DAB+ Update
ABU TC 19 October 2024

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Topics

- Global update
- Emergency Warning System

Core benefits of broadcast radio

- News and local culture
- Free to air
- Reliable in emergencies

In many regions the audio market is changing

- New service types are being developed
- Global tech players want to access new markets
- Local content is being challenged

Essential to have a strategy for broadcast radio

FM spectrum is full

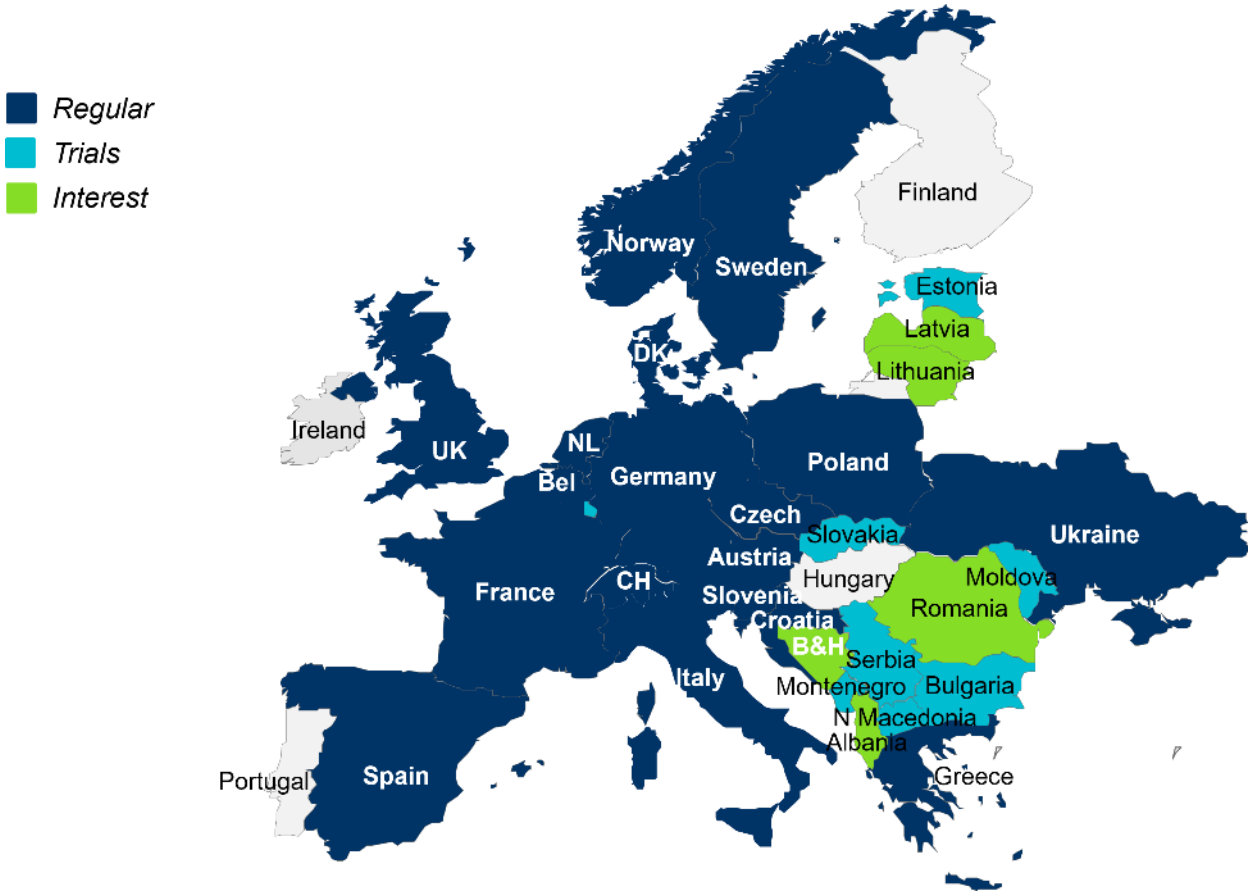
- No capacity to expand
- Impossible to innovate

