

THE FULLY NETWORKED CAR



**The new ITU-T focus group FitCar
(From/In/To Cars Communication)
– ITU-T test specification for hands-
free terminals in Cars**

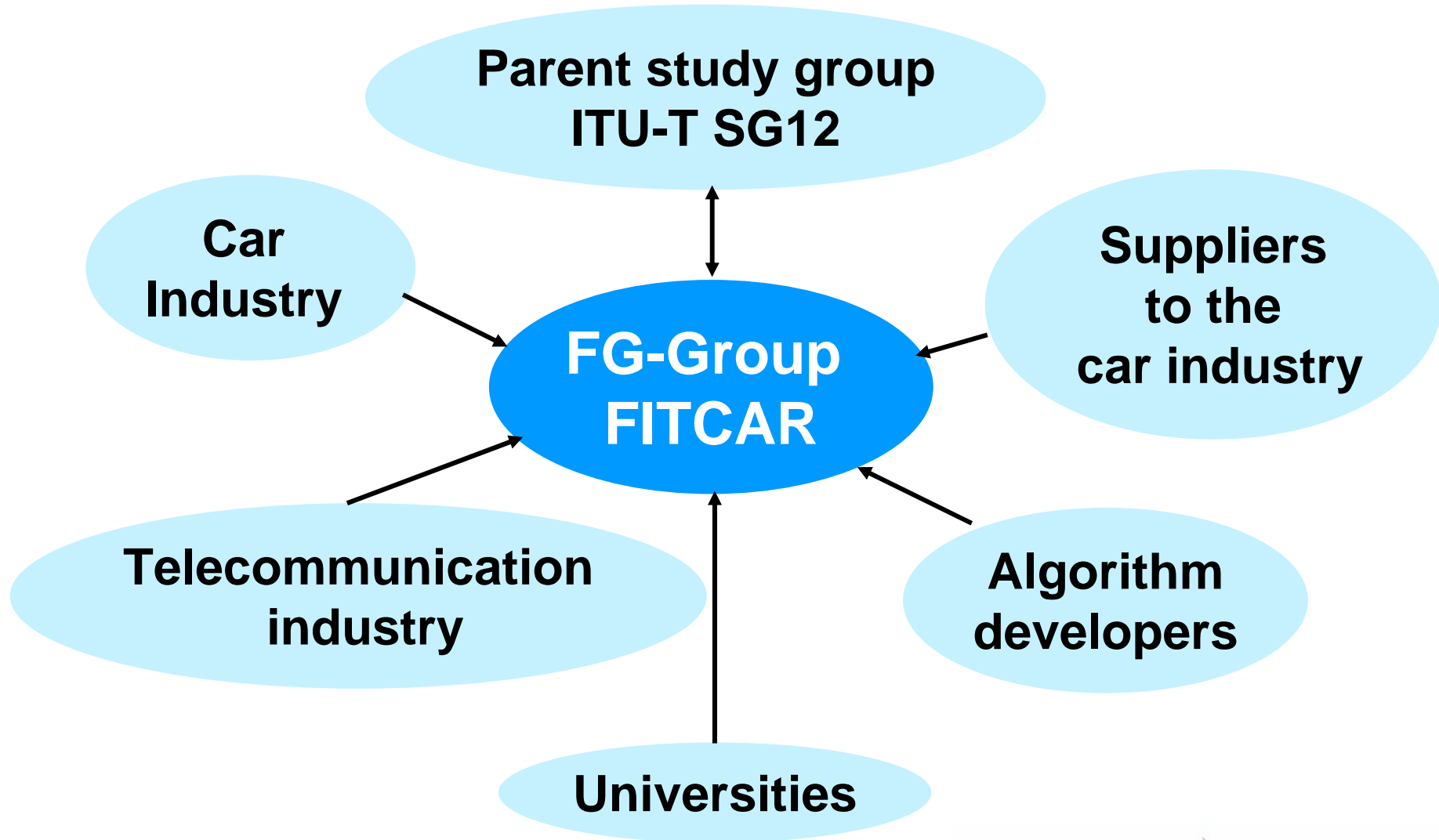
H. W. Gierlich, HEAD acoustics GmbH

