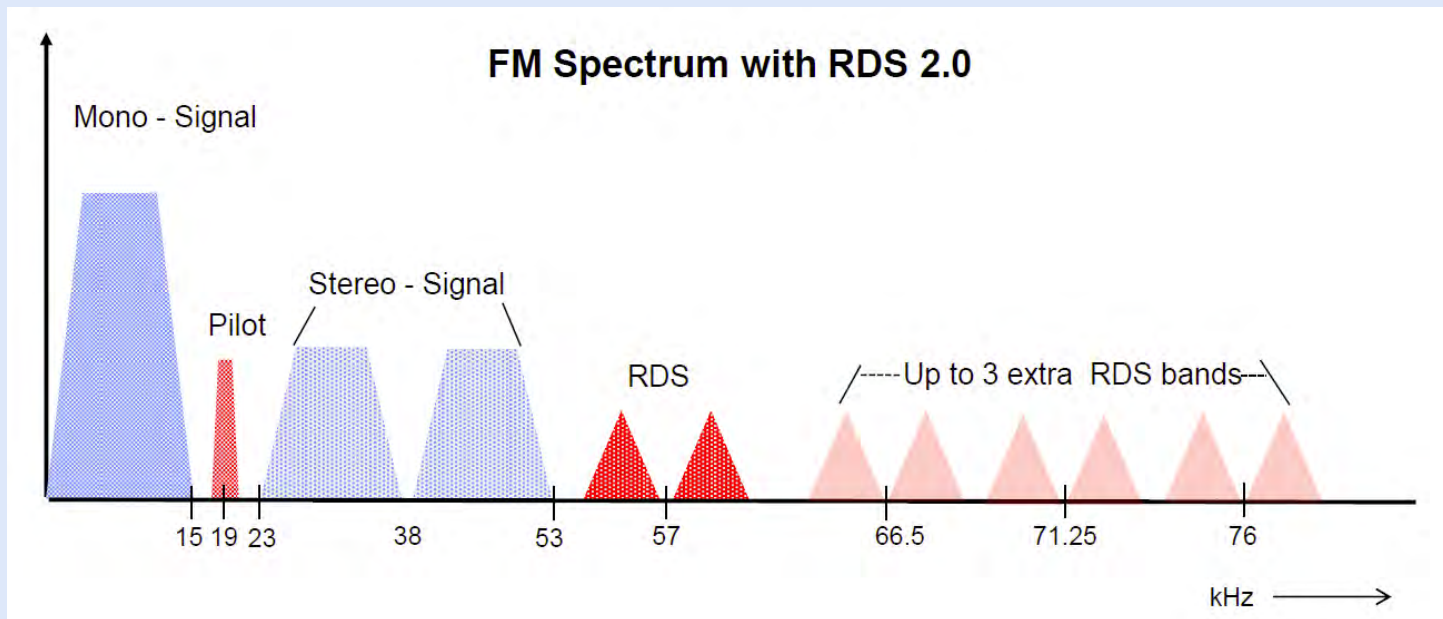# RDS 2.0
- IEC 62106 proposed adaptation

- **First RDS specification published by EBU in 1984**
- **First RDS CENELEC standard published in 1990**
- **CENELEC RDS standard updated in 1992 and 1998**
- **First RBDS US standard published in 1993, updated in 2005 and 2011**
- **30th anniversary of RDS specification was in 2014**
- **First RDS IEC standard published in 2000, updated in 2009 and 2015**

30 Years of RDS

- **This is a very mature technology**
  - Widely used worldwide
  - FM radio is over 60 years old
  - RDS is over 30 years old
  - Over one billion FM/RDS receiver chips are now made per year worldwide
  - Price is as low as 1 USD per FM/RDS chip
  - Smart phones have been the largest market
  - Car radio market is next and in Europe almost 100%
  - Most radio receivers sold in Europe and in the USA have RDS
  - In the USA a national variant, RBDS, is very widely used
  - RDS has been a kind of "silent revolution"

Possibilities to enhance RDS

- **RDS 2.0 uses additional subcarriers**
  - Remains within the ITU modulation limits of 10% (Rec ITU-R BS.450-3)