DAB+ is the digital backbone for broadcast radio

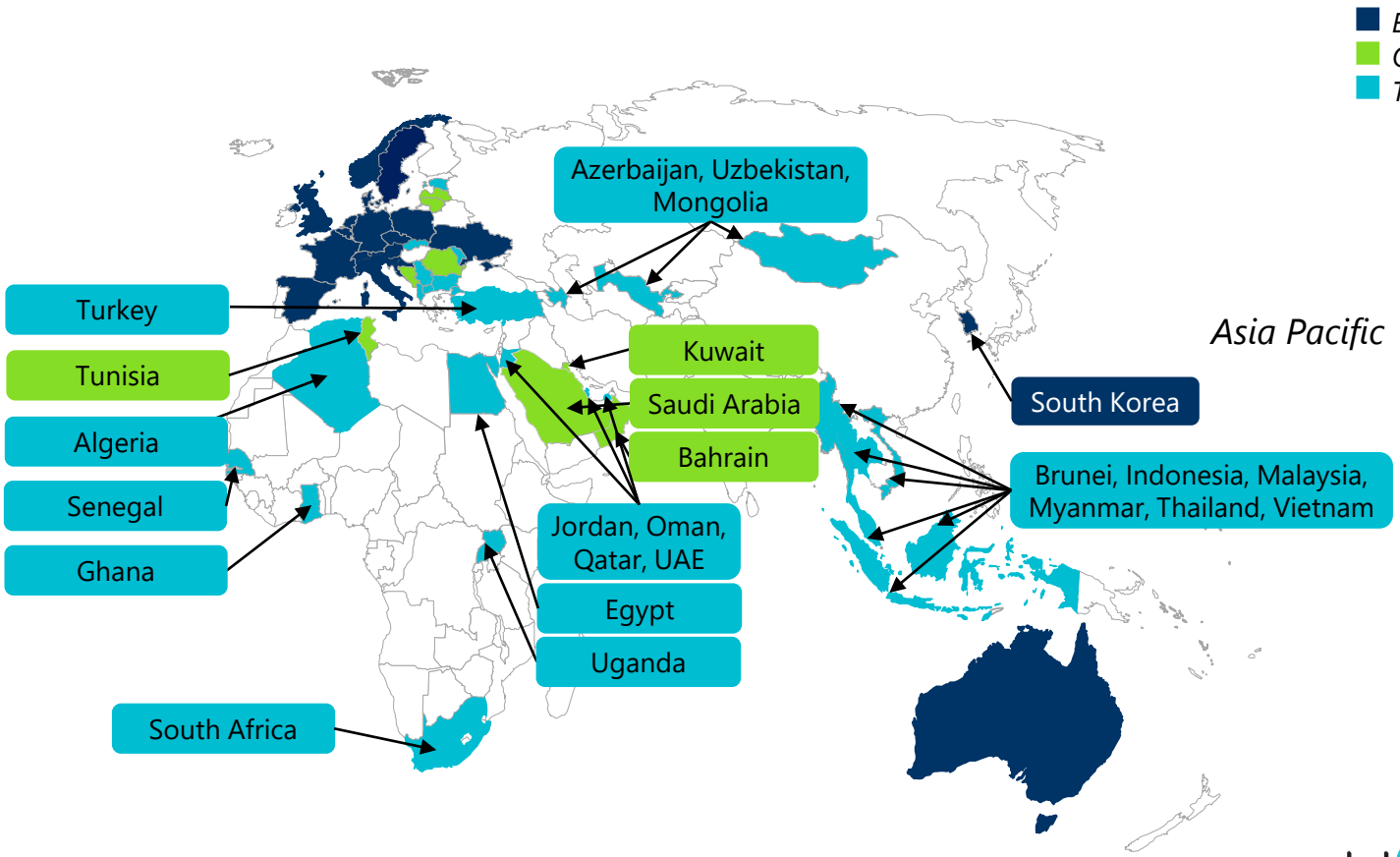
- Digital Audio Broadcasting
  - digital terrestrial radio
  - Band III so it can augment analogue radio
- DAB+ provides many services together
  - new services
  - existing services but with enhancements

