WorldDAB Automotive

DAB Digital Radio
In-car User Experience Guidelines

January 2022 – v.37

Contents

1. The Group – Radio in the Car and the User Experience

1.1 Background: Radio in the Car

- Radio remains important to drivers - Car Buyers Survey 2021*
  - 90% of car buyers say that broadcast radio should be standard in every vehicle
  - Broadcast radio is the most preferred source of in-car entertainment across the globe
  - Over 80% of consumers are less likely to buy or lease cars without a built-in radio tuner
  - Consumption of broadcast radio is significantly higher than for any other form of in-car audio; 93% want access to radio to remain free
  - Car buyers' most desired radio features include voice controls and content information

- Legislation encourages DAB growth: European Electronics Communications Code Directive mandates digital radio in new cars
  - Came into force on 20 December 2018
  - All new car radios sold or rented in the EU now need to have digital terrestrial radio as standard

- WorldDAB Infographic tracks all areas of DAB and the car - sales of in-car DAB remain strong
  - New cars with DAB: 100% Norway, Italy, 99% Switzerland, over 95% UK, Belgium, Netherlands, Germany, 93% Denmark, Over 80% Australia, France
  - Road coverage: Above 95% Switzerland, Denmark, Germany, Norway, Netherlands, Belgium, Italy, 94% Australia, 87% UK

* Edison Research - Car Buyers Survey 2021 - https://www.worlddab.org/news/blogs/89/car-buyers-survey-2021

1.2 Background: WorldDAB in-car User Experience Group

- The WorldDAB in-car user experience group was formed in 2016 to:

    - Improve the user interface for in-car digital radio putting the consumer at the heart of the design process
    - Understand how future technology will impact on UI design
    - Identify and action the collaboration required between broadcasters and car manufacturers to improve and innovate UI design
    - Produce collaborative broadcast/car manufacturer user interface design guidelines

- The Group represents an unprecedented collaboration between broadcasters from across Europe, Australia and the US, leading car manufacturers and in-car technology providers

- The Group remit continues to expand, to focus on new and important areas of the in-car DAB UX experience

- The UX Group holds four meetings per year at which the UX Guidelines are reviewed with the aim of publishing updated UX Guidelines annually

- To find out more about the group and how to join contact rosemary.smith@worlddab.org

1.3 Background: Document status

This is the **fourth public version of the UX guidelines** incorporating feedback received from car manufacturers and includes:

- Specific updates to the current version include:
  - Updated and expanded section on Hybrid Radio
  - New section on Voice Controls and Phonemes
  - New and updated ETSI specification information - all DAB specifications can be found on the WorldDAB website: https://www.worlddab.org/dab/technical-specifications
  - Switching between platforms, use of FIG Switching/Linking *(in next update)*
- This document is live and is subject to change as and when feedback is received from stakeholders and partners.

1.4 Background: UX Guidelines for North America - NABA

- The North American Broadcasters Association (NABA) has produced a set of UX Guidelines based on this original document

- The development of these Guidelines aims to give a clear picture to vehicle manufacturers and broadcasters of how radio should appear and function for users in North America

- The NABA Guidelines are on the whole the same as these Guidelines however due to market conditions do differ in parts.

- A list of these differences is provided as the first item in the Annex of these UX Guidelines.

- To receive a full version of the UX Guidelines for North America contact Jenn Hadfield at NABA, jhadfield@nabanet.com

1.5 Current & Future work of the WorldDAB UX Group

The current focus of the WorldDAB UX Group is to continue engagement with OEMs to help support the UX design, good DAB performance, and supporting the introduction of Hybrid radio and voice technology to enhance and improve the radio experience in connected cars.

Areas of on-going work:

- We are seeing the introduction of Voice Controls, whether it be a car manufacturer proprietary platform, Amazon Alexa, Google Assistant or others. We support the introduction of voice to support hybrid radio. Voice lends itself perfectly to radio and significantly minimises driver distraction.

- Although the introduction of truly Autonomous Vehicles (Level 4 and 5) will not happen in the short term, work is ongoing now developing the infotainment and radio experience in a lean-back automotive environment WorldDAB and it's members want to ensure continued collaboration on the radio experience.

- In line with current market trends the introduction of Electric Vehicles continues at pace, while not entirely different to the UX in the non electric car this group is looking into various factors which may affect the use of DAB in the Electric Vehicle.

world dab

2.1 A Hybrid Radio Future in the Connected Car

- Radio is evolving in-line with increased connectivity in the car and the introduction of voice

- **The WorldDAB UX Group believes that Hybrid radio with DAB, DAB+ as the core and FM and IP working together provides the best radio experience in next generation connected cars by making the best use of the relative strengths of each platform**

    - Broadcast radio: Free-to-air, robust, good coverage
    - IP: Metadata, return path, interactivity

- Hybrid radio is already available in some new cars and on the roadmap for many more. See Section 5 of these guidelines for guidance on implementing hybrid radio.

- It is evident that a good hybrid radio implementation enables car manufacturers to meet almost all the UX guidelines and can provide the best possible digital radio UX for drivers.

- See EBU study on the cost-benefit analysis of FM, DAB, DAB+ and IP:
  https://tech.ebu.ch/publications/tr_2017_radio

3. WorldDAB User Experience Research

3. WorldDAB In-Car User Experience Research

- This Group conducted the first ever qualitative consumer research on the DAB digital radio user interface in-car across five European markets: Germany, UK, France, The Netherlands and Belgium.

