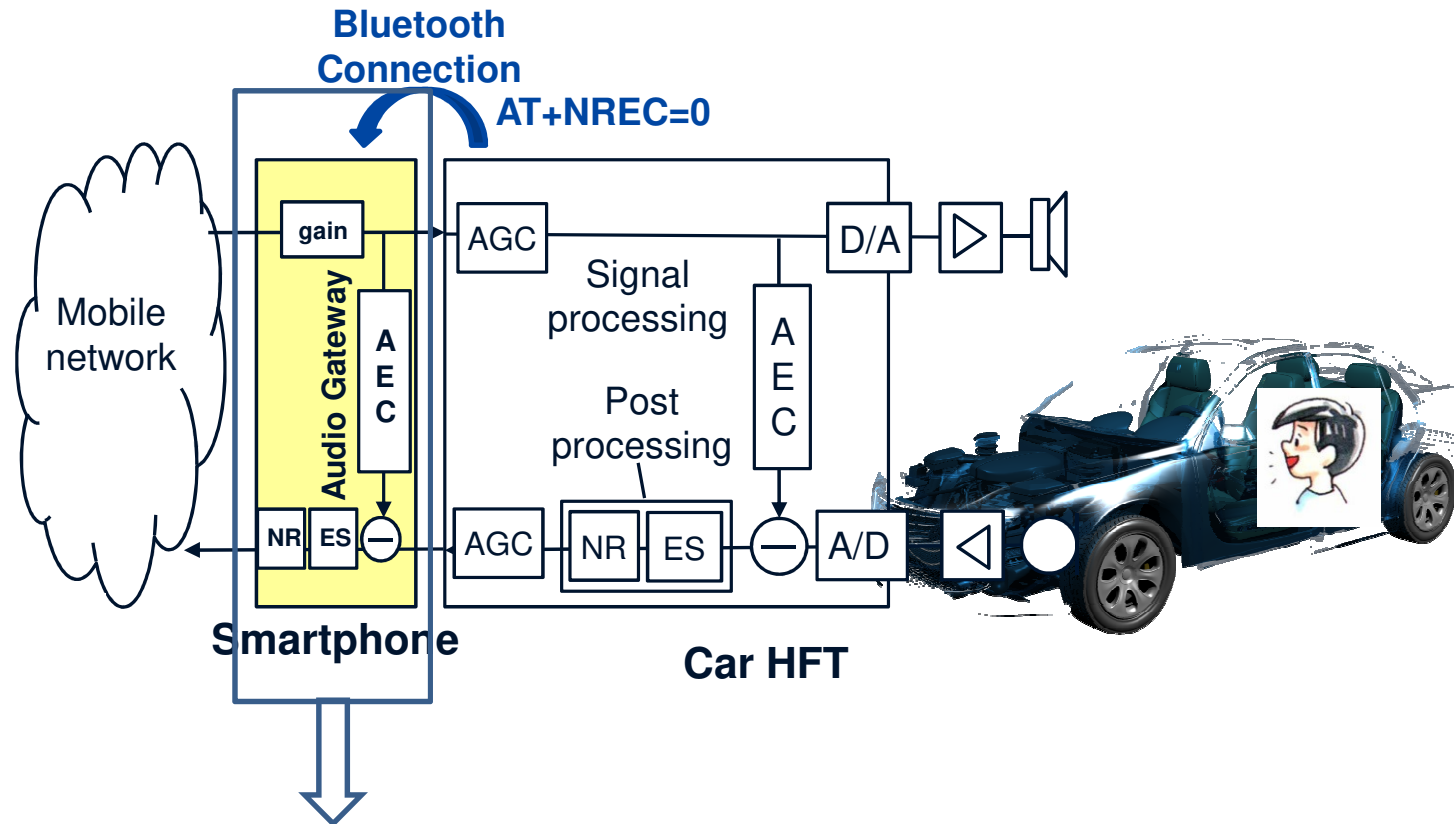




ITU-T Requirements and Tests specified in Chapter 12 of P.1100 / P.1110

HEAD acoustics GmbH



Verification through audio testing

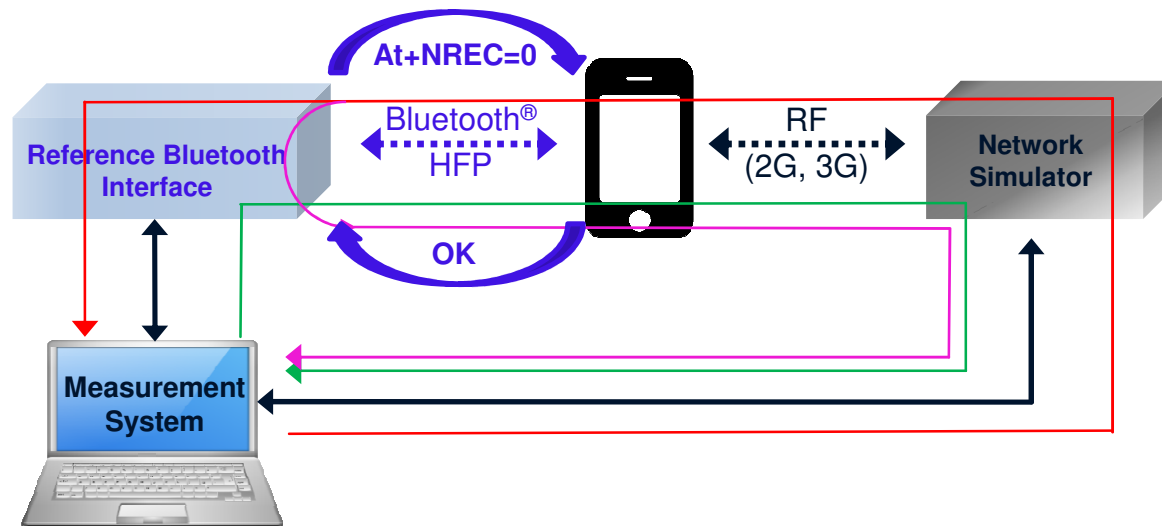
Recommendations ITU-T P.1100 / P.1110, Chapter 12

