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

**Title: 3GPP SA4 SQ SWG report at SA4#111-e**

**Document for: Approval**

**Agenda item: 13.4**

**3GPP SA4 #110-e Speech Quality Sub-Working Group**

The SQ SWG during SA4#111-e was held in three telcos (1 ½ time slots). The SQ SWG e-mail discussions (mainly limited to announcements of draft Tdocs) during the meeting can be tracked here:

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

**Executive summary**

The meeting (xxx participants) handled 9 documents including 6 output documents. The meeting outcome is summarized below for work items under SQ SWG responsibility:

* **ATIAS (Terminal Audio quality performance and Test methods for Immersive Audio Services)**: A dCR to 26.260 (S4-201612) has been agreed as a basis for further editing. This includes draft text (in brackets) on interfaces, round-table conferencing scenario and setup, metrics, and associated test cases for sending/receiving. The ATIAS time plan has been revised (S4-201492) with an end date pushed to from Dec. 2020 to Dec. 2022 (aligned with IVAS time plan), and one AH telco prior to SA4#112-e.
* **HaNTE (Handsets Featuring Non-Traditional Earpieces)**: A preliminary Lab 2 report with round robin results has been discussed. The HaNTE test plan has been revised (S4-201613) to specify some missing details and update the WI time plan (one AH telco prior to SA4#112—e and completion of round robin shifted to SA4#112-e).
* **HInT (Extension for headset interface tests of UE)**: dCRs to 26.131 and 26.132 have been agreed as a basis for further editing (S4-201482, S4-201614), and two AH telcos prior to SA4#112-e have been included in the revised time plan (S4-201615).

**Agreed adhoc conference calls prior to SA4#112-e:**

* AH telco on HInT: Dec. 7th, 16:00-17:30 CET; Submission Deadline: Dec. 4th 23:59 CET; Host: HEAD acoustics GmbH
* AH telco on ATIAS, HaNTE, HInT: Jan. 18th, 16:00-17:30 CET; Submission Deadline: Jan. 15th 23:59 CET; Host: Qualcomm Incorporate

**A.I. 9.1 Opening of the session**

Stéphane Ragot (SQ Chair) opens the session at 15:30 CET and welcomes all delegates. He recalls the schedule for SQ sessions with three slots (Friday, Monday, Tuesday) and points to the URL to access the template SQ SWG report.

Fabrice Plante (Apple) kindly volunteers for taking minutes.

**A.I. 9.2 Registration of documents**

Stéphane shows the agenda derived from the SA4 Chair. The Tdoc allocation is approved.

See Annex A for the latest Tdoc allocation including output documents produced during the meeting.

**A.I. 9.3 Liaison Statements**

None.

**A.I. 9.4 CRs to Features in Release 16 and earlier, and other contributions on terminal acoustics**

None.

**A.I. 9.5 ATIAS (Terminal Audio quality performance and Test methods for Immersive Audio Services)**

**Part from telco #1 (Friday):**

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| --- | --- | --- |
| [**S4-201309**](https://www.3gpp.org/ftp/tsg_sa/WG4_CODEC/TSGS4_111-e/Docs/S4-201309.zip) | DraftCR TS26.260 on Immersive Speech Communication Systems (update) | HEAD acoustics GmbH |

**Presenter:** Jan Reimes (HEAD acoustics)

The objective of the work item ATIAS is to develop a set of test specifications for 3GPP immersive services, both conversational and non-conversational. The current version of TS 26.260 does not contain any tests methodologies that are specifically tailored to conversational services.

This dCR introduces new clauses for test setups for immersive communication systems. In clause 5 there are no rev marks but this is a completely new clause.

**Comments / questions:**

Peter: Two high-level comments. This is built upon the assumption that we reproduce reality and it should be rendered like in the picture with HATS. There could be different situations for larger than life rendering. The proposal is for a basic reference to detect if something is reproduced at 30 or 40 degrees. Also there is a WI adding electrical tests for traditional mono some of these tests may be done as electrical tests.0

Jan: For an electrical interface you need to have connection with a real device, and this connection is not clear for immersive devices. For the “larger than life” set-up, yes this proposal is a basic example but already complex to put in place and do this similar to handset, headset, etc. This is a simple approximation and devices may behave differently.