- The research summary, full findings and consumer videos can be seen on the WorldDAB website: https://www.worlddab.org/automotive/user-experience-guidelines

- The research has been used to inform these UX Guidelines, in particular the sections titled Consumer problems, Consumers want, and Consumer quotes

- The headline findings of that research were:
  - Drivers expect a great, simple UX
  - A radio button is essential to access DAB easily and quickly
  - An A-Z station list is the best search UX
  - Pre-sets should be easy to set and the process must be consistent and explained
  - Terminology must be easier to understand

- There was a high level of consistency in the consumer responses across geographic regions

- The research was well received by the vehicle industry and several vehicle manufacturers have implemented the Guidelines

4. Consumer Use Cases

4. Consumer Use Cases

Informed by the research and discussion within the UX group, a number of consumer use-cases have been identified. If delivered together, they form an easy to use UI and provide a structure for the design guidelines:

Consumers indicated that "I want"….

1. to find DAB radio easily in the car media system

2. to find DAB stations easily

3. the list of stations to be up to date

4. to be able to easily set a station as a pre-set

5. To keep listening to my station if it's available

6. to know more about what I'm listening to

7. my DAB radio to be set up for me

world dab

5. Design Guidelines

5. User Experience: Design Guidelines

For each consumer use case the associated design guideline follows the same structure:

- The current consumer problems and research references

- What consumers want

- Consumer quotes

- Design guideline

- Hardware requirements and/or Technical references

- Visual example of how the guidelines could be implemented (unless not required)

5. User Experience: Design Guidelines – Guiding Principles

To assist in creating comprehensive Design Guidelines there were certain principles that the group decided should be followed for each consumer 'want' and therefore each Guidelines:

- Design guidelines must be based on consumer use cases and what they want

- Every car manufacturer will design their own radio UI, the Guidelines were created based on consumer cases to help them achieve the best UX

- Broadcasters and manufacturers must both follow the guidelines to deliver a great UX to the driver

- Keys/buttons should have consistent behaviour between FM and DAB

- For ease of use and to avoid driver distraction, actions and navigation should require the least number of button presses and menu layers as possible

- To ensure DAB performance enhances a great UX, dual DAB tuners and a good DAB antenna implementation are required

- Example: See **WorldDAB Aftermarket Device Guidelines** for examples of good antenna placement which applies to vehicles as well as these devices - https://www.worlddab.org/automotive/aftermarket

5.1 Use Case: I want to find DAB easily in the media system

5.1 I want to find DAB radio easily in the car media system

Consumer problems and research references:

- In cars without a "Radio" button on the dashboard or screen, most consumers find it frustrating and difficult to find the DAB radio quickly*

- This could cause driver distraction and impact safety

- When consumers want to move from listening to AM/FM to DAB they find it difficult to do*

Consumers want:

- A quick, easy and safe way to access the DAB radio. Research shows that cars with a "Radio" button provide this solution.

Consumer quote:

"*There are a lot of arrows on the dashboard….there was nothing to direct me to radio*"

* https://www.worlddab.org/automotive/user-experience-guidelines

© WorldDAB

5.1 I want to find DAB radio easily in the car media system

Design guidelines:

- Include a permanent "Radio" button on the dashboard or the top-level menu on the screen.

- Selecting "Radio" should default to DAB (when it is available) or go to a menu where radio platforms can be chosen

- In a hybrid radio the best platform signal will be automatically selected

- When listening to AM/FM, include a "DAB" button on the screen

- Where there is no "Radio" button: Selecting a radio station is only 2 clicks from the home screen

- Provide a mechanism for no more than "2 click" switching between a projection system (e.g., Apple CarPlay, Android Auto) and car radio.

Hardware/ technical reference:

- No DAB technical reference included in this section as relates to UX design by vehicle manufacturers.

worlddab

5.1 Example - I want to find DAB radio easily in the car media system

Radio button on the top level permanent menu on-screen

| Home | Radio | Media | Nav | Phone |

5.1.1 I want to find DAB radio easily in the car media system – Switching between other platforms

Design guidelines:

- This section is an area of study for the WorldDAB UX Group and will be released in 2022.

Hardware/ technical reference:

5.2 Use Case: I want to find DAB stations easily

5.2 I want to find DAB stations easily

Consumer problems and research references:

- Finding stations by multiplex can be difficult, confusing, and in some cases impossible*

- An A-Z station list of DAB stations provides the best experience for finding stations*

- Consumers may value the ability to search for specific stations via alphabetical characters

Consumers want:

- A quick, easy and safe way to search for and find their DAB stations that does not require knowledge of the DAB broadcast network. Research shows that an A-Z station list provides this.

Consumer quote:

"Once I'd found DAB radio I was thinking I'd be able to find stations by searching through a list within the DAB part but what I needed to was find another menu which I didn't realise"

*https://www.worlddab.org/technology-rollout/automotive/user-experience

© WorldDAB

5.2 I want to find DAB stations easily

Design guidelines:

- Present an integrated and unified A-Z list of all available stations (FM, DAB, IP) which defaults to DAB *or* present an A-Z list of all available DAB stations

- Optional: It may also be useful to offer an A-Z list of alphabetic characters where consumers can choose the first letter of their wanted station and be presented with all available stations starting with that letter. A numerical "1" can be shown before "A" to denote stations that start with a number

- Note: Most users will not use ensemble information or channel codes, and don't understand them, if they are shown within the station list

Hardware /technical requirements:

- Note: Delivering a dynamic, accurate A-Z station list requires dual DAB tuners

- SPI via DAB or RadioDNS (https://radiodns.org/) can help create a single station listing

5.2 Example - I want to find DAB station easily

Alphabetical character list, takes you to all stations whose name begins with that letter. Stations beginning with a number may be shown first. Optional to show a numerical "1" in the scrolling list before "A"

| Home | Radio | Media | Nav | Phone |

A-Z station list of available stations. Dynamic updates made upon starting the car and then as new stations become available and existing stations are lost. Station labels 8-16 characters