FM Spectrum with RDS 2.0
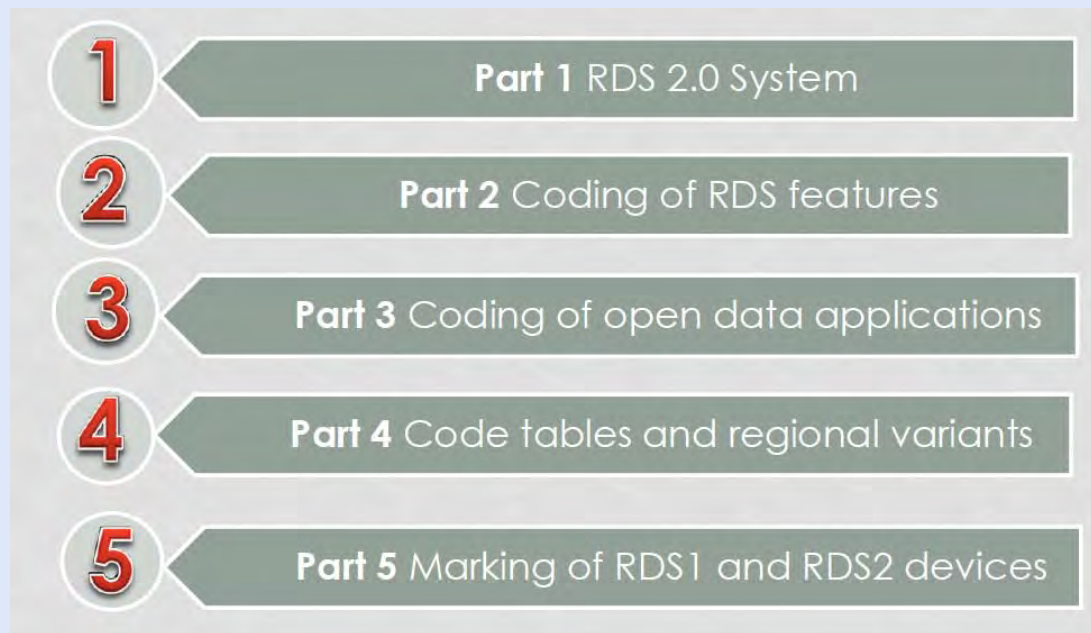
Mono - Signal

Pilot

Stereo - Signal

RDS

-----Up to 3 extra RDS bands-----

15 19 23 38 53 57 66.5 71.25 76

kHz

- Basic RDS will ensure backwards compatibility on stream 0
  - Streams 1 to 3 will transmit only ODAs

Some more detail about RDS 2.0

- The structure of RDS will be completely maintained : it simply adds three more 'pipes' to deliver the RDS data stream to the RDS device

- In traffic terms it's like widening a single carriageway road to four lanes

- The data throughput is increased quite dramatically – not just by a factor of four, but by more, as it's not necessary to carry in the additional sub-carriers 'mandatory' RDS elements that are already in the 'main' sub-carrier

For example the 'PI Code' – which mandatorily takes up 25% of the main sub-carrier doesn't need to be carried at all in any of the additional sub-carriers, as it is already in the groups carried in the main sub-carrier

RDS 2.0 development objectives

- **Designed for the next 30 years**

- **Fully backwards compatible with RDS**

- **Makes use of experience gained with RDS**

- **Achieves a higher data through-put**
  - Improvement is mainly for open data applications
  - ODAs can be transmitted 20 x faster

- **Character coding with UTF-8 will support many languages worldwide**

- **Support for larger displays as used in Smart phones and navigational devices in cars**

- **Hybrid radio for connected devices to be supported**

RDS 2.0 requires

- **New structure of IEC 62106 consisting of 5 parts**
- **Aim to be achieved is also a more flexible maintenance**
- **Enhanced support for application development**

1	**Part 1** RDS 2.0 System
2	**Part 2** Coding of RDS features
3	**Part 3** Coding of open data applications
4	**Part 4** Code tables and regional variants
5	**Part 5** Marking of RDS1 and RDS2 devices

- FM radio with RDS is mature, cheap and universally available

- FM radio attracts by far the largest number of listeners everywhere

- Traffic services TA/TP and TMC are well established

- Due to sophisticated technologies like multiple tuners; multiple antenna systems and RDS algorithms this system is just about perfect

- The perceived audio quality does not differ significantly from that heard via Digital Radio

- A general FM switch-off is unlikely within the next 10 to 15 years and on top of this, it is ecologically crazy to throw away millions of FM/RDS radios

- Outside Europe the number of FM radio listeners even increases as increasingly smart phones are used as FM radio receivers

TRENDS IN BROADCASTING

TRENDS IN BROADCASTING:
AN OVERVIEW OF DEVELOPMENTS

Report

F E B R U A R Y 2 0 1 3
Telecommunication Development Sector

ITU

- **"Conclusions** on

- Broadcasting by the end of this decade

  "FM will remain an important means of delivery of audio broadcasting. In general switch-off of FM stations lies far ahead, but a few countries may have switched-off analogue radio."