Stéphane: There is dependency on IVAS as noted. For the electrical connection, the IVAS work item will define input and output formats (e.g. mono, stereo, binaural, etc… for rendering) and it may be possible to derive tests assuming for instance stereo or binaural rendering over headset.

Stefan D: Did you make measurements with this set-up?

Jan: Yes the impulse responses are available.

Stefan D: did you try with a mock-up device?

Jan: yes we use the BGN 8-ch array as a DUT on a table for the sending direction but we have not analyzed it.

Stefan D: interesting, not tested a DUT with speakers built-in to detect frequency response?

Jan: idea is to have 2 stereo devices, 2 out of 8 signals are used, but it is not adequate if we have a random playback, we want to check the ITD later to see from which direction the sound comes from.

Stefan B: This proposal assumes using HATS, could we envisage another system (mic array) to avoid the HATS effect, for instance spatial microphones?

Jan: This will depend on what you want to measure. For ITD, it refers to left and right ear. If you want to do absolute measurement it will be more difficult also how close a mic array is from human perception. For ITD and frequency response, HATS are close to human perception. HATS with diffuse-field equalization is common sense and it is a valid approach to use it.

Stéphane: speaker array could also be used to mimic 3D sound?

Jan: ok for general audio, but for conversational speech, it is better to use a system close to human talker.

Stefan B: Like to connect to comment from Peter. Have to k now how in reality we will be away from the ideal situation if we measure in receive direction. DUT may have difficulty to reproduce what we have in reality. The question is how to compare different schemes that are far away from the ideal situation.

Jan: one may find unrealistic that people are sitting as show on the picture. It’s a valid test setup. It is more on the reproduction side that a device may not target to reproduce the scenario. One may do a different rendering, some frequencies may be attenuated or some processing may be applied

SB: my comment is also addressing the receive side. It may not be possible to reproduce the reference scenario.

Tomas: n the example, if one would assume a simple reference playback, the DUT may use optional rendering, it could be hard to reproduce exactly with real devices the test set-up.

Jan: not reproduce perfectly, one can start with the overall level, same for frequency response, one can reproduce what binaural reproduction gives, the question is to defione tolerances.

Tomas: even if one has a good DUT, there can be larger differences to the reference values

Jan: Need measurements to have a better idea.

Stéphane: We have to give a status to the dCR, there were some concerns about the scenario. However, for the metrics it seems agreeable as there was no comment. Should there be a permanent document for ATIAS collecting agreeable text or do we keep a dCR collecting agreed text?

Jan: as in HInT, we can use the draft CR as living document could be a way forward

Tomas: even if the metrics seem agreeable, we should keep the brackets, we do not know if the proposed metrics will be used in the end.

Stéphane: could Jan guide us through the document to see which parts can be included in a revised dCR, starting from the beginning? One can skip the reference section, we can include this part with some clean-up after we see the text to be included.

(Jan presents the proposed text section by section)

Peter: could the reference set-up be used to test object-based audio?

Jan: it should be able to handle audio objects, but it is too soon to specify this in the document.

Peter: could end up with codec supporting multichannel, objects, etc. if we want to test one mode, we need to make sure that we execute this mode.

Jan: not excluded here.

Stéphane: editor’s note could be used for this.

Stefan B: use brackets for references. It is well defined what we mean by ‘reference clients’? Is it a smartphone or it covers more device types?

Jan: reference clients are not well defined for now. Could be helpful to add diagrams of the overall audio path.

Tomas: there could be several types of reference clients, for a stereo device it depends on the form factor.

Stéphane: It may be premature to include the details on round table, they may be kept in brackets. Time is running, we can allocate a new Tdoc number (S4-201612) for a revision. For the diagram, one may also refer to a past contribution from Sony on interfaces. Please prepare a revision based on comments for the Tuesday slot.

**Decision:** S4-201309 is revised to S4-201612.

Stéphane: S4-201492 is a late document and will not be taken in the first slot. A draft version has been shared by Stefan B on the Drafts/SQ folder. Could Stefan B give a heads-up on the proposed updates?