Station Label
Station Label
Station Label
Station Label
Station Label
Station Label
Station Label

A
B
C
D
E
F
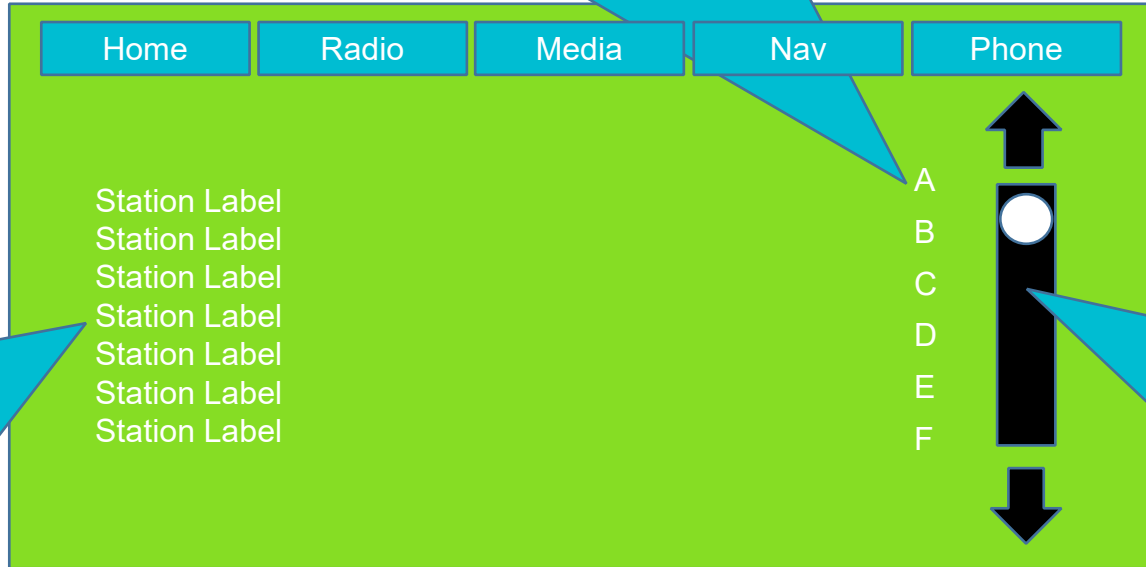
Assumes touch-screen scrolling is available. Physical scrolling wheel/button also available for search

© WorldDAB

worlddab

5.3 Use Case: I want the list of stations to be up to date

5.3 I want the list of stations to be up to date

Consumer problems and research references:

- It is a poor experience for consumers if the list of stations is not current

- It is confusing and annoying if a station is listed but not available

- Lists need to be up to date to show drivers new services for a richer experience

Consumers want:

- Their list of DAB stations to include all available stations, be current and dynamically updated.

Consumer quote:

"I don't understand why the radio offered a station to me and then it wasn't even there?"

*https://www.worlddab.org/technology-rollout/automotive/user-experience

5.3 I want the list of services to be up to date

Design guidelines:

- The station list should be automatically updated when stations become available or unavailable

- Part-time stations should be displayed with an appropriate indication if they are not currently available

- The driver should however have the choice to turn this feature off

- Note: Pre-sets should remain even if service is currently unavailable

- For connected cars that provide a list of stations based upon vehicle location, the receiver must combine any additional stations that are currently receivable

- Stations should only be added to the list once but should not have the same SI & PI code – Further information will be added on this section which will added to the annex to clarify this issue

Hardware/technical references

- Delivering a dynamic, accurate A-Z station list requires dual DAB tuners

- ETSI TS 103 176 section 6 describes how to keep service lists updated with new, removed and part-time services

5.4 Use Case: I want to easily set a station as a pre-set

5.4 I want to easily set a station pre-set

Consumer problems and research references:

- Research showed that 36% of people found it difficult or impossible to set a pre-set*

- Those consumers who found it difficult had typically not set a pre-set before on a DAB radio at home or in a car, so had no experience of pressing-and-holding buttons to set pre-sets. Those that found it easy knew to try this method.

Consumers want:

- To be able to set DAB station pre-sets as it makes using the radio easier and safer.

- The action to set pre-sets to be consistent across all radio platforms and radios (at home and in the car).

Consumer quote:

"I didn't know where to go on the menu. Maybe it should have a '+' sign somewhere?"

