email discussion, suggest taking r03 as a basis for discussion to define S4-211628

*A summary of the online review/editing for the draft version (r03) is provided below:*

* On delay requirements:

Stéphane: suggest discussing first the delay values left in brackets, there is [0] for analog, [20-40] for wireless digital and [20-25] for wired digital, any proposal to set only one value?

Alain: better to have lower delay, propose 20 in last two cases

Jan: 20 ms would comply with ITU-T P.1100 and P.1110, for wireless digital measurements also suggest 20 ms, because lots of measured DUTs even had a better delay, with a negative delay budget

Stéphane: can be agree on [20] in last two cases?

**Answer: yes**

* on RLR:

Jan: we only take one channel, so need to remove binaural

* on distortion:

Fabrice: we have identical tables 8b1 and 8b2 but in receiving we can keep only one table

Stéphane: clarify if there is a difference from the test method

Jan: we have two levels for send but for receive we have only one

* on delay:

Tomas: correction ‘vendor specification’ in note of table 8quater1

Jan: double ‘ms’ in NOTE1

(*Stéphane makes online edits in the NB clauses, then move to WB*)

Fabrice: since it repeats in WB, etc., can skip the online edits and make them offline?

Stéphane: right, I can implement the same edits as in NB for other bandwidth

Stéphane: based on the online edits for NB and the corresponding edits to be done offline for other bandwidth, I will produce r04, should we agree on this without presentation or not?

Fabrice: prefer to see the revised dCR

Stéphane: we will park the dCR and come back to it during the wrap-up session

The discussion resumes in the wrap-up session.

Stéphane: r05 has been produced, are there any comments on this draft revision?

**Answer: none**

Stéphane: then S4-211628 is agreed based on r05

Tomas: there is still a ‘vendor specification’ left in a NOTE

(*Stéphane corrects this with online editing*)

Stéphane: we correct r05 with this extra correction, and produce r06, can we agree on r06?

**Answer: yes**

Stéphane: S4-211628 is agreed (as r06), the objective is to produce formal CRs at this meeting, however we are missing CR numbers, will check offline to get CR numbers, allocate S4-211631 for CR to 26.131 and S4-211632 in advance to produce formal CRs to 26.131 and 26.132 respectively, S4-211631 will be derived from S4-211628 with minor changes in the cover page (Tdoc number and CR number, removal of DRAFT)

**Decision:** S4-211628 is initially parked, after several draft revisions, S4-211628 is agreed

This dCR will be used to produce the formal CR to 26.131 on HInT in S4-211631

|  |  |  |
| --- | --- | --- |
| **S4-211627** | DraftCR TS26.132 (update) | HEAD acoustics GmbH |

**Presenter:** Jan Reimes

A draft version of this document has been shared.

See email discussion:

|  |  |  |
| --- | --- | --- |
| [Re: S4-211627 draftCR 26.132 (HInT)](https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_SA_WG4_SQ;3ca29adf.2111C&S=) | Reimes, Jan | Thu, 18 Nov 2021 11:33:12 +0000 |
| [Re: S4-211627 draftCR 26.132 (HInT)](https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_SA_WG4_SQ;3a6b0531.2111C&S=) | Reimes, Jan | Wed, 17 Nov 2021 14:13:45 +0000 |
| [Re: S4-211627 draftCR 26.132 (HInT)](https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_SA_WG4_SQ;9ac02219.2111C&S=) | Reimes, Jan | Tue, 16 Nov 2021 16:03:11 +0000 |
| [Re: S4-211627 draftCR 26.132 (HInT)](https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_SA_WG4_SQ;c746967e.2111C&S=) | Reimes, Jan | Tue, 16 Nov 2021 10:35:09 +0000 |
| [Re: S4-211627 draftCR 26.132 (HInT)](https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_SA_WG4_SQ;612f2509.2111B&S=) | Fabrice Plante | Fri, 12 Nov 2021 15:55:52 -0800 |
| [S4-211627 draftCR 26.132 (HInT)](https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_SA_WG4_SQ;e8eb7aa2.2111B&S=) | Reimes, Jan | Fri, 12 Nov 2021 13:17:06 +0000 |

**Comments / questions:**

*A summary of the online review/editing for the draft version is provided below:*

(*Jan displays the draft revision and goes over open points*)

Jan: reference clauses updated with version numbers

* on types of electrical interfaces to be tested:

Jan: different types of electrical interfaces, a DUT could have multiples types, 3 options are possible

Stéphane: is there a similar text on the choice of acoustic interfaces to be tested (handset, headset...)?