Stefan B: The present time plan for ATIAS is outdated and we are not close to finalizing the work item. The proposed updates take into account the dependency on the IVAS work item, and they are based on the proposal in S4-201362. We decided to put the document in the Drafts/SQ folder as this depends on the discussion in the EVS SWG on IVAS.

Stéphane: Delegates are invited to check the draft document asap, and S4-201492 will be taken in the SQ slot on Tuesday.

**Part from telco #3 (Tuesday):**

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| [**S4-201**](https://www.3gpp.org/ftp/tsg_sa/WG4_CODEC/TSGS4_111-e/Docs/S4-201309.zip)**612** | DraftCR TS26.260 on Immersive Speech Communication Systems (update) | HEAD acoustics GmbH |

**Presenter:** Jan Reimes (HEAD acoustics)

(*Jan presents a draft version of* S4-201612 *available in the Drafts/SQ folder*)

Clause 5.1 inserted, including Sony contribution.

**Comments / questions:**

Peter: agree better to align with IVAS. Can adapt further clause 5.1 if necessary.

Stéphane: change Figure 1 to figure X

Stefan D: Only the header is in bracket, shouldn’t the bracket be around the whole clause

Stéphane: Yes, each clause should be in brackets.

(*Jan edits online the document to put brackets around each clause*)

Stéphane: before we had a note about reference client definition

Jan: This is now moved to clause 5.1

Stefan B: no further comment about the definition.

Stéphane: could be good to add the term “Editor’s note” before text highlighted in yellow to avoid confusion, this is just editorial and can be done offline before submitting the Tdoc.

**Decision:** S4-201612 is agreed

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| S4-201492 | Draft time plan for ATIAS, v0.3 | ATIAS Co-Rapporteurs (Orange, Dolby Laboratories, Inc.) |

**Presenter:** Stefan Bruhn (Dolby)

(*Stefan presents a draft version of* S4-201492 *available in the Drafts/SQ folder*)

End date is moved to Dec. 2022.

**Comments / questions:**

Stéphane: any telco prior to SA4#112-e?

Stefan: up to Jan, Peter.

Peter: no plans, ATIAS is now long-term.

Jan: planned to do measurements and Stefan D asked for results, but we have a limitation of lab access.

Stéphane: no strong push for a telco, it seems.

Andre: may take HaNTE test plan and see if make sense to have a general SQ telco.

(S4-*201492 is parked and discussion resumes after the conclusion on* S4-201613)

Stéphane: can use Jan. 18 telco slot from HaNTE for ATIAS?

Answer: yes

**Decision:** S4-201492 is agreed.

An AH telco (shared with other WIs) is agreed: Jan. 18th, 16:00-17:30 CET; Submission Deadline: Jan. 15th 23:59 CET; Host: Qualcomm Incorporated

**A.I. 9.6 HaNTE (Handsets Featuring Non-Traditional Earpieces)**

**Part from telco #2 (Monday):**

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| [**S4-201317**](https://www.3gpp.org/ftp/tsg_sa/WG4_CODEC/TSGS4_111-e/Docs/S4-201317.zip) | Preliminary results of HaNTE round robin test results for Lab2 | HEAD acoustics GmbH |

**Presenter:** Jan Reimes (HEAD acoustics)

This contribution reports on the Handsets featuring Non-Traditional Earpieces (HaNTE) round robin results at Laboratory 2 (HEAD acoustics GmbH). Tests were conducted according to the agreed test plan of the 3GPP work item HaNTE. In addition, initial results and definitions from lab 1 of the round robin test are reviewed.

What is new compared to the Oct 19 telco is the addition of frequency responses for long sequences.

Tests are ongoing for robustness with B&K.

**Comments / questions:**

Andre: The attenuation for HaNTE phones is not less than the non-HaNTE phone, all phones are with the same range. It seems it does not look like there is an issue for HaNTE terminals.

Jan: Quite audible for DUT5 which has -11db RLR-MAX but not sure it should be based on this to require a certain attenuation. Not sure what to derive, except that if we put a requirement it would also apply to non-HaNTE devices.

Andre: All data indicate that nothing is significantly worse than the reference device.

