



# WorldDMB General Assembly - Car Radio Entertainment

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Ron Schiffelers, Director Program Management



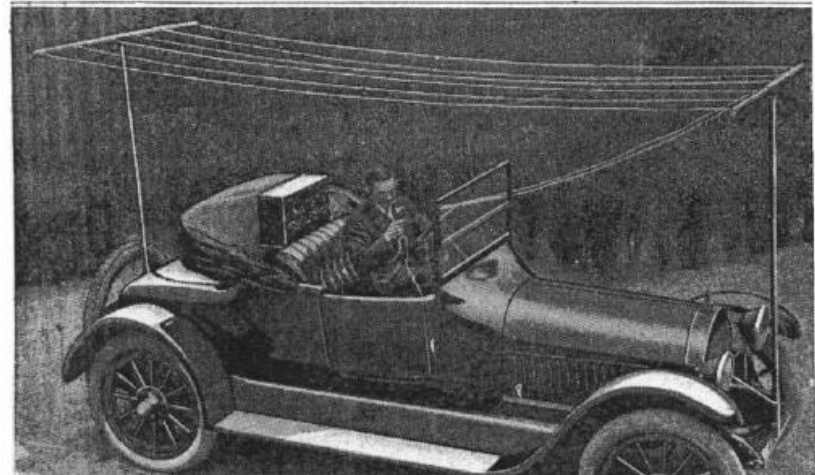
# Radio & Car – inseparable since 1920's

- ▶ In-car radio had a lot of opposition in the beginning → too dangerous
- ▶ Today it is the main entertainment in the car and a must-have feature
- ▶ Radio-listening often done in the car
- ▶ Digital Radio slowly becoming a mandatory feature in automotive
- ▶ Multiple standards for Digital Radio – countries on different timelines