*https://www.worlddab.org/technology-rollout/automotive/user-experience
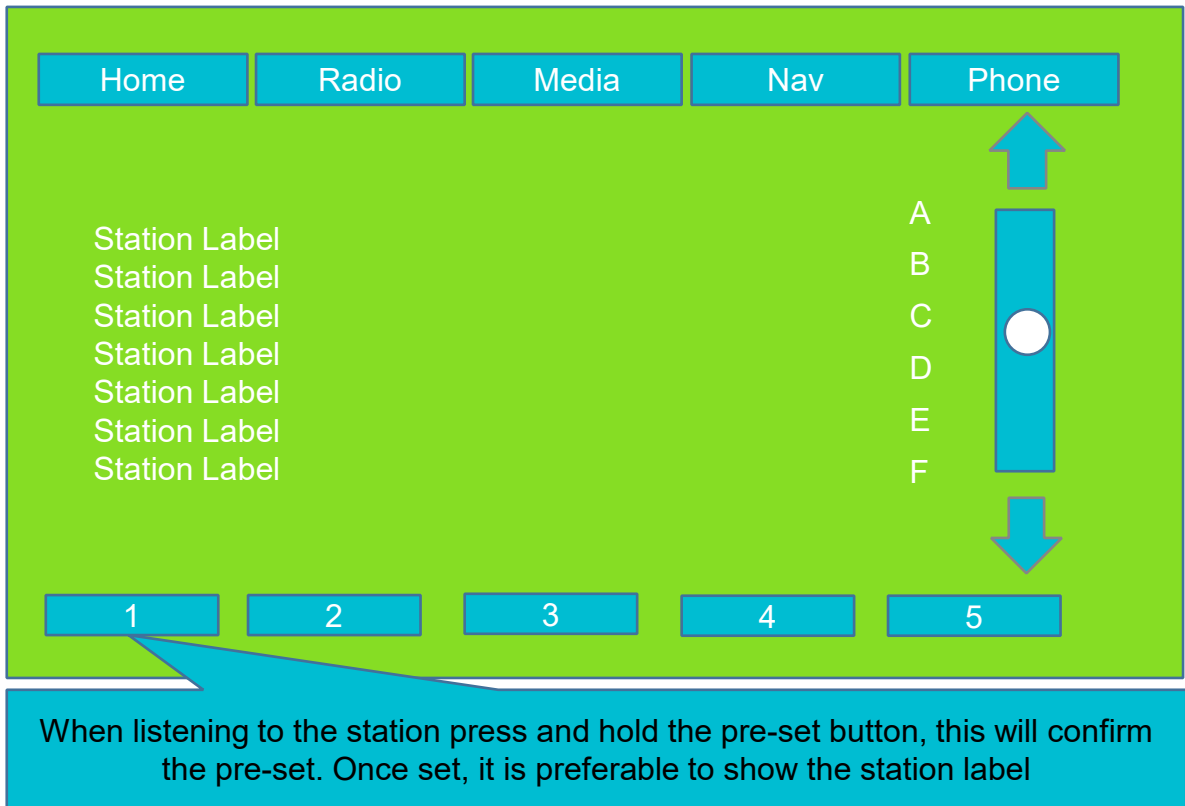
5.4 I want to easily set a station pre-set

Design guidelines:

- The action to set a DAB pre-set should always be to press and hold a button when listening to the wanted station. Recommend 5 seconds hold to set and less than 1 second response time when tapping to select.

- If the media system has physical numbered buttons, these should be used to press and hold when listening to the wanted station.

- If the media system has touch-screen soft keys, these should be numbered or clearly marked as pre-set buttons.

- Ensure clear instructions in the user manual for setting pre-sets

- Optional: If possible, on-screen prompts describing how to set a pre-set (until a pre-set has been set and therefore is understood)

- Optional: Audible feedback to confirm the pre-set has been saved

Hardware/technical references:

- No DAB technical reference included in this section as relates to UX design by vehicle manufacturers.

world dab

When listening to the station press and hold the pre-set button, this will confirm the pre-set. Once set, it is preferable to show the station label

© WorldDAB

5.5 Use Case: I want keep listening to my station if it's available

5.5 I want keep listening to my station if it's available

Consumer problems and research references:

- Losing radio signal in the car can be frustrating for consumers.

- While any lack of DAB coverage should be addressed by broadcasters, the station may still be available on another DAB multiplex or on FM or IP

Consumers want:

- The radio to find the best signal (FM, DAB or IP) to ensure they can continue listening to their station

Consumer quote:

"To be honest, I just want my radio to find the best signal and stick with it!"

*https://www.worlddab.org/automotive/user-experience-guidelines

worlddab

5.5 I want to keep listening to my station if it's available (Hard/Soft Linking)
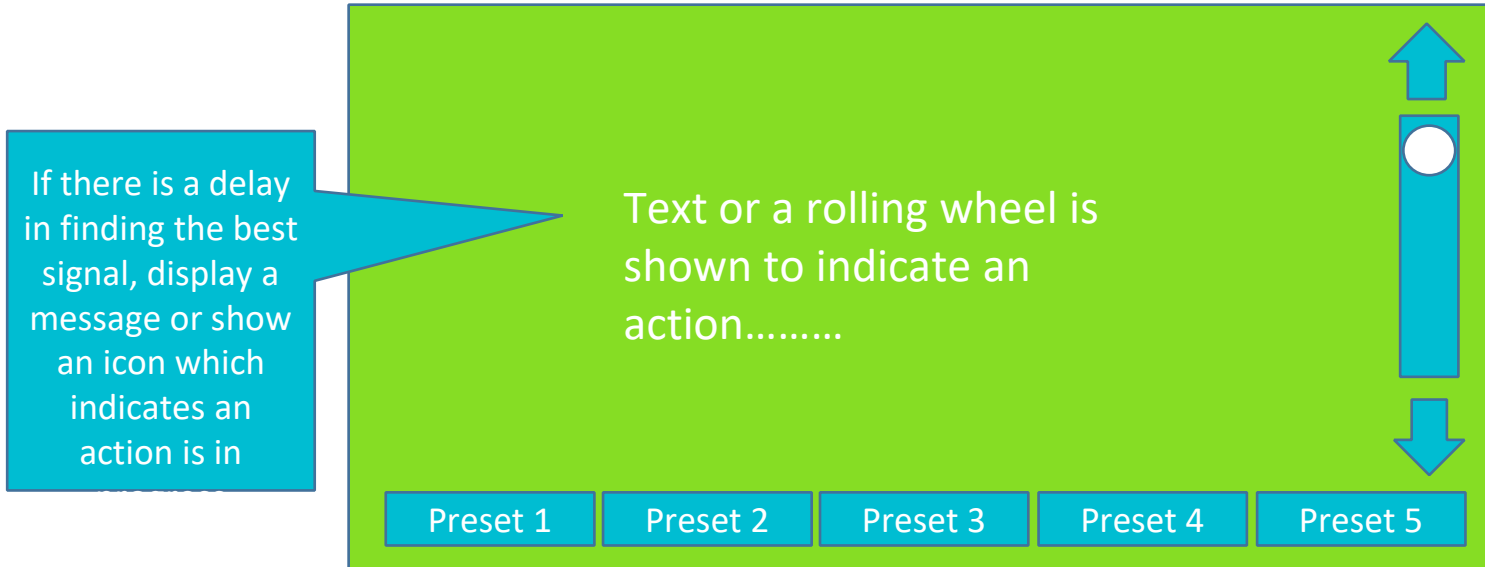
Design guidelines:

- For FM/DAB tuners, the radio should search for the best signal on FM, DAB, DAB-DAB, for the station being listened to. This happens automatically.

- If there is a delay in finding a station, display a message or have an icon for example a rolling wheel to show an action is in progress

- This function which is known technically as 'Service Following/Linking" is turned ON in the car by default.* The driver is notified of 'best signal search is on' periodically so they understand if they don't want it. This notification should also include guidance on how to turn it OFF

- For FM/DAB tuners with IP access, the radio should search for the best signal on FM, DAB, DAB-DAB, for the station being listened to. This happens automatically.

Hardware and technical references:

- FM/DAB tuners including Implicit, Hard and Soft linking - ETSI 103 176; Digital Audio Broadcasting (DAB); Rules of implementation; Service information features.

- FM/DAB/IP – Radio DNS https://radiodns.org/

Note: there is an option at importer level to turn off explicit Service Linking between DAB and FM as many non European countries will not have defined FM PI code systems and corresponding DAB SID codes for simulcast services.

worlddab

5.5 Example - I want to keep listening to my station if it's available

If there is a delay in finding the best signal, display a message or show an icon which indicates an action is in progress.....

Text or a rolling wheel is shown to indicate an action………

| Preset 1 | Preset 2 | Preset 3 | Preset 4 | Preset 5 |

world dab

5.6 I want to know more about what I'm listening to

Consumer problems and research references:

- Research shows that consumers value information such as station name, now playing, and potentially station logos*.

- Broadcasters should be providing this information – both as text (Dynamic Labels, or DLS) and as images (Slideshow) to enhance the experience in the car. When this isn't available it can be a poor experience in the car

- When that data is made available by broadcasters, it is sometimes badly presented on the screen or very hard to find, which is frustrating for listeners and broadcasters

Consumers want:

- Information about what they're listening (e.g. station name, station logo, now playing, programme name) clearly presented on the screen

Consumer quote:

"There were too many pieces of information on a large screen. Some of the information was good but felt cluttered"

*https://www.worlddab.org/automotive/user-experience-guidelines

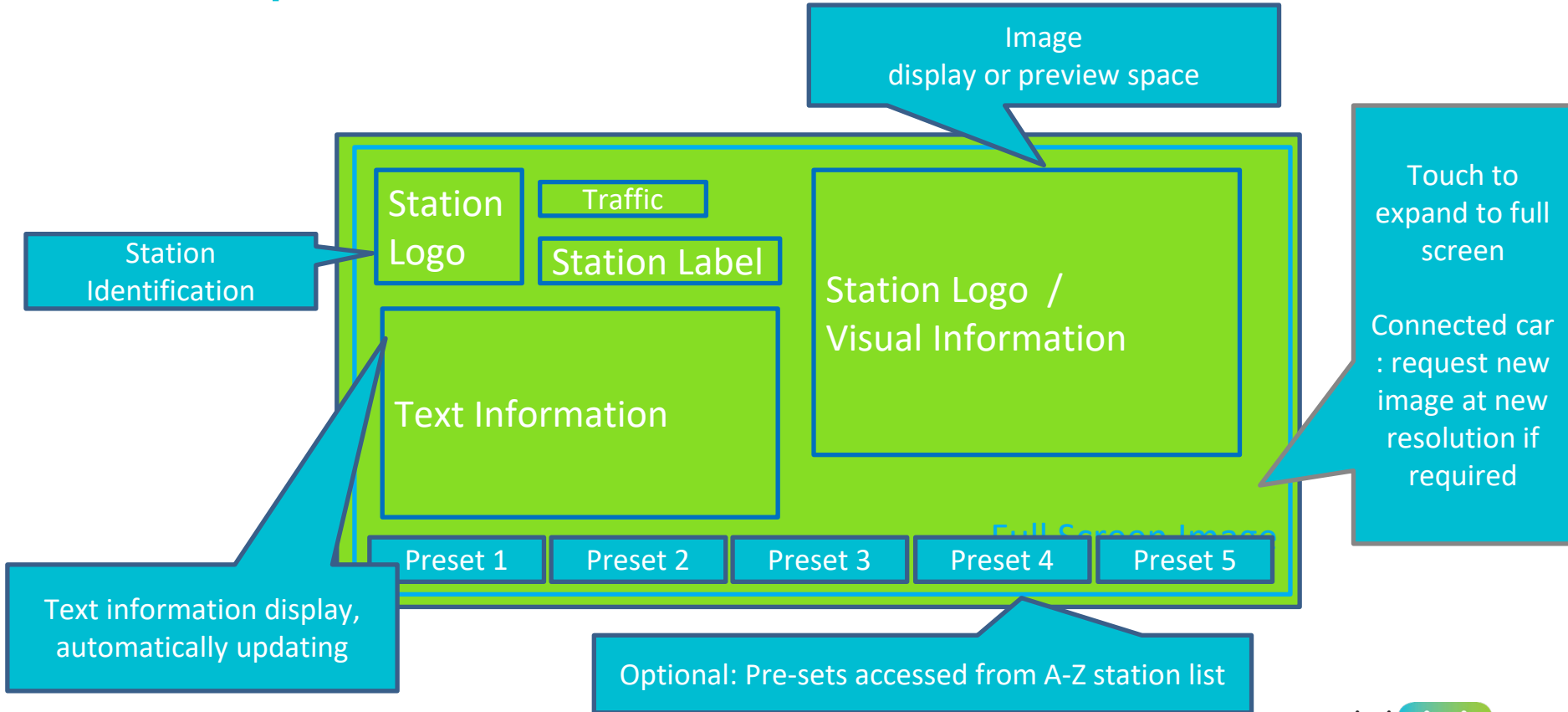# 5.6 I want to know more about what I'm listening to