DAB+ offers “now playing” info, song and artist, station logos

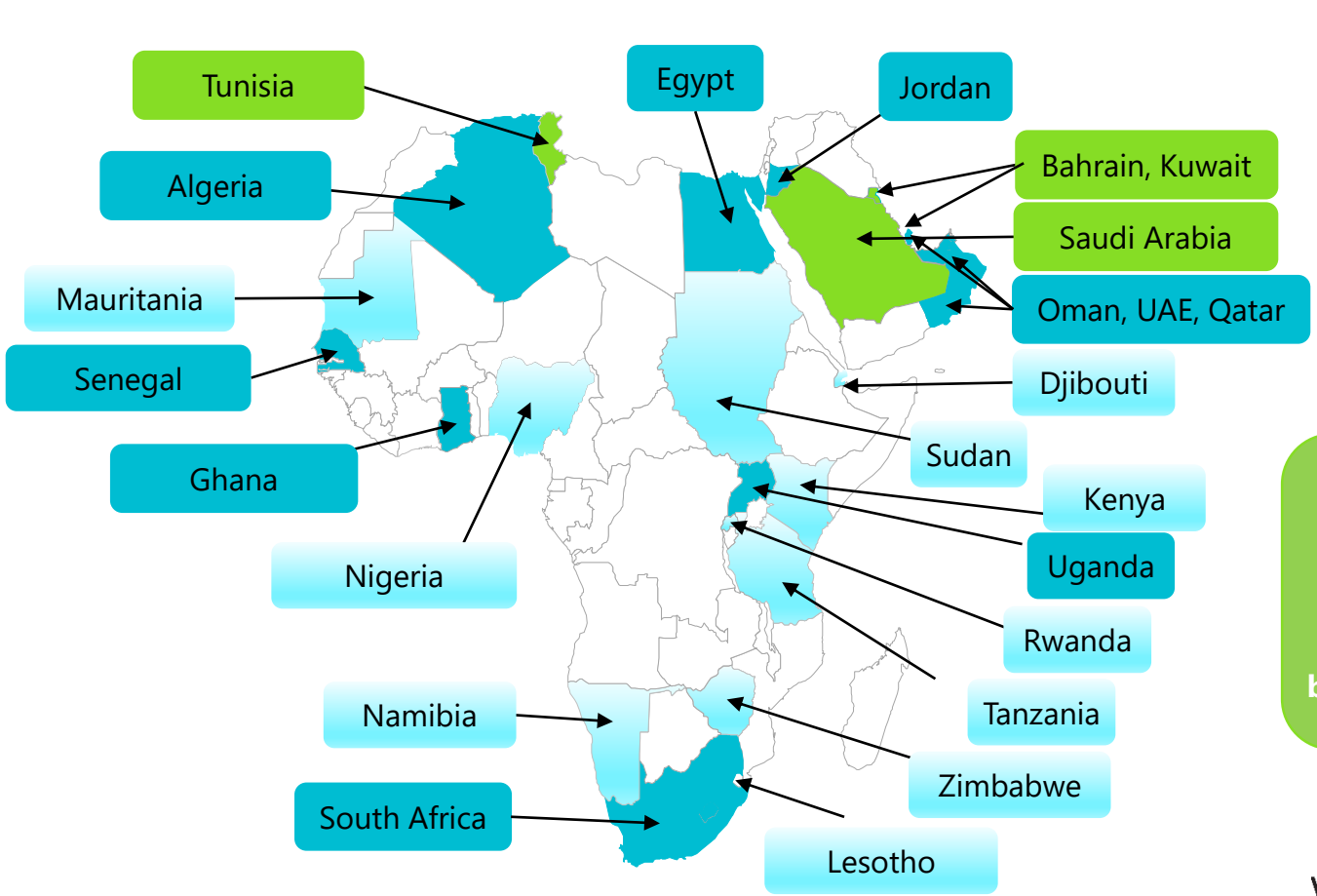
In Europe, DAB+ is the core digital platform for radio



