



IEC 62106 - progress on restructuring



- **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
 - RDS has been a kind of “silent revolution”



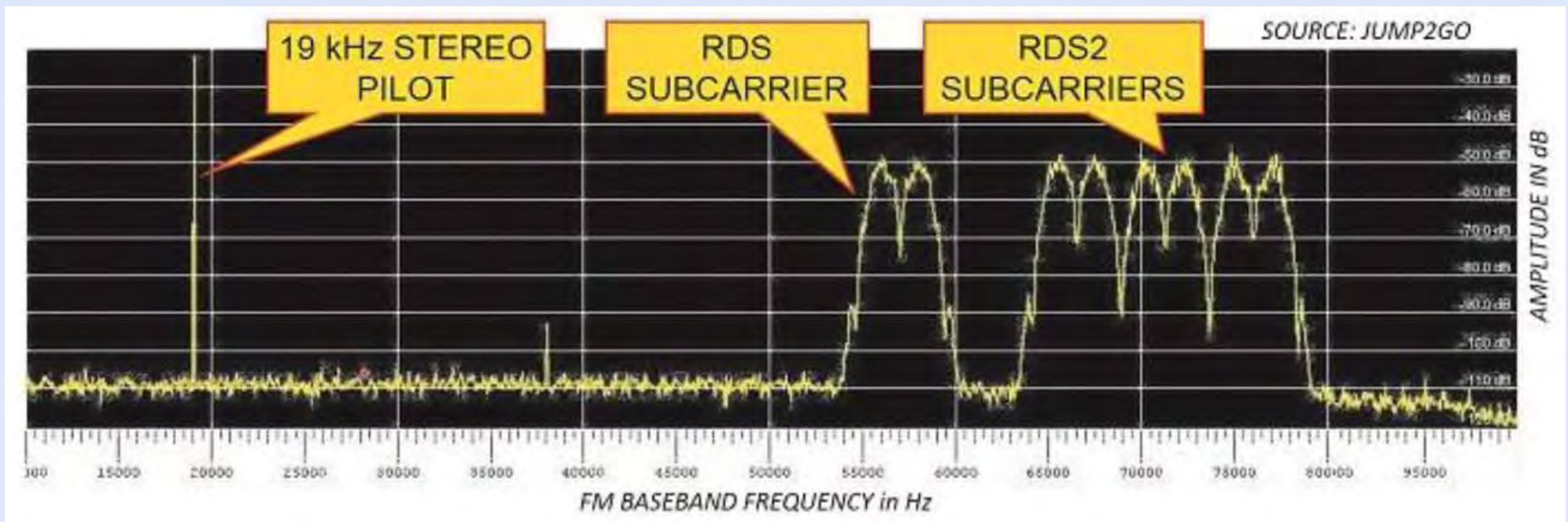
- FM radio with RDS is mature, cheap and universally available
- FM radio attracts by far the largest number of listeners everywhere
- Traffic services TA/TP and TMC are well established
- Due to sophisticated technologies like multiple tuners; multiple antenna systems and RDS algorithms this system 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 30 years and probably will never happen 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 also smart phones are used as receivers



Conclusions in this ITU study:

- 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.”

- Use of three additional subcarriers
 - Remains within the ITU modulation limits of 10% (Rec ITU-R BS.450-3)



- RDS2 is backwards compatible for data stream 0

- RDS2 will offer very strong opportunities where increased data capacity for added value features and services is required
 - On the RDS Forum web site is a Table that compares RDS and RDS2
 - <http://www.rds.org.uk/2010/RDS2.htm>
- RDS2 may offer a great chance for enriched TMC services, particularly for detailed road information in large urban areas, increasingly required and feasible
 - http://www.rds.org.uk/2010/pdf/R16_061_1.pdf
- RDS2 will be free of IPR
 - Developed as an open technology by the RDS Forum
- RDS2 will be relatively inexpensive to implement
 - Uses DSP technology / Many existing RDS ICs can be adapted to RDS2 for manufacturing new RDS2 chips
- RDS2 encoders will arrive on the market in 2017 already
- **RDS2 is optional**
 - For each of the data-streams 1, 2 and 3