Tests applied during 1st Test Event in 2014, 2nd and 3rd Test Event in 2016



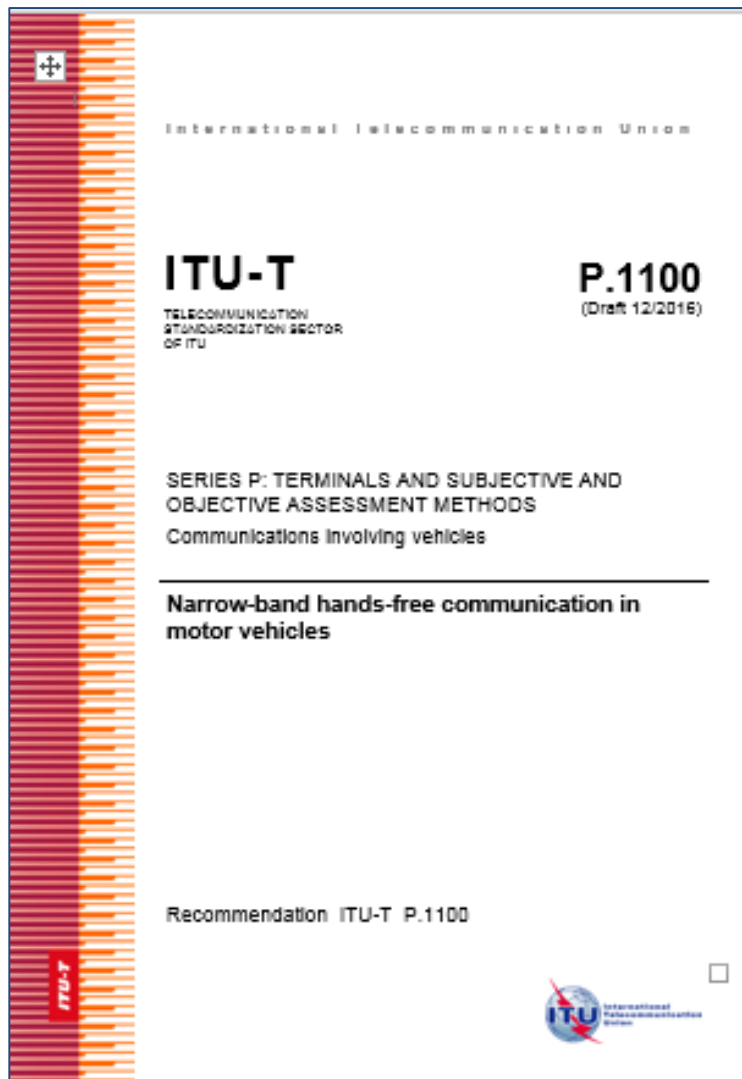
Involved Parties and their Roles

- Automotive industry:
 - Provides integrated hands-free terminals (HFT)
 - Relies on the audio gateway functionality provided by mobile phones
- Mobile phone industry:
 - Provides audio gateway (AG) functionality for the HFT
- Bluetooth® SIG:
 - Specifies the Hands-Free Profile (HFP) used for connecting the HFT to the AG
 - Problem: The HFP specification describes protocols and commands but not the audio performance.
- ITU-T:
 - Provides Recommendations (P.1100/1110 Chapter 12) for “transparent“ audio performance of the AG in a short-range wireless (SRW) connection (e.g. Bluetooth®)
 - ITU-T Whitelist: List of transparent phones.



Testing of the phone in isolation in a simulated connection (HFP) to car HFT

1. Set up Bluetooth® Connection and sending the AT command
2. Establishing the audio connection (Call)
3. Performing audio tests to determine the phones' performance





12.1.1 SRW delay

12.1.1.2 Test in send direction

12.1.1.3 Test receive direction

12.2 SRW loudness ratings

12.2.2 Test SRW JLR in send direction

12.2.3 Test SRW JLR in receive direction

12.2.4 SRW linearity in send direction

12.2.5 SRW linearity in receive direction

12.3 SRW sensitivity frequency responses

12.3.1 SRW send sensitivity frequency response

12.3.2 SRW receive sensitivity frequency response

12.4 SRW noise cancellation test in send direction

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12.4 SRW noise cancellation test in send direction

12.5 SRW speech quality during single talk

12.5.1 One-way listening speech quality in send direction

12.5.2 Listening speech quality stability in send direction *)

12.5.3 SRW one-way listening speech quality in receive direction

12.5.4 Listening speech quality stability in receive direction *)

12.5.5 Verification of disabled echo control

*) for representative positions of the phone within the vehicle and different combinations of SRW links active.