Africa, Middle East and Asia are assessing the opportunity for DAB+



Increased interest in Africa and Middle East



WorldDAB working with ATU, AUB, AFRALTI and regional broadcast bodies

DAB+ receivers

Over 125 million receivers have been sold consumer & automotive

Cumulative DAB sales:

129 million

Sources: WorldDAB, GfK, JATO, national industry associations

Consumer DAB+ receivers are mass market

- Prices from US$20
- Sony, Panasonic, Yamaha and many more

… from multiple brands

New car radios: digital radio as standard

European Union mandate

New car radios must have digital terrestrial radio

DAB+ is a standard feature in European cars

>96% of new cars with DAB+

Source: JATO, WorldDAB, industry sources – based on Germany, France, UK, Italy, Spain, Poland, Belgium, Netherlands, Sweden, Austria, Switzerland, Czechia, Denmark, Norway, Portugal

All major automotive manufacturers support DAB+

And there are devices to convert your car to DAB+

Albrecht DR56C
DAB+ adapter with
colour screen

JVC Kenwood
DAB+ / FM / Bluetooth

Imperial DABman 61
DAB+ adapter

Emergency Warning System

- The WorldDAB Technical Committee has completed the design of the new Emergency Warning System for DAB
- New standards have been drafted to document the description, signalling and receiver behaviours needed, and to support a receiver testing compliance scheme
- The standards have been published by ETSI

Automatic
Safety Alert

DAB ASA: Key features

Alert Messages

- Spoken message for essential information: where, when, what to do
- Cross ensemble signalling to inform receivers when an alert is active
- Location targeting to reach the right people (and not disturb the rest)

Sleep and Wake-up

- Receivers have a low-power sleep mode but monitor a DAB ensemble for alert signalling even when sleeping
- Receivers evaluate alert signalling and wake-up to play the audio, retuning to another ensemble if needed

Receiver testing

- A formal testing specification to ensure that receivers react correctly to the alert signalling
- This technical standard to be the basis for a compliance scheme with a recognisable Mark to be used on product packaging

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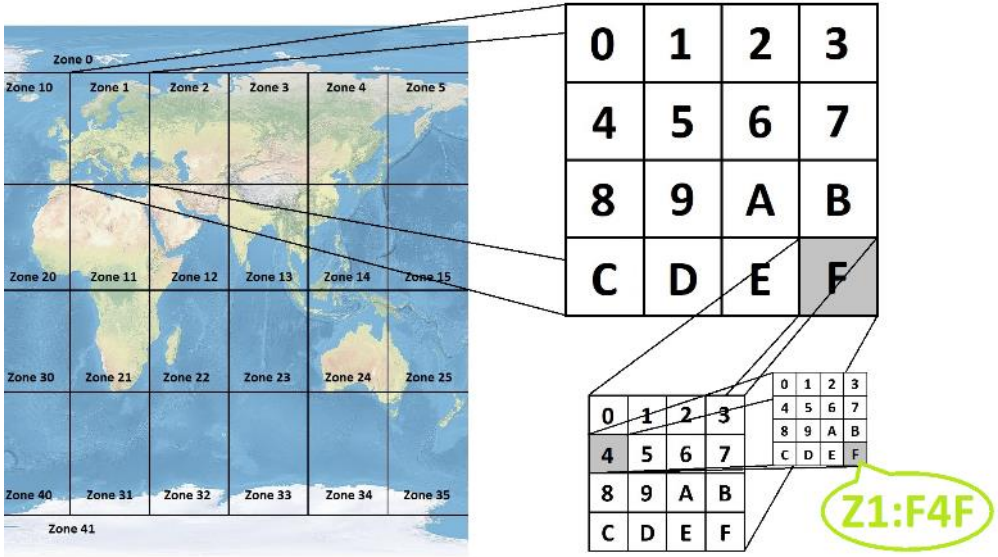
Three key innovations