J. Y. Monfort, Orange-FT Group

Geneva, 5-7 March 2008

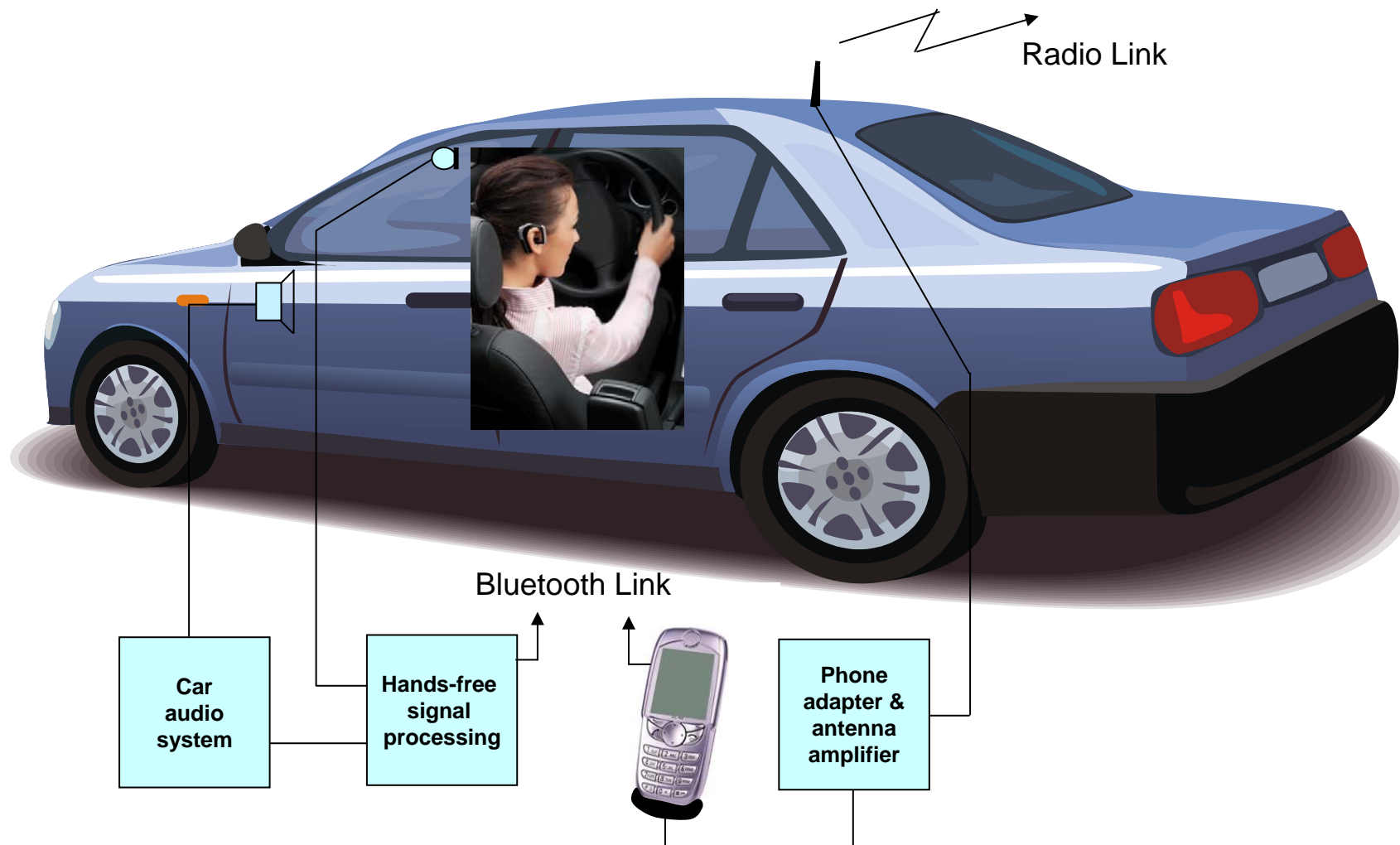


- The participants of the focus group
- The goals
- The New FITCAR - Specification
- Schedule and future work
- Conclusions