Jan: different acoustic modes can be tested with separate methods, here for electrical intefaces we use the same test signal and measurements

for sake of simplicity I prefer first option, can agree on this one?

**Answer: yes**

* on analog connections:

Jan: there was a comment from Andre to make the example of USB-C clear, can remove brackets?

**Answer: yes**

* on digital connections

Jan: in email has long discussion, transparency tests apply only for Bluetooth, to check if signal processing is deactivated, any other opinion? should be done?

Fabrice: expressed concern about it also in a telco, going too far, in 131/132 we test the whole solution, here testing a subset of it, we do not see the value of this in 26.131/132

Jan: see longer answer sent by email, it is part of a test specification, we cannot rely on signal processing at Bluetooth interface, we observed many issues, even when signal processing is supposed to be turned correctly, we could see some noise reduction. This would cause tandem signal processing by the headset and the phone. The phone does not react as expected to Bluetooth commands, it is important to ensure interoperability, P.383 contains much more, we proposed to make the more important tests

Stéphane: could be made informative?

Jan: we detect signal processing, could be normative with pass/fail or should? a phone could pass tests but fail with annex G

in the headset case when device is with Bluetooth providing active signal processing, all tests do not apply, signal processing should be disabled, prefer shall here

Alain: will be in favor of shall to make sure that we have a clear test situation

Fabrice: can agree to keep this but to keep this informative, go offline?

* other changes

Jan: see change 20 for sidetone delay, propose to compensate by eletrically inserted delays, also for other test

Annex G is unchanged, for SWB/FB note was added

Stéphane: fix word in the note on the Bluetooth codec

Fabrice: remove ‘in any case’, last sentence confusing

(*Jan makes online changes*)

Stéphane: we conclude that we park this draft and offline discussions will propose a compromise on the transparency tests

The discussion resumes in the wrap-up slot. The corresponding discussions is summarized below:

Jan: r02 of draft S4-211627 is available, r01 corresponds to what was discussed in the editing session, I removed all editor’s notes, based on offline discussion with Fabrice, a revision is provided on contentious topic of transparency tests. In clause 5.1.6.2, issue to resolve is transparency tests, make tests informative or nomative with shall or should to be conducted, Annex G is still in brackets, terminology changed to noise reduction and echo cancellation

Stéphane: r01 is the output of the online editing session, and r02 is the output of the offline?

Jan: correct

main question is if Annex G is normative or informative, ask group if there is any strong opinion, in the online editing there were views expressed, Apple prefers informative, HEAD acoustics prefers normative, there was careful agreement from Orange to have rather normative tests

Tomas: no strong opinion, but want to understand issue Apple sees, can you elaborate?

Fabrice: text is now in better shape, still think that transparency tests are more for a Bluetooth spec, manufacturer can adapt, prefer to have this informative, there can be different headsets

Tomas: if processing is done in headset, to be handled in Bluetooth, not 3GPP?

Fabrice: in 26.131/132 we test the whole terminal, here there is between headset and UE, quite difficult, something could be shared, you may make quality as good as you can even if there is 3rd party component, our proposal is to remove this test

Tomas: in case of headset, signal processing will be done by the UE?

Jan: expected way is that UE performs signal processing, assuming the headset is passive, then tests in clauses 7 to 10 are applicable. If the headset does signal processing, the UE has to switch off its processing, this is important for the test, when both are active, we get tandem signal processing. The headset may signal that it is doing signal processing

Tomas: IE cannot deactivate?

Jan: here reference gateway acts as headset

Stéphane: is there any applicable Bluetooth conformance specification here to check the handling of AT commands, etc.?

Jan: there is a test suite for HFP, AT commands need to be tested, audio tests are out of scope, it’s a soft test, this is not covered by Bluetooth specification

Stéphane: should we send and LS to BT SIG?

Jan: they may react and answer, audio tests are out of scope in Bluetooth, same if Annex G is out of scope

Stéphane: one might see if transparency tests could be used as a diagnostic tool

suggest we check informally positions to try to find a way forward

Would be support having Annex G normative? **Answer: 2 companies**

Would be support having Annex G informative? **Answer: 1 company**

Would be object having Annex G normative? **Answer: 1 company**

Would be object having Annex G informative? **Answer: 1 company**

Fabrice: quite grey area, if we do not test whole system, we should not put requirements, there may be a compromise

Jan: compromise could be to run normative tests, but report results, with should in Annex G

Fabrice: if test informative, can run it, usually we run all tests in 26.131/132, even if this is for characterization, request to have more time to check internally

Stéphane: feedback will take place tomorrow, seems we will need an extra slot to finalize discussion, can we add an SQ SWG session on Thursday, 16:00-17:00 CET?

