Joint TSG-S4#10 - SMG11#15 Meeting
February 28 – March 3 2000, Helsinki, Finland

S4/SMG11 Tdoc 155/00

Title: **Comments to TS 26.132 v0.0.3**

Source: **Bosch Telecom Danmark A/S**

Document for: **Discussion**

1. Concerns by Bosch Telecom

Bosch Telecom has 3 major concerns regarding the new specification for the 3GPP devices:

1) Only using the air interface for measurements.

2) Using HATS for the measurements.

3) Making complex requirements to external hands-free devices.

2. Problems using the air interface

1. Measuring via the air interface does not (from our experience with the R&S UPL-16) provide reliable results, especially with low level stimuli, SINAD and idle noise measurements. Differences are also seen on the sensitivity measurements, when compared with DAI measurements.

2. Many measurements are not possible, such as linearity and clipping measurements, which are essential to a good design.

3. Well known measuring methods cannot be applied due to the speech coder. With a DAI interface simple and standard equipment/methods can be used due to the simple PCM interface.

4. The stimuli levels will with complex signals will be alternating, thus the power put into the measuring path is constantly changing. It is therefore impossible to tell to what degree the system has been pushed. A problem f.ex. with the distortion measurements.

5. The complex stimulus requires very large average times, which makes the method unsuitable for running production testing. At the same time having a air link + very complex measuring equipment increases cost in a production. This will result in that no manufacture will do acoustic tests in running production (maybe on sample basis only). Today's DAI method is simple and low cost, and at the same time fast and reliable.

6. When thinking about development of terminals, it will be impossible to use the air link for measurements during the beginning of the development, since it is not implemented yet. In contrast, the DAI interface is typically build-in to the chipset, thus accessible from day one. From our point of view, it generates a paradox - a DAI interface is needed during development, but are not allowed for type approval.

7. In summery the air interface method increases the complexity of the measurements, the equipment and the development of terminals, and removes the possibility to used standard measuring methods. The only thing the air interface method is good for is the possibility that anyone can test on any terminal. This does not improve the performance

3. Problems using HATS

1. The reproducibility of HATS measurements is not very good. The positioning of the handset is very sensitive to even small changes in position.

2. We expect that there will be large differences in measuring with the type 3.4 and the type 3.3 (We do not have a type 3.4 ear, but we expect the leakage to be significant different due to the physical different shapes).

3. A HATS does not provide a better description for the natural leakage between the phone and the ear, since it also only test ONE position of the handset. Moving the handset a little provides a new leakage. What is the correct position?.....There is no answer, because it is up to the user of the terminal. The argument is that a type 3.2 coupler is just as good and recommended.

4. Using HATS is not in agreement with the PSTN standards.

5. The HATS technology is very new and it is primary designed for sound recording. Several investigations have proven that they are not a very good “average” human representative. We think that the technology is too mature for the intended use.

6. The HATS is NOT suitable for testing in running production. Mounting of handset is time consuming and it requires a skilled person, and a special device for holding the handset in place. It will be very noise sensitive and requires an almost free-field environment. Again the result will be that the manufactures eliminates the acoustic production test.

7. The cost of the equipment required is again significantly increased without any improvements compared with measurements using a standard test head set-up and a type 3.2 coupler.

8. The HATS measurements are NOT in agreement to the GSM standard. We would like to see this relation.

9. For testing integrated hands-free there is no need for using HATS. A free-field microphone is sufficient due to symmetry and known transmission path from the source.

10. Positioning of the HATS within +/- 2° as required is close to unrealistic, and again is the HATS very sensitive to small changes hereof.

4. Problems with making complex requirements to external hand-free devices

1. The environment in which the hand-free devices are placed will always be an unknown factor thus no tests will reveal the actual usage situation. Why not make the requirements for free-field conditions, thus when measured using a simple sound source and a free-field microphone. A HATS measurement in a simulated environment will NOT give a better estimate of the usage situation anyway.

2. Again, since the environment in which the hand-free devices are placed will always be an unknown factor the echo will be as well. Reduce the requirements to a stability requirement, and make it up to the manufacture to make a good echo-canceller. No persons will buy a hands-free device if there is an annoying echo.

5. Conclusion

Based on this,

Bosch Telecom supports the use of DAI in 3GPP terminals for most reliable and wide range measurements. Measurements via air interface may still be optional as in GSM standards.

Bosch Telecom supports the use of LRGP measurement on 3GPP terminals. To provide conformity with GSM standards a type 3.2 low leak coupler should be used. This provides common acoustic specifications for dual-mode GSM/UMTS terminals as well

Bosch Telecom can NOT support the use of HATS for Terminal and integrated hands-free testing.