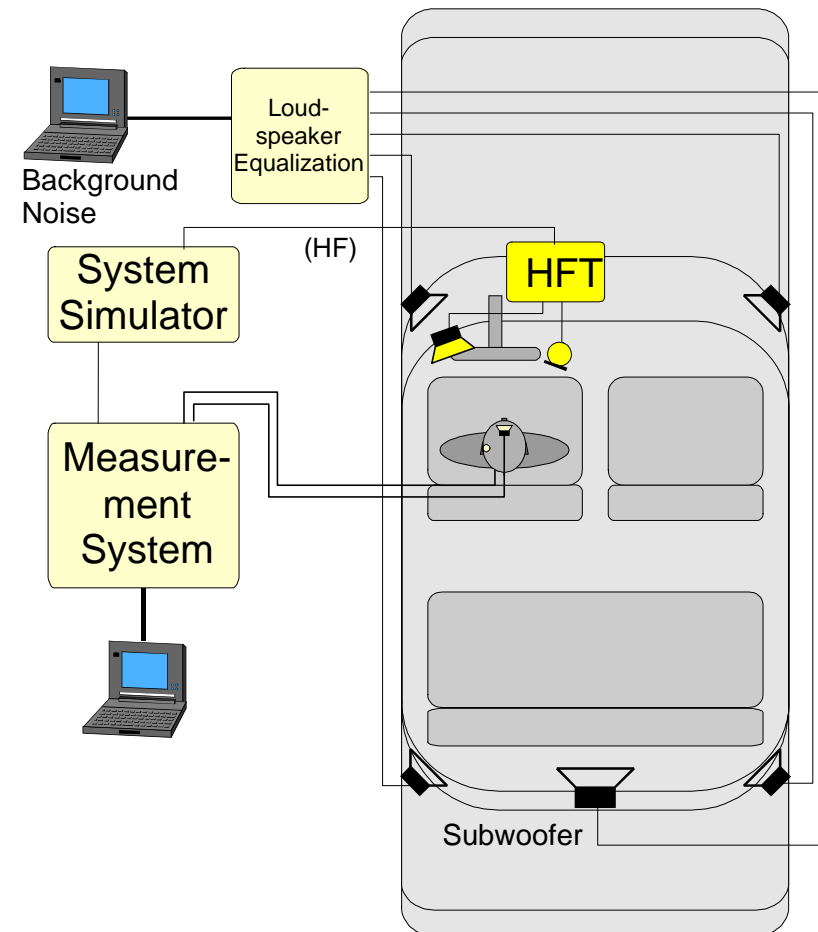
- o Development of a standard for testing and optimization
 - the communication quality
 - from cars to the mobile/fixed network
 - of audio components installed in a car and used for hands-free communication
 - wireless devices e.g. headsets used in a car

Hands-Free Functional Blocks in a Car



- Definition of the test arrangement in a car
- Description of a digital interface concept for development and debugging
- Microphone test specification for separate microphones in a car
- Measurement parameters and requirements for hands-free terminals
- Bluetooth test interface for validation of telephone performance
- Subjective test strategy for car to car communication