**Answer: yes**

The discussion resumes in the extra SQ SWG slot:

Jan: r03 of the dCR is available, there are just two clauses affected resolving the Bluetooth transparency tests. Two changes:

* On setup for digital interface: shall be conducted, shall be reported, but no requirement to pass.
* On Annex G: now informative, no requirement (shall), now transparency tests (not checks), tests changed to should

Propose to remove two brackets

Fabrice: OK with r03

Stéphane: still normative annex if there is normative text like should? check that informative is correct?

Jayeeta: shoudl be ok to have informative if no shall; in drafting rules, all annexes are informative in TR

Stéphane: can we agree on r03 with brackets removed?

**Answer: yes**

**Decision:** S4-211627 is initially parked, after several draft revisions, S4-211627 is agreed

This dCR will be used to produce the formal CR to 26.132 on HInT in S4-211632

|  |  |  |
| --- | --- | --- |
| **S4-211631** | CR26131-0083 Extension for headset interface tests of UE | Orange |

**Presenter:** Stéphane Ragot

This is based on S4-211628 with minor changes to the cover page

**Comments / questions:**

None.

Stéphane: can we agree on this CR?

**Answer: yes**

**Decision:** S4-211631 is agreed

|  |  |  |
| --- | --- | --- |
| **S4-211632** | CR26132-0105 Extension for headset interface tests of UE | HEAD acoustics GmbH |

**Presenter:** Jan Reimes

This is based on S4-211627 with minor changes to the cover page

Title is aligned with CR to 26.131.

**Comments / questions:**

Stéphane: editorial fixes in cover page, with reference to S4-211627

(*Jan makes online edits on the draft*)

Stéphane: can we agree on this CR?

**Answer: yes**

**Decision:** S4-211632 is agreed

|  |  |  |
| --- | --- | --- |
| **S4-211634** | Summary for WI HInT | HEAD acoustics GmbH, Orange |

**Presenter:** Jan Reimes

This is a short summary for HInT following guidelines from the template.

**Comments / questions:**

Stéphane: can remove duplicated ‘defined’ and extra space

(*Stéphane makes online edits*)

Stéphane: this is not for agreement, this will be forwarded to SA4 closing plenary. Can we endorse this document?

**Answer: yes**

**Decision:** S4-211634 is endorsed

Stéphane: just to check, should we consider sending an LS to BT SIG on transparency tests?

Jan: could be done, maybe too late to draft document, could be in next meeting when CRs are enforced. Can check in advance if ETSI and ITU-T made correspondence on this topic with BT SIG, the issue has been known in Bluetooth for about 10 years. If felt necessary, can offer to draft something.

Stéphane: we conclude that no LS is prepared at this meeting, and one draft LS may be prepared at the next meeting.

**A.I. 10.8 New Work / New Work Items and Study Items**

None.

**A.I. 10.9 Any other business**

None.

**A.I. 10.10 Close of the session**

The meeting was closed at 17:06 CET on November 18.

**Annex A – Meeting agenda**

**Source: SA4 SQ SWG Chair[[2]](#footnote-2)**

**Title: Meeting agenda (SQ SWG during SA4#116-e)**

**Document for: Information**

**Agenda item: 9.2**

|  |  |  |
| --- | --- | --- |
| 9 | Speech Quality (SQ) SWG |  |
| 9.1 | Opening of the session |  |
| 9.2 | Registration of documents |  |
| 9.3 | Liaison Statements |  |
| 9.4 | CRs to Features in Release 16 and earlier, and other contributions on terminal acoustics |  |
| 9.5 | ATIAS (Terminal Audio quality performance and Test methods for Immersive Audio Services) |  |
| 9.6 | HaNTE (Handsets Featuring Non-Traditional Earpieces) | dCR 26.132 (Orange, Qualcomm)1535->1629ndCR 26.131 (Orange, Qualcomm)1534->1630nTime plan1633a A.I. 15.3telco Dec 3, 16:00-17:00 CET (host: HEAD acoustics), submission deadline: Dec 2, 23:59 CET  |
| 9.7 | HInT (Extension for headset interface tests of UE) |  dCR 26.132 (HEAD acoustics)1501->1627adCR 26.131 (Orange)1536->1628aProposals on masks (Orange)1537nAnnex of 1537 is agreedUpdated measurements results (HEAD acoustics)1500nformal CR 26.1311631a A.I. 15.4formal CR 26.1321632a A.I. 15.4WI summary1634endorsed A.I. 15.4 |
| 9.8 | New Work / New Work Items and Study Items |  |
| 9.9 | Any Other Business |  |
| 9.10 | Close of the session |  |