Antero: Are you sure that short sentences are good for the test, as some tests pass with the long, but fail with the short. Also spectrum seems more ‘spiky’ with the short sentences.

Jan: In some devices the long/short sentences do not make a difference. In some it does (see DUT3 and 4).

Antero: Are the test results repeatable with the short sentences or is there variance?

Jan: Need to check. Spikes may be an artifact of the test signal, sometimes it is frequency dependent.

Andre: The short sentences do not cover the spectrum range of the long sequences. There is extra variability because of lower signal contents.

Stéphane: Spikes are not surprising, RFR measurement implies averaging spectra, so longer sequences lead to more smoothing.

Peter: Good hypotheses. Dynamic processing could have more influence on short sentences.

Stéphane: Will be good to check repeatability to confirm.

Alain: For the fork positions, how do you choose position?

Jan: Follow table 4 & 5.

Alain: Did you use the supporting pins?

Jan: Supporting pins are always used, otherwise the phone will not mount correctly and stay in place.

Tomas: How is the interpolation done for Annex A? In some cases it seems changes of level are pretty fast.

Jan: It uses linear interpolation in dB, assumed 40 dB at edges. Using the RLR value at the various points (S0, s1, etc..). In some cases values are quite low.

Stéphane: You made some changes to the test plan. Should the test plan be updated?

Jan: The changes are not on the mandatory part and not necessary to update, except for position scheme which is not fixed in the test plan.

Andre: Yes we can update the test plan and add the rationale for the fork positions.

Stéphane: allocate S4-201613 for the updated test plan.

Jan: DUT6 is the most problematic to hold.

Andre: yes this DUT is difficult. We can update the test plan with the new value.

Jan: Don’t have access to the lab until mid-December. Only Test 3 with B&K is missing. Can offer to do the tests later. Email discussion about the schedule.

Andre: main request, sending the phones to the next lab (Orange), better than 1 month delay.

Alain: How much time did you spend for testing?

Jan: distributed over 1-2 weeks, overall for each phone 1-2 hours.

Alain: We don’t have all the automatic equipment. Will you provide the ACQUA database?

Jan: yes

Alain: Jan can send some devices, will start testing. Hope to be done in January.

Stéphane: this Tdoc is for discussion, and not the final set of results, can we note it?

Jan: yes

**Decision:** S4-201317 is noted. An updated test plan will be produced in S4-201613.

**Part from telco #3 (Tuesday):**

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| S4-201613 | Proposals for data collection of HaNTE – test methods | Rapporteur (Qualcomm Incorporated) |

**Presenter:** Andre Schevciw (Qualcomm)

(*Andre presents a draft version of* S4-201613 *available in the Drafts/SQ folder*)

Updated test plan. For time plan, lab 2 not finalized.

**Comments / questions:**

Antero: can start measurements in mid January.

Andre: tests are not long, especially if using automated setup for HEAD acoustics equipment.

**Decision:** S4-201613 is agreed.

An AH telco (shared with other WIs) is agreed: Jan. 18th, 16:00-17:30 CET; Submission Deadline: Jan. 15th 23:59 CET; Host: Qualcomm Incorporated

**A.I. 9.7 HInT (Extension for headset interface tests of UE)**

**Part from telco #2 (Monday):**

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| [**S4-201482**](https://www.3gpp.org/ftp/tsg_sa/WG4_CODEC/TSGS4_111-e/Docs/S4-201482.zip) | dCR 26.131 Extension for headset interface tests of UE | Orange |

**Presenter:** Alain Curti (Orange)

TS 26.131 does not currently specify requirements for an analogue, digital or wireless headset interface of a terminal. It is relevant to introduce testing of the headset interface in today’s market where users can purchase compatible products that use standardized connections from different suppliers, and compatible headsets can be freely combined with mobile phones.

This document is a resubmission of the dCR agreed during the Oct 19 AH telco.

**Comments / questions:**

Stéphane: This document is the same as the dCR presented at the last SQ SWG telco. Can we agree on it?

Answer: yes.

**Decision:**

S4-201482 is agreed as basis for further editing.