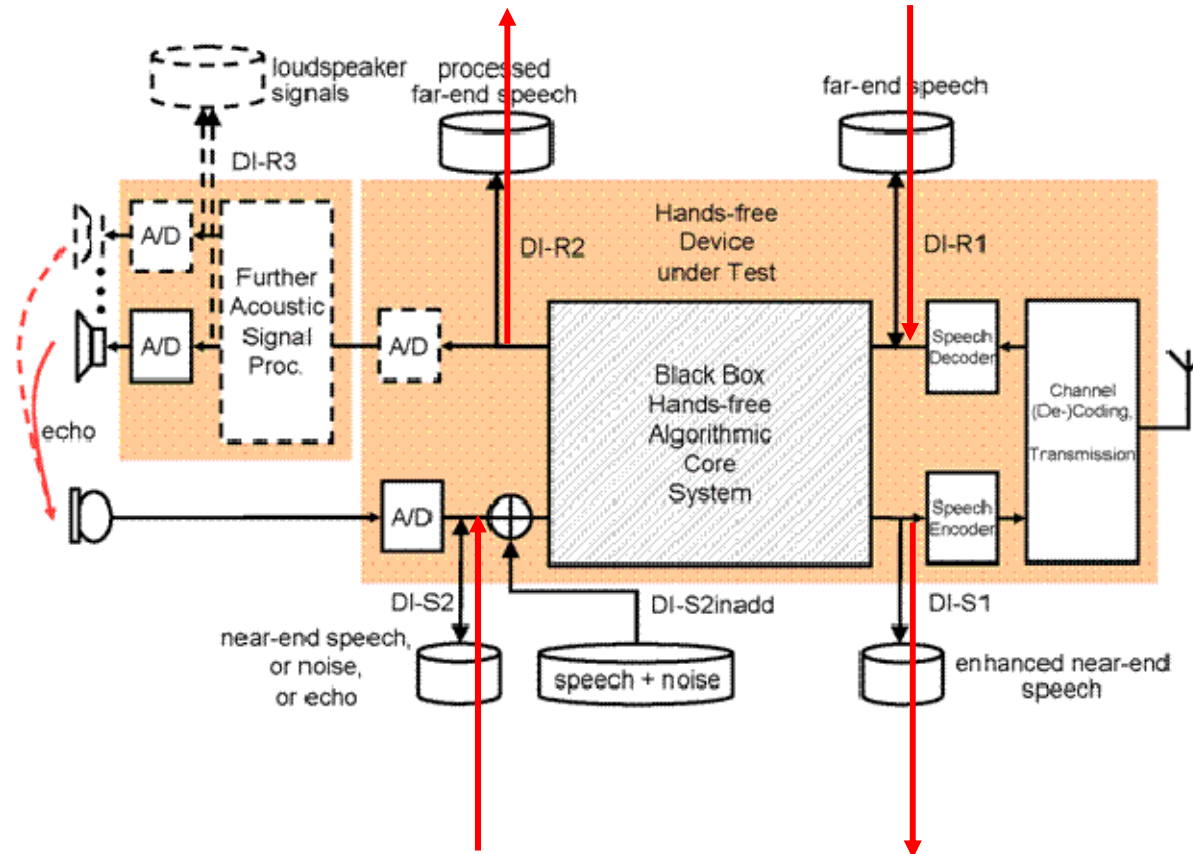
- Target car with hands-free installed
- Background noise simulation installed
- Speaker/listener substituted by an artificial head
- Network substituted by a network system simulator