- A novel location coding system
  - Alert areas and DAB ensemble coverage areas will rarely align
  - Globally applicable
  - Lightweight with high coding efficiency
- New signalling specifically tailored to alerting
  - Identification of participating ensembles
  - Identification of incidents, the alert stage, its importance, its location
- Receiver synchronisation
  - to minimise audio loss at the start of an alert
  - to maximise battery life

Universal location coding system

- Hierarchical Code scheme of WGS84 Coordinates
  - Full code has ~1km resolution
  - Shorter codes = larger “square”
  - Defines
    - Alert area (set of codes)
    - Receiver location (single full-length code)
- Properties
  - Globally universal
  - Very low device impact
  - Very low signalling overhead

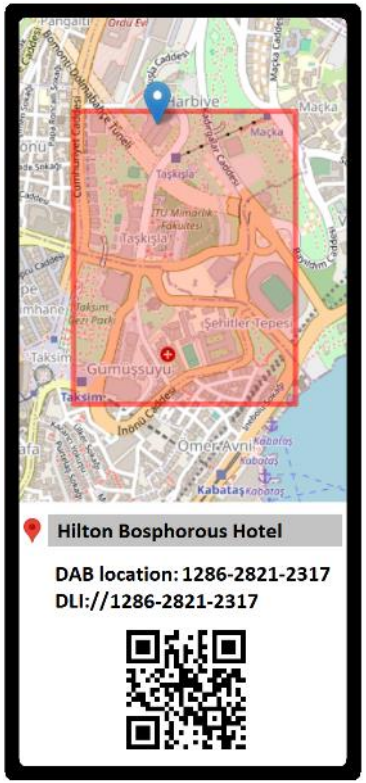


Device location

- In order to use localisation, the device needs to know its location
  - For a low-cost, static device, like a kitchen radio, this means a user entered code, the code being generated by an app or website
  - For a higher specification device, it might be input from an app or website via Bluetooth or wifi
  - For a mobile device – like a vehicle, for which the location is always changing – GNSS is probably the best source of data to calculate the location code from the WGS84 coordinates

Device presentation code example

- The Hilton in Istanbul is located at WGS84 (41.04451, 28.98957)
- These coordinate are algorithmically turned into a DAB location code
- The location code for the Hilton Istanbul is Z1:F4F20A
- But Z1:F4F20A is not user friendly!
- We specify a transform to create a simpler code using just the numbers 1 to 8
- The presentation code includes two digits for error checking by the receiver