RDS feature	Group	Usage Intense	Usage Seldom	Usage Never	Future	Observations
AF	0A	x			x	
AID (ODA)	3A	x			x	
CI (PI)	all	x			x	
CT	4A	x			x	
DI	0A&0B					
DI-d_0	0A&0B			x		Mono/stereo
DI-d_1	0A&0B			x		Artificial head: yes/no
DI-d_2	0A&0B			x		Compressed: yes/no
ECC	1A		x		x	Needed for RadioDNS
EG (Linkage)	14A		x			
EON	14A	x			x	
eRT	ODA		x		x	Future potential
EWS	9A		x			Can be replaced by ODA
EWS id	1A		x			Can be replaced by ODA
IH	6A&6B		x			Can be replaced by ODA
ILS (Linkage)	14A		x			
LA (Linkage)	1A&14A		x			
LSN (Linkage)	14A		x			
Language code	1A			x		
MS	0A&0B&15B			x		
ODA		x			x	
PI	all	x			x	
PIN	1A			x		
PS	0A&0B	x			x	
PTY	all	x			x	
PTYI	DI-bit d_3		x		x	Static/dynamic PTY id
PTYN	10A		x		x	
RP	7A		x			Can be replaced by ODA
RP id	1A		x			Can be replaced by ODA
RT	2A&2B	x			x	
RT+	ODA		x		x	Future potential
TA	0A&0B&14A15B	x			x	
TDC	5A&5B		x			Can be replaced by ODA
TMC	ODA (8A)	x			x	
TP	all	x			x	

Features never used by RDS receivers and without future can now be deleted

RDS standard review of RDS features

RDS FORUM 2015

- Everything that has no future can be deleted from the RDS standard

- A good alternative to redefining unused bits will be to declare them as reserved for future use

- A list of features will be useful that would be nice to have in RDS 2.0, such as PS (32 bytes long) with UTF-8 coding

- However in RDS 2.0, the ODA concept will be increased in importance

- We shall keep of course the main features of RDS 1.0

- **In June 2015 the RDS Forum's annual meeting will be asked to approve the new concept**

The new RDS 2.0 standard version

- The RDS standard will remain the IEC 62106 with an incremented edition counter

- However, the setup and partitioning of the various sections will be entirely new

- RDS 2.0 will cover now also the frequency band extension from 64 MHz to 87.5 MHz (China) and 76 to 87.5MHz (Brazil)

- The difference of RDS 2.0 with respect to the existing RDS (1.0) standard will be clearly explained

- The backwards compatibility issue is fully secured

- ICs for RDS 2.0 will not much increase in price

- DSP technologies will make this possible

RDS-PS name is the best known

The PS- Programme Service name in RDS (1.0) has 8 characters at maximum. It shall be static so that listeners can see what radio programme they hear

In this particular case PS is toggled as ENERGY and BERN

- Hence a good example why a long PS is now needed

RDS 2.0 will enhance the PS name

Screen shot: VW - 2014

In addition to the existing "short" PS there will be a long PS with max. 32 byte
Character coding in all languages worldwide will then be possible