Design guidelines:

- Single-line text display – provide a button which shows the latest text message, scrolling if necessary to fit onto the display

- Multi-line text display – always show the latest text message without the driver having to press any buttons

- Colour screen display – always show the latest text message. Show the station logo until the first visual is received, then show it automatically. Logos in the station list should be sourced using RadioDNS lookup for SPI for connected vehicles, but acquisition of logos using SPI over DAB+ should also be supported.

- Connected car – Request images at native screen resolution, for best quality
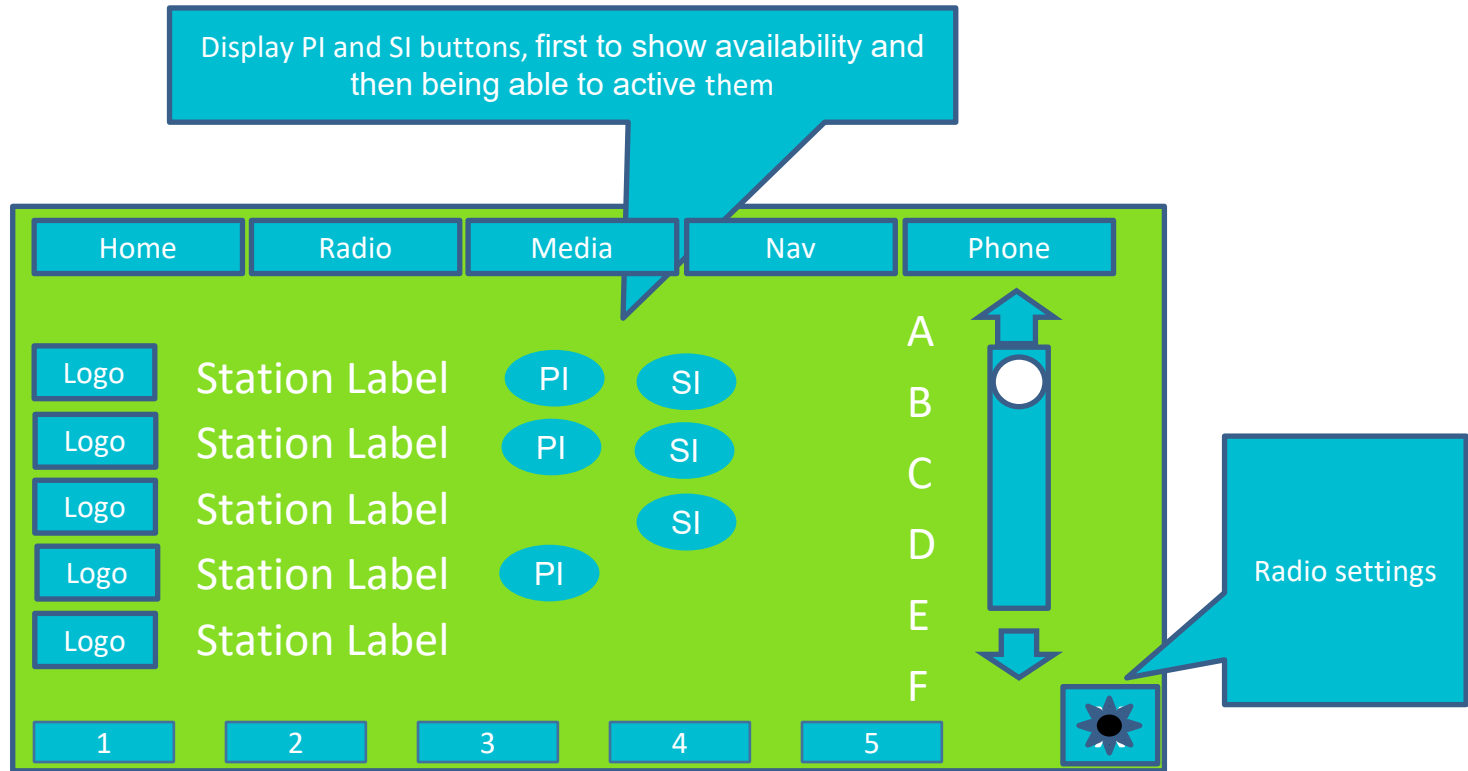
Hardware and technical references:

- DLS - ETSI EN 300 401v2.1.1

- Slideshow (Visuals) - ETSI TS 101 499

- Programme information and station logos – ETSI TS 102 818

- Radio DNS / WorldDAB guidance paper - Provision of Station Logos to Automotive Receivers
  https://www.worlddab.org/public_document/file/1091/StationLogosDoc_FINAL_2019.pdf?1548678132

5.6 Example – Station Information

Image display or preview space

Station Identification

Station Logo

Traffic

Station Label

Station Logo / Visual Information

Touch to expand to full screen

Connected car : request new image at new resolution if required

Text Information

Full Screen Image

Text information display, automatically updating

| Preset 1 | Preset 2 | Preset 3 | Preset 4 | Preset 5 |

Optional: Pre-sets accessed from A-Z station list

© WorldDAB

world dab

5.6 Example – Station Information

5.7 Use Case: I want my DAB radio to be set up automatically

5.7 I want my DAB radio set automatically

Consumer problems and research references:

- When consumers buy a new car, they are typically briefed by the dealer on how to use the functions and controls in the car. Unless it is specifically asked for, this briefing will not always include the DAB radio functionality and settings.