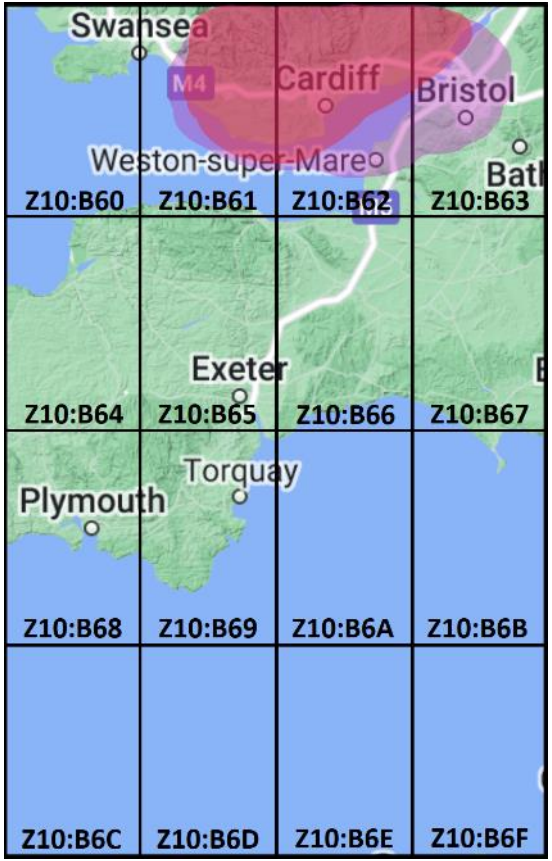


Alert area location coding

- The alert area will be represented by a number of location codes
  - Shorter location codes represent larger areas
- The device compares its location code with each location code provided in the FIC that represents the alert area
  - Because of the code hierarchy, if a received alert area location code has fewer than 6 digits, only the corresponding digits of the device's location code are compared: if they match then the device is located within the alert area – the additional digits describe an area within the shorter code

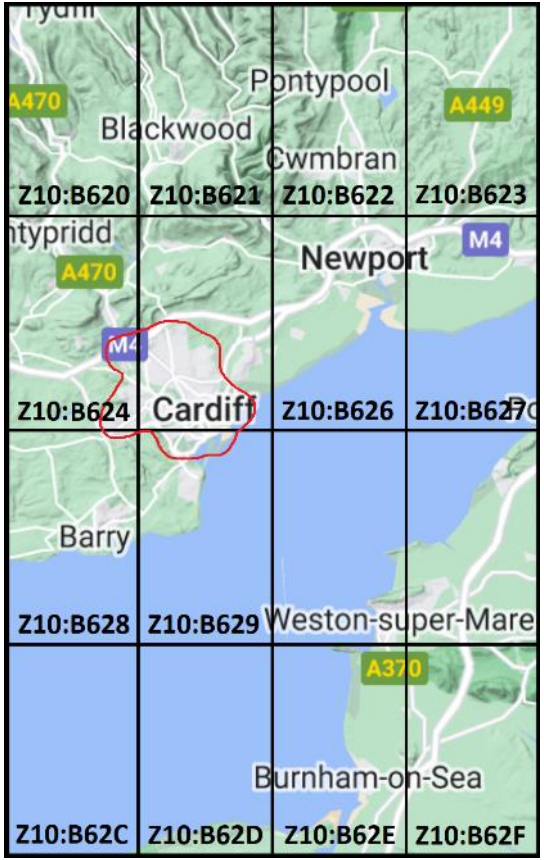
Alert area - example

- The transmission coverage of the Cardiff and Newport DAB ensemble is shown
- The light area is “overspill” – unintended coverage due to geography
- The whole ensemble area is contained within 3 3-digit location codes
  - Z10:B61, Z10:B62, Z10:B63
- The city of Cardiff is in Z10:B62