All screen shots: VW - 2014

RDS FORUM 2015

- Best example is **RadioText Plus**
  - Used up to now mostly in Germany and the USA
    - The potential for being used more widely remains very high
      - Not only in car radios but also in smart phones
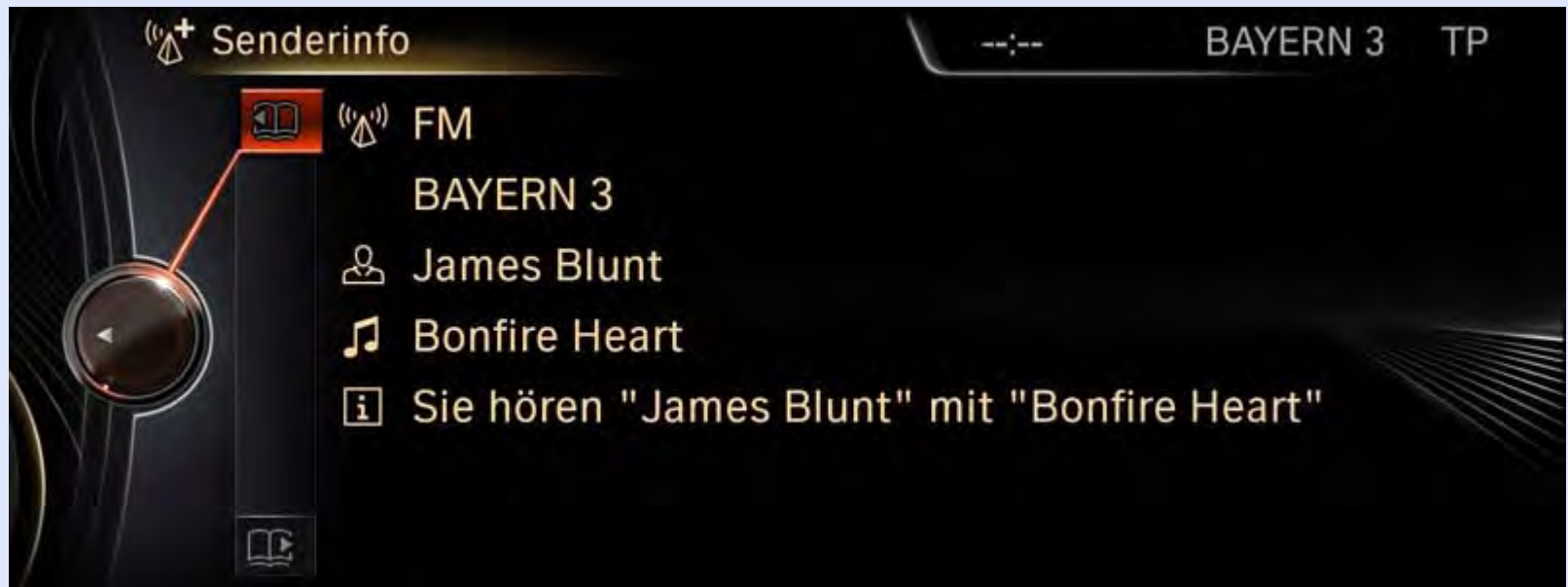
Screen shot: BMW Professional nav car radio - 2013

Review of not widely used features

- **During the RDS 2.0 development**
    - RDS 1.0 has been critically reviewed
    - Unused RDS features have beenn identified for deletion
        - This will simplify the RDS standard
- **However, changes made to the RDS standard**
    - Must be backwards compatible
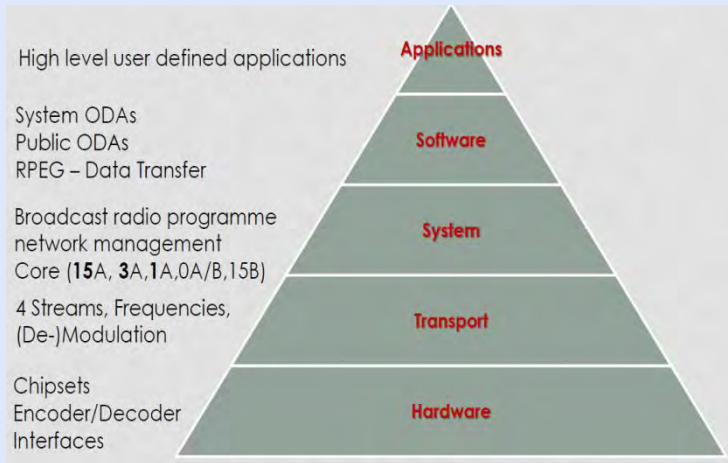
RDS 2.0 could offer better TMC

- **RDS2 will be a kind of turbo engine for TMC**
  - Supra-regional TMC can remain on RDS 1.0
  - RDS 2.0 could offer more regional and urban info