- Consumers do not understand what different functionality settings will mean for the UX or which settings they should have ON by default

Consumers want:

- Their default settings for the DAB radio to provide the best user experience

Consumer quote:
"I didn't really know where to start, especially when I couldn't find a radio button"

*https://www.worlddab.org/automotive/user-experience-guidelines

© WorldDAB

5.7 I want my DAB radio set automatically

Design guidelines:

- The following functions should all be on as default and form the basis of the factory re-set status of the car media system:

  - Service following – DAB-FM-DAB / Hard linking / Soft linking*

  - A-Z station list (default option to search)

  - Automatic station list updating

  - Default to DAB

Hardware and technical references:

- Automatic station list updating requires dual tuners

*Note: There is an option at importer level to turn off explicit Service Linking between DAB and FM as many non-European countries will not have defined FM PI code systems and corresponding DAB SID codes for simulcast services.

6. Use case: I want to use my voice to control my radio - and why phonemes are important

6. Voice: Enabling a safer radio experience in car

- Voice control, whether it be an OEM proprietary platform, Amazon Alexa, Google Assistant or others, lends itself perfectly to radio and significantly minimises driver distraction.

- Voice assistants should be able to control broadcast DAB+ radio, as well as IP, via a hybrid radio implementation, working offline and online.

- Voice assistants must also be able to provide accurate search results for all radio stations, recognising the phonetic detail of stations names and regional dialects.

- When using voice control to access radio, the voice interface should follow the same priorities and listener preferences for signal source as the standard (non-voice) interface.

- For services with a multilingual audience provide phonemes should be provided for each language.

- Car manufacturer should use these phonemes to improve recognition of spoken station names.

6. Voice: Consumer Considerations

Consumer problems and research references:

Must consider consumer use cases i.e. a user would like to listen to….
- a specific radio station
- the radio station he/she listen to last time
- a category radio station (rock, pop, news, etc)
- a recommended radio station
- a local radio station

Consumer want:

- To know the name of the current station, the name of the current programme, know what's playing (music, song, artist), when a programme is available and being broadcasted, get suggestions for similar stations, set and save a station as a favourite pre-set

Industry Quote
*The share of cars featuring in-car connected services, which voice recognition requires, grew to **45% in 2020** from 30% in 2018, and is expected to reach 60% by 2024, according to IHS Markit. **May 17, 2021***

6. I want to use my voice to control my radio

Design Guidelines

- Manufacturers should reference <alias> and <phoneme> elements in SPI provided by broadcasters to determine accurate voice recognition and voice reproduction of text elements, such as station and programme names
- Broadcasters should provide <alias> elements in their SPI where there is potential for consumers to reference the station using colloquial or unofficial names
- Broadcasters should provide <phoneme> elements for all textual elements in their SPI.
  Guidance on how to do this is available from WorldDAB and RadioDNS

Hardware and technical references:
- ETSI TS 102 818 is being extended to add phoneme support.
  This change has been approved by the WorldDAB Technical Committee and Steering Board and the new version of the specification will be available in early 2022.

7. Use case: I want a richer radio experience using hybrid DAB and IP in the connected car

7. Hybrid Radio: Use Case

Hybrid radio: Enables car manufacturers to meet the majority of the UX Guidelines

- Hybrid radio seamlessly combines Broadcast radio and the Internet. Your broadcast signal (FM, HD, DAB, DAB+) continues to carry audio (and some data), but a radio with an Internet connection (WiFi, 3G, 4G, LTE) can seamlessly connect back to your station for multimedia and interactivity.

- In the car, Hybrid radios offers:
    - Service following - The ability to seamlessly switch between broadcast platforms and IP, following the strongest signal
    - Great visuals - The matching of metadata over IP with the broadcast stream to provide station logos, artist information, news, weather and commercials
    - Interaction – Providing the listener with the ability to find out more about the content and offers the [potential for greater personalisation

WorldDAB supports open standards for Hybrid radio and for more information go to https://radiodns.org/

world dab

7. Hybrid Radio Guideline

Design Guidelines:

- Station search should be presented in a single A-Z station list where stations are listed only once and the best platform with the strongest signal is automatically selected.

- The radio should default to DAB+, then FM, then only move to IP streaming if the broadcast signals become unavailable. Once a broadcast signal becomes available again, the radio should switch back to either DAB+ or FM.

- Seamless-switching (seamlessly blending the broadcast and IP streams to mitigate the inherent latency and ensuring the switch of platforms incurs no time delay) is recommended. Hard-switching (switching to another platform once the signal of the current platform becomes unavailable, with no attempt to mitigate the inherent latency between platforms) is possible but will provide a worse consumer experience with delays in switching between broadcast and IP.

- Broadcaster supplied metadata should take precedence over metadata from other sources. Broadcaster supplied metadata provided over IP, where available, should be used in preference to that provided over DAB+. IP provided metadata is usually more comprehensive, faster to acquire and at a high detail / resolution.