## POPULAR MECHANICS

October, 1919

RADIO SETS FOR AUTOMOBILES  
PROMISE OF NEAR FUTURE



# NXP Connects the Car

... enabling communication between cars, people, infrastructure

## NXP Semiconductors

Established 2006

former part of Philips

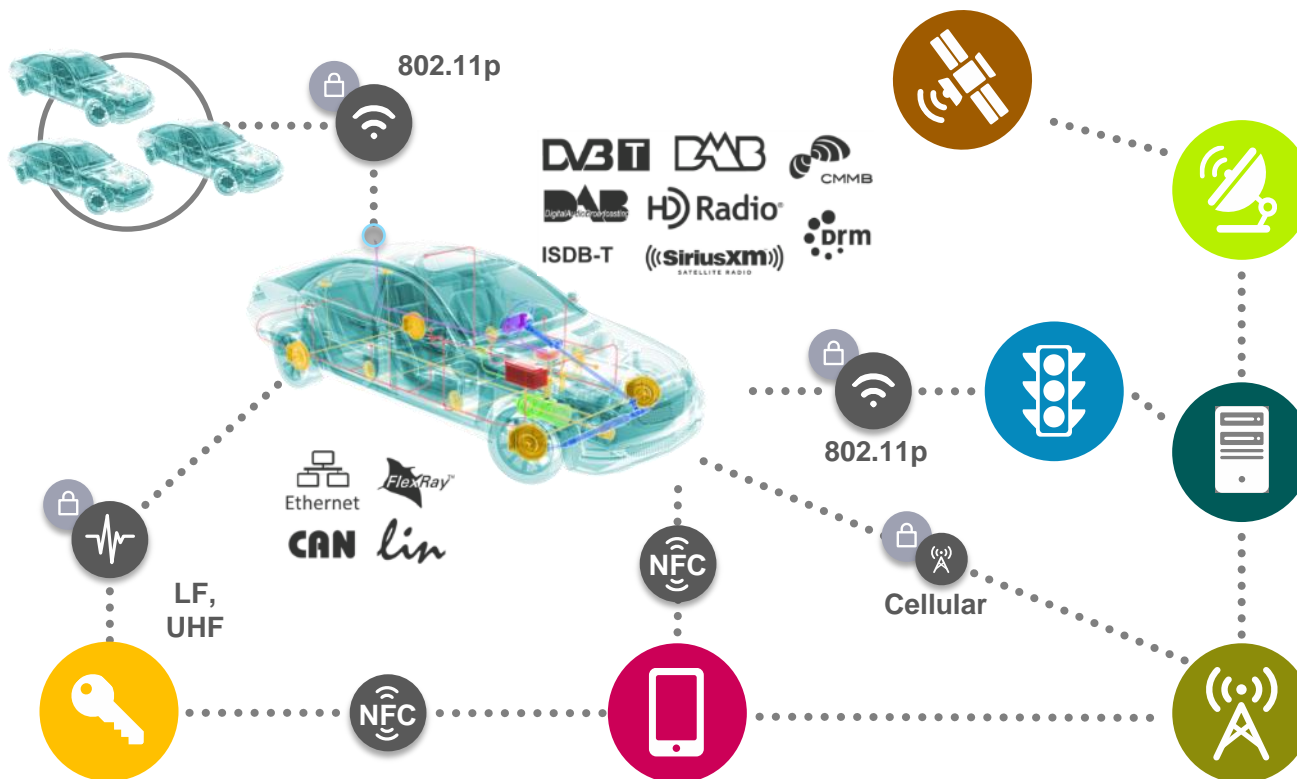
25,000 employees

4.4B\$ revenue 2012

Global innovator:

11,000 patents, >600M\$ R&D

>200M\$ R&D in The Netherlands (nr.6)



## Automotive IC Market Positions

- #1 Car Entertainment
- #1 Car Access
- #1 In-Vehicle Networking
- #3 Magnetic Sensors
- #1 Automotive Logic
- #1 Small Signal Discretes

# NXP: long history in radio



On 17th August 1956 Fieldmarshal Montgomery visited the Philips plant in Nijmegen.

It became a real triumphal procession for Montgomery, who liberated Nijmegen from the German occupation during Operation Market-Garden in 1944. On this occasion Montgomery received a transistor radio, which was specially made for him.

The radio, presented by the former director of Philips Nijmegen, Dr. Ir. J.J. v.d. Spek, contains the following Philips Nijmegen transistors: OC44, 2 x OC45, OC70 and 2 x OC72.

The presentation took place in the main entrance of building A.

... a radio on  $\sim 1\text{cm}^2$  with  
10's of Millions of transistors



From a 6-transistor radio to ...

# Is Automotive different for digital radio?

- **Temperature & Lifetime**
- **Global platforms**
- **Distraction free & intuitive use**
- **Challenging reception situations**
- **On the road: entertained & informed**

Cold



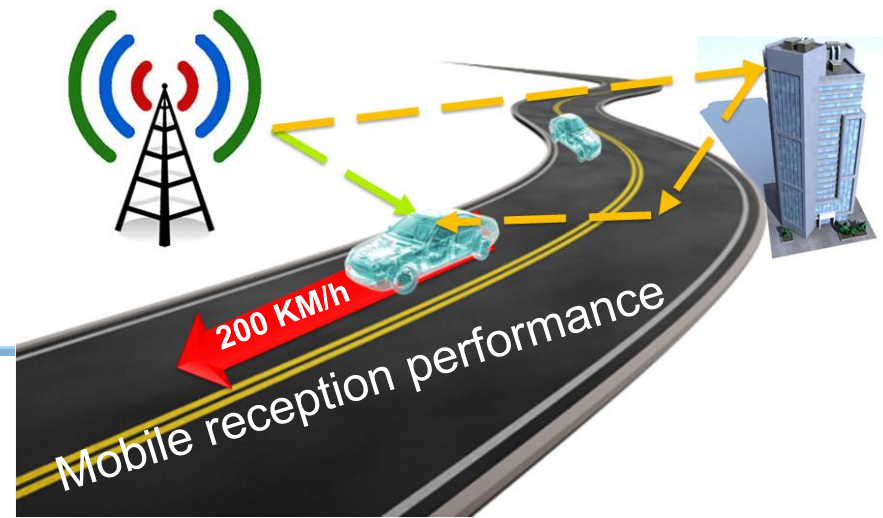
Hot



Lifetime



**Yes, Automotive is different**



# How to get the car radio into the Digital Age?



# Digital Radio: the automotive challenges

- **Temperature & Lifetime**
- Global platforms
- Distraction free & intuitive use
- Challenging reception situations
- On the road: entertained & informed