Unique selling points
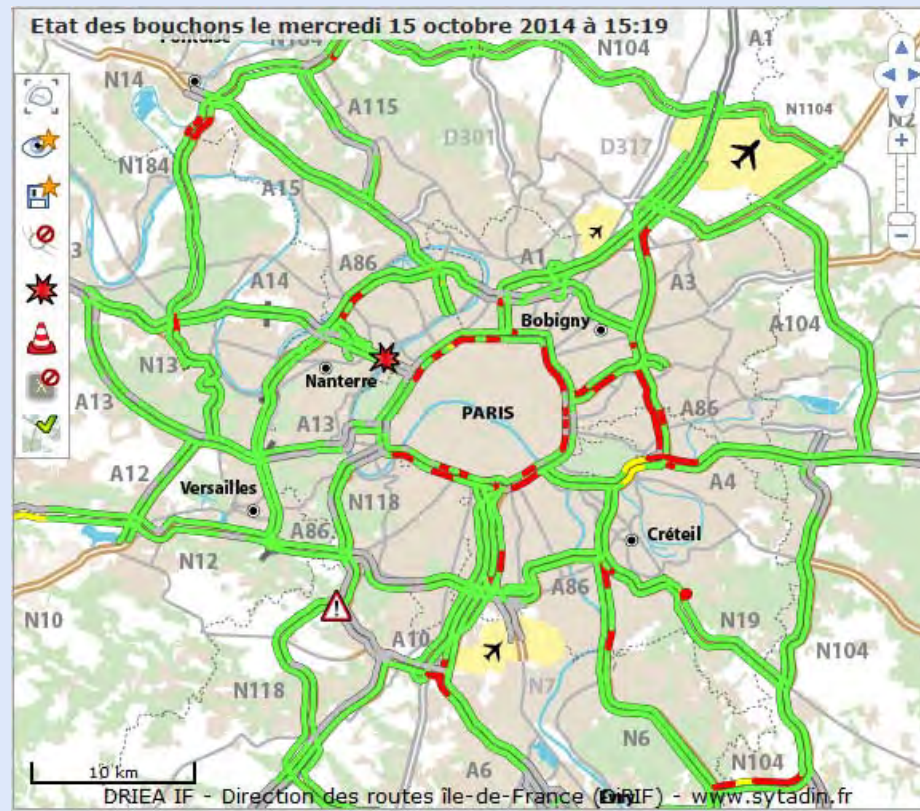
- **PS name possible in characters used worldwide**

- **Two kinds of RadioText will be possible in parallel**
  - RT with group type 2A can be used for English text
  - eRT as ODA with UTF-8 and 128 byte long can be used in addition for Russian, Chinese , Arabic or Indian text (even with possible text flow from left to right)

- **Very widespread TMC could be very much powered up**
  - To provide also more regional & and better local info in urban areas

- **RDS 2.0 will be able to support graphical features, logos etc**

- **RDS 2.0 will be able to support Hybrid radio** (device connected to Internet)
  - To capture additional programme related information from the broadcaster's web site

- **Improved possibilities for presenting FM radio**

RDS 2.0 – More objectives

High level user defined applications — **Applications**

System ODAs
Public ODAs
RPEG – Data Transfer — **Software**

Broadcast radio programme
network management
Core (**15**A, **3**A,1A,0A/B,15B) — **System**

4 Streams, Frequencies,
(De-)Modulation — **Transport**

Chipsets
Encoder/Decoder
Interfaces — **Hardware**

- **Support the connected car concept**
  - Provide Internet links using the Hybrid radio concept
    - Radio France is developing an ODA application since 2013
- **Better support applications development**
  - Example: Android OS
  - Use ODAs to achieve this
  - Support for RDS decoding with Java programming is under study
- **Support character coding as used on the Internet**
  - UTF-8 coding is already applicable worldwide
  - Supports Chinese, Arabic, Cyrillic, Indian etc.
- **Make FM radio look more modern and interactive**
  - Create above all business opportunities for the next 30 years of FM radio with RDS

Positioning of RDS 2.0

- RDS 2.0 will offer very strong opportunities where increased data capacity for added value features and services are required

- RDS 2.0 is not meant as a competitor for DAB or HD Radio. These will have their own roll-out scenarios

- FM/RDS will continue to co-exist next to Digital Radio

- This will particularly be the case for countries where Digital Radio does not rapidly expand

- RDS 2.0 may offer a great chance for enriched TMC services, particularly for detailed road information in large urban areas, increasingly required and feasible

Roadmap for RDS 2.0

- **June 2014 -** Decision taken in the RDS Forum

- **November 2014 -** Concept worked out in a workshop in Budapest in a small team of specialists

- **January 2015 -** Feasibility report written

- **June 2015 -** Presentation in the RDS Forum and decision on how to move forward

- **Autumn 2015 -** Official release to the outside world (if the RDS forum agrees)

- **End of 2015 –** Draft new RDS 2.0 standard ready for IEC

- # **Thank you for your attention**

  and thanks to all those colleagues who gave me feedback

  above all

  RDS Forum members Attila Ladanyi, Frits de Jong and Mark Saunders

- ## **Contact us at the RDS FORUM**

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