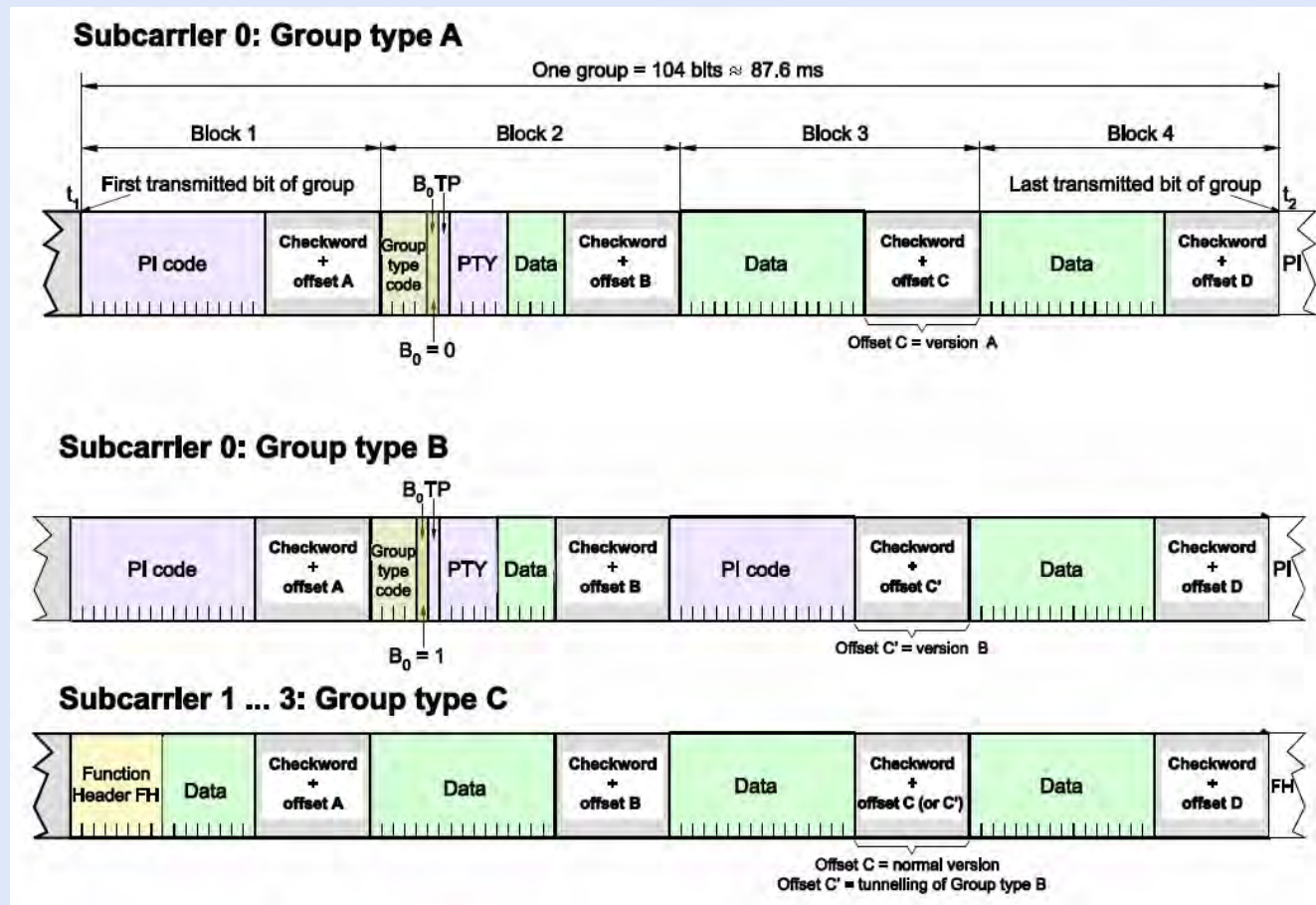
- **Remove from RDS unused features**
- **Enhance the coding of some features**
 - ECC needed for unique worldwide FM radio programme identification
 - Planned FM band extensions below 87.5 MHz
 - (AF coding) for Brazil, China, etc.
 - Universal character coding with UTF-8
 - To support text in any language worldwide
 - Long PS name (32 bytes)
- **Changes to the current RDS standard are very small**