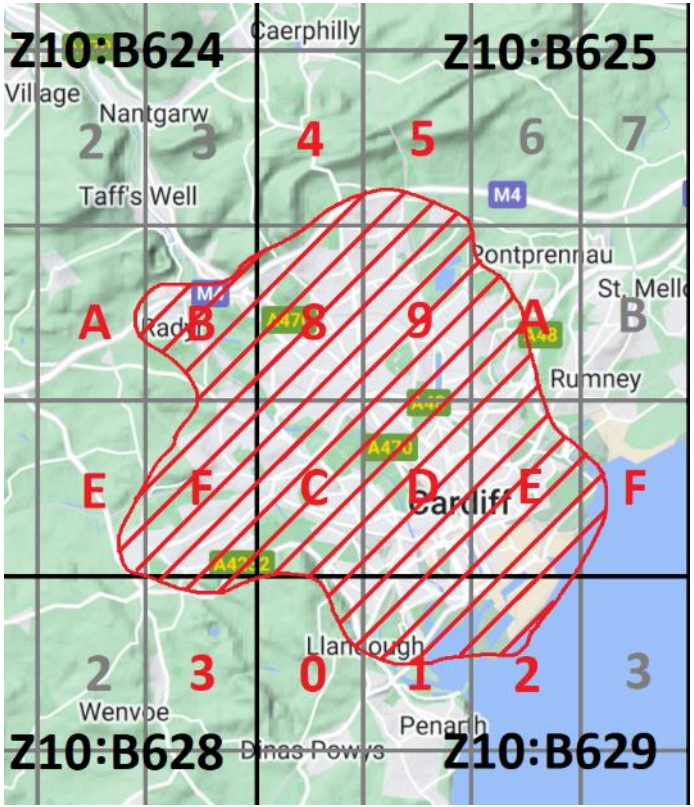
Alert area - example

- This slide shows the area of Z10:B62
- An emergency has occurred, and the authorities wish to alert only the people in the city, within the red line.
- The 16 sub-areas are identified
- 4 of these sub-areas contain the alert area
  - These 4 location codes of 4-digits each could be signalled, but the total area is much bigger than the desired alert area



Alert area - example

- Going one division further, the alert area is part of 17 5-digit spherical rectangles
  - In order to ensure all that should be alerted are alerted, there is still some extension to the desired alert area, but it is small

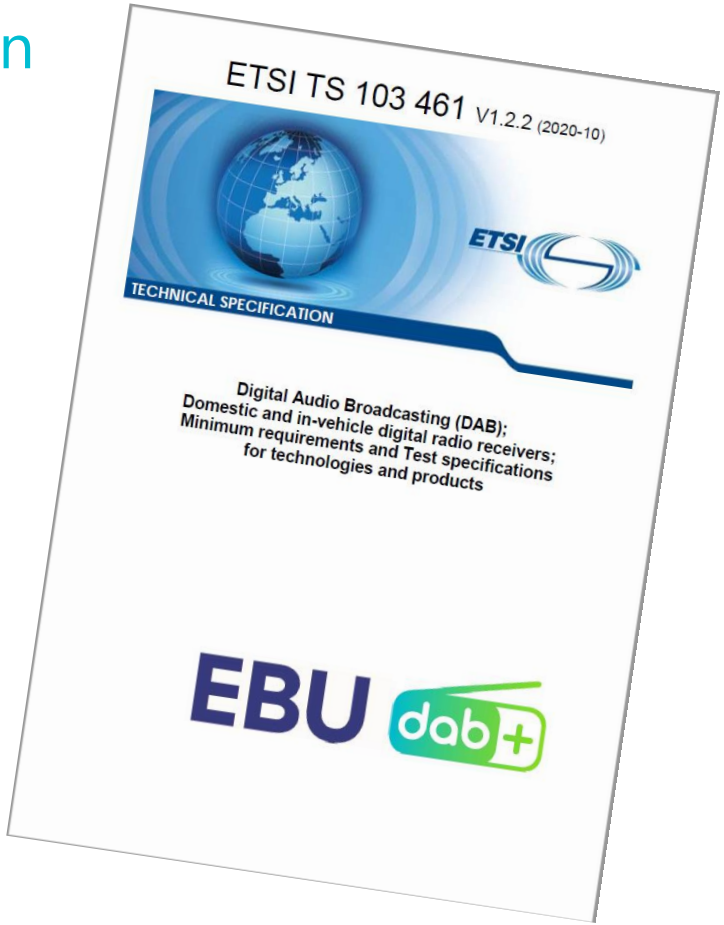


Roll-out plans: Germany

- Major flooding in 2021
  - 135 people killed
  - extensive damage to roads, bridges
  - water contamination, crop losses
  - Mobile phone networks out of action for days
- ASA network infrastructure rolling out now for public launch in 2025
- Other countries showing strong interest

DAB receiver testing and certification

- For DAB receivers, the ETSI standard TS 103 461 is the basis of receiver testing
- It is used for the Digital Radio UK Tick Mark certification scheme
- It provides functional and performance requirements for DAB receivers
- It provides test methods and success criteria for both core technology (i.e. chips and modules) and for products



ASA testing and certification

- ASA testing builds on top of DAB receiver testing
  - Manufacturers are already familiar with the processes
- The new ETSI standard sets out the additional testing and results needed for achieving the ASA certification mark
- The ASA scheme ensures public safety
  - Devices carrying the ASA mark have proved their reliability and compliance in an independent test laboratory