**Legend for Tdocs:**

* **Color: not-yet processed**, **processed**, **late**, **~~withdrawn~~**, **moved to a different A.I.**, **under email agreement**

a agreed, app approved, n noted, pa partially agreed, np not pursued, pp postponed

**Annex B – List of participants (table filled in online by delegates)**

|  |
| --- |
| Apple - Fabrice Plante |
| Dolby - Brian Lee |
| Dolby - Stefan Bruhn |
| Ericsson - Tomas Toftgård |
| ETSI MCC - Jayeeta Saha |
| Fraunhofer IIS - Markus Multrus |
| HEAD acoustics - Jan Reimes |
| Huawei - Huan-Yu Su |
| Huawei Technologies - Antero Tossavainen |
| NOKIA - Anssi Rämö |
| NOKIA - Lasse Laaksonen |
| NTT - Naotaka MORITA |
| NTT - Takehiro Moriya |
| OPPO - Minjie Xie |
| Orange - Alain Curti |
| Orange - Stéphane Ragot |
| Philips - Marek Szczerba |
| Qualcomm - Andre Schevciw |
| Qualcomm - Imre Varga |
| Samsung - Sungryeul Rhyu |
| Xiaomi - Wang Bin |

**Annex C - Documents status**

**C.1 Agreed documents (not presented to SA4 plenary)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc | Title | Source(s) | Agenda Item(s) | Status |
| **S4-211627** | dCR 26.132 Extension for headset interface tests of UE | HEAD acoustics GmbH | 9.7 | Agreed |
| **S4-211628** | dCR 26.131 Extension for headset interface tests of UE | Orange | 9.7 | Agreed |

**C.2 Agreed documents (to be presented to SA4 plenary)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc | Title | Source(s) | Agenda Item(s) | Status |
| **S4-211631** | CR26131-0083 Extension for headset interface tests of UE | Orange | 9.7, 15.4 | Agreed |
| **S4-211632** | CR26132-0105 Extension for headset interface tests of UE | HEAD acoustics GmbH | 9.7, 15.4 | Agreed |
| **S4-211633** | Proposals for data collection of HaNTE – test methods | Qualcomm Inc (Editor) | 9.6, 15.3 | Agreed |

**C.3 Other status than agreed documents (not to be presented to SA4 plenary)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc | Title | Source(s) | Agenda Item(s) | Status |
| [**S4-211500**](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_116-e/Docs/S4-211500.zip) | Updated measurement results for HInT | HEAD acoustics GmbH | 9.7 | Noted |
| [**S4-211501**](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_116-e/Docs/S4-211501.zip) | DraftCR TS26.132 (update) | HEAD acoustics GmbH | 9.7 | Revised |
| [**S4-211534**](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_116-e/Docs/S4-211534.zip) | Requirements for HaNTE | Orange, Qualcomm Incorporated | 9.6 | Revised |
| [**S4-211535**](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_116-e/Docs/S4-211535.zip) | Test methods for HaNTE | Orange, Qualcomm Incorporated | 9.6 | Revised |
| [**S4-211536**](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_116-e/Docs/S4-211536.zip) | dCR 26.131 Extension for headset interface tests of UE | Orange | 9.7 | Revised |
| [**S4-211537**](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_116-e/Docs/S4-211537.zip) | Proposals on frequency masks for HInT | Orange | 9.7 | Noted (Annex agreed) |
| **S4-211629** | Test methods for HaNTE | Qualcomm Incorporated | 9.6 | Noted |
| **S4-211630** | Requirements for HaNTE | Qualcomm Incorporated | 9.6 | Noted |

**C.4 Other status than agreed documents (to be presented to SA4 plenary)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc | Title | Source(s) | Agenda Item(s) | Status |
| **S4-211634** | WI summary for HInT | HEAD acoustics GmbH, Orange | 9.7, 15.4 | Endorsed |

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2. **Mr. Stéphane Ragot, Orange**

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