The Digital Test Interface

Record processed far end speech

Insert far end speech



Insert near end speech & noise

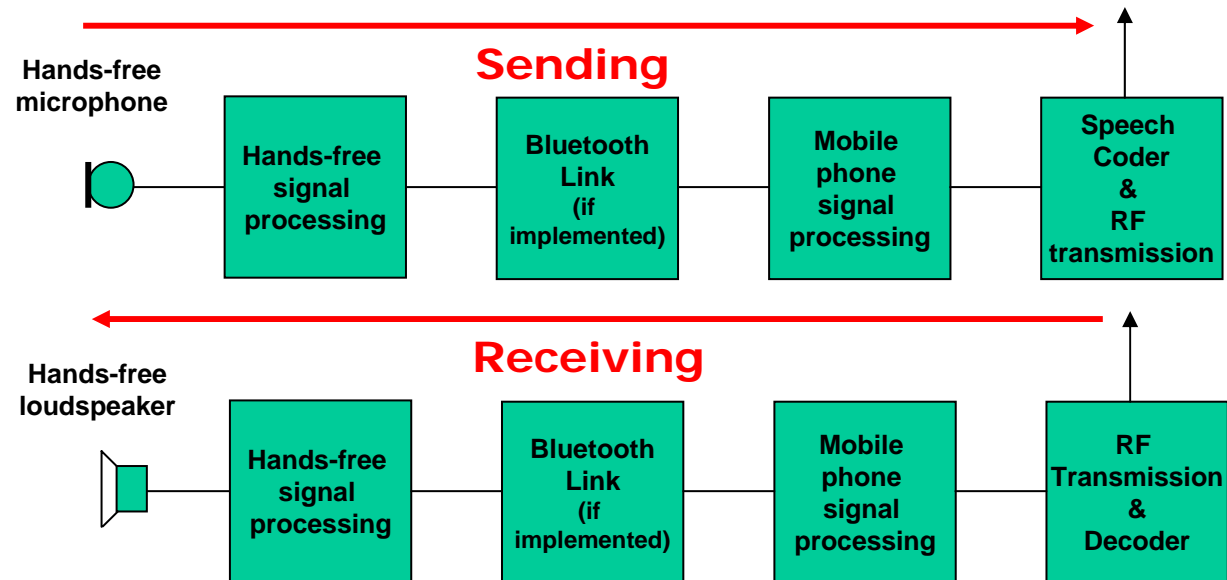
Record processed near end speech

- Tests in anechoic conditions focusing on the microphone properties
 - Sensitivity
 - Directivity
 - Response characteristics

- Performance tests in the car
 - Sensitivity
 - Directivity
 - Response characteristics

The Main Parameters in the FITCAR Specification

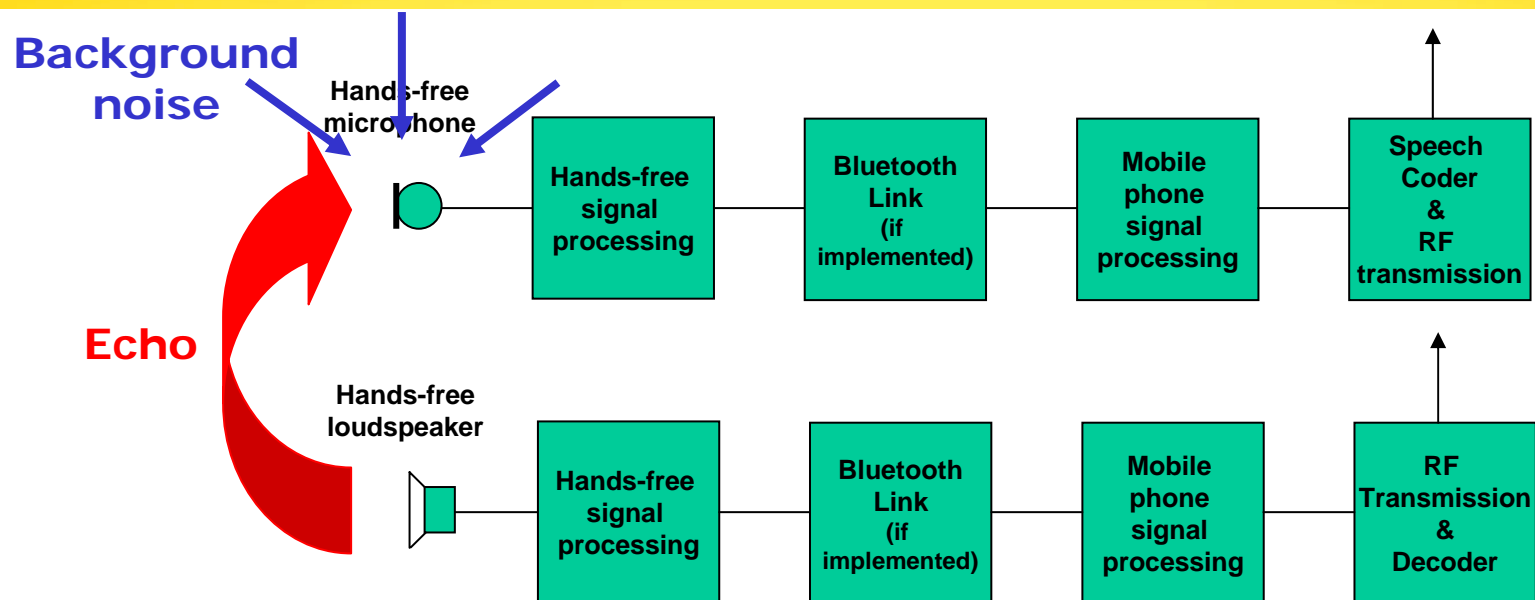
10



- o Single talk - Sending and Receiving
 - Delay
 - Loudness
 - Speech Sound Quality