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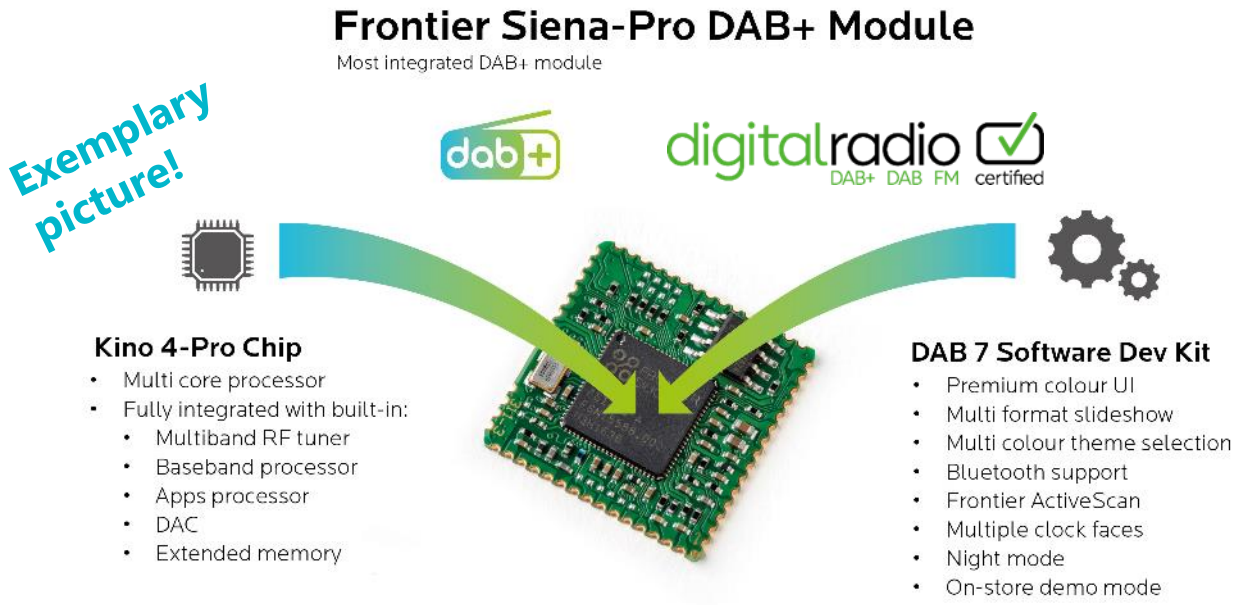
ASA
Automatic Safety Alert

Der Exekutivdirektor / The Executive Director

João Negrão

IFA Demo from FrontierSmart Chipsets: September 6 – 10, 2024



FrontierSmart getting ready for launch

- A demo at IFA, showing **ASA functionality on Frontier's reference platforms**.
- Collaboration with **TechniSat** and **JVCKenwood** for a joint project demo a week after IFA, aiming to **showcase** similar functionality

German Warning Day: September 12, 2024

Automatic Safety Alert

Why is ASA different to what has gone before?

- All the ASA functions and behaviours are defined in detail
  - Historically, Alarm Announcements have been at the heart of radio emergency warning functionality
    - These systems have no rules for wake-up, etc, so receiver behaviour is only specified when the radio is on and tuned to the transmission with the alarm
    - With ASA all behaviours are specified and tested
- ASA makes it hard for bad actors to “capture” radio listeners
  - Unlike narrowband systems, the DAB multiplex structure and inter-ensemble signalling ensures that bad actors are largely excluded
    - The design took note of the way that the FM-RDS emergency function was “neutralised” by rogue broadcasters raising the alarm permanently to capture car radios that scanned the band and retuned to any alarm signal
    - With ASA, the DAB ensemble for monitoring can be selected by the user

Thank you

www.worlddab.org