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| [**S4-201308**](https://www.3gpp.org/ftp/tsg_sa/WG4_CODEC/TSGS4_111-e/Docs/S4-201308.zip) | Draft-CR TS 26.132 Extension for headset interface tests of UE (updated) | HEAD acoustics GmbH |

**Presenter:** Jan Reimes (HEAD acoustics)

Within the scope of the work item HInT, it is intended to add new test methods to TS 26.132 for analogue and digital interfaces of UE. As a preparation for these, a detailed specification and description of the introduced interfaces has to be included. This dCR introduces new clauses for analogue and digital interfaces, editorial changes in the existing clauses regarding measurement equipment.

Fixed cover sheet. Only specified for clause 7 (NB case). Proposal to use junction loudness rating. In 7.5.3, assume default sensitivity to transfer electrical sidetone to ear. In 7.5.4, no acoustic path, may use default delay (5ms?)

**Comments / questions:**

Stéphane: yellow highlighting shows the changes compared to the document presented at the Oct 19 AH telco?

Jan: yes

Stéphane: For the idle noise, you move some of the text in overview. If clause 7.3.1 is referenced in external spec, there could be something missing.

Jan: agree, will add text to refer to 7.3.0.

Peter: for headset sensitivity in 7.5.3, the value comes from safety consideration to avoid to be too loud, and some tolerance is added to avoid to be at maximum. The tolerance of +/-6dB is used ITU-T P.381.

Stéphane: allocate S4-201614 for an update based on today’s comments, will see the revision on Tuesday.

**Decision:**

S4-201308 is revised to S4-201614.

**Part from telco #3 (Tuesday):**

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| [**S4-20**](https://www.3gpp.org/ftp/tsg_sa/WG4_CODEC/TSGS4_111-e/Docs/S4-201308.zip)**1614** | Draft-CR TS 26.132 Extension for headset interface tests of UE (updated) | HEAD acoustics GmbH |

**Presenter:** Jan Reimes (HEAD acoustics)

(*Jan presents a draft version of* S4-201614 *available in the Drafts/SQ folder*)

There was offline discussion on sensitivity for clause 5.1.6.

It should have been -37 dBV for NB and -39 dBV for WB (&SWB/FB). Two options:

1) keep -39 dBV consistent for bandwidth, being compatible with P.381, or

2) use more accurate and bandwidth (BW)-specific nominal levels, but being incompatible with P.381

For sidetone, all comments were cleaned into one. In 7.7. new sentence inserted with 1/3 octave band. In 7.7.5, assume echo attenuation of 30 dB, in some cases it is 20 or 40 dB, have to do some echo simulation. In 7.12.3, HEAD acoustics can provide offline recordings (similar to handset testing).

**Comments / questions:**

Peter: propose to have single value for all BW, similar to -16dBm0 for receiving, it will be simpler. It should be -38.5 dB which is rounded to -39 dB, so the difference is 1.5 dB.

Jan: Not a large difference. It will be better / easier.

Andre: What is the meaning of “average signal level” in this context? Is it average over multiple measurement or RMS?

Jan: The sentence comes from P.381.

Peter: Good comment, we need to be clear about signal and level definition.

Stéphane: request to insert explicit statement for “editor note’s”, but this is just editorial and it can be done offline before submitting the Tdoc.

**Decision:**

S4-201614 is agreed as basis for further editing.

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| S4-201615 | Time Plan for HInT, v0.2 | Rapporteurs (HEAD acoustics GmbH, Orange) |

**Presenter:** Stéphane Ragot (Orange)

(*Stéphane presents a draft version of* S4-201615 *available in the Drafts/SQ folder*)

Updates are to reflect what has been done so far. Proposal to have two telcos.

**Comments / questions:**

(*online corrections done on the draft to correct telco details: specify CET, submission deadline, host*).

**Decision:** S4-201615 is agreed.

**A.I. 9.8 New Work / New Work Items and Study Items**

None.

**A.I. 9.9 Any other business**

None.

**A.I. 9.10 Close of the session**

The SQ Chair thanked all delegated for their participation and contributions. The session was closed on Tuesday at 16:43 CET.