The Main Parameters in the FITCAR Specification

11

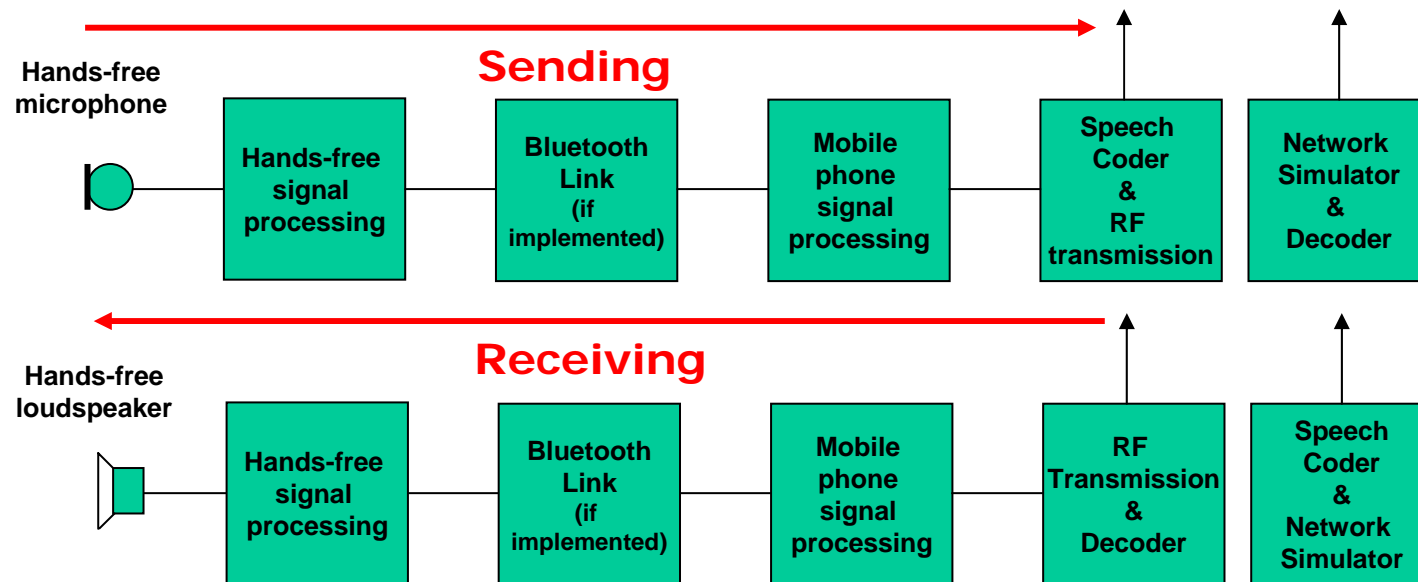


o Echo performance

- Echo loss
- Temporal and spectral echo loss
- Time variant echo path
- Echo performance with background noise

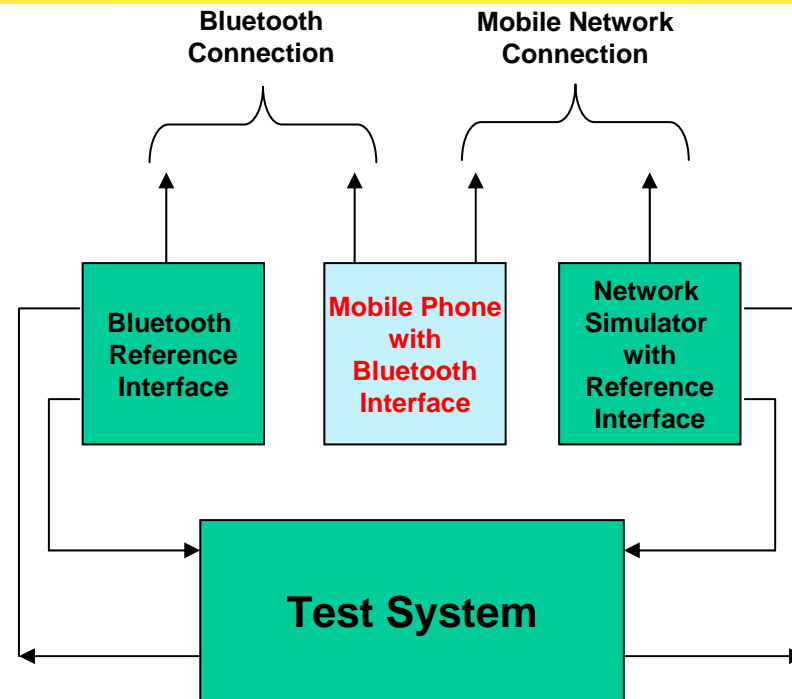
The Main Parameters in the FITCAR Specification