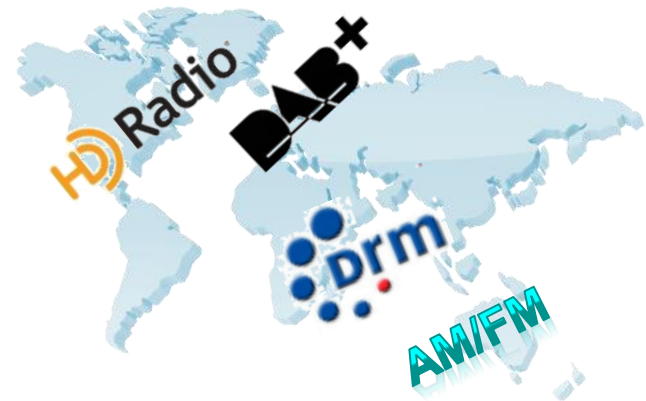
- ▶ **Automotive quality chip sets**



# Digital Radio: the automotive challenges

- Temperature & Lifetime
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## ▶ SW Defined Radio





# Digital Radio: the automotive challenges

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## ▶ HMI: day vs night



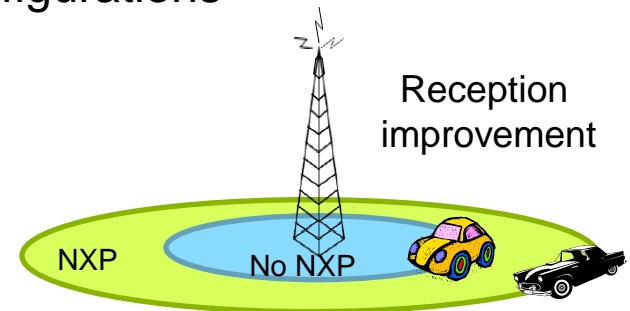
- ▶ **Unified** service list for DAB & FM
- ▶ **Seamless** blending



# Digital Radio: the automotive challenges

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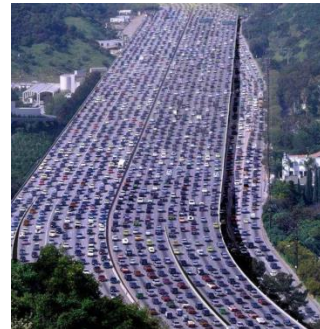
- ▶ **Superior sound** under varying reception and challenging antenna configurations



# Digital Radio: the automotive challenges

- Temperature & Lifetime
- Global platforms
- Distraction free & intuitive use
- Challenging reception situations
- **On the road: entertained & informed**

## ▶ Data services & **exclusive** content



BBC  
RADIO



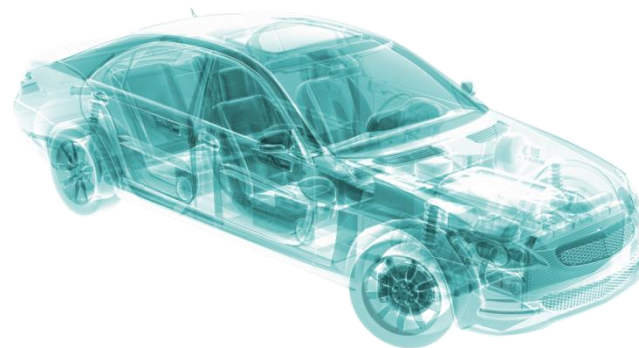
Nieuws 24



# Conclusions



- ▶ Automotive is different
- ▶ NXP and the industry tackle those challenges
- ▶ A lot has been done but still some way to go





**Thank you**



**Ron Schiffelers**  
**Director Program Management**  
**Email: [ron.schiffelers@nxp.com](mailto:ron.schiffelers@nxp.com)**