Hardware and technical references:
https://radiodns.org for technical standards, questions and How To Guides

7. Hybrid Radio: Resources

WorldDAB member companies that are experts in hybrid radio development:

- AIM
- Pluxbox
- Radiobridge
- Radioline
- Radioplayer
- Xperi

More information at https://www.worlddab.org/about/worlddab-members

8. Performance of DAB in-car

8. Performance of DAB in-car

WorldDAB's In-car Performance Working Group is committed to collaborating with car manufacturers to help ensure DAB+ performance is as good as possible, a huge factor in a good digital radio user experience. The Group has been collating performance testing and benchmarking from different markets, conducting new research and collaborating with car manufacturers.

All the conditions are in place to offer great performance of DAB+ in-car:

● DAB networks are maturing in many countries Broadcasters utilize the DAB capabilities: more and unique content, audio and visuals Latest DAB chips are lower cost with better performance and more features & functions

● However, the challenge to get good in-car DAB reception is increasing, driven by: increased levels of radio interferences non-rooftop antenna systems with lower sensitivity. The Group has conducted and collated research on antenna performance including highlighting the significant shortfalls performance of some antenna configurations and the substantial benefits offered by others

Car manufacturers have asked WorldDAB for DAB+ test routes in different markets to help development and performance measurement. WorldDAB has now published some DAB+ test routes in key European markets which can be found on the WorldDAB website: https://www.worlddab.org/automotive/dab-plus-test-routes

Annex

Annex NABA UX Guidelines: Comparison Table

Item	NABA	WorldDAB	Section(s) NABA / WorldDAB
Digital radio technology	HD Radio	DAB / DAB+	-
Discovering the radio	HD Radio on by default	Separate DAB button	5.1 / 5.1
Discovering radio stations	● Station list organized by frequency ● Main and multicast channels on one station list ● Support combined AM and FM presets (also multicast channels)	Organized alphabetically by station name	5.2 / 5.2
	● Consumer can request station list update	(not specified)	5.3 / 5.3
Service following	Optional - broadcaster should have ability to enable use of audio stream based on location	Not location specific	5.1 and 5.5 / 5.5
Voice control	● Support for AM radio	No AM	6 / 6
Hybrid radio	● Station list organized by frequency ● Support for AM radio	Organized alphabetically / no AM	7 / 7
AM radio	● Include in all-electric vehicles	(no requirement)	8 / -

Annex Glossary of Terms

Text Message

DAB DLS, FM RT or RadioDNS /text.

Manufacturers

Text Messages must always be automatically updated on the display as they are received. Commands to "REMOVE" messages must be respected. The receiver may restrict text message change rate to one update every 20 seconds.

Broadcasters

- Text Messages should describe accurately what is being broadcast now, or something directly relevant to the listener.

- Text Messages should not be updated more than once every 20 seconds.

- It is important for Car and driver distraction that updates are not more frequent then 20s to comply with law.

Either Broadcaster are slowing down upcoming changes or car manufacturer have to do it on their side.

Annex Glossary of Terms

Service Label

DAB Service Label, FM PS, or RadioDNS Name elements.

Manufacturers

There is no requirement to update a Service Label whilst receiving a Service (e.g. "Scrolling PS")

In markets where PS is unreliable, it can be discarded in favour of DAB Service Label or RadioDNS Name elements, if the service is correctly identified (e.g. DAB SId = RDS PI = RadioDNS bearer match)

Display the longest Service Label that can fit the available display space without scrolling:

- RadioDNS <longName> element
- DAB Service Label (16 characters) or RadioDNS <mediumName> element
- FM RDS PS (8 characters) or RadioDNS <shortName> element

worlddab

Annex Glossary of Terms

Station Logo

DAB EPG <mediaDescription> element

RadioDNS <mediaDescription> element

Manufacturers

The Station Logo must be displayed at the highest resolution for the available display space.

The Station Logo with the closest available resolution must be selected for display, and scaled to fit, but the aspect ratio must not be changed

See WorldDAB / Radio DNS guidance on Provision of Station Logos here

Broadcasters

You must provide 5 versions of your logo on IP, and/or 4 versions over DAB SPI

The Station Logo should be allowed to be cached for up to 30 days.

The Station Logo must not feature any transparency layers

world dab

Annex Glossary of Terms

Phonemes

- Phonemes describe how words are pronounced

- Phonemes are good for voice recognition and voice control

- Phonemes help to improve voice recognition better detect spoken words and allow better voice output to the User

- Phonemes are different for different languages or dialects

- Phonemes are part of Station Corporate Identity and Corporate Design

- Station names are often pronounced differently then transmitted and shown to user

- Example:
    - NRJ pronounced as Energy as phoneme ehnərʤi
    - 2FM pronounced as Twofm as phoneme tuˈehˈfm
    - Most systems will not understand the user if he asks for 2FM or NRJ because voice assistant would need to have different Phonemes for different pronunciation NRJ -> nrj or ˈehnərʤi

About WorldDAB

WorldDAB is the global industry association responsible for defining and promoting DAB digital radio. By bringing together radio industry professionals, WorldDAB provides knowledge and expertise that helps countries successfully adopt and implement broadcast digital radio.

Our 1200+ experts from over 100 member organisations cover 29 countries across the globe and include public and commercial broadcasters, regulators, network providers and manufacturers of receivers, chips, professional equipment and automobiles.

Together, we are shaping the future of radio, delivering advice and tailored solutions on all aspects of the switch from analogue to digital.

To find out more about the group and how to join contact rosemary.smith@worlddab.org

www.worlddab.org

WorldDAB Automotive – DAB Digital Radio In Car User Experience Design Guideline