12

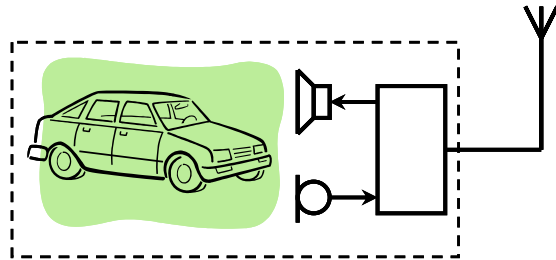


o Double talk performance

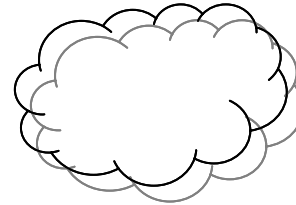
- Attenuation of the speech signal
- Echo during double talk



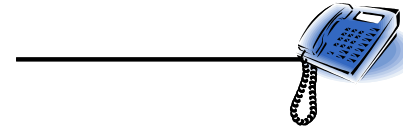
- o Performance parameter of the phone used in the connection
 - Delay
 - Linearity
 - Deactivated signal processing



Hands-free system under test in the car (near end)

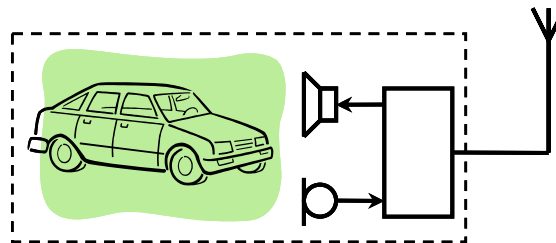


Cellular network

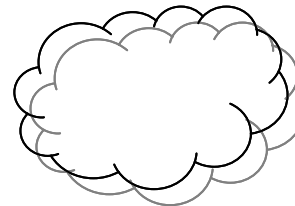


Landline (far end)
Supervisor

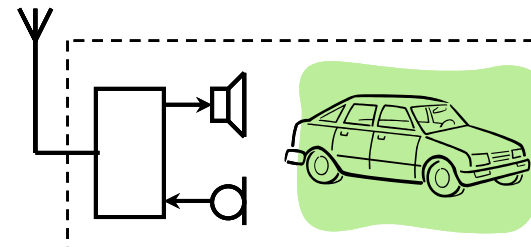
o Tests car to landline



Hands-free system under test in the car (near end)



Cellular network



Hands-free system in the observing car (far end)
Supervisor

o Tests car to car

Schedule and Future Work: The New Focus Group CarCom

15

- Input of FITCAR specification to ITU-T SG12
- “Kick off” new group FG CarCom - meeting June 08

⋮

- Mid 2009

- *Input from FITCAR Specification for Narrowband Hands-Free*

⋮

- *New Specification, Wideband*

- The ITU-T focus group *FITCAR* was an excellent forum to join forces for standardization
 - From the telecom industry
 - From the car industry
 - Suppliers
 - Universities
- The focus group *FITCAR specification* is the first comprehensive standard covering all conversational aspects of handset and speakerphone conversation in cars

<http://www.itu.int/ITU-T/studygroups/com12/fgfit/index.html>