- **Mostly ODAs**
 - New features shall use Open Data Application concept where ever possible
 - Example: Programme Service logo and pictograms
 - **Increase data transmission rate for ODAs by more than 10 – 15**
 - RDS stream 0 has capacity for 2 – 4 ODA groups/sec
 - RDS2 streams 1 ... 3 can transport over 30 ODA groups/sec
 - **Data throughput increase with new group type C**
 - $3 * 56/37 = 4.5$ (see next slide for more detail)
 - **Reason:** Not necessary to repeat the basic tuning elements from data stream 0
- **Possible significant improvements for some RDS features**
 - In mobile reception: Increased repetition rates for RT and LPS if also distributed on upper data streams increase reliability of reception and shorten acquisition

How can the data capacity be increased?

Rds forum 2017

- RDS subcarrier 0 uses Group types A (Data: 37 bits) and B (Data: 21 bits)
- RDS2 subcarriers 1, 2 and 3 use the **new Group type C** (Data: 56 bits)
 - Group types A and B can be “tunnelled” in type C
 - Group type C consists of a Function Header byte FH (Function ID of 2 bits and Function Number of 6 bits) and 7 bytes of data
 - FH determines the identification of the group



- The structure of RDS is completely maintained on stream 0
 - Streams 1, 2 and 3 simply add three more 'pipes' to deliver the RDS data stream to the RDS receiving 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 is not necessary to carry in the additional streams 1, 2 and 3 'mandatory' RDS auto-tuning elements that are already on stream 0

For example the 'PI Code' – which takes up 25% of data stream 0 doesn't need to be carried at all in any of the additional streams

- **IEC 62106 was split into 6 parts**
- **CDVs were circulated in May 2017**
- **August 2017: All six CDV parts were approved**
See docs CC_100_2907 to 2912
- **Apart from the voting**
 - IEC-CO reviewed the CDVs to suggest editorial improvements
 - For IEC 62106-5 technical comments were received from Japan
 - These were considered by RDS Forum and corresponding corrections were agreed
 - **FDIS will be ready in autumn 2017**

- **Part 1: Modulation characteristics and baseband coding**
- **Part 2: RDS message format, coding and definition of RDS features**
- **Part 3: Usage and registration of Open Data Applications ODAs**
- **Part 4: Registered code tables**
- **Part 5: Marking of RDS and RDS2 devices**
- **Part 6: Compilation of technical specifications for Open Data Applications in the public domain**

- **Two additional parts are already under preparation**
 - Target: Final draft standards (CDVs?) will be ready by end of 2017
- **These are**
 - Part 7 (IEC 62106-7) RBDS
 - This is the RDS variant used in North America
 - So far standardized by the US National Radio Systems Committee
 - Latest version is from 2011
 - In progress now: Adaptation of latest RBDS specification to IEC 62106-1 to 62106-6
 - Part 8 (IEC 62106-8) UECP
 - This will be the Universal Encoder communication Protocol
 - RDS Forum version 8 (2017), fully adapted to support RDS2
- **Now we need:**
 - **Agree new projects for Parts 7 & 8**
 - **Also, Part 6 (Compilation of the public ODAs) will need updating already**
 - Under development now: ODA for RDS2 file transfer / the ODA-RFT

- **Thank you for your attention**
 - A special thank you to the IEC-CO in Geneva for their great editorial assistance in re-structuring IEC 62106 ed. 3 (2015)
- **Contact us at the RDS FORUM**
 - rdsforum@bluewin.ch
- **Consult the RDS Forum web site**
 - www.rds.org.uk