**Annex A – Meeting agenda**

|  |  |  |
| --- | --- | --- |
| 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) | Test setups for immersive communication systems:1309->1612a (HEAD acoustics) A.I 15.3Time plan1492a (Co-Rapporteurs) A.I 15.3Telco (Jan. 18th, 16:00-17:30 CET; Submission Deadline: Jan. 15th 23:59 CET; Qualcomm Incorporated) |
| 9.6 | HaNTE (Handsets Featuring Non-Traditional Earpieces) | Report from Lab 2 (RR):1317n (HEAD acoustics)Test plan (including time plan)1613a A.I 15.4Telco (Jan 18, 16:00-17:30 CEST; Submission Deadline: Jan 15 23:59 CEST; Host: Qualcomm Incorporated) |
| 9.7 | HInT (Extension for headset interface tests of UE) | 26.132:1308->1614a (HEAD acoustics) A.I 15.526.131:1482a (Orange) A.I 15.5Time plan1615a A.I 15.5Telco (Dec. 7th, 16:00-17:30 CET; Submission Deadline: Dec. 4th 23:59 CET; Host: HEAD acoustics GmbH)Telco (Jan. 18th, 16:00-17:30 CET; Submission Deadline: Jan. 15th 23:59 CET; Qualcomm Incorporated) |
| 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 (provided by the SA4 Secretary – MCC)**

**B.0 Consolidated list of participants (merging three telcos with no doubles)**

**B.1 Telco on 13th November 2020 (15:30-17:00 CET)**

**xxx participants**

**B.2 Telco on 16th November 2020 (16:00-17:30 CET)**

**xxx participants**

**B.3 Telco on 17th November 2020 (15:00-16:30 CET)**

**xxx participants**

**Annex C - Documents status**

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

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| --- | --- | --- | --- | --- |
| Tdoc | Title | Source(s) | Agenda Item(s) | Status |
|  |  |  |  |  |

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

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| --- | --- | --- | --- | --- |
| Tdoc | Title | Source(s) | Agenda Item(s) | Status |
| [**S4-201482**](https://www.3gpp.org/ftp/tsg_sa/WG4_CODEC/TSGS4_111-e/Docs/S4-201482.zip) | dCR 26.131 Extension for headset interface tests of UE | Orange | 9.7, 15.5 | Agreed |
| S4-201492 | Draft time plan for ATIAS, v0.3 | ATIAS Co-Rapporteurs (Orange, Dolby Laboratories, Inc.) | 9.5, 15.3 | Agreed |
| S4-201612 | DraftCR TS26.260 on Immersive Speech Communication Systems (update) | HEAD acoustics GmbH | 9.5, 15.3 | Agreed |
| S4-201613 | Proposals for data collection of HaNTE – test methods | HaNTE Rapporteur (Qualcomm Incorporated) | 9.6, 15.4 | Agreed |
| S4-201614 | Draft-CR TS 26.132 Extension for headset interface tests of UE (updated) | HEAD acoustics GmbH | 9.7, 15.5 | Agreed |
| S4-201615 | Time Plan for HInT, v0.2 | Rapporteurs (HEAD acoustics GmbH, Orange) | 9.7, 15.5 | Agreed |

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

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| --- | --- | --- | --- | --- |
| Tdoc | Title | Source(s) | Agenda Item(s) | Status |
| [**S4-201308**](https://www.3gpp.org/ftp/tsg_sa/WG4_CODEC/TSGS4_111-e/Docs/S4-201308.zip) | Draft-CR TS 26.132 Extension for headset interface tests of UE (updated) | HEAD acoustics GmbH | 9.7 | Revised |
| [**S4-201309**](https://www.3gpp.org/ftp/tsg_sa/WG4_CODEC/TSGS4_111-e/Docs/S4-201309.zip) | DraftCR TS26.260 on Immersive Speech Communication Systems (update) | HEAD acoustics GmbH | 9.5 | Revised |
| [**S4-201317**](https://www.3gpp.org/ftp/tsg_sa/WG4_CODEC/TSGS4_111-e/Docs/S4-201317.zip) | Preliminary results of HaNTE round robin test results for Lab2 | HEAD acoustics GmbH | 9.6 | Noted |

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

None.

1. **Mr. Stéphane Ragot, Orange**

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