YES - RDS can be enhanced

This presentation highlights the possibilities for extended RDS - xRDS

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Benefits 1/3

- **RDS data rate can be quadrupled**
  - RDS has now a usable data rate of 673.7 bits per second
  - xRDS would be up to 2021 bps in addition

- **The possible extension will be compatible**
  - With old receivers
  - Only new receivers will be able to use the extended RDS
  - For xRDS new RDS encoders are needed
    - Implementation will depend on revenue the xRDS would generate
    - Initial tests started in 2009 with old RDS encoders using them in a cluster of four and where each of the three additional RDS signals was shifted up
  - Broadcasters can choose to use RDS or xRDS
Interesting additional option:
- xRDS may concern only a certain category of receivers
  - For example only Personal Navigational Devices
  - Advantage: most radio receivers can continue to use RDS and need no xRDS
- Only receivers with an xRDS chip can receive the enhanced RDS data service
Benefits

YES - RDS can be enhanced
Other advantages 1/2

- Relatively easy to adapt the RDS standard
  - Modulation of xRDS channel
  - Injection level
  - Adapted ODA feature

- Possible to adapt and enhance the UECP
  - Important to retain the universal RDS encoder communication protocol and adapt it to xRDS
Other advantages 2/2

- **Easy to code the xRDS segment**
  - Use exclusively the adapted ODA feature
    - Requires a small adaptation for xRDS in the standard
    - This permits to define new applications and to extend known applications like TMC (already using ODA)

- **Apparently compatible with existing ITU-Recommendations**
  - An international consensus is needed on this issue
    - Concerns regulators, transmission operators and broadcasters

YES - RDS can be enhanced
Disadvantages of xRDS

- xRDS and HD radio cannot be used simultaneously
- xRDS will be a licenced technology
  - Contrary to RDS
- xRDS may require a small reduction of the FM modulation level of the radio programme
  - This will cause a small reduction of the coverage area
  - In most cases this will not be noticeable
- Other disadvantages are so far not known
Can the mass produced FM/RDS chips be adapted to support xRDS?

- Yes – even by software retooling for some of the existing chips
  - But this must be customer driven by an important industry sector
  - Like automotive industry needing powerful TTI services
    - TMC and/or TPEG
    - TMC could have a 20 times higher capacity with xRDS
    - TPEG cannot be used with xRDS

Can encoders be built for xRDS at market prices comparable to now?

- Yes - if sufficient quantities are needed by the broadcasters and transmission operators
xRDS will have to generate new business

- If xRDS is able to achieve this
  - This new business will drive the introduction
    - Example: Encrypted TTI

- Broadcasters and transmission operators
  - Will only be interested if the investment is very profitable
  - Internet radio already attracts more and more listeners
    - This will slow down the implementation of enhanced radio programme information and relevant “multimedia” data services
  - Where DAB and/or HD radio conquers the market
    - Interest in xRDS implementation will be adversely affected
    - Condition under which Digital radio will have no impact
      - If broadcasters need the xRDS data capacity to enhance the programme associated data services for FM radio (unlikely)
The future of FM/RDS vs digital radio 1/2

- **FM/RDS is used worldwide**
  - Now - the most popular and inexpensive radio technology by far
  - Any switch off or switch over scenario can hardly convince the experts
    - FM/RDS will still be used after 2025 worldwide

- **FM/RDS consumer market is over 1 billion units per year**
  - Mobile phones
  - Car radios
  - Navigational devices
  - Short range transmission devices
  - Portable radios
  - Home radio receivers

YES - RDS can be enhanced
Digital Radio in comparison – 10 to 15 million per year

- DAB is only slowly adopted by the market
  - Very small market sector in comparison to FM/RDS radio
- Up to now: mostly used in portable radios
  - (also called kitchen or bathroom radios)
- Is good for car radio reception if good area coverage is available
  - This is very expensive to build as well demonstrated by the BBC
  - most countries cannot afford it
  - We live in difficult economical times where DAB coverage building has only a negligible priority
  - Nevertheless there is a lot of political media lobbying to push it to the market
  - Thus the market future is uncertain and difficult to predict
- In the USA - HD radio is adopted a bit faster, but has not a significant market either yet in comparison to FM/RDS


## xRDS opportunity analysis

### Best case assumption

- Business cases will be good and generate demand
  - Then it will take **4 to 5 years** until xRDS will happen
  - All technical adaptations needed will fall into this time window
    - Adapted RDS standards would be in place
    - xRDS chips would be there
    - xRDS encoders would be installed
    - New services and applications would be ready

- If the above assumptions are correct
  - Who as a potential user could be interested
    - Broadcasters and or transmission providers?
    - TTI service industry?
    - Automotive industry?
    - Mobile phone industry?
The following RDS Forum members have contributed to this presentation:

- Attila Ladanyi
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- Johnny Beerling
- Joop Beunders
- Josh Caskey
- Dietmar Kopitz
Thank you for your attention

- We hope that we have convinced you of the importance and the potential of xRDS

Are you interested in these new possibilities?

- You can join us in the RDS Forum any time

How